GUIDEBOOK for MARINES



GUIDEBOOK for MARINES

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PREFACE AND ACKNOWLEDGMENTS

This eleventh revision of the original *Guidebook For Marines* is the result of a combined effort by Headquarters, U. S. Marine Corps, Marine Corps Schools and *Leatherneck* Magazine. Its purpose is to provide Marines with a convenient, up-to-date source of basic military information.

Modern warfare demands constant improvements in military operations and equipment and, consequently, the *Guidebook* is revised periodically to keep it abreast of these new developments.

This revision would not have been possible without the invaluable assistance and worthwhile contributions received from countless Marines. In addition, The Leatherneck Association gratefully acknowledges the services and cooperation extended by many other organizations and agencies, particularly the G-3 Division, HQMC; the Training and Test Regiment, Marine Corps Schools; and the Schools Demonstration Troops, Marine Corps Schools.

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The Marines' Hymn

From the Halls of Montezuma,
To the shores of Tripoli;
We fight our country's battles
In the air, on land, and sea;
First to fight for right and freedom
And to keep our honor clean;
We are proud to claim the title of
UNITED STATES MARINE.

Our flag's unfurled to every breeze
From dawn to setting sun;
We have fought in every clime and place
Where we could take a gun;
In the snow of far off northern lands
And in sunny tropic scenes;
You will find us always on the job—
THE UNITED STATES MARINES.

Here's health to you and to our Corps
Which we are proud to serve;
In many a strife we've fought for life
And never lost our nerve;
If the Army and the Navy
Ever look on Heaven's scenes;
They will find the streets are guarded by
UNITED STATES MARINES.




UNITED STATES
MARINE BARRACKS
WASHINGTON, D. C.
ORIGINAL SITE OCCUPIED
SINCE
1801

Chapter 1

History and Traditions

DURING its many years of experience in peace and war, the Marine Corps has developed many traditions; traditions of devotion to duty, self-sacrifice, versatility, and dependability; traditions of loyalty to country and to Corps; traditions of uniform, insignia, and equipment. Since the American Revolution, generations of Marines have maintained and perpetuated these traditions.

The Marine learns that his traditions are as much a part of his equipment as his pack, his rifle, or his ammunition. Pride of person is instilled in every Marine. But the making of a Marine is not alone a matter of smart appearance, drill, and discipline. Of greater importance, he learns to know his equipment and how to use it so that he is ready to meet any emergency that may arise and to report: "The Marines have landed and the situation is well in hand."

Symbols of Tradition

The familiar emblem of globe and anchor, adopted in 1868, embodies the tradition of world-wide service and sea traditions. The spread eagle, symbol of the Nation itself, holds in its beak a streamer upon which is inscribed the famous motto of the United States Marines: *Semper Fidelis,* which means in Latin "always faithful."

The term "Leatherneck" as applied to Marines is widely used but few people associate it with the uniform. The fact that United States Marines wore a black leather stock, or collar, from 1798 to 1880 may have given rise to the name. According to tradition, the stock was originally worn to protect the jugular vein from the slash of a saber or cutlass. However, official records fail to bear this out.

The sword with a Mameluke hilt, presented to Lieutenant Presley N. O'Bannon of the Marine Corps by a former Pasha of Tripoli, became the symbol of authority of Marine Corps officers for more than 100 years. It symbolized the exploits of O'Bannon and his Marines on the shores of Tripoli in 1805, an episode climaxed by the raising of the American flag for the first time in the Old World.

Marine Origins

The use of fighting men as part of the regular complement of ships of war was common to the Phoenicians and to all the maritime states of Greece at least five centuries before the Christian Era. The Marines of that day had definite tactical missions: first, to fight in naval engagements, defending the bulwarks of their own ships, and conducting boarding parties against the ships of the enemy; second, to capture and hold the land approaches of a harbor when it was necessary for the fleet to put into port in some strange country; and third, to enable the fleet to strike a blow on land by means of a raiding party or a small, compact offensive force.

The British Marines. The custom of using fighting soldiers aboard ships, coming down from the Greeks and Romans, was continued in the British Fleet. But not until the year 1664, during the reign of Charles II, was there any military organization placed under authority of the British Admiralty. This was accomplished by an Order in Council (October 28, 1664), which directed

the organization of "The Admiral's Maritime Regiment," in deference to the Duke of York and Albany, whose title was Lord High Admiral of England. The regiment was designated later as "Regiment of Marines," and in case of war was first to embark with the Fleet for service afloat.

The Colonial Marines. The American Colonial Marines came into existence early in the year 1740, when three regiments of Marines were raised in the American Colonies, concurrently with the re-establishment of the British Marines, for service in naval operations in the West Indies with the fleet under command of Admiral Edward Vernon of the Royal Navy. Native Americans were supposedly better fitted for service in this climate than Europeans, and their uniforms of "camlet coats, brown linen waistcoats, and canvas trousers" were considered well adapted for their duties. On April 2, 1740, the King commissioned Alexander Spotswood, former Governor of the Colony of Virginia, a colonel, to be commandant of the entire organization of American Marines.

After the death of Colonel Spotswood (June 7, 1740), the force of Marines was formed into a single regiment of four battalions under the command of Colonel William Gooch of Virginia, generally referred to as Gooch's Marines. It ranked in the British Army list as the 43rd Regiment. One of the officers of the American Marines was Lawrence Washington, the half-brother of George. The reestablishment of the British Marines, the creation of the first American Marines and their joint Caribbean service more than two centuries ago is commemorated by both services in their mutual use of the colors crimson and gold.

The Continental Marines. An organization of Marines, as a regular branch of our country's service, was formed by an act of the Continental Congress passed on November 10, 1775. The Continental Marines, though few in number, performed notable service during the American Revolution. With the Naval forces, they made several expeditions to the Bahamas, served with the lake fleets of the Continental Navy in the operations on Lake Champlain, with John Paul Jones, with the navies of the several States, and with Washington's Army in the Battles of Princeton and Assanpink Creek. Following the close of that war, they, like the Navy, went out of existence.

Beginnings of the Corps

The Marine Corps, as it exists today, was formed by the Act of July 11, 1798, at the beginning of the Naval War with France. The Marines took part in that war from 1798 to 1801, and in the war with the Barbary corsairs from 1801 to 1805. They took an active part in the War of 1812, serving aboard practically all American warships which engaged the enemy; with the Army in the Battle of Bladensburg, August, 1814; and with Jackson at New Orleans.

In 1824, Marines formed part of a landing force which operated against a nest of pirates in Cuba. In 1832, Marines again saw action against pirates, this time as part of a combined landing force from the U.S. frigate *Potomac* to punish the Malay pirates at Quallah Battoo, Island of Sumatra, for the capture and plunder of the USS *Friendship*.

In 1833, Marines from the Boston Navy Yard suppressed a mutiny in the Massachusetts State Prison which was beyond the control of the civil authorities. During 1836 and 1837, they helped the Army fight the Creek and Seminole Indians in Georgia and Florida, where they served under their Commandant, Colonel Archibald Henderson.

The Mexican War. During the war with Mexico and in the conquest of California, the Marines took an important part both on the Atlantic and Pacific Coasts, assisting in the capture of Monterey, Yerba Buena (San Francisco), Mazatlan, Vera Cruz, Tampico, and Tobasco. Their conduct at Los Angeles, San Diego, San Gabriel, and Guaymas merited the commendation of Commodore Shubrick. One battalion of Marines marched with General Scott to Mexico City, participating in the final attack on the Castle of Chapultepec and the march to the National Palace, the Halls of the Montezumas. This explains the words for many years inscribed on the colors of the Corps: "From Tripoli to the Halls of the Montezumas." The words are commemorated today in the first two lines of "The Marines' Hymn"—although the unknown author of the words of the first verse shifted the chronology when he wrote: "From the Halls of Montezuma to the shores of Tripoli."

Marine Corps Mottos. Shortly after the Mexican War, the Marines carried the so-called "Tripoli-Montezuma" flag, which had the motto, "By Land, by Sea." When the present Marine

Corps emblem was adopted in 1868, the Navy Department authorized the use of the words on the flag of the United States Marine Corps. The present motto, "Semper Fidelis," replaced "By Sea and Land" on streamers above the eagle soon after the Civil War, and was officially adopted as the motto in 1880. The march, "Semper Fidelis," was composed by the late John Philip Sousa in the year 1888 during the time he was leader of the U. S. Marine Band.

The Uniform. Although no historical reason is assigned for the red stripe on the outer seams of the trousers worn by officers and noncommissioned officers of the Corps—adopted shortly after the Mexican War—tradition has it that the red stripe commemorates the bloody battle of Chapultepec.

In the famous blue uniform of the Marine Corps, which was first authorized by Secretary of War James McHenry, August 24, 1797, just prior to the formal establishment of the Marine Corps on July 11, 1798, are incorporated many of the traditions of the Corps. Blue or "Navy Blue" an inconspicuous color at sea and employed generally by the naval forces of all countries, was selected by the U. S. Marines for their uniforms, while the pattern and trimmings of red and gold served at the same time to make them distinctive. Although the red edging or piping on the blouse was used primarily for its decorative effect, it will be remembered that John Paul Jones dressed his Marines in red uniforms and it is quite possible that sentiment played its part. In view of the fact that the early organization, duties and regulations of the American Marines were patterned somewhat after ways and customs of their forerunners, the British Marines, it is possible that the traditional red of the British uniform had its effect in the adoption of red for the uniform of the United States Marines.

From Civil War to World War I

During the Civil War Marines served afloat and ashore. They took an active part in all the more important naval operations: those of the Gulf and the Mississippi Valley, the operations leading to the capture of New Orleans, and also against the coastal defenses on the Atlantic seaboard, culminating in the last big operation of the war—the capture of Fort Fisher. They also took part in a number of land engagements, including the fight on July 21, 1861, which was known in the North as "Bull Run" and in the South as "Manassas." A noteworthy incident at the beginning of the Civil War period (1859) was the participation of Marines in the capture of John Brown and the suppression of the uprising and riot at Harpers Ferry.

Scattered Actions. The "peacetime" activities of the Marine Corps from the close of the Civil War until the War with Spain, were in accordance with the Marines' tradition of versatility. They aided the civil authorities in suppressing labor riots in Baltimore and Philadelphia and enforcing the revenue laws in New York. At the same time, they sent expeditions to the Caribbean Area, Korea, China, and other foreign countries for the purpose of protecting American lives and property. During the years 1867 and 1870, they formed part of the Formosa expedition. A year later, in what was then termed the most important action since the Civil War, a battalion of Marines, as part of a naval brigade, led the advance against the Korean forts in reprisal for serious offenses against Americans. In 1882, a detachment of Marines landed at Alexandria, Egypt, to assist in restoring order.

The Spanish War. In the War with Spain, the Marines again were first to land in enemy territory, at Guantanamo Bay, Cuba. They served on the larger ships with Admirals Dewey and Sampson in the battles of Manila Bay and the naval battle off Santiago de Cuba. Following the spectacular naval victory in Manila Bay, the Marines of the cruiser *Baltimore,* under command of First Lieutenant Dion Williams, USMC, landed to take the Spanish Naval Arsenal at Cavite, and from then on Marines garrisoned this station.

The Philippine Insurrection. Not long after the War with Spain, a Marine brigade was sent to the Far East, where it helped to suppress the Philippine Insurrection. Notable among Marine Corps activities in the Philippines was their participation in the Battle of Novaleta and the ill-fated expedition across the Island of Samar.

The Boxer Rebellion. During the Boxer Rebellion in China, in the summer of 1900, Marines from ships on the Asiatic station took part in the defense of the Legation Quarter at Peking, and a regiment of Marines formed part of the Allied relief expedition from Taku to

Peking, as well as participating in the Battle of Tientsin. A very interesting and unique tradition of friendship between the 23rd British Foot (the Royal Welsh Fusiliers) and the United States Marine Corps had its inception in this campaign. During the course of the desperate fighting at the walls of Tientsin, each of these two famous organizations was supported by or came to the assistance of the other on a number of occasions. The conspicuous service rendered by each organization resulted in mutual admiration. Saint David's Day (March 1) is marked annually by cabled greetings to each other, messages which contain only the ancient Welsh password, "And Saint David."

In 1903, Marines were landed in Santo Domingo and Korea, while a detail of Marines served as guards for a diplomatic mission to Abyssinia by camel caravan across the desert to negotiate a treaty with King Menelik.

From 1906 to 1908, the Marines participated in the Army of Occupation in the Cuban Pacification, a number of expeditions to Panama and Nicaragua from 1909 to 1912, and the 1914 expedition to Vera Cruz, Mexico.

Marines in World War I

In World War I, the Marines did the hardest fighting in their history up to that time. The Fourth Brigade of Marines (composed of the famous 5th and 6th Regiments and the 6th Machine Gun Battalion) served as one of the infantry brigades of the Second American Division, participating with distinction in the important battles of Belleau Wood, Soissons, St. Mihiel, Blanc Mont Ridge, and the Argonne. At Belleau Wood in June 1918, the Marines of the 4th Brigade fought with such ferocity that the Germans in their official reports referred to them as "teufel-hunden" ("devil-dogs"), a fighting name that has increased in popularity with the passing of time. The 5th Brigade of Marines (11th and 13th Regiments and the 5th Brigade Machine Gun Battalion) also took part in the war in France, mostly on guard duty.

Marine aviation units under command of Major Alfred A. Cunningham (who became the Marine Corps' first aviator in 1912) rendered conspicuous service as the Day Wing of the Northern Bombing Group in Northern France and Belgium. The Marine pilots flew 57 bombing missions, dropping 52,000 pounds of bombs, and shooting down at least a dozen German planes. The 1st Marine Aeronautic Company under command of Major Francis T. Evans operated an anti-submarine patrol station in the Azores from January, 1918 to January, 1919. (Major Evans, in February, 1917, was the first to loop a seaplane, a feat thought impossible.)

Between Two Wars

For more than a decade after the first World War the Marines were continually engaged in efforts to restore peace in the countries of the Caribbean area—always acting as the strong arm for carrying out the Nation's foreign policy. In three Caribbean countries they carried on extensive campaigns against disorderly elements, assisting the governments of those countries to put down armed insurrection, to organize efficient native constabularies to maintain order after they withdrew, and to restore peace. In Haiti from 1915 to 1934 they fought two wars with *Cacos;* in the Dominican Republic it took them six years to suppress banditry; and in Nicaragua they fought the bandit elements from 1927 to 1932. The fighting at Nicaragua was the first evidence of the development of the famous Marine "air-ground team" concept. Cargo resupply by aircraft was also used for the first time.

Duty in China. For almost a century the Marines have felt at home in China. As early as 1854 internal upheaval which endangered the lives of Americans required the presence of a landing force of Marines. From that time to the Boxer Rebellion of 1900, Marines and Sailors landed on a number of occasions for the protection of our national interests. The decade from 1901 was a comparatively peaceful one, but in 1911 and 1912 Marines operated in China to protect Americans during the overthrow of the Manchu Dynasty.

Beginning in 1924, conditions in China again became troublesome and contingents of Marines and Sailors landed from time to time to protect American citizens and American interests. In 1927, owing to the upheaval in that country and the attending danger to Americans, a force of about 5000 Marines was dispatched and stationed at various trouble points, principally at Shanghai and Tientsin. Three squadrons, VF-6M, VO-10M, and VS-1M, formed the aviation component. During the next two years more than 3000 sorties, mostly reconnaissance, were flown by the Marine aviators. By January 1929, the situation having improved, the force, which had been formed into the 3rd Marine Brigade, returned to the United States, with the exception of the 4th Marines, which remained in Shanghai.

This two-battalion Regiment, with occasional reinforcements in 1932 and 1933, was engaged in preventing the belligerents from entering the International Settlement. In 1937 the 6th Marines, with a battery of anti-aircraft guns, contributed to the formation of the Brigade at Shanghai nearly 3000 officers and men. After a few months the 6th Marines returned to the United States, but the 4th Regiment remained on duty in China until withdrawn just before the attack on Pearl Harbor in December, 1941.

Fleet Marine Force. In 1933 the Fleet Marine Force came into being as an integral part of the United States Fleet. The troops regularly assigned to this organization were mostly stationed at San Diego, California and Quantico, Virginia, and were constantly trained for their specialized duties by participation in the annual maneuvers of the Fleet. At each of these stations there was maintained a reinforced brigade of reduced strength consisting of an infantry regiment, a battalion of light field artillery (pack howitzers), a battalion of antiaircraft artillery, an aviation group, a light tank company, and small contingents of engineer and chemical troops. The aviation unit at each of these posts was composed of two fighting squadrons, two bombing squadrons, three observation squadrons, and two general utility squadrons.

Marines in World War II

In 1941, Marine units were stationed half way around the world, and approximately 2000 Marines were serving in China and the Philippines under the command of the Commander in Chief of the Asiatic Fleet. The 4th Regiment was stationed in Shanghai, with detachments in Peiping and Tientsin, North China, and two detachments at Olongapo and Cavite in the Philippines. In addition, several thousand Marines were serving at naval stations in the Hawaiian Islands, Guam, Wake, Midway, American Samoa, the Panama Canal Zone, and Cuba. The 1st Provisional Marine Brigade, taken largely from the Second Marine Division at San Diego, was on duty in Iceland, and provisional Marine Companies were stationed on various islands in the Atlantic Ocean and the Caribbean Area, leased from Great Britain in exchange for 50 over-age destroyers.

The Japs Attack. When the Japanese struck in the Pacific, the Marines from the stations in China had been successfully withdrawn to the Philippines with the exception of the Marine Detachments at Peiping and Tientsin in North China. The 4th Marines and the two Marine garrisons regularly stationed at Cavite and Olongapo in the Philippines participated in the defense of Bataan and Corregidor, until the American forces were finally overpowered and captured by the Japanese. The handful of Marines on Guam put up an heroic but futile defense. Marines on Wake Island made a gallant stand, the details of which are familiar to the American people. In Hawaii, an aviation group consisting of one fighter and two dive bomber squadrons was almost completely put out of action by the Japanese raid.

Marines to the Defense. Immediately after the Japanese attack of December 7, 1941, additional Marines with defense battalion equipment were sent out from the United States to reinforce the Hawaiian Islands and the smaller islands (Midway, Johnston, and Palmyra) lying to the westward. At the same time, measures were taken to strengthen the chain of islands across the South Pacific which protected the line of communication to Australia. The 7th Defense Battalion of Marines had been stationed at Tutuila, American Samoa, since March 15, 1941, and had taken some steps toward fortifying the harbor of Pago Pago. As further reinforcements for this important position, a Brigade of Marines, the 2nd, taken mostly from the 2nd Marine Division at San Diego, was formed and together with Marine Aircraft Group 13 (MAG-13) proceeded early in January of 1942 to American Samoa and set up defenses and air facilities on Tutuila. An additional Brigade of Marines, the 3rd, was organized from units of the 1st Marine Division at New River, North Carolina, and sent to Western Samoa, where they arrived on May 8, 1942.

This Brigade took up and organized positions on Upolu and Savaii Islands and, with naval units, established important air and naval facilities. A few weeks after the arrival of the 3rd Brigade, one of its units, the 8th Defense Battalion, reinforced, was sent 400 miles farther west to occupy Wallis Island, which was turned over to the control of the Marines by the Free French. The westward thrust of the Marines was resumed early the following October when a part of a Marine Defense Battalion occupied the island of Funafuti in the Ellice Islands. Several months later they again proceeded farther to the northwest and occupied the islands of Nanumea and Nukufetau.

Guadalcanal. In the meantime, the United States Fleet and Army Air Forces had repeatedly turned back strong Japanese thrusts designed to secure a hold on the Australian continent. In order to secure our line of communication to the southwest Pacific, the 1st Marine Division was sent to New Zealand in June of 1942. Even before the rear echelon arrived in New Zealand, Major General Alexander A. Vandegrift was notified that his division (reinforced by the 2d Marines of the Second Marine Division, the 1st Raider Battalion, and the 3d Defense Battalion) was to carry out a landing attack in the Tulagi-Guadalcanal Area.

On August 7, 1942, the 1st Marine Division (reinforced) effected landings on the north coast of the Island of Guadalcanal and on several smaller islands about twenty miles to the north that surround the important naval anchorage of Tulagi. This amphibious assault marked the beginning of the United States' offensive operation against the Japanese Empire. By August 10, the Marines had destroyed the Japanese garrisons at Tulagi, Gavutu, and Tanambogo, and had secured the airfield on Guadalcanal. For the next four months, the 1st Marine Division, later reinforced by Army troops and additional elements of the 2nd Marine Division, supported by the ships and aircraft of the Navy and planes of the Army and the Marine Corps, successfully repulsed numerous Japanese attacks made by land, sea, and air. This bitterly fought and grueling campaign was highlighted by the battles of the Tenaru River, Bloody Ridge, and the Matanikau River. Pilots and enlisted men of Marine Aircraft Group 23 performed almost legendary feats in fighting off Japanese air attacks at Guadalcanal and carrying the fight to enemy ships and bases.

Up the Solomons. After winning Guadalcanal, which was used as the first stepping stone to Tokyo, our forces moved up the Solomons ladder and seized bases in the New Georgia Islands. Army and Marine Corps units had landed on the Russell Islands in February of 1943, which gave us an airbase for operations against enemy bases in the New Georgia group. In June and July 1943, Marine Corps and Army troops landed on New Georgia and Rendova Islands, followed by landings on Vella Lavella, Arundel, and Kolombangara Islands. On November 1, 1943, the 3rd Marine Division made a landing at Empress Augusta Bay, Bougainville. The Bougainville campaign marked the beginning of close air support in the modern sense. For the first time pilots (forward air controllers) and enlisted men (radiomen) from the Wing reported to the Division for duty, where they helped company and battalion commanders obtain and direct air attacks on specific enemy emplacements holding up the advance of the Marine ground units. During the next 45 days the 3rd Marine Division defeated the Japanese in the battles of Koromokina Lagoon and Piva Forks, which ended enemy opposition to the Empress Augusta Bay Area as an allied airbase.

The Gilberts. After the seizure of Bougainville, the allied offensive against Japan was intensified. Army forces accelerated their leapfrog tactics up the north coast of New Guinea, and our Central Pacific forces breached the Japanese outer line of defense when on November 20, 1943, the 2nd Marine Division landed on Tarawa and elements of the Army 7th Division went ashore on Makin Island, both in the Gilberts Group. Within four days the Marines had wiped out all enemy resistance on Tarawa, but had suffered very heavy casualties. In the meanwhile, American and Australian forces cleared New Guinea's north coast, and on December 15, 1943, crossed to Arawe, New Britain, in a drive aimed at cutting the Japanese southern line of communications to Rabaul. On December 26, 1943, the 1st Marine Division went ashore on Cape Gloucester on the northern coast of New Britain, cutting the enemy northern line of communications and forcing him to withdraw to the vicinity of Rabaul. In a series of bloody battles, Marines secured the Cape Gloucester airdrome and captured a number of strategic hills in the Borgan Bay Area.

By March of the following year the Japanese were fleeing eastward toward Rabaul. On April 28, 1944, the Commanding General of the 1st Marine Division turned over command of the Cape Gloucester-Talasea Area to the Army. The 1st Division's operations in the western

New Britain campaign breached the enemy's defense arc from Java to Rabaul by cutting both northern and southern barge lines and creating a gap through which the Allied forces could drive northward.

The Marshalls. Meanwhile, to the north our Central Pacific forces were smashing through the Japanese defensive line by seizing a number of islands in the Marshalls group. The 4th Marine Division captured Roi and Namur Islands at the northern end of Kwajalein Atoll, while the Army's 7th Infantry seized Kwajalein Island at the southern end. After organized enemy resistance had ceased on Kwajalein Atoll February 7, 1944, these forces followed up by capturing Eniwetok Atoll, and other northern islands of the Marshalls group.

The landings in the Marshalls were followed by the seizure of the Green Islands in the South Pacific by American Marines and New Zealand troops on February 14, 1944, and a landing on the St. Matthias Island by Marine Corps Raider units on March 20, 1944. The capture of the Green Islands, for all strategic military purposes, completed the campaign for the Solomon Islands and forged another line in the chain of encirclement of Rabaul, New Britain. The occupation of the St. Matthias Group, together with the concurrent Army operations in the Admiralty Islands, tightened the noose around the Bismarck Archipelago and left approximately 70,000 Japanese troops to surrender or die by starvation and disease.

The Marianas. After the conquest of the Marshall Islands, our Central Pacific forces shifted their offensive to the north. On June 15, 1944, the 2nd and 4th Marine Divisions with the 27th Army Division in reserve landed abreast on the western side of Saipan in the Marianas Islands. The battle for Saipan, the most bitterly defended of the group, evolved into three distinct stages; first, there was the fight for the beachhead, a bitter struggle in which the enemy offered the heaviest resistance; second, there was the figh, for the Mount Tapotchau line; and third, there was the seizure of the northern part of the island, in which a desperate enemy counterattack of July 7 was the outstanding feature. Within 10 days, the American forces had captured the Aslito Airfield and were blasting the enemy out of caves on Mount Tapotchau, the key terrain feature of the island. By June 26th, the 2nd Marine Division had mopped up the Mount Tapotchau fortress and had established positions at the summit. Meanwhile the 4th Marine Division had captured Kagman Peninsula on the eastern side of the island. On July 9, after 25 days of heavy fighting, all organized enemy resistance had ceased and the island was officially secured.

Eleven days later, July 21, 1944, the 3rd Amphibious Corps, composed of the 3rd Marine Division, the 1st Provisional Marine Brigade, and the 77th Infantry Division, began landing on the west coast of Guam. In spite of the rugged terrain and a number of strong enemy counterattacks, the American forces had by July 25 gained control of the southern half of Orote Peninsula. Organized resistance ceased on Guam August 10, 1944.

Three days after the landing on Guam, the 2nd and 4th Marine Divisions went ashore on Tinian and moved inland against light resistance under strong cover. The two divisions advanced across the northern part of the island, then wheeled to drive southward. Within two days, they had captured the Ushi Point Airfield and on July 31 smashed through the last Japanese defenses along the southern plateau of Tinian Island. By the afternoon of August 1, the two Marine Divisions had smashed organized resistance in the different terrain on the southern part of the island and Tinian was secured.

No time was lost in taking advantage of our strategic position in the Marianas. Bombing runs on the Bonin Islands got under way almost at once. While Navy land-based Liberator bombers continued the attacks on enemy-held Bonin Islands, the construction of air bases in the Marianas for B-29 Superfortress bombers was rushed to completion. On November 23, 1944, Marianas-based B-29's made the first raid on Tokyo since April 18, 1942, when General Doolittle's 16 carrier-based B-25's had made their daring attack.

While these important breaches in the Japanese island defenses were being made, Marines of the ship's detachments had served with the Navy in support of the Allied landing in Normandy. On August 29, 1944, during the invasion of Southern France, Marine units from two United States cruisers landed on three small islands near Marseilles, captured Nazi installations, and disarmed the enemy troops.

The Palaus. In the Pacific, the shifting tide of the allied offensive moved southward. On September 15, the 1st Marine Division landed on the southwest coast of Peleliu, a small but rugged island near the southern end of the Palau Islands chain. In spite of difficult reef conditions and heavy enemy opposition, a substantial beachhead was established and the attack pushed inland, although the Marines had to fight their way step

by step over exceptionally rugged terrain and against strong enemy opposition from caves and the pillboxes. The Marines of the 1st Division had secured the major portion of the island by the afternoon of September 26. The assault phase of the Palau operation ended on October 12, although there was considerable resistance from the one remaining Japanese pocket on an elevation called "Bloody Nose Ridge."

The Philippines. The capture of Peleliu neutralized the remaining islands of the Palau group and opened the way for an invasion of the Philippines by General Douglas MacArthur's South Pacific forces. Within eight days after Peleliu had been secured General MacArthur sent his forces ashore on the east coast of Leyte Island in the Central Philippines. Marine divisions were not committed in the Philippines, although the Headquarters Battery and two battalions of V Corps artillery, and air liaison personnel participated. But in Marine aviation annals the Luzon campaign provides a notable milestone. Here the Marines set out to perform a distinct mission and they trained for just that specialty—the assistance of ground troops in advancing against the enemy. In this case the ground troops were U. S. Army divisions. Small detachments of Marine aviators with the Army units provided the necessary coordination between ground and air. Lessons learned on the paddy fields of Luzon paid off six years later in Korea. When strong units of the Imperial Navy moved into the Philippines theater a few days after the Leyte landing to counter our latest move westward, a great naval and air action resulted. In this "Battle for Leyte Gulf" Marines aboard the battleships, carriers, and cruisers of the mighty 3rd and 7th Fleets participated in the decisive victory, which not only gave the Allies control of the waters east of the Philippines but eliminated the Japanese Navy as a serious factor in future attacks upon enemy-held islands.

Iwo Jima. In order to provide fighter protection for the B-29 bombers based in the Marianas and at the same time eliminate the enemy's air base for attacks on the Superforts, it was necessary to secure Iwo Jima in the Volcano Islands. The rugged, natural terrain of this bit of volcanic bleakness had been supplemented by extensive man-made fortifications. On the morning of February 19, 1945, hundreds of landing boats roared through the pounding surf to spill thousands of 4th and 5th Division Marines onto Iwo's southeastern beaches. The 3rd Marine Division was held in reserve.

During the second day, the 28th Marines moved forward to the slope of Mount Suribachi, while the remainder of the 5th Division and the 4th Division, wheeling to the north, captured Airfield No. 1 and began the assault on the heavily fortified enemy positions between Airfields 1 and 2.

The 21st Regiment of the 3rd Marine Division landed during the afternoon of February 21 and the 9th Marines landed the afternoon of February 24. Meanwhile, on February 23, units of the 28th Marines captured Mount Suribachi, which eliminated enemy fire on the landing beaches and gave the Marines an excellent observation point.

On February 25, the three Marine Divisions, spearheaded by tanks and supported by heavy bombardments from Marine Corps artillery, gunfire of 5th Fleet warships, and carrier-based planes, captured Airfield No. 2, thereby breaching the main Japanese defensive position. By February 28, the 3rd Marine Division had captured Motoyama village, and was at the southern edge of Airfield No. 3. By nightfall on March 3 the three airfields and the Motoyama plateau had been seized by Marines.

On March 10, after extremely bitter fighting the 3rd and the 4th Divisions reached the eastern beaches at several points, which split the Japanese force into small pockets.

Organized resistance ended on Iwo Jima at 1800, March 16, 1945, when the 3rd and 5th Marine Divisions smashed through the enemy's lines to reach Kitano Point at the extreme northern tip of the island.

Okinawa. In the final great land battle of the Pacific Area, the invasion of Okinawa, the Marine Corps was represented by the 1st, 2nd, and 6th Marine Divisions, which formed the 3rd Amphibious Corps. Air support came from the 2nd Marine Aircraft Wing and a Task Unit including Marine Aircraft Groups 14, 22, 31, and 33. Carrier planes of the U. S. Navy also gave close support early in the campaign. The 3rd Corps, with the 1st and 6th Marine Divisions in assault and the 2nd in reserve, began landing on the western beaches of Okinawa on April 1, 1945, as the left Corps of the 10th Army. Enemy opposition was light and by the end of the second day, the American forces had reached the opposite coast, cutting the island in two.

By April 8, while the Army troops were making slight gains in their drive southward toward Naha, the 6th Marine Division was fanning out onto Motobu Peninsula, while the 1st Marine Division was mopping up in its sector.

On April 10 the 6th Division encountered the first organized enemy resistance, when an unesti-

mated number of Japanese, holding positions near the center of Motobu Peninsula, launched a series of strong counterattacks.

By April 17, elements of the 6th Marine Division units had advanced under the protective support of Marine fighter-bombers to the northern coast of Okinawa, and had captured Mount Yae Take, key terrain feature on Motobu Peninsula, which eliminated the final pocket of Okinawa's enemy resistance in the northern part of the island.

On May 1, the 1st Marine Division attached to the XXIV Corps, relieved the 27th Infantry Division on the right (west) flank of the line above the city of Naha. On May 7, the 1st Division reverted to control of the 3rd Amphibious Corps and May 9 found the 6th Marine Division in the line on the right of the 1st Marine Division.

Increased pressure was brought against the enemy line of defense which stretched across the island from Naha on the west coast eastward to Shuri Castle. On May 13, units of the 6th Marine Division entered the ruins of Naha and on this and the following day, the capture of high ground to the east of Shuri by the 96th and 77th Infantry Divisions and the seizure of high ground to the west of the fortress by the 1st Marine Division, placed the jaws of a pincer around this position.

By nightfall of May 31, the 1st Marine Division had captured Shuri Castle, and on June 1, the capture of Shuri was completed and the Marine Corps and Army units continued their drive southward against diminishing resistance. Presently, on June 2, the 1st Marine Division plunged across the Naha-Yonabaru highway in a 1000-yard advance, and the next day, the 7th Infantry Division, on the left flank, drove across the Chinen Peninsula. The 6th Marine Division on June 4 landed strong forces on Oroku Peninsula and captured half of the Naha Airfield.

By June 7, the 1st Marine Division had advanced its lines to within 200 yards of the west coast north of the town of Itoman, a move which cut off escape for the enemy forces in the vicinity of Oroku Peninsula. During the night of June 17-18, units of the 8th Marines, 2nd Marine Division, relieved the 7th Marines on Mezado and Kunishi Ridges.

More than 14,000 close air support sorties were flown during the Okinawa campaign, over half of them in support of Army troops. Marine night-fighters also recorded a highly increased effectiveness here as they held off desperate Japanese attacks on this island of the Japanese homeland. Meanwhile, other Marine aviators were fulfilling the U. S. Marine tradition of being ready for any emergency. Japanese Kamikaze planes threatened to overcome the air superiority of U. S. aircraft carriers. During the first six months of 1945, ten Marine fighter squadrons moved from land bases in the southwest Pacific to aircraft carriers to increase defensive capabilities of the fleet.

On June 21, the announcement was made that organized resistance on Okinawa had ended and that the first conquest of Japanese soil was completed.

Japan Capitulates. The successful conquest of Okinawa enabled our ships, planes, and submarines to tighten the blockade around Japan's home islands and sever her vital sea links to the Asiatic mainland and the areas to the south. With the end of the Okinawa campaign, the bombing attacks upon Japan were stepped up, which together with our submarines and ships further weakened Japan's ability to wage war.

In mid-July, 1945, while the U. S. 3rd Fleet was in the midst of its sustained assault on their homeland, the Japanese made a bid for peace, but they asked for terms more favorable than unconditional surrender. The Potsdam Declaration, however, killed any hope of a compromise.

During the last days of July and the first few days of August, Allied planes and warships increased their attacks in number and intensity, and troops in the rear areas rushed preparations for more and heavier blows to come. On August 6, and atomic bomb was dropped on Hiroshima, and the Japanese apparently realized that their game of conquest was nearing its end. At 1700, August 8 (Moscow time), Foreign Commissar Molotov informed Japanese Ambassador Sato that a state of war would exist between Russia and Japan as of 0001, August 9, 1945. Nagasaki, industrial city and important port on the coast of Kyushu, was blasted at noon, August 9, by the second atomic bomb to be used against Japan. The next day the Japanese expressed their willingness to accept the terms of the Potsdam Declaration. Immediate cessation of offensive operations by Allied armed forces was ordered and the Japanese Government was instructed through the Swiss Government to order its troops on all fronts to lay down their arms. At about 0900, August 15, 1945 (Guam time), "Cease fire" orders were flashed to the United States Pacific Fleet and all other units.

On August 27 and 28, 1945, the Allied Fleet inaugurated the first step in the occupation program by moving into Sagami and Tokyo Bays. Major occupation forces began landing during the

early morning of August 30, with U. S. Marines and Army Airborne Troops landing on Japanese soil almost simultaneously at about 0600. The first Marine Corps unit to land was the 2nd Battalion, 4th Marines of the 6th Marine Division, which went ashore at Futtsu Cape on the eastern shore of Tokyo to secure control of heavy coastal guns in the area. Several hours later, approximately 9000 U. S. Marines and 1200 picked naval landing personnel, plus 450 British Marines and Sailors, made the main seaborne landing in the vicinity of Yokosuka, site of one of Japan's main naval bases.

On September 2, 1945, in a brief but solemn ceremony aboard the battleship *Missouri,* representatives of Japan signed the surrender documents. Thereafter, Allied occupation of Japan and the territory under Japanese control went steadily ahead, with Marines playing an important role.

Demobilization and Peacetime Problems. When the war with Japan ended in 1945, the Marine Corps numbered six divisions and five air wings. The 1st and 6th Marine Divisions were sent to help disarm and repatriate the Japanese occupation forces in China. The 2nd and 5th Divisions were assigned to disarm garrison forces on the islands which had been by-passed during the war. The 3rd and 4th Divisions were decommissioned. The 1st Marine Aircraft Wing supported the ground troops in China and the 2nd Wing returned to Cherry Point, N. C. The 3rd, 4th and 9th Wings were decommissioned. During the year following the end of the war the Marine Corps accomplished a demobilization which cut its size from six to two divisions, from five to two wings, and from almost 500,000 men to about 100,000 by the end of 1946. At this time the 2nd Division and 2nd Wing were based in North Carolina and the 1st Division and 1st Wing in China. It was not until late in 1949 that the last Marine units left China and returned to the United States. The 1st Division and 1st Wing were based in Southern California until the outbreak of the Korean War.

Amphibious Training.—During World War II the tactics and techniques of amphibious operations were greatly improved by the Navy and Marine Corps. A Troop Training Unit (TTU) under Marine command was established at San Diego, Calif., as part of the Navy's Amphibious Training Command. After the war this TTU was retained as TTU Pacific, and TTU Atlantic was organized at Norfolk, Va. In addition to these training units, the operating forces continued to emphasize amphibious training in individual and unit exercises. Marine air-ground team tactics were further evaluated and developed. Annual maneuvers by the combined ground and air units on each coast emphasized the coordinated combat-ready condition of the fighting forces of the Marine Corps even in the atmosphere of headlong demobilization which characterized the military picture in this country between 1945 and 1950.

National Security Act of 1947.—This act specified the functions to be carried out by the Marine Corps for the first time in history. Now the role of the Marine Corps as a force in readiness was more than just a matter of tradition.

Marines In Europe.—During 1948, the Marine Corps averaged about 80,000 enlisted men and 7000 officers. Continuing the 177-year-old tradition of safeguarding American rights in war and peace, Marine units were regularly assigned to the Sixth Task Fleet operating in the Mediterranean Area. Every four months a reinforced infantry battalion and one or two fighter squadrons reported aboard naval vessels of our European fleet to keep them in a state of readiness for any emergency. In the performance of their duties the Marines on the four-month tour traveled throughout the Mediterranean, visiting such places as North Africa, Malta, Spain, France, and Italy.

Continued Development of Amphibious Techniques.—Intensive effort was made in the Marine Corps after World War II to develop and perfect the techniques and equipment associated with amphibious warfare. New concepts emerged in transport submarine operations; air transport, and especially helicopter transport of troops; cold weather operations; and improvement of amphibious vehicles and weapons. Marine personnel of the Troop Training Units on both coasts continued their heavy schedules of training troops of all services for amphibious operations. In support of this growing program, the Marine Corps Schools at Quantico were reorganized in 1950 into two major subdivisions, the Marine Corps Educational Center and the Landing Force Development Center.

Marines in Korea

On June 25, 1950, the Communist North Korean Army invaded without justifiable cause the Republic of South Korea. The move was immediately denounced by the Security Council of the United Nations, and supporting the decision of that body, the United States came to the defense of South Korea, first sending in what had been Army occupation troops in Japan, and then calling on the only combat-ready troops in the United States, the U. S. Marines. On July 7, the 1st Provisional Marine Brigade was activated, consisting of the 5th Marines (reinf.) and supported by Marine Aircraft Group 33. Embarkation followed five days later. First offensive action against the enemy was made by MAG-33's fighter-bombers on August 2, and the Brigade first clashed with the enemy on August 7, exactly one month after it had been alerted for the move.

The Pusan Perimeter.—The 1st Provisional Marine Brigade was attached to the Eighth U. S. Army in the Pusan Perimeter at the time when the North Korean advance had come within 35 miles of Pusan. The problem was one of holding against numerically superior enemy troops and the Marines were used as "firemen"—a hard hitting mobile reserve to be shifted from one threatened area to another for counterattacks. Three times the Brigade helped stop the enemy cold in such operations. The famous Marine "air-ground team" immediately began to prove the soundness of the post-war developments in close air support.

The Inchon Landing.—September 15, 1950, was D-Day for the 1st Marine Division, less the 7th Marines, as the X Corps landing force at Inchon; a daring amphibious landing which led to the capture of Seoul, the seizure of Kimpo airfield as a base of operations for the 1st Marine Air Wing units and the outflanking of the entire North Korean Army. On the morning of the 15th, the 3rd Battalion, 5th Marines, supported by tanks, air and naval gunfire, landed and seized the two harbor islands of Wolmi-do and Sowolmi-do. Late that afternoon the 1st and 5th Marine Regiments hit the beaches at Inchon. Within 24 hours they had secured this west coast Korean seaport and swept on, under the Corsairs of Marine Fighter Squadrons 214 and 323 who alternately attacked, screened with smoke, observed, and kept the sky free of enemy aircraft.

The Capture of Seoul.—The enemy resisted stubbornly along the approaches to Seoul and three days of street fighting were necessary to secure this city of a million and a half pre-war population. The finish of the war seemed in sight as the 7th Marines, after landing on D plus 7, pushed north of Seoul to seize Uijongbu and the main road to the North Korean capital of Pyongyang. On October 7, the 1st Marine Division was relieved by Eighth Army elements and sent by sea around the peninsula.

Chosin Reservoir.—After an administrative landing at Wonsan on the 25th of October, the 1st and 5th Marines were assigned by X Corps to patrolling and blocking missions while the 7th Marines advanced from Hamhung toward the Chosin Reservoir. On November 3, this regiment met and began battle with a Chinese Communist (CCF) division. It was the first large-scale battle between the Americans and the CCF. The 7th Marines, in a four-day battle, crippled this CCF division so badly that it never saw service on that front again. On November 24, an offensive was launched by the Eighth Army in Western Korea and by X Corps in the northeast. The next day, massed CCF forces struck back in overwhelming numbers, sending the Eighth Army into retreat and driving between it and X Corps. On the night of the 27th, the 5th and 7th Marines, who had advanced to Yudam-ni, west of the Chosin Reservoir, were attacked. Other CCF divisions cut the main supply route. From November 28 to December 2, the 1st Marine Division held its own against eight CCF divisions, including two in reserve. In addition to fanatical enemy attacks which resulted in the temporary isolation of certain elements of the division, the Marines had to fight bitter sub-zero cold and howling snowstorms. Then began the fighting withdrawal over 70 miles of tortuous road through mountain passes and canyons dominated by CCF forces. The long twisting convoy battled through to Hagaru-ri, with fighting units sweeping the foe from nearby slopes. The reverse slopes and flanks

became the responsibility of the supporting aircraft of the Marine air-ground team. New chapters of heroism were written as cooks and bakers fought with rifles and bayonets on the ground while fliers braved tremendous difficulties and dangers to support the withdrawal from the air. At Hagaru-ri the reunited division was supplied by air drop and casualties were evacuated by aircraft from an improvised strip. The column began its breakout on the 6th, cutting a path through enemy forces to Koto-ri where more casualties were evacuated by air. Bitter resistance had to be overcome along the main supply route to Chinhung-ni and Marine engineers installed a 24-ton Treadway bridge, dropped by Air Force C-119s, to replace a vital span blown by the enemy. Marine close-air support was reinforced by Marine Air Group 12 at Yonpo and Navy planes from carriers. The 1st Marine Division reached Hamhung on December 11, having brought out its casualties, vehicles, and equipment. The main body was evacuated on the 15th to South Korea by Task Force 90, which pulled out the remaining units of X Corps and 91,000 civilian refugees to complete its "amphibious landing in reverse."

Stopping the CCF Advance.—Upon arrival at Pusan the 1st Marine Division again passed into Eighth Army reserve. Its first mission was to neutralize a North Korean guerrilla division in the Pohang-Yongdok-Andong area. By February 6, 1951, the enemy had been reduced an estimated 60 percent in strength. The Marines then participated in Operation KILLER and Operation RIPPER, limited offensives in central Korea designed to keep the enemy off balance. Meanwhile, operating under 5th Air Force control, 1st Marine Aircraft Wing planes were shifted to interdiction missions, seeking enemy military targets far into North Korea. On April 22 the Communists struck back in a large-scale counterattack. The 1st Marine Division in the Hwachon Reservoir Area, exposed to CCF pressure from the flank as well as the front, beat off all enemy attacks and inflicted heavy losses. A second enemy offensive was stopped the following month. This was followed by attacks in which the Marines pursued and severely punished the enemy.

Truce Talks.—Marines ended their first year in Korea in the "punchbowl" area just north of the 38th parallel, former dividing line of North Korea and South Korea. Early in July, 1951, United Nations and Communist representatives met for the first peace talks which created a lull in the activities at the front. At first, action was limited on both sides to patrolling; after the first few months of unsuccessful negotiations, limited fighting broke out on many sections of the front.

The truce was signed on July 27, 1953, and the 1st Marine Division returned to the United States in the spring of 1955, after almost five years of outstanding service in Korea.

Marine Corps Expansion

The year 1952 was highlighted by legislation approved by Congress and the President which gave the Marine Corps a minimum strength of three combat divisions, and three air wings with supporting troops. The Commandant of the Marine Corps was also authorized co-equal status with the members of the Joint Chiefs of Staff in matters directly concerning the Corps. The 3rd Marine Brigade was activated at Camp Pendleton, Calif., on June 20, 1951. On January 7, 1952, it became the 3rd Division, composed of the 3rd, 4th, 9th and 12th Marine Regiments. The 3rd Marine Aircraft Wing was activated at Miami, Florida on February 1, 1952, composed of MAGs 31, 32 and 45.

Mission of the Marine Corps

The Marine Corps shall be organized, trained and equipped to provide Fleet Marine Forces of combined arms, together with supporting air components, for service with the U. S. Fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign; to provide detachments and organizations for service on armed vessels of the Navy, and security detachments for the protection of naval property at naval stations and bases; to develop, in connection with the Army, the Navy, and the Air Force, the tactics, technique and equipment employed by landing forces in amphibious operations; to train and equip, as required, Marine forces for airborne operations, in coordination with the Army, the Navy and the Air Force in accordance with policies and doctrines of the Joint Chiefs of Staff; to develop, in coordination with the Army, the Navy and the Air Force, doctrines, procedures and equipment of interest to the Marine Corps for airborne operations and which are not provided for by the Army; to be prepared, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components to meet the needs of war.





Chapter 2

Discipline and Courtesy

Military Discipline

MILITARY discipline is the state of order and obedience among military personnel resulting from training. When we speak of discipline in the Marine Corps we do not refer to regulations, punishments, or a state of subservience. What we mean is the exact execution of orders resulting from an intelligent, willing obedience rather than one based solely upon habit or fear. Habit plays its part, however, and for this reason the Marine benefits from such things as Gun Drill, Close Order Drill, or Bayonet Drill. Punishment of individuals for breaches of discipline are sometimes necessary, but only to reform or eliminate those who are unfit to serve on the team.

Discipline is necessary to secure orderly action which alone can triumph over the seemingly impossible conditions of battle. The individual must be able to recognize and face fear because fear is the enemy of discipline. Fear unchecked will lead to panic and a unit that panics is no longer a disciplined unit but a mob. There is no sane person who is without fear, but with good discipline and high morale all can face danger.

Some Marines do not appreciate the necessity for discipline until they have undergone the experience of battle. However, when a Marine learns to be a disciplined Marine, he has learned a sense of obligation to himself and to his comrades, to his commander and to the Marine Corps. He has learned that he is a member of a team which is organized, trained and equipped for the purpose of engaging and defeating enemies of his country. The final object of military discipline is effectiveness in combat—to make sure that a unit performs correctly in battle, that it reaches its objectives, performs its assigned mission and helps others to accomplish their missions.

A military commander is vested with a high degree of authority. This authority extends to matters which would normally be considered of personal concern to the individual alone. These include such things as the eating of food, the care and manner of wearing clothing, health habits, and morale factors, all of which directly or indirectly affect the lives of the individuals under his command. It is important that a Marine promptly obey the orders of his commander even in matters which might, at first thought, appear to be of an individual or personal nature. The commander is genuinely interested in the welfare of the individuals within his unit, and developing the habit of prompt obedience to all orders will improve the discipline of each individual and the unit. It is too late to learn discipline on the battlefield. It must be learned in training. A Marine trains together with other Marines so that as a team they can accomplish increasingly difficult tasks in a manner in which they can take pride. You must not forget that you carry the badge of your Corps and your Country, and that those who see you regard you not as individuals but as representatives of the Corps whose insignia you wear. If you appear smart, alert and efficient, others will not only say "that is a good Marine," but also "that is a good outfit."

The word "discipline" is frequently combined with other words to refer to specific phases of living and fighting. For example: we speak of "fire discipline" which means obedience to fire orders and the observance of all instructions pertaining to the use of weapons during firing or in combat. When a platoon first goes into action, its fire discipline may be poor. Even after an outfit has been through several actions, there may be one or two "trigger happy" Marines in it. A "trigger happy" Marine is one who wastes ammunition in battle and shoots at every sound he hears at night. An entire platoon may pay with their lives for one man's lack of fire discipline. "Water discipline" means the proper use of water during marches, field exercises or battle. "March discipline" means prompt obedience to march orders, and alert, orderly conduct when on the march.

Naval Justice

A. Uniform Code of Military Justice. Since May 31, 1951, all of the armed services have been under a unified system of justice, enacted by the Congress, known as the Uniform Code of Military Justice. The information contained in this Code is of such general interest and importance that Article 137 of the Code requires that certain articles of that Code be carefully explained to every enlisted person at the time of his entrance on active duty in any of the armed forces of the United States, or within six days thereafter. They shall be explained again after he has completed six months of active duty, and again at the time he reenlists. Also, a complete text of the Uniform Code of Military Justice and of the regulations prescribed by the President thereunder shall be made available to any person on active duty, upon his request, for his personal examination.

B. Agencies. There are four agencies which determine guilt and award punishment to offenders. These range from "office hours" through the summary, special, and general courts-martial.

1. Commanding Officer's Nonjudicial Punishment. A Marine who commits an offense is brought before his commanding officer for a hearing commonly called "Office Hours." The commanding officer informs the offender of the offense he is charged with, and explains Article 31, UCMJ, advising him against self-incrimination. If the alleged offense is serious, the commanding officer will refer the charges to trial by court-martial. If the alleged offense is minor, he may award an admonition or reprimand (official bawling out), or impose one or more of the following punishments. The rank of the commanding officer dictates what punishments he may award. If he is a captain or below, he may impose seven days correctional custody; reduction of one rank, provided he has the authority to promote to that rank; 14 days extra duty; 14 days restriction; detention of 14 days pay; and forfeiture of seven days pay. If he is a major or above, he may impose 30 days correctional custody; reduction of one rank, provided he has the authority to promote to that rank; 45 days extra duty; 60 days restriction; detention of one-half of one month's pay per month for three months; and forfeiture of one-half of one month's pay per month for two months. These punishments are the maximums, and will not necessarily be imposed on "first offenders." Certain combinations of punishments may be awarded. A Marine may refuse nonjudicial punishment and request trial by court-martial. While embarked aboard ship, seven days confinement or three days confinement on bread and water may be awarded at Office Hours, and the right to refuse nonjudicial punishment and request a court-martial does not apply. A Marine may, if he feels the punishment is unjust or too severe, appeal to the next higher authority within 15 days. Nonjudicial punishments are recorded in your service record book, reflect in your conduct marks, and are taken into consideration at promotion time.

2. The Summary Court-Martial. Before a Marine is tried by court-martial he must be charged with an offense by someone who is subject to the Uniform Code of Military Justice who either has personal knowledge of the offense or has investigated it. The person who prefers the charges is known as the accuser. The offender may be ordered to trial by court-martial only by an officer above him in the chain of command. If the officer who would normally order the trial is the accuser, he cannot order the trial but must refer it to his next superior in the chain of command. Many offenses are too serious in nature to be disposed of by the commanding officer at office hours, yet not grave enough to warrant trial by special or general court-martial. These are tried by summary courts-martial. A summary court-martial is conducted by one officer. This officer impartially brings out the evidence on both sides, protecting the rights of the accused as well as prosecuting the case for the government. He then decides whether the accused is guilty or not guilty and, in the case of a verdict of guilty, imposes a sentence. The Uniform Code of Military Justice provides that a summary court-martial may "adjudge any punishment not forbidden by this code except death, dismissal, dishonorable or bad-conduct discharge, confinement in excess of one month, hard labor without confinement in excess of forty-five days, restriction to certain specified limits in excess of two months, or forfeiture of pay in excess of two-thirds of one month's pay." A Marine cannot be tried by summary court-martial unless he so consents prior to the beginning of his trial. The most usual outcome of not consenting to trial by summary court-martial is that the accused is brought to trial by special court-martial. An offender who has previously elected to refuse nonjudicial punishment cannot refuse trial by summary court-martial.

3. The Special Court-Martial. Next comes the special court-martial. A special court-martial has three or more members who act as judge and jury. They see that the trial is conducted fairly and determine the guilt or innocence of the accused and, in case of guilt, impose the sentence. The accused is acquitted unless two-thirds or more of the members find him guilty and any sentence imposed must have the vote of at least two-thirds of the members. If the accused so requests, he is entitled to have one-third of the members be enlisted men. The enlisted members cannot be detailed from the accused's company or from the crew of his ship if he is a member of a ship's detachment. If enlisted members serve on a court, they must comprise at least one-third of the membership. They are normally mature staff noncommissioned officers. The case against the accused is presented by an officer appointed as trial counsel and the accused is defended by an appointed defense counsel. The law requires that the legal qualifications of the appointed defense counsel must be the same as or better than those of the trial counsel. Thus, if the trial counsel is a lawyer the accused is entitled to have a lawyer defend him. The accused is entitled to counsel of his own choice and may decide whether such counsel works together with the appointed defense counsel or conducts the defense alone. If the accused requests a counsel of his own choice who is in the military service and who is reasonably available, his request will be granted except in extreme cases where the individual cannot be spared from his duties. Military personnel cannot accept a fee for defending an accused before a court-martial. The accused may hire civilian counsel if he so desires, but he must then pay whatever fees and expenses the civilian counsel may charge. Special courts-martial are empowered by the Uniform Code of Military Justice to "adjudge any punishment not forbidden by this code except death, dishonorable discharge, dismissal, confinement in excess of six months, hard labor without confinement in excess of three months, forfeiture of pay exceeding two-thirds pay per month, or forfeiture of pay for a period exceeding six months." Note that a special court-martial may sentence the accused to be discharged from the service with a bad-conduct discharge. This is a handicap to his future which is only slightly less grave than a dishonorable discharge.

4. The General Court-Martial. General courts-martial are awarded for the most grave offenses. Men charged with desertion are usually tried by general court-martial. The procedure and composition of the general court-martial are similar to those of the special, but there are the following important exceptions: A general court-martial must have at least five members and a law officer. The general function of the members is to hear and weigh the evidence in order to determine the guilt or innocence of the accused and to impose sentence if he is guilty. The law officer, who must be passed upon by the Judge Advocate General of the Navy as meeting rigorous professional requirements as a lawyer, acts as judge in deciding legal technicalities and ensures that the trial is conducted fairly. For instance, it is he who rules on objections by counsel—not the president of the court as in a special court. The appointed counsel must have the prescribed legal qualifications as good or better than those prescribed for the trial counsel, but in a general court-martial both are required to be well qualified lawyers. The only limit to sentences which may be imposed by general courts-martial are the maximum punishments which are prescribed for each offense. There are some offenses for which the maximum punishment is death and others for which it is life imprisonment. The remainder vary down to those having a maximum punishment of a few months confinement, forfeiture of pay, or both. The maximum punishment depends, of course, upon the gravity of the offense.

C. Court Procedure. No man can be tried by general court-martial until a formal investigation has been made of all the charges and specifications on which he is to be tried. This investigation corresponds to indictment proceedings in civil courts. The accused has the same constitutional right to remain silent that he does at office hours or before a court-martial. He is entitled to counsel and may cross-examine witnesses who appear against him and may present anything he wishes in his own behalf. The investigation may result in a recommendation for trial by general court-martial on some or all of the charges and specifications, or may clear the accused or indicate that the offense is one which may be handled by a lesser court-martial.

D. Rights of the Accused. The accused before a court-martial has a number of rights which the law grants him as safeguards against the miscarriage of justice. Some of the more important of these safeguards follow:

1. The accused is innocent until he is proved guilty beyond a reasonable doubt. The burden of proof is *always* on the prosecution. If the evidence presented in court by the prosecution should leave a reasonable doubt in the minds of the prescribed majority of the court as to the guilt of the accused, he is acquitted, even though he may

not have presented one shred of evidence in his own defense.

2. Witnesses who can present evidence favorable to the accused can be compelled to appear and testify before courts-martial. Their fees and travel expenses are paid by the government.

3. An accused who has been tried and acquitted by a legally constituted court-martial having jurisdiction of his case cannot be tried again by court-martial for the same offense. If he is convicted, granted a rehearing, and the conviction is sustained at the rehearing, he cannot be given a sentence harsher than the sentence imposed at the original trial.

4. Every conviction and sentence is subject to review. In other words, in every case, there are one or more agencies which must study the record of the trial to see that no error was committed which might have been damaging to the rights of the accused.

Military Courtesy

Courtesy is the accepted form of politeness among civilized people. Courtesy smooths the personal relationship among individuals in all walks of life. Civilian rules of courtesy are generally applicable to the military life. However, military courtesy has developed certain special forms of politeness and respect which you as a Marine must be thoroughly familiar with and must practice. The most important of all military courtesies is the salute. This is an honored tradition of the military profession throughout the world. The salute is a custom that goes back to earliest recorded history. It is believed to have originated in the days when all men bore arms. In those days warriors raised their weapons in such a manner as to show friendly intentions. They sometimes would shift their weapons from the right hand to the left and raise their right hand to show that they did not mean to attack. The salute has several forms. The hand salute (see the frontispiece of this chapter) is the most common, but note also the rifle salute indicated in figures **2.1** and **2.2**. The salute must never be rendered in a casual or perfunctory manner, nor with a pipe or a cigarette held in the mouth or in the right hand. It is rendered only at a halt or a walk. The rifle salute is not rendered while the rifle is at left shoulder. Persons in the naval service never salute "uncovered"; that is, when not wearing a cap. Prisoners do not salute since they are denied the privilege of this courtesy.

A. Courtesies to Individuals. Just as you show marks of respect to your seniors in civilian life, military courtesy demands that you show respect to your seniors in the military profession. Your military seniors are the officers and noncommissioned officers senior to you. Regulations require that all officers be saluted by their juniors and that they return such salutes. Enlisted personnel do not ordinarily exchange salutes. Some rules for saluting officers are:

1. When meeting an officer who is either riding or walking, salute when six paces away in order to give him time to return your salute before you are abreast of him.

2. Hold the salute until it is returned.

3. Accompany the salute with a "Good morning, sir," or some other appropriate greeting.

4. Render the salute but once if the senior remains in the immediate vicinity. If conversation takes place, however, again salute when the senior leaves, or when you depart.

5. When passing an officer who is going in the same direction, as you come abreast of him, salute and say "By your leave, sir." He will return the salute and say "Carry on," or "Granted." You then finish your salute and pass ahead of him.

6. When armed with a rifle, the rifle salute is executed as shown in figures **2.1** and **2.2** except when on guard duty when "Present Arms" is rendered.

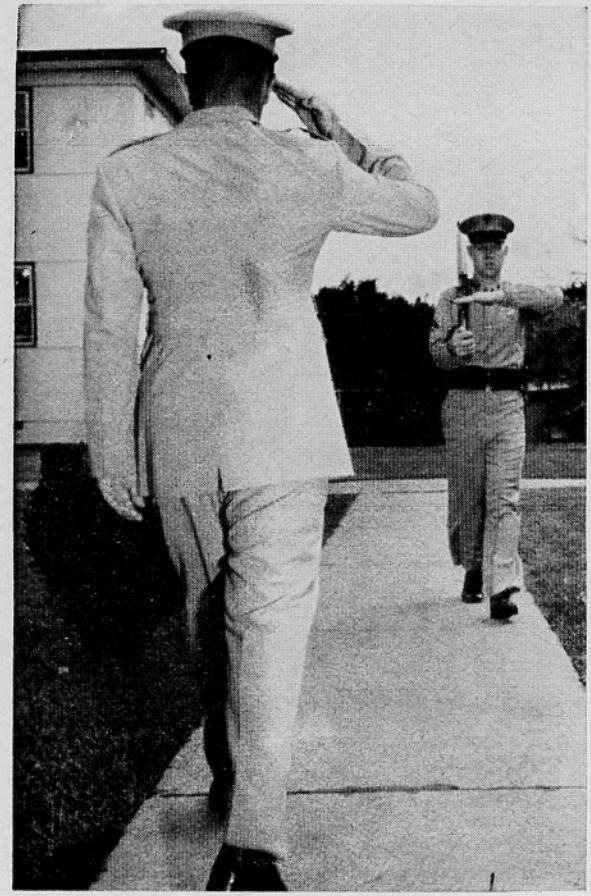
7. Do not salute if you are engaged in work or play unless spoken to directly.

8. Members of the naval service are required to render a salute to officers, Regular and Reserve, of the Navy, Army, Air Force, Marine Corps, Coast Guard, members of the Army Nurse Corps and Navy Nurse Corps and to foreign military and naval officers whose governments are formally recognized by the Government of the United States.

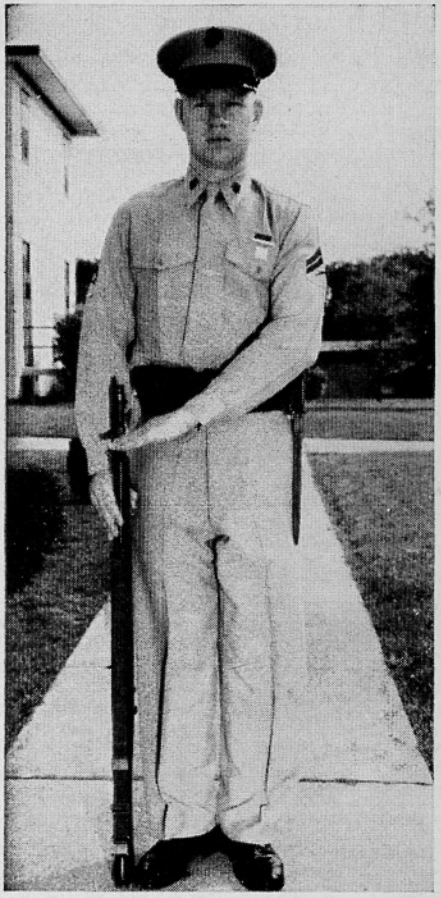
9. In general, one does not salute when at work, indoors (except when under arms), guarding prisoners, under battle conditions, or when a prisoner.

10. Individuals in formations not armed with the rifle do not salute, except at the command "Present Arms."

11. Upon the approach of an officer, superior in rank, individuals of a group not in formation are called to attention by the first person noticing



2.1 The rifle salute while walking.



2.2 The rifle salute at attention.

the officer and all come smartly to attention and salute.

Other forms of military courtesy to individuals are:

1. When ordered to report to an officer, either outdoors, or indoors if under arms, approach the officer at attention and halt about 2 paces from him, render the appropriate salute and say "Sir, ———— reporting as ordered," using proper names and grades. For example: "Sir, Private Jones reporting as ordered." Hold the salute until it is acknowledged. When the business is completed, salute and after that salute has been returned, take one step backward, execute about face and depart at attention.

2. When reporting to an officer indoors when not under arms, follow the same procedure except remove the headgear before approaching the officer and do not salute.

3. When accompanying a senior, walk on his left.

4. When entering an automobile or small boat, the junior goes first and the others follow in inverse order of rank. In leaving an automobile or a small boat, the senior goes first and the others follow in order of rank.

B. Honors to Color and Anthem. Honors to the National Anthem or to the Color are rendered as follows:

1. Whenever the National Anthem or To The Colors is played and you are not in formation and not in a vehicle, come to attention at the first



2.3 When the National Anthem or "To the Colors" is played, face the flag and salute.

note, face the flag, and render the prescribed salute. Hold the salute until the last note of music is sounded. (Fig. **2.3**.)

2. If no flag is near, face the music and salute.

3. If in formation, salute only on the order "Present Arms."

4. Vehicles in motion are brought to a halt. Troop formations riding in vehicles do not disembark. They and the driver remain seated at attention and do not salute. Drivers and passengers riding in either military or private vehicles remain seated at attention and do not salute. (Fig. **2.4**.)

5. If outdoors and uncovered, stand at attention and face the direction of the flag or music. When the National Anthem is played indoors, officers and enlisted men will stand at attention and face the music or the flag if one is present.

6. When passing or being passed by an uncased color which is being paraded, presented, or is on formal display, salute at six paces distance, and hold the salute until six paces beyond it or until it has passed you by six paces.

7. If uncovered, stand or march at attention when passing or being passed by an uncased color.

8. The marks of respect shown above are also rendered to the national anthem of any friendly country when played upon official occasions.

C. Boarding Naval Vessels. When boarding a naval ship, upon reaching the top of the gangway face aft and salute the national ensign. After completing this salute, salute the officer of the deck who will be standing on the quarter deck at the head of the gangway. When leaving the ship, render the same salutes in reverse order. The officer of the deck will return both salutes.

D. Miscellaneous. **1.** The expression "under arms" means carrying or having attached to you, by sling or holster, a weapon. A person wearing a "duty belt" is also considered "under arms". When "under arms," uncover only when seated in attendance at a court or a board (but sentries guarding prisoners do not uncover), when entering places of divine worship, or when indoors not on duty, i.e., eating, etc.

2. The term "outdoors" is construed to include such buildings as drill halls, gymnasiums, and other roofed enclosures used for drill or exercise



2.4 Vehicles are halted; occupants remain seated at attention; do not salute.

of troops, theatre marquees, covered walks, and other shelters open on the sides to the weather. "Indoors" includes offices, hallways, kitchens, orderly rooms, recreation rooms, washrooms, squadrooms, etc.

3. When personal honors are being rendered individuals of high rank and you are not in formation, salute at the first note of the music and hold the salute until the completion of the ruffles, flourishes and march.

4. When a military funeral passes, salute during the period when the caisson or hearse bearing the remains in the procession is passing.

5. For the proper manner of rendering honors when on duty as a sentry see Chapter VI, Guidebook for Marines.

Marine Corps Customs

The deeds, customs, traditions and history of the Marine Corps of the past have given us the present day characteristics of *esprit de corps,* readiness for action and courage in battle. There are many little things we do that can also be traced to the past. These customs and traditions may seem unimportant to some, but not a day goes by when we don't use them or see them operating.

The Uniform

A green uniform was distinctive from the earliest days of the Corps.

The Quatrefoil design on officers' caps came from the days of John Paul Jones when such a design was on the caps of Marines to keep them from being fired upon by other Marines stationed in the rigging of the ship.

The red stripe on the blue trousers of the

officers and noncommissioned officers commemorates the blood shed at the battle of Chapultepec in the Mexican War.

The Fourragere is a double loop of green and red braided cord. It is worn over the left shoulder by all men now in the Fifth and Sixth Marine Regiments as well as by those who were members of those regiments in World War I. This is a decoration given these regiments by France for gallantry in that war.

Bearing and Appearance

Uncover out-of-doors only for divine services.

Use of "Aye, aye, sir," instead of "Yes, sir," is considered to be proper usage.

In the Marine Corps, an officer below the rank of captain may be addressed as "Mister". However, there is a tendency, and it is proper, to address all officers by their titles.

When enlisted men address a higher-ranking NCO, always use rank, or rank and name, except that Staff NCOs may be called just sergeant. First sergeants and sergeants major, however, should be addressed as such.

Privates, PFCs and lance corporals are addressed by last name.

It is traditional that Marines, while in uniform and in public, or out-of-doors on a military base, do not do any of the following:

Put hands in pockets
Chew gum
Whistle
Smoke on the street
Embrace or hold hands with women
Hold an umbrella—not even as an escort
Break step, while walking with another person

Traditional Sayings and Quotations

Among the traditional sayings applied to the Marine Corps are the following:

"First to Fight."

"Tell it to the Marines."

"Esprit de Corps."

"The Marines have landed and the situation is well in hand."

"Devil Dogs"—applied by the Germans during World War I.

"Gung Ho"—adopted from the Chinese, and meaning "working together."

Miscellaneous Traditions

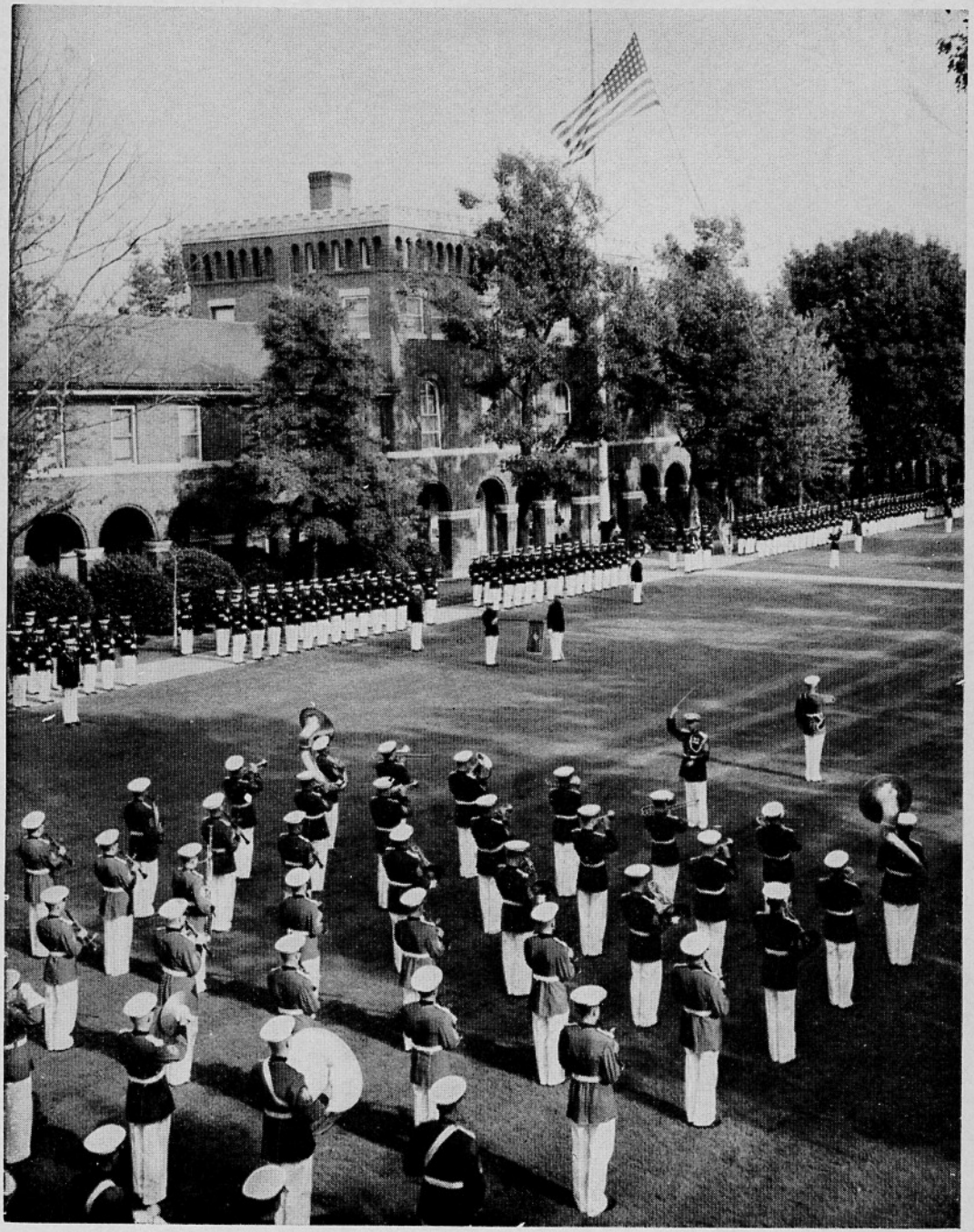
The United States Marine Band is officially called "The President's Own," and is also called "The President's Band."

Philadelphia is considered to be the home of the Marine Corps because the Corps was founded there and because of the large Marine installation at the Philadelphia Navy Yard in the early days.

The flag-raising at Iwo Jima is one of our most recent traditions. It has come to signify what the Marine Corps stands for.

The Marine Corps Motto

Semper Fidelis means "Always Faithful." The march by this name was written by John Philip Sousa. It should not be confused with *The Marines' Hymn.* Both are played at parades. Marines always stand at attention when *The Marines' Hymn* is played.



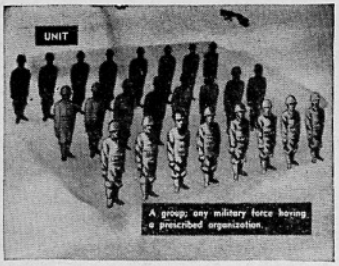


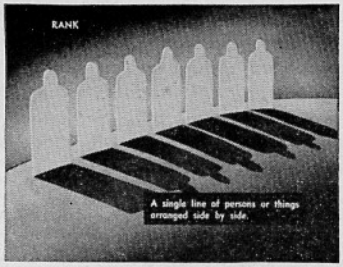
Common Military Terms

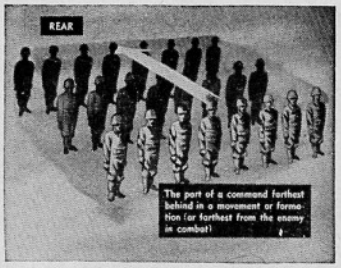
CERTAIN words and phrases common to the military profession are defined on pages 28 to 35. An alphabetical list of these definitions, and their location, is given below.

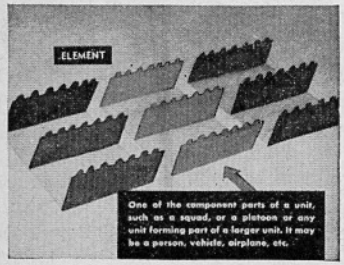
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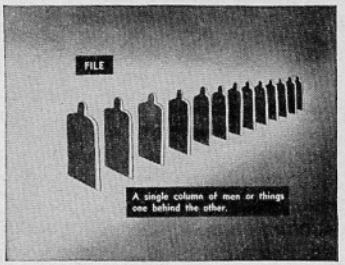
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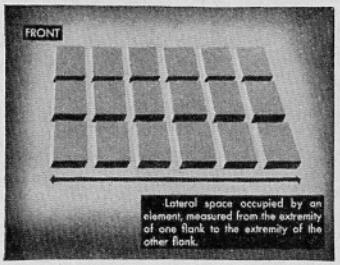


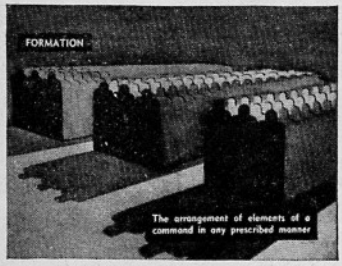




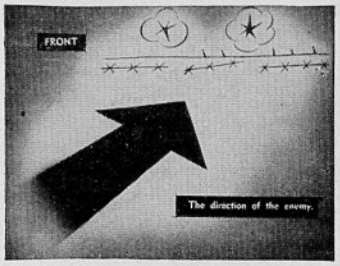


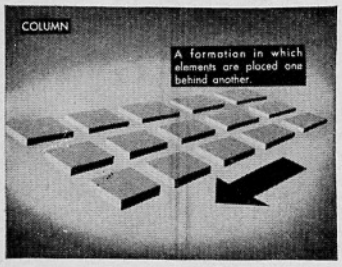


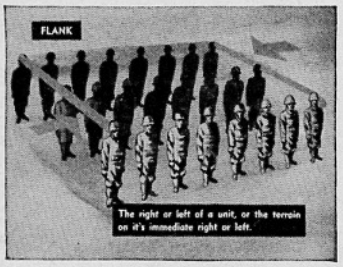


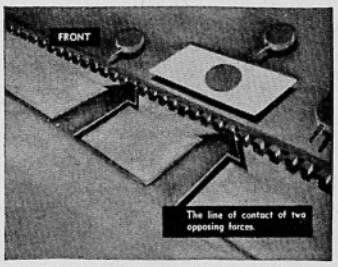


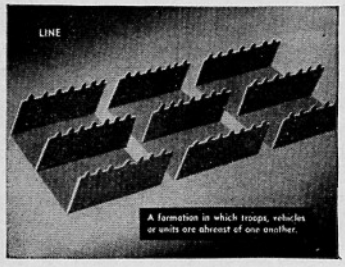


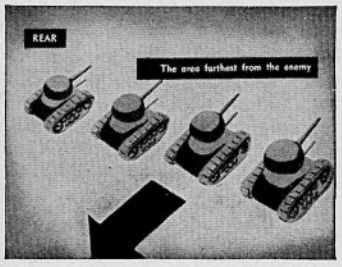


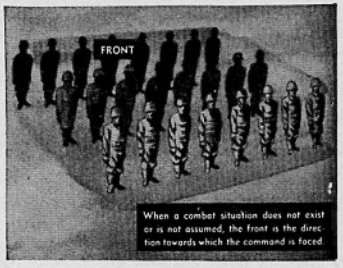




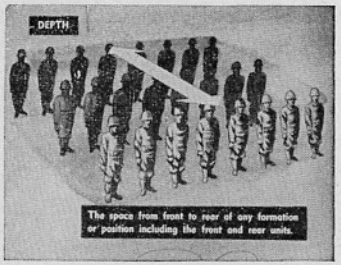


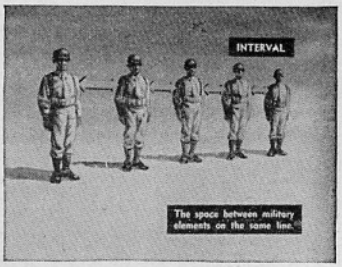


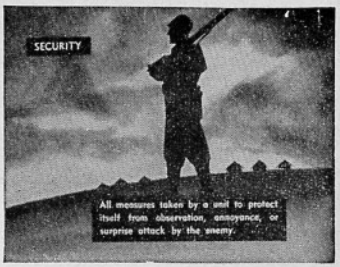


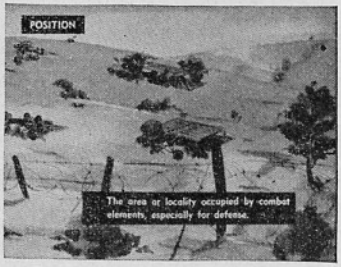


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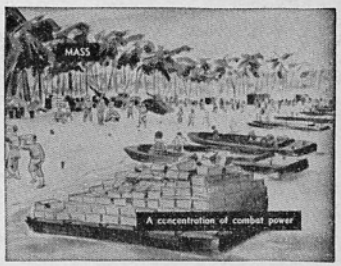


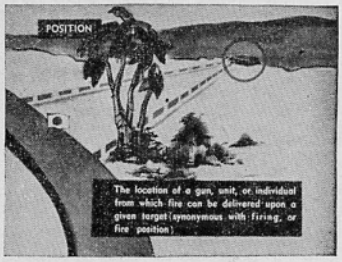


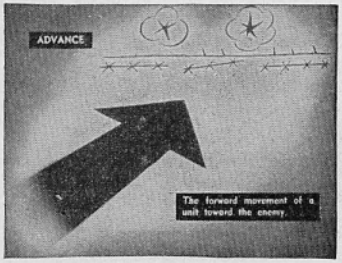


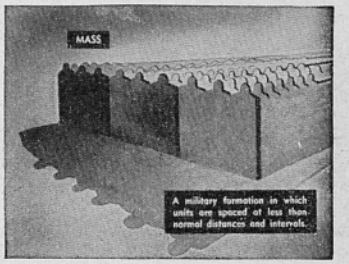


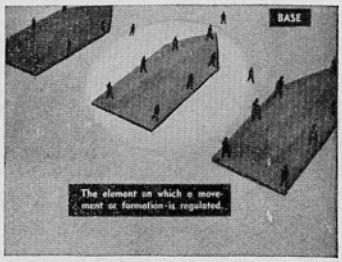


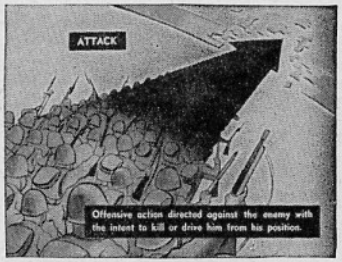


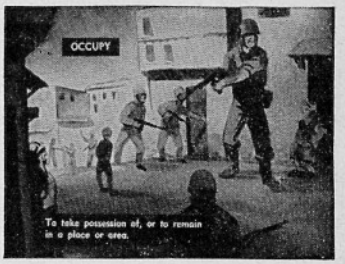


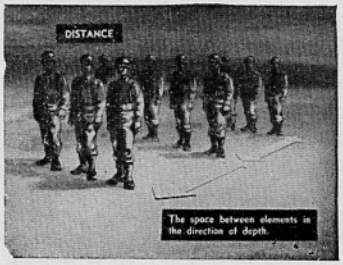


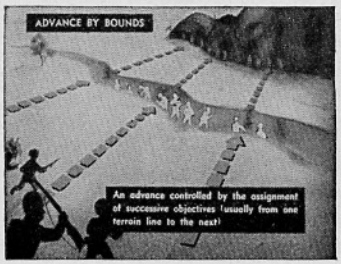






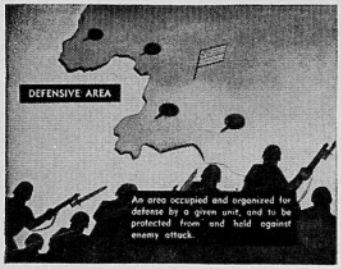




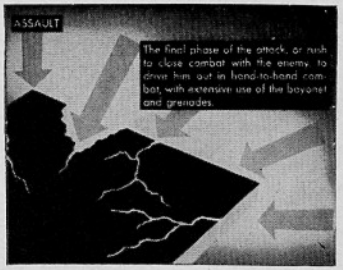




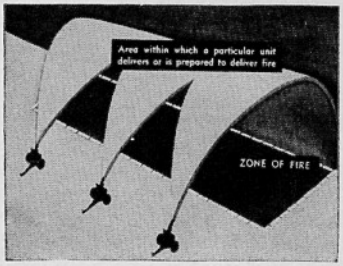
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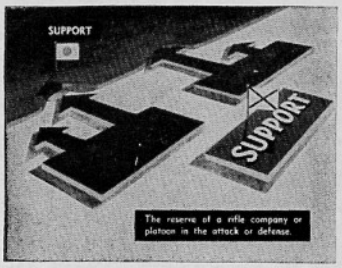




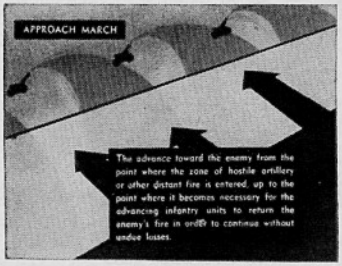


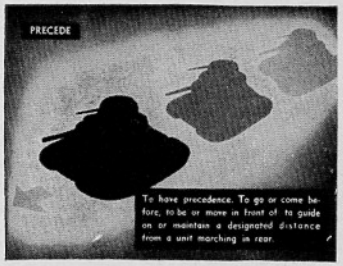




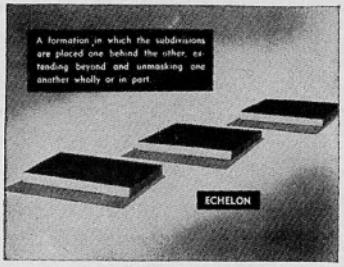


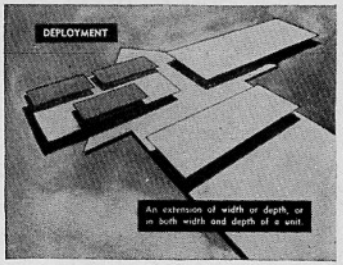


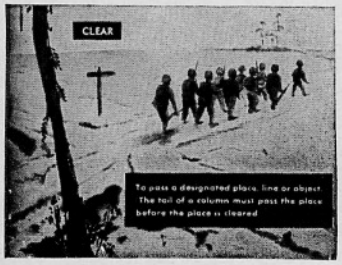




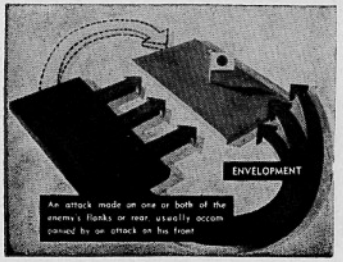








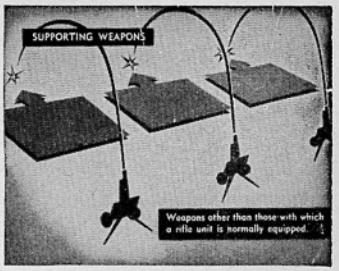


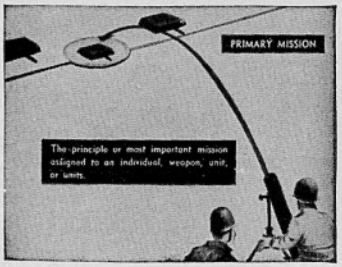


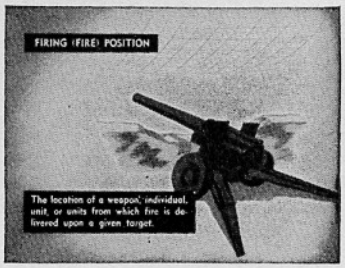
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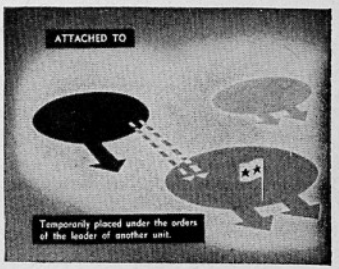






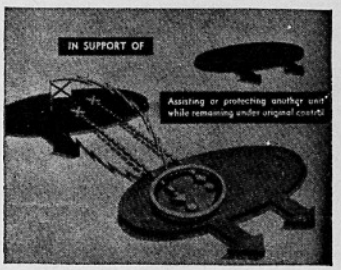


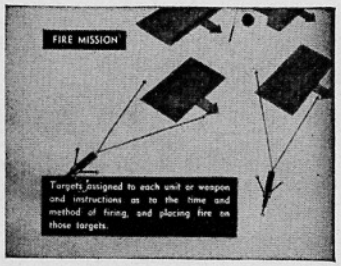




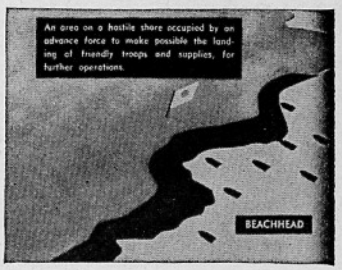




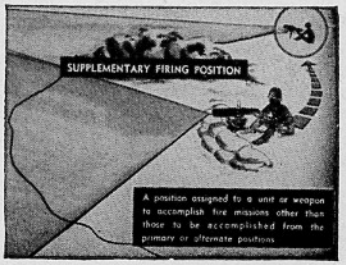










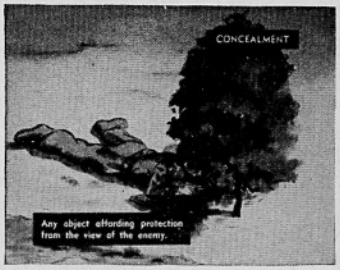


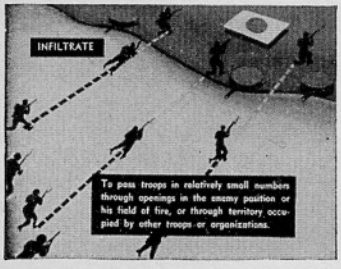


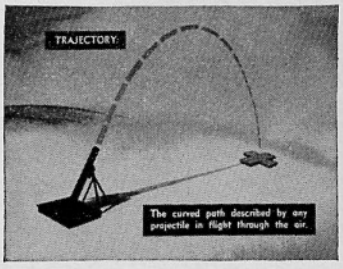
COMMON MILITARY TERMS



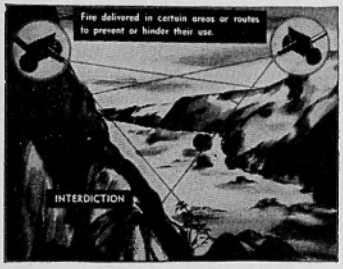


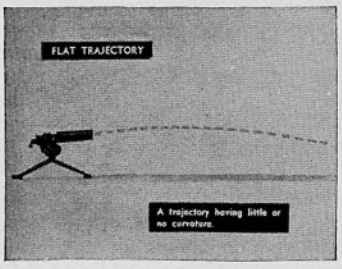


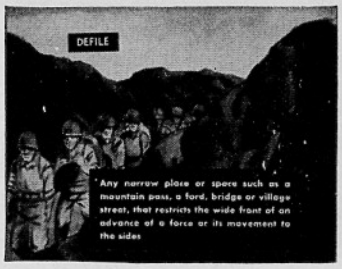


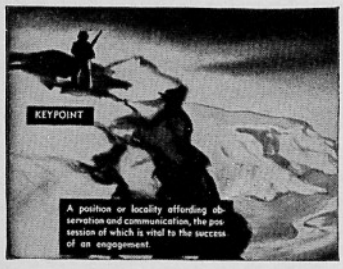


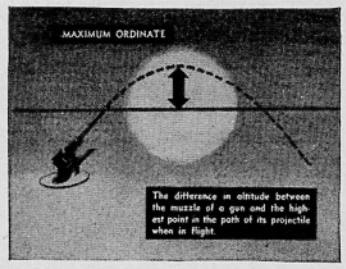


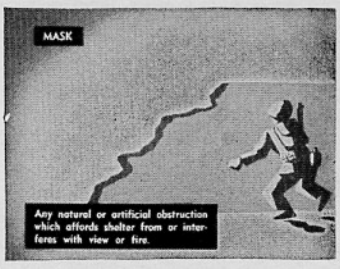


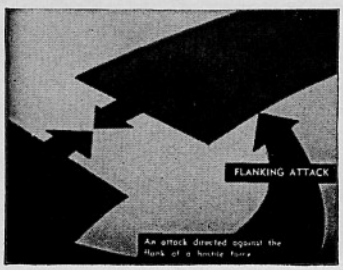




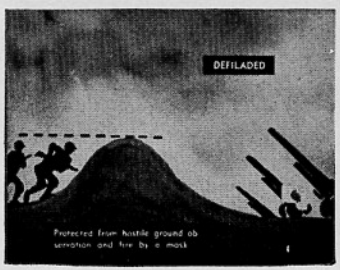




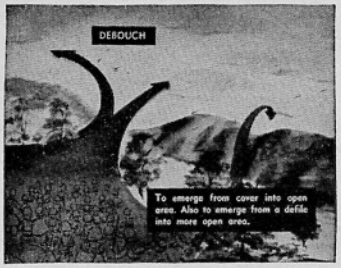




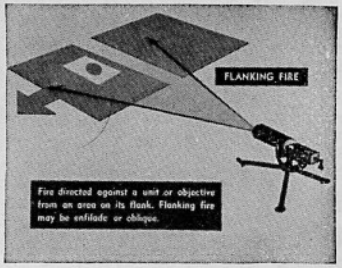


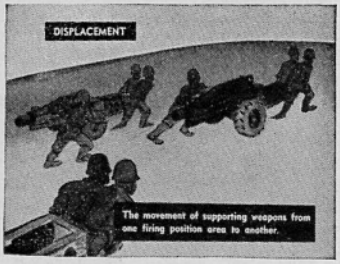


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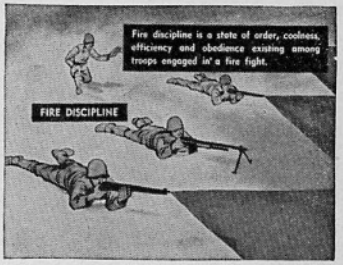








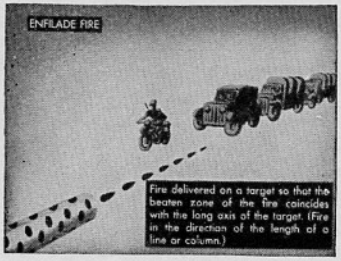




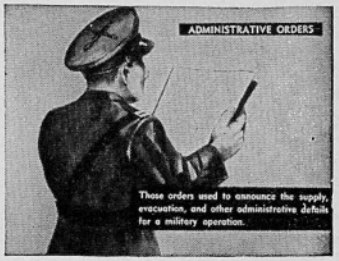






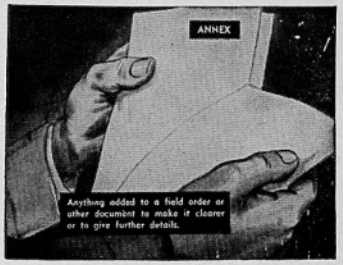




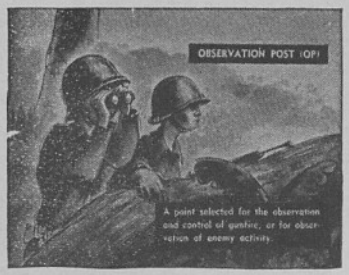


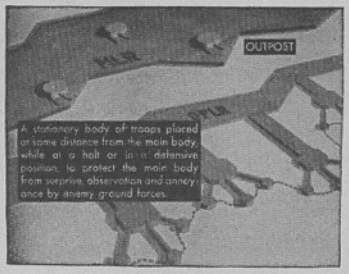


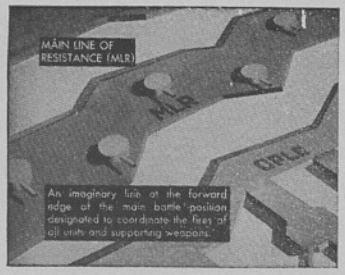




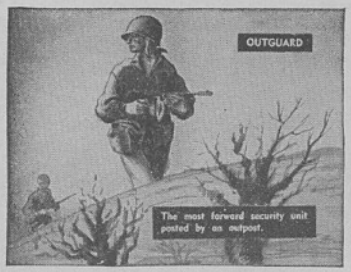
COMMON MILITARY TERMS

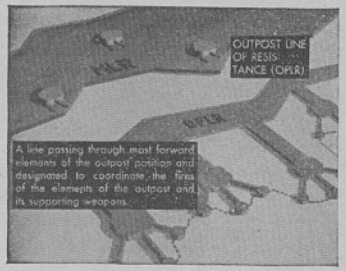


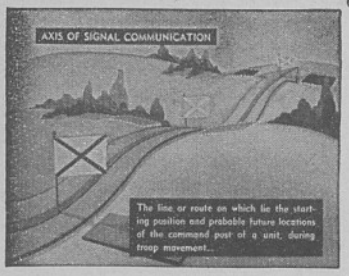


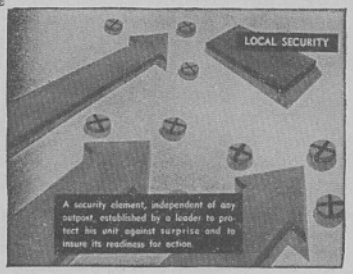


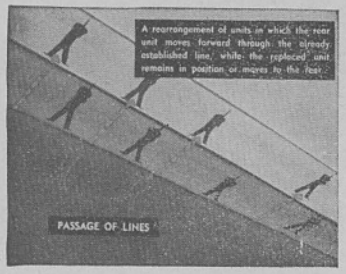


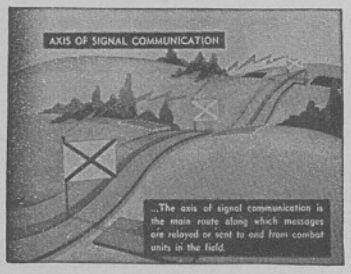


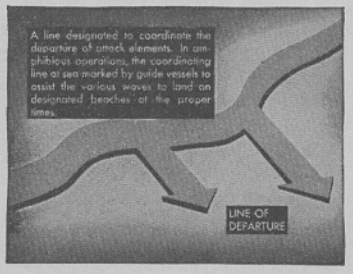


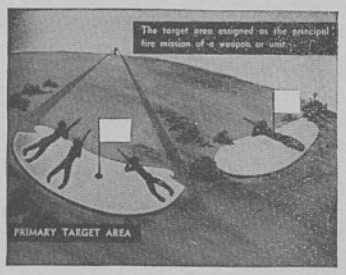


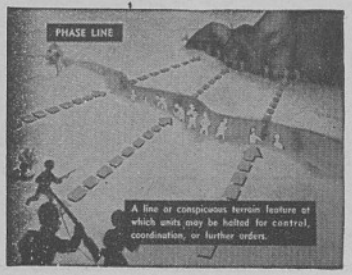


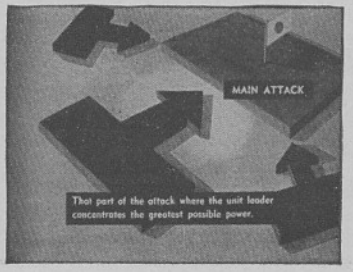


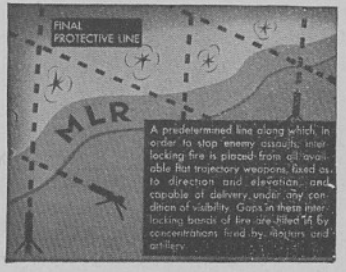




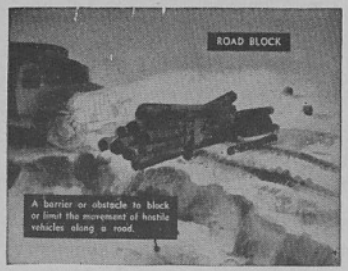


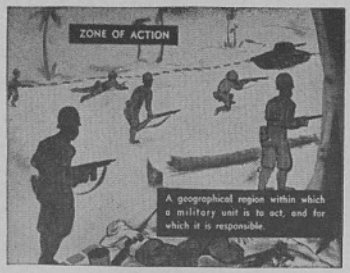


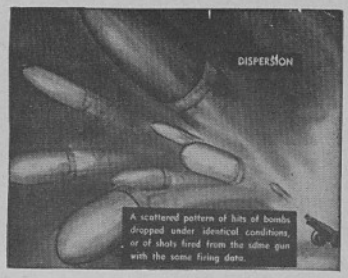


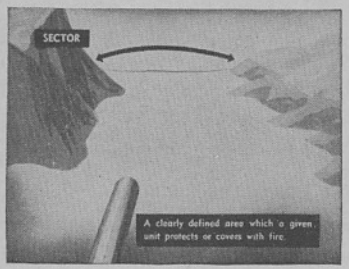


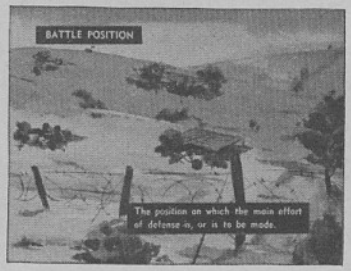
COMMON MILITARY TERMS

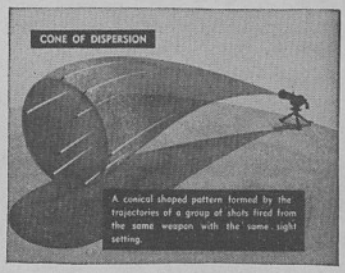


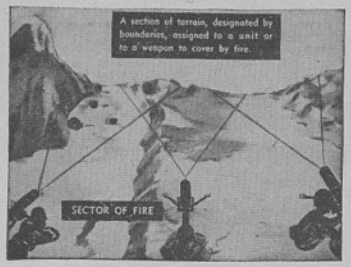


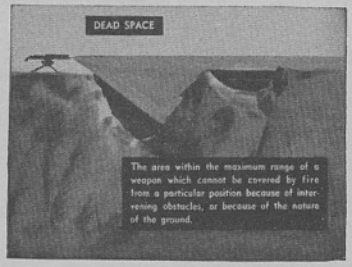


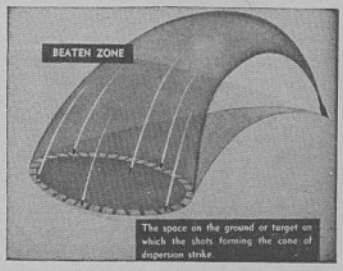


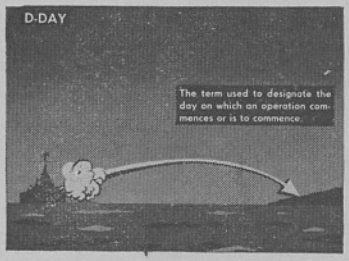


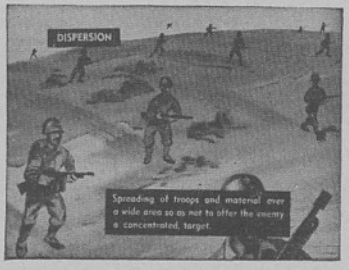


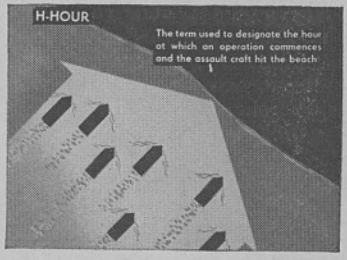




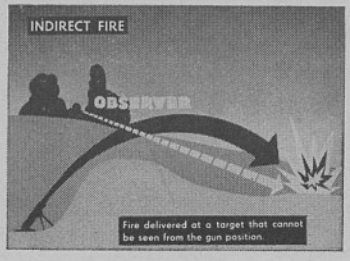


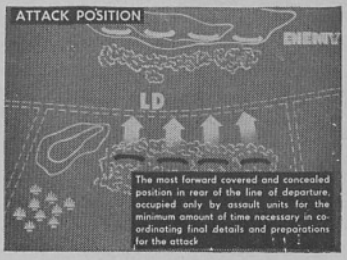














Chapter 4

Rank and Insignia

ONE of the first things you will want to know upon entering the service is how to recognize the ranks and ratings of the Marine and Navy personnel with whom you work. To help you do this, the chart on the next two pages outlines Marine enlisted and officers' ranks and gives the corresponding Navy ratings. But if you are to fully understand these ranks and ratings, you must do more than simply distinguish between the various insignia which are worn or the rank by which the various individuals are addressed. You must recognize at the same time everything which is represented by this rank and insignia. Specifically, you must understand that in the Marine Corps insignia of rank are worn only by those who have demonstrated ability and a willingness to accept responsibility. If these individuals are to discharge the responsibilities with which they are charged, it is necessary that they be equipped with a degree of authority as well. Remember that rank, insignia, ability, responsibility and authority all go together.

Enlisted Ranks and Ratings

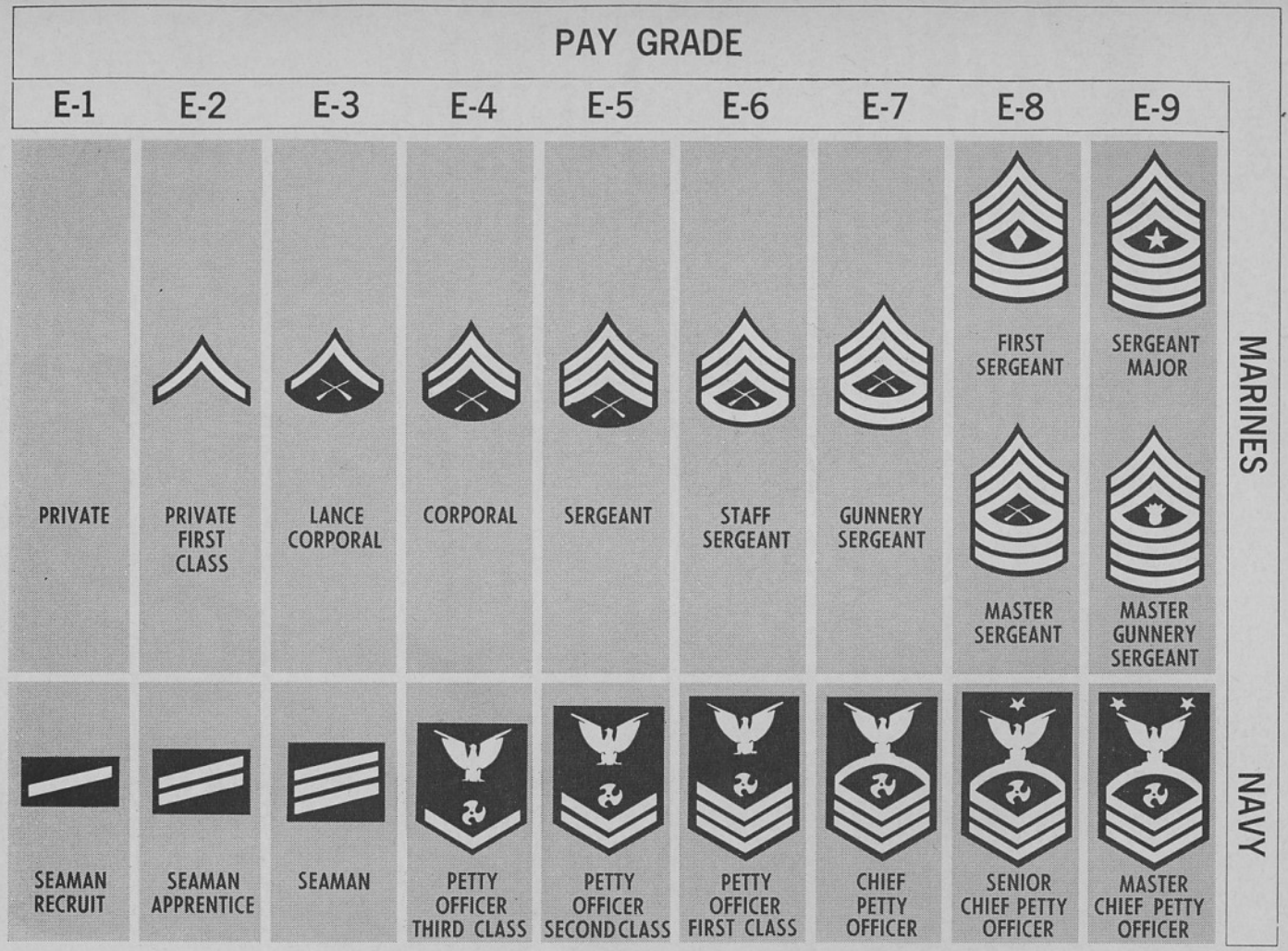
Marine enlisted men wear insignia of rank on both sleeves.

Rank chevrons of the Marine Corps are forest green on the winter uniform, with a background of red. On shirts, the background is khaki. For the dress blue uniform, chevrons are yellow on red. Marines wear one slanting stripe near the cuff of the sleeve on the winter or dress blue uniform for each four years' enlistment completed. (See opposite page.)

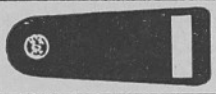
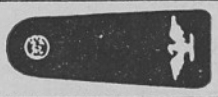
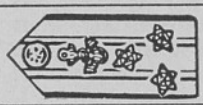
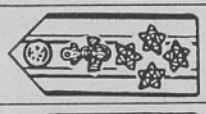
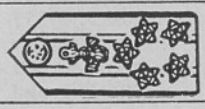
(1) All rating badges of naval enlisted personnel will be worn on the left sleeve between the shoulder and elbow.

(2) All distinguishing marks (gun captain, range finder operator, etc.) will be worn on the right sleeve between the shoulder and elbow, except that aviation and submarine qualification




PAY GRADE
E-1
E-2
E-3
E-4
E-5
E-6
E-7
E-8
E-9
PRIVATE
PRIVATE FIRST CLASS
LANCE CORPORAL
CORPORAL
SERGEANT
STAFF SERGEANT
GUNNERY SERGEANT
FIRST SERGEANT
MASTER SERGEANT
SERGEANT MAJOR
MASTER GUNNERY SERGEANT
MARINES
SEAMAN RECRUIT
SEAMAN APPRENTICE
SEAMAN
PETTY OFFICER THIRD CLASS
PETTY OFFICER SECOND CLASS
PETTY OFFICER FIRST CLASS
CHIEF PETTY OFFICER
SENIOR CHIEF PETTY OFFICER
MASTER CHIEF PETTY OFFICER
NAVY

RANK AND INSIGNIA

MARINE CORPS		NAVY	
INSIGNIA	RANK	INSIGNIA	RANK
	WARRANT OFFICER W-1 CHIEF WARRANT OFFICER W-2		WARRANT OFFICER W-1 CHIEF WARRANT OFFICER W-2
	CHIEF WARRANT OFFICER W-3 CHIEF WARRANT OFFICER W-4		CHIEF WARRANT OFFICER W-3 CHIEF WARRANT OFFICER W-4
	SECOND LIEUTENANT (GOLD BAR)		ENSIGN
	FIRST LIEUTENANT (SILVER BAR)		LIEUTENANT (JUNIOR GRADE)
	CAPTAIN		LIEUTENANT
	MAJOR (GOLD LEAF)		LIEUTENANT COMMANDER
	LIEUTENANT COLONEL (SILVER LEAF)		COMMANDER
	COLONEL		CAPTAIN
	BRIGADIER GENERAL		REAR ADMIRAL (LOWER HALF)
	MAJOR GENERAL		REAR ADMIRAL (UPPER HALF)
	LIEUTENANT GENERAL		VICE ADMIRAL
	GENERAL		ADMIRAL
NO CORRESPONDING RANK			FLEET ADMIRAL

awards will continue to be worn on the left breast as prescribed. (Other awards are naval aviation pilot, balloon pilot, combat aircrewman, parachutist, submarine combat patrols.)

The pay grade and rating group of non-rated men will be indicated by diagonal stripes worn on the upper part of the left sleeve in the same position prescribed for rating badges.

Officer Ranks

Marine Corps officers wear gold or silver insignia of rank on the shoulder straps of their coats or overcoats. They also wear small replicas of this insignia on their shirt collars. Naval officers' ranks can be determined by gold stripes on shoulder boards (epaulettes) of their white and khaki coats. The stripes are either one-half or one-fourth inch wide, depending upon the rank indicated. On blue uniforms, the rank of the officer is shown by gold stripes around the bottom part of both coat sleeves. In addition to the stripes which show rank, Navy officers also wear on their shirt collars insignia like that of the corresponding Marine Corps rank—bars, leaves, eagles, and stars.

Marine Corps officers, in addition to their insignia of rank, can be identified by the twisted braid on top of their barracks caps.

Army ranks, incidentally, are like those of Marine officers, except that the Marine Corps has no five-star generals. Coast Guard ranks are like those of the Navy, except that the Coast Guard has no five-star admiral.

Explanation of Military Service Laws

The Congress of the United States has passed two military service laws which vitally affect every young man who has joined one of the Armed Forces since June 19, 1951, or who will be called for service in the future.

These laws affect you as a Marine. They establish a permanent policy and will be in effect for a long time to come. They require that you serve a total of six or eight years—part on active duty and part as a member of the Reserve.

If you plan to make a career in the Marine Corps, men junior to you will ask you questions about them in time to come, and these laws are as much a part of the Corps as the enlistment oath. Should you leave the service with less than eight or six years of active duty, as applicable, you will be directly affected by them.

The two laws are the Universal Military Training and Service Act as amended (UMT&SA) and the Armed Forces Reserve Act of 1952, as amended (AFRA). UMT&SA is the nation's draft law. AFRA explains HOW the Reserve time can be spent and under what conditions members of the Reserve can be recalled to active duty.

The Reserve Forces Act of 1955, Public Law 305, 84th Congress, approved August 9, 1955, amends in several important respects the foregoing Acts. It imposes on persons entering the Armed Forces after the law was enacted (August 9, 1955) a lesser military obligation of six years. There are two exceptions to this; six-month trainees and officers commissioned from PLC, NROTC, and OCC, who do not serve on active duty. Although no statutory obligation is set on these two groups, draft deferment is contingent on participation in the Ready Reserve for eight years.

Public Law 305 does not reduce the military obligations of persons who entered the Armed Forces prior to August 9, 1955, nor does it cancel the military obligation of combat veterans. However, the law specifically says that combat veterans will be given special consideration for screening from the Ready Reserve to the Standby Reserve.

An individual serving in an eight-year or six-year obligation is, upon release from active service, transferred to the Ready Reserve unless he has had five or more years of active service, in which case he is eligible for transfer to the Standby Reserve. Individuals transferred to the Ready Reserve may spend the remainder of their obligated service in the Ready Reserve. Those members having an eight-year obligation are not subject to the compliance measure for participation in Reserve training.

All persons entering service AFTER August 9, 1955, will be obligated to participate in Reserve training while members of the Ready Reserve, and will also have the liability for involuntary recall in a presidential emergency.

The general details of the two acts as amended by the Reserve Forces Act of 1955, are explained in the following series of questions and answers:

Q. How do Marines become members of the

Marine Corps Reserve after completing active duty?

A. Those who still have obligated service to complete under the nation's draft law are AUTOMATICALLY registered as reservists. Others may volunteer at time of discharge or enlist at Reserve facilities in their home communities.

Q. In case of a national emergency, will every Reservist be recalled at once?

A. No. The Armed Forces Reserve Act sets up two principal classifications within the Reserve —the Ready Reserve and the Standby Reserve. ONLY THE READY RESERVE WILL BE RECALLED IN THE EVENT OF A NATIONAL EMERGENCY PROCLAIMED BY THE PRESIDENT. The Standby Reserve, in addition to the Ready Reserve, will be called in the event of a national emergency or an all-out war declared by Congress, when a total mobilization will occur.

Q. Who is in the Ready Reserve?

A. The law says that everyone shall be placed in the Ready Reserve upon completion of active duty time, and shall remain in this classification for the remainder of his obligated service, UNLESS HE QUALIFIES FOR TRANSFER TO THE STANDBY RESERVE.

Q. Who is in the Standby Reserve?

A. Men who have taken advantage of provisions under law which allow them to transfer to the Standby Reserve upon fulfillment of certain requirements.

Q. How can a veteran who still has obligated service to perform transfer from the Ready Reserve to the Standby Reserve?

A. A veteran may be transferred under either of the following conditions:

1. If he has served on ACTIVE DUTY for at least five years.
2. If, having served on ACTIVE DUTY for less than five years, he has been a member of an ORGANIZED Marine Corps Reserve training unit, or another approved training program for a period which, when added to ACTIVE DUTY TIME, totals five years. (If he does not desire to spend five years on active duty, he may join the Organized Reserve any time after his 17th birthday and begin working off his Ready Reserve time before going on active duty.)

Q. What is the difference between the Ready and Standby Reserves, and the Organized Reserve?

A. The "Ready" and "Standby" designations are classifications which denote an individual's availability for recall in case of national emergency or war. The "Organized Reserve" is a training designation. This organization is composed of units all over the country which hold regular meetings and receive pay. Membership in the Organized Reserve is limited to Ready Reserve.

Q. What are the advantages of joining an Organized Reserve Training Unit?

A. Organized Reservists receive pay for every meeting attended. They also receive credits toward retirement pay (veterans have automatically accumulated many such credits by virtue of having been on active duty). Organized Reservists qualify for promotions. They receive up-to-date, thorough training which would be invaluable should they ever be called to active service. Members of the Ready Reserve who join an Organized Reserve training unit become eligible QUICKER for transfer to the Standby Reserve.

Q. Does Public Law 305, 84th Congress, change the vulnerability of members of the Ready and Standby Reserve?

A. Yes, to a degree. Under the foregoing Act, the President has the authority, in time of emergency proclaimed by him, to order to active duty up to one million members of the Ready Reserve WITHOUT further Congressional authorization. The Standby Reserve continues to be liable for active duty only in time of war or emergency declared by Congress, subject to selective recall.

Q. Does Public Law 305 contain a provision to increase participation in Reserve training?

A. Yes. The Act imposes on all young men entering the Armed Forces after August 9, 1955, the obligation to take part in Reserve training and provides effective measures for insuring compliance with that obligation.

Q. To what extent will such young men be required to take part in Reserve training?

A. The Reserve Forces Act of 1955 establishes a requirement to participate in 48 scheduled drills or training periods and not more than 17 days active duty for training per year, or in lieu thereof, a maximum of 30 days of active duty for training per year. The act provides specifically that reservists who become divinity students may, at their request, be relieved of the training obligations.

Q. Do the compliance measures apply to individuals who enter directly into the Reserve?

A. Yes. It makes no difference whether initial entry into the Armed Forces is into the Active Forces or into the Reserve.


UNITED STATES MARINE CORPS
1968
W. L. Austin

Chapter 5

General Administration

THE term "administration," as used in the armed services, means the management of all phases of military operations not directly involved in tactics and strategy. The administration of your unit means the interior management of the unit. It includes feeding, clothing, equipping, sheltering, paying, transporting, and maintaining the health and welfare of the unit as a whole and of its individual members. A large portion of the Marine Corps is engaged in administration, but the three people who are directly responsible for administration as it concerns you as an individual are your platoon commander, your company or detachment commander, and your first sergeant.

When you have a problem, if your unit leader or chief cannot help you, see the first sergeant. You are not allowed to go directly to the company or detachment commander without the first sergeant's permission. The first sergeant holds his job because he has the training and experience to perform administrative duties for the unit. He can handle most of your problems without either his or your having to consult the company commander. If, after having talked to the first sergeant, you still want to see the company commander, you may then ask permission. You may at some time have an important problem which you want to present to no one but your company commander. In that situation, you are privileged to tell the first sergeant that you have a problem which you would rather discuss directly with the company commander and to ask permission to see him. Bear in mind, though, that this is not the normal procedure and is not usually the best procedure. The concern with your welfare does not stop with your company or detachment commander. Your battalion commander, or whatever commanding officer you may have on the level above the company or detachment, is also available on periodic occasions to hear your problems. The time and place and manner of arranging to see him will be made known to you. You may have a private audience if you wish. The period which the commanding officer sets aside for this purpose is known as "request mast." If you avail yourself of the right of request mast in good faith, you need have no fear of prejudice to your interests.

It is the duty of every Marine to assist in the smooth administration of his unit. The way that you can do this is to keep yourself informed. Effective administration requires obedience to regulations and orders. To obey a regulation or order, you must know it and understand it. If you do not understand it, ask for an explanation from someone who does. Most of the orders and regulations which you will have to comply with will either be announced at unit formations or posted on your organization bulletin board. Keep your ears open at formations. When you join an organization familiarize yourself with all of the material on the official bulletin board. Thereafter, read twice daily the new material which has appeared on the bulletin board since you last read it. Ignorance of what is on the bulletin board is no excuse for failing to comply with regulations or orders.

The first concern of the Marine Corps is that every Marine be employed in the manner which does most to maintain a force in readiness for our nation's defense. Unit administration is conducted with the objective of doing everything for your welfare which does not interfere with the primary objective of maintaining a combat force in readiness. By thus looking out for its men, the Marine Corps has maintained its enviable *esprit de corps* throughout our national history. Insofar as it does not conflict with the effectiveness of your unit or of the Marine Corps as a whole, you are given considerable choice in your duty station, the type of work you do, the type of specialist training you get, and the time you go on leave. Also, the Marine Corps will assist you when you are faced with serious financial or other emergencies, either directly or by securing the help of associated agencies. The remainder of this chapter will go briefly into some of the features of personnel administration with which you should be familiar. For more complete information consult your first sergeant.

Military Job Structure

Every Marine is trained in the basic techniques of infantry ground combat and is taught how to take care of himself in the field. In addition, each man learns a special job and, when he masters it and progresses in experience and rank, goes on to learn a more difficult and responsible job along the same line of work. Your qualifications for your specialist job appear in your service record and in all personnel records all the way up to Headquarters, Marine Corps. These qualifications are classified as your Military Occupational Specialty (MOS). An MOS is described by both a title and a code number, for example: Machine Gunner, 0331. Your primary MOS is the important one, for it is the basis for your assignment and promotion. Every Marine has a primary MOS. Some Marines have one or more additional MOSs. The Machine Gunner might, for example, have the additional MOS of Barber, 8941.

Marine Corps units are organized in accordance with Tables of Organization (T/O) approved by the Commandant of the Marine Corps. The T/O for a unit shows a number of billets equal to the authorized number of officers and men in the unit. Each billet is shown by rank, job in the unit and MOS code number of the individual who is supposed to fill it. You can see that "billet" and "MOS" do not mean the same thing and should not be confused. The title of a billet may differ from the title of the MOS which is required to fill that billet. For example: The war strength T/O for a rifle company has in its machine gun platoon billets for seven corporals who have the MOS of Machine Gunner, 0331. Six of these billets are in the six machine gun squads and appear in the T/O as "CPL (Machine Gunner)." The remaining one is in the machine gun platoon headquarters and appears as "CPL (Ammunition)." Thus, if a corporal with MOS 0331 is assigned to a rifle company, he might be put in any one of the seven billets where his MOS is required; he would not be limited to the six which happen to bear the same billet title as his MOS title.

Classification is that part of personnel administration which entails interviewing individuals, testing them, preparing and maintaining their qualification records, and classifying their military qualifications. The foundation of our classification system is the assignment of a suitable MOS to every Marine. The Marine Corps Manual says of assigning a primary MOS: "That MOS will normally identify billets for which the Marine is best qualified, with due consideration given to such factors as:

"a. The needs of the Marine Corps as a whole which will be promulgated by the Commandant of the Marine Corps.

"b. The duty assignment policy for enlisted personnel.

"c. The technical skills required.

"d. The Marine's education, experience, aptitudes, and capabilities.

"e. The duty preference of the Marine."

The military job structure is divided into occupational fields. The first two digits of your MOS identify your occupational field and are often used in conversation in place of the name of the field. Thus, if a Marine tells you that his occupational field is 03, he is in infantry; if he tells you that it is 35, he is in motor transport. There are between 30 and 40 occupational fields in the Marine Corps. Normally, a Marine is not assigned to an occupational field until he finishes his recruit training. He is then assigned the basic MOS of his occupational field. The basic MOS for any occupational field is a four digit number. The first two digits identify the occupational field; the second two are a double zero. MOS 0300 is Basic Infantryman. Most of the billets assigned by the T/O to privates first class E-2 and privates E-1 in the Marine infantry regiment call for Basic Infantrymen, but not all. The next most numerous group below noncommissioned officer rank in the infantry regiment are the Basic Operational Communication Men, MOS 2500. When a commanding officer thinks that a private first class E-2 in his unit is qualified for an MOS above the basic he may assign him a higher MOS in the same occupational field, provided the private first class E-2 has demonstrated his qualifications by actual performance on the job for at least 90 days or has completed a course which specially qualifies him to perform the duties of the higher MOS. Holding an MOS above basic is one of the requirements for promotion to corporal E-3. The higher MOS may be assigned before the private first class E-2 is otherwise eligible for promotion.

The corporal with the MOS of Machine Gunner, 0331, whom we have been using for an illustrative example, was probably assigned to his machine gun platoon as a Basic Infantryman, 0300, and became qualified for his specialty by on-the-job training in the platoon. When he had completed 90 days or more on-the-job training

he was considered capable of serving as a machine gunner and given that MOS. When he had satisfied the other requirements for promotion and his advancement was authorized, he was promoted to corporal E-3.

You are assigned an MOS not only that you may be fitted into a billet for which you are suited, but also to give direction to your training for a more responsible job. Some MOSs are appropriate only to a single pay grade; others cover two, three, four, or five pay grades. An MOS which covers two or more pay grades has different standards of proficiency for the different pay grades. In other words, you have to know more about your specialty to be promoted to a higher NCO rank even if your MOS is one which carries over to the higher rank. With the important exception of basic MOSs every MOS is a training assignment for one particular higher MOS. If you are in a billet calling for your primary MOS and doing the kind of work which answers the description of that MOS, you will normally step up to the MOS which includes all of the skills which you have learned in the lower one. Unlike a PFC E-2, an NCO whose MOS is one which requires a change in order for him to be promoted may not have the change made until he is otherwise eligible for promotion.

It so happens that the MOS for Machine Gunner, 0331, is not appropriate for men above the rank of sergeant, E-4. It is a "non-promotable" MOS above Pay Grade E-4. Thus, a corporal, E-4, 0331 who has met all of the qualifications for promotion to sergeant, E-5 in a machine gun platoon will be changed to MOS 0369, Infantry Unit Leader, which is a "promotable" MOS for men holding it in Pay Grades E-5, E-6 and E-7. Therefore, a sergeant, E-5, Infantry Unit Leader, 0369, need not have his MOS changed in order to be promoted. Nevertheless, he must be proficient in the qualification requirements prescribed by the MOS Manual for Pay Grade E-5 in his MOS before he may receive a promotion to sergeant, E-5. To demonstrate his proficiency, he must satisfy his commanding officer with his on-the-job performance and must also pass a Marine Corps-wide technical test.

So far, we have followed the classification system through the course of its normal operation. There are some occasions when a Marine's MOS may be changed to one other than the next higher one for his current MOS. The 0331 whose MOS is changed to 0369 receives a new MOS in the same channel. If it were changed to Mortar Man, 0341, he would be receiving one in a different channel although in the same occupational field, infantry. Such a change is relatively simple. So is the change from the basic MOS in one field to the basic MOS in another. A Marine who holds a primary MOS above basic in one occupational field and requests transfer to a new occupational field must accept a basic MOS in the new field if his request is granted. He must, of course, learn his job in the new field from the ground up. While he is learning it he is said to be in a retraining assignment. He keeps the basic MOS in his new field and remains in a retraining assignment until he has either passed the qualifying test for his current pay grade for an MOS in the new field or has successfully completed a course of instruction at a service school for which quotas are established by the Commandant of the Marine Corps. He then assumes the MOS of his current rank and must further qualify before he may be promoted.

The Marine Corps' military job structure is designed for career planning for the individual. The assignment of the right man to the right job is made in accordance with a plan. The plan is designed to advance your professional value as a Marine in the type of work which is suited to your experience, ability, and interest. The plan will better benefit both you and the Marine Corps.

Promotion

As a general rule, Marines are never promoted more than one rank at a time. Promotion to Private First Class, E-2 is achieved in accordance with policies established by the Commandant of the Marine Corps; in general such promotion, when authorized, is based upon completion of a given period of time in grade, satisfactory personal conduct, certain standards of proficiency in duty performance, and other factors of this nature. Promotion to lance corporal, E-3 and to each of the higher noncommissioned officer ranks comes only to Marines who can meet specified requirements of service in grade, conduct, performance of duty, knowledge of general military subjects required of all noncommissioned officers in the next higher rank, and the specialist knowledge required to hold the MOS which the noncommissioned officer will hold in the next higher rank. The selection is made of the Marines throughout the entire Marine Corps who fulfill these requirements best. The number chosen within each occupational field or MOS depends

upon the vacancies at the time. When they are chosen their commanding officers are then authorized to promote them. However, a man's commanding officer is not required to effect the promotion unless he is satisfied that the man has the necessary leadership, personality, and moral character for the higher rank.

The overall military knowledge expected of all Marines is measured by a general military subjects test (GMST). The technical knowledge of a Marine's particular field of specialization is measured by a technical test geared to the occupational field and MOS of the individual. Both types of tests are of broader scope and increasing difficulty with increasing rank. Promotion tests, both GMST and technical, are usually given every six months. An announcement is made about three months ahead telling what tests are to be given, the date and time they are to be given and, in terms of specific eligibility testing requirements, who is eligible to take them. GMSTs cover the same subject matter that is required for the instruction of all Marines. Many of the questions which you will be asked on your GMST are answered in this book. Certain courses offered by the Marine Corps Institute, Box 1776, Washington, D. C., will also be of help. The main source of preparation for your technical test is on-the-job training. Other sources are special schools, correspondence courses, and field and technical manuals. The officer or NCO under whom you work directly will usually be the person best qualified to advise you what to study in preparation for your technical test.

Service in grade requirements for eligibility to take promotion tests change from time to time and are not the same in all ranks. They are based upon date of rank rather than date of promotion. A Marine who is in a disciplinary status when a test is given is not eligible to take it. On the date of the test, he must not have been convicted by sentence of a summary court-martial within three months, nor of a general court-martial within twelve months; and he may not take it if he is in a probationary status as a result of the sentence of a court-martial.

After the tests are taken they are sent to the Marine Corps Institute, Washington, D. C., for grading. Eligibility for promotion is determined from a composite score which includes such elements as service in grade, total active duty service, past performance of duty, and whether the GMST and technical tests were passed or failed, etc. All elements are included in the score according to a mathematical formula established by the Commandant of the Marine Corps. At Headquarters Marine Corps a cutting score is established so that the number of those whose composite score is above the cutting score is equal to the number of vacancies in the rank and occupational field being considered. Suppose there were 160 Marines competing for promotion in a given rank and occupational field for which there were 130 vacancies. The composite scores would be arranged in a descending series and opposite each composite score listed would be the number of Marines who had that score. The cutting score would be at the point where there were 130 men above it and 30 men below it. Those whose composite scores were below the cutting score would not be considered eligible for promotion at that time, but would have to wait until after the next test.

The Commandant of the Marine Corps sends the names of those who are listed as eligible for promotion to their commanding officers. Promotion is made immediately, unless a commanding officer thinks that the noncommissioned officer should not be promoted; in that event he refers the case back to the Commandant of the Marine Corps.

A commanding officer does not receive a list of the names of Marines who are found eligible for promotion to corporal, lance corporal, and private first class, but he may promote to these ranks on his own authority. In this connection, commanding officers establish local promotion boards which select eligible personnel for advancement who have the necessary leadership, personality and moral character. To assist him in determining who is best suited for promotion, the commanding officer may cause tests to be prepared and administered within his command. These tests will be graded locally rather than by the Marine Corps Institute, and may be more of a practical or performance nature than a written test.

Board members decide from personal knowledge and personal interview whether candidates for promotion possess these qualities to the degree commensurate with the next higher rank. They may also call upon superior officers of the candidates, including noncommissioned officers, for testimony as to these qualities. The board recommends to the candidate's commanding officer whether or not he should be promoted. The commanding officer's decision in the matter is always final.

In addition to the normal promotion requirements, and procedures, described above, command-

ing officers may, subject to limiting restrictions as to rank and number, promote deserving Marines to the next higher grade for exceptional performance of duty.

Our promotion system is designed so that there is little left to inconsequential factors such as the length of time a Marine has served in his unit. The Marine with outstanding leadership and ability will rise rapidly. The average Marine with a clean record and willingness to work may rise somewhat less rapidly, but his increasing experience and the recognition given his length of service will ensure his steady progress to successively higher ranks.

Leave and Liberty

Leave is authorized vacation or absence from duty, as distinguished from liberty. Liberty is the authority to be away from a place of duty and is not chargeable as leave. In a civilian job, your annual vacation would be the counterpart of leave. Weekends, periods between the end of work one day and the beginning of work the next, and occasional days or afternoons off not counting against your annual vacation would correspond to liberty.

Leave is earned at the rate of two and one-half days per month; in twelve months you earn 30 days leave. The leave you take is charged against you in the Leave Record of your Service Record Book. At the end of the fiscal year 30 June, your leave record is balanced. Any leave you have coming to you on 30 June is carried forward to your credit as accrued leave, but this accrued leave carried forward cannot be more than 60 days.

If the computation results in a larger figure, everything in excess of 60 days is wiped off the books. If you have a considerable amount of accrued leave, you should try to take it before the 1st of next July.

Your leave record will also be balanced upon the expiration of your enlistment and accrued leave of 60 days or less will be credited. Upon discharge, you are paid a lump sum equivalent to your pay and allowances for the number of days accrued leave credited if you do not reenlist. If you reenlist immediately, you have your choice of taking this lump sum payment, taking the accrued leave as reenlistment leave, or taking credit for it on your leave record. You may also take 30 days advance leave in addition to your accrued leave as reenlistment leave.

No leave is earned during periods of unauthorized absence nor during periods of confinement serving sentence of a summary, special, or general court-martial.

Advance leave is an accounting term used to describe leave granted in advance of accrual. It may or may not exceed the earned leave which you have to your credit. It may be granted for emergency leave, for annual leave, or for reenlistment leave, or for any combination thereof, provided no excess leave results. However, if your enlistment is due to expire or you are due to return to inactive status before the 30th of next June, you may not take any more advance leave than you can earn by the time you are discharged.

Excess leave is leave taken in excess of the amount of unused accrued leave plus 30 days advance leave. Excess leave may be granted only in emergencies. Commanding officers may grant excess leave up to 15 days under conditions of emergency leave. Only the Commandant of the Marine Corps may grant more than 15 days. Personnel receive no pay or allowances for time spent on excess leave.

You may not always be able to get your annual leave at the particular period or periods when you would like to have it. Commanding officers are restricted as to the number of men whom they may allow to be on leave at one time, and they must grant leave so that there is the least interference with their work and training schedules. You need not take all of your annual leave during a continuous period, but may take portions of it at different times during the year.

You may not go on leave without a written Leave Authorization made out on the prescribed form. On the form is entered the date and time your leave is effective and the date and time it ends. Keep your Leave Authorization with you while you are on leave and return it to your first sergeant when you get back.

Following are the instructions which appear on the back of the Leave Authorization form:

"1. Leave is granted subject to immediate recall; therefore, maintain communication with your leave address. Keep these leave papers in your possession at all times.

"2. It is understood you have sufficient funds to defray your expenses on leave, including round-trip transportation. Each case of transportation obtained from recruiting stations, or other Marine Corps activities, by personnel on leave, will be investigated and where no urgent necessity was

apparent in applying for transportation request, disciplinary action may be taken.

"**3.** You are cautioned against the disclosure of any classified information. While it is desirable to tell the public about the Marine Corps, do not discuss any subject unless you are certain it is unclassified. In case you are asked to participate in a press conference, talk to reporters or speak through any other media on matters pertaining to the Naval Service, you should express a desire to cooperate, but should first consult with and obtain clearance from the nearest Marine Corps public information officer.

"**4.** Inform yourself of transportation schedules, and make allowances for delays. Missing connections is not an excuse for UNAUTHORIZED ABSENCE. Train, bus, and plane schedules and connections are frequently unreliable.

"**5.** Cooperate with shore patrol and military police at all times, particularly on trains. Misconduct will be cause for disciplinary action. You are subject to orders of your superior officers in all branches of the Armed Services.

"**6.** If necessary to request an extension of leave, communicate with your commanding officer by telegram or letter. IF NO REPLY IS RECEIVED YOU WILL CONSIDER YOUR REQUEST NOT GRANTED.

"**7.** In case of serious illnesses or injury incurred while on leave which requires medical attention or hospitalization, report facts to your commanding officer by telegram and request instructions. You are advised that costs incident to hospitalization or medical treatment received at other than Navy, Army, Air Force, or Public Health Service facilities, may be defrayed by the Marine Corps in emergency cases only. No charge against your leave, or reduction in total period of leave granted will be made for any period of hospitalization. Unless otherwise ordered, you will revert to a leave status upon release from a hospital, and will immediately notify your commanding officer that you have been released and have reentered leave status, giving leave address, preferably by telegram. Proof of hospitalization must be provided upon return from leave."

You may wish to visit your home while performing the travel to a new station. Unless orders from higher authority to your commanding officer directing your transfer to another station prevent him, your commanding officer is authorized to grant you delay en route to your new station, this delay to count as leave. The reasonable number of days required to travel between your old and new stations is additional and does not count as leave. Your travel orders will tell you the date you are to report to your new station. If you are granted delay and report to your new station before the date specified, the unused portion of your delay is not counted as leave. You gain nothing, however, if the time you spend between stations is less than the travel time you are allowed. When leave is granted for the purpose of visiting the United States from foreign duty, the time spent in direct travel from your foreign station to the port of entry in the United States and from the port of exit in the United States back to your foreign station is in a duty status and does not count as leave. Nevertheless, no travel expense is allowed; so, if you travel by commercial transportation, you must pay your own way. You are considered as having returned to a duty status when you report in at a military activity at the seaport or aerial port of exit from the United States.

There may at some time be an emergency at home which requires your presence and, for some reason, you cannot be granted routine annual leave. You may then be granted emergency leave if:

1. Your commanding officer is assured that an emergency exists, and

2. Your leave will alleviate the emergency.

Since opinions will differ as to what constitutes an emergency, the interpretation is governed by regulations. The Marine Corps Manual states that emergency leave is granted when, "Through death or serious illness to a member of the immediate family, circumstances are created which place an unusual and severe problem on either the Marine or the immediate family, and where the problem is such that it can be alleviated only by the Marine's presence and such presence is required within a period not normally exceeding 15 days to properly solve the problem. Immediate family will include only father, mother, wife, children, brother, sister, only living relatives, or those in loco parentis." The Manual also permits the granting of emergency leave when a member of the immediate family is dying and not expected to live more than a month, if such leave would materially contribute to the patient's morale. The granting of emergency leave is not necessarily limited to cases of death or serious illness, but also applies to cases where the presence of the Marine is necessary to take care of a severe and unusual hardship which must be taken care of within 30 days. In no case may emergency leave exceed 90 days.

Requests for emergency leave ordinarily require a verification of the emergency. The American Red Cross is the agency which is usually called

upon to make the verification. The Red Cross reports the facts to the commanding officer and he makes the decision as to whether or not emergency leave is warranted. The request for verification need not come from the commanding officer. If the family will contact their local American Red Cross office at the same time they contact you and tell them the circumstances and where you are stationed, the Red Cross will then make the verification and send the report to your station. There is no charge for this service.

Emergency leave is charged against accrued leave and advance leave in the same manner as is annual leave. It is the only occasion for authorizing excess leave; and, if it runs into excess leave, the Marine receives no pay and allowances for the portion which is excess.

Liberty and leave are distinctly separate and cannot be combined. If your leave begins during a liberty period, you may not check out before the time your leave is effective; and you must check in by the time your leave is up, whether or not that time is during a liberty period.

Liberty is a privilege which is granted only when it does not interfere either with the work and training of the command or with its prescribed state of readiness. The commanding officers of most posts and stations prescribe the liberty limits beyond which members of the command may not go without written permission. Regulations specifically prohibit traveling farther on liberty than the distance you may normally go and return during the liberty period by using the usual means of commercial transportation, excluding air. Some posts and stations allow liberty on oral permission in the immediate area, but require a written pass for liberty to more distant points within the authorized area. Marines are required to have liberty cards in their possession at all times when they are on liberty.

The instructions quoted above which appear on the back of the Leave Authorization for the most part apply to liberty and leave alike. Become familiar with them.

Information

The freedoms we Americans enjoy are privileges and responsibilities which we all cherish. Through your family, teachers, friends, and church you have acquired an understanding of loyalty, patriotism, and devotion to your country.

You are now a Marine who has taken an oath of allegiance to defend our Constitution. This new responsibility requires that you have an even deeper understanding of our American way of life.

In the Marine Corps, much of this knowledge is absorbed through your regular training and daily living. During your entire Marine career you will find a spirit of comradeship which is traditional throughout the ranks. It is vital to all who serve in the Corps. Through comradeship, your noncommissioned officers and officers will help you to cultivate further qualities of honor, courage, pride, and leadership. They will also encourage you to improve physically, mentally, and morally.

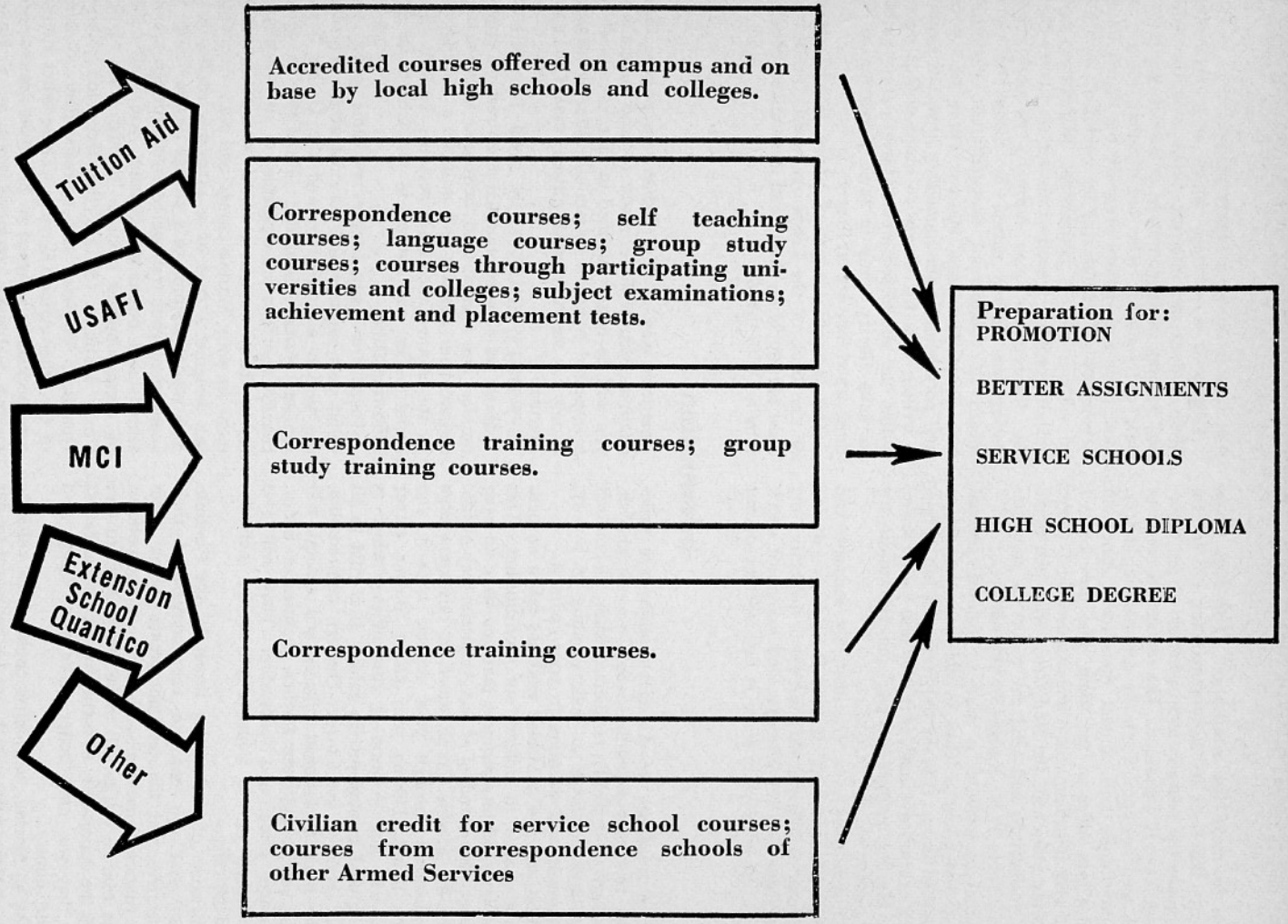
Because of the present threat by the Communists, you will need to keep abreast of their objectives and the resultant trends which affect international, national, and Marine Corps policies. The Marine Corps will make every effort to give you the opportunity to fortify your personal beliefs so that you may better serve your Corps and your country.

As a Marine, you must continue to cultivate the characteristics which are so necessary to our American way of life. When you possess these qualities, you will be ready to lead others and you will be better qualified to take your place as a respected citizen in community life. Remember —only a well-informed citizen makes a good Marine.

OFF-DUTY EDUCATION AND TRAINING

Many off-duty educational and training opportunities are available to help you improve and expand your abilities and skills as a Marine and at the same time reap personal benefit. The opportunities are shown in the chart on the following page.

There are many courses available which will fulfill your military and personal needs. Through the tuition aid program and the United States Armed Forces Institute (USAFI), academic courses and tests are available on all educational levels. They serve as a sound basis for improvement in your Marine career and they frequently can become a part of a program leading to a high school diploma or a college degree. Also, to supplement your training received through service schools and on-the-job training, you may enroll in correspondence courses through the Marine Corps Institute (MCI); the Extension School, Quantico, Virginia; and correspondence schools of the other Armed Services. These latter courses are specifically designed to help you advance and assume additional responsibilities as a United


Tuition Aid
USAFI
MCI
Extension School Quantico
Other
Accredited courses offered on campus and on base by local high schools and colleges.
Correspondence courses; self teaching courses; language courses; group study courses; courses through participating universities and colleges; subject examinations; achievement and placement tests.
Correspondence training courses; group study training courses.
Correspondence training courses.
Civilian credit for service school courses; courses from correspondence schools of other Armed Services
Preparation for:
PROMOTION
BETTER ASSIGNMENTS
SERVICE SCHOOLS
HIGH SCHOOL DIPLOMA
COLLEGE DEGREE

States Marine.

Wherever you are assigned, your Education Officer will give you guidance in your studies. He can tell you what specific courses are available and help you establish a program which will meet your individual needs.

Dependents

Enlisted Marines are entitled to allowances for dependents. In order to claim such an allowance, a Marine must allot a prescribed amount of his pay to the dependent or dependents who are to receive it. Both the Marine's allotment and the government's contribution are forwarded directly by the government to the dependent or dependents. An enlisted Marine may receive allowances for a wife and legitimate minor children, and for certain other dependents who rely upon him for chief support. The regulations governing dependency allowances are complex and have changed frequently. If there is anyone for whom you have not claimed a dependency allowance, who is dependent upon you for his or her chief support, you should consult your first sergeant. Likewise, you should inform him immediately of any change in the status of your dependents. It is particularly important to inform him when you cease to be the chief support of a dependent or the grounds for claiming dependency cease to exist, for your pay is checked for any payments which your dependents receive that they are not entitled to.

The remainder of the remarks in this section will all apply to married enlisted Marines of the lower pay grades. Some do and some do not apply to officers, staff noncommissioned officers and sergeants with over seven years service who, in some respects, are governed by different regulations.

A married Marine of the lower pay grades may, subject to the approval of his commanding officer, be permitted to mess separately from his organization's general mess and be reimbursed a prescribed amount approximately equal to the cost to the government of the food he would consume if he ate in the mess.

A dependent wife and children are not normally entitled to government quarters, although low-cost government housing is sometimes available for rent. Such housing is not normally available except at the post where the Marine is stationed.

Dependents are entitled to free medical care at hospitals and clinics of the armed services, but this does not include dental work by Navy dentists. House calls are not normally made except in emergencies when it would be dangerous to move the patient to a hospital. Some medicines may be supplied at no cost from service pharmacies, but others may have to be purchased at civilian drug stores. Hospitalized dependents are charged for their meals. Ambulance service for dependents is not normally available. It may be that the dependent facilities of a service hospital to which a dependent seeks admittance are filled to capacity. In that event, the government will pay for the hospitalization of the dependent at a civilian hospital. Your dependents are required to show a form signed by your commanding officer or the adjutant of your organization as proof that they are eligible for medical treatment. They should retain this form and have it with them every time they go for consultation or treatment.

Dependents of Marines in the lower pay grades are not entitled to transportation at government expense. However, they are sometimes permitted to travel by government transportation to an overseas station, provided space is available and the housing situation is such at the overseas station that the government will authorize the travel.

A Marine who is married and has to support a family on his pay and allowances must forego many of the luxuries and pleasures which he could afford as a single man. He is expected to practice the economy necessary to provide adequate support for his dependents. If his dependents are subject to real privation and hardship because of sickness or other emergency, the American Red Cross or the Navy Relief Society will provide financial assistance. It must be understood that these organizations do not have enough money to help those who are capable of meeting their emergencies without assistance. For instance, they could not be expected to loan money to a Marine who could raise the money himself by selling an automobile which he has bought only for his own pleasure and convenience and not for essential transportation.

Legal Assistance

Most commands have legal assistance officers who are qualified to answer your questions about legal problems and advise and assist you in their solution. A legal assistance officer is prohibited

by regulations from revealing confidences of personnel obtaining legal assistance to the same extent that a civilian lawyer is prohibited by legal ethics from revealing confidences of his clients. Throughout the United States there are agencies set up within the legal profession to assist servicemen with their legal affairs. The Navy Department maintains liaison with these agencies. If you have a legal problem which requires the services of such an agency, your commanding officer or legal assistance officer can advise you of the procedure to follow.

Personal Finances

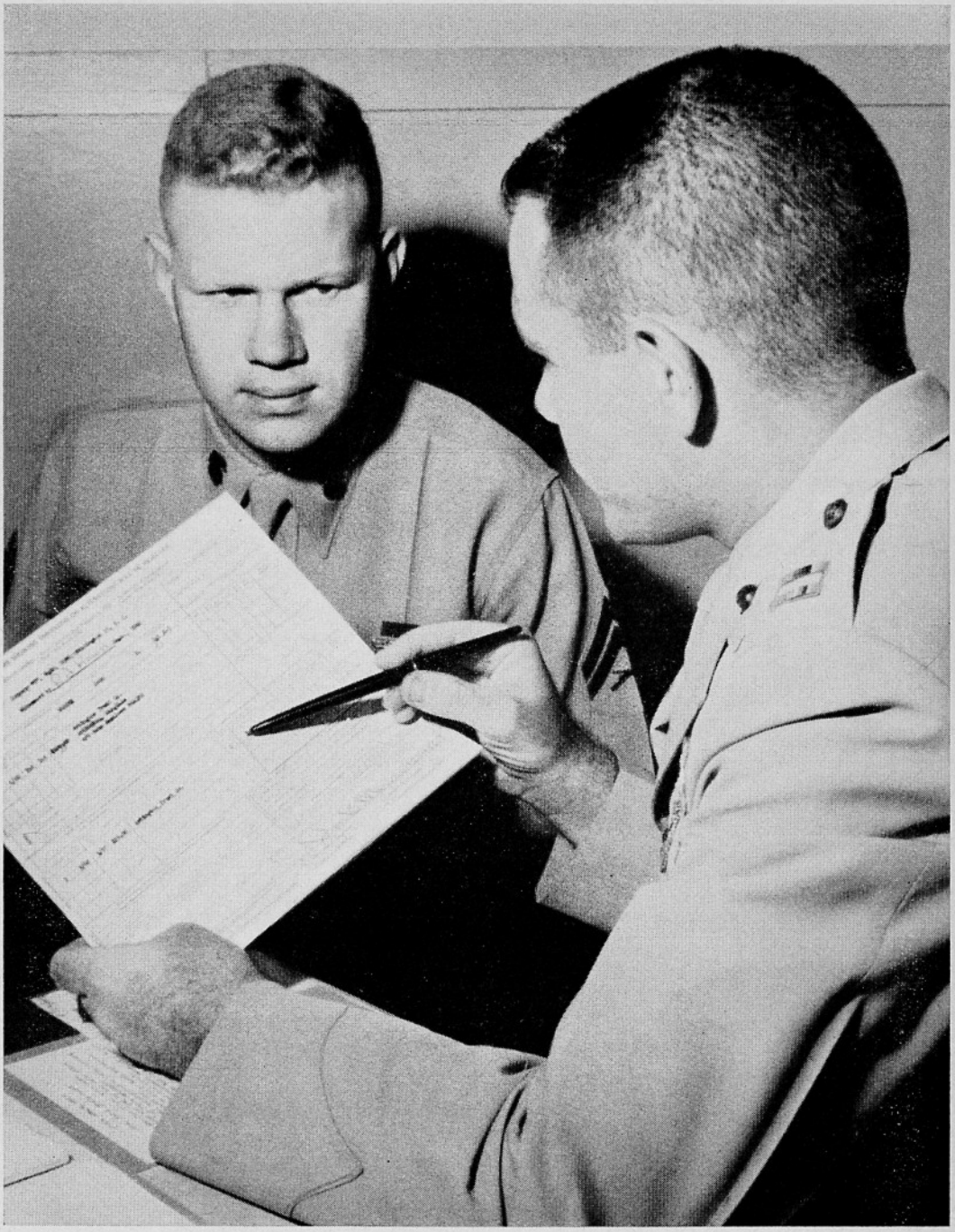
The Marine Corps recognizes that it is sometimes necessary to go into debt to procure the ordinary essentials of life, but prompt settlement of indebtedness for essentials is expected.

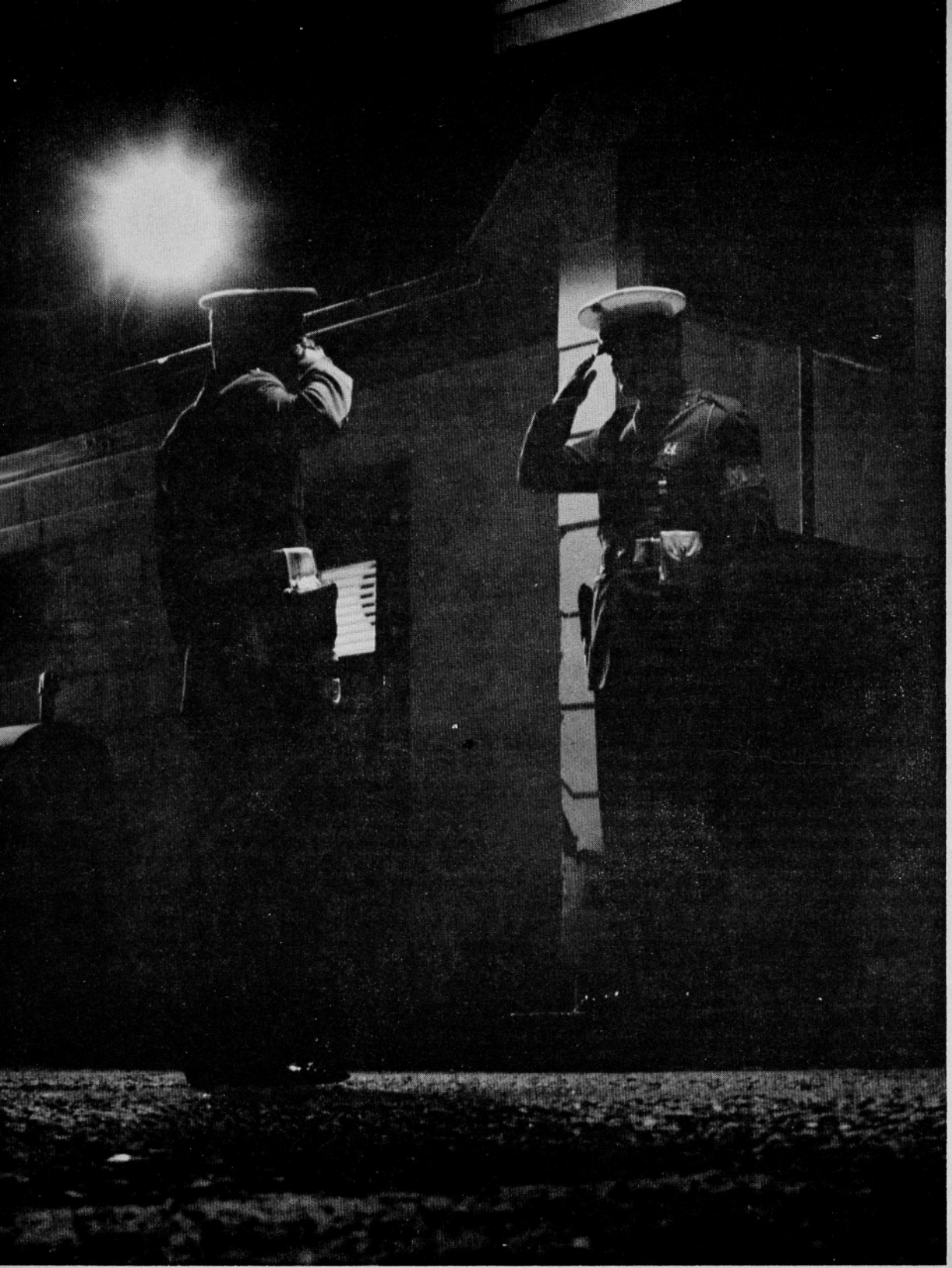
If you own an automobile, you should be covered by liability insurance against both personal and property damage to others. Some states require such insurance. Many posts and stations of the Marine Corps which are not in states where insurance is required by law nevertheless will not allow personnel to have their cars on the post unless covered by insurance.

An allotment is a regular sum of money deducted from your pay monthly and paid by the government to a payee whom you designate. Allotments are made only upon your written request and only for purposes allowed by regulations. Allotments to dependents who are authorized dependency allowances are discussed elsewhere. Allotments may also be registered for relatives not authorized to receive dependency allowances. An allotment to a bank may be for the support of family or relatives or to the grantor's checking or savings account. U. S. Savings Bonds purchased in a regular amount each month may be paid for by allotment. So may monthly life insurance premiums, including premiums on commercial insurance, when the insurance is on the life of the grantor. The Navy Relief Society and the American Red Cross usually require a Marine who receives a loan to register an allotment for its repayment. There are some restrictions as to the number of allotments which a Marine may register, but, in general, these restrictions are such that it is not necessary to stop an existing allotment when a new allotment is registered for Savings Bonds, additional life insurance, or repayment of a loan from Navy Relief, or the Red Cross.

It is not mandatory that a Marine draw all of the pay he has coming to him each pay day. Generally, he may let all or part of the pay due him "ride on the books," that is, remain credited to him on his account until the next or any subsequent pay day. Several days prior to pay day a Marine is given a chance to indicate how much of the pay due him he wishes to draw and may at that time request payment by either cash or check.

An enlisted Marine, reserve or regular, on active duty may make savings deposits with his disbursing officer. Savings deposits are an entirely different thing from letting pay "ride on the books." The disbursing officer opens a deposit record book in your name when you make your initial deposit. All deposits to your credit for six months or longer draw interest at the rate of four per cent per year. Interest begins the day after the deposit is made. One deposit may be made each month. Deposits need not be made every month and the amount deposited need not be the same each time a deposit is made. Deposits must be in even dollar amounts of at least five dollars. They may be made by either cash or by checkage against pay which is due. Except for money which is withdrawn from deposit with the disbursing officer upon discharge and is redeposited upon reenlistment, deposits are limited to the amount of net pay and allowances which has been paid or accrued to the account of the depositor during the preceding three months. *None of your deposits can be withdrawn until you are discharged or released from active duty unless an emergency arises and withdrawal is approved by your commanding officer.* The only other exceptions are the cases of enlisted Marines who retire, transfer to the Fleet Marine Corps Reserve, or advance to commissioned or warrant status. The restriction against withdrawing deposits before discharge is a tremendous advantage to the Marine who wants to have a considerable sum of money when he is discharged, yet is sometimes too easily tempted to spend money that he has available. A man who is discharged and reenlists receives his deposits and accrued interest and may either keep the money out or redeposit all or any part of it until his next discharge. Many Marines have saved sums running into five figures during their enlisted careers.





Chapter 6

Interior Guard

WHEREVER you are stationed as a Marine, ashore or afloat, your commanding officer always establishes and maintains an interior guard. This guard is charged with the preservation of order, protection of property, and the enforcement of orders and regulations. Guard duty is a function of special importance to Marines since they are assigned to protect Naval installations ashore. Such Naval establishments as shipyards, ammunition dumps, proving grounds, administration buildings, airfields, and the like, are guarded by Marines.

The functions of interior guards vary with the desires of the commanding officers of individual posts, and with the nature of particular posts and stations. For example, sentries at a Naval ammunition depot generally have challenging posts, while stations like Quantico have few if any challenging posts.

When you are on duty with an interior guard, you are one member of a distinct organization with definite orders to carry out. The persons with authority over an interior guard are the commanding officer and the officer of the day. The officer of the day is the commanding officer's direct representative and is in charge of the security of the post during his tour of duty.

There are five classes of personnel in an interior guard. These classes are: (1) the commander of the guard, (2) the sergeant of the guard, (3) the corporals of the guard, (4) the field music of the guard, and (5) the privates or PFCs of the guard.

Usually there are three reliefs in each interior guard. Since a corporal is assigned to each relief, there are three corporals of the guard. There are enough privates and PFCs to provide three reliefs for each post the interior guard is assigned, plus a certain number of supernumeraries depending on the size of the guard. These supernumeraries are held in reserve in case of emergency.

Sergeant of the Guard

When you are assigned to interior guard duty you will find that there are certain set duties which must be performed. The following discussion outlines the principal duties and responsibilities of the sergeant, corporals and privates of the guard.

A. Sergeant. The senior noncommissioned officer of the guard, whatever his rank, will officially be known as the sergeant of the guard. If there is no officer of the guard, he will perform the duties prescribed for the commander of the guard. The sergeant of the guard performs the following tasks:

1. The sergeant of the guard has general supervision over the other noncommissioned officers, field musics, and privates of the guard. He will be thoroughly familiar with their orders and duties.

2. The sergeant of the guard is responsible for the property under charge of the guard and will see that it is cared for properly. He will report any discrepancies to the commander of the guard. He will make a list of all the articles which are taken out by working parties and see that such articles are returned in good condition unless they are issued and cared for by the brig officer or similar authority.

3. The sergeant of the guard will assign members of the guard to reliefs, unless this has been done by higher authority. The sergeant of the guard will prepare duplicate lists of the names of the noncommissioned officers, field musics and privates of the guard, showing the reliefs and posts or duties of each. One list is given to the

commander of the guard and the other retained by himself.

4. The sergeant of the guard will see that all reliefs are turned out at the proper time and that the corporals of the guard thoroughly understand and are prompt and efficient in the discharge of their duties. He will designate bunks in the same vicinity for each relief so that they may be quickly found and turned out.

5. The sergeant of the guard will make such inspections and see that the other noncommissioned officers of the guard make such inspections and patrols as may be prescribed by higher authority.

6. The sergeant of the guard will turn over his duties to the next ranking noncommissioned officer before absenting himself from the guardhouse.

7. The sergeant of the guard will take the place of the corporal of the guard whose relief is on post or designate another noncommissioned officer to do so, should the corporal of the guard be called away from the guardhouse.

8. The sergeant of the guard will be responsible for the proper police of the guardhouse, including the area around it.

9. The sergeant of the guard will report as may be directed by the commanding officer to the adjutant's office for the guard report book.

10. The sergeant of the guard will report the following to the commander of the guard, or, if none is detailed, to the officer of the day:

(a) Any suspicious or unusual occurrence that comes to his attention.

(b) All persons apprehended by the guard.

(c) The approach of an armed party.

(d) Any orders or instructions received from persons other than the commander of the guard, or the officer of the day.

11. When the brig guard is included in the interior guard, the sergeant of the guard may be assigned the duties of brig warden. When so assigned, he will administer the brig in accordance with the orders of the officer of the day, the commander of the guard, and other applicable instructions.

Corporal of the Guard

B. A noncommissioned officer of the guard detailed for duty in charge of a relief of the guard will be officially known as the Corporal of the Guard. The corporal of the guard performs the following tasks:

1. If members of the guard are not assigned to reliefs and posts by higher authority, the corporal of the guard assigns the members of his relief to posts by number, immediately after the guard is divided into reliefs. These assignments are not changed during the same tour of guard except by direction of the commander of the guard or higher authority. The corporal of the guard assigns the most experienced men to posts at the guardhouse and at remote or responsible places.

2. The corporal of the guard makes a list of the members of his relief, including himself. This list shows the number of the relief, the post to which each man is assigned, and his name and organization. The list is made in duplicate. One copy is given to the sergeant of the guard as soon as completed and the other is retained by the corporal of the guard.

3. The corporal of the guard instructs all the members of his relief regarding their orders and duties.

4. The corporal of the guard posts his relief.

a. **To post reliefs.**

(1) At an appropriate time before sentries are due to go on post, the corporal of the guard assembles them, checks their appearance, fitness for duty, condition of arms if carried, issues ammunition if required, and assures himself that they understand their general and special orders and any special instructions. When the relief is large, it may be more convenient to form the relief, call the roll, and inspect the sentries in ranks. The corporal of the guard then reports to the sergeant of the guard that his relief is ready to be posted, or if directed, posts the sentries without so reporting. The corporal of the guard will personally supervise the posting of each sentry of a new relief. The corporal of the guard moves his relief to their posts by marching or by vehicle. When movement is by truck, the relief will embark in the inverse order from which the sentries will debark at their respective posts.

(2) Where there are few posts, or the posts are only a short distance from the guardhouse, the corporal of the guard may send his sentries to their posts by direct order. Thus, "Private A, Private B, take your posts," or if the roll has been called, "Take your posts." Each sentry will then

proceed directly to his post. Where sentries are sent to their posts by direct order, one sentry relieves another by meeting at a particular point at a prearranged time. The sentry on post at the expiration of his tour will remain on post within view of the prearranged relieving point and when relieved by the new sentry he will proceed directly to the guardhouse and report to the corporal of the guard of the old relief. When reliefs are posted in this manner, the last sentry on duty on a night post will proceed directly to the guardhouse at a designated time and will report to the corporal of the guard that he has secured his post.

(3) The corporal of the guard writes down the names of the sentries, the number of their posts, the time and date they were posted, or directed to their posts, and the time they report back to the guardhouse upon being relieved.

(4) If the relief was posted with arms loaded, the corporal of the guard of the old relief will see that no cartridges are left in the chambers or magazines before dismissing the members of the old relief. The same rule applies to the brig guard.

5. The corporal of the guard acquaints himself thoroughly with all orders of every sentry on his relief. He sees that each sentry understands, carries out, and correctly transmits such orders in detail to his successor.

6. If the guard should be turned out, the corporal of the guard calls his own relief and sees that its members fall in promptly. Tents or bunks are designated in the same vicinity for the reliefs so that all members of each relief may be found and turned out in the shortest time and with the least confusion.

7. When his relief is on post, the corporal of the guard takes his post in the guardhouse. He does not fall in with the guard when it is formed. There is at least one NCO constantly on the alert at the guardhouse. This is the corporal of the guard whose relief is on post.

8. The corporal of the guard reports at once to the sergeant of the guard or commander of the guard any violation of regulations, or any unusual occurrence which is reported to him or which comes to his notice.

9. The corporal of the guard has his rifle or other prescribed arm with him constantly.

10. The corporal of the guard wakes the NCO whose relief is next on post in time for the latter to verify prisoners, form his relief, and post it at the proper hour.

11. The corporal of the guard notifies the sergeant of the guard whenever it becomes necessary for him to leave his post.

12. After notifying the sergeant of the guard, the corporal of the guard goes at once to any sentry who may call "Corporal of the guard, Post Number —."

13. The corporal of the guard promptly notifies the commander of the guard and sergeant of the guard if a sentry calls "The guard" or "Fire."

14. If a sentry calls "Relief," the corporal of the guard relieves him by the man next for duty on that post. If the sentry is relieved for a short time only, he posts him again as soon as the necessity for his relief ceases.

15. The corporal of the guard examines the persons or parties detained by a sentry. If there is reason to believe that they have no authority to cross the sentry's post, the corporal of the guard conducts them to the commander of the guard.

16. The corporal of the guard takes custody of all suspicious and disorderly persons and those taken in the act of committing crimes. All such persons are conducted at once to the commander of the guard.

17. The corporal of the guard sees that no persons or parties enter the guardhouse or cross the posts of sentries posted there except by proper authority.

18. The corporal of the guard challenges all suspicious persons or parties he may observe during the times for challenging.

C. Non-rated men of the guard. When you are a private or a PFC of the guard, you normally are assigned to a relief by the sergeant of the guard. The corporal of the guard for your relief usually assigns you to your post. You cannot be changed from one relief to another during the same tour of guard duty except by proper authority. Rules which govern your conduct while serving as a private or PFC of the guard are:

1. You must know and thoroughly understand the meaning of the 11 general orders for sentries and the special orders applying to your particular post.

2. When your guard or relief is dismissed, you place your rifle, if you have one, in the arm rack or stack unless you are required for duty at once. You do not remove the rifle from the rack or stack unless it is required in the performacne of duty.

3. When you are a member of the interior guard, you do not leave the immediate vicinity of the guardhouse without permission from your corporal of the guard. This permission is never granted except in cases of necessity.

4. You do not remove your equipment or clothing without permission from your corporal of the guard.

Orders for Sentries

When you go on a tour of interior guard duty, your orders as a sentry will fall into two classes; general orders, and special orders.

A. Special orders. Your special orders will be those required at a particular post, or those required for unusual duties which you are assigned for a single tour of guard duty.

B. General orders. The general orders do not change. There are 11 general orders and they are the same wherever and whenever you are on interior guard duty. *You are required to know and memorize these general orders and be able to recite them whenever you are called upon to do so.*

C. Reporting Posts. A sentry reports his post to an officer as follows: "Sir, Private ———— reports post number —— all secure," (or anything that has to be reported).

The 11 general orders are listed below, with explanations of those which are necessary. The orders themselves are in bold face type. You must know and memorize these lines.

1. To take charge of this post and all government property in view.

(a) All persons in the service, whatever their ranks may be, are required to respect you in the performance of your duties as a sentry and a member of the guard.

(b) You report immediately to the corporal of the guard, by telephone or other means, every unusual or suspicious occurrence.

(c) You take into custody and turn over to the corporal of the guard all suspicious persons, all parties involved in a disorder on or near your post, and all parties who try to enter your post at night without authority.

2. To walk my post in a military manner, keeping always on the alert, and observing everything that takes place within sight or hearing.

(a) You are not required to halt and change the position of your rifle on arriving at the end of your post, nor to execute "to the rear" precisely. You may face about in the manner most convenient to you, and at any part of your post best suited to the proper performance of your duties.

(b) You may carry your rifle on either shoulder. When exposed to wet or severe weather, you may carry it in the position which best protects it.

(c) When in a sentry box, you may stand at ease. Sentry boxes are used only in wet weather or at times when specially authorized by the commanding officer.

(d) In very hot weather and only on the express authority of the officer of the day or the commander of the guard, you may stand at ease at your post provided you can discharge your duties effectively in this position.

3. To report all violations of orders I am instructed to enforce.

You usually report a violation of orders when you are inspected or relieved. If the case is urgent, however, and it is necessary, you take custody of the offender and call the corporal of the guard.

4. To repeat all calls from posts more distant from the guardhouse than my own.

(a) You pass on (or repeat) all calls from sentries farther from the guardhouse than you are so that word will reach the corporal of the guard. The corporal of the guard will then act on the call as required.

(b) In no case do you call, "Never mind the corporal." The corporal cannot heed such a call if it is given.

5. To quit my post only when properly relieved.

(a) If you become sick or for any reason must leave your post, you call, "Corporal of the Guard, Post Number ——, relief."

(b) When you are being relieved, you halt and, with rifle at right shoulder arms, face toward the relief when he is 30 paces from you. You come to port arms with the new sentry and in a low tone transmit to him all special orders relating to the post and any other information which will help him perform his duties better.

(c) If you are armed with a pistol, you assume the position of attention while being relieved, unless it is during the hours for challenging. In this case, you hold your weapon at raise pistol.

6. To receive, obey, and pass on to the sentry who relieves me all orders from the commanding officer, field officer of the day, officer of the day, and officers and noncommissioned officers of the guard only.

(a) You are subject only to the orders of these officers during your tour of duty, but any officer can investigate and report violations of regulations when he may observe them.

(b) You give up possession of your weapon only upon receiving a direct order to do so from the person you can lawfully receive orders from while on post. No other person can require a

sentry to quit his piece or even require it to be inspected.

7. To talk to no one except in line of duty.

(a) When persons make proper inquiries of you, answer courteously.

(b) When you are challenging, or holding conversation with any person, take the position of port arms if you are armed with a rifle.

(c) At night, if you are armed with a pistol, take the position of raised pistol in challenging or holding conversation.

8. To give alarm in case of fire or disorder.

(a) In case of fire, you immediately call, "Fire, Post Number ——." You then turn in the alarm or make certain that the alarm already has been given, and if possible, without danger to yourself, extinguish the fire. If you cannot extinguish it, take the steps necessary to direct the fire apparatus to the fire.

(b) In case of disorder, call, "The guard, Post Number ——."

(c) If the danger is great in case of either fire or disorder, and there is no other method of giving an immediate alarm, discharge your rifle or pistol three times in rapid succession before you call.

9. To call the corporal of the guard in any case not covered by instructions.

(a) You call "Corporal of the guard, Post Number ——," giving the number of your post, when you need the corporal of the guard for any purpose other than relief, fire, or disorder.

10. To salute all officers, and all colors and standards not cased.

(a) When you are a sentry you salute all persons and parties entitled to this compliment from the guard. This includes officers of the Army, Navy, Marine Corps, Air Force and Coast Guard. It also includes officers of the National Guard and Organized Reserves who are in uniform, and military and naval officers of friendly foreign powers. (See Fig. **6.1.**)

(b) If you are engaged in some duty which would be hampered by stopping to salute, you need not salute.

(c) If you are armed with a pistol during the hours of challenging, you do not salute but stand at the position of raise pistol.

(d) You salute in the following manner when you are a sentry:

(1) If you are walking your post, halt and salute by presenting arms when you carry a rifle with a parade sling. If you are otherwise armed, or if you are carrying your rifle slung, give the hand salute. (2) If you are doing patrol duty, you do not halt, unless spoken to, but you give the rifle salute when armed with a rifle and the hand salute when otherwise armed. (3) If you are in a sentry box, stand at attention in the doorway upon the approach of the person or party entitled to the salute. If you are armed with a rifle with a parade sling, you present arms. If otherwise armed, give the hand salute.

(e) During the hours when you are required to challenge, salute an officer as soon as he is duly recognized, except when armed with a pistol. In this case, remain at raise pistol.

(f) You salute an officer as he comes on your post. If he stops to hold conversation with you, assume the position of port arms, if armed with a rifle, or the position of attention throughout the conversation. You salute again when the officer leaves.

(g) If you are in conversation with an officer, do not interrupt the conversation to salute another officer. In case the officer to whom you are talking salutes a senior, however, you also salute.

(h) When the flag is raised at morning colors or lowered at evening colors, you stand at attention at the first note of the National Anthem or "To the Colors" (Standard) and render the prescribed salute. If you are engaged in some duty which would be hampered, you need not salute. You usually face the flag while saluting, but if your duty requires it, you can face in another direction. When the music sounds "Carry On" you resume your regular duties.

(i) If an armed part of the guard approaches your post, you halt when they are about 30 paces from you. You face toward them with your rifle at right shoulder arms. If the party has not come there to relieve you, place yourself so that they will pass in front of you. Resume walking your post when they have passed six paces beyond you.

11. To be especially watchful at night and, during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.

(a) During challenging hours, if a sentry sees any person or party on or near his post, he will advance quickly along his post toward such person or party, and when within 30 paces will challenge sharply, "HALT! Who is there?" The sentry ordinarily takes action to conceal himself while challenging, but he may halt in the open if circumstances require. Sentries are sometimes equipped with a police whistle with which to attract attention when challenging. After challenging, the sentry places himself in the most

advantageous position from which to pass or arrest the person or party. In selecting this position, the sentry may require the challenged person or one of the party to advance toward him, to remain halted, to advance to a particular place, to face toward the light, to take whatever position necessary in order that he may most surely and promptly determine whether the person or party should be passed or turned over to the guard.

(b) If the person or party challenged is mounted or in a vehicle, the sentry will proceed as when the person or party challenged is on foot. If necessary to the proper performance of his duty, he may cause one or all of a party to dismount.

(c) The sentry will permit only the senior person of a party to approach him for the purpose of being duly recognized. The senior person must identify the remainder of the party to the sentry.

(d) The sentry must satisfy himself beyond a reasonable doubt that those challenged are what they represent themselves to be and have a right to pass. If he is not satisfied, he will detain the person or party and call the corporal of the guard by the nearest telephone or other means.

(e) When a party approaches, the sentry, on receiving an answer indicating that the party is authorized to pass, will say, "Advance senior person to be recognized," and when that one has been recognized will then say, "Advance friend, (Officer of the day, etc.)," repeating the answer to the challenge. Thus, if the answer is "Patrol (friend, etc.)," sentry will say, "Advance senior person to be recognized." The person or party being advanced is allowed to approach close enough to be recognized and is halted. When recognized, sentry will say, "Advance patrol (friend, etc.)."

(f) If a person approaches alone, he will be directed to advance to be recognized and when recognized will be advanced as previously indicated for one of a party. Thus, if the answer is, "Friend (officer of the day, etc.)," the sentry will call, "Advance, friend (officer of the day, etc.), to be recognized." After recognition, the sentry will say, "Advance friend (officer of the day, etc.)."

(g) If two or more persons or parties approach the sentry's post from different directions at the same time, they will be challenged in turn and required to halt and remain halted until advanced.

(h) The senior is first advanced in accordance with the foregoing rules.

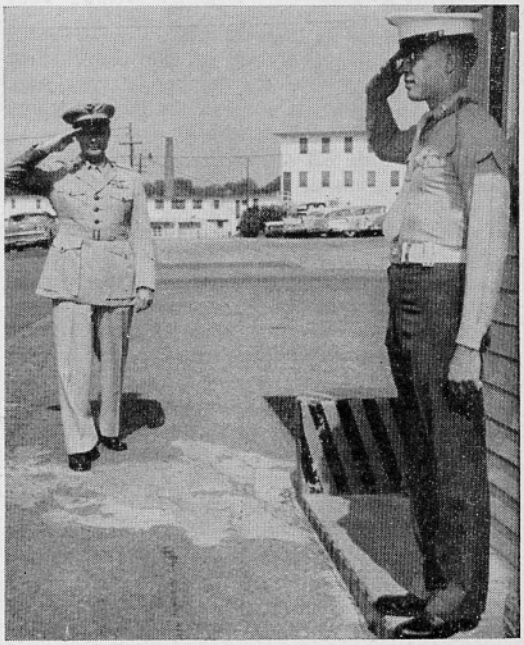
(i) If a person or party is already advanced and in conversation with a sentry, the latter will challenge any other person or party that may approach. If the person or party challenged is senior to the one already on his post, the sentry will advance the new person or others that may be challenged; otherwise the sentry will advance no one until the senior leaves. He will advance only the senior of the remaining ones and so on.

(j) The following order of rank governs a sentry in advancing different persons or parties approaching his post; commanding officer, field officer of the day, officer of the day, officer of the guard, officers, patrols, relief, noncommissioned officers of the guard in order of rank, and friends.

(k) A sentry must never allow himself to be surprised, nor permit two parties to advance upon him at the same time.

(l) Answers to a sentry's challenge intended to confuse or mislead him are prohibited, but the use of such an answer as "Friend" is not to be misunderstood as misleading; it is the usual answer made by officers or patrols when the purpose of their visit makes it desirable that their official capacity should not be announced.

(m) The commanding officer may limit challenging to suspicious looking persons, or eliminate it altogether at his discretion. A sentry may, however, challenge any person or party whom he considers suspicious.



6. A sentry salutes all persons entitled to the courtesy.

Use of Weapons While Assigned to Interior Guard

It is possible that sometime during your assigned tour of Interior Guard Duty, it will be necessary for you to use the weapon with which you are armed. The following instructions will govern your actions in the use of your particular weapon.

A. Nightsticks. A sentry equipped with a nightstick shall confine the use of the nightstick to that portion of the body below the shoulders. The head will not be struck except as a last resort to protect human life.

B. Firearms.

1. Armed personnel, on duty, will carry firearms with chambers empty and clip or magazine inserted in weapon, or as prescribed by proper authority.

2. Firearms will be used to protect human life, to prevent the destruction or theft of valuable government property, and to give an emergency alarm when there is no other method of giving an immediate alarm. They may also be used for the following purpose: If a prisoner attempts to escape, the sentry over the prisoners or any member of the prisoner guard or main guard who sees him, will call "HALT!" If the prisoner fails to halt when the call has been once repeated, and there is no other effective means of preventing his escape, the sentry or member of the guard will fire at the prisoner. A sentry must never fire in any direction where there is a chance of injuring an innocent person or causing serious property damage.

3. When changing a pistol from one sentry to another, the following routine will be followed:

(a) Sentry being relieved will draw the pistol from the holster, come to raise pistol, remove the magazine, draw the slide to the rear, locking it to the rear, look into the chamber and ascertain that it is empty, then hand it with the slide open, to the corporal of the guard, who will inspect it and hand it to the new sentry.

(b) The new sentry will hold the pistol at raise pistol, examine the chamber, release the slide, pull trigger, insert magazine and place pistol in his holster.

Guard Duties Aboard Naval Vessels

A. Distinguished from guard duty ashore. The instructions for interior guard duty as herein set forth primarily apply to the organization, routine, orders, and instructions for interior guards serving on shore. On board ship, the spirit of these instructions will apply, modified as may be necessary to conform to service afloat. The terms employed, such as *Sergeant of the guard, Corporal of the guard,* etc., have special significance, and apply also to petty officers performing these duties.

B. Variations. The following variations from guard duty ashore apply aboard ship:

1. Marines normally perform all guard duty on ships having Marine detachments. When there are no Marines, guard duty, if required, is performed by such ship's division, or details from the deck divisions, as the commanding officer may direct, and is generally known as the seamen guard.

2. The guard of the day is mustered only between morning and evening colors when honors may have to be rendered.

3. Sentries do not challenge.

4. The guard does not raise and lower the colors.

5. The guard, except the sentry on the brig post, is not responsible for the prisoners.

6. The chief master at arms, or any of his authorized assistants, have access to the prisoners at all times.

7. The relief does not make the round of all posts as a unit when going on watch.

8. The corporal of the guard visits sentries at such times as may be prescribed by the commanding officer and as directed by the officer of the deck.

9. There is no officer of the day. The officer of the deck has a corresponding function in his relation to the guard.

10. There is no officer of the guard. However, all officers of the Marine detachment or of the ship's guard are always on duty while on board ship, and are responsible for the functions and duties performed usually by the officer of the guard. The detachment Marine officers visit sentries frequently to insure that each sentry thoroughly understands his orders and duties.

11. Guard mount, when held, normally consists only of a muster and inspection.



Chapter 7

Packs and Equipment

IN any military operation, supplying the individual with what he needs is one of the most critical problems—some experts say it is the most critical. To fight in Korea we had to set up the longest supply lines in history. They extended from this country to Korea, and beyond. Every mile and every pound of equipment had the most serious meaning. This is a lesson that every Marine must remember.

It is expected that vast quantities of material will be expended in combat; it is not expected that gear will be carelessly lost or destroyed. Clothing and equipment lost because of carelessness or negligence may mean loss of lives in battle! So that you may not be responsible for needless loss of lives, and so that you may rely on yourself and not your buddies, you must know how to use and take care of your equipment and clothing.

The Equipment You Receive

The Marine Corps issues you the following equipment: (1) a pack, including haversack, knapsack, and belt suspenders, (2) a cartridge belt, (3) a bayonet with scabbard for those armed with the rifle, (4) a rifle, or automatic rifle (BAR), with the gear needed to keep the weapon in good condition and proper working order. Men armed with the rifle receive a combination tool, a brush and thong, an oiler, and an oil and thong case. Automatic riflemen receive a kit containing spare parts and accessories. Both weapons are issued with leather or web gun slings; (5) mess gear, consisting of a meat can with cover, and knife, fork, and spoon; (6) a canteen and cup with cover; (7) a first aid packet and pouch; (8) a poncho; (9) a shelter-half with a pole, five pins, and a guy line.

To individuals preparing for combat, additional gear is issued. This generally consists of: (1) a steel helmet with fiber lining; (2) a gas mask; (3) an entrenching tool—shovel, pick mattock, or machete.

Special equipment, such as pack boards and sleeping bags, may be issued to you when you are with combat units. What it is will depend on your job. For example, a squad leader may be furnished with a compass, wire cutter, wrist watch, and so on.

Packs—Contents, Construction, Uses

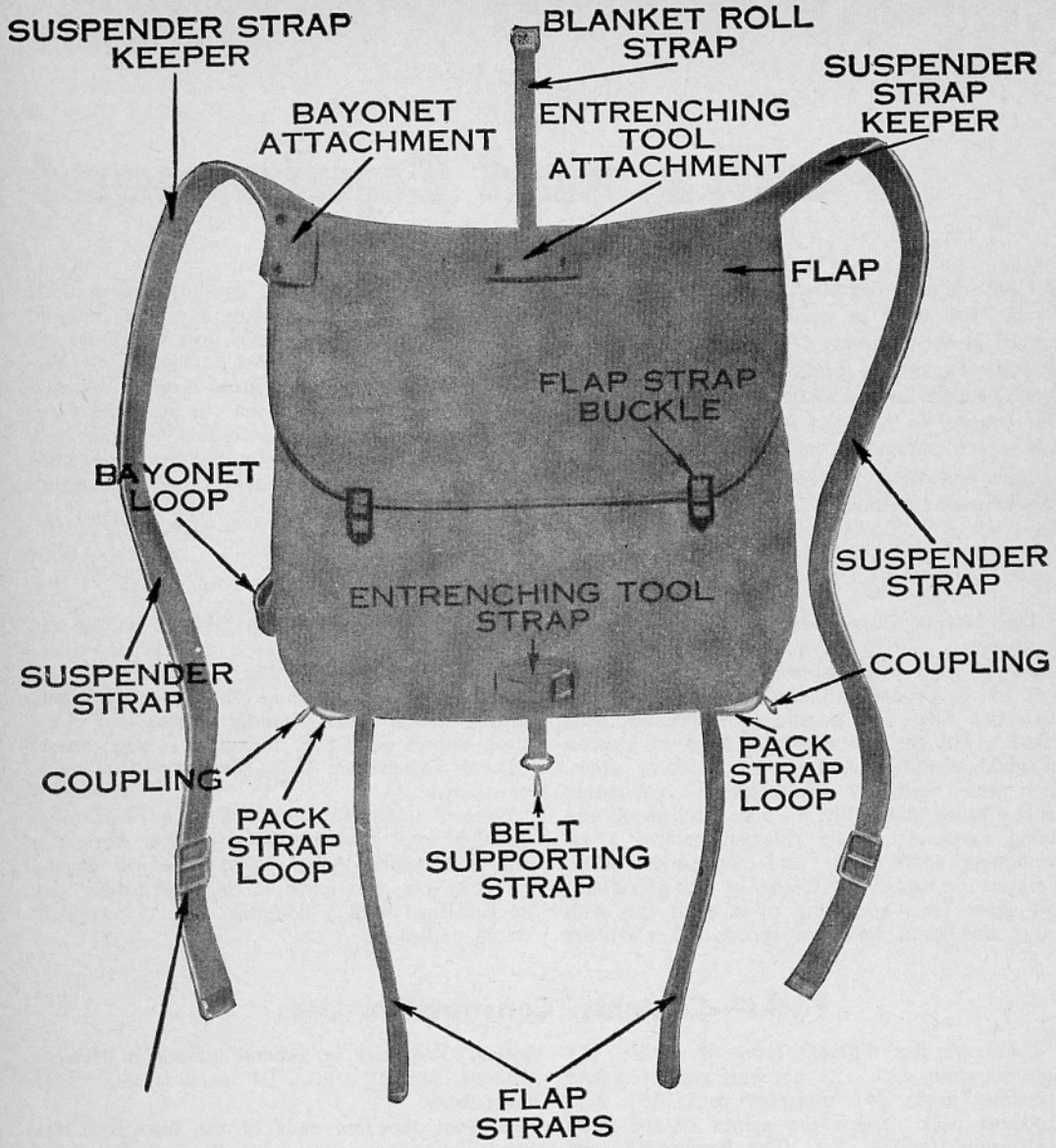
There are five different types of packs: (1) light marching pack; (2) marching pack; (3) field marching pack; (4) transport pack; (5) field transport pack. Learn the names of the parts by turning to Fig. **7.1** "The haversack", and Fig. **7.2** "The knapsack."

A. Light Marching Pack (LMP). The smallest and lightest of the packs is the light marching pack, which consists of the haversack, with normal contents and other prescribed equipment. As normal contents you will carry toilet articles, one undershirt, one pair of drawers, one pair of socks, mess gear, poncho and rations when issued. You may be ordered to use it with, or without, normal arms. To make it up, follow these steps:

1. Pass the free ends of the haversack suspender straps up and through the first slot of the "M" buckles and down and through the second slot.

2. Then pass the free ends of the haversack suspender straps through the pack strap loops from front to rear. Before you do this, give the straps a half turn outboard to make them lie better.

3. Pass the free ends of the haversack sus-



7.1 The haversack.

pender straps up and through the fourth slot from the top of the "M" buckles and down through the third slot.

4. Adjust the pack to conform to the wearer by adjusting the "M" buckles.

B. Marching Pack (MP). The marching pack consists of the haversack with normal contents, belt suspenders, and cartridge belt. In it you will carry rations, toilet articles, one undershirt, one pair of drawers, one pair of socks, mess gear, and



7.2 The knapsack.

poncho. You will attach to the haversack the entrenching tool, and steel helmet if it is not being worn. This pack is used as a combat pack, and on marches or field exercises not involving bivouac. (See Fig. **7.3**.) To make up the marching pack, follow these six steps:

1. Couple the haversack suspenders to the belt suspenders by passing the free end of the haversack suspender strap through the belt suspender ring, back upon itself and through the haversack suspender keeper.

2. Pass the ends of the belt suspender pack straps through the haversack pack strap loops from front to rear. Give the pack straps a one half turn outboard before passing them through the loops. This makes them lie flat against your body.

3. Cross the straps behind the haversack.

4. Now couple the belt suspenders to the haversack suspender "M" buckle by the snaps.

5. Try on the pack without the cartridge belt, and adjust pack straps and haversack suspender straps until the pack feels comfortable. The belt does not hold the pack down. If the pack is properly adjusted, suspenders and belt supports hold the belt up.

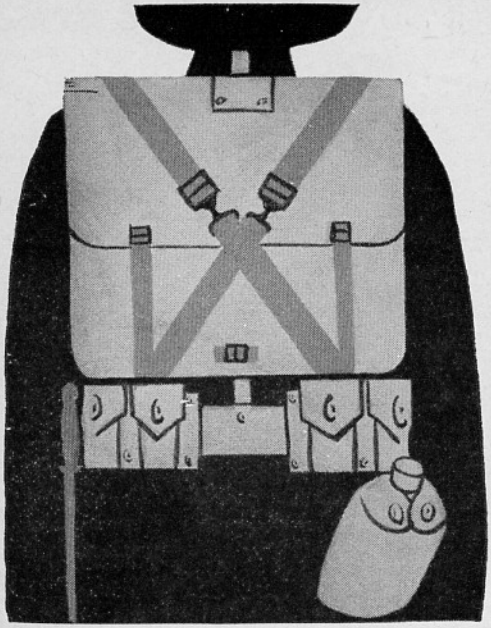
6. Put on the belt and fasten the belt suspender hooks into eyelets along the top edge of the belt which will provide the most comfort. Hook the haversack belt supporting strap into center rear eyelet on the belt.

C. Field Marching Pack (FMP). The field marching pack (Fig. **7.4**) is used for marches and field exercises involving bivouacs. It is made simply by adding a short blanket roll to the marching pack. The short blanket roll is made this way:

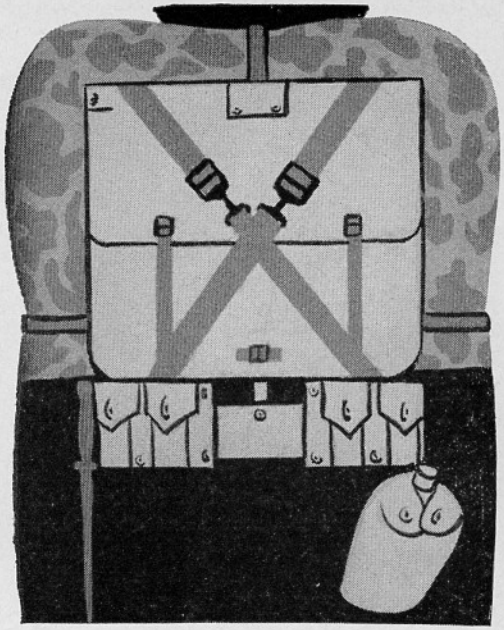
1. Lay the shelter half out with the tent peg loops down and away from you and with the triangular ends of the shelter half folded inboard.

2. Lay the blanket on the shelter half with the ends of the blanket covering the triangular ends of the shelter half and with one side of the blanket a few inches in from the far edge of the shelter half.

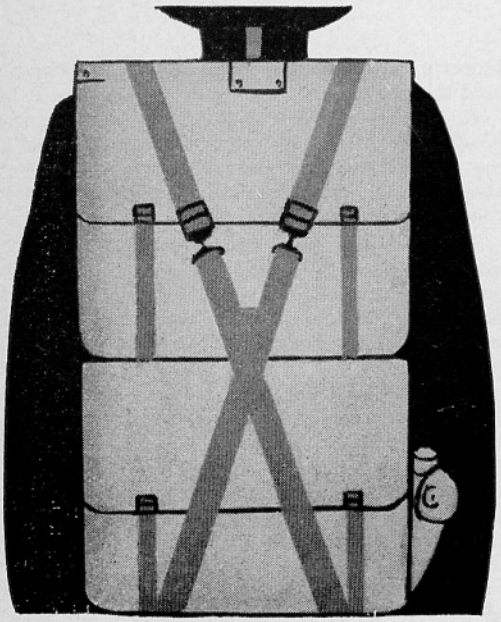
3. Fold the blanket in equally from each end so that the width of the blanket equals the length of the extended tent pole. Fold the blanket up



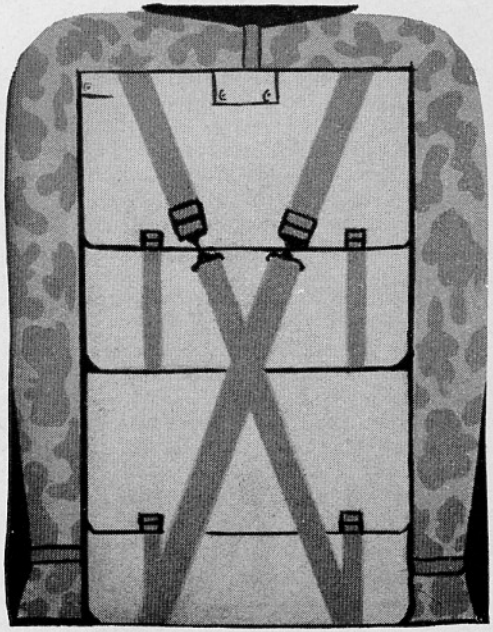
7.3 The marching pack.



7.4 The field marching pack.



7.5 The transport pack.



7.6 The field transport pack.

from the edge near you, so that the blanket edge is within the shelter half.

4. Place the tent pole in the center of the blanket a few inches above the near edge. Place the guy line and two tent pins on a line with the pole at the edge of the blanket where the portion of the triangular end of the shelter half is exposed. Place the remaining three pins at the other end in a corresponding manner.

5. Fold the portion of the triangular part of the shelter half that extends beyond the blanket into the center from each end.

6. Roll the blanket(s) and shelter half, starting at the side which contains the pole and pins. Roll tightly and smoothly. Two men can do a better and smoother job of rolling the blankets and shelter half together. Team up with someone for this.

7. Bind the roll with "shelter tent straps." Then you attach the roll to the pack by means of the blanket roll straps.

D. Transport Pack (TP). The transport pack is used for traveling by ship or rail when you will not need blankets. In addition to the haversack and belt suspenders, it consists of a knapsack in which additional clothing can be carried. This clothing may include a pair of shoes, a pair of trousers, two shirts, two pairs of socks, two undershirts and two pairs of drawers. (See Fig. 7.5.) You attach the knapsack to the haversack in the following manner:

1. Pass the knapsack coupling through the couplings on the haversack. Draw the strap up snugly and buckle it.

2. Lengthen the haversack's suspender and pack straps. Pass the ends of the pack straps through the knapsack pack strap loops. If your clothing is not too bulky, you can pass the pack straps through the loops in the reinforcing strap across the rear of the knapsack before passing them through the knapsack pack strap loops.

3. Cross the straps behind the haversack.

4. Couple the pack strap snaps onto the haversack suspender "M" buckle.

5. Adjust the pack straps and haversack suspenders to fit. This pack will be more comfortable when it is riding high on your back, so adjust it accordingly.

6. Put on your belt and fasten the hooks.

E. Field Transport Pack (FTP). You use the field transport pack for traveling and for field exercises when slow movement is unimportant. It is your largest pack and consists of the transport pack with a long blanket roll attached. (See Fig. 7.6.) The long blanket roll is made this way:

1. Lay the shelter half out flat and with the tent peg loops down and away from you.

2. Fold your blanket(s) end to end. Lay the blanket(s) on the shelter half with the single fold along the edge of the shelter half which has the tent peg loops. The fold should be adjusted so that four to six inches of both edges of the shelter half are exposed.

3. Place the tent pole in the center of the blanket(s) a few inches above the near edge.

4. Place two pins and the guy line on line with the tent pole at an end of the blanket(s) near one of the triangular ends.

5. Place the remaining three pins on a line with the pole and at the other end of the blanket(s) so that they correspond to the two pins and guy line.

6. Now fold the triangular ends of the shelter half over the blanket(s) into the center.

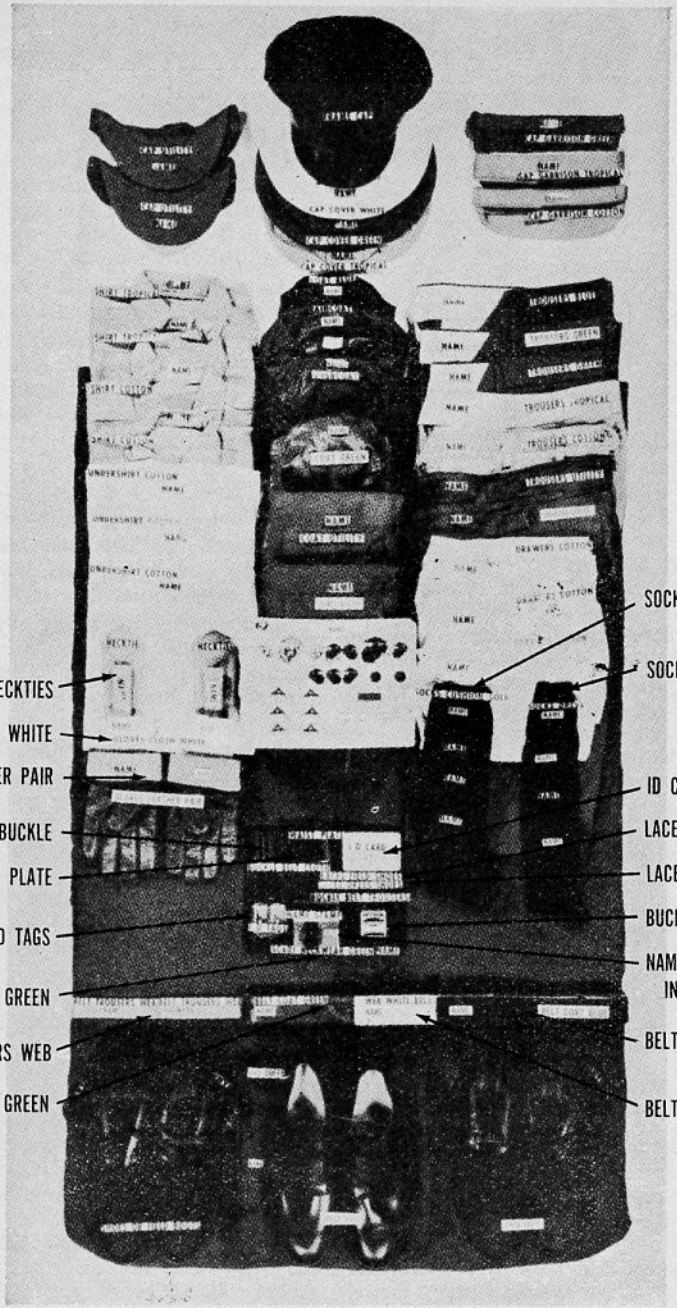
7. Begin to roll at the side, holding the pole, pins, and guy line. Roll toward the side of the shelter half containing the buttons. This long blanket roll, as well as the short blanket roll, can be assembled more easily if two men work together, so team up again for this job, if possible.

8. Bind the roll with the shelter tent straps and attach it to the transport pack. If you have only two blanket roll straps, they must be used in the knapsack blanket roll strap loops for this pack.

Marking Clothing

1. ***General***—The longest service of the various articles of the prescribed uniforms can be obtained only by proper care and maintenance. This information is presented in order that the useful life of uniforms and equipment may be prolonged and that each of you may follow the regulations set forth in the Marine Corps Manual for the marking of clothing.

2. No matter how well fitting a uniform is when new, it will not continue to look its best or keep its shape unless it is given proper care. Coats should be kept buttoned and large or heavy objects should never be carried in the pockets. Uniforms should always be kept on hangers when not in use. Paragraphs 49351 through 49366 MCM give specific instruction for removing certain stains and marks from the uniform.



7.7 Clothing on the bunk.

3. ***Marking of Uniforms and Clothing***—Every article of uniform clothing in the possession of enlisted men, except those issued on temporary memorandum receipt, shall be plainly and indelibly marked with the owner's name. Marks shall be of a size appropriate to the article of clothing and the space available for marking, and shall consist of block letters not more than one-half inch high. Marking machines, stencils, name tapes, or stamps, as appropriate, may be used. Tape shall be used only on gloves and socks. Names shall be marked in black on light-colored material and in white on dark-colored material. Except on utility shirts, marks should not be placed so that they show when the clothing is worn. There is no prerequisite that all clothing be marked in a standard manner, except for the following.

a. ***Bag, duffel:*** On the outside of the bottom of the bag.

b. ***Belts*** (except trouser belts): On the underside, near the buckle end.

c. ***Trouser, web belts:*** On one side only

d. ***Caps, frame:*** On the sweatband.

e. ***Caps, garrison and utility:*** On the inside.

f. ***Coats, overcoats and jackets:*** On the lining of the right sleeve, near the shoulder.

g. ***Cover, cap:*** Inside the band.

h. ***Drawers:***

1. On the plain waistband, near the front.
2. On the stretch-type, near the front, immediately below the waistband.

i. ***Gloves:*** Inside at the wrist.

j. ***Neckties:*** On the inside of the neckloop.

k. ***Raincoats and overcoat liners:*** Inside the neckband.

l. ***Scarf, neckwear, green:*** Near one end.

m. ***Shirts*** (except utility): Inside the neckband.

n. ***Shirts, utility:*** Outside, horizontally centered one-half inch above the pocket of the left breast.

o. ***Shoes and Boots:*** Inside near the top.

p. ***Socks:*** Near the top.

q. ***Trousers:*** Inside the waistband.

r. ***Undershirts:*** Near the neckband.

Clothing and Pack Display

Commanding officers are required by regulations to conduct frequent inspections of clothing and equipment. These inspections are for the purpose of determining the amount and condition of clothing and equipment in your possession. In order to facilitate these inspections certain standard regulations have been adopted by the Marine Corps.

The information to follow will outline the approved methods for displaying clothing and equipment for inspection.

The correct manner of laying out clothes for inspection on the bunk is shown in Fig. **7.7.**

An accepted arrangement of clothes in the locker is shown in Fig. **7.8.**

You are required to display your pack whenever your unit is transferred. Your commander wants to check your equipment in detail. The pack and its contents must be laid out, with every item in its proper place so that he can inspect it quickly. He checks to see that you have *all the prescribed equipment,* that you have *no one else's equipment,* and that *your equipment is in good condition.*

There are five kinds of pack displays, just as there are five kinds of packs. The layout pattern for these pack displays is very simple. The pattern is simply enlarged as equipment for the larger packs is added.

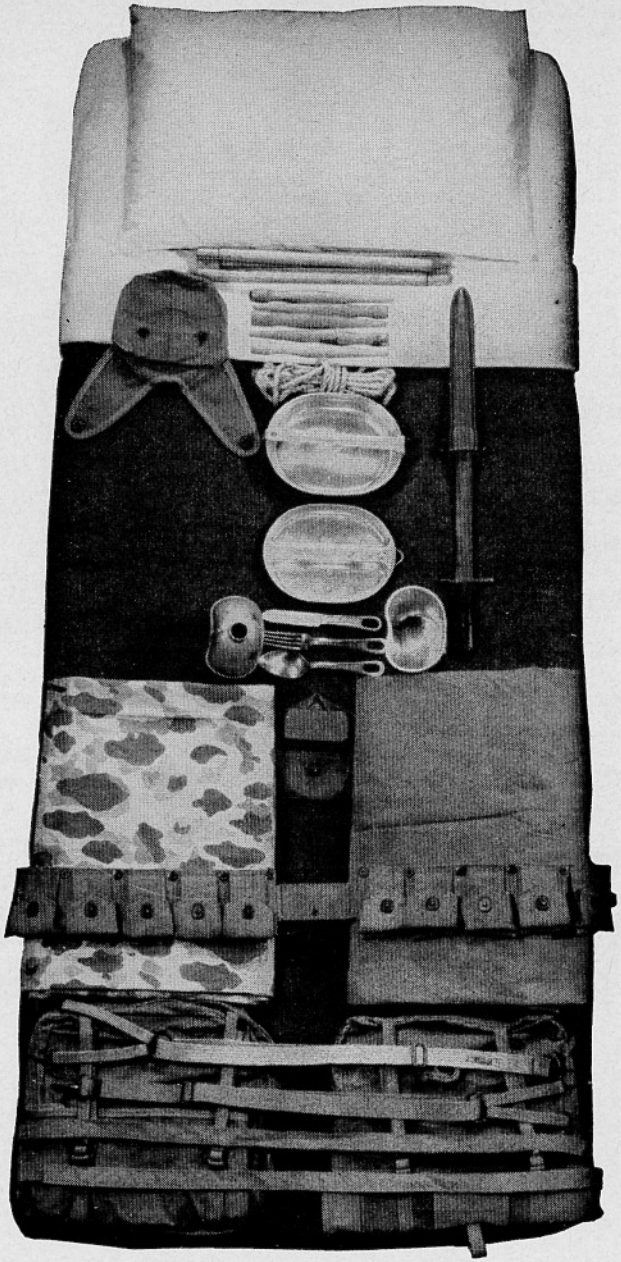
The five kinds of pack display are: equipment on the bunk; clothing and equipment on the bunk; field marching pack; field transport pack; and field transport pack, complete. They are shown in Figures **7.9** through **7.13.**

A. Equipment Display on the Bunk. (Fig. **7.9.**) This display can be made up rapidly. The arrangement of equipment such as mess gear and web equipment is simple. Notice particularly how the mess gear, bayonet, cartridge belt, first aid kit, tent poles, pegs, and rope are laid out. You use this same arrangement in the other pack displays.

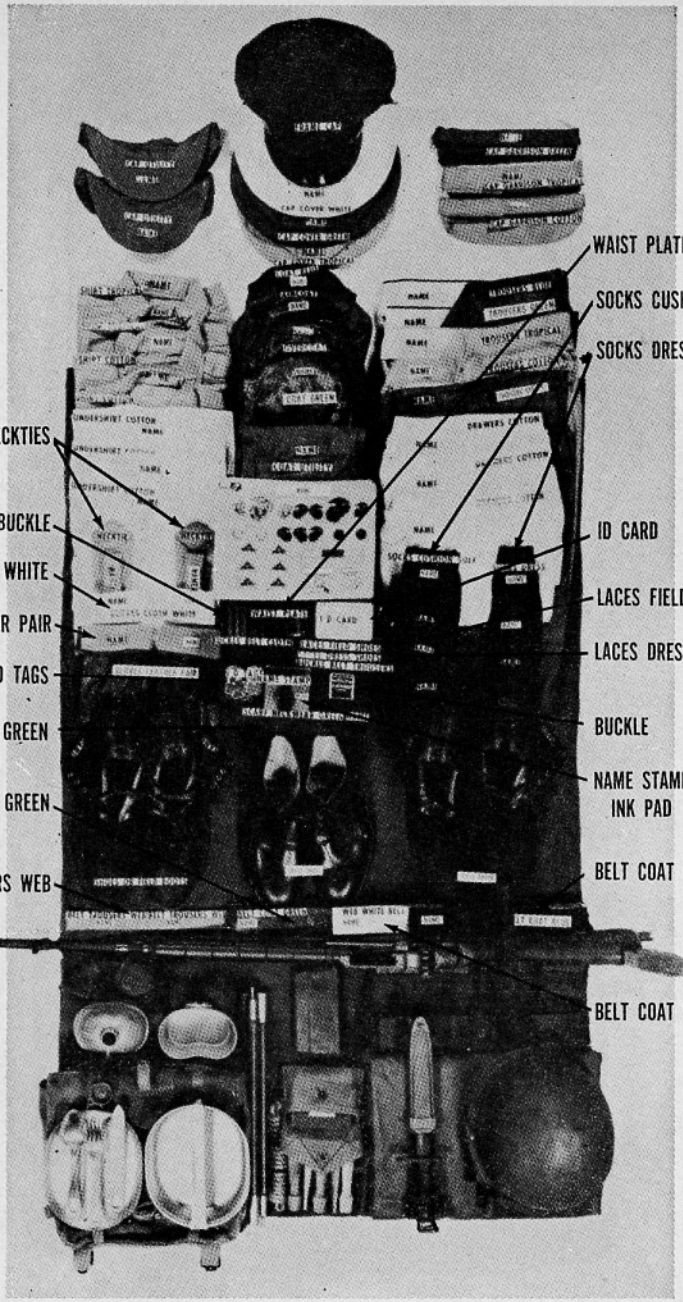
B. Clothing and Equipment Display on the Bunk. (Fig. **7.10.**) Notice the basic pattern for laying out the equipment. Also note how the basic pattern for clothing layout remains the same.



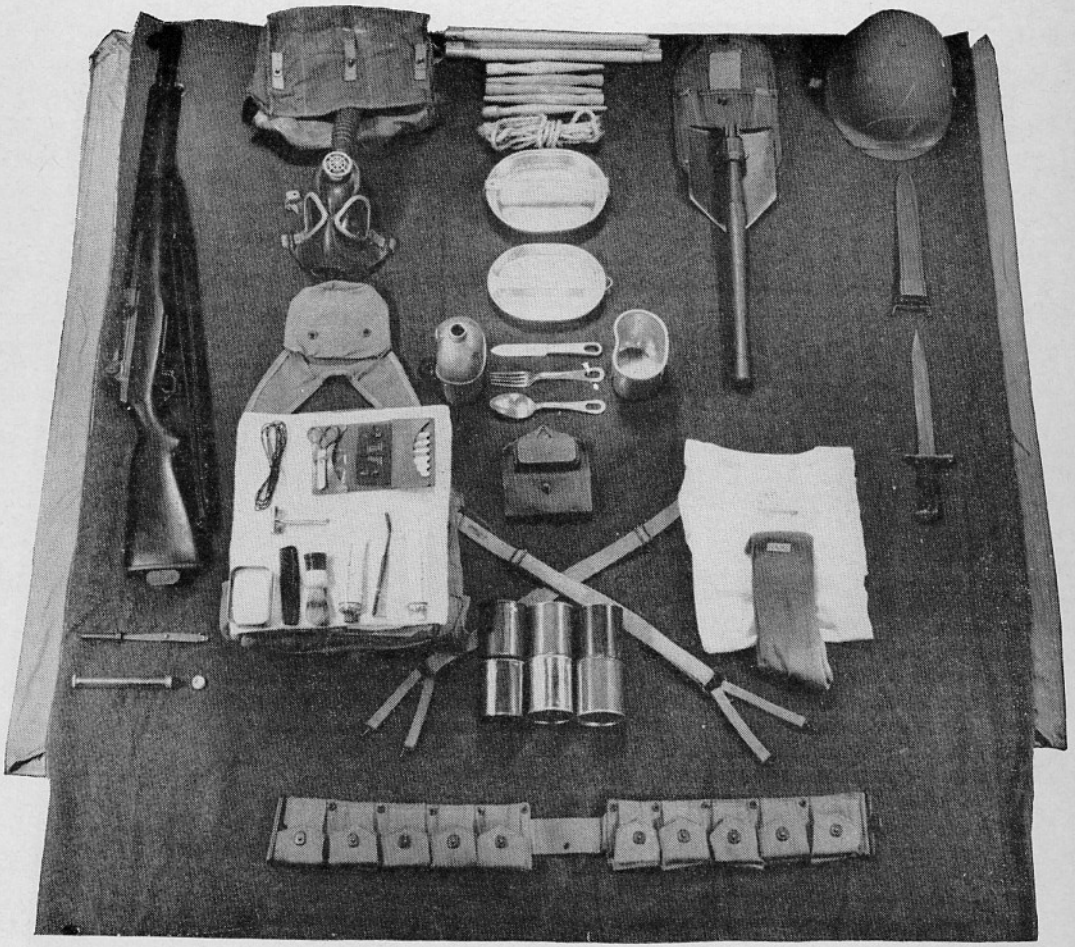
7.8 Wall locker display.



7.9 Equipment on the bunk.



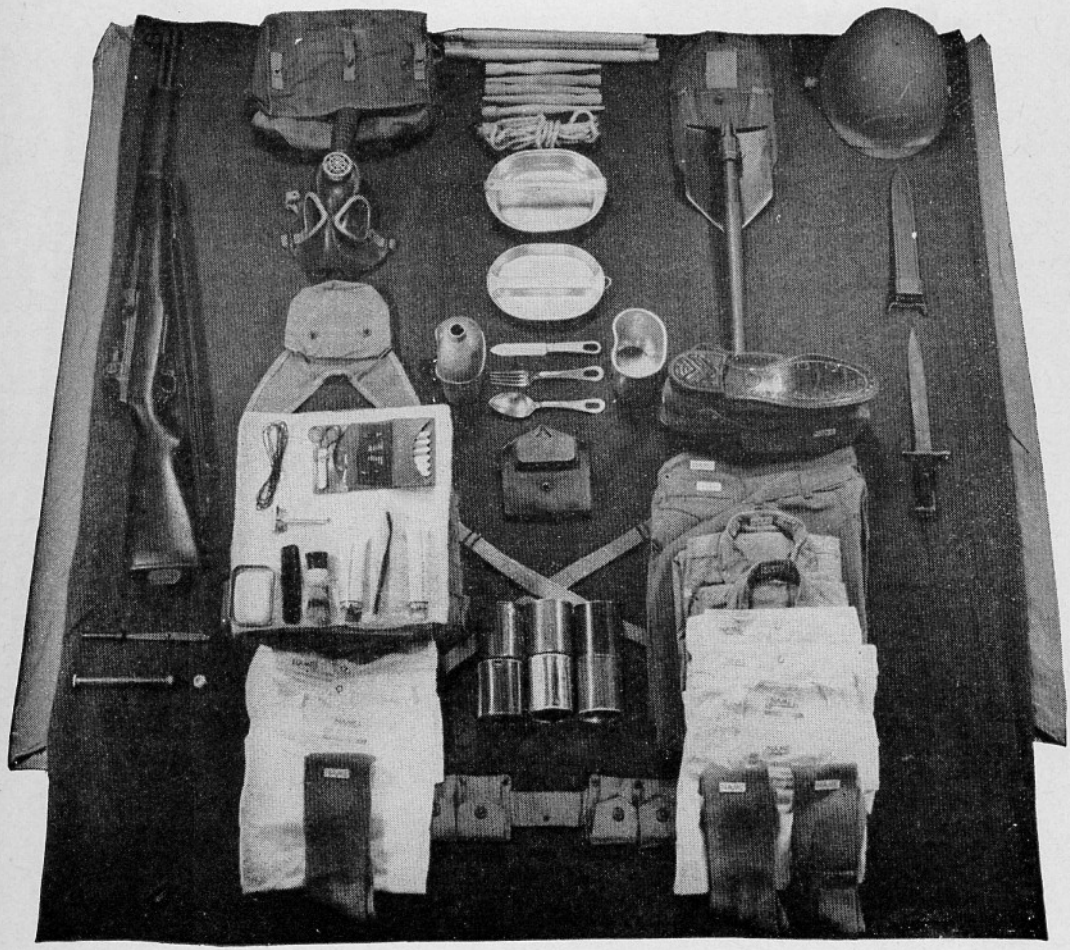
7.10 Equipment and clothing on the bunk.
(Grenadiers see figure 37.13, page 493)



7.11 Field marching pack.

Marked clothing is easily seen and is perfectly aligned and neat. The careful folding and positioning of each item can greatly improve the individual's display. The duffle (sea) bag, shelter half and poncho should be folded the width of the bunk and on top of one another from bottom to top in the order named.

C. Field Marching Pack Display. (Fig. **7.11.**)



7.12 Field transport pack.

You may not have been issued rations, gas masks, and entrenching tools. Notice, however, that the pattern of the display remains the same whether the extra gear is present or not.

D. Field Transport Pack Display. (Fig. **7.12.**) Notice that the blankets are folded in the same manner for the field transport pack as for the field marching pack.



7.13 Field transport pack, complete (pistol)

E. Display of Field Transport Pack, Complete. (Fig. *7.13.*) It is readily noticeable that this display is the same as the fourth display, with the exception that rations, gas masks, and entrenching tools, field glasses, compass, wire cutters, etc., are added to it. Personnel displaying gear in the field stand at attention behind the tent pole, facing their gear.



Chapter 8

First Aid

FIRST AID means the medical measures you can carry out for yourself or for your companions before emergency treatment can be given by a doctor or corpsman. The medical department has the finest equipment and its personnel has been trained in the most modern methods of saving life and easing pain. But the corpsmen can't be every place at once. There may be a time when you will have to depend on your own knowledge to save your own life or that of your buddy. You can save a life if you know what to do and what not to do, and if you act quickly and calmly. If you are injured, don't lose your head and just call for help. Apply first aid, and then seek medical help as soon as possible. The basic rules for first aid given in this chapter are to help you to help yourself and your friends when it is necessary.

You can't stop to give help in the heat of battle. If you stop to aid someone who is wounded, there are two of you out of the fight. By continuing to fight, you will make it possible for the corpsmen to advance with the troops and give emergency treatment. Always remember this when you are on the battlefield. Your first job is to fight.

You are issued a first aid kit containing a clean dressing which can protect and save life. Keep your first aid kit with you at *all* times.

Wounds are the most common conditions requiring first aid. Before you treat a wound you have to see all of it so that you can tell exactly where it is, how large it is, and how much it is bleeding. Usually it is better to cut or tear the clothing rather than to try removing it. Drawing the clothing over the wound increases the danger of infection. Moving the wounded parts may make the wound worse and cause needless pain. Look for the place where the bullet or other object that caused the wound came out because that wound may be larger than the entering one.

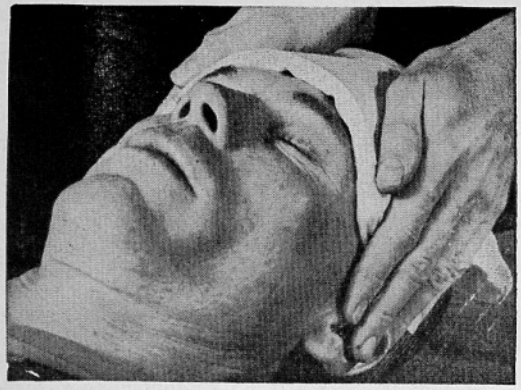
Three Steps for Saving Life

The three life-saver steps in first aid are: stop bleeding, protect the wound from infection, and prevent or treat shock. Every Marine should memorize these three steps and learn the simple methods for carrying them out. Prompt and correct first aid for wounds will not only speed healing, but will often save a life—*and that life may be yours!*

A. How to Stop Bleeding. The first thing to do for any wound is to stop bleeding because loss of too much blood causes death. Place an opened first aid dressing (see Fig. **8.1**) over the wound and press hard. (You'd better use the wounded man's dressing—you may need your own later on.)

If the wound is a large one, put on another dressing. Place your hands over both dressings and spread pressure over the entire wound. Wrap the bandage around the part and tie the ends so that the dressing is secure but not too tight. Bleeding may not stop the instant you apply pressure—so keep it firm and continuous until it does stop or you are sure it isn't going to stop.

If the wound is in the arm or leg and simple pressure does not stop the bleeding, raise the limb. If a wounded arm or leg is raised, the blood will not flow into the limb so fast and bleeding from the wound will be slowed. Of course, some blood will always flow through the limb so you will still have to use the bandage and pressure. The wounded man should lie down and the arm or leg be held as high as possible. If you think there is a broken bone, do not raise the arm or leg. Moving a fractured limb is painful, dangerous, and will increase the shock. If the bleeding does not slow down considerably in a few minutes, it is time to try something else—a tourniquet. However, *never* apply a tourniquet



8.1 Using pressure to stop bleeding.

until all other methods of stopping bleeding have failed.

When pressure and elevation fail to stop bleeding from a limb or, when blood is gushing from a wound, a tourniquet should be quickly applied. The tourniquet should always be placed above the wound but in case of bleeding just below the knee or elbow, it should be placed above these joints. Protect the skin by putting the tourniquet over the sleeve or trouser leg. Once the tourniquet is in place a tag should be attached to the man indicating at what time the tourniquet was applied. Modern evacuation techniques are rapid, therefore it should not be necessary for you to loosen a tourniquet. Only trained medical personnel should do this since the additional loss of blood from loosening the tourniquet may cause death. *Therefore,* NEVER LOOSEN A TOURNIQUET except in extreme emergency.

This is the way to make a tourniquet: (a) Make a loop around the limb with a strip of cloth, a belt, or some such item [see Fig. **8.2(1)**]. (b) Pass a stick, scabbard, or bayonet under the loop [See Fig. **8.2(2)**]. (c) Tighten the loop just enough to stop bleeding [see Fig. **8.2(3)**]. (d) Bind free end to limb in order to keep tourniquet from unwinding [see Fig. **8.2(4)**].

B. How to Protect the Wound. The first aid bandage protects wounds from the outside. It keeps dirt and germs out. It protects wounds from further injury (Figs. **8.3** and **8.4**).

When you place this bandage on a wound, take care that you keep the side that goes next to the wound clean, as shown.

C. How to Prevent Shock. Shock is a condition of great weakness of the body, and can result in death. It may accompany any kind of wound. The worse the wound the more likely it is that shock will develop. Severe bleeding causes shock. A person in shock may tremble and appear nervous; he may be very pale, wet with sweat, and may completely lose consciousness.

Shock may not appear for some time after an injury. *Treat every wounded man for shock before he has a chance to get it.*

Make the man comfortable. Take off his pack and anything else he is carrying. Loosen his belt and clothes. Handle him very gently. Do not move him more than absolutely necessary. If he is lying in a doubled up position, make sure no bones are broken before you straighten him out.

Lower his head and shoulders to increase the flow of blood to the brain. If the ground slants, turn him gently so that his feet are uphill and his head downhill. If he is unconscious, place him face down with his head turned to one side in case he should vomit. Keep the man warm with a blanket or coat. Place something under him to protect him.

Morphine will help prevent shock. Just lay him face down. But if the man is unconscious, or has a head wound, *don't give morphine.*

Special First Aid Measures

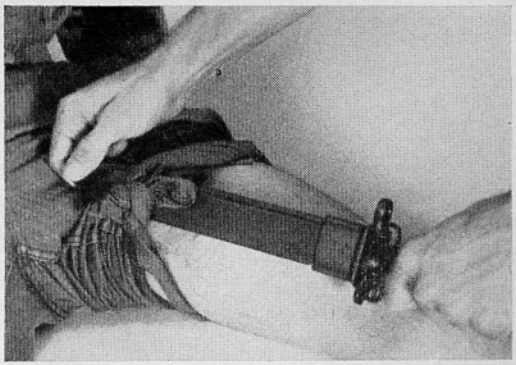
The three life-saving rules, which you have just learned, apply to the treatment of all wounds. However, there are certain types of injuries which require special first aid measures. These are chest wounds, belly wounds, jaw and face wounds, burns, and fractures (broken bones).

A. Chest Wounds. Chest wounds through which air is sucking in and blowing out are particularly dangerous. The chest wound itself isn't as dangerous as the air which goes through it into the chest cavity. This air squeezes and compresses the lung, and prevents proper breathing.

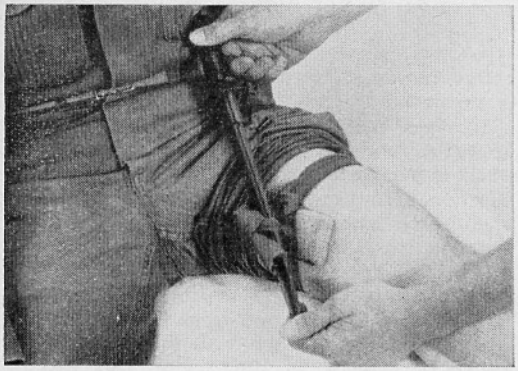
The life of the man may depend upon quickly making the wound air-tight. Apply a dressing which is large enough to cover the wound and to stop the flow of air. Pack the dressing firmly over the wound. Cover the dressing with a large piece of raincoat or other material to help make the wound air-tight. Bind this covering securely with belts or even strips of torn clothing. Encourage the man to lie on his injured side. If he



8.2(1) Make loop around limb.



8.2(2) Pass stick or scabbard under loop.



8.2(3) Tighten loop until bleeding stops.



8.2(4) Bind the end to prevent unwinding.

wishes, let him sit up. This may ease his breathing.

B. Belly Wounds. Cover the wound with a sterile dressing and fasten securely. Treat the victim for shock.

Don't try to replace any organs protruding from a belly. If you do you will cause infection and severe shock.

Don't give (or take) food or water. Anything taken by mouth will pass out from the intestine and spread germs through the belly.

C. Jaw Wounds. Wounds of the face and neck need special treatment to avoid choking on blood. Bleeding from the face and the neck is usually severe because of the many blood vessels. First, stop the bleeding by exerting pressure with a sterile dressing. Then bind the bandage so as to protect the wound. If the jaw is broken, tie the bandage around it and up over the head so as to give support (see Fig. **8.5**). Make sure you don't prevent the blood from draining out of the mouth.

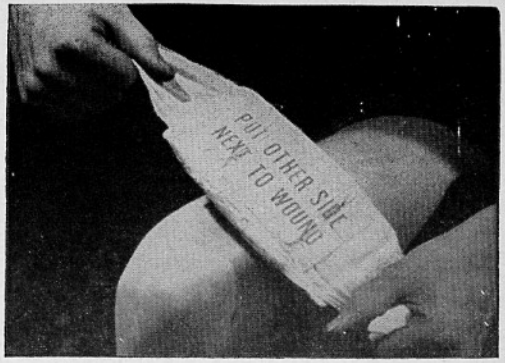
To prevent choking on blood, the man may sit up with his head held forward and down, or he may lie face down. These positions will allow the blood to drain out of his mouth instead of going down his windpipe. Also treat for shock.

D. Burns. Severe burns are just as likely to cause shock as any other severe wound. There is also a great danger of infection. Do not pull clothes away from the burned area; instead, cut or tear the clothes and gently lift them off. Do not try to remove pieces of cloth that stick to the skin. If a motor vehicle kit containing burn ointment is available, apply ointment to the burn. Carefully cover the burned area with sterile dressings. Never break blisters or touch the burn.

It is especially important to treat for shock. The victim should drink lots of water because burns cause a great loss of body fluids. There is



8.3 To open bandage, grasp the ends and pull. Do not touch sterile underside.



8.4 Notice the printing which tells you the side to put next to the wound.

also a great loss of body salts. Therefore, if possible, add two salt tablets or a ¼ teaspoonful of loose salt to each canteenful of water. Three or more canteensful should be drunk in 24 hours.

E. Fractures. A fracture is a broken bone. These are the signs of a broken bone: (a) Tenderness over the injury with pain on movement. (b) Inability to move injured part. (c) Unnatural shape (deformity). (d) Swelling and discoloration.

A fracture may or may not have all these signs. If you aren't sure, give the wounded man the benefit of the doubt and treat the injury as a fracture.

There are two kinds of fractures: (a) A simple break in the bone (see Fig. **8.6**) and (b) a broken bone with a wound from the outside (see Fig. **8.7**). The second type, compound fracture, can be caused by a broken bone piercing the skin or by a bullet which pierces the flesh and breaks the bone.

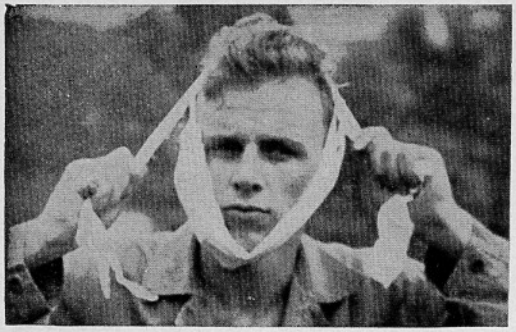
Fractures usually require splinting. Fixing the fragments of a broken bone by means of splints prevents the jagged edges of the bone from tearing blood vessels and nerves. In simple fractures (one in which there is no communication between the outside of the skin and the fracture) proper application of a splint will prevent the bone from piercing the skin, which would make it a compound fracture. If the fracture is compound, splinting will prevent further injury to the wound and the introduction of more infection. In addition, proper splinting greatly relieves the pain of a fracture and will reduce and sometimes actually prevent shock. Remember, all fractures of long bones should be splinted "where they lie" before movement or transportation of any kind is attempted.

Standard leg and arm splints are the most desirable forms of splints when available and when trained personnel is available for their application. However, first aid in the field may require the improvisation of splints from any material that is handy. The following paragraphs tell how to improvise when it is necessary. Fig. **8.8** shows how various broken bones are splinted.

1. Be Careful. If you think a person has a broken bone, handle him with the greatest care. Rough or careless handling causes pain and increases the likelihood of shock. Furthermore the cracked ends of the bone are razor-sharp and can cut through muscle, blood vessels, nerves, and skin. So, don't move a man with a fracture unless you have to. If you must, be gentle and keep the fractured part from moving. *If there is a wound with a fracture, treat it as any other wound by applying a clean dressing.*

2. Broken Leg or Hip. The quickest way to splint a broken leg is to tie it to the uninjured leg. Tie the legs together at least in two places above and below the break. You can use a belt, cartridge belt, strips of cloth, or handkerchiefs tied together. Don't move a man with a broken leg unless it is necessary to get him off a road or away from enemy fire. If you must move him, tie his legs together first. Then, grasp him by the shoulders and pull him in a straight line. Do not roll him or move him sideways.

3. Splints for Broken Leg, Thigh, or Hip. If you have time, you can make a good splint for the lower limb by using two long sticks or poles. Roll the sticks into a folded blanket from both



8.5 Binding a jaw wound.

sides. This forms a trough in which the leg rests. Bind the splints firmly at several places. For fractures of the leg, splints should extend from a point above the knee to a little below the foot. If the thigh or hip is broken, the inside splint should extend to the crotch and the outside splint should extend to the armpit. Always be sure that the ends of the sticks are well padded.

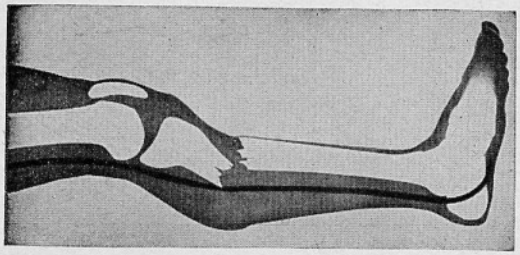
4. To Support an Injured Arm or Shoulder. A sling is the quickest way to support a fractured arm or shoulder, a sprained arm, or an arm with a painful injury. (See Fig. **8.9**.)

5. Splint for Broken Arm. When possible, keep a broken arm from moving by support with splints. Temporary splints are made from boards, branches, bayonets, scabbards, and so on. Splints should always be padded with some soft material to protect the limb from pressure and rubbing. Bind splints securely at several places above and below the fracture but not so tightly as to stop the flow of blood. It is well to apply two splints, one on either side of the limb. If the injured elbow is bent, do not try to straighten it; if straight do not bend it (see Fig. **8.8**).

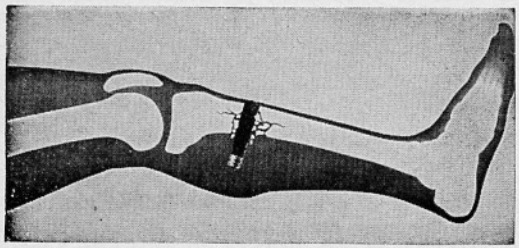
6. Broken Back. It is often impossible to be sure a man has a broken back. Be suspicious of any back injury, especially if the back has been sharply struck or bent, or the person has fallen. The sharp bone fragments will cut the spinal cord if they are moved. This would cause permanent paralysis of the body and legs. (See Fig. **8.10**.)

For a broken back, don't move the victim unless absolutely necessary. Don't raise his head. Don't twist his neck or back.

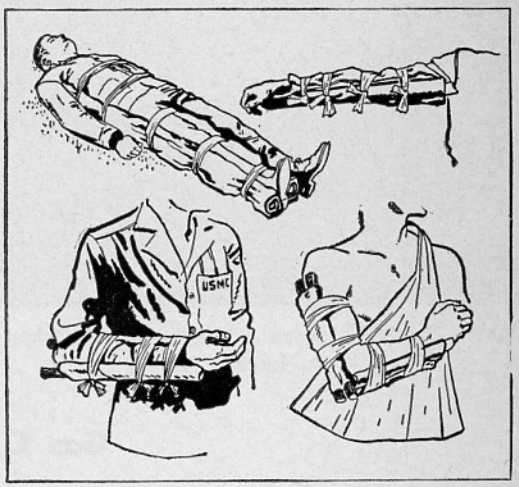
7. Broken Neck. Handling a broken neck is extremely dangerous. Bone fragments may cut the spinal cord just as in a broken back. *Keep*



8.6 Simple fracture.



8.7 Compound fracture.



8.8 Upper left, splint for broken leg or thigh; upper right, splint for arm fracture where elbow can't be bent; lower left, splint for fracture of lower arm; lower right, splint for fracture of upper arm.



8.9 Several ways to make a sling.

the head straight and still. Moving may cause death. Keep the head and neck motionless by placing large stones or packs on each side of the head to support it. Place a rolled blanket around head and neck for support and padding but do *not* place anything *UNDER* his neck (Fig. **8.11**). If he must be moved, get help. One person supports the man's head and keeps it straight while others lift him. Put him on a hard stretcher or board. Keep him face up.



8.10 Do NOT move a man with a broken back.



8.11 Protection for broken neck.

Gas Casualties

You are provided with equipment with which you can protect yourself against poisonous gas. You are issued a gas mask, Protective Ointment M-5 for the skin, and BAL Eye Ointment for the eyes. When considered necessary, you may also be issued protective clothing, protective covers, eye shields, and a protective material to put on your shoes. In addition to knowing how to use these *protective measures* you must know the proper *first aid measures.*

A. Blister Gas. If a liquid blister gas, such as liquid mustard, gets on the skin, blot off the

liquid with the gauze which comes with each tube of protective ointment. Do not rub the mustard into your skin or spread it. Discard the gauze. Next apply some protective ointment over the area and rub it into your skin. Wipe off the excess with clean gauze. Apply some fresh ointment and allow it to remain. This must be done within a few minutes after exposure, the sooner the better.

If a liquid blister gas gets in your eye, apply some BAL Eye Ointment inside the lower lid. Close your eye and rub for one minute. Then flush your eye with water from the canteen for at least 30 seconds. If your eye cannot be opened, apply some ointment to the edge of the lower lid and rub it in. Some will get underneath the lid. When the eye can be opened, apply the BAL Eye Ointment and water as usual.

If you are caught in an emergency without protective clothing, Protective Ointment M-5 may be applied to all parts of the body, especially the areas sensitive to mustard vapor such as the genital organs, groin and armpits. Take care that you keep Protective Ointment M-5 away from your eyes.

B. Choking Gases. If you are exposed to a choking gas such as chloropicrin or phosgene, put on your gas mask at once. These gases cause crying, choking, coughing, and a tight feeling in the chest. As long as symptoms last, rest and keep warm. Don't smoke.

C. Blood and Nerve Poisons. Put on your gas mask at once. Otherwise, severe symptoms like convulsions and paralysis may develop. If breathing stops, give artificial respiration.

D. Amyl Nitrite. Amyl nitrite is given to counteract the effects of blood gases. Crush two amyl nitrite ampoules (supplied in gas casualty kits). Place them inside the victim's gas mask. Repeat three times at intervals of three or four minutes.

E. Tear Gases. The effects of tear gas are temporary and disappear when fresh air is reached, or when the gas mask is put on and kept on.

F. Vomiting Gases. The sneezing, nausea, and vomiting caused by these gases are not dangerous. Put on your gas mask. If you have to vomit, pull the gas mask away from your chin, vomit, then replace the mask immediately. Inhaling chloroform (supplied in gas casualty kits) relieves symptoms.

G. White Phosphorus. Burning pieces of phosphorus on the skin should be immediately extinguished by water from the canteen. To prevent further burning, wet a *copper sulphate pad* with water and apply to the phosphorus. Remove particles of phosphorus by gentle rubbing with the pad.

Common Emergencies

In addition to the first-aid kit which every Marine carries, special first-aid kits are often available. These are for use in common emergencies like small burns, cuts, and eye injuries. First-aid kits supplied in many motor vehicles contain tourniquets, iodine swabs, adhesive plaster, burn ointment, eye ointment, and dressings of several sizes. Learn to use them. Directions are included with each kit.

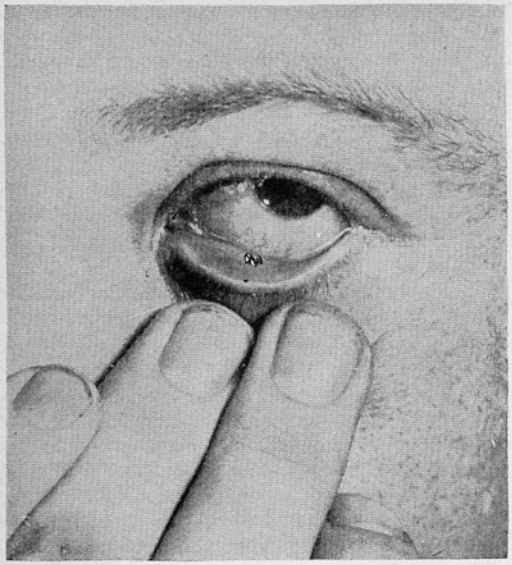
A. Minor Wounds and Burns. Small wounds, such as cuts, usually do not bleed very much, and will stop bleeding once a dressing has been applied. Infection is the principal danger and any break in the skin should be protected. Do not touch a wound with the fingers or allow clothes to touch it. Keep it clean.

Apply a dressing over the wound. There are various sized dressings in the motor vehicle and other first-aid kits. Pick out a size which is large enough to cover the wound adequately. Be careful not to touch the inside of the dressing with the fingers.

Small burns are a frequent accident and, unless properly protected, they may become infected. Burns may be caused by dry heat, hot liquids, chemicals, or electricity. Severe sunburn requires similar first-aid measures. If a first-aid kit containing burn ointment is available, apply ointment over the burn, using the wooden applicator. Cover the burned area with a dressing of suitable size. If no ointment is available, at least cover the burn with the dressing from your first-aid kit.

B. Foreign Body in Eye. If a particle gets in your eye, do not rub the eye. Close it for a few minutes and tears may wash away the object. If not, have someone treat the eye as shown in Figs. **8.13** and **8.14**.

C. Foreign Bodies in Ear, Nose, and Throat. Never probe into the ear with a pin, wire, or stick if an object is in the ear. Let the medical



8.13 To remove object from lower lid or eyeball, have someone pull down lower lid and remove object with clean handkerchief.

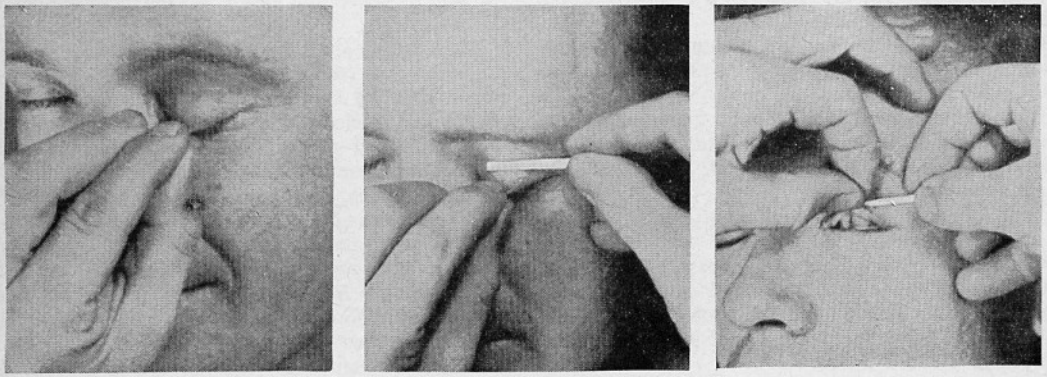
officer get it out. An insect in the ear may be killed with a few drops of oil or water. Other objects also may be flushed out this way. However, if the object is something which swells when wet (such as a bean), do not put water into the ear.

Probing into the nose will merely jam the foreign body tighter. Try to loosen it by gently blowing the nose. If this doesn't work, wait until you see a medical officer. Objects in the nose are usually not dangerous.

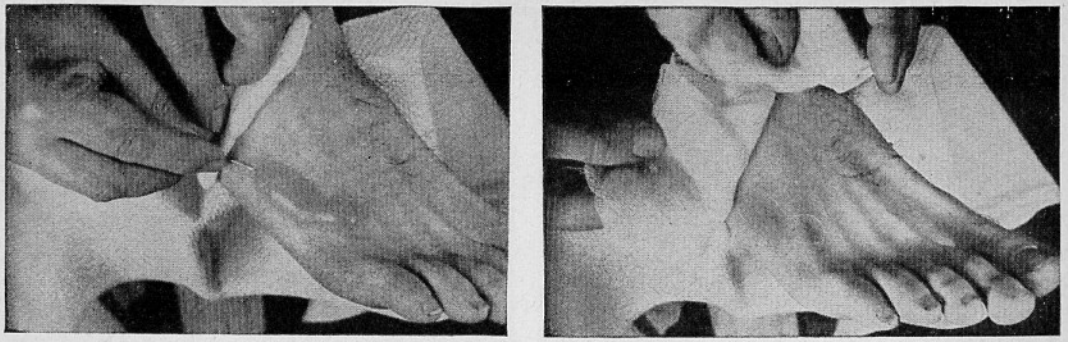
If a foreign body in the throat can be reached with the finger, it may be picked out. Hold your head down when you do this. Be careful not to push the object down farther.

D. Care of the Feet. Marines have to use their feet constantly. Prevention of foot trouble is the best first aid for feet. Keep feet clean. Drying the feet thoroughly after bathing, especially between the toes, helps prevent athlete's foot. For itching or redness between the toes, apply GI foot powder twice daily. If it does not improve, see your medical officer. Don't try to treat it yourself. Don't cut a callous or corn unless you want to risk a serious infection. Report to your medical officer instead. To avoid ingrown toenails, keep toenails clean and short, and cut them straight across.

Dust feet with GI foot powder after bathing and before a march. Foot powder absorbs perspiration and prevents chafing. Put on clean socks every day if possible. Don't wear socks that have holes, are poorly darned, or don't fit properly. Break in shoes before wearing them on a march. If a blister develops and a medical officer is not available use the treatment shown in Fig. **8.15**.



8.14 To remove foreign body from upper lid, have someone pull down upper lid, as in left picture. Next, have him place matchstick on upper lid, as shown in the middle. Then roll upper lid back, as shown at right, while another person removes the object with a clean handkerchief.



8.15 Open blister at the edge with a sterile needle, as shown at left. Opening must be large enough to allow the fluid to escape. Leave loose skin on as a cover. Then apply a sterile gauze pad, as shown at right.

E. Snake-Bite. Poisonous snake-bites must be given immediate attention. The person who is bitten should remain as quiet as possible and not walk or run about. If possible, kill and keep the snake so that it can be identified and proper medicine given by a medical officer. However, giving first aid immediately is the most important thing to do.

If the bite is on arm or leg, improvise a tourniquet and apply it about two inches above the bite. The tourniquet must be tight enough to stop the flow of blood returning to the heart.

Next, make a cross-cut over *each* fang mark long enough and deep enough to allow free bleeding—about ¼ inch long and ¼ inch deep. Suck the poison from the wound, spitting it out frequently. Snake poison is harmless in the mouth unless there are cuts. Suction should be kept on the wound for at least one hour, but remember to loosen the tourniquet every 20 minutes for a few seconds to allow fresh blood to flow to all parts of the injured member. A snake-bite victim can do all these things for himself.

If the bite is on a part of the body where it is impossible to apply a tourniquet, make the cross incisions and apply suction just the same. After giving first aid, secure medical help as soon as possible.

F. Poison Plants. Poison ivy, poison oak, and poison sumac cause skin irritation. The faster you give first aid after exposure, the milder the effects will be. Learn to recognize the plants so you will know when you have touched them and can start first aid before a rash appears. Poison ivy is a creeper having three leaves on each stem. The leaves are shiny, pointed, and have prominent veins. Poison oak and poison sumac are shrubs or small trees. If you discover that you have been exposed to a poison plant, wash parts of the body affected promptly and thoroughly, using water and strong soap. GI soap is very good. The rash starts with redness and intense itching. Later little blisters appear. If a rash has already developed do not wash it. Avoid scratching, for it will make the condition worse. Seek medical attention.

G. Unconsciousness. It is often impossible to find the cause of unconsciousness. Bleeding, heat stroke, or head injury may have been the cause. If you can't find the cause, keep the victim lying down. Do not move him unless absolutely necessary, and then do so very carefully. If he is cold, get him warm. If he has suffered the effects of excessive heat, give him first aid accordingly. Do not pour liquids into the mouth of an unconscious person. If you do, you may choke him. Take off his equipment. Loosen his clothing. Get a medical officer.

If the man has merely fainted, he will regain consciousness in a few minutes. Let him lie quietly. Loosen his clothing. Apply a wet, cold cloth to his face. If he is about to faint or has actually fainted while sitting up, lower his head between his knees so that the blood may flow to his head. Hold him carefully so that he does not fall and injure himself.



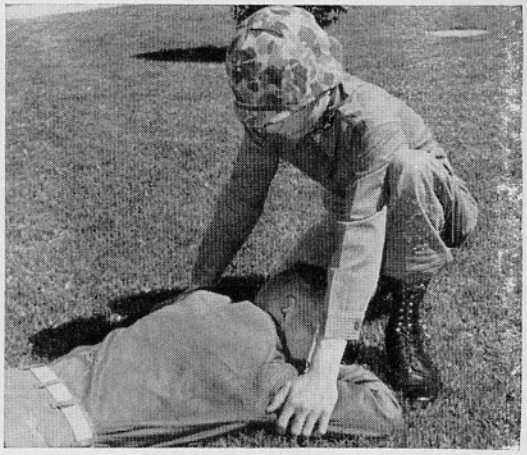
8.16 First step.



8.17 Second step.



8.18 Third step.



8.19 Fouth step.

Effects of Heat

1. This chart will help to distinguish between sunstroke and heat exhaustion:

Sunstroke and Heat Stroke

CAUSE: Exposure to heat, particularly the sun's rays.

SYMPTOMS: Headache, red face, skin hot and dry, no sweating, pulse strong and rapid, very high temperature, usually unconscious.

TREATMENT: Call a doctor, cool body with bath or cold applications, patient lies with head elevated, no stimulants.

Heat Exhaustion

CAUSE: Exposure to heat, either sun's rays or indoors.

SYMPTOMS: Pale face, skin moist and cool, sweating profuse, pulse weak, temperature low, patients often faint but seldom remain unconscious for more than a few minutes.

TREATMENT: Keep head level or low. Give salt. Coffee or tea may help. External heat needed in severe cases.

Heat Cramps

The cramps occur usually in the abdominal muscles or in the limbs. They are extremely painful, and may or may not be accompanied by the symptoms of heat exhaustion. First aid is the same as for heat exhaustion. Give the patient salt (a teaspoonful to a pint of water) in small drinks at frequent intervals. Firm hand pressure applied to the muscles of the limbs will often relieve the cramps.

Effects of Cold

(See Chapter 21 Cold Weather Indoctrination and Training)

Artificial Respiration

A. Drowning. Always try to revive a person who seems to be drowned. Start artificial respiration immediately. Raise his hips in order to allow water in the air passage to drain out. Then lay the person face down. Force his mouth open, pull his tongue forward, and remove false teeth or debris from mouth and throat. His elbows should be bent upward with hands resting one upon the other; his face turned to one side, a cheek resting upon the top hand, with mouth at a downward angle to allow fluid to run off.

1. First Step. (See Fig. **8.16**.) Kneel facing the patient's head, and place your hands on the patient's back. The thumbs should just touch, and the heels of the hands should be just below a line running between the armpits.

2. Second Step. (See Figure **8.17**.) In the compression stage, rock slowly forward until your arms are approximately vertical. This allows the weight of the upper part of your body to exert slow even pressure downward and pushes the air out of the patient's lungs.

3. Third Step. (See Figure **8.18**.) In the lung-filling stage you should release the pressure, taking care to avoid a final thrust. Rock back slowly, sliding your hands to the patient's arms just above the elbows. Continuing to rock backward, raise the arms until resistance and tension are felt at the patient's shoulders.

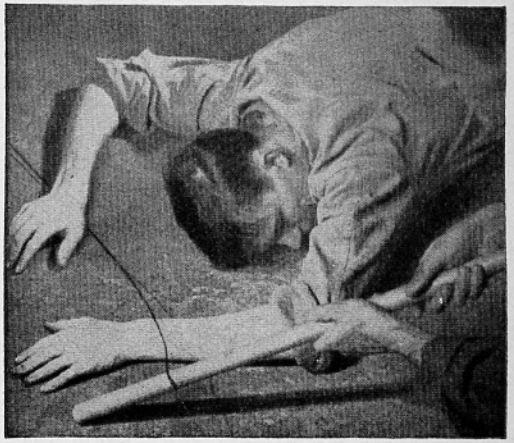
4. Fourth Step. (See Figure **8.19**.) In the final step, gently lower the arms to the ground, and the cycle is completed. The full cycle is repeated 10-12 times a minute. Keep up artificial respiration for two hours or longer without stopping, unless the victim begins to breathe normally. You will not get tired so quickly if you take turns with another person. Do not break rhythm in changing. Wrap the victim in a blanket. When he is conscious, give him a warm drink such as coffee or tea.

B. Electric Shock. Electric shock is a frequent accident resulting from contact with a "live" wire. Being struck by lightning is not so common. If a person has come in contact with an electric current, turn off the switch if it is nearby, but do not waste time looking for it.

Use a dry wooden pole, dry clothing, dry rope, or some other material which will not conduct electricity, to remove the person from the wire. If a pole is not handy, simply drag him off the wire by means of a loop of dry cloth. Don't touch the wire or the man with your bare hand or you will get a shock, too. (See Fig. **8.20.**)

Electric shock causes breathing to cease, so start artificial respiration immediately and keep it up for not less than two hours just as you do for drowning.

C. Carbon Monoxide Poisoning. Carbon monoxide poisoning gas has no odor and kills without warning. Poisoning from this gas occurs most often from breathing motor vehicle exhaust gas. This happens frequently from running an



8.20 Removing electric shock victim.

engine with the garage doors closed. It happens from sitting in a vehicle with the windows closed and the motor running, especially when the exhaust becomes clogged, with snow for example. The same gas is formed by stoves in poorly ventilated shelters, where it is equally dangerous.

If a person is overcome with carbon monoxide, get him into fresh air. Start artificial respiration immediately. Keep him quiet.

Carbon monoxide poisoning is inexcusable. It results from carelessness.

Transportation of the Sick and Wounded

Knowing how to move seriously injured persons is one of the most important parts of first aid. Careless or rough handling not only may increase the seriousness of an injury, but may even result in death. Unless there is a good reason for moving an injured person immediately, do *not* transport him until a litter or ambulance is available. Sometimes when the situation is urgent and you know that no medical facilities are available you will have to move the victim yourself. That is why you ought to know the different ways of carrying casualties. Always give necessary first aid before attempting to move a man who is wounded.

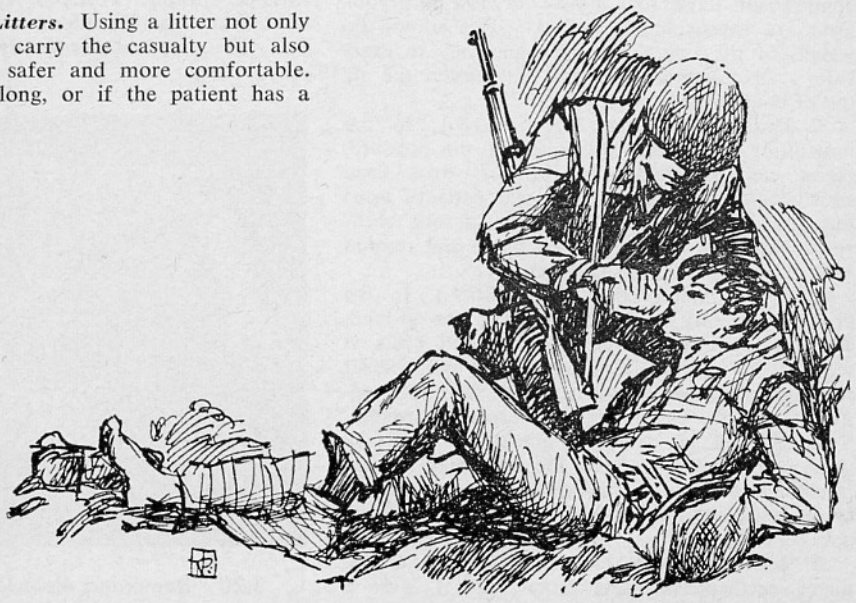
If the casualty has a broken bone, never attempt to move him until you have splinted it.

A. Improvised Litters. Using a litter not only makes it easier to carry the casualty but also makes the journey safer and more comfortable. If the distance is long, or if the patient has a fractured leg, hip, back, neck, or skull, he must not be moved except on a litter. A litter can be improvised from many different things.

A blanket, shelter half, tarpaulin, or other material may be used for the litter bed. The poles may be made from strong branches, tent poles, rifles, skis, and the like.

B. Carries. There are several ways by which a casualty may be moved without using a litter. Use the carry which is easiest for you and which is best fitted for the situation.

The following figures illustrate some common carries.





8.22 Poncho Drag.



8.23(1) Fireman's carry, first step



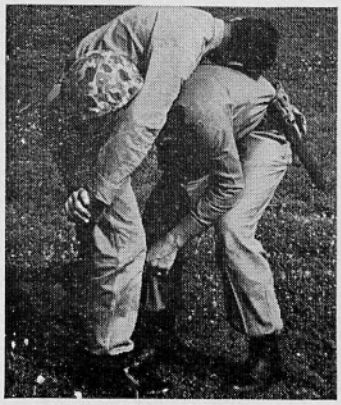
8.23(2) Second step.



8.23(3) Third step.



8.23(4) Fourth step.



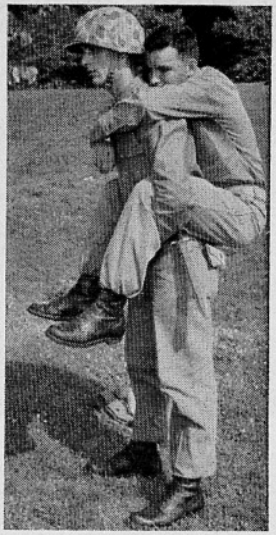
8.23(5) Fifth step.



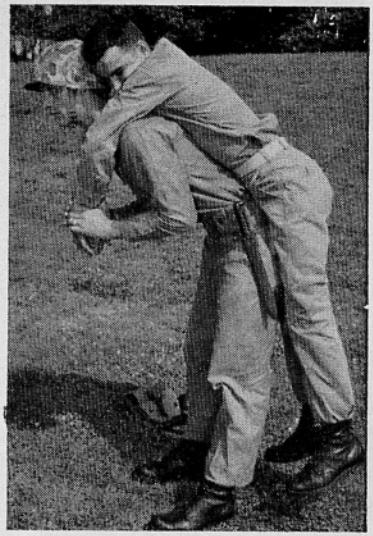
8.23(5) Sixth step.



8.24(1) Arms carry.



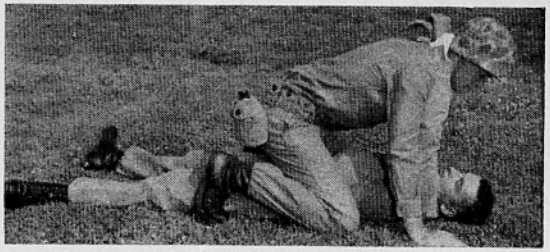
8.24(2) Saddleback carry.



8.24(3) Pack strap carry.



8.24(6) Chair carry.



8.24(5) The fireman's drag.



8.24(4) The back lift.



8.25(1) Link two pistol belts together in continuous belt. Place it under man's thighs and hips so that loop extends from each side. Lie between man's outstretched legs, thrusting arms through belt loops. Grasp his right hand with your left hand.



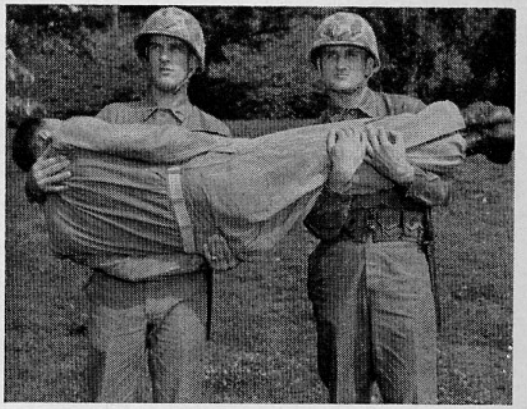
8.25(2) Roll toward side, turning your face downward, carrying wounded man onto your back. Adjust the slings.



8.25(3) First rise to knees, then stand, as shown. This carry leaves you hand free to help you over obstacles.



8.26(1) Supporting carry.



8.26(2) Arms carry.



Hygiene and Sanitation

WHEN a unit suffers a breakdown in sanitation it is because a number of individuals become careless. As a result of this carelessness more and more men are stricken by disease. The fighting efficiency of the organization falls off, its members are less alert, and you may lose your life because of it. Disease and sickness are allies of your enemy.

The rules of sanitation and hygiene are simple, but this does not mean that they can be overlooked. By following them carefully you will help your outfit to win.

General Sanitation Measures

There are general rules of sanitation which you need to know wherever you go as a Marine. These are:

1. An unclean body may be the cause of disease. Take a bath at frequent, regular intervals, and at least twice a week. Pay particular attention to armpits, the part between the legs, the feet, and under the foreskin.

2. Always wash your hands thoroughtly before eating and after using the toilet, as you may have some disease germs on your hands which will get on the food you eat and into your system. You are especially likely to get such germs on your hands when going to the toilet.

3. If bathing facilities are not available, scrub your body frequently with a wet cloth, paying particular attention to your armpits, crotch, and feet.

4. Have your underwear, shirts, and socks washed frequently and change them at least twice a week. If water is not available crumple up your clothing, shake it well, and hang it in the sunlight for at least two hours.

5. Be on the lookout for body lice and crab lice. If you have a continued itching on your body or head, report to a medical officer at once.

6. When your clothing or shoes get wet, change them as soon as possible. Sitting around in wet clothes or with wet feet is almost certain to give you a cold or other serious illness.

7. Keep your mouth clean by thoroughly brushing your teeth at least twice a day; one brushing should always be before going to bed. Brush your teeth on the inside and outside, away from the gums and toward the cutting surfaces of the teeth. If particles of food remain between the teeth, they should be promptly removed, care being taken not to injure the gums. If your teeth are bad, or ache, report to the dental officer.

8. Get into the habit of having your bowels move regularly once each day at as nearly the same time as possible. Always go to the toilet to urinate, or to move your bowels. Using the ground for this purpose is a source of great danger to everyone. Flies or other insects may alight where you have relieved yourself, pick up germs, and later deposit them on food. These germs may also be carried by rain or drainage into wells or a stream which serves as a water supply for some city or your own camp or post.

9. Drink plenty of water at intervals during the day but do not drink a large amount at one time, especially when you are over-heated after exertion.

10. Drink from your own glass or cup, or from a bubbling fountain. Never use a cup which is used by others, as someone may have left live germs on it from his mouth or hands, and you may catch a disease when drinking from it. For the same reason do not exchange pipes, cigars, musical instruments played by the mouth, handkerchiefs, towels, or shaving outfits.

11. Be sure to use your mosquito net when mosquitos are present. See that it is well tucked in and that it has no holes in it.

12. Flies and cockroaches frequently carry disease germs and leave them on food and other articles over which they walk. Get rid of flies in every way. Whenever you see a fly in the barracks, kill it. Be sure that screens in windows and doors are kept tightly closed.

13. Food containers and garbage cans must be kept tightly closed. Scraps of food, fruit skins, and manure should never be left on the ground about the post or camp.

14. Keep your barracks and squad bay clean. If you find bedbugs in your bed, or in the barracks, report that fact to your company commander.

15. Keep your hair cut short and your fingernails clean. This is especially important if you are detailed as a cook, baker, or in other positions in which you handle food.

16. Avoid venereal diseases. These diseases are almost always caught by sexual intercourse with an infected woman. If you have sexual intercourse, report at once for prophylaxis. The prophylactic treatment must be carried out thoroughly and the directions followed exactly. The sooner you report for this treatment, and *at least* within two hours after exposure, the more certain you are of avoiding disease.

17. If you should feel that you have caught a venereal disease, report to the medical officer at once and do exactly as he tells you. Failure to report for treatment of venereal disease is a court-martial offense. Any veneral disease can be cured much more quickly if proper treatment is begun early. Above all, do not try to treat yourself or go to an advertising quack doctor. Either may permanently damage your body.

Sanitation in the Field

While all of the rules given above are of the same importance in the field as they are in your post or cantonment, the following are of especial importance in your field service:

1. Be more careful of the water you drink. Never drink any water from a stream, spring, well, or faucet until it has been passed as pure by a medical officer and a sign posted that the water is safe to drink.

When orders have been issued that all drinking water must be boiled, be sure that the water you drink has *actually been boiled for 20 minutes* and not merely heated a little.

Sometimes water will be provided for drinking which has been purified in a sterilizing bag known as a Lyster bag. These bags are usually placed in your company street or near the company kitchen. When this is done, drink only the water from the bag. Do not mind the peculiar taste; it will not hurt you in the least and comes from a chemical issued for the purpose of purifying the water. Water purified in this way may make your urine sting a little but this means nothing harmful. Let the water run from the faucet of the bag into your own cup. Do not dip a cup into the bag and do not drink by putting your lips to the faucet. Keep the Lyster bag clean inside—especially on the top cover.

The water purification tablets may be used to make water safe for drinking when no Lyster bag is available. They should be used in accordance with instructions.

2. Be especially careful not to relieve yourself except in the head, or the night urine can provided in your company street.

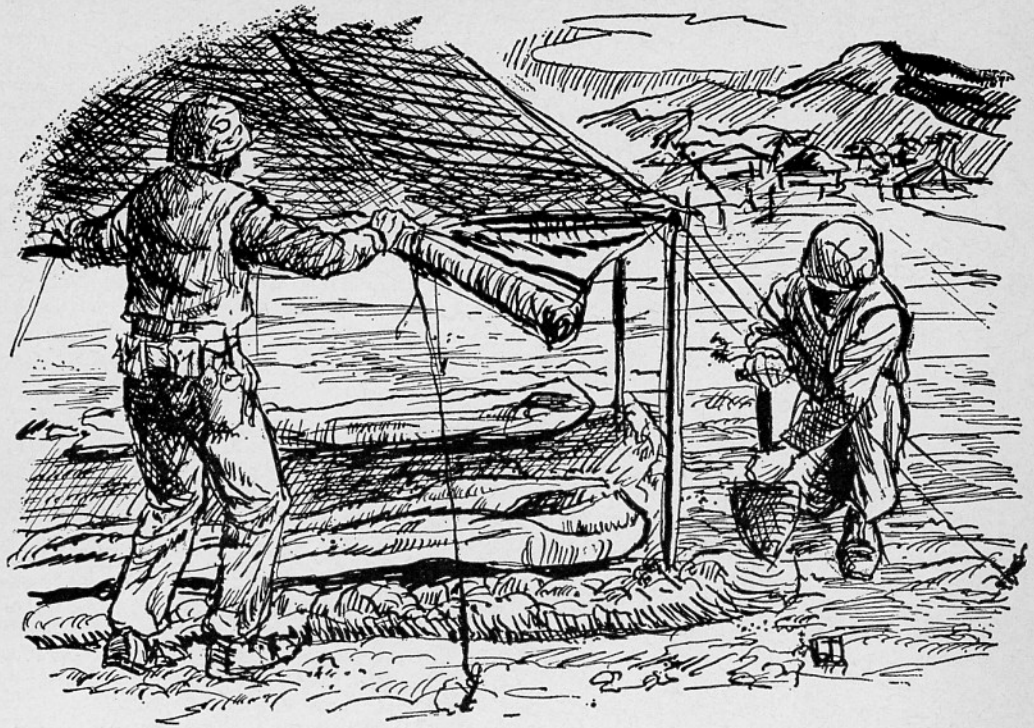
3. Be sure that your mess kit and knife, fork, and spoon are washed in hot soapy water and rinsed in boiling water before and after they are used. Unless facilities are available for you to take these sterilization precautions in the field, mess gear should never be used. At the completion of the meal, you should file by a pit or garbage can, and scrape out the food remnants from your meat can. Then you should pass by a fire on which there are three cans of actively boiling water. Soap should have been added to the first of these cans and the last two should contain just plain boiling water. Your mess gear is dipped into each of these cans of boiling water and thoroughly rinsed. Don't use a cloth to dry it as the heat of the metal will cause it to dry very quickly in the air. Unless the washing is done in boiling water, your mess gear may pick up disease germs. Dysentery can be very easily acquired from greasy mess gear.

4. Use the mosquito net whenever there are mosquitos, or when directed by your company commander.

5. Get a bath whenever possible. Watch for lice or other vermin on your body and clothing, and, if found, report immediately to the medical officer.

6. Do not sit or lie directly on the damp ground. When you are hot or perspiring, or when your clothes are damp, do not remain where a draft can strike you. If you do, you will get chilled and may contract a cold, rheumatism, or pneumonia.

7. Every day, if possible, hang your blankets and clothing out to air in the sun and then shake or beat them with a stick.



8. Wash your shirts, underwear, and socks frequently. Whenever possible, open your tent so the air and sun can get in it.

9. Ditch your tent as soon as you can after it is put up, even if your camp is only for one night. If you do not, a little rain may spoil a whole night's rest.

10. When possible, prepare your bed before dark. If you have no cot, level off the ground and scrape out a little hollow for your hips. Use some straw, dry grass, leaves or small branches. Sleep on your poncho. This keeps dampness from coming up from the ground.

11. Bury your empty ration cans. They attract flies as well as the enemy.

12. If you are ordered to select a camp site, here are some definite sanitary advantages you should try to obtain: (a) a site with a stream nearby; (b) an elevated site to allow drainage and some freedom from insects; (c) an area large enough to allow living quarters to be 100 yards from heads and latrines; (d) a prevailing wind blowing toward heads, away from camp; (e) a site free from swamps and low water where various harmful insects might breed.

13. For a short bivouac or temporary camp where time does not permit construction of normal type deep-pit heads used in more permanent camps, the digging of straddle-trenches should begin immediately after arriving on the location. These straddle-trenches are often referred to as "1-2-3 trenches" as they are one foot wide, two feet deep, and three feet long. One straddle-trench should be dug for each ten men. The dirt that is removed should be piled at one end of the trench and a can or shovel placed on each pile of dirt so that each man can cover his waste after using the trench. If this is not done, flies can easily and quickly spread disease throughout the command. Before breaking camp all heads and straddle-trenches must be filled, mounded over, and marked with the date they were closed.

14. The proper use of heads cannot be stressed too greatly. Desirable camp sites are few, and a careless unit may so contaminate a camp site that it will be unfit for further use for months.



Drill for Foot Troops

DRILL for Foot Troops inspires an individual to be a member of a team—a team working confidently together in unison and to a measured cadence. No team is any better than its weakest members. You learn to march in step, keep straight lines, and perform the Manual of Arms precisely for your team.

The purposes of drill are to—

(1) Move a unit from one place to another in a standard, orderly manner.

(2) Provide simple formations from which combat formations may be readily assumed.

(3) Teach discipline by instilling habits of precision and automatic response to orders.

(4) Better morale by developing team spirit.

(5) Give troops an opportunity to handle individual weapons.

(6) Give junior officers and noncommissioned officers the confidence of command and of giving proper commands.

Close Order Definitions

The terms defined herein are used in drill for foot troops. Definitions of other military terms are included in Chapter 3.

ELEMENT—An individual, squad, section, platoon, company, or other unit which is part of a larger unit.

ALINEMENT—A straight line on which several elements are formed. To aline: to dress several elements on a straight line.

BASE—The element on which a movement is regulated.

CADENCE—Uniform step and rhythm in marching.

CENTER—The middle point or element of a unit or left center element for an even number of elements.

COLUMN—A formation in which elements are placed one behind the other.

FILE CLOSER—Any officer or enlisted man posted in rear of the rear rank.

HEAD—The leading element of a column.

DEPTH—Space from head to rear of a formation or position. It includes the leading and rear elements. The depth of a man is accepted as 12 inches.

DISTANCE—Space between elements in the direction of depth. Between individuals, the space between your chest and the person to your front. Between vehicles, the space between the front end of a vehicle and the rear of the vehicle to its front. Between troops in formation (either on foot, mounted or in vehicles), the space from the front of the rear unit to the rear of the unit in front.

POINT OF REST—The point at which a formation begins. Specifically, the point toward which units are alined in successive movements.

QUICK TIME—Cadence at 120 steps per minute.

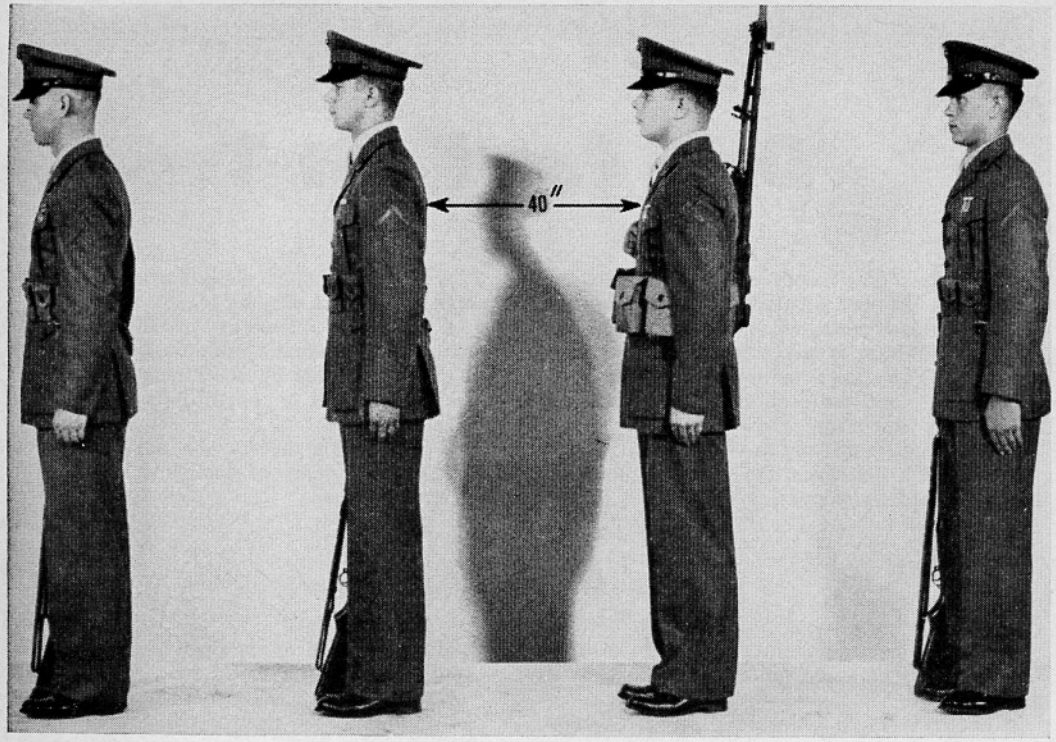
DOUBLE TIME—Cadence at 180 steps per minute.

SLOW TIME—Cadence at 60 steps per minute. Used for funerals only.

INTERVAL—The lateral space between elements on the same line. Interval is measured between individuals from shoulder to shoulder or elbow to elbow; between vehicles, from hub to hub or track to track. It is measured between formations from flank to flank. Normal interval between individuals is 30 inches. Close interval between individuals is 4 inches.

EXTENDED MASS FORMATION—The arrangement of a company or larger unit in which elements in column are abreast and at a specified interval greater than close interval.

FILE—A column of men or vehicles one behind the other.



10.1 Distance and file.

FLANK—The right or left extremity of a unit, either in line or in column. The element on the extreme right or left of the line.

FORMATION—Arrangement of elements of a unit in line, in column or in any other prescribed manner.

FRONT—The space occupied by an element, measured from one flank to the other. The front of a man is accepted as 22 inches.

GUIDE—The (base) individual upon whom a formation, or elements thereof, regulates its march. To guide: to regulate interval, direction or alinement; to regulate cadence on a base file (right, left, or center).

LEFT (right)—Extreme left (right) element or edge of a body of troops.

LINE—A formation in which the elements are abreast.

MASS FORMATION—The arrangement of a company or larger unit in which its elements are in column and abreast at close interval.

STEP—The distance from heel to heel between the feet of a marching man. The half step and back step are 15 inches. The right and left steps are 12 inches. The quarter step is a step approximately 8 inches, and the short step is approximately 22 inches. (These steps are used only in executing squads right (left), and squads right (left) about to obtain proper positioning of personnel). The steps in quick and double time are 30 and 36 inches respectively.

PACE—The length of a full step in quick time.

PIECE—An individual firearm such as a rifle or automatic rifle.

RANK—A line of men or vehicles placed side by side.

SNAP—In commands or signals, the quality that inspires immediate response. In drill, the immediate and smart execution of a movement.



10.2 Interval and rank.

Commands

A command is the direction of the commander expressed orally and in prescribed wording. In drill for foot troops all commands are given at attention. Commands must be delivered in a loud, clear voice and all officers and men must fix their attention at the first word of a command.

There are two kinds of commands:

(1) The preparatory command, such as "Forward," which indicates the movement to be executed.

(2) The commands of execution, such as MARCH, HALT or ARMS, which cause the desired movement, or halt, or element of the manual to be executed.

In certain commands, the preparatory command and the command of execution are combined, as for example: FALL IN, AT EASE, and REST.

Preparatory commands are indicated in this manual by Small Letters; those of execution by CAPITAL LETTERS. Commands in parentheses show movement "By the Numbers."

The commands BELAY THAT or AS YOU WERE are given to recall a command or to start over on a command given incorrectly. On either of these commands you return to the position held before the improper command was given.

Positions

The correct positions to be assumed upon receiving various commands are given in detail here.

A. ATTENTION. 1. Heels on the same line and as near each other as the conformation of the man permits. (Fig. **10.4(1).**)

2. Feet turned out equally and forming an angle of 45 degrees.

3. Knees straight without stiffness.

4. Hips level and drawn back slightly; body erect and resting equally on hips, chest lifted and arched; shoulders square and falling equally.

5. Arms hanging straight down without stiffness so that the thumbs are along the seams of the trousers; backs of the hands out; fingers held naturally.

6. Head erect and squarely to the front: chin drawn in so that the axis of the head and neck is vertical; eyes straight to the front.

7. Weight of the body resting equally on the heels and the balls of the feet.

8. In assuming the position of attention, the heels are brought together smartly and audibly.



POSITION OF ORDER ARMS. The butt of the rifle rests on the ground, barrel to the rear, toe of the butt on line with the toe of, and touching the right shoe, right hand holding the rifle between the thumb and fingers with right thumb touching seam of trousers. Left hand as in the position of attention without arms.

B. RESTS. All rests are executed from the halt. The commands are: FALL OUT; REST; AT EASE; and 1. Parade, 2. REST.

1. At the command FALL OUT, men leave ranks but are required to remain in the immediate vicinity. They resume their former places at attention at the command FALL IN.

2. At the command REST, one foot is kept in place. Silence and immobility are not required.

3. At the command AT EASE, the right foot is kept in place. Silence, but not immobility, is required.

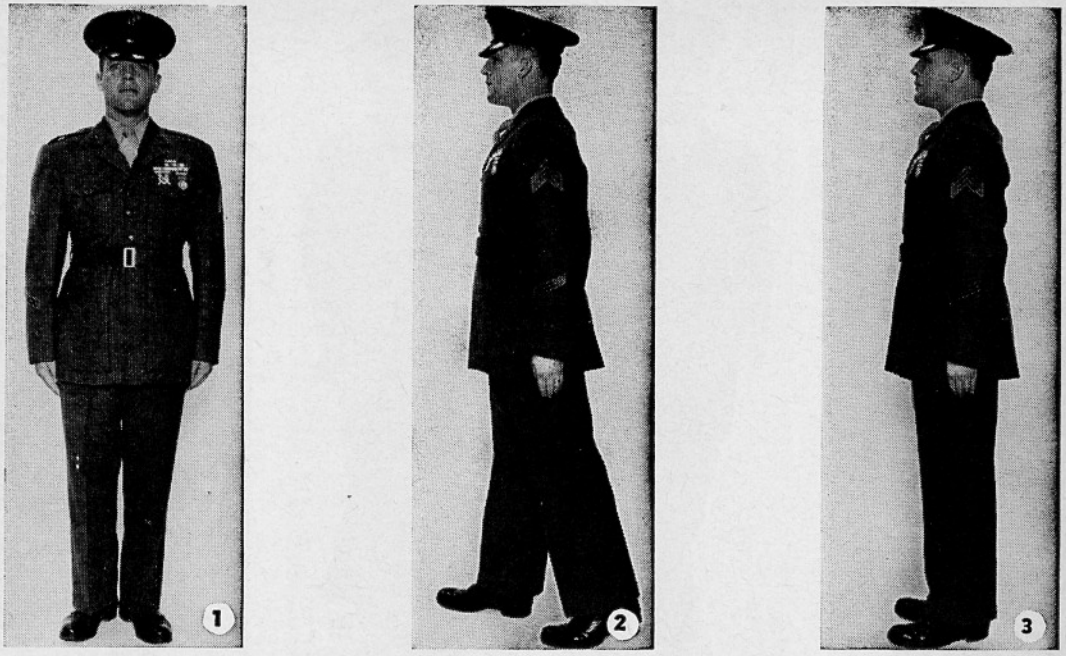
4. At the command of execution REST, of 1. Parade, 2. REST, move the left foot smartly 12 inches to the left of the right foot, keeping the legs straight so that the weight of the body rests equally on both feet. At the same time, clasp the hands behind the back, palms to the rear, thumb and fingers of the right hand clasping the left thumb without constraint; preserve silence and immobility. This command is executed from the position of attention only.

C. EYES RIGHT OR LEFT. The commands are: 1. Eyes, 2 RIGHT (LEFT), 3. Ready, 4. FRONT. At the command RIGHT, each man turns his head and eyes smartly to the right. At the command FRONT, the head and eyes are turned smartly to the front.

D. FACINGS. All facings are executed from the halt and in the cadence of quick time.

1. TO THE FLANK. The commands are: 1. Right (Left), 2. FACE. At the command FACE, which is the count of (ONE) in this movement, slightly raise the left heel and the right toe; face to the right, turning on the right heel, assisted by a slight pressure on the ball of the left foot. Hold the left leg straight without stiffness. (TWO) Place the left foot smartly beside the right. (See Fig. **10.4 (1), (2),** and **(3).** Execute 1. Left, 2. FACE by turning on the left heel and the ball of the right foot in a corresponding manner.

2. TO THE REAR. The commands are: 1. About, 2. FACE. At the command FACE, carry the toe of the right foot to a position touching the



10.4(1) Attention, as "Right FACE" is given. 10.4(2) At command "FACE," face to the right. 10.4(3) Bring left foot up beside the right foot.

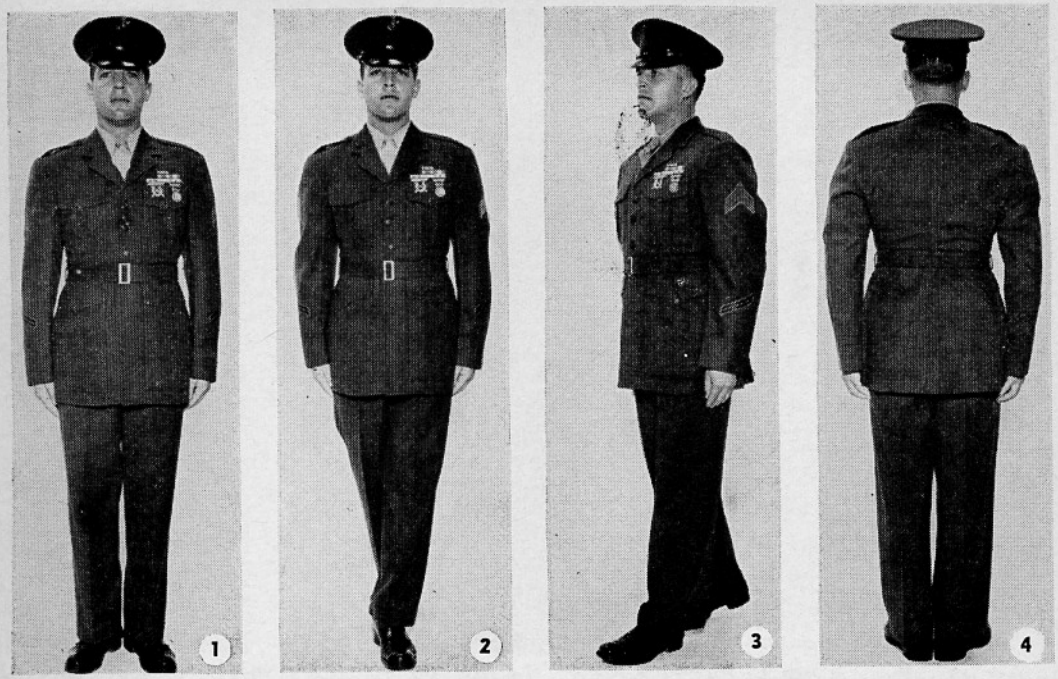
ground a half-foot length to the rear and slightly to the left of the left heel without changing the position of the left foot; weight of the body mainly on the heel of the left foot; right leg straight without stiffness. (TWO) Face to the rear, turning to the right on the left heel and on the ball of the right foot; place the right heel beside the left (Fig. **10.5**).

E. HAND SALUTE. The commands are: 1. Hand, 2. SALUTE. At the command SALUTE, raise the right hand smartly until the tip of the forefinger touches the lower part of the headdress or forehead above and slightly to the right of the right eye, thumb and fingers extended and joined, palm down, upper arm horizontal, forearm inclined at 45 degrees, hand and wrist straight; at the same time turn the head and eyes toward the person saluted. (TWO) Return the hand smartly in one motion to its normal position by the side, at the same time turn the head and eyes to the front, unless facing that direction.

Saluting distance is the distance at which recognition is easy. Usually it does not exceed 30 paces. The salute is rendered when the person to be saluted is 6 paces distant, or at the nearest point of approach if it is apparent that he is not going to approach to within 6 paces. Hold the first position of the salute until the person saluted has passed or the salute is returned. Then execute the second movement of the hand salute.

Steps and Marchings

With the exception of right step, all steps and marchings beginning from a halt start with the left foot. The instructor indicates the proper rhythm by counting cadence. He will do so only when necessary. To change direction on the march, both the preparatory command and the command



10.5 From left to right, movements of "About FACE" are shown. First stand at attention as command is given. Second, at command "FACE," carry the toe of the right foot to a position touching the ground a half-foot length to the rear and slightly to the left of the left heel. Third, face to the rear, turning to the right on the left heel and on the ball of the right foot. Fourth, place the right heel beside the left.

of execution are given as the foot, in the desired direction of the turn, strikes the deck.

1. QUICK TIME. If at a halt, the command to march forward at quick time is 1. Forward 2. MARCH.

a. At the command 1. Forward, shift the weight of the body to the right leg without noticeable movement.

b. At the command 2. MARCH, step off smartly, left foot first, and march straight ahead with 30-inch steps. Swing arms easily in natural arcs, 6 inches straight to the front and 3 inches to the rear. Do not exaggerate movements and do not march stiffly.

2. DOUBLE TIME. The commands are: 1. Double Time, 2. MARCH. It may be given as either foot strikes the deck.

a. If at halt, at the command "double time," shift the weight of the body to the right leg without perceptible movement. At the command MARCH, raise the forearms, fingers closed, knuckles out, to a horizontal position along the waistline and take up an easy "jog" with the step and cadence of double time, being at a halt or in March in quick swinging motion across the front of the body. Be sure to keep forearms horizontal.

b. If marching in quick time, at the command MARCH, take one more step in quick time and then step off in double time.

c. To resume the quick time from double time, the commands are: 1. Quick Time, 2. MARCH. At the command MARCH, given as either foot strikes the ground, advance and plant the other foot double time; resume the quick time, dropping the hands by the sides.

3. MARK TIME. The commands are: 1. Mark Time, 2. MARCH.

a. Being in march, at the command MARCH, given as either foot strikes the ground, advance and plant the other foot; then bring up the foot in rear, placing it so that both heels are on line, and continue the cadence by alternately raising and planting each foot. When the feet are raised, the balls of the feet are 2 inches from the ground.

b. Being at a halt, at the command MARCH, raise and plant first the left foot, then the right as described above.

c. Mark time may be executed in either quick time or double time.

d. The halt is executed from mark time as from quick time or double time by taking 2-inch vertical steps (par. a. above) in place of 30-inch horizontal steps. Forward march, halt, and mark time may be executed one from the other in quick or double time.

4. HALF STEP. a. The commands are: 1. Half Step, 2. MARCH. At the command MARCH, take steps of 15 inches in quick time. The half step is executed in quick time only.

b. To resume the full step from half step or mark time, the commands are: 1. forward, 2. MARCH.

5. SIDE STEP. The commands are: 1. Right (left) Step, 2. MARCH. At the command MARCH, carry the right foot 12 inches to the right; then place the left foot beside the right, left knee straight. Continue in the cadence of quick time. The side step is executed in quick time from a halt for short distances only.

6. BACK STEP. The commands are: 1. Backward, 2. MARCH. At the command MARCH, take steps of 15 inches straight to the rear. The back step is executed in quick time from a halt for short distances only.

7. TO MARCH BY THE FLANK. Being in march, the commands are: 1. By The Right (left) Flank, 2. MARCH. At the command MARCH, given as the right foot strikes the ground, advance and plant the left foot; then face to the right in marching and step off in the new direction with the right foot. (See Fig. **10.6.**)

8. TO MARCH OTHER THAN AT ATTENTION. The commands are: 1. Route Step, 2. MARCH or 1. At Ease, 2. MARCH.

a. 1. Route Step, 2. MARCH. At the command MARCH, men are not required to maintain silence or to march in cadence at attention.

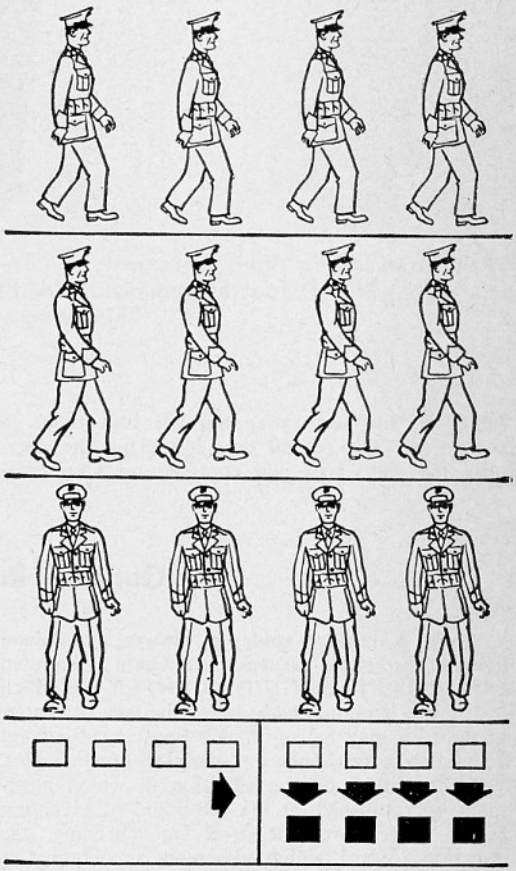
b. 1. At Ease, 2. MARCH. At the command MARCH, men are not required to march in cadence at attention, but are required to maintain silence.

9. TRAIL ARMS. Being at order arms. 1. Trail, 2. ARMS. At the command ARMS, raise the rifle and incline the muzzle forward so that the barrel makes an angle of about 15° with the vertical, the right arm slightly bent. (See Fig. **10.16.**)

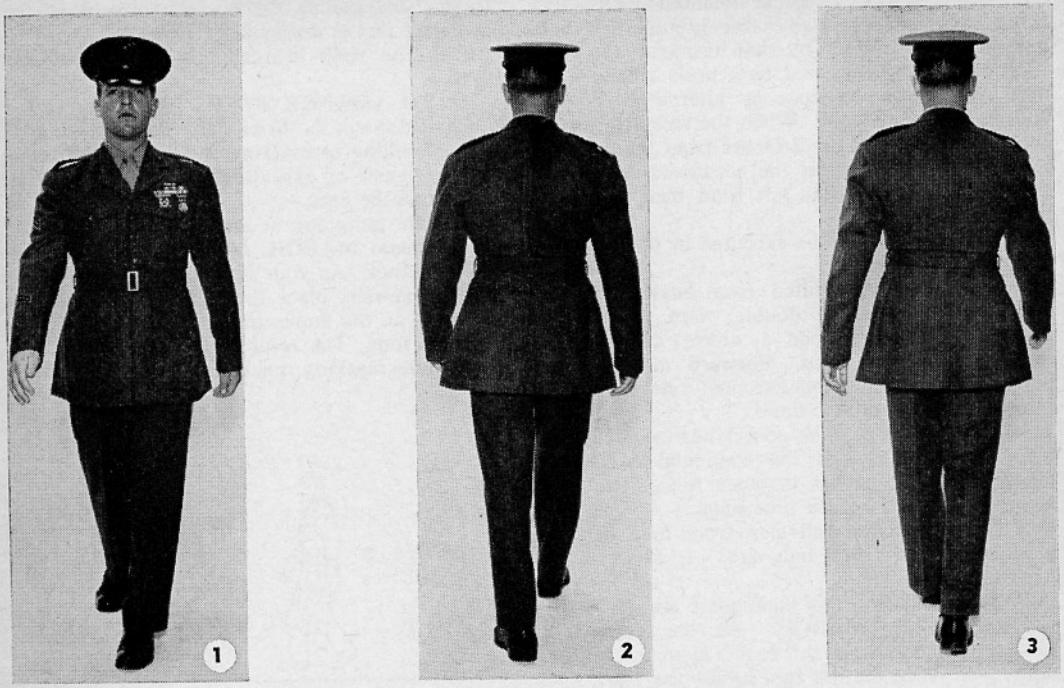
10. TO CHANGE STEP. The command is 1. Change Step, 2. MARCH. It may be given while marching or marking, quick or double time. The command of execution is given as the right foot strikes the deck.

a. While marching at quick or double time, at the command MARCH, take one more step with your left foot. As your right foot comes forward in the next step, place the right toe near the left heel and at the same time step out again with your left foot. The result is one skip.

b. While marking quick time, at the command



10.6 "By the right flank, MARCH."



10.7. From left to right, movements of "To the Rear, MARCH" are shown. First advance one step with left foot at command "MARCH." Second, face to the rear, still marching. Third, step off with left foot.

MARCH, lift and lower the left foot twice in succession. The second time it touches the deck, raise the right foot and continue marking time.

c. While marking double time, at the command MARCH, hop twice on the left foot and continue marking double time.

General Rules for Drill

While marching, guide is always maintained toward the right, except: a. Upon command GUIDE LEFT, or GUIDE CENTER, in which case guide is maintained toward the left, or center, as the case may be, until such time as subsequent command reestablishes the direction of alinement.

b. Regardless of the direction in which alinement is established, at the command of execution for a drill movement involving marching, the direction toward which alinement is obtained is the flank toward which the movement is made. Upon completion of the drill movement, alinement will be in the direction established prior to commencing the movement.

1. Slight changes in direction are made by adding Half to the preparatory command for turning or column movements; for example, Column Half Right (left) changes direction 45°. Commanding INCLINE TO THE RIGHT (LEFT) the guide changes direction of march slightly to the right (left).

2. Men in a squad are numbered from right to left in line by squad and from front to rear by squad in column. Squads in a platoon are

numbered from right to left in line and from front to rear in column.

3. Whenever drill movements are executed while troops are marching, the command of execution MARCH is given as the left foot strikes the ground if the movement is to the left, and as the right foot strikes the ground if the movement is to the right.

4. Drill movements may be divided into individual motions for instruction. When drills are executed by the numbers, the first motion is made on the command of execution. Subsequent motions are made in proper order on the commands TWO, THREE, FOUR, the number of counts depending upon the number of motions in the movement. To use this method the command By the Numbers precedes the preparatory command. All movements are then executed by the numbers until the command Without Numbers is given.

Manual of Arms

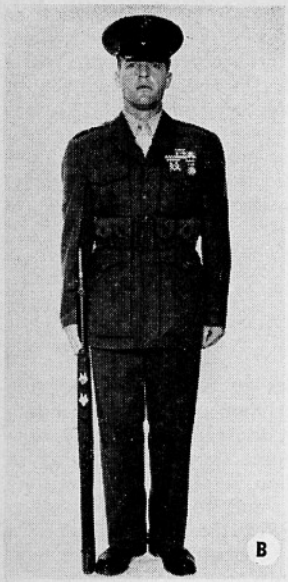
The manual of arms is the means by which the rifle is moved in an orderly and precise manner from one position to another. Every Marine learns to execute these movements with utmost exactness so that when the manual is ordered in formation the entire formation executes them as though it were one man.

1. SLING ARMS. Being at order arms. 1. Sling, 2. ARMS. This movement is not executed in cadence and applies to any rifle, automatic rifle, light machine gun, light mortar, etc. Loosen the sling, if not already loosened, and in the most convenient manner assume the position shown in Fig. **10.9**. This position is authorized for long parades, long reviews, and for occasions when the prolonged holding of the piece becomes a hardship on the troops. When used in ceremonies, the bayonet may be fixed.

2. UNSLING ARMS. Being at sling arms. 1.



10.8 From left to right, the following basic positions are illustrated; Order Arms, Port Arms, Left Shoulder Arms, Right Shoulder Arms.







ORDER ARMS TO PORT ARMS. COMMAND: 1. Port 2. ARMS (ONE) At the command ARMS, raise the rifle with the right hand and carry it diagonally across the front of the body until the right hand is in front of and slightly to the left of the face so that the barrel is up, butt in front of the right hip, barrel bisecting the angle of the neck and the left shoulder. At the same time, grasp the rifle at the balance with the left hand, palm toward the body. (TWO) Carry the right hand to the small of the stock, grasping it, palm down, holding the right forearm horizontal; left elbow resting against the body; the plane of the rifle parallel to and about four inches in front of the center of the body, barrel extending upward and to the left at an angle of 45 degrees.

Unsling, 2. ARMS, 3. Adjust, 4. SLINGS. At the command ARMS, pieces are unslung. At the command SLINGS, slings are adjusted to the drill position. This adjustment of the sling will be made before precise movements of the manual are to be executed.

3. ORDER ARMS TO PRESENT ARMS. COMMAND: 1. Present 2. ARMS. (ONE) At the command ARMS, with the right hand carry the rifle in front of the center of the body, barrel to the rear and vertical; grasp it with the left hand at the balance, forearm horizontal and resting against the body. (TWO) Grasp the small of the stock with the right hand. (See Fig. **10.10.**)

4. PRESENT ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. (ONE) At the command ARMS, move the right hand from its grasp on the stock and regrasp the piece between the upper sling swivel and the stacking swivel. (TWO) Release the grasp of the left hand and lower the rifle to the right so that the butt is three (3) inches from the ground, barrel to the rear, left hand with fingers extended and joined steadying the rifle, forearm and wrist straight and inclining downward. (THREE) Complete the order by lowering the rifle gently to the ground with the right hand. Cut the left hand smartly to the side.

5. ORDER ARMS TO INSPECTION ARMS. COMMAND: 1. Inspection 2. ARMS. At the command ARMS, take the position of port arms. (THREE) With the fingers of the left hand closed, place the left thumb on the operating rod handle and push it smartly to the rear until it is caught by the operating rod catch; at the same time, lower the head and eyes sufficiently to

glance into the receiver. (FOUR) Having found the receiver empty, or having emptied it, raise the head and eyes to the front; at the same time, regrasp the piece with the left hand at the balance.

6. INSPECTION ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. (ONE) At the preparatory command Order, place the rear edge of the right hand against the operating rod handle with the fingers extended and joined, forcing the operating rod handle slightly to the rear, and at the same time, depress the follower with the right thumb to release the bolt. Remove the thumb and permit the bolt to close. Pull the trigger and resume port arms. At the command ARMS, move the right hand from its grasp on the stock and regrasp the piece between the upper sling swivel and the stacking swivel. (TWO) Release the grasp of the left hand and lower the rifle to the right so that the butt is three (3) inches from the ground, barrel to the rear, left hand with fingers extended and joined steadying the rifle, forearm and wrist straight and inclining downward. (THREE) Complete the order by lowering the rifle gently to the ground with the right hand. Cut away the left hand smartly to the side.

7. ORDER ARMS TO TRAIL ARMS. COMMAND: 1. Trail 2. ARMS. At the command ARMS, raise the rifle and incline the muzzle forward so that the barrel makes an angle of about 15 degrees with the vertical, right arm slightly bent. (See Fig. **10.16.**)

8. TRAIL ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. At the command ARMS, lower the rifle with the right hand and resume the position of order arms.

9. RIFLE SALUTE. 1. Rifle 2. SALUTE. a. Being at right shoulder arms. At the command SALUTE, carry the left hand smartly to the small of the stock, forearm horizontal, palm of the



PORT ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. (ONE) At the command ARMS, move the right hand from its grasp on the stock and regrasp the piece between the upper sling swivel and the stacking swivel. (TWO) Release the grasp of the left hand and lower the rifle to the right so that the butt is three (3) inches from the ground, barrel to the rear, left hand with fingers extended and joined steadying the rifle, forearm and wrist straight and inclining downward. (THREE) Complete the order by lowering the rifle gently to the ground with the right hand. Cut away the left hand smartly to the side.

hand down, thumb and fingers extended and joined, first joint of the forefinger touching the rear end of the receiver of the M1 rifle or the end of the cocking piece of the M1903 rifle; look toward the person saluted. (See Fig. **10.11.**) (TWO) Cut away the left hand smartly to the side; turn the head and eyes to the front.

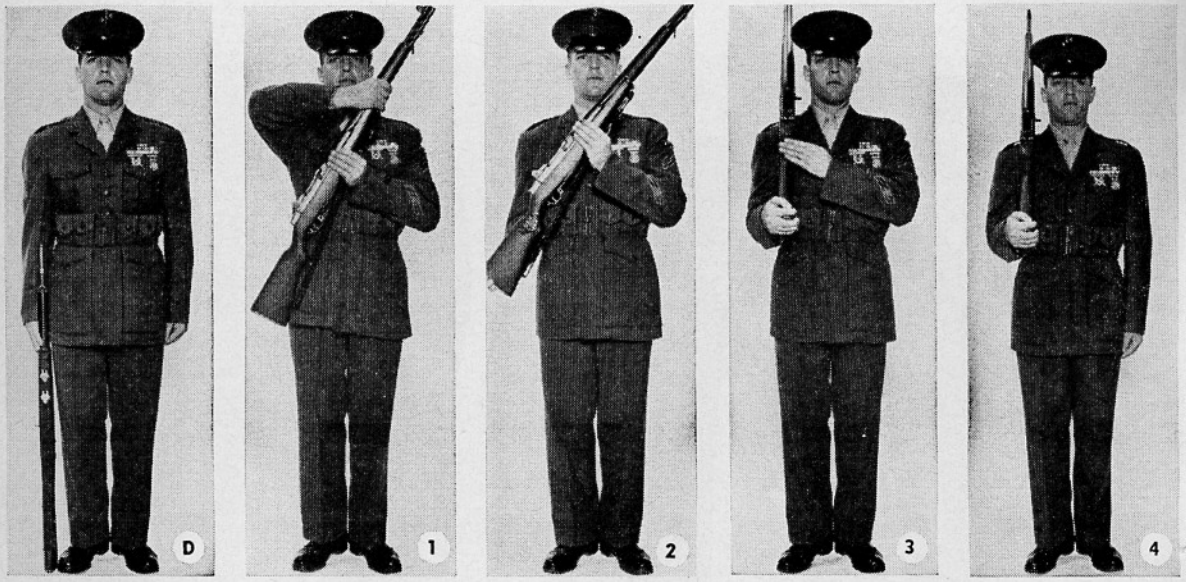
b. Being at order or trail arms. At the command SALUTE, carry the left hand smartly to the right side, palm of the hand down, thumb and fingers extended and joined, forearm and wrist straight, first joint of forefinger touching the barrel between the stacking swivel and the muzzle at a point which best suits the conformation of the man, and look toward the person saluted. (See Fig. **10.12.**) (TWO) Cut away the left hand smartly to the side; turn the head and eyes to the front.

10. FIX BAYONETS. Being at order arms. 1. Fix 2. BAYONETS. At the command BAYONETS—

a. If the bayonet scabbard is on the belt, move the muzzle of the rifle to the left front and grasp the rifle below the stacking swivel with the left hand; grasp the bayonet with the right hand, back of the hand toward the body; pressing the spring with the forefinger, draw the bayonet from the scabbard and fix it on the barrel, glancing at the muzzle; resume the order.

b. If the bayonet scabbard is on the haversack, draw and fix the bayonet in the most convenient manner.

c. These movements are not executed in cadence.



ORDER ARMS TO RIGHT SHOULDER ARMS. COMMAND: 1. Right Shoulder 2. ARMS. (ONE) At the command ARMS, raise and carry the rifle diagonally across the body with the right hand; at the same time, grasp it at the balance with the left hand. (TWO) Regrasp it with the right hand on the butt, the heel between the first two fingers, thumb and fingers closed on the stock. (THREE) Without changing the grasp of the right hand, place the rifle on the right shoulder, barrel up and inclined at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder, right elbow against the side, forearm horizontal. Carry the left hand, thumb and fingers extended and joined, to the small of the stock, first joint of the forefinger touching the rear of the receiver, wrist straight and elbow down. (FOUR) Cut away the left hand smartly to the side.

Manual of the Automatic Rifle

1. GENERAL RULES. a. Except when otherwise prescribed, the automatic rifle is habitually carried slung over the right shoulder, butt down, barrel to the rear, right hand grasping the sling, hand in front of armpit.

b. For marches and field exercises, the automatic rifle may be carried slung over either shoulder.

c. When troops are at ease, the automatic rifle is kept slung unless otherwise ordered.

d. When troops are at rest, the automatic rifle may be unslung.

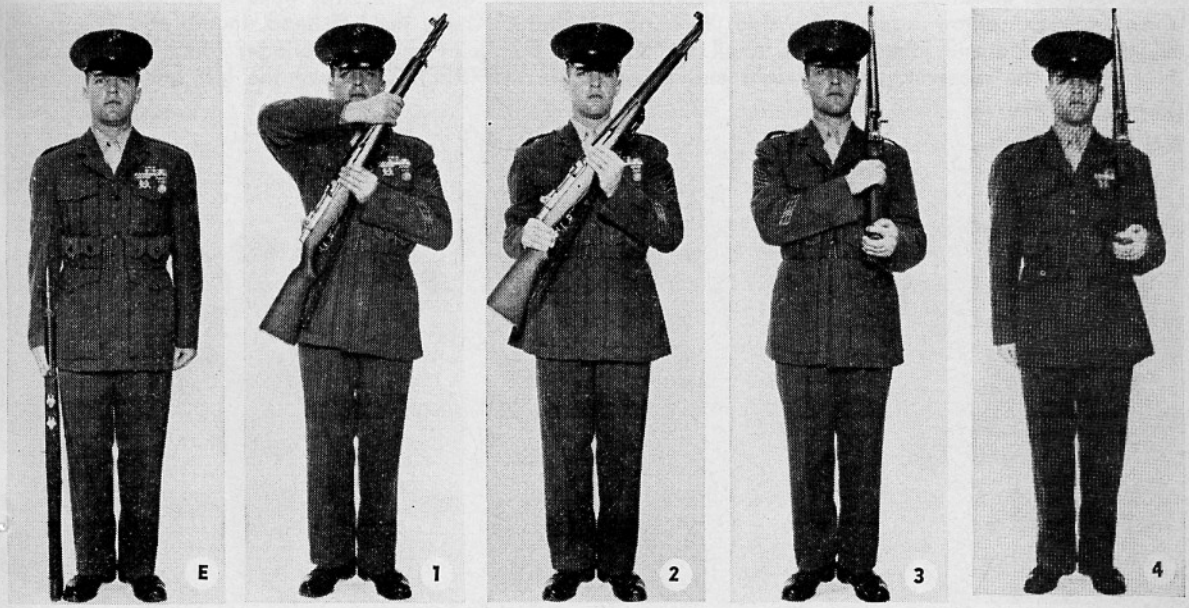
e. Only the following movements of the manual are executed by the automatic rifleman:

(1) *Parade rest.* Being at sling arms, execute as without arms keeping the right hand on the sling.

(2) *Inspection arms.* Being at sling arms, at the command ARMS, grasp the magazine with the left hand; at the same time press the magazine release with the right hand. Withdraw the magazine with the left hand and place it in the belt. Pull back the operating handle with the left hand.

(3) *To resume sling arms.* Being at inspection arms. 1. Order (Port, Right Shoulder, Left Shoulder), 2. ARMS. At the command ARMS, pull the trigger, replace the magazine, and resume the position of attention, the automatic rifle being kept slung.

f. When a unit is formed or dismissed, men



ORDER ARMS TO LEFT SHOULDER ARMS. COMMAND: 1. Left Shoulder 2. ARMS. At the command ARMS, take the position of port arms. (THREE) Release the grip of the left hand on the riflle, and with the right hand still grasping the small of the stock, place it on the left shoulder, barrel up and inclined at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder. At the same time grasp the butt with the left hand, heel of the butt between the first and second fingers, thumb and fingers closed on the stock, left forearm horizontal, left elbow against the side. (FOUR) Drop the right hand smartly to the right side.



PORT ARMS TO RIGHT SHOULDER ARMS. COMMAND: 1. Right Shoulder 2. ARMS. (ONE) At the command ARMS, grasp the butt of the rifle with the right hand, the heel between the first two fingers, thumb and fingers closed on the stock. (TWO) Without changing the grasp of the right hand, place the rifle on the right shoulder, barrel up and inclined at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder, right elbow against the side, forearm horizontal. Carry the left hand, thumb and fingers extended and joined, to the small of the stock, first joint of the forefinger touching the rear of the receiver, wrist straight and elbow down. (THREE) Cut away the left hand smartly to the side



RIGHT SHOULDER ARMS TO PORT ARMS. COMMAND: 1. Port 2. ARMS. (ONE) At the command ARMS, press the rifle butt down quickly and throw the rifle diagonally across the body; at the same time, turn the butt clockwise one-quarter turn so as to bring the barrel up, the right hand retaining its grasp on the butt, the left hand grasping the rifle at the balance. (TWO) Move the right hand from its grasp on the butt and regrasp the piece at the small of the stock, palm down, holding the right forearm horizontal; left elbow resting against the body; the plane of the rifle parallel to and about four inches in front of the center of the body, barrel extending upward and to the left at an angle of 45 degrees.







PORT ARMS TO LEFT SHOULDER ARMS. COMMAND: 1. Left Shoulder 2. ARMS. (ONE) At the command ARMS, release the grip of the left hand on the rifle, and with the right hand still grasping the small of the stock, place the rifle on the left shoulder, barrel up and inclined at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder. At the same time grasp the butt with the left hand, heel of the butt between the first and second fingers, thumb and fingers closed on the stock, left forearm horizontal, left elbow against the side. (TWO) Drop the right hand smartly to the right side.







LEFT SHOULDER ARMS TO PORT ARMS. COMMAND: 1. Port 2. ARMS. (ONE) At the command ARMS, grasp the rifle with the right hand at the small of the stock. (TWO) Release the grasp of the left hand and at the same time carry the piece with the right hand diagonally across the front of the body, barrel up, butt in front of the right hip, barrel bisecting the angle of the neck and the left shoulder. Grasp the rifle at the balance with the left hand, palm toward the body.



RIGHT SHOULDER ARMS TO LEFT SHOULDER ARMS . COMMAND: 1. Left Shoulder 2. ARMS. At the command ARMS, take the position of port arms. (THREE) Release the grip of the left hand on the rifle, and with the right hand still grasping the small of the stock, place it on the left shoulder, barrel up and inclining at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder. At the same time grasp the butt with the left hand, heel of the butt between the first and second fingers, thumb and fingers closed on the stock, left forearm horizontal, left elbow against the side. (FOUR) Cut away the right hand smartly to the side.



LEFT SHOULDER ARMS TO RIGHT SHOULDER ARMS. COMMAND: 1. Right Shoulder 2. ARMS. At the command ARMS, take the position of port arms. (THREE) Regrasp the rifle with the right hand on the butt, the heel between the first two fingers, thumb and fingers closed on the stock. (FOUR) Without changing the grasp of the right hand, place the rifle on the right shoulder, barrel up and inclining at an angle of about 45 degrees from the horizontal, trigger guard in the hollow of the shoulder, right elbow against the side, forearm horizontal. Carry the left hand, thumb and fingers extended and joined, to the small of the stock, first joint of the forefinger touching the rear end of the receiver, wrist straight and elbow down. (FIVE) Cut away the left hand smartly to the side.



RIGHT SHOULDER ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. (ONE) At the command ARMS, press the rifle butt down quickly and throw the rifle diagonally acoss the body; at the same time, turn the butt clockwise one-quarter turn so as to bring the barrel up, the right hand retaining its grasp on the butt, the left grasping the rifle at the balance. (TWO) Move the right hand from its grasp on the butt and regrasp the piece between the upper sling swivel and the stacking swivel. (THREE) Release the grasp of the left hand and lower the rifle to the right so that the butt is three (3) inches from the ground, barrel to the rear, left hand with fingers extended and joined steadying the rifle, forearm and wrist straight and inclining downward. (FOUR) Complete the order by lowering the rifle gently to the ground with the right hand. Cut away the left hand smartly to the side.

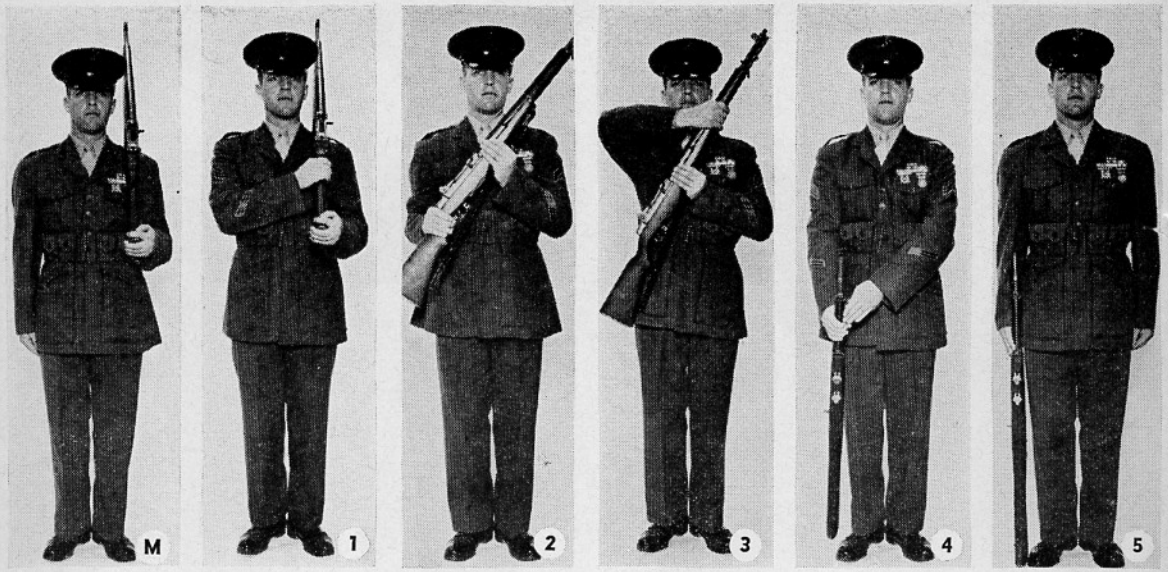
armed with the automatic rifle execute inspection arms at the commands: 1. Inspection, 2. ARMS.

g. Men armed with the automatic rifle salute with the hand salute when not in ranks, or when in ranks and the command Present ARMS is given.

h. For instructions, ceremonies, and drill, the organization commander may, at his discretion, substitute rifles for automatic rifles.

Manual of the Pistol

1. GENERAL. a. The movements herein described differ in purpose from the manual of arms for the rifle in that they are not designed to be executed in exact unison, there being, with



LEFT SHOULDER ARMS TO ORDER ARMS. COMMAND: 1. Order 2. ARMS. At the command ARMS, take the position of port arms. (THREE) Move the right hand from its grasp on the stock and regrasp the piece between the upper sling swivel and the stacking swivel. (FOUR) Release the grasp of the left hand and lower the rifle to the right so that the butt is three (3) inches from the ground barrel to the rear, left hand with fingers extended and joined steadying the rifle, forearm and wrist straight and inclining downward. (FIVE) Complete the order by lowering the rifle gently to the ground with the right hand. Cut away the left hand smartly to the side.



10.16 Trail Arms.



10.9 Sling Arms.



10.10 Present Arms.



10.11 Salute at Right Shoulder Arms.



10.12 Salute at Order Arms.



10.13 Position of Parade Rest.

only a few exceptions, no real necessity for their simultaneous execution. They are not therefore planned as a disciplinary drill to be executed in cadence with snap and precision, but merely as simple, quick, and safe methods of handling the pistol.

b. *In general, movements begin and end at the position of raise pistol.*

c. Officers and enlisted men armed with the pistol remain at the position of attention during the manual of arms, but render the hand salute at the command Present ARMS.

2. RAISE, PISTOL. 1. Raise, 2. PISTOL. At the command PISTOL, unbutton the flap of the holster with the right hand and grasp the stock, back of the hand outward. Draw the pistol from the holster; reverse it, muzzle up, the thumb and last three fingers holding the stock, the forefinger extended outside the trigger guard, the barrel of the pistol to the rear and inclined to the front at an angle of 30°, the hand as high as, and 6 inches in front of, the point of the right shoulder. (See Fig. **10.14.**)

3. WITHDRAW MAGAZINE. At the command Withdraw, MAGAZINE, without lowering the right hand, turn the barrel slightly to the right; press the magazine catch with the right thumb and with the left hand remove the magazine. Place magazine between the belt and outer garment.

4. OPEN CHAMBER. At the command Open, CHAMBER, withdraw the magazine, if not already withdrawn, and resume the position of raise pistol. Without lowering the right hand, grasp the slide with the thumb and the first two fingers of the left hand (thumb on the left side of slide and pointing downward); keeping the muzzle elevated, shift the grip of the right hand so that the right thumb engages the slide stop. Push the slide downward to its full extent and force the slide stop into its notch with the right thumb without lowering the muzzle of the pistol.

5. CLOSE CHAMBER. At the command Close, CHAMBER, with the left thumb press down the slide stop and let the slide go forward. Squeeze the trigger, being sure that the muzzle is still elevated.

6. INSERT MAGAZINE. At the command



10.14
Raise Pistol.



10.15 Inspection
Arms (Pistol).

Insert, MAGAZINE, without lowering the right hand, turn the barrel to the right. Grasp a magazine with the first two fingers and thumb of the left hand; withdraw it from the belt and insert it in the pistol. Press it fully home.

7. LOAD AND LOCK. At the command LOAD, if a loaded magazine is not already in the pistol, insert one. Without lowering the right hand, turn the barrel slightly to the left. Grasp the slide with the thumb and fingers of the left hand (thumb on right side of slide and pointing upward). Pull the slide downward to its full extent. Release the slide and engage the safety lock.

8. UNLOAD. At the command UNLOAD, withdraw the magazine. Open the chamber as prescribed in paragraph 4. Glance at the chamber to verify that it is empty. Close the chamber. Take the position of raise pistol and squeeze the trigger. Then insert an empty magazine.

9. INSPECTION ARMS. 1. Inspection, 2. ARMS. At the command ARMS, withdraw the magazine. Open the chamber as prescribed in paragraph 4. Take the position of raise pistol. The withdrawn magazine is held in the open left hand at the height of the belt. (See Fig. **10.15**.) After the pistol has been inspected or at the command 1. Return, 2. PISTOL, close the chamber, take the position of raise pistol, and squeeze the trigger, being sure that the muzzle is still elevated. Insert an empty magazine and execute return pistol.

10. RETURN PISTOL. 1. Return, 2. PISTOL. At the command PISTOL, lower the pistol to the holster, reversing it, muzzle down, back of the hand to the right; raise the flap of the holster with the right thumb; insert the pistol in the holster and thrust it home; button the flap of the holster with the right hand.

Manual of Arms with the M14 Rifle

If you have learned the manual of arms with the U.S. Rifle, Cal. .30, M1, you will have no trouble mastering the manual of arms with the newer, lighter M14. Due to the configuration of the M14, however, there are a few changes in the handling of the piece. Most notable is the manner of coming to inspection arms, order arms, and trail arms. Further, to stack arms with the M14 requires adjustment of the sling by the stackman. The following pages provide complete instructions on the execution of the manual and stacking arms.

1. General.

a. Execute FALL IN with the rifle at order arms.

b. Facings, alignments, and short-distance marching movements are executed from order arms. Side step, backward march, open and close ranks, and close and extend are short-distance movements. Forward march may be given from order arms to march units forward for a short distance. When these movements are commanded while at order arms, it is necessary to come automatically to trail arms on the command of execu-

tion for the movement. The rifle is returned to order arms upon halting.

c. Before a command for any marching movement (other than the exceptions stated in Paragraph b.) is given to armed troops, they are faced in the direction of march and their weapons brought to right shoulder, port, or sling arms by the appropriate command. After a marching movement has been completed and it is desired to execute a facing movement, the command to order or unsling arms is given, followed by the command for the facing movement.

d. When at a position other than sling arms, the troops must come to port arms for double time. When the troops are in formation, the commander gives the appropriate commands.

2. Rules for the Rifle Manual of Arms.

a. The term "at the balance" refers to a point on the rifle (Fig. **10.17**) just forward of the magazine well. In this position the little finger of the left hand is placed on the lower band. While this is not the true balance of the rifle, it is used as a reference point for instructional purposes and to facilitate the manipulation of the weapon while performing the manual of arms.

b. The position of the rifle known as "diagonally across the body" (Fig. **10.18**) is as follows:

(1) The left hand is at the balance, with the thumb and fingers grasping the rifle and sling. To do this, extend and join the fingers so as to form a "U" with the thumb.

(2) The barrel is up and at such an angle that it bisects the juncture of the neck and shoulder. The heel of the butt is on line with the right hip (Fig. **10.18**).

(3) The rifle is held at a height which allows the right forearm to be horizontal when the small of the stock is grasped with the right hand.

(4) The distance of the rifle from the body depends upon the conformation of the body, but it should be about 4 inches from the belt.

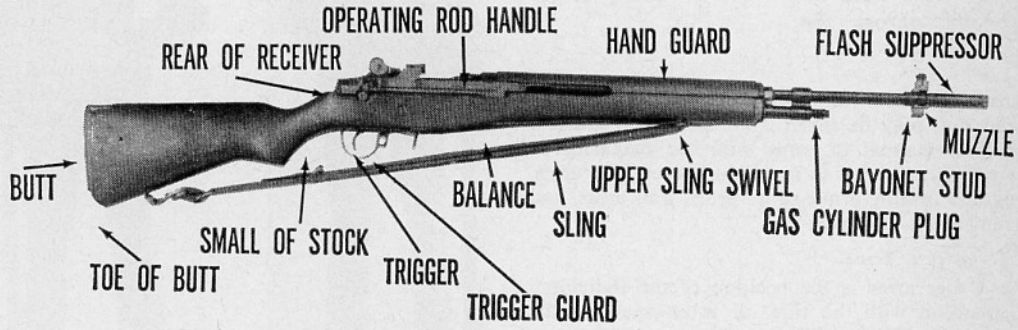
c. The cadence for rifle movements is quick time, but in early stages of instruction the movements are done more slowly until the troops can execute them with precision. They are then practiced until the proper cadence is acquired.

d. The manual for the rifle is executed while standing at the position of attention. To add interest to drill and to lessen fatigue on long marches, movements between right and left shoulder and port arms may be commanded when marching at attention in quick time.

(1) To move the rifle from the right shoulder to the left shoulder, Left Shoulder, ARMS, is commanded as the left foot strikes the deck. The first count of this movement is executed as the right foot strikes the deck and the left arm is swinging forward in a natural arc.

(2) To move the rifle from the left shoulder to the right shoulder, Right Shoulder, ARMS, is commanded as the right foot strikes the deck. The first count of this movement is executed as the left foot strikes the deck and the right arm is swinging forward in a natural arc.

e. The following positions are commanded from order arms only: inspection arms, trail arms, sling arms, fix and unfix bayonets, and the rest posi-



10.17 Drill nomenclature of the U.S. Rifle, 7.62-mm., M14.



10.18 Rifle held diagonally across the body.



10.19 Order arms.

tions at order arms. Port arms is the only command that may be given from inspection arms.

f. The manual of arms with the magazine in the rifle is restricted to inspection arms, port arms, sling and unsling arms, order arms, trail arms, and fix and unfix bayonets.

3. Order Arms.

a. Order arms is the position of the individual at attention with the rifle. It is assumed on the command, ATTENTION, from any of the rest positions except fall out. Order arms is assumed on the command, FALL IN, and on the command Order, ARMS, from any position in the manual except inspection arms and sling arms.

b. At order arms, the position of attention is maintained except for the right arm and rifle. The rifle butt is placed on the deck with the barrel to the rear and the toe of the butt against and on line with the toe of the right shoe. The upper part of the handguard is grasped with the right hand in a V formed by the fingers and the thumb. The fingers are placed diagonally so the tips of the index finger and the thumb are grasping the sides of the stock; the right arm is kept behind the rifle so the thumb is along the trousers seam (Fig. **10.19**).

4. Rest Positions With the Rifle. Rest positions with the rifle are commanded and executed as without arms, with the following exceptions and additions:

a. On the command, Parade, REST, the left foot is placed 12 inches from and on line with the right foot. The rifle butt is kept against the right foot, the butt toe on line with the shoe toe. The barrel of the rifle rests against the hip along the seam of the trousers as in the position of attention. The grasp of the rifle is unchanged. The left hand is placed behind the back just below the belt line with the fingers and thumb extended and joined and the palm facing the rear (Fig. **10.20(2)**).



10.20(1) Parade rest.



10.20(2) Continued.

b. On the command, AT EASE, or REST, the right foot remains in place and the rifle is held as in parade rest with the right arm relaxed slightly.

c. When at sling arms, rest positions are commanded and executed as described in paragraph 13.e.

d. Armed troops must be at attention at order arms, port arms, stack arms, or unsling arms before FALL OUT may be given.

5. Trail Arms.

a. For instructional purposes, the command, Trail, ARMS, may be used to teach the position at a halt. At the command, ARMS, the rifle is raised vertically 3 inches off the deck with the wrist straight and the thumb along the seam of the trousers; the grasp of the rifle does not change (Fig. **10.21**). This movement is executed in one count.



10.21 Trail arms.

b. At the command, Order, ARMS, the rifle is lowered vertically to the position of order arms. For instructional purposes when Trail, ARMS, is commanded, the rifle is held at the trail until Order, ARMS, is given.

6. Port Arms.

a. The command is Port, ARMS.

b. This is a 2-count movement from order arms. At the command, ARMS, the rifle is raised diagonally across the body with the right hand; the left hand grasps the rifle at the balance and holds it so that it is 4 inches from the belt. The left elbow is held down without strain (Fig. **10.22(1)**). On the second count, the rifle is regrasped with the right hand at the small of the stock, fingers and thumb closed around the stock (Fig. **10.22(2)**). The right forearm is horizontal and the elbows are against the sides.





10.22(1) Port arms. 10.22(2) Continued.

c. From port arms to order arms is a 3-count movement. At the command, ARMS, the right hand is moved to regrasp the upper part of the handguard without moving the rifle (Fig. **10.22(1)**). On the second count, the left hand is removed from the balance, and the rifle is lowered to the right side with the right hand until the butt is 3 inches from the deck. The left hand is placed immediately below the bayonet stud, fingers and thumb extended and joined, palm to the rear, to steady the rifle and hold the barrel

vertical (Fig. **10.23**). On the third count, the left hand is cut sharply to the side while the rifle is lowered gently to the deck, and the position of order arms is assumed.



10.23 Next to last count of order arms.

7. Right Shoulder Arms.

a. The command is Right Shoulder, ARMS.

b. When executed from order arms, right shoulder arms is a 4-count movement. At the command, ARMS, the first count of port arms is executed as described in paragraph 6 (Fig. **10.24(1)**). The right elbow is held down without strain. On the second count, the rifle is regrasped at the butt with the right hand, the heel of the butt between the first two fingers, and the thumb and fingers closed around the heel with the thumb and forefinger touching, Fig. **10.24(2)**). On the third count, the rifle is placed on the right shoulder with the grasp of the right hand unchanged. At



10.24(1) Right shoulder arms.



10.24(2) Continued.



10.24(3) Continued.



10.24(4) Continued.

the same time, the left hand is moved from the balance to the small of the stock where it is used to guide the rifle to the shoulder (Fig. **10.24(3)**). The thumb and fingers are extended and joined with palm turned toward the body. The first joint of the left forefinger touches the rear of the receiver. The left elbow is kept down. On the fourth count, the left hand is cut smartly back to its position by the side, as at attention. The right forearm is horizontal with the right elbow against the side and on line with the back (Fig. **10.24(4)**).

c. The return to order arms is a 4-count movement. On the command, ARMS, the rifle butt is pulled quickly toward the body with the right hand. As the rifle clears the shoulder, the right hand smartly twists the stock 90° in a clockwise direction, causing the rifle to be guided diagonally across the body. At the same time, the left hand is brought up to catch the rifle at the balance, smartly and audibly. On the second count, the right hand is moved up to grasp the upper part of the handguard. The third and fourth counts are executed the same as the second and third counts used in executing order arms from port arms as described in paragraph 6.c.

d. Right shoulder arms from port arms is a 3-count movement. On the first count, the rifle is grasped at the butt with the right hand as in coming to right shoulder from order arms. The last 2 counts are the same as the last 2 counts in moving from order to right shoulder arms.

e. Port arms from right shoulder arms is a 2-count movement. The first count is the same as the first count from right shoulder to order arms. On the second count, the rifle is regrasped with the right hand at the small of the stock in the position of port arms.

8. Left Shoulder Arms.

a. The command is Left Shoulder, ARMS.

b. To move the rifle to left shoulder arms from the order, the rifle is brought to port arms in the first two counts (Figs. **10.22(1)** and **(2)**). On the third count, the rifle is placed on the left shoulder with the right hand and at the same time the stock of the rifle is driven smartly and audibly into the palm of the left hand as the right arm comes across the body. The butt is grasped with the left hand (Fig. **10.25(1)**). On the fourth count, the right hand is cut smartly to the side as in the position of attention (Fig. **10.25(2)**).

c. Port arms from left shoulder arms is a 2-count movement. On the first count, the right hand moves up and across the body and grasps



10.25(1) Count 3 of left shoulder arms from order arms.



10.25(2) Continued.

the small of the stock and the right arm is pressed against the body (Fig. **10.25(1)**). On the second count, the rifle is brought from the shoulder and diagonally across the body with the right hand and regrasped at the balance with the left hand as in the position of port arms. (Fig. **10.22(2)**).

d. Order arms or right shoulder arms from left shoulder arms is a 5-count movement. On the first 2 counts, the rifle is brought to port arms. On the last 3 counts, it is possible to go to order arms or right shoulder arms as described in Paragraphs 3 and 7.

9. Present Arms.

a. The command is, Present, ARMS.

b. Order arms to present arms is a 2-count movement. On the first count, the rifle is raised and carried to the center of the body. It is held vertically, approximately 4 inches from the body with the barrel to the rear. The right elbow is down. The rifle and sling are grasped at the balance with the left hand. The left forearm is horizontal and the left elbow is against the side (Fig. **10.26(1)**). On the second count, the right hand regrasps the rifle at the small of the stock (Fig. **10.26(2)**).



10.26(1) Present arms.



10.26(2) Continued.

c. Order arms from present arms is a 3-count movement. On the first count, the rifle is grasped at the upper part of the handguard with the right hand (Fig. **10.26(1)**) with the right elbow kept down and against the side. The rifle is lowered to the deck with the right hand on counts 2 and 3 as in port arms to order arms.

d. Port arms from present arms is executed in one count. The rifle is raised and twisted with the right hand, the muzzle moves to the left, and the rifle is regrasped at the balance with the left hand (Fig. **10.22(2)**).

e. Present arms from port arms is executed in one count. The rifle is lowered and twisted with the right hand while being moved into a vertical position where it is regrasped at the balance with the left hand.

10. Inspection Arms (Without Magazine).

a. The command is Inspection, ARMS. It is a 4-count movement, executed only from order arms.

b. At the command, ARMS, the rifle is raised diagonally across the body with the right hand and is grasped with the left hand at the balance as in the first count of port arms. On the second count, the right hand grasp is released and the right hand slides down the rifle with the fingers extended and joined, until the knife edge of the hand comes in contact with the operating rod handle (Fig. **10.27(1)**). At this time, the thumb is on the opposite side of the receiver. On the third count, the operating rod handle is pressed sharply to the rear and the bolt lock is depressed with the thumb so that the bolt is locked in the rearmost position. At the same time, the head and eyes are lowered to check the receiver (Fig. **10.27(2)**). On the fourth count, having found the receiver empty or having emptied it, the head and eyes are raised to the front and the rifle is regrasped at the small of the stock as in port arms.



10.27(1) Inspection arms without magazine.



10.27(2) Continued.

c. Port, ARMS, is the only command that is given from inspection arms. On the preparatory command, the grip on the small of the stock is relaxed to permit the index finger to hook around the operating rod handle, pulling it slightly to the rear so that the bolt lock will be released (Fig. **10.28(1)**). At the command, ARMS, the operating rod handle is released, the trigger pulled, and the small of the stock regrasped in the position of port arms.

11. Inspection Arms (With Magazine).

a. The command is, Inspection, ARMS. It is a 4-count movement with the first two counts the

same as inspection arms without the magazine. On the third count, the operating rod handle is pressed sharply to the rear with the knife edge of the right hand until the bolt engages the magazine follower. At the same time, the head and eyes are lowered to check the receiver. On the fourth count, having found the receiver empty or having emptied it, the head and eyes are raised and the rifle is regrasped at the small of the stock as in port arms.

b. Port, ARMS, is the only command given from inspection arms. On the preparatory command, the right hand releases the rifle and, with fingers extended and joined, the knife edge of the hand is pressed against the operating rod handle. After the operating rod handle is pressed to the rear, the thumb is inserted in the rearmost part of the receiver to depress the magazine follower. The bolt is allowed to slide forward slightly (Fig. **10.28(2)**). On the command, ARMS, the operating rod handle is released. The right hand is returned to the small of the stock, the trigger is pulled, and the position of port arms is assumed.



10.28(1) Port arms from inspection arms.



10.28(2) Continued.

12. Rifle Salutes.

a. This movement may be executed from order arms, trail arms, right shoulder arms, or left shoulder arms. For instructional purposes, the command, Rifle, SALUTE, may be used. The rifle salute is a 2-count movement.

b. When at order arms, the left arm moves across the body on the first count, with the forearm and wrist straight, fingers and thumb extended and joined, and palm down. The first joint of the forefinger touches the rifle at a point below the bayonet stud (Fig. **10.29(1)**). If not in ranks, the head and eyes turn toward the person or color saluted. On the second count, the left hand is cut smartly to the side and the head and eyes are turned to the front.

c. When saluting at trail arms, the movements are identical with those for saluting at order arms, except that the rifle is held in the trail arms position.

d. At right shoulder arms, the movement is executed by moving the left arm across the chest and touching the first joint of the forefinger to the rear of the receiver. The left elbow is held so that the left forearm is horizontal. Fingers, thumb, and wrist are held as described in Paragraph b. The palm is down (Fig. **10.29(2)**). The second count of the rifle salute at right shoulder arms is executed by cutting the left hand smartly to the side.



10.29(1) Rifle salute.



10.29(2) Continued.

13. Sling and Unsling Arms.

a. The command, Sling, ARMS, is given only from order arms. This movement is not executed in cadence. If the sling is not adjusted, the butt of the rifle is placed on the right hip and the rifle is cradled in the crook of the right arm at the command of execution. The sling is adjusted with both hands and the rifle is then slung over the right shoulder in the most convenient manner. When at sling arms, the sling is grasped with the right hand, keeping the right forearm horizontal and holding the barrel of the rifle vertical (Fig. **10.30**). If the sling is already adjusted, the rifle is slung in the most convenient manner at the command of execution.



10.30 Sling arms.



10.31 Fix and unfix bayonets.

b. The command Unsling, ARMS, is given only from the position of sling arms. At the command of execution, the rifle is unslung and brought to the position of unsling arms by steadying the rifle with the left hand. The positions of order arms and unsling arms are the same except that at unsling arms the sling is loose.

c. So that precise movements of the manual can be executed, the command, Adjust, SLINGS, is given. At the command, SLINGS, the sling is tightened while holding the rifle as described in Paragraph a.

d. To salute while at sling arms, on the command, ARMS, of Present, ARMS, the sling is grasped with the left hand to steady the rifle. The palm of the left hand is to the rear and the forearm is horizontal. At the same time, the sling is released with the right hand and the first count of the hand salute is executed. At the command, ARMS, of Order, ARMS, the right hand and arm are moved smartly to the side as in the position of attention and then the original position of sling arms is resumed.

e. When at sling arms, parade rest, rest, and at ease are executed as from order arms except that the rifle is held slung with the right hand. When the command, REST, is given, the rifle may be unslung. When calling a unit to attention, the position of parade rest at sling arms is assumed on the preparatory command.

14. Fix And Unfix Bayonets.

a. These movements are not executed in cadence.

b. On the command Fix, BAYONETS, the muzzle of the rifle is moved across the body and regrasped with the left hand below the gas cylinder plug. The snap on the scabbard is unfastened and the bayonet is grasped with the right hand, as shown (Fig. **10.31**). The bayonet is drawn from the scabbard. The point of the bayonet is turned skyward and the bayonet is fixed on the muzzle of the rifle with a downward motion. After the bayonet is fixed, the position of order arms is assumed.

c. The command Unfix, BAYONETS, is given only at the position of order arms.

d. At the command, BAYONETS, the rifle is moved to the left hand as when fixing bayonets. The rifleman glances down and grasps the handle of the bayonet with the right hand, the palm toward the body. The bayonet catch spring is pressed with the inside of the forefinger. The bayonet is raised vertically until the handle is approximately a foot above the muzzle of the rifle. Then, keeping the eyes on the point of the bayonet, the rifleman returns the bayonet to the scabbard, reversing the movements of its withdrawal. The snap on the bayonet scabbard is fastened with the left hand and the position of order arms is assumed. The bayonet is carried in the scabbard with the ring to the front.

e. Safety precautions should be observed when fixing bayonets while the rifle is held diagonally across the body with the left hand. Tap the base of the bayonet handle with the heel of the right hand, to make sure that the bayonet is secure. If resistance is met when unfixing the bayonet, thrust the bayonet into the ground, blade facing the right toe. Then press the bayonet release with the toe of the right shoe and remove the rifle

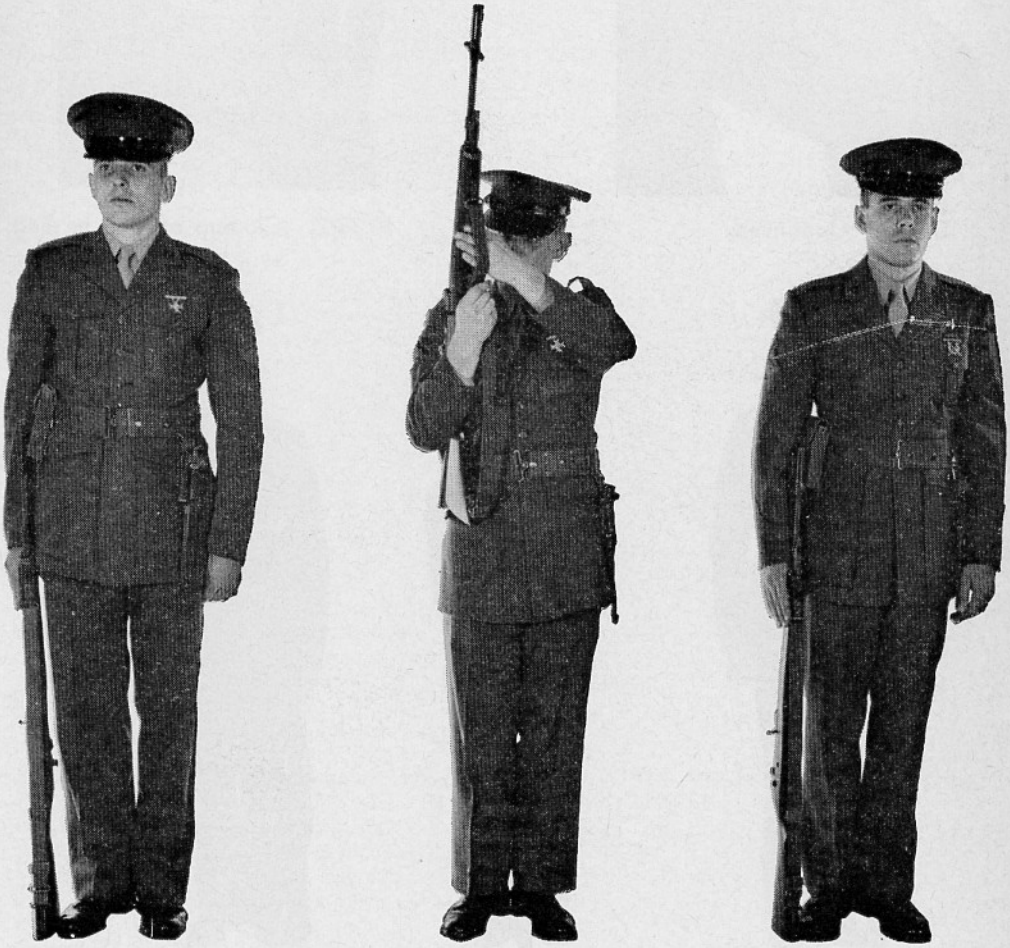
from the bayonet. The blade of the bayonet is not touched with the bare hands.

15. To Stack Arms.

a. The members of the squad stack arms from their positions in line at normal interval on the command of Stack, ARMS. After the squad counts off, the commander designates the stackmen by numbers and then gives the command, Prepare, SLINGS.

b. At the command, SLINGS, the stackman places the butt of his rifle on his right hip and cradles it in the crook of his right arm (Fig. **10.32(1)**). He then adjusts the sling keeper to form a 4-inch loop (a palm's width within the loop) next to the upper sling swivel (Fig. **10.32(2)**). As soon as he has prepared the loop, the stackman returns to order arms. After all stackmen are at order arms, the command Stack, ARMS, is given.

c. At the command, ARMS, the stackman places his rifle directly in front of and centered on his body with the sling facing to the front (Fig. **10.33(1)**). The heel of the rifle butt is on the deck on line with the toes of the stackman. The stackman grasps the rifle by the handguard with



10.32(1) Preparing sling to stack arms.



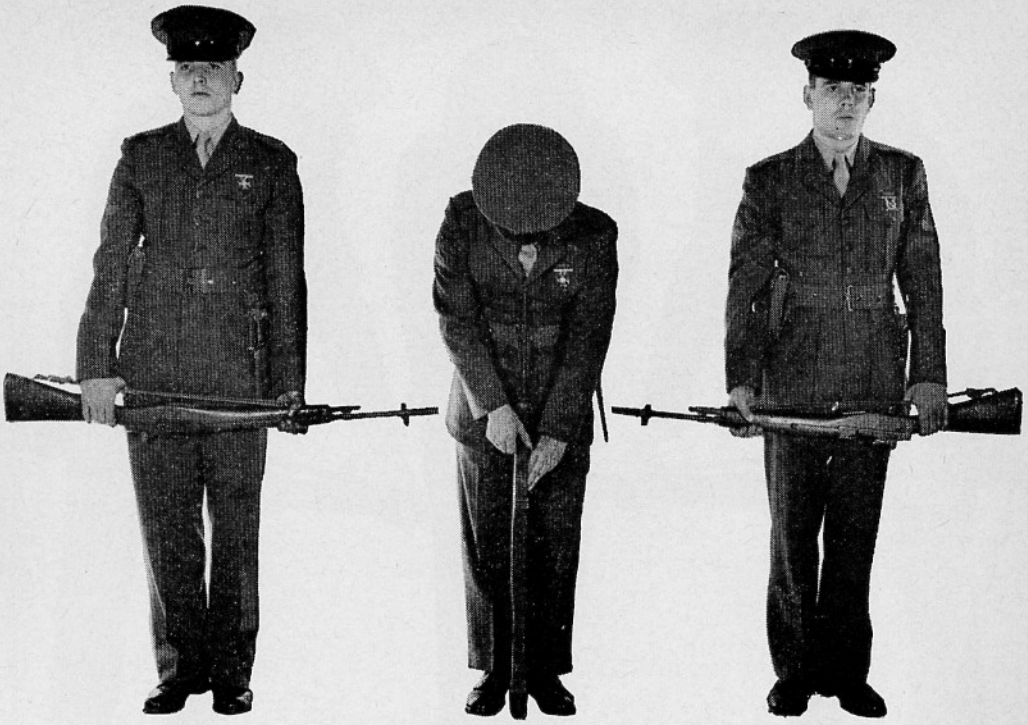
10.32(2) Continued.



10.33(2) Closeup of loop in sling.



10.33(1) Stack arms.



10.33(3) Continued.

his left hand. The first two fingers of the left hand hold the inner part of the loop against the rifle. He reaches across the front of the rifle with the right hand, grasps the outer part of the loop, and holds it open for the insertion of the other rifles (Figs. **10.33(2)** and **(3)**). He holds the rifle vertical at all times.

d. After the stackman has positioned his rifle, the men on his right and left perform the following movements simultaneously:

(1) The man on the stackman's left raises and rotates his rifle, sling up, to a horizontal position across his body, muzzle to the right. At the same time, he grasps the rifle at the small of the stock with the left hand, palm downward, over the sling. He continues to grasp the upper part of the handguard with his right hand. He lets both arms hang naturally, holding the weapon in a horizontal position (Fig. **10.33(3)**).

(2) The man on the stackman's right moves his rifle vertically and across his body with his right hand until his wrist is shoulder high in the center of the body. He grasps the rifle with his left hand immediately under the right hand, palm over the sling. He then lowers his right hand to the small of the stock, palm facing the sling, and turns the rifle until the sling is up, muzzle to the left, and the rifle is in a horizontal position. He lets his arms hang naturally (Fig. **10.33(3)**).

(3) As soon as both men have completed these movements, each moves his foot that is nearest the stackman 18 inches to the oblique and toward the stackman. In a continuing motion, the man on the stackman's left inserts the muzzle of his rifle into the loop held by the stackman until the bayonet stud protrudes past the far end of the loop (Fig. **10.33(4)**). He holds his weapon in this position until the man on the stackman's right inserts the muzzle of his rifle through the loop in the same manner. The muzzle



10.33(4) Continued.

of the second rifle is on top.

e. When both rifles have been inserted into the loop, the men on each side of the stackman swing the butts of their rifles outward and down to the deck until the stack is tight with the rifle butts on line and approximately 2 feet from the base line (Fig. **10.33(5)**).

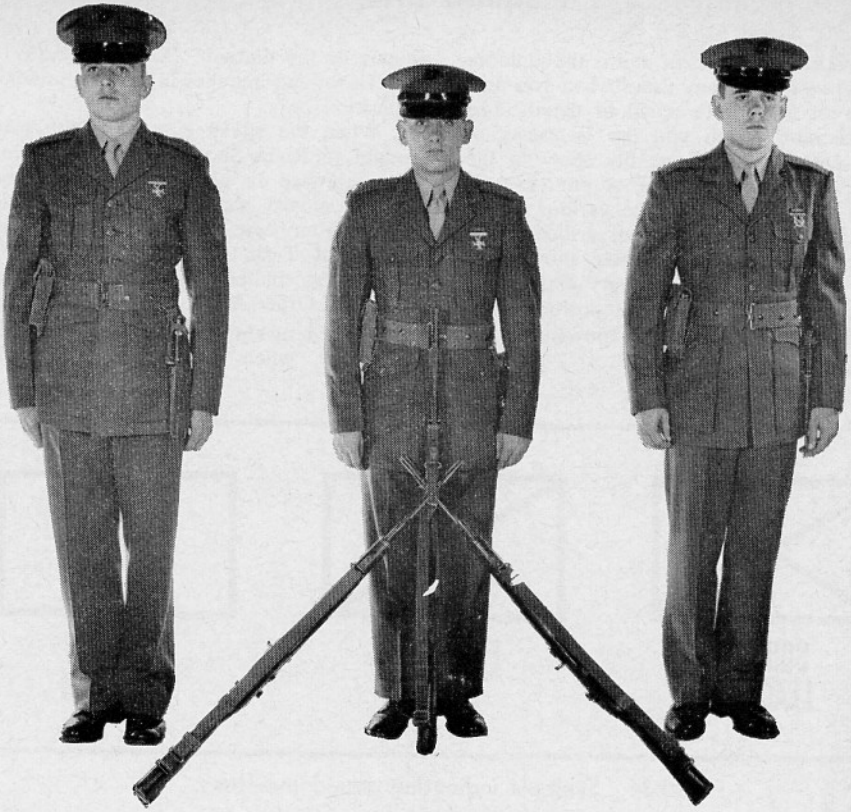
f. After necessary adjustments have been made, all three men come back to the position of attention (Fig. **10.33(5)**).

g. Extra rifles are passed to the nearest stack on the right. As each rifle is passed, it is grasped at the upper part of the handguard with the right hand. Then, with the rifle held vertically, it is passed with fully extended arm to the right front. The man on the right grasps the rifle at the balance with his left hand, brings the rifle to the center of his body, and regrasps it at the upper part of the handguard with his right hand. This action continues until the stackman receives the rifle and places it on the stack with his right hand as nearly vertical as possible. He places the rifles on the stack with the slings away from the stack.

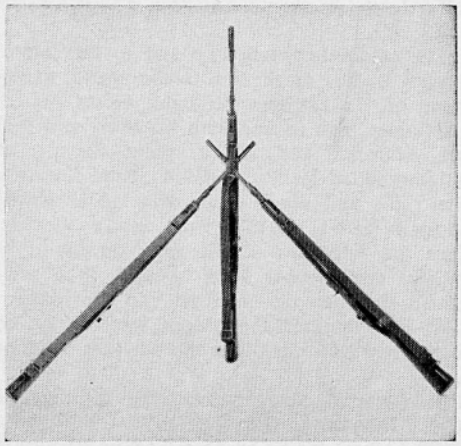
16. To Take Arms.

a. The squad in position, on line behind the stacks, takes arms at the command, Take, ARMS.

b. At the command, ARMS, the stackman passes each extra rifle towards its bearer. The rifles are handled in the manner described for passing them to the stack (left hand at the balance, right hand at the upper part of the handguard). As the men receive their rifles, they resume the position of order arms.



10.33(5) Continued.



10.33(6) Continued.

c. After all extra rifles have been returned, the stackman grasps the base rifle, holding the loop open as in stack arms.

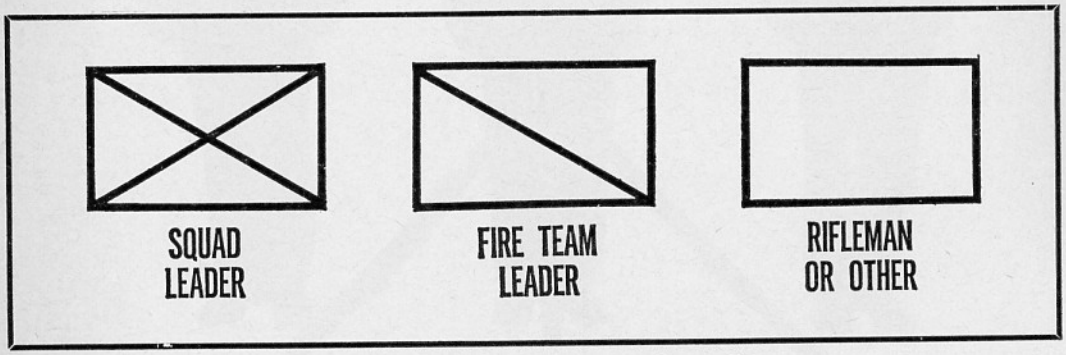
d. The men to the right and left of the stackman take one step to their left and right fronts, respectively. They reach down and grasp their rifles, bringing them to a horizontal position. They grasp them as shown in Figure **10.33(4)**. The man to the right of the stackman frees his rifle from the stack first. Each man returns to order arms after retrieving his rifle. He does this by guiding and steadying the rifle with his left hand as in the next to last count of order arms.

e. The stackman adjusts the sling of his rifle before returning to order arms.

Squad Drill

1. General. The basic drill unit is the platoon. However, there will be many times when you drill as a member of a separate squad or detail. The snap and precision which you use in execution of the drill commands will readily show in the performance of the squad, detail, or platoon as a whole. This section describes the various movements used in squad drill. A well drilled squad is one which can execute all these movements alone or as part of a platoon. Every man in the squad should be able to drill in any position within the squad. For this reason the movements are described in detail.

2. To form the squad. The squad forms at normal or, when directed to do so, at close interval.



10.34 Symbols indicating squad members.

a. Figure **10.34** shows the symbols used to indicate the positions of squad leader, fire team leader, and riflemen or other members of the squad.

b. Squads are formed for the purposes of instruction, discipline, control, and for becoming part of the platoon.

c. Squad members take post, move and execute the manual of arms as described in the first portions of this chapter. All members execute movements at the same time except where otherwise described.

d. The integrity of the squad should be retained whenever possible. Normal formation for the squad is a single rank or file. This permits variation in the number of men composing the squad, since all squads are not alike. The squad always forms on line, but may assume a column formation on command. A squad may be formed in two lines or two columns except when drilling as part of the platoon. See Fig. **10.35.**

e. The squad marches in line for minor changes in position only.

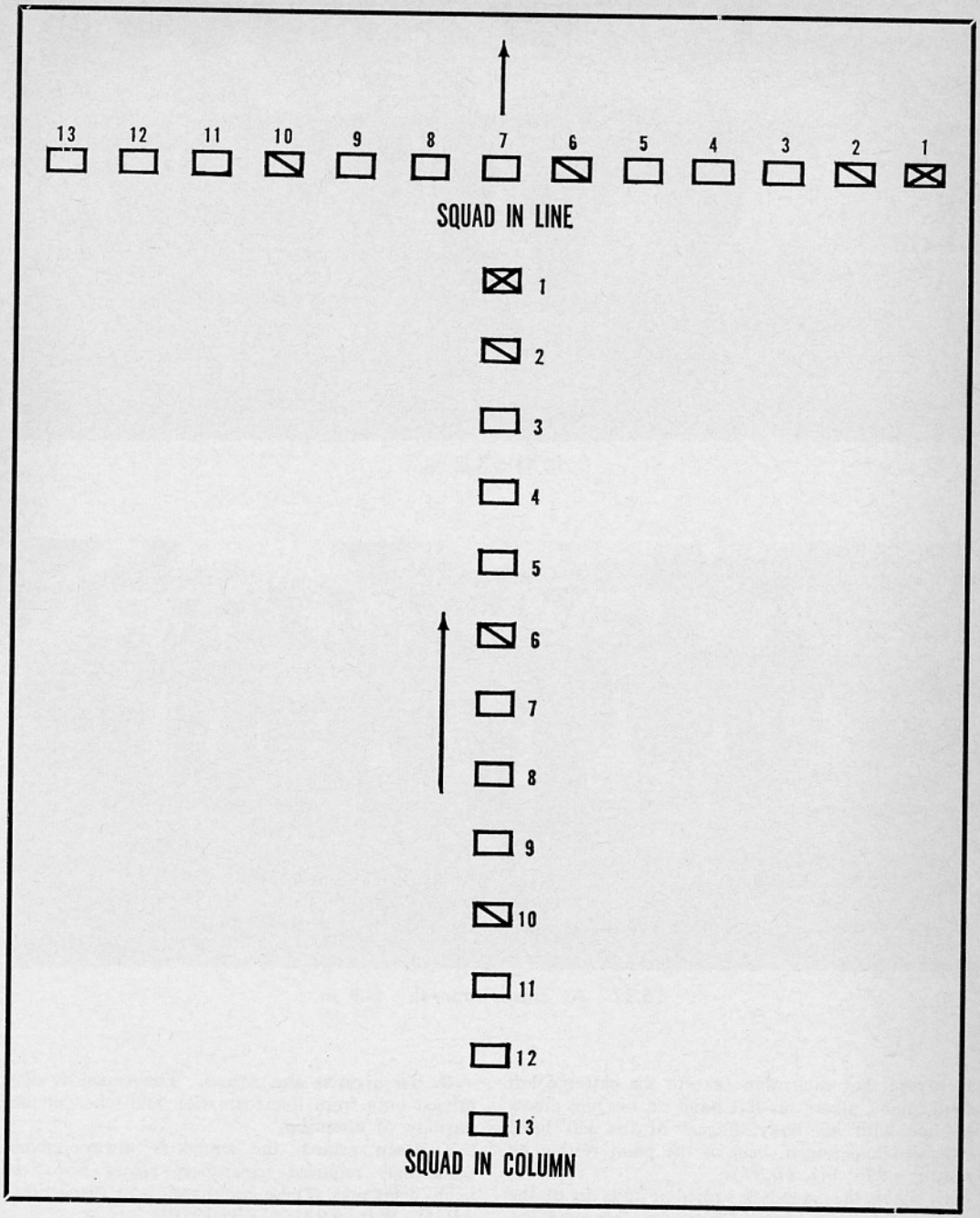
f. When the squad is armed with rifles, it is brought to Right Shoulder or Sling Arms before being marched in column. However, the squad may be moved short distances at Trail Arms. In this latter case, the squad may assume the position of Trail Arms automatically and will, upon being halted, automatically resume the position of Order Arms.

a. To form at normal interval, the command is FALL IN.

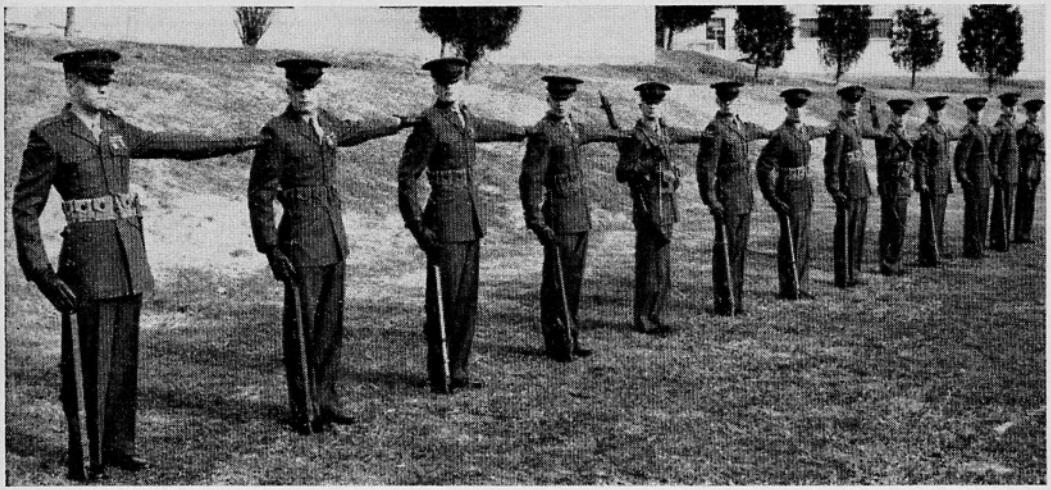
b. The squad forms in line and to the left of the squad leader. Each man in the squad, except the man on the extreme left flank, raises his left arm shoulder high in line with his body and with fingers extended and joined, palm down. All except the squad leader turn their head and eyes to the right and place themselves on line with the squad leader so that each man's shoulder touches the fingertips of the man on his right. (See Fig. **10.36**). As soon as each man is in line with the man on his right and the man on his left has obtained the proper interval, he returns smartly and quickly to the position of attention.

c. To form at close interval, the command is At Close Interval, FALL IN.

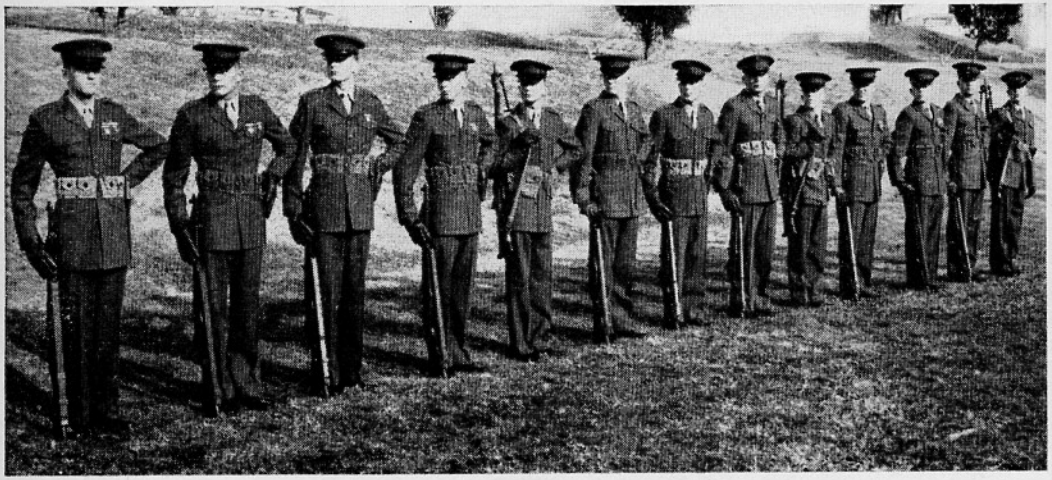
d. The squad forms as described in Paragraph



10.35 Squad formations.



10.36 Fall in.



10.37 At close interval. Fall in.

b, except that each man (except the extreme left flank man) places his left hand on his hip, elbow in line with his body, fingers of the left hand extended and joined, heel of the palm resting on the hip. (See Fig. **10.37**).

e. When the squad is armed it falls in at the position of order arms. Pieces are inspected immediately after the squad is formed.

3. To dismiss the squad. The squad is dismissed only from line formation and when at the position of attention.

a. When armed, the squad is always given commands required to inspect pieces prior to being dismissed. These commands are: Inspection, ARMS; Port, ARMS; DISMISSED.

b. Unarmed squads are dismissed with the

command, DISMISSED.

4. To count off. Counting off is done in the cadence of quick time.

a. The squad in line, the command is, COUNT OFF. At the command, all men except the man on the right flank turn their heads smartly and look to the right. The right flank man shouts ONE. The remaining members of the squad, in sequence, call ascending numbers proceeding down the squad to the left. As each man shouts his number, he turns his head smartly back to the front.

b. When the squad is in column the command is, From Front To Rear, COUNT OFF. Each man, starting with the front man, turns his head to the right and smartly shouts his number as he turns his head back to the front.

5. To align the squad.

a. The squad in line, the commands are: Dress Right (Left), DRESS; Ready, FRONT. It may be desired to align the squad at close interval. If so, the commands then become: At Close Interval, Dress Right, DRESS; Ready, FRONT.

b. At the command of execution, DRESS, all members of the squad except the right flank man turn their heads smartly, look, and align themselves to the right. At the same time all except the left flank man extend their left arms shoulder high (or, if forming at close interval, place their hands on hips). All men except the right flank man position themselves by short side steps until they are on line and their shoulders are touching the fingertips of the man on the right. (If at close interval, then elbows will be touching the elbow of the man on the right.) (See Figs. **10.36** and **10.37**.) This position is held until the command Ready, FRONT is given. On the command FRONT all men resume the position of attention by placing arms at their sides and smartly turning their head and eyes to the front.

c. The left arm is used to obtain the proper interval whether dressing to the right or to the left.

6. To obtain close interval from normal interval when in line.

a. The command is Close, MARCH.

b. At the command, MARCH, all members, except the man on the right flank, face to the right in marching. The right flank man places his left hand on his hip. Others march toward the right flank man until approximately a 4-inch interval is obtained. They then halt, face to the left and place left hands on hips as when dressing at close interval. As each man feels the man on his left assume the proper interval, he lowers his left hand smartly and turns his head to the front.

7. To obtain normal interval from close interval when in line.

a. The command is Extend, MARCH.

b. At the command, MARCH, all men, except the right flank man, face to the left and march away from the man on the right, until approximate normal interval has been obtained. They then halt and face to the right. They form at normal interval by extending the left arm at shoulder height and dressing to the right. Each man lowers his left arm smartly and turns his head to the front when the man on his left has assumed the proper interval.

8. To obtain double interval when in line.

a. From either close or normal interval, the command is, Take Interval To the Left (Right), MARCH. At the command, MARCH, squad members move as when extending from close to normal interval except that double-arm interval is obtained by each man raising both arms and touching the fingertips of the man on either side. The right flank man raises only his left arm and the left flank man raises only his right arm. Each man lowers his right arm when he has proper interval and lowers his left arm when the man on his left lowers his right arm. Each man turns his head smartly to the front as he lowers his right arm. Armed troops are given this command only when at sling arms.

b. To obtain normal interval from double-arm interval the command is, Assemble To The Right (Left), MARCH. This movement is executed in the same manner as Close, MARCH except that normal interval is obtained.

9. To march to the flank from in line.

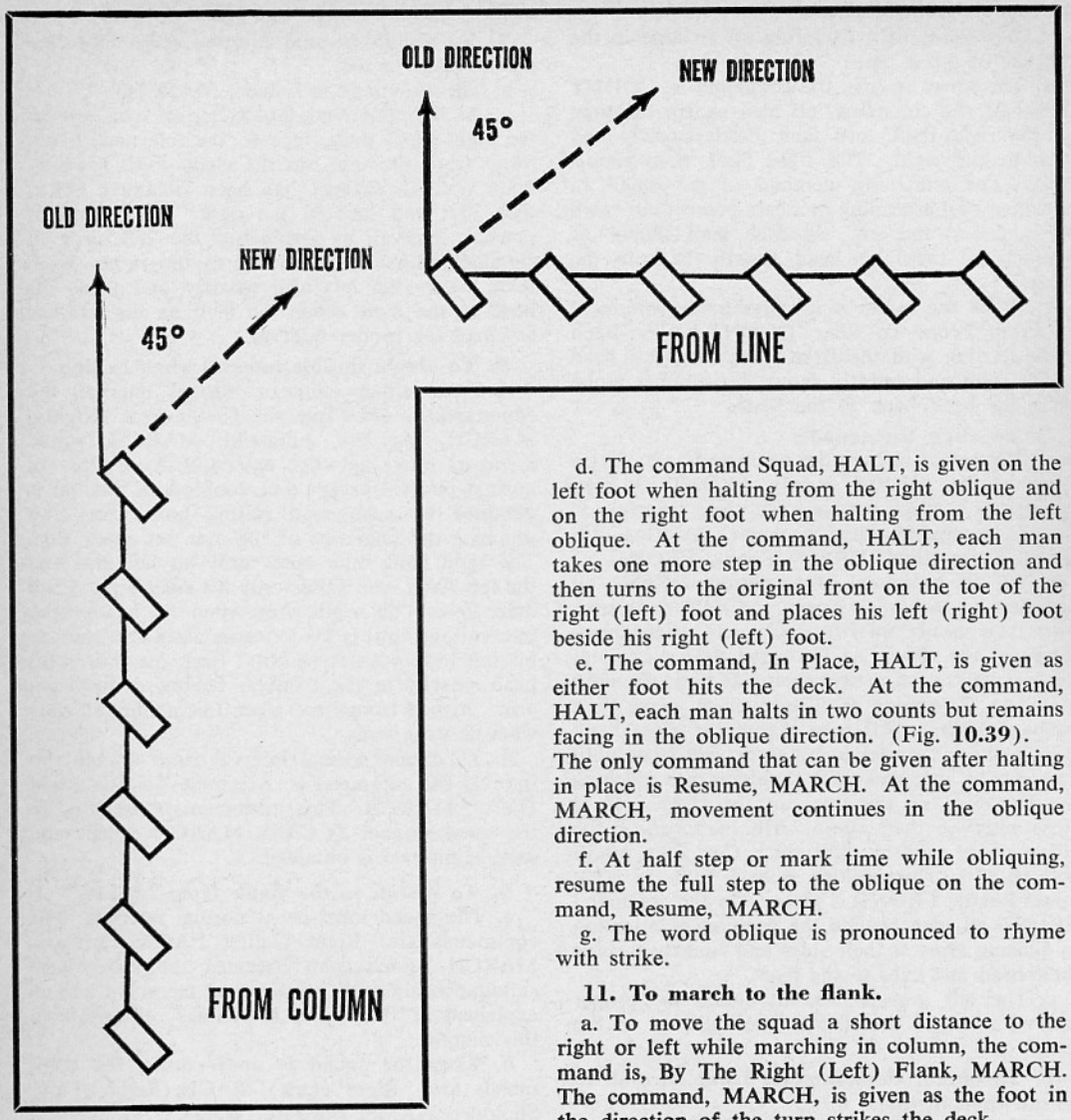
a. The squad must be at normal interval. The commands are: Right (Left), FACE; Forward, MARCH. Each man executes the movements simultaneously with other squad members and as explained in "Steps and Marchings" elsewhere in this chapter.

b. When the squad is under arms, the commands are: Right (Left), FACE; Right (Left) Shoulder, ARMS; Forward, MARCH.

10. To march to the oblique.

a. When marching in any formation, the command is Right (Left) Oblique, MARCH.

b. At the command, MARCH, which is given as the foot in the direction of the turn strikes the deck, each man takes one more step forward, then faces to the half right (left) in marching, and steps off at a 45° angle from his original direction of march (Fig. **10.38**).



10.38 Marching to the oblique.

c. The command, Forward, MARCH, is given to resume the original direction of march. It is given as the foot toward the original front strikes the deck. At the command, MARCH, each man takes one more step in the oblique, then faces half right or left (as required) in marching, and then steps off to the original front.

d. The command Squad, HALT, is given on the left foot when halting from the right oblique and on the right foot when halting from the left oblique. At the command, HALT, each man takes one more step in the oblique direction and then turns to the original front on the toe of the right (left) foot and places his left (right) foot beside his right (left) foot.

e. The command, In Place, HALT, is given as either foot hits the deck. At the command, HALT, each man halts in two counts but remains facing in the oblique direction. (Fig. **10.39**). The only command that can be given after halting in place is Resume, MARCH. At the command, MARCH, movement continues in the oblique direction.

f. At half step or mark time while obliquing, resume the full step to the oblique on the command, Resume, MARCH.

g. The word oblique is pronounced to rhyme with strike.

11. To march to the flank.

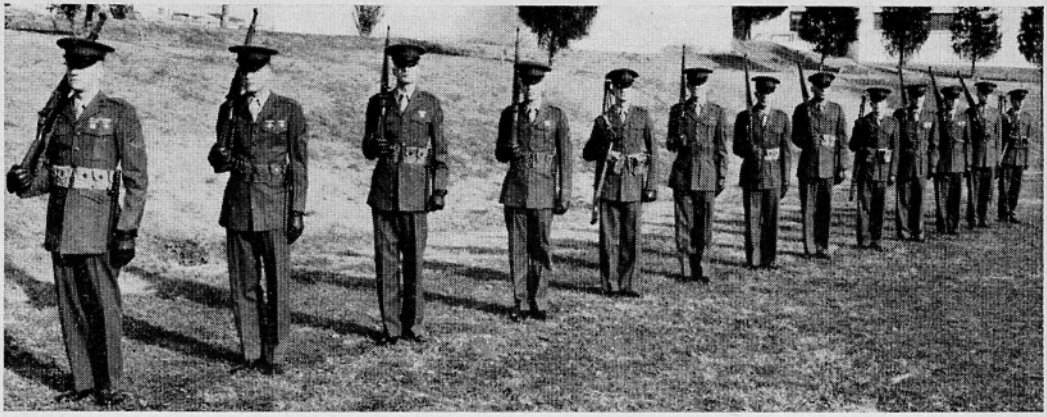
a. To move the squad a short distance to the right or left while marching in column, the command is, By The Right (Left) Flank, MARCH. The command, MARCH, is given as the foot in the direction of the turn strikes the deck.

b. At the command, MARCH, each man takes one more step, then faces to the Right (Left) in marching and steps out in the new direction. This command will not be given while the squad is at a halt.

12. To change the direction of a column.

a. The command is Column Right (Left), MARCH.

b. The command, MARCH, is given as the



10.39 In Place, HALT

foot in the direction of turn strikes the deck. At the command, MARCH, the front man faces to the right (left) in marching and steps out in the new direction of march. Other men in the column continue the march to the point where the front man pivoted. Upon reaching this point, they successively execute the pivot and march out in the new direction.

c. When the squad is halted, at the command, MARCH, the front man faces to the right (left) in marching by turning to the right (left) on his right toe and steps out with his left foot in the new direction. Other members of the squad march forward to the pivot point. They then face to the right (left) successively, in marching, and step out in the new direction.

d. For slight changes of direction, the command INCLINE TO THE RIGHT (LEFT) may be given. At the command, the front man changes direction as commanded. All other men march forward to the pivot point and then pivot so as to follow the line of march established by the front man. This is not a precision movement. It is executed only when marching in a column.

13. To stack arms with the M1 Rifle.

a. Members of the squad stack arms from their positions in line at normal or close interval. Numbers 3, 7, and 11 are designated as stackmen except when there is no one on their left. If the squad contains more than 14 men, additional stackmen will be designated. The commands are: Count, OFF; Numbers 3, 7, and 11 (more if required) Are Stackmen; Stack, ARMS.

b. At the command, ARMS, the man on the left of the stackman grips his rifle by the upper hand guard, raises it with the muzzle straight up until his right arm is level with the deck. He then passes his rifle to the stackman, who grips it with his left hand at the upper hand guard just below the stacking swivel.

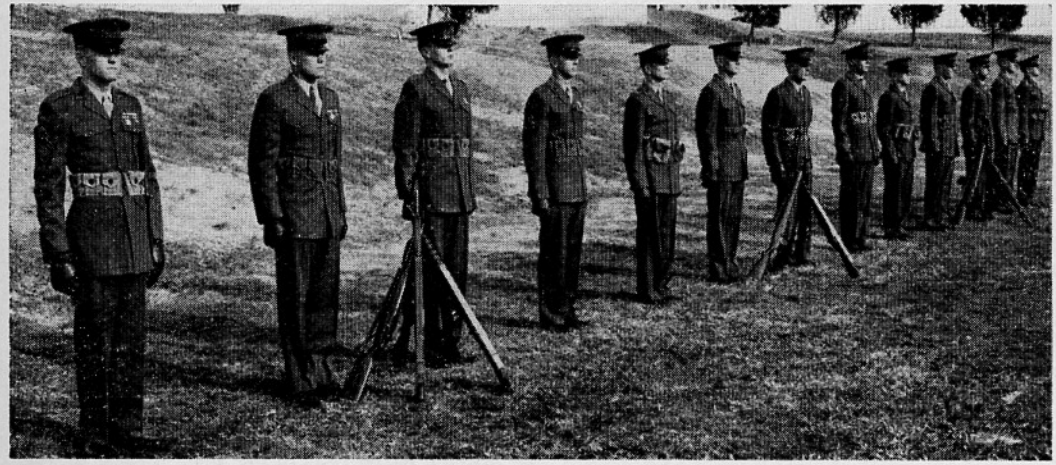
c. The stackman places the butt of the left rifle between his feet, with the barrel to the front, muzzle tilted forward. He raises the stacking swivel of the left rifle with his left thumb and forefinger. Then he swings the butt of his own rifle 2 feet in front and 6 inches to the right of his right toe. He then shifts his right hand to the stacking swivel, which he engages with that of the left rifle.

d. The man on the right of the stackman grips his rifle with his right hand at the small of the stock, his left hand near the stacking swivel. Without moving his right foot, he steps to the left front and carries his rifle well forward, barrel up. With the forefinger of his left hand, he hooks his stacking swivel to the free hook of the center rifle's stacking swivel. Then he rotates his rifle so that the barrel rests in the angle formed by the other two rifles. He pulls the butt toward him until the stack is tight and then lowers the butt to the deck. He then resumes the position of attention. (See Figs. **10.40, 10.41,** and **10.42.**).

e. Other rifles, and the automatic rifles and other weapons are passed to the nearest stack on the right. When passing extra weapons to the stack, the right hand grips the upper hand guard and the left hand grips the balance. The muzzles of all weapons point straight up while being passed to the stack. They are laid on the stack



10.40 Stacking arms. The man on the right engages stacking swivel of his rifle with that of the center rifle.



10.41 Stacking arms. Stacks completed, members of the squad resume the position of attention.

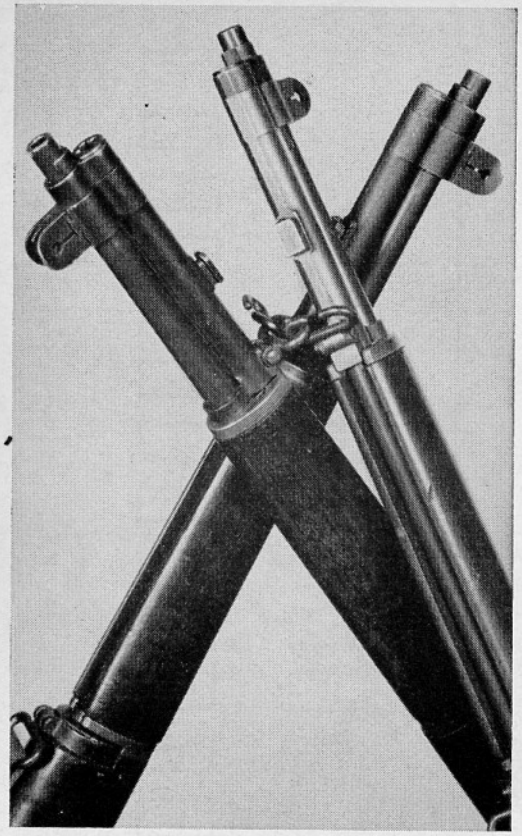
by the stackman, sights inboard, and tilted so that they remain in place.

f. The procedure for stacking arms with the M14 Rifle is described in that portion concerning the Manual of Arms With the M14.

14. To take arms.

a. The squad in line and behind the stack, the command is, Take, ARMS.

b. At the command, ARMS, the extra weapons are removed from the stack by the stackman



10.42 Barrel of the right rifle resting in the angle formed by the other two rifles.

and passed back. Weapons are held in the same manner as when passing toward the stack. As each man receives his rifle, he assumes the position of order arms or sling arms, as appropriate.

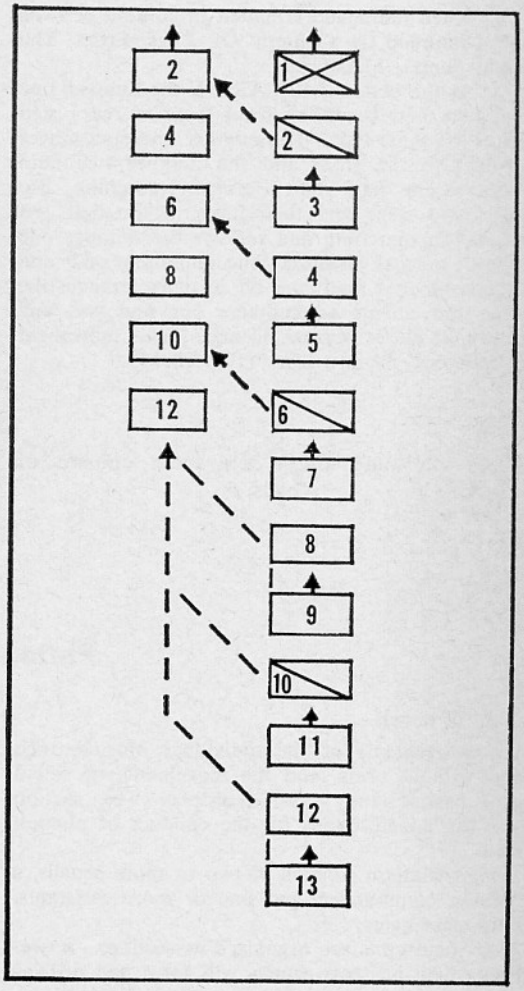
c. When the extra weapons have been returned, the stackman grips his rifle and the rifle of the man on his left. The man on the right of the stackman steps out to the left front as in stacking arms and takes his rifle. He then resumes the position of order arms (or sling arms).

d. The stackman then disengages the two remaining rifles. He passes the left rifle back to the man on the left. The man on the stackman's left grips his rifle at the upper hand guard and resumes the position of order arms or sling arms. The stackman then resumes order arms or sling arms, as appropriate.

15. To form column of twos from single file.

a. When the squad is halted in column, the command is Column Of Twos To The Left (Right), MARCH.

b. On the command, MARCH, the front man



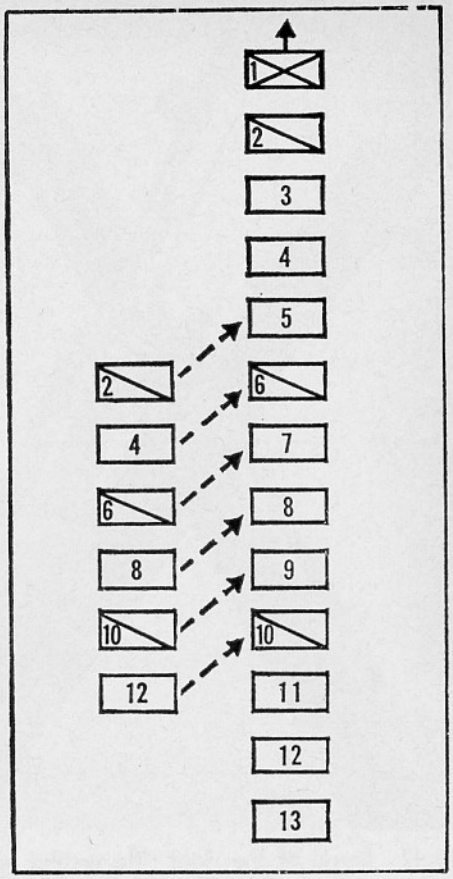
10.43 Forming column of twos from single file.

stands fast. Even-numbered men (counting from front to rear) face half left (right) in marching, take two steps, face half right (left) in marching and move forward until they are beside and at normal interval from the odd-numbered men who were in front of them. Each odd-numbered man, except the front man, marches forward and halts as he reaches normal distance from the odd-numbered man in front of him. All men required to move do so at the same time (Fig. **10.43**).

16. To form single file from column of twos.

a. When the squad is halted in column of twos the command is Column Of Files From The Right (Left), MARCH.

b. At the command, MARCH, the number one and two men (counting from front to rear) step off at the same time. The number one man moves straight to the front and the number two man faces to the half right (left) in marching. He takes two steps and then faces to the half left (right) in marching and follows the number one man at normal distance. The remaining odd- and even-numbered men step off in pairs, execute the same movements as numbers one and two and follow in file at normal distance. This movement is done only from a halt. (Fig. **10.44**).



10.44 Forming single file from column of twos.

Platoon Drill

1. General.

a. Movements of the individual Marine, with and without arms, and the movements of squad drill have already been described. This section sets forth instructions for the conduct of platoon drill.

b. A platoon consists of two or more squads, a platoon commander, and one or more assistants, plus messengers.

c. Some units are organized as sections. A section which has two squads will form and drill as a platoon. Small sections, not subdivided into squads, will form and drill as one squad.

d. Squads in a platoon are numbered from front to rear when in line and from left to right when in column.

e. The platoon forms on line in two or more ranks with 40 inches distance between ranks. The platoon may move in a column of twos, threes, or fours. Movements in this section are described for such columns though the column of threes is normal for most platoons.

f. When in line, the platoon changes interval and counts off, dresses right (left), and stacks arms in the same manner as the squad, except each squad executes the movements simultaneously with the other squads.

g. Squad leaders are normally the base for all

movements, though, when required, the platoon may be directed to dress or to guide on another base. Each man in rear of the front rank covers his corresponding number in the front rank.

h. The platoon guide moves to the right when the platoon takes interval to the left and he does not count off.

2. Formations.

a. The two formations for the platoon are column and line. (See Figs. **10.45** and **10.46**).

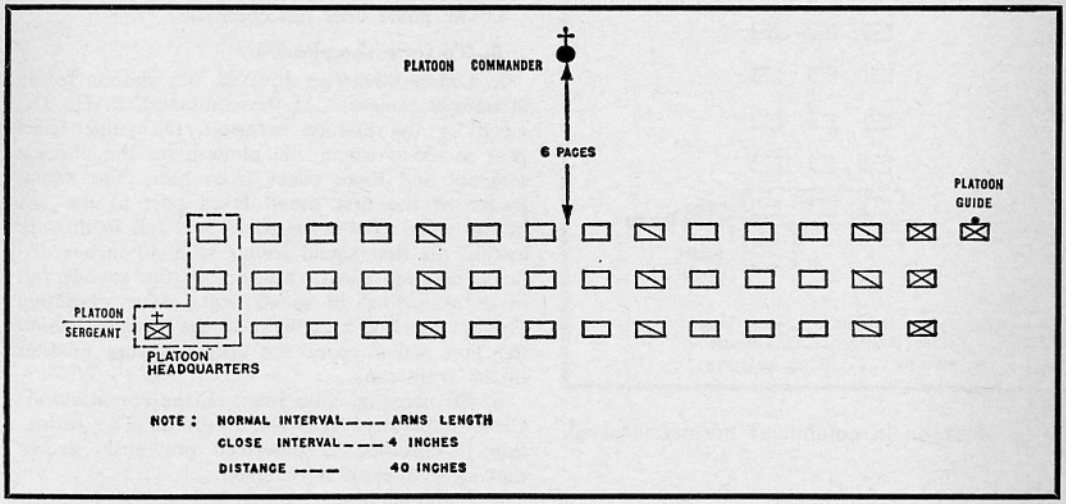
b. The platoon forms in line with the squad leaders on the right. The platoon is marched in line for short distances only, or when executing portions of trick drill.

front of the squad leader of the right squad.

d. Extra men may be attached to platoons without changing permanent squad organization. These men fall in on the left when the platoon is in line in such a fashion as to even up the squads or ranks.

4. Rules for the guide.

a. Except when the platoon commander directs otherwise, guide is to the right and the guide takes post on the right. With the platoon in line he takes post on the right of the first squad leader. In column, he takes post in front of the squad leader of the right squad. (See Figs. **10.45** and **10.46**).



10.45 Platoon in line at normal interval.

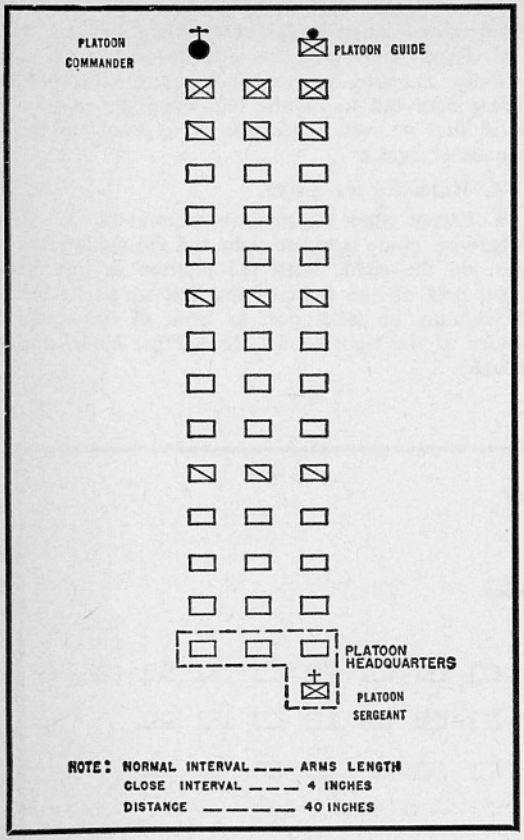
3. Posts of individuals.

a. In line, the platoon commander takes post six paces in front of the center of the platoon. In column, he marches at the head of the platoon and in front of the first squad leader. (See Figs. **10.45** and **10.46**).

b. When the platoon is in line, the platoon sergeant takes post to the left of the left flank man of the rear rank. In column, he marches behind the rear man of the right squad.

c. The platoon guide takes post on the right of the first squad leader when the platoon is in line. When the platoon is in column he marches in

b. In column, when it is desired to guide left, the command, GUIDE LEFT, is given. At this command, the guide and the platoon commander exchange positions if the platoon is in column. The guide crosses between the platoon commander and the body of the platoon. To return the guide to normal position, GUIDE RIGHT is commanded. The platoon commander and the guide again change positions, with the guide passing between the platoon commander and the body of the platoon. This movement may be made at a halt or on the march. The base squad is the one behind the guide.



10.46 Platoon in column at normal interval.

c. The guide does not change position when the platoon is commanded to Dress Right (Left), DRESS.

d. When a platoon in line is commanded to execute right face, the guide executes the movement with the platoon and then immediately executes another right face and marches to a position in front of the right squad leader, halts, and executes left face. When the platoon is commanded to face to the left from in line, the guide executes the movement with the platoon but does not change his position.

e. When a platoon in column is given the command Column Of Files From the Left, MARCH, the guide, on the preparatory command, takes his position in front of the left squad leader so that he is at the head of the column.

f. When a platoon in column is given the command Column Of Twos From The Left, MARCH, the guide, on the preparatory command, takes his position in front of the second file from the left so that he heads the right of the column to be formed.

g. When reforming in a column of threes or fours from a file or column of twos, the guide posts himself in his normal position when the movement is completed.

h. The guide sets direction and cadence of the march. The leading man in each file establishes interval.

i. When a platoon is marching in column and the command to march by a flank or to the rear is given, the guide executes the movement with the platoon but does not change his position within the platoon.

j. The guide does not count off.

5. To form the platoon.

a. Unless otherwise directed, the platoon forms at normal interval. At the command, FALL IN, given by the platoon sergeant, the guide takes post so as to center the platoon on the platoon sergeant and three paces from him. The squad leader of the first squad takes post to the left of the guide. Other squad leaders fall in directly behind the first squad leader with 40 inches distance between them. Marines in the squads fall in as prescribed in squad drill. After obtaining proper interval, members of the squads behind the first squad cover the corresponding number in the front rank.

b. To form at close interval, the command At Close Interval, FALL IN, is given. The formation is executed as described previously except that close interval is obtained.

c. If the platoon is armed, Marines fall in at the position of order arms and the commands to inspect weapons are given as soon as each man is in position.

6. To dismiss the platoon.

a. The platoon is dismissed only from a line and at the position of attention.

b. When armed, the platoon is dismissed with the commands: Inspection, ARMS; Port, ARMS; DISMISSED.

c. Unarmed platoons are dismissed with the command, DISMISSED.

d. The platoon sergeant is usually called forward by the platoon commander to dismiss the platoon.

7. To align the platoon.

a. The platoon obtains proper interval and

alignment as prescribed for the squad except that the guide raises his left arm to obtain proper interval and the first squad leader turns his head to the right and aligns himself with the guide. Other squad leaders cover the first squad leader.

b. As soon as he has given the command Dress Right, DRESS, the platoon commander verifies the alignment of each rank. To do this, he moves by the most direct route to a point one pace to the guide's right (or to the right of the first squad leader if there is no guide). He faces down the line and aligns the front rank by directing men to move up or back as required. When the front rank is aligned, the platoon commander faces to the left in marching and dresses succeeding ranks in like manner, until all ranks are properly dressed. After verifying the alignment of the last rank, he faces to the right in marching and marches straight to a point three paces beyond the front rank. He then halts, faces to the left, and commands Ready, FRONT; COVER. The squads then return to the position of attention and rear squads cover their corresponding number in the front rank.

c. When the platoon is well drilled, or when there is not enough time to verify alignment, the platoon commander may command Ready, FRONT; COVER, from his normal post without verifying the alignment of the ranks.

d. When marching in column, the platoon is aligned by the command, COVER. The base squad leader obtains 40 inches distance from the guide. Other squad leaders obtain proper interval and dress on the base squad leader. Other men in the base squad obtain proper distance and cover the squad leader. The remaining members of the platoon cover their squad leaders and dress on the base squad.

8. To march to the right (left).

a. The platoon being in line, to march to the right (left) the commands are: Right (Left), FACE; Forward, MARCH. The platoon executes the movements as in squad drill.

b. The platoon marches in a column of two or more squads.

9. Supplementary commands.

a. When the platoon commander gives a command which all squads are not to execute simultaneously, the squad leaders must give appropriate supplementary commands.

10. To march (form) at close interval while in column.

a. When the platoon is in a column at normal interval, either at a halt or on the march, the command is Close, MARCH.

b. When at a halt, on the command, MARCH, members of the base squad stand fast. Other squads obtain close interval by executing right (left) step until proper interval is obtained.

c. When marching, the command, MARCH, is given on the right foot when the base squad is on the right of the platoon. If the base squad is on the left, then the command, MARCH, is given on the left foot. Should the base squad be center, the command may be given on either foot. On the command of execution, the base squad takes up the half step and other squads oblique toward the base squad until close interval is obtained. They then oblique toward the front and take up the half step. The platoon commander then commands Forward, MARCH, and all squads resume the 30-inch step.

11. To march (form) at normal interval.

a. When in column at close interval and at a halt, or in march, to obtain normal interval between files, the command is Extend, MARCH.

b. At a halt, on the command, MARCH, members of the base squad stand fast. Other squads obtain normal interval by doing right (left) step.

c. When marching, the command, MARCH, is given on the left foot when the base squad is on the right, and on the right foot when the base squad is on the left. If the base squad is center, the command may be given on either foot. At the command, MARCH, the base squad takes up the half step. Other squads oblique away from the base squad until normal interval is obtained. When squad members are abreast of corresponding members of the base squad, they oblique to the front and take up the half step. At the command Forward, MARCH, all squads resume the 30-inch step.

d. When the platoon executes flanking movements from a column at close interval, squads in rear of the squad which becomes the leading squad take up the half step after doing the flank movement until 40 inches distance is obtained between ranks. After such a movement, the platoon maintains normal interval and distance until it is again directed to close march.

12. To change the direction of march.

a. The command is, Column Right (Left), MARCH (or Column Half Right (Left), MARCH). The base squad for this movement is always the squad on the flank in the direction of the turn. The pivot man is the man in lead of the base squad, excluding the platoon commander or the guide.

b. When marching, the command of execution

is given on the foot in the direction of the turn. On the command, MARCH, the pivot man faces to the right (left) in marching and steps out with one full 30-inch step and then takes up the half step. When other men in his rank are abreast, he resumes the full step. Other men of the leading rank oblique twice to the right (left) without changing interval and place themselves abreast of the pivot man, conforming to his step. They execute the first oblique at the command of execution and the second oblique when opposite their new line of march. Ranks in rear of the leading rank execute the movement in the same manner and on the same ground as the leading rank. (Fig. **10.46**).

c. When halted, at the command of execution, the pivot man faces the right (left) in marching by turning to the right (left) on his right toe and stepping out with his left foot in the new direction. He then takes up the half step as described in Paragraph b. Other men of the leading rank oblique twice to the right (left) in marching without changing interval and place themselves abreast of the pivot man and conform to his step. They execute the two oblique movements as when the platoon is commanded to execute Column Right while marching. Other men march forward and execute the movement on the same ground and in the same manner as the leading rank.

d. During column movements, the platoon commander and the guide oblique smartly in the direction of the turn, half step, and resume full step in a manner that places them in their proper positions in the formation for marching in the new direction.

e. For slight changes of direction, the command, INCLINE TO THE RIGHT (LEFT) may be given. The guide then changes direction as commanded and the rest of the platoon obtains proper interval, distance, and direction of march on him. This is not a precise movement and is



10.47 Column Right, MARCH. Command of execution is given as the right foot strikes the deck. Pivot man takes one more step and pivots to the right in marching, takes one full step then takes up the half step. Other men of leading rank oblique twice to the right in marching at the command of execution, etc.

executed only on the march.

13. To form line from column.

a. The commands are, Column Right, MARCH; Platoon, HALT; Left, FACE. The command, HALT, is given after the column movement has been completed by the entire platoon.

14. To march toward a flank.

a. The command is, By The Right (Left) Flank, MARCH. It may be given from any marching formation, but it is never given at a halt. The command of execution is always given on the foot in the direction of the turn.

b. At the command, MARCH, each man takes one more step, then faces to the right (left) in marching and steps out in the new direction at full 30-inch steps.

c. When flanking movements are commanded for a platoon in column at close interval, the squads execute the action described in Paragraph 11.d.

d. This movement is used to move a column for short distances to the right or left and for presenting a large front during trick drill.

e. After execution of a flanking movement, dress is always to the right, regardless of the direction of the turn, unless commanded otherwise.

15. To stack arms.

a. Before stacking arms, the platoon is commanded to count off and ranks are opened. Arms are then stacked on command of the platoon commander, by squads, and in the manner prescribed for squad drill.

b. The procedure for building stacks with the M14 Rifle is set forth in that section explaining the Manual of Arms With the M14.

16. To open ranks.

a. The commands are: Open Ranks, MARCH; Ready, FRONT. They are given only when the platoon is in line. At the command, MARCH, the front rank takes two paces to the front, halts, and executes dress right. The second rank takes one pace to the front, halts, and executes dress right. The third rank, if present, stands fast and executes dress right. Remaining ranks take 2, 4, or 6 steps backward, as appropriate, halt, and execute dress right. The platoon commander verifies alignment of the squads or ranks as prescribed in Paragraph 7 and then commands, Ready, FRONT.

17. To close ranks.

a. The command is, Close Ranks, MARCH. It is given only from open ranks.

b. At the command, MARCH, the front rank stands fast. The second rank takes one pace forward and halts. Succeeding ranks take 2, 3, 4, or 5 paces forward and halt. Each man covers his corresponding number in the front squad. The platoon commander normally gives the command to close ranks from the same position from which he commanded Ready, FRONT. After ranks are closed, he moves by the most direct route to his post 6 paces in front of and centered on the platoon.

18. To form for shelter tents.

a. Shelter tents will be pitched in line formation only for the purposes of inspection and instruction. In field bivouac, full use will be made of available cover and concealment.

b. The platoon forms in line to pitch shelter tents. When space is at a premium, squad lines may be used.

c. Arms are slung prior to forming to pitch shelter tents and are grounded when pitching tents.

d. The platoon in line, commands are: Form For Shelter Tents To The Left, MARCH; Take Interval To The Left, MARCH; Count, OFF.

(1) At the command, Form For Shelter Tents To The Left, the platoon sergeant moves to a position on the right of the right flank man of the front rank. Messengers, if any, take post to the left of the left man of the rear rank. The squad leader of the first squad commands, STAND FAST, and other squad leaders command, By The Left Flank. (Note: This is the one time when a flanking movement is commanded from a halt.)

(2) At the command, MARCH, all squads except the first face to the left in marching and step off. Squad leaders move their squads into line abreast of the squad(s) already on line by giving the commands: By The Right Flank, MARCH; Squad, HALT.

(3) At the command, Take Interval To The Left, MARCH, the entire platoon of one rank takes interval as prescribed in Squad Drill.

(4) At the command, COUNT OFF, the entire rank counts off as prescribed in squad drill.

e. When directed by the platoon commander, the odd-numbered men will draw bayonets and thrust them in the ground alongside the outside of the left heel near the instep. The bayonet indicates the position of the front tent pole. Odd-numbered men without bayonets mark the spot with the left heel. Odd- and even-numbered men pitch their shelter halves into one tent.

f. To assemble, the commands are: Assemble

To The Right, MARCH; Right, FACE; Column Of Twos (Threes, Fours) To The Right, MARCH. At the command, MARCH, the platoon sergeant and messengers resume their normal posts. The squads, other than the first squad, march to their proper positions abreast of the first squad as described in paragraph 19.e.

19. To form column of twos and single file and reform.

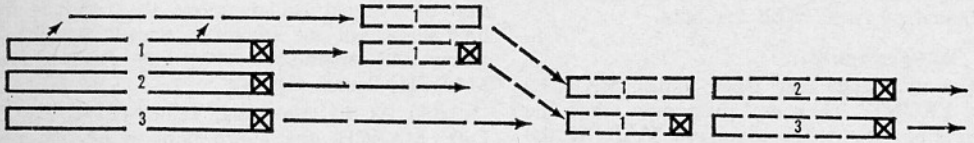
a. The platoon may be marched in column of twos or single file by the procedure described in this section. The change in column is always given from a halt.

b. Being in column of threes, to form column of twos, the commands are as follows: The platoon commander commands, Column of Twos From The Right (Left), MARCH. At the command, MARCH, the left (right) squad forms a column of twos to the left (right) as prescribed in squad drill and then executes column half right (left) and column half left (right) so as to follow the leading squads in column. Normal distance is maintained. (Fig. **10.48**).

c. Being in column of twos, to reform in column of threes, the command is, Column Of Threes To The Left (Right), MARCH. At the command, MARCH, the leading two squads stand fast. The rear squad forms a single file from the right (left) moving to its normal position beside the leading squads by executing column half left (right) and then column half right (left). The squad leader gives the commands for these movements and halts his squad when the leading file is on line with the leading rank of the platoon. (Fig. **10.49**).

d. Whenever there are more than three squads to a platoon, variations in the aforementioned procedure are authorized. For instance, if there were four squads in a platoon, and it was desired to march in a column of twos, the two remaining squads would simply execute half column movements and march behind the leading squads.

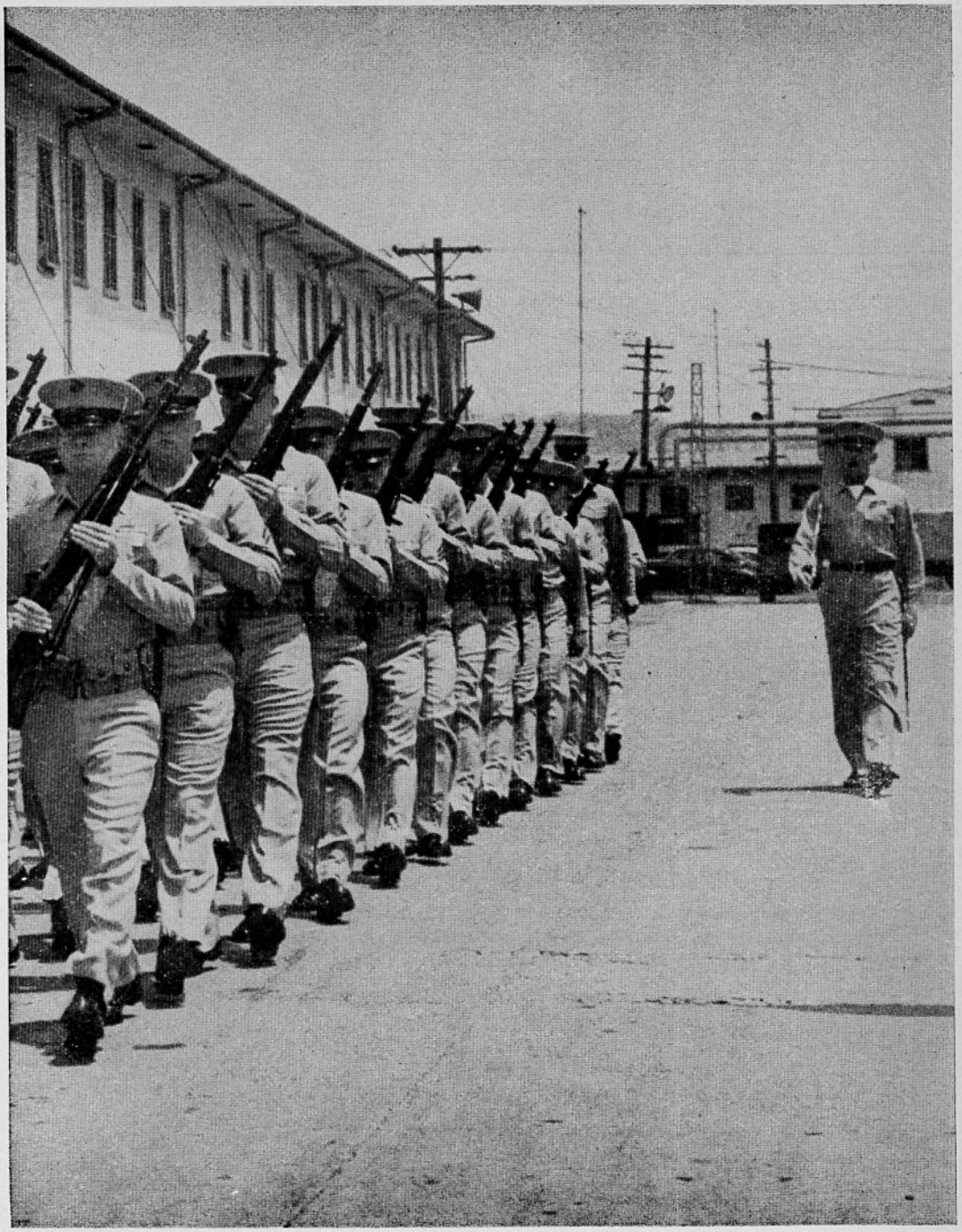
e. To march in single file, the command is, Column Of Files From The Right (Left), MARCH. The right (left) squad then marches forward and the remaining squads follow in trace by executing half column movements. To reform after marching in single file, the command is Column of Twos (Threes, Fours) To The Left (Right), MARCH. At the command, MARCH, the right (left), squad stands fast and the remaining squads execute the necessary column half right (left) movements to march forward to a position abreast of the leading squad. When abreast, the squads are halted.



10.48 Column of twos from column of threes.



10.49 Reform column of threes.





Chapter 11

Battalion Organization

THE Marine Corps has many different types of organizations. Among these are detachments aboard ship, security detachments at navy yards, recruit depots, and schools. The main fighting strength of the Corps, however, is in its Fleet Marine Force. The Fleet Marine Force is an organization made up of ground and air units which is designed to serve with the Fleet for seizing and defending advanced naval bases and for conducting such land operations as may be essential in the prosecution of a naval campaign.

The key fighting organization of the Fleet Marine Force is the infantry battalion. All of the many other types of units within the Fleet Marine Force such as artillery, aviation, tank, engineer, motor transport, shore party, supply, maintenance and medical units are included to help the infantry carry out its mission. Supporting fires to supplement those of the infantry are provided by artillery, aviation and naval gunfire units which send small detachments to the infantry battalion. These detachments maintain contact with their parent unit, advise the infantry commander on the capabilities of their supporting weapon, and are constantly prepared to call down fires on any target upon request. These supporting fires can usually be *delivered within minutes.*

The infantry battalion is the basic tactical unit of the Marine division. There are three infantry battalions in each infantry regiment and three infantry regiments in each Marine division. The mission of the infantry battalion in the attack is to close with the enemy and destroy or capture him by fire and movement; and in the defense to repel his assault by fire and close combat. The infantry battalion is capable of fighting either independently or as part of an infantry regiment, and in conjunction with support aircraft and naval support vessels. It can enter combat on foot or operate as a motorized or air transported force, but has limited supply and maintenance functions.

Similar to other Marine units, the infantry battalion has a wartime organization. The infantry battalion wartime organization will be described in detail.

The infantry battalion is made up of companies. There is a headquarters and service company and four rifle companies. The infantry battalion is commanded by a lieutenant colonel. Included within the organic weapons of this fighting unit are all of the infantry weapons required to attack or defend a battle position. However, attached weapons units and supporting arms at division level such as artillery, aviation and naval gunfire are available to ease the burden of the infantry battalion. A rifle company is commanded by a captain.

An infantry battalion depends upon the fighting strength of the rifle companies. For the company to be effectively employed, its platoons must be properly organized and trained. A rifle platoon is led by a lieutenant who has a platoon sergeant, platoon guide and two messengers (privates or privates first class) in platoon headquarters. The striking force of the rifle platoon lies within its three rifle squads, each of which is led by a squad leader (sergeant) and contains three fire teams. A fire team is made up of a fire team leader (corporal), an automatic rifleman, an assistant auto-

matic rifleman, and a rifleman (private or private first class).

Even though the backbone of the rifle company is the rifle platoon, supporting fires for the company are provided by the machine guns and rocket launchers of the weapons platoon. The



weapons platoon consists of three machine gun sections and three rocket squads. This platoon is also led by a lieutenant.

In addition to the lieutenant, platoon headquarters of the weapons platoon contains a platoon sergeant, an ammunition NCO (corporal), and two messengers (privates or privates first class). This platoon contains three machine gun sections, each of which is led by a section leader and contains two machine gun squads of one light machine gun each. The machine gun squad is composed of a squad leader (corporal), machine gunner, an assistant machine gunner and two ammunition men (privates or privates first class).

In addition to the machine guns, the weapons platoon contains a rocket section. This section is used to provide a close-in anti-mechanized protection for the company. It has a section leader (sergeant) who controls each of the three rocket squads. The rocket squads are made up of two teams each. A rocket team is made up of a rocket gunner, an assistant rocket gunner, and an ammunition man (private or private first class).

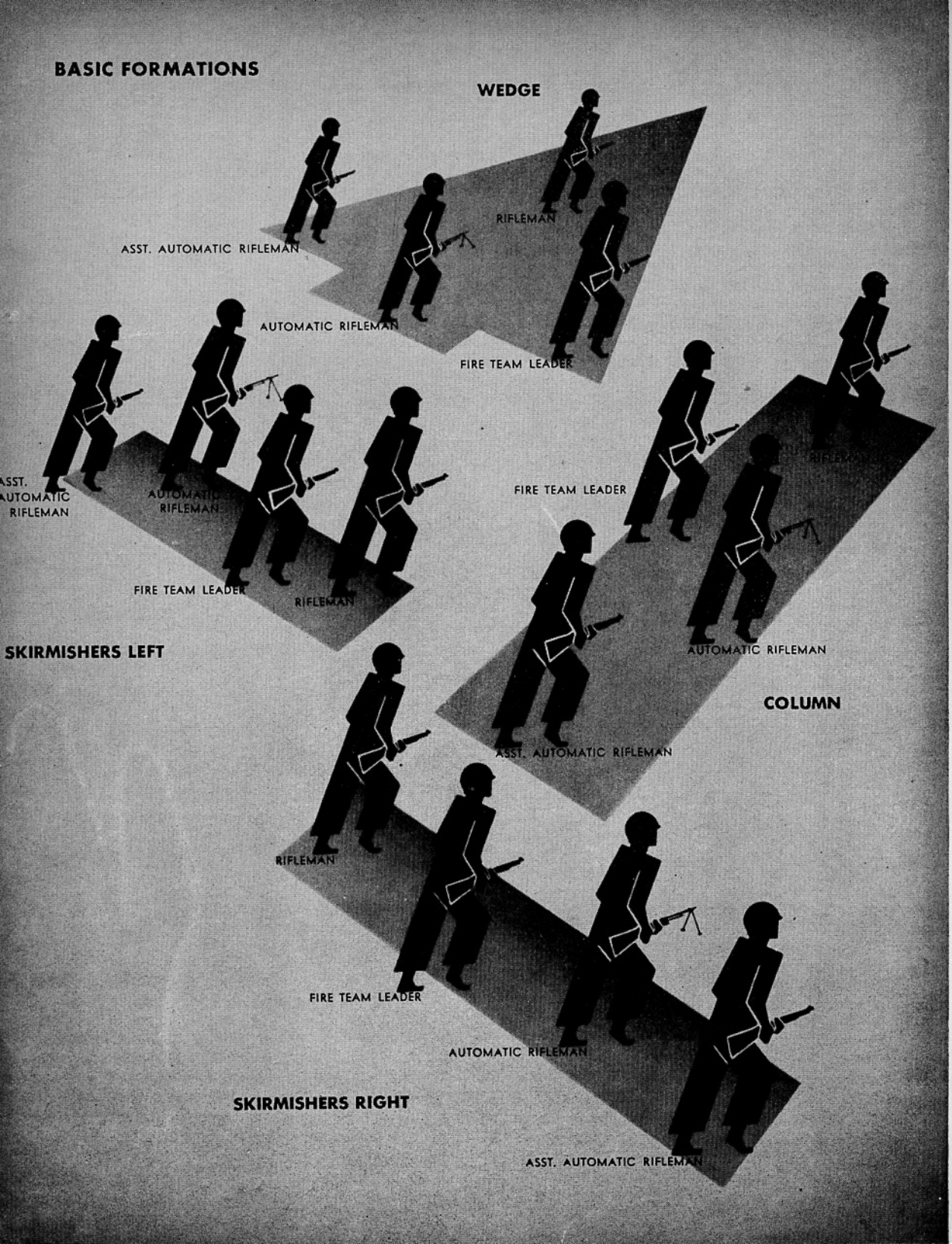
Heavier weapons are available to a battalion commander of the infantry battalion. These weapons are used to furnish supporting fires for maneuvering rifle companies and in the defense. Control and coordination are the basic requirements for the employment of supporting fires in the battle situation. The heavier weapons organic to the infantry battalion are the 106-mm. Recoilless Rifle and the 81-mm. Mortar.

The 81-mm. mortar platoon consists of a platoon headquarters and four mortar sections. Platoon headquarters consists of a lieutenant, platoon commander; a lieutenant, assistant platoon commander; platoon sergeant, an ammunition sergeant, and communications personnel. Each mortar section has a section leader in charge of the two mortar squads of the section as well as observation, communications, ammunition supply personnel and a truck driver in section headquarters. The mortar squad is composed of seven men including the squad leader (sergeant).

The responsibilities of the battalion commander are many, both in peace and in war. Headquarters and service company is designed primarily to assist the battalion commander in properly controlling and supervising his unit. All Marines within the battalion must be trained, fed, clothed, and supplied. The mission of headquarters and service company is to assist the battalion commander in carrying out the functions listed previously.

The Marine infantry battalion is a fighting unit that is capable of self-sustained operation for a limited period. It *can* support its own maneuvers with its organizational weapons, but when necessary, supporting fires can be quickly obtained. Provisions have been made for the infantry battalion to remain healthy, maintain a level of supply, and provide other essential services as well as maintain an efficient fighting organization.




BASIC FORMATIONS
WEDGE
ASST. AUTOMATIC RIFLEMAN
RIFLEMAN
AUTOMATIC RIFLEMAN
FIRE TEAM LEADER
ASST. AUTOMATIC RIFLEMAN
AUTOMATIC RIFLEMAN
FIRE TEAM LEADER
RIFLEMAN
SKIRMISHERS LEFT
FIRE TEAM LEADER
AUTOMATIC RIFLEMAN
COLUMN
ASST. AUTOMATIC RIFLEMAN
RIFLEMAN
FIRE TEAM LEADER
AUTOMATIC RIFLEMAN
SKIRMISHERS RIGHT
ASST. AUTOMATIC RIFLEMAN

Chapter 12

Combat Formations and Signals

THE formations that your fire team and squad practice and use for combat are called combat formations. Close order drill formations are not suitable for combat. The purpose of close order drill is to move a body of men from place to place quickly and in a military manner. In close order drill, exact intervals and distances are kept.

Exact intervals and distances are not kept in combat formations. These formations must be suited for quick and easy changes. The purpose of drill in combat formations is to train you and your fire team and squad to move in formations that can be used in battle.

This chapter explains and pictures the different combat formations. The arm and hand signals used in the execution of these formations also are explained.

Basic Formations of the Fire Team

The basic combat formations of your fire team are the column, the wedge, skirmishers right, skirmishers left, echelon right and echelon left. All of these except echelon right and left are illustrated on the opposite page.

A. The Column. This formation permits rapid, well-controlled movement. It is open to enemy fire from the front, however, and must be changed when all of your team's fire power is wanted in the front.

B. The Wedge. This formation permits good control and use of almost all fire to the front. It provides all around protection and readiness for action in any direction.

C. Skirmishers Right (Left). This formation allows use of full fire to the front but it is difficult to control. It is best employed when an enemy position is located and an assault planned.

D. Echelon Right (Left). This formation is similar to skirmishers right and left except that one flank (right or left) is drawn back, permitting fire to the front or flank.

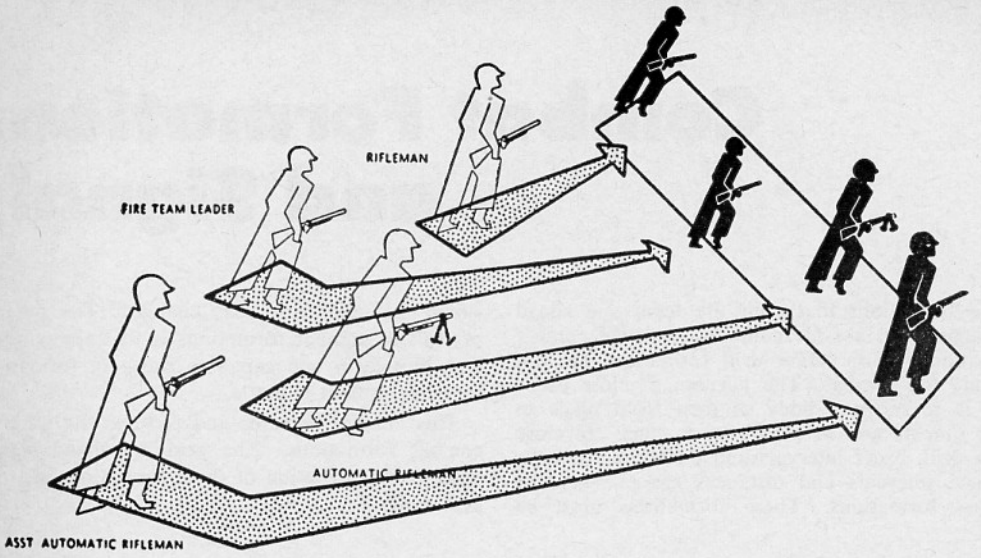
Basic Formations of the Rifle Squad

The basic formations of the rifle squad are: Squad column (column of fire teams); Squad wedge (one fire team forward, two fire teams back); Squad vee (two fire teams forward, one fire team back); Squad echelon right (left); Squad line (line of fire teams). The characteristics of these squad formations correspond generally to those of the fire team explained above, except in the case of two fire teams forward and one fire team back, the so called "V" formation, which is not adaptable to use by the fire team. The principal difference is that, while the individual is the maneuver element of the fire team, a team of individuals becomes the maneuver element in the case of the squad. In this respect squad formations correspond more nearly to those of platoons and larger units.

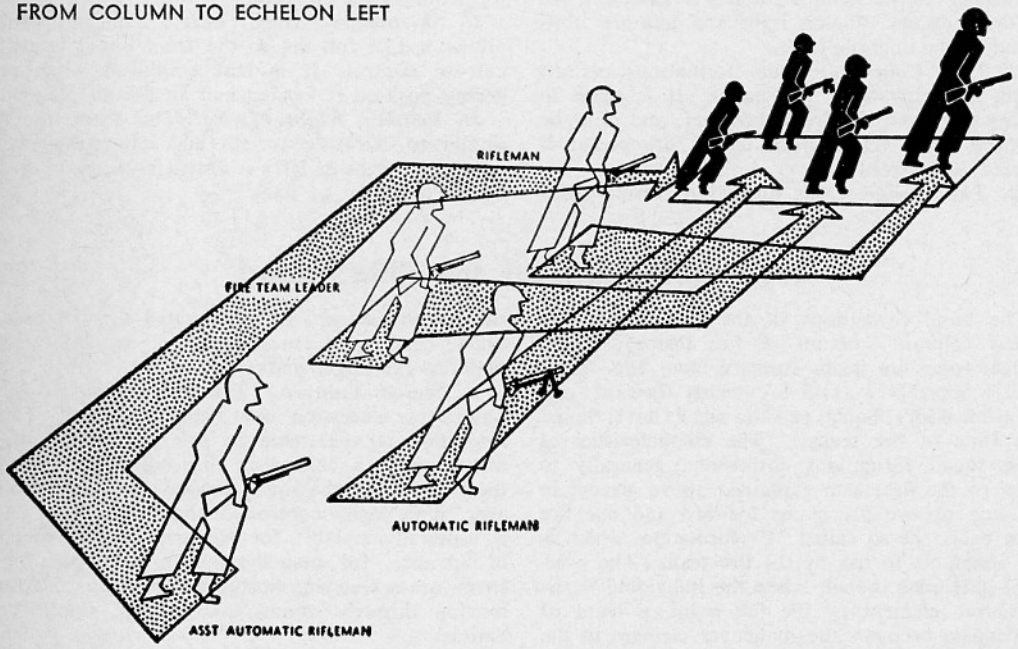
A. Squad Column. The fire teams are arranged in succession one behind another. This formation is vulnerable to fire from the front, and requires a change in disposition to employ the weapons of the squad toward the front; however, it is easily controlled and maneuvered. It is especially suitable for narrow, covered routes of advance, for maneuvering through gaps between areas receiving hostile artillery fire, and for moving through woods, and in fog, smoke or darkness.

COMBAT FORMATIONS AND SIGNALS

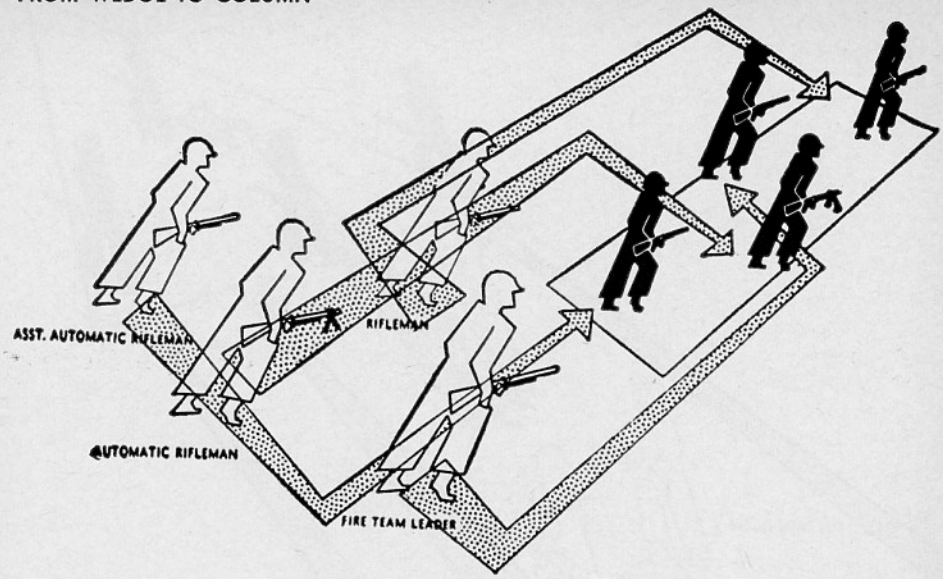
FROM COLUMN TO SKIRMISHERS RIGHT



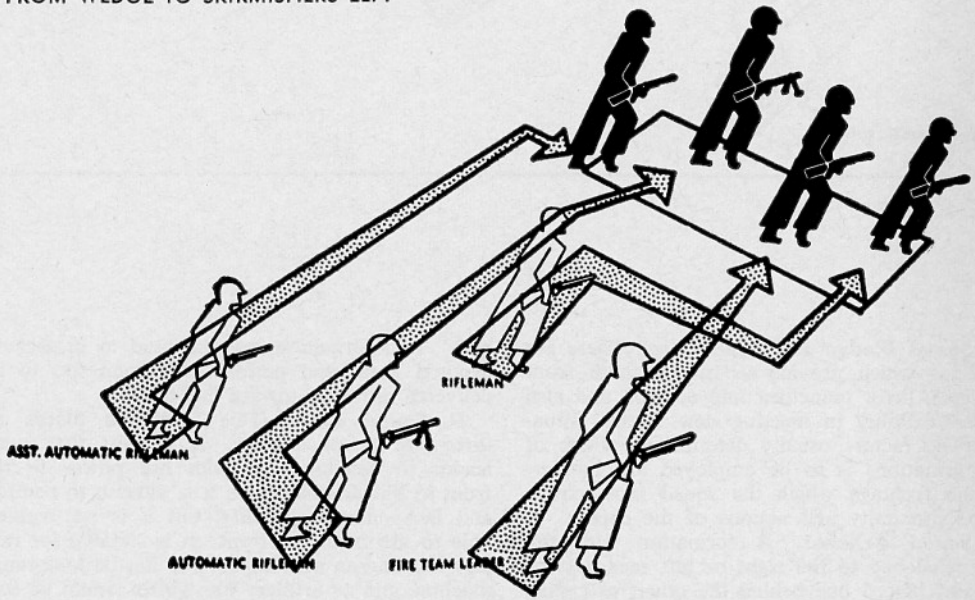
FROM COLUMN TO ECHELON LEFT

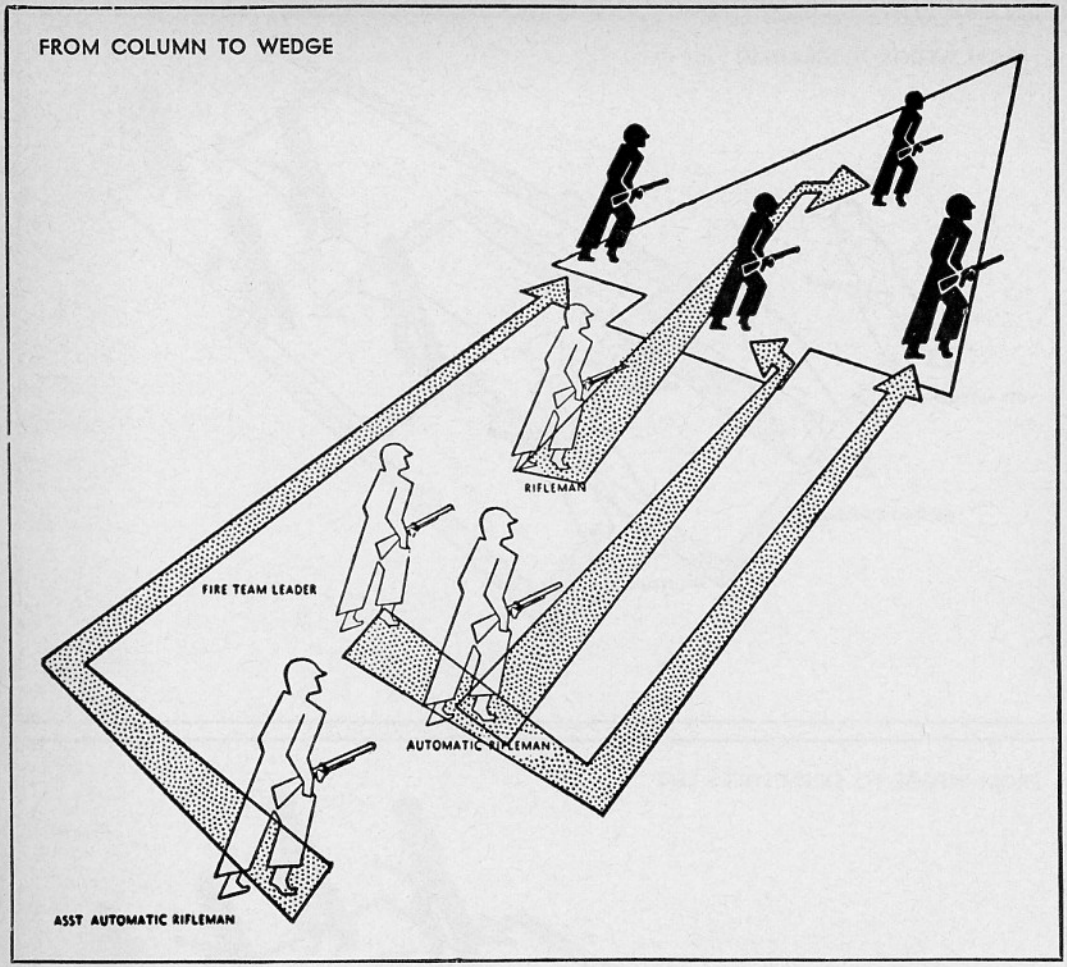


FROM WEDGE TO COLUMN



FROM WEDGE TO SKIRMISHERS LEFT



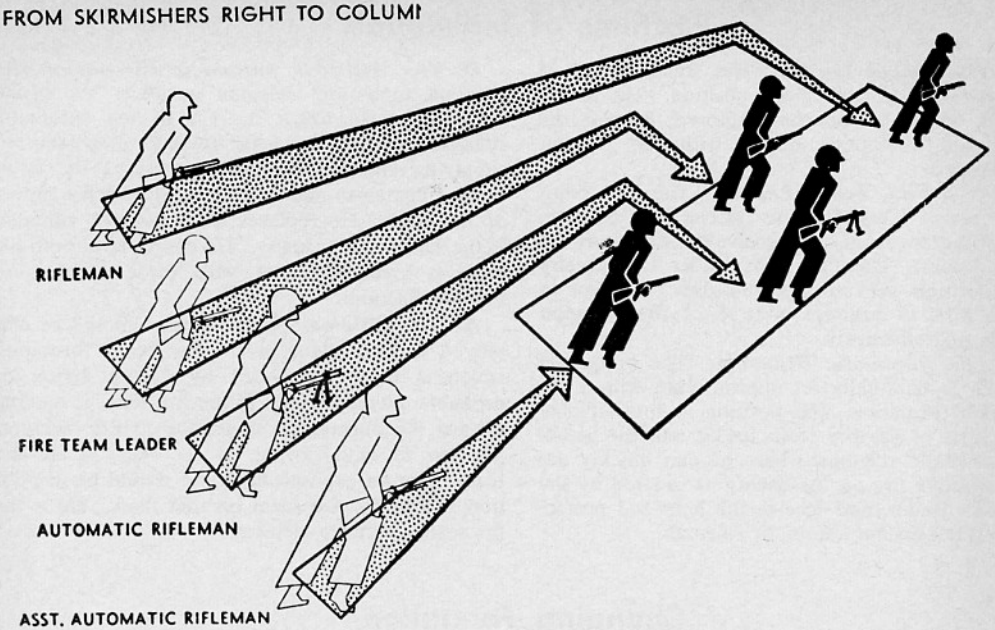


B. Squad Wedge and Squad Vee. These are formations which provide security to both front and flanks, favor maneuver and control, and also provide flexibility in meeting new tactical situations. The factors usually determining which of these formations is to be employed are the terrain, the frontage which the squad must cover, and the proximity and actions of the enemy.

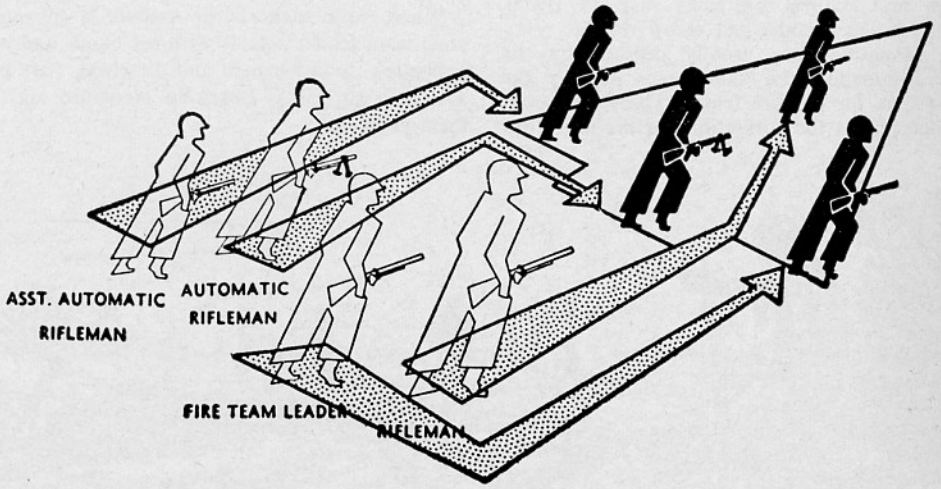
C. Squad Echelon. A formation with fire teams echeloned to the right or left rear has the fire teams placed one behind the other, extending beyond and unmasking one another wholly or in part. This formation may be used to protect an exposed flank and permits maximum fire to be delivered promptly toward that flank.

D. Squad Line. This formation places all three fire teams abreast. It permits the squad leader to develop maximum fire power to the front in the shortest time. It is difficult to control, and lacks maneuverability; but it is less vulnerable to fire from the front. It is suitable for rapidly crossing an area exposed to hostile long-range machine gun or artillery fire which cannot be successfully avoided in any other manner.

FROM SKIRMISHERS RIGHT TO COLUMN



FROM SKIRMISHERS LEFT TO WEDGE



Positions of Individuals

A. The Squad Leader. The squad leader is not restricted to any given position. He places himself where he can best observe, control the squad, and maintain contact with the platoon commander.

B. The Fire Team Leader. The fire team leader places himself where he can best observe, control the fire team, and receive the orders of the squad leader. The fire team leader is normally in a position next to his automatic rifleman to enable him to exercise control of that weapon quickly and effectively.

C. The Automatic Rifleman. The automatic rifleman is habitually an interior man within the fire team formation. His position is normally between that of the fire team leader and the assistant automatic rifleman where he can quickly deliver effective fire on the enemy as ordered by the fire team leader, and receive the help and protection of the assistant automatic rifleman.

D. The Assistant Automatic Rifleman. The assistant automatic rifleman normally should be placed adjacent to or in rear of the automatic rifleman so that he may function effectively in supplying ammunition and in assisting the automatic rifleman in maintaining maximum fire power of the BAR. He replaces the automatic rifleman if the latter is a casualty. He coordinates both his position and movement with those of the automatic rifleman.

E. The Rifleman. The rifleman should be employed at that place in the fire team formation which is most threatened by enemy action or probable enemy action. If the fire team is moving toward the enemy, he should be in the foremost position; if withdrawing, at the rear; if the fire team is on an exposed flank, he should be in position within the fire team on that flank. He is the fire team's security element.

Changing Formation

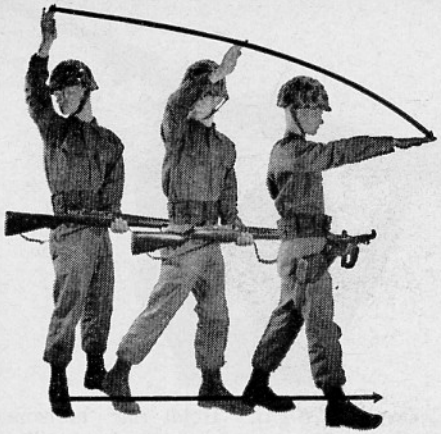
The formations of the squad may be changed by the squad leader to reduce casualties from hostile fire, to present a less vulnerable target, or to get over difficult or exposed terrain. Formation changes in varying or rough terrain are frequent in order to get the squad over man-made obstacles and natural obstacles such as rivers, swamps, jungles, woods, and sharp ridges.

First formations are usually ordered by the platoon commander for the squads and by the squad leaders for the fire teams. Thereafter, each leader determines the formation for his unit after giving consideration to the mission, enemy dispositions, and the terrain.

The approved directions of movement for members of your team when your leader signals for changes of formation are shown on the preceding four pages.

When your team is to execute a movement, your team leader signals with his hands and arms, indicating the movement and direction. (See pages 151 through 159.) Learn to recognize and give them yourself.





Forward. Use to start from a halt. The leader faces and moves in the desired direction (right, left, or rear). At the same time he extends his hand straight up, palm to front. He lowers arm and hand in the direction of movement until his arm and hand are in a horizontal position.



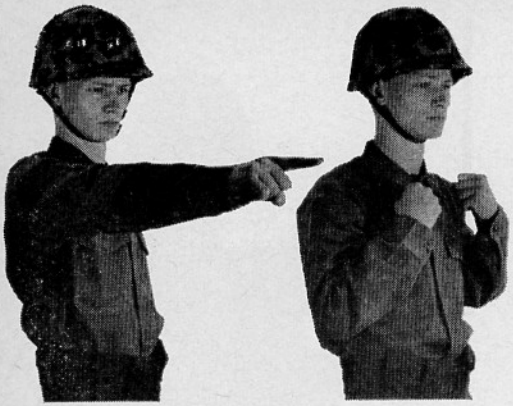
Halt. This signal is used to halt the group. The hand is brought up to the shoulder, as shown, with the palm to the front. Then the hand is thrust upward vertically to the full extent of the arm and held in that vertical position until the signal has been understood by all.



Dismount; Down; Take Cover. Extend arm sideward at an angle of 45° above horizontal, palm down, and lower it to side. Repeat until understood.



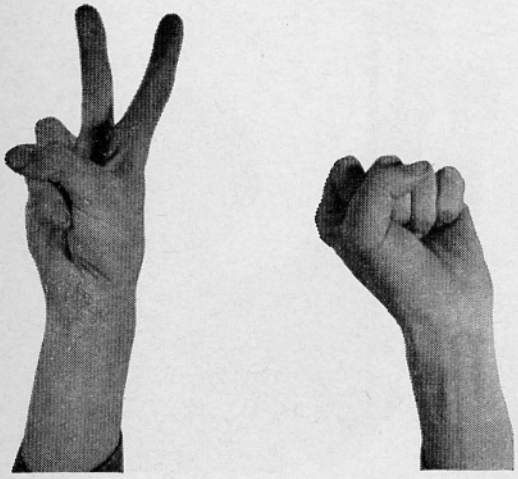
Double Time, or Rush. The hand is carried to shoulder, fist closed. The fist is thrust rapidly upward to full extent of arm, then brought back to shoulder several times. This signal is also used to increase gait.



Shift. Point to the individuals or units concerned. Then beat chest simultaneously with both fists.



Enemy in Sight. Hold rifle horizontally, pointed toward enemy, above your head with arms extended.



Range. Extend arm, with fist closed, fully toward men being signalled. Open fist, exposing one finger for each 100 yards of range. The man in the picture is indicating a range of 200 yards.



Are You Ready? Extend arm toward person to be signalled, palm toward him, with fingers extended and joined.

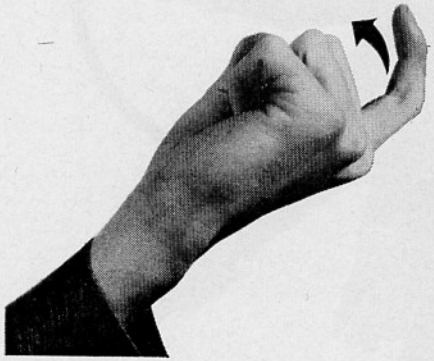
I Am Ready. This is the same signal as that for "Are You Ready?"



Commence Firing. Extend the arm in front of the body, waist high, palm down, and move it through a wide horizontal arc several times. **Fire Faster.** Execute rapidly. **Fire Slower.** Execute slowly. (For machine guns, a change to the next higher/lower rate of fire is required.)



Cease Firing. Forearm is raised, palm out, in front of forehead, then swung up and down several times before face.



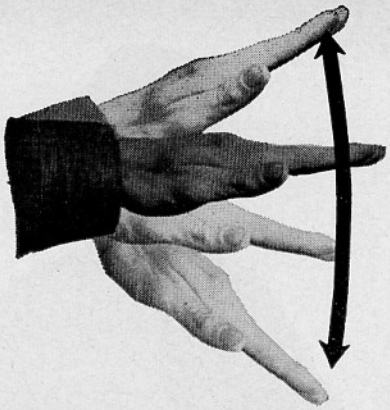
Leaders Join Me. Extend arm toward leader or leaders to be signalled, then use fingers to beckon leaders.



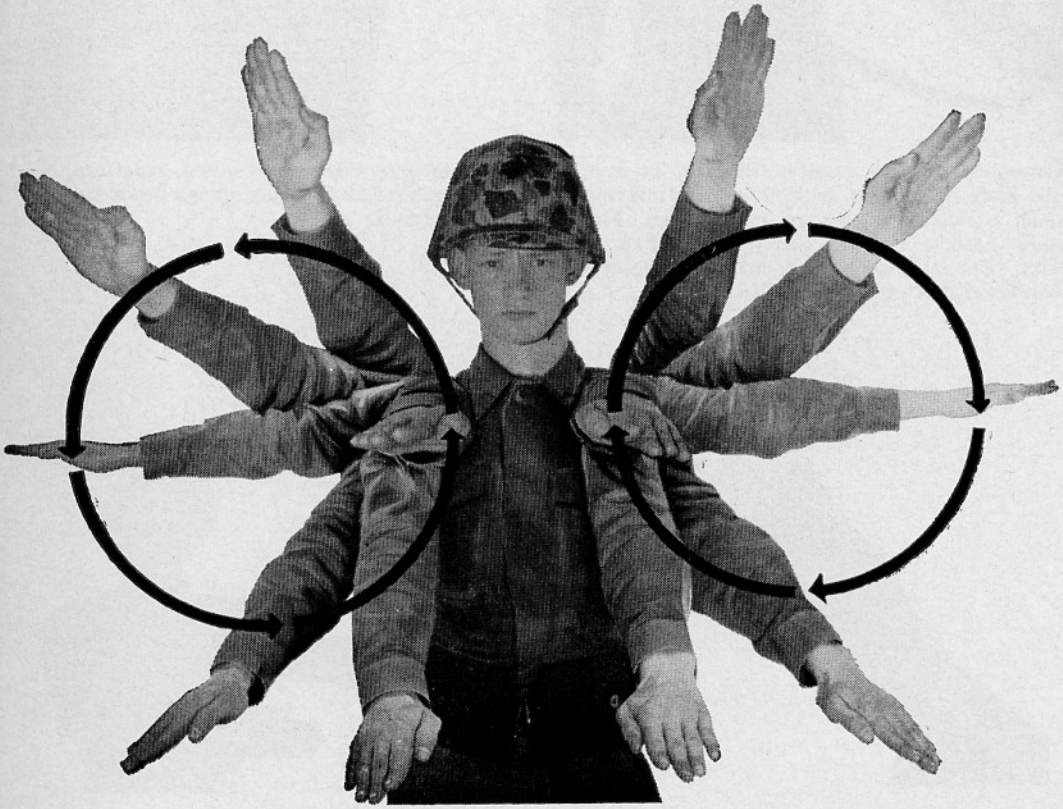
Right (Left) Flank (Vehicles, Craft or Individuals Turn Simultaneously). Extend both arms in direction of desired movement.



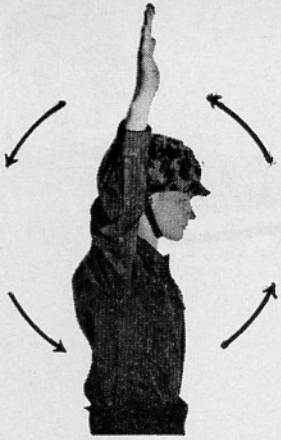
Fire Team. The forearms are crossed above the head, as shown.



Squad. Hand is extended toward squad leader and moved up and down from wrist.



Platoon. Both arms are extended forward, palms down, toward the leaders or units to be signalled. Then large vertical circles are made with the hands, as shown.



Form Column. Raise either arm to the vertical position. Drop the arm to the rear, describing complete circles in a plane perpendicular to the body. The signal may be used to indicate either a troop or vehicular column.



"*V*". The arms are extended at an angle of 45 degrees, as shown, so that the letter "V" is formed.



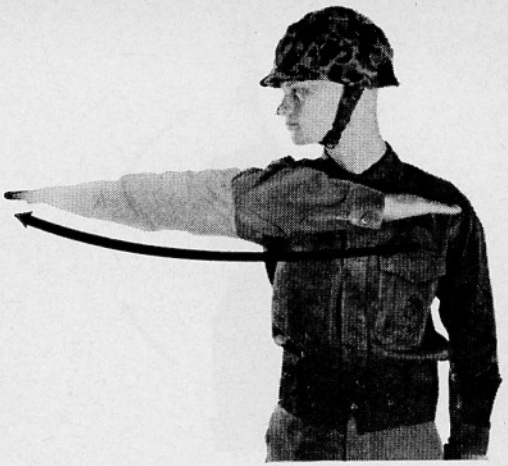
Echelon Right (Left). Face the unit(s) being signalled and extend the arm in the direction in which the unit(s) is to be echeloned, downward to the side at an angle of 45° below the horizontal, palm to the front; extend the other arm upward and to the side at an angle of 45°, palm to the front.



Wedge. Extend both arms downward and to the side at an angle of 45° below the horizontal.



Decrease Speed (Vehicles,) Quick Time (Dismounted Troops). Extend the arm horizontally sidewards, palm to the front, and wave arm downward several times, keeping the arm straight. Arm does not move above horizontal.



Change Direction (Right or Left). Hand on side of new direction is brought across body. With palm down and forearm horizontal, arm swings straight out to point new direction.



Assemble. Hand is raised straight up, as far as it will go, fingers extended. Then large circles are made.



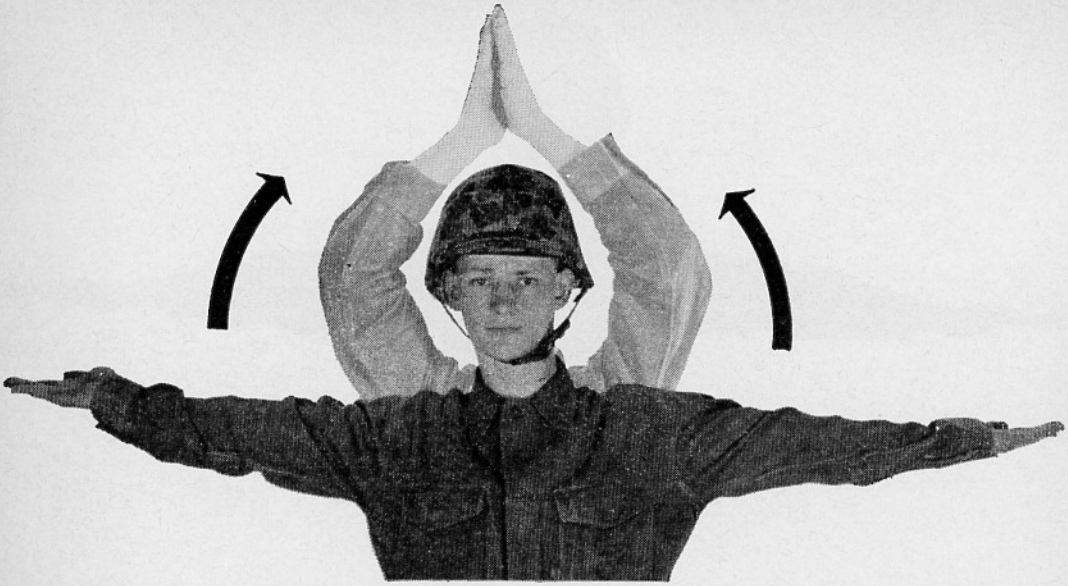
Fix Bayonets. The movements made by the hand in fixing a bayonet on a rifle are simulated for this signal.



As Skirmishers; Line. Both arms are raised, palm down. To indicate the direction of march after this signal, "Forward" is signalled while leader moves at same time in the desired direction. The same signal is used for "Line."



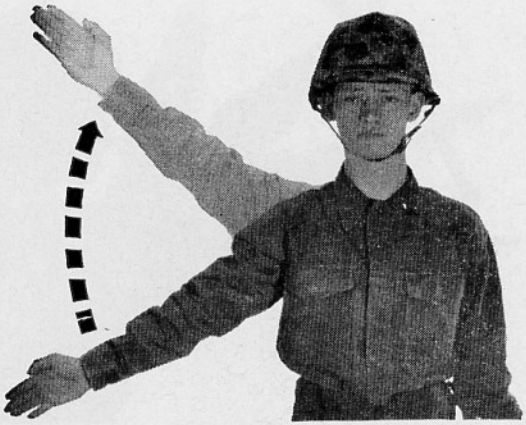
As Skirmishers, Right (Left). Arms are raised to same position as for "As Skirmishers." Then the arm on the side toward which the deployment is to be made is swung straight up and back to horizontal. The swinging movement is repeated several times, with the other arm and hand held steadily in the horizontal position.



Close Up. Start signal with both arms extended sideward, palms up, and bring palms together overhead momentarily. When repetition of this signal is necessary, the arms are returned to the starting position by movement along the front of the body.



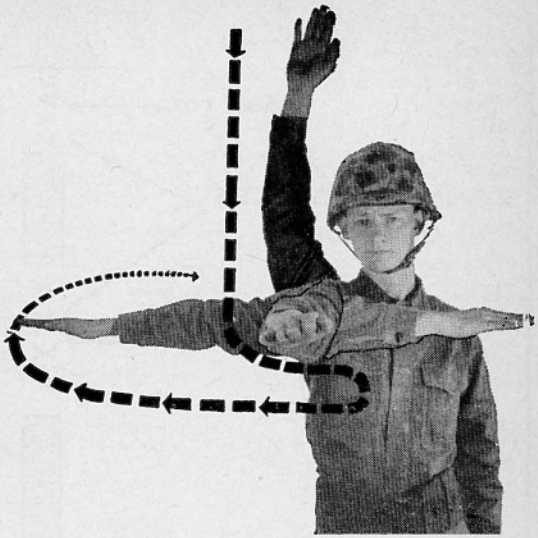
Open Up; Extend. Start signal with arms extended overhead, palms together, and bring arms to the horizontal position at the sides, palms down. When repetition of this signal is necessary, the arms are returned along the front of the body to the starting position and the signal is repeated until understood.



Mount. With the hand extended downward at the side with the palm out, raise arm sideward and upward to an angle of 45° above the horizontal. Repeat until understood.



Attention. Extend the arm sideways, slightly above horizontal, palm to the front; wave toward the head several times.



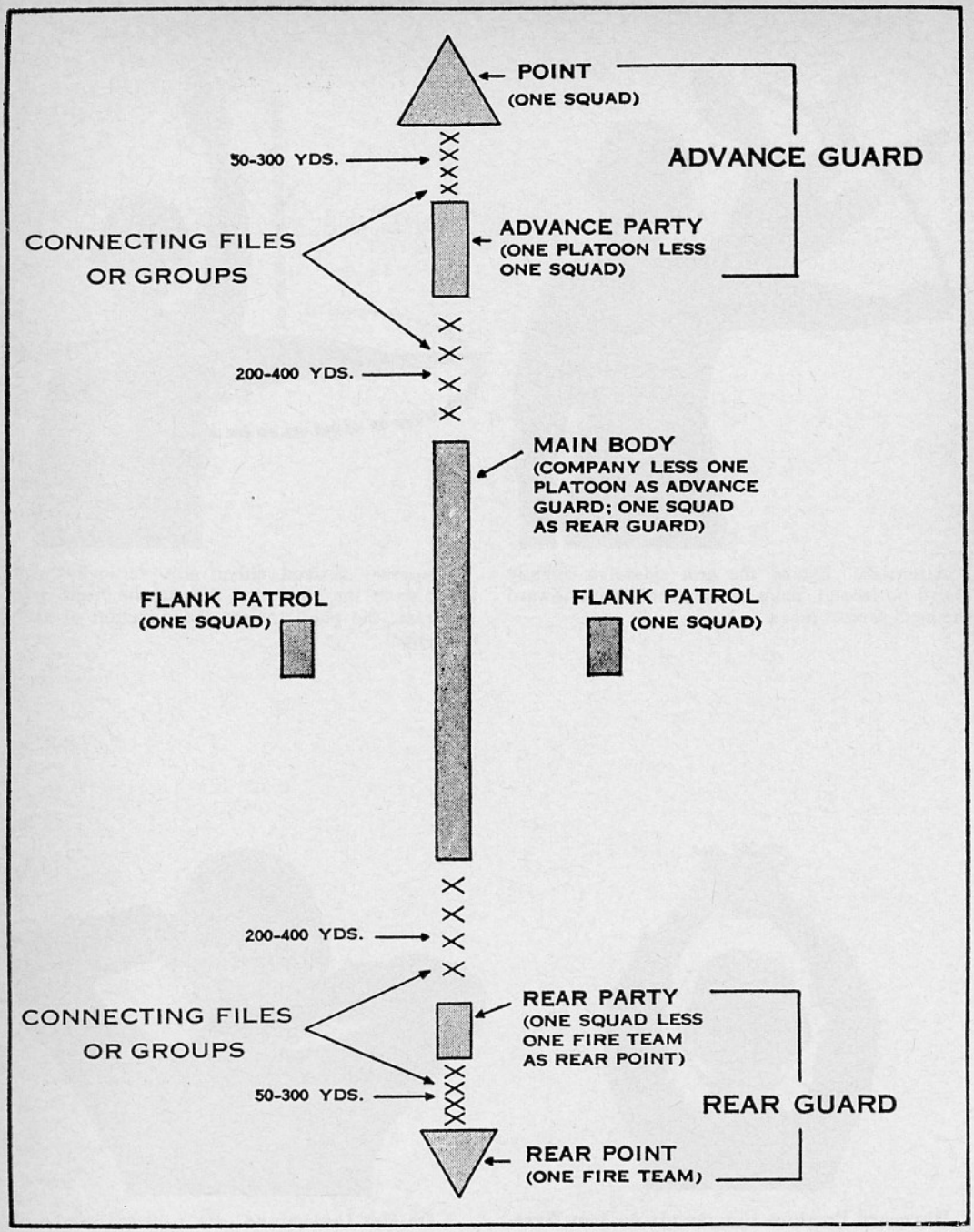
Disperse. Extend either arm vertically over head; wave the hand and arm to the front, left, and rear, the palm toward the direction of each movement.



Disregard Previous Command; As You Were. Face the unit or individual being signalled, then raise both arms and cross them over the head, palms to the front.



I Do Not Understand. Face toward source of signal. Raise both arms sidewards to the horizontal, bend both arms at elbows and place both hands across the face, palms to the front.



COMPANY IN TACTICAL COLUMN

Chapter 13

Squad Tactics

Introduction

THE rifle squad of the Marine Corps is the result of many years of development and combat experience. The aggressive, intelligent and effective employment of the rifle squad in combat is the primary basis for success in battle. Before you consider the tactics of a squad in combat, consider first the organization of the squad and its fire teams, and the duties of its members.

The rifle squad is made up of one sergeant, who is squad leader, and three fire teams of four men each—a total of 13.

The fire team consists of one corporal who is fire team leader, and three privates or PFC's. One of the privates or PFC's is the automatic rifleman, one the assistant automatic rifleman, and the third is a rifleman.

Duties of Squad Members

A. Sergeant—Squad Leader. He leads the squad and carries out the orders issued to him by the platoon commander. He is responsible to the platoon commander for the training, conditioning, conduct and discipline of his squad at all times, and for the condition and care of the weapons and equipment of his squad. He is responsible for the fire control, fire discipline and movement of his squad. He takes position where he can best carry out orders and observe and control his squad. He participates in the fire fight only in critical situations.

B. Corporal—Fire Team Leader. He heads the fire team and carries out the orders of the squad leader. He acts as a rifleman and rifle grenadier. He is responsible for the employment of his fire team, its fire control and fire discipline. He is responsible to the squad leader for the condition and care of the weapons and equipment of his fire team. The senior fire team leader is second in command.

C. The Automatic Rifleman. The AR man carries out the orders of the fire team leader and is responsible for knowing the functioning, characteristics, and proper employment of his weapons. He is responsible for the condition of his own weapon and equipment. In combat, he fires his AR as ordered by the fire team leader.

D. The Assistant AR Man. He carries out the orders of the fire team leader and assists the AR man in keeping the AR in action at all times. He does this by protecting the AR man, maintaining the ammunition supply for the AR, helping to clear stoppages, identifying targets or replacing the AR man if he is a casualty. He functions as a rifleman, scout, and grenadier and is responsible for the condition of his weapons and equipment.

E. The Rifleman. The rifleman acts as rifleman, scout, or rifle grenadier. He is responsible for the care and condition of his own weapon and equipment.

Offensive Combat

The purpose of offensive combat is to destroy the enemy and his will to fight. Offensive action is the only means by which a decision is gained in combat. It requires superiority over the enemy, but superiority in numbers or fire alone is not necessarily the deciding factor. In the final analysis, superiority is achieved by a combination of higher morale, greater aggressiveness, a higher quality of leadership, better training and better equipment.

Since war is not an exact science, the events of war do not follow a set pattern and no rule can

be offered as the correct solution for every combat situation.

However, as an aid to an understanding of sound principles and what might be considered sound procedure in most cases, offensive combat is described herein as being divided into four phases—the movement to contact phase, the attack phase, the consolidation phase and the exploitation phase. These phases cover the squad's action from the time it starts to move toward the enemy until it stops forward movement to take up a defensive position. Within each phase the action of the squad may be further broken down into steps. This does not mean that in every combat action the squad must go through every step of all the phases. The action of the squad will naturally vary with different situations. Generally speaking, the squad will pass through all phases, even though the time spent in a particular phase may be cut short. It will more often be true that a step within a phase will be shortened, omitted or repeated. The discussion that follows explains these phases and steps of offensive combat:

A. Movement to Contact Phase:

1. Contact remote
2. Contact improbable
3. Contact imminent

B. Attack Phase:

1. Advance by fire and maneuver
2. Assault position
3. Assault and advance through the assigned objective
4. Pursuit by fire

C. Consolidation Phase:

1. Hasty defense
2. Reorganization

D. Exploitation Phase:

1. Continuation of the attack, or
2. Pursuit, or
3. Mopping up.

A. The Movement to Contact Phase.

The movement to contact phase of offensive combat begins when a unit enters a zone where enemy activity may be expected. The movement to contact phase ends when the troops of a unit are compelled to fire upon the enemy in order to advance. By proper use of the steps of the movement to contact phase, the rifle squad will be placed in contact with the enemy at the proper time and in effective condition for combat. The disposition of troops during the movement to contact phase is greatly influenced by the number of, nearness to and activity of enemy ground, air and/or sea forces.

1. Contact remote: When contact is remote, administrative considerations govern. The unit commander believes there is practically no possibility of contact with enemy ground forces, and our troops are beyond maximum range of enemy heavy artillery. Movement of troops is by route column.

a. Route column: In route column, units need not be grouped tactically and may move by various means and different routes, usually by rail or motor. Methods of movement are determined only by ease, economy and speed. Very little consideration is given to enemy contact except for security measures against long-range air. The route column ends when the unit commander decides that he must group his unit tactically before continuing the movement.

2. Contact improbable: The unit commander believes that the possibility of contact with the enemy has increased, and that the situation requires additional security measures. During this step of movement to contact, both tactical and administrative considerations govern and movement is made in tactical column.

a. Tactical column: In tactical column troops are grouped tactically so as to permit the prompt use of combat formations or the orderly occupation of and departure from an assembly area. Security detachments may be deployed to front, flanks, or rear as required.

The tactical column *normally* ends when a unit occupies an assembly area to prepare for the attack. However, the enemy situation may cause a unit to deploy into the approach march formation, from the tactical column, without occupying an assembly area.

A unit may also continue the march from an assembly area in a tactical column formation, and consequently occupy more than one assembly area. *Normally* however, the approach march formation is used when a unit departs from an assembly area. The entire procedure depends completely upon the enemy situation and the commander's estimate of the situation.

b. Assembly area: An assembly area is an area in which units assemble prior to further tactical action. The desirable characteristics of an assembly area include:

(1) Concealment from air and ground observation.

(2) Space to permit proper dispersion of personnel and vehicles.

(3) Cover from direct fire.

(4) Natural protection against mechanized attack.

The location of the assembly area is governed primarily by the mission of the unit. It is located as close to the enemy position as terrain and

enemy activity permit; it should have good avenues of approach to the enemy position. If practicable, it is located in an area which is outside the probable effective fire of hostile short range weapons, yet within easy marching time of the attack position.

The primary activity in the assembly area is preparation for combat. Troops are given the maximum rest consistent with security, briefing, and preparation for their mission. Squads remove all excess equipment and prepare for combat. Heavy packs and blanket rolls are removed and arranged in squad stacks. Units do not mingle. Control is maintained, and all hands are kept alert and ready to move out on short notice. Combat loads of ammunition, rations, and special equipment are issued in the assembly area occupied prior to an attack, and before the assault elements move through the contact imminent phase (approach march) to the attack position.

3. Contact imminent: Enemy ground forces are believed or are known to be near at hand and contact with them is expected at any moment. This information comes from reconnaissance and intelligence sources. Continuation of the movement toward the enemy is now made in approach march.

a. Approach march: The approach march takes place:

(1) On order of higher authority.

(2) To minimize enemy long range fire.

(3) When contact with the enemy appears imminent.

The approach march is a method of advance wherein the leading troops are further deployed on a broad front and/or in depth. The advance guard which operated for the tactical column may continue as advance guard, but in a deployed formation, covering the entire zone of advance of the parent unit. Normally this security or advance guard is assigned a zone of reconnaissance. From an overall viewpoint, the column formations are maintained in rear of each advance guard for ease of control and speed, until circumstances require further deployment for readiness to attack. Leading units are rotated as required to avoid delay of the advance. There are no regular halts. Advance is by bounds, stopping on critical terrain features to coordinate the advance. The purpose of the approach march is to bring the units as close to the enemy as possible in readiness for action with minimum losses.

When the platoon takes up the approach march, the squad takes a position in the platoon formation as ordered by the platoon commander. The squad formations are those shown in Chapter 12. For the advantages and disadvantages of these formations refer to Chapter 12.

In the approach march the rifle squad may serve as the point, rear point, flank patrols, connecting elements either to the flanks or in the column, a march outpost, or it may simply march as part of a larger unit.

When marching in a main body, the squad follows the commands of the platoon commander and moves with the main body toward the enemy.

When acting with a connecting group or file, members of the squad pass along the orders of the party ahead of, or behind them. They keep visual contact with each other and allow the column to keep greater distances between large groups of men while giving each group a knowledge of what the group ahead or behind is doing. A connecting group is of fire team size or larger. A connecting file is made up of individuals or the file can be one individual.

When employed as a point, rear point or flank patrol, the squad is expected to protect the column against surprise attack from the areas in which it is operating. In these jobs, squads serve as the eyes and ears of the column.

When serving as an element of march outpost, the squad has the mission of protecting the column during a halt.

Upon assuming an approach march formation, the platoon commander usually prescribes the initial squad formations. As the march progresses, however, the squad leaders order formation changes in accordance with the terrain, the frontage assigned, and the likelihood of coming under enemy observation and fire. In the same manner, the squad leader usually prescribes the initial fire team formations; thereafter, the fire team leaders may order necessary changes in formation.

During the approach march the squads and fire teams must take every advantage of cover and concealment provided along their route by folds in the ground, brush, ravines, reverse slopes, woods and other terrain features. In order to take advantage of available cover and concealment the squad leader may make minor changes in his assigned route of advance. When crossing an exposed area, the squad leader orders one fire team at a time to rush across the open area to a predesignated location. If the exposed area is receiving enemy fire, the fire team advances by individual infiltration.

When a platoon is advancing in the approach march, the platoon commander often designates a base squad within the platoon. The base squad

is a squad which assists the platoon commander in maintaining the proper direction, position and rate of march. The direction of advance is indicated to the base squad leader by pointing out a route, assigning an azimuth, or designating a terrain feature. Other squads guide on the base squad, and the base squad is changed from time to time.

During the approach march, the squad leader moves at the head or in advance of his squad, except for squad leaders of leading squads who are engaged in scouting missions. He regulates his squad's advance on the base squad, or, if his squad is the base squad, he advances it as directed by the platoon commander. As he moves, he studies the ground to the front in order to choose the best route and to control and regulate the movement of his fire teams. He decreases distances and intervals between fire teams as conditions of visibility become poor. He maintains the proper direction. He makes minor detours to take advantage of better routes of advance. He is responsible for the security of his squad from hostile action.

When a rifle platoon in the approach march is not preceded by friendly troops within view, it sends out its own scouting elements. These scouting elements are usually one or two fire teams; sometimes an entire squad or more is used. Fire teams used as scouting elements are called scouting or leading fire teams. They are controlled by the platoon commander who is assisted by the squad leader. A squad leader whose squad is providing scouting fire teams normally marches near the platoon commander to be readily available to assist in the control of the scouting fire teams. Scouting fire teams move forward aggressively to cover the front of the advancing platoon and force any enemy to disclose his position. Formations generally used are the wedge, the vee and skirmishers, depending upon the terrain as well as the frontage assigned. Normally a squad will be called upon to scout a frontage of from 50 to 150 yards. Scouting fire teams are covered by the platoon, or, when the platoon is masked, the fire teams cover their own advance. The fire team leaders watch constantly for signals from the platoon commander. Scouting fire teams move at a distance from the platoon as ordered by the platoon commander. This distance varies with the terrain and probable position of the enemy and may be as much as 300 yards.

In open terrain the platoon commander usually directs the scouting fire team(s) to move by bounds along a succession of objectives. Under conditions of limited visibility or close terrain the leader of the scouting fire team(s) must maintain sight contact with the platoon commander.

When a scouting fire team is directed to advance over open ground to an edge of woods, members of the team, preferably the rifleman and the assistant automatic rifleman, reconnoiter within the woods for 50 to 60 yards, while the other two men of the fire team cover them. As soon as it is determined that the area near the edge of woods is clear, the fire team leader sends a member of the team to signal "forward" to the platoon commander. The scouting fire team(s) holds a line 50 to 75 yards within the woods, maintaining observation toward the enemy until the platoon comes up. Before moving out farther into the woods, the scouting fire team(s) awaits orders from the platoon commander. Upon arriving at the far edge of the woods, the scouting fire team(s) halts and again waits for orders from the platoon commander.

When a scouting fire team is fired upon, the individuals immediately seek cover. They then locate targets and return the enemy fire. The scouting fire team leader must, at this time, accomplish one of the most important parts of his mission. He determines as many of the following items as possible:

Location of enemy (range and reference points).
Extent of position (location of flanks).
Types of positions (foxholes, pillboxes, bunkers, obstacles, etc.).
Number of enemy (how many).
Enemy weapons (machine guns, mortars, tanks, etc.).
Nature of terrain between his position and the enemy (routes of approach, trails, roads, streams, woods, etc.).

As soon as possible, the platoon commander contacts the leaders of the scouting fire teams to find out as much of this information as possible. After getting this information the platoon commander usually returns the scouting fire teams to the control of the squad leaders. In most situations each of these squad leaders then brings up the rest of his squad and commits the entire squad to the fire fight. However, under ideal conditions, where enemy positions are known, the squad occupies the attack position before commencing the attack phase.

b. Attack position: The attack position is the last position occupied by assault units before crossing the line of departure. Troops occupying the attack position include only those units actually attacking. The reserve battalion of a regiment, the artillery, or other divisional units not making

the assault are not considered to be in an attack position. These units are considered to be occupying assembly areas or firing positions as the case may be.

The desirable characteristics of an attack position are similar to those of the assembly area. (See paragraph 2 b.) Characteristics especially desirable include:

(1) Concealment from ground observation.
(2) Cover from direct fire.
(3) Good avenues of approach to the line of departure.
(4) Terrain which permits all around observation on or near the perimeter of the attack position, to afford additional security.

The attack position usually is located in the last covered and concealed position in rear of the line of departure. There may be times when the terrain and the situation are such that it is advisable to have one area serve the purpose of both an assembly area and an attack position.

The primary activities in the attack position are final preparations for combat. Last minute orders are issued and final details of coordination and reconnaissance are completed. In situations where it is possible to bring vehicles and supplies to the attack position without jeopardizing the secrecy of the attack, it may be desirable to distribute combat loads of ammunition, rations and special equipment to the individual troops at this location. The attack position is occupied for a minimum of time before the attack.

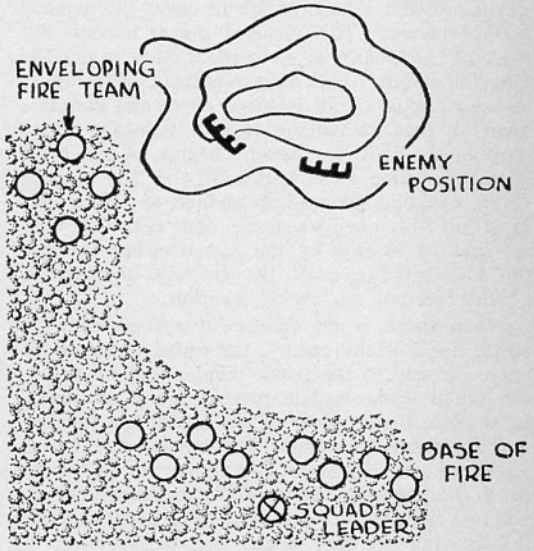
B. Attack Phase.

The attack phase of offensive combat begins when the troops of a unit are forced to fire upon the enemy in order to advance, or when the leading troops cross the line of departure. The attack phase ends when the squad or other unit seizes its final objective. The squad assists in accomplishing the platoon mission. Generally, it may be used to provide a base of fire, as a maneuvering element, or to seize a separate objective within the platoon zone of action. Maximum support from all supporting arms is given the attacking infantry during this phase.

In the event that troops do not have contact with the enemy by fire when crossing the line of departure the advance is made as in the approach march, until contact by fire has been made. When contact by fire has been made with the enemy, the squad begins the first step of the attack phase.

1. Advance by fire and maneuver: When the squad reaches a point where it can no longer advance without sustaining excessive casualties, the squad leader orders one or more fire teams to fire on the enemy positions. The remainder of the squad moves forward under the protection of this covering fire. Units and individuals within the squad alternate in moving and covering by fire the advance of the others. Supporting fires from weapons not organic to the squad may be provided. This includes machine guns, mortars, tanks, artillery, rockets, naval guns, aircraft and other weapons. Fire, either organic or nonorganic to the squad, is employed to prevent the enemy from manning his defenses and repelling the advance. Supporting fires should be followed closely by the advancing troops so that the advantage of the shock effect of the fire upon the enemy will not be lost and the enemy permitted to reoccupy his positions. The squad leader may request supporting fires from his platoon commander who, if he approves the request, forwards it up through the chain of command.

Upon opening fire, the squad seeks to gain fire superiority over the enemy holding up its advance. Fire superiority is gained by subjecting the enemy to fire of such accuracy and volume that the enemy fire ceases or becomes ineffective. The squad leader commits enough of his squad so that fire superiority is gained. The fire teams use all of the weapons at their disposal to accomplish this task. Rifles, rifle grenades and especially the automatic rifle, are employed. The automatic rifle's capacity for delivering a large volume of fire makes it especially useful in gaining fire superiority. This weapon is normally controlled by



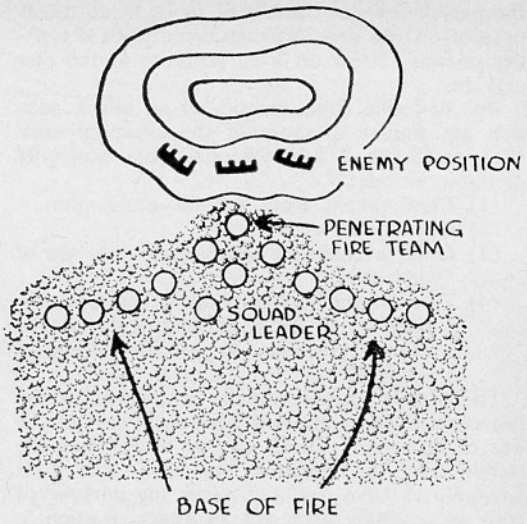
13.1 Rifle squad making an envelopment.

the fire team leader. The fire team leader may designate the firing position, the target and the rate of fire for the automatic rifle. He usually initiates the movement of the automatic rifle to new firing positions, endeavoring to place the weapon in such a position that enfilade or oblique fire can be placed upon the enemy.

Once fire superiority has been gained, the squad is ready to continue its advance toward the enemy. Fire superiority must be maintained throughout the attack in order to insure the success of any maneuver. Before he advances any part of his squad, the squad leader should assure himself that there is sufficient supporting or organic fire on the enemy to render his return fire ineffective. Two types of maneuvers are normally employed by the squad in the attack phase. These are the single envelopment and the penetration. In single envelopment, the main attack is directed against the flank or immediate rear of the enemy's position. (See Figure **13.1**.) It is almost always assisted by a secondary attack directed against the enemy's front. This secondary attack is almost always an attack by fire rather than a physical attack. The other type of attack maneuver is the penetration, which is an attack on the enemy's front by driving a wedge into it or piercing it completely (See Figure **13.2**). This type of attack is characterized by rushes of individuals or fire teams of the squad under the covering fire of the remaining members of the squad.

When moving against the flank, one part of the squad provides a base of fire to cover the maneuvering element. This element moves around the flank of the enemy so as to place itself in a position to assault. The maneuvering element must take advantage of all possible cover and concealment so that the enemy is kept unaware of its movements until the assault begins. Care must be taken during an envelopment that the maneuvering element moves deep enough to insure that it is on the enemy's flank and rear. At the moment of assault by the maneuvering element the base of fire must lift entirely or shift to another part of the enemy position.

When there is no chance of maneuvering to either flank of the enemy, the squad is forced to move directly to the front. Under this condition, the squad leader orders one or more fire teams to advance under cover of the fire of the remaining fire team or teams. The moving fire teams advance as rapidly as possible to new fire positions, using the maximum cover and concealment available. When new fire positions have been reached, the moving element opens fire by surprise, if possible. The fire team or teams which were



13.2 Rifle squad making a penetration.

providing the base of fire cease firing when the moving group opens up. Under cover of this newly established base of fire, the fire teams acting as the initial base of fire move toward the enemy, using all available cover and concealment. This process is continued until part or all of the squad passes through the assault position.

2. Assault Position: The assault position is located between the line of departure and the objective. At this position, many of the supporting fires (direct and indirect) which cover the forward movement of the squad are lifted and the squad uses its own maximum fire power for the final assault of the enemy position. The distance from the assault position to the objective varies from 25 to 150 yards, depending upon how close the squad can move to friendly supporting fires without suffering casualties from these fires. The assault position may be in front of or to the flank (rarely to the rear) of the objective. The determining factors are the enemy disposition and the location of covered and concealed routes of approach in the vicinity of the objective. There is no delay or hesitation at the assault position. The timing of the lifting of supporting fires is coordinated closely by higher commanders with the movement of the assault echelon; this permits the uninterrupted movement through the assault position.

3. Assault and advance through the assigned objective: The third step of the attack phase is the assault and advance through the assigned

objective. It begins when leading troops have advanced as close to the enemy as possible without moving into friendly supporting fires. The assault is started on orders, or signal, of the platoon commander, or on the initiative of a squad or fire team leader. The assault is delivered at the earliest moment that promises success and without regard to the progress of adjacent squads. In launching an assault, the squad employs assault fire to keep the enemy down. Riflemen usually fire from the hip or shoulder at a rapid rate. The automatic riflemen utilize any firing position that is convenient; they may fire from the hip in short bursts at a rapid rate. Extensive use of the bayonet and grenades is stressed. The assault must be aggressive and vigorous. To provide greater control and thorough coverage of the enemy position each fire team is given a definite objective by the squad leader.

When the squad's objective, or the squad's portion of the platoon's objective, contains two or more emplacements it is imperative that the squad does not stop at the near edge of the objective but drives rapidly to the far edge. The enemy is given no time to recover from the shock of the assault. The assault and the process of fire and maneuver may be repeated here to drive all enemy forces from the objective by continuing the advance through the entire objective.

4. Pursuit by fire: The fourth and last step of the attack phase is the pursuit by fire. When the advance through the hostile position is completed the squad fires upon the withdrawing enemy forces until they are no longer visible. This is pursuit by fire. This fire is continued until the enemy is no longer visible, or is beyond the effective range of the squad weapons. The pursuit by fire normally lasts for only a very short time. Seldom will a rifleman be able to fire many rounds at the withdrawing enemy before they have become concealed.

C. Technique of Fire.

In combat, enemy soldiers on the move present small, fleeting targets. This increases the importance of an accurate sight setting and an accurate lead. When targets appear suddenly, allowing no time for sight adjustment, you will have to use the battle sight and select a proper aiming point with respect to the center of the target so that the moving target and the bullet meet.

D. Method of Aiming.

1. Aiming Point: When you use your battle sight setting (300 yards zero) the path of the bullet's flight is relatively flat up to a range of 400 yards; when firing at a standing man, you should aim at the center of his body about belt level. Therefore, if the enemy soldier is moving directly toward or away from you, use this same aiming point. Should you find it necessary to engage an enemy soldier at a range greater than 400 yards, effective results can be obtained by setting your sight at the proper range and continuing to use the same aiming point.

2. Leads: To get the proper lead for firing at a man walking across your line of fire, use the following aiming points:

(a) At ranges less than 300 yards, aim at the forward edge of the body.

(b) At ranges of 300 yards or more, lead your target by the width of the body.

If the man is running, double the lead. Accuracy in this type of firing depends largely on the amount of time you devote to the practice of leading the target, aiming, squeezing the trigger, following through, and correct battle sight setting.

3. Types of Unit Fire: The size and nature of the target presented may call for the fire power of the entire fire unit or only certain parts of it and will suggest the type of unit fire to be employed against it. The squad leader receives his orders from the platoon commander who will usually designate a specific target, or targets, and/or a sector of fire for the squad. If practicable, it is usually desirable for each squad to cover the entire target designated for the platoon in order to insure adequate coverage. This will be done unless otherwise ordered. Squads frequently make the mistake of covering only that portion of the platoon target that corresponds to their portion of the firing line. In the event it is not desired that the squad cover the entire platoon target, the platoon commander will assign each squad a designated sector of the platoon target; or he may direct a squad to engage a target, or shift to a target of opportunity, which may be entirely separate from the target being engaged by the remainder of the platoon. The same principles will apply in the case of fire teams. A fire team will normally attempt to cover the entire target designated for the squad, although the squad leader may order a fire team leader to limit the fire of his fire team to a sector of the squad target, to engage a separate target, or to shift to a target of opportunity. The type of unit fire employed by a fire unit must necessarily be concentrated or distributed fire.

E. The Consolidation Phase.

The consolidation phase is the third phase of offensive combat. The consolidation phase covers

the period from the end of the attack phase to the moment of commencing some further action to exploit success. In this phase, the rifle squad takes action to hold the ground it has gained, to protect its reorganization and to reorganize so that the advance may be continued. The consolidation phase consists of the hasty assumption of the defense and reorganization.

1. Hasty defense: After the squad has driven the enemy from its position, its job is to hold what it has won. The squad leader hastily organizes a defense of the position, as security against enemy counterattacks during reorganization and before offensive action is resumed. Primary consideration is given to the positions of the fire teams and automatic weapons, digging in, and provisions for local security. This position is maintained until orders are received from the platoon commander to continue the advance or until the reorganization of the squad is completed.

2. Reorganization: The second step of the consolidation phase is the reorganization. The purpose of reorganization is to allow the squad to regain its combat efficiency so that it can continue the advance. The squad leader replaces his casualties, redistributes ammunition and grenades, evacuates his own casualties, searches the enemy dead, and turns prisoners over to the next higher unit. He then generally prepares the squad to continue the attack on order of the platoon commander by making a visual reconnaissance to his front.

F. The Exploitation Phase.

The fourth and final phase of offensive combat is the exploitation phase. It begins immediately following the reorganization of the squad on its objective. The exploitation phase consists of three steps: continuation of the attack, or pursuit, or mopping up. Normally a unit does not participate in these steps concurrently or in sequence. This phase is a follow-up of the consolidation phase and the particular step which follows depends upon the situation.

1. Continuation of the attack: The rifle squad continues the attack upon orders from the platoon commander assigning the squad a new objective. The attack is continued by using the steps of the approach and/or attack phase as applicable. When the newly assigned objective is overrun, the steps of the consolidation phase are then repeated. The attack is continued in this manner until the enemy is destroyed, hostile action forces the squad to take up a defensive position, or the rifle squad is assigned one of the other steps of the exploitation phase.

2. Pursuit: The rifle squad, alone, will not pursue an enemy unless ordered to do so by the platoon commander. When ordered to physically pursue the enemy, the rifle squad advances by using steps of the approach and/or attack phase as applicable. The disorganized enemy is pursued relentlessly to the limits assigned by the platoon commander. A physical pursuit must be aggressive and constant pressure must be kept upon the enemy to prevent him from reorganizing and preparing new defensive positions. Speed is important.

3. Mopping up: The third step in the exploitation phase is mopping up. It is used to eliminate enemy units that have been isolated by envelopment or that have been bypassed. Such a mission is frequently assigned a rifle squad. This mission is accomplished by a repetition of the steps of the approach and/or attack phase, depending upon the situation encountered. All enemy positions, enemy dead and enemy wounded are examined. Unit control and security are maintained. Booby traps and duds are marked. Mopping up is characterized by extensive use of smoke, demolitions, rockets, rifle grenades and flame throwers. Because of the close proximity of friendly troops, small arms fire is kept to the minimum except when fired at point-blank range. Mopping up is not only conducted in the immediate vicinity but also to the flanks and to the rear.

Defensive Combat

A. Purpose. The purpose of defensive combat is to gain time pending the development of more favorable conditions for offensive combat, or to hold the enemy with a relatively small force on one front in order to launch an offensive with strong forces on another front.

B. Missions of the Squad.

1. Front-line squad. The mission of a front-line squad in defense is to stop the enemy by fire forward of the squad position and to repel him by close combat if he reaches it.

2. Squad as part of the reserves. The squad may serve as part of the supports or reserves of the defense, located to the rear of front-line units. The squad may be ordered to organize and defend a position from which to limit enemy penetrations of the front lines and may be ordered to counterattack as part of a large force.

3. Squad as a security element. The mission of a squad located forward of the front lines as a security element of the defense is to gain information about the enemy and to delay, deceive, and

disorganize the enemy as much as possible before withdrawing to the front lines.

C. Organization of the Squad Position. In his order, the platoon commander assigns the squad exact squad areas to be organized, the general trace of the line to be occupied, specific sectors of fire and the general location and principal direction of fire for the automatic rifles. The squad leader then organizes his assigned area as follows:

1. Assigns a position and sector of fire to each fire team in such a manner that the sectors of fire overlap in order that there will be complete coverage of the squad sector of fire.

2. Assigns a position, a principal direction of fire, and a sector of fire to each automatic rifleman within the positions of the fire teams if not previously assigned by the platoon commander. These automatic riflemen cover gaps in the final protective lines of machine guns, and likely avenues of enemy approach into the squad position. (See Figure **13.3.**)

3. Designates one or more members of the squad to observe and listen at all times for enemy activity.

4. Carries out the priority of work assigned by the platoon commander in organization of the ground. This involves:

a. Clearing fields of fire for all weapons.

b. Digging foxholes.

c. Constructing obstacles.

Camouflage measures are begun as soon as the position is occupied and are carried out while other work is going on.

5. Selects a position for himself from which he can:

a. Observe the area over which the enemy must advance to reach the squad position.

b. Best observe as much of the squad position as possible, particularly the positions of the three fire team leaders.

c. Best exercise control over his fire teams, usually slightly to their rear and generally in the center of the squad position.

D. Hasty Assumption of the Defense. Enemy fire or the threat of imminent enemy attack may necessitate the hasty assumption of the defense. Then, the first considerations of the squad leader are to get his men on the squad position, to have them start digging in and to provide for local squad security. Time limitations may cause the squad leader to curtail or omit, initially, some of the action outlined above which would normally be taken in the organization of a defense where time was not a factor. However, once a hasty assumption of the defense has been ordered, no time or opportunity will be lost in the continual improvement and strengthening of the position into the most complete and formidable defense possible.

E. Conduct of the Defense.

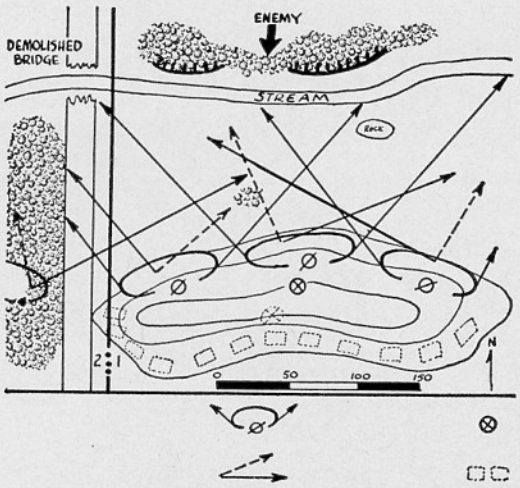
1. The squad opens fire on the squad leader's order when the enemy comes within effective range, generally 500 yards.

2. As the enemy approaches, the squad covers its sector of fire, and protects by fire any machine guns, antitank guns or other supporting weapons on or near the squad position.

3. If the enemy reaches the squad position, he is met with grenades, point blank fire, and bayonets. The squad holds its position at all costs.

4. If the position of an adjacent squad is overrun by the enemy, the squad leader shifts the fire of part of the squad into the adjacent area, and if necessary, moves some of his men to the threatened flank.

5. If tanks support enemy infantry in the attack, the squad concentrates its fire on the enemy infantry until the tanks come within range of the antitank rifle grenades, when designated members of the squad open fire with grenade dischargers. If the enemy tanks reach the squad position, those members of the squad directly in the path of tanks crouch in the bottom of their foxholes until the tanks have passed; then rise and fire antitank grenades into the rear of the tanks.



13.3 Front line rifle squad position.



Chapter 14

Protective Measures

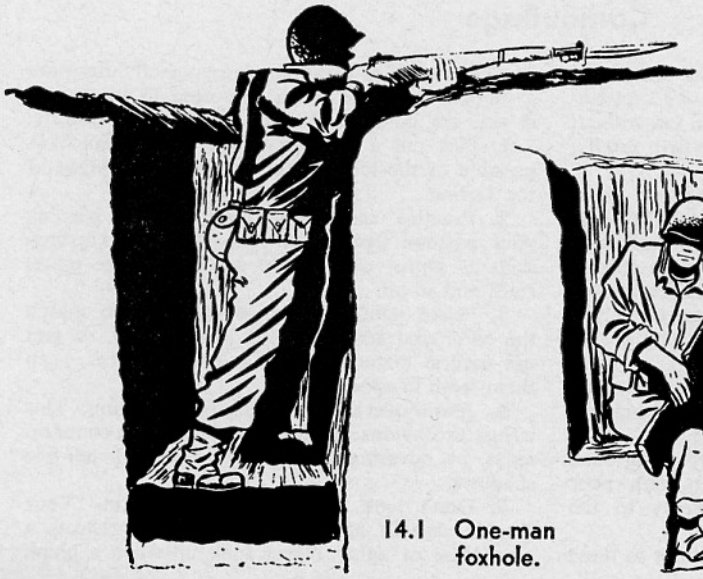
THERE is a Marine Corps rule for fighting which says: "Each unit leader is responsible for the all-around security of his own unit."

This does not mean that just the officer or NCO in charge of your group is the one to see that you and your outfit are protected. It is also your responsibility to take quick measures to protect yourself when your unit may be stopped in a forward movement in battle and at other times when protection is needed. When your outfit cannot advance farther, you usually need protection quickly against the fire of enemy small arms, mortars, and artillery. This protection should be simple, available almost at once, and should be capable of further improvement as long as you remain in that position.

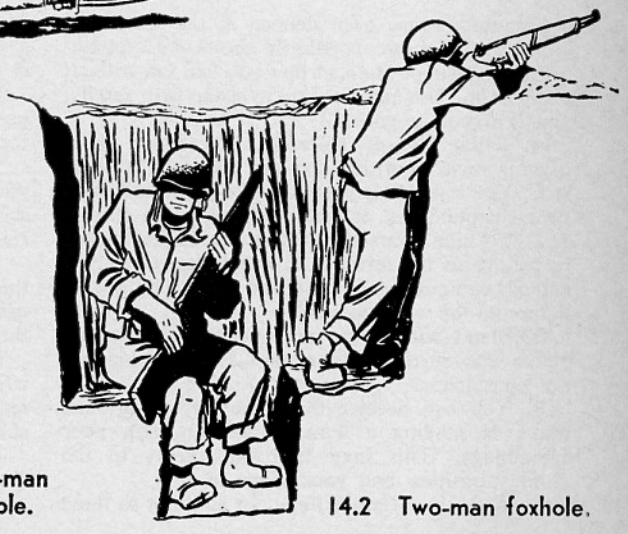
Entrenchments

Entrenchments are located to cover a selected area with fire and, at the same time, provide concealment from aerial and ground observation and protection from enemy fire. The three most commonly used entrenchments are briefly explained in this section.

A. The Foxhole. Foxholes are entrenchments normally dug for individual protection when contact with the enemy is imminent or in progress. They provide protection against small arms fire, artillery shell fragments, airplane fire or bombing, and the crushing action of tanks. The one and two-man foxholes are basic types, the choice of type resting with the squad leader if not prescribed



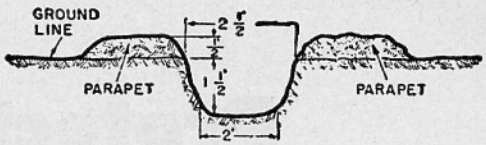
14.1 One-man foxhole.



14.2 Two-man foxhole.



14.3 Individual Prone Shelter.



14.4 Connecting Trench.

by higher authority. The two-man foxhole consists essentially of two adjacent one-man foxholes. It is used when men must work in pairs or when, for psychological reasons, battlefield comradeship is desirable. Fig. **14.1** shows a one-man foxhole, and Fig. **14.2** shows a two-man foxhole.

B. The Individual Prone Shelter. A prone shelter may be dug more quickly than a foxhole, and it gives considerable protection from small arms fire, artillery and aviation. However, since it is shallow, it does not provide protection against the crushing action of tanks, and it is not suitable as a firing position. Fig. **14.3** shows an individual prone shelter.

C. Connecting Trenches. Connecting trenches are conspicuous to aerial observers and on aerial photographs, and thus reveal the defensive dispositions. Continuous connecting trenches are not dug as a normal procedure. When two forces are in contact and dispositions have been revealed beyond any question, a few short trenches may be dug in inconspicuous places to permit necessary daylight movement across exposed areas. Necessary connecting trenches also may be dug in close country, such as jungle, where the position probably will not be disclosed. Further, they may be dug whenever the improved protection, control, communications and supply outweigh the sacrifice of concealment. Fig. **14.4** shows a connecting trench.

Camouflage

Camouflage has been defined as the science of military deception. It affords protective concealment for your position so that you can see without being seen. This permits you to strike first, fatally, and at no cost to yourself.

A. Hide, Blend, Deceive. There are three general ways in which you can camouflage yourself. You can hide, you can blend yourself with your surroundings, or you can deceive the enemy.

1. To hide yourself, use the advantages offered by nature in the terrain. If nature has given you enough camouflage for you and your supplies, let nature do the work unaided.

2. Blend with your surroundings so that you match the surrounding terrain features and are not conspicuous.

3. You can deceive the enemy by using such tricks as making a dummy position with poor camouflage. This may lead the enemy to the dummy position and your range of fire.

B. Rules for Camouflage. In addition to these general means of camouflaging yourself, there are a number of rules which you need to learn well if you are going to protect yourself successfully.

1. Pick out a position which uses as much as possible of the tactical and concealment values of the terrain.

2. Practice camouflage discipline by keeping your position free of tell-tale signs of occupancy such as paths, dead leaves on camouflage materials, and so on.

3. Select your camouflage materials to match the color and texture of the local terrain. If you use natural materials, such as grass or trees, keep them fresh in appearance.

4. Avoid over-camouflaging your position. This is just as obvious as no camouflage. Use common sense in covering regular outlines and tell-tale shadows.

5. Don't look up from your position. Your face is smooth and light colored, and reflects a great deal of light. Never look up when a plane



14.5 Light gleams on uplifted faces.



14.6 A discarded cigarette can betray you.

is overhead, or if you do, break off a branch or bush and look through the leaves carefully. Observe in Fig. **14.5** how an up-lifted face can reveal your location.

6. Never throw down a cigarette. Pinch out the fire, split the paper and roll it into a small ball. Scatter the shreds of tobacco around so no clues will be left. Fig. **14.6** indicates how a cigarette shows up.

7. Some objects shine like mirrors in the sunlight and can be seen for miles. Watch your mess gear and weapons. Keep them under cover or in the shade. Note in Fig. **14.7** how sunlight can change your mess gear into a mirror.

8. Tape your dog tags so that they do not clink. Put them together and bind them with a piece of friction tape or adhesive tape, as shown in Fig. **14.8**.

9. Follow the paths laid out for you. The paths may be wired, they may be taped, or they may just be blazed. But they were laid out for a purpose. Don't try to take short cuts away from them; you make new tracks.

10. Don't cut the brush or limbs you plan



14.7 Mess gear, flashing in the sun, can be seen for miles.



14.8 Tape dog tags together so that they will not clink.



14.9 Don't cut branches near camouflage.

to use for camouflage from a bush next to your position, as shown in Fig. **14.9.** Go some distance for them and don't take them all from the same place.

11. Bury your empty ration cans and all other waste material as shown in Fig. **14.10.** Fill the dirt back in very carefully and cover the spot with leaves or dry grass. Go so far as to sod the spot if you find it necessary.

12. Lyster bags may be hanging from a limb. If they hang from a limb, tie some foliage against their sides to cover the white canvas, as shown in Fig. **14.11.**

13. Stay off the horizon. It is important that you know where the horizon is. If the enemy is downhill from you, you usually are on his horizon, as shown in Fig. **14.12**, and present him with a good target.

14. Stay in the shadows and also be sure you have a blending background. You can be seen in silhouette if you are in shadow with a lighted background beyond you.

15. Smoke billowing up in a straight column is always bad. Build your fires under trees or put a screen over the fire.

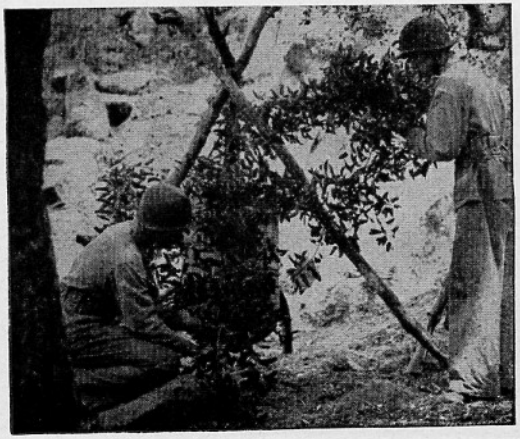
Elementary Obstacles

You can sometimes put out artificial obstacles such as wire, so that the enemy will be channeled into areas where he is covered by your fire. These obstacles are placed in woods, tall grass, brush, or some other place where they can be hidden, if it is possible. They have to be covered by fire at all times to prevent the enemy from removing, destroying, or surmounting them.

At all times when wire is used, there should be some alarm system attached to the wire. One



14.10 Carefully buried ration cans will not give your outfit away to the enemy.



14.11 Leaves obscure the whiteness and outline of a Lyster bag.



of the simplest and most effective alarm systems consists of a few pebbles placed in empty tin cans, which are fastened to the wire.

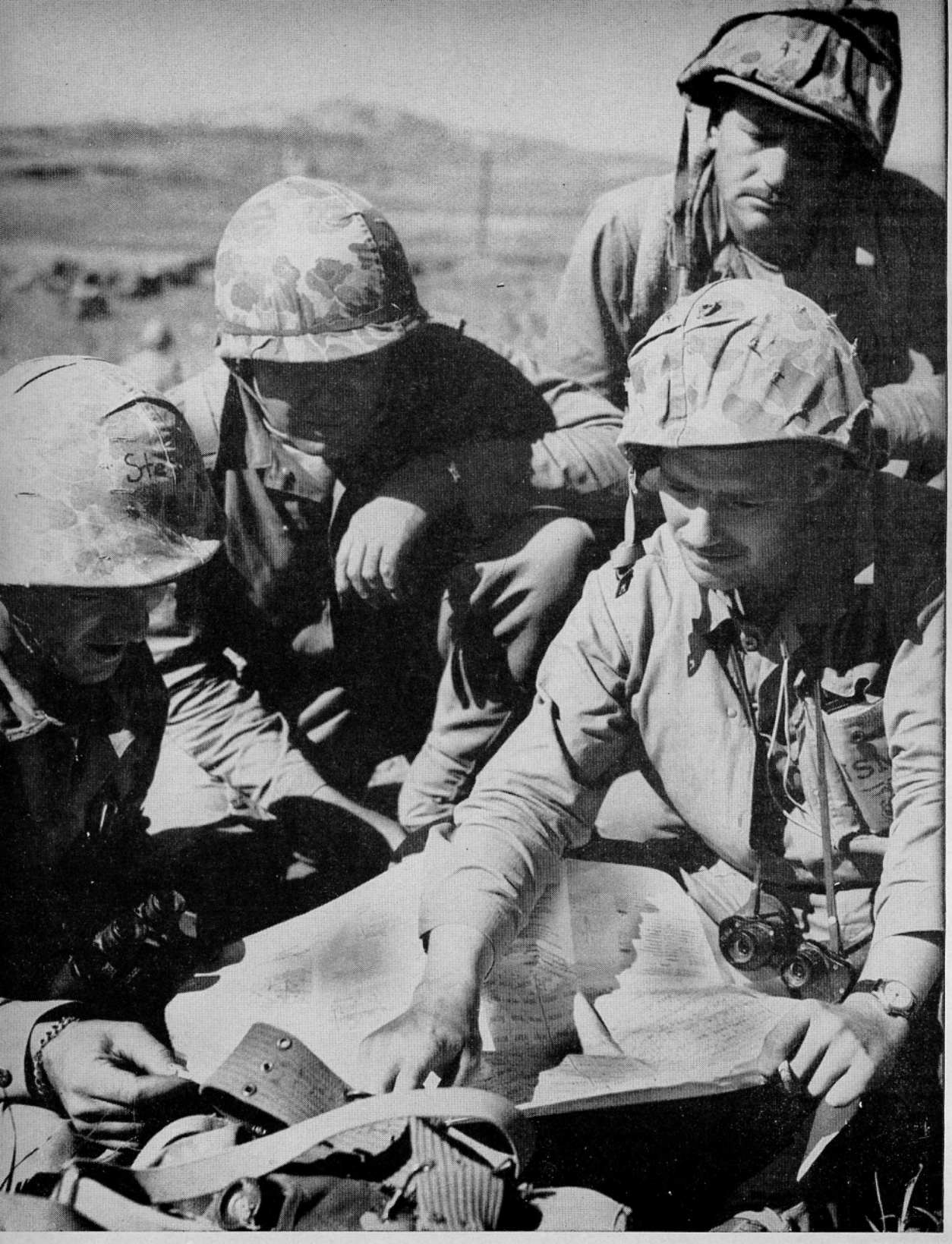
A. Tactical Obstacles. Some obstacles are called tactical obstacles. These are obstacles placed to hold the enemy in areas covered by defensive fires, particularly by the final protective fire of machine guns. Such obstacles can be double apron fences, concertinas, or a combination of both. Two parallel rows of double apron fences or a pyramid of three concertinas fastened together by strands of barbed wire are common.

B. Protective Obstacles. Protective obstacles are used to surround a platoon defense area completely. They are set up to hinder a surprise attack by the enemy. They must be placed beyond hand grenade range. A single four-strand barbed wire fence can become a protective obstacle.

C. The Abatis. An abatis is made by felling dead trees or interlacing live tree branches to form a barrier to enemy infantry. In addition to trees, wires may be intertwined among the branches and booby traps can be placed in an abatis, if ordered.



14.12 An enemy downhill from these men has been given a good target.



Chapter 15

Mapping and the Compass

IN civilian life it is possible for a stranger to find his way around a large city or town by merely asking directions from any policeman or friendly native of the town. He may have to overcome a few wrong directions thrown in with the right ones, but he is sure of finding his way.

In war, Marines often find themselves in strange surroundings. As a Marine, you will have to ask directions like any other stranger but you will also get information from your map. Your map has all the answers and you must be able to read it. Reports from Marines in combat show us that every man must know how to read and use a map if he wants to stay alive and keep his outfit safe at all times.

A native of a place can tell us lots of things to help us, but we have to be able to speak his language. We must also learn to read and understand the language of a map. It is a simple and clear language. You will have use for it very often while you are in the Marine Corps, especially when you are in a tight spot. If you learn to use it correctly, it won't let you down.

A map is a picture. It isn't a puzzle and it isn't hard to read. It is a picture of the land and the things people have built on the land. A map is flat and when we look at a map we are looking at a picture of the ground from a spot high in the air. That view is different from the one we have looked at all our lives, from one point on the ground to another point on the ground. That is the first thing to remember about maps. *Maps are views of things from directly above.* They give a view as though you were hovering over a football stadium in a helicopter. In map reading we are looking from overhead at something with many more details than a football game, and at an area much larger and not so near to us; the land itself really looks strange.

What Is On A Map?

A map is a picture, but it is not a photographic picture. It is a drawing in ink on paper, and a big difference between a map and a photograph is that the map has signs and symbols instead of photographs of objects. These signs and symbols represent various things on the ground.

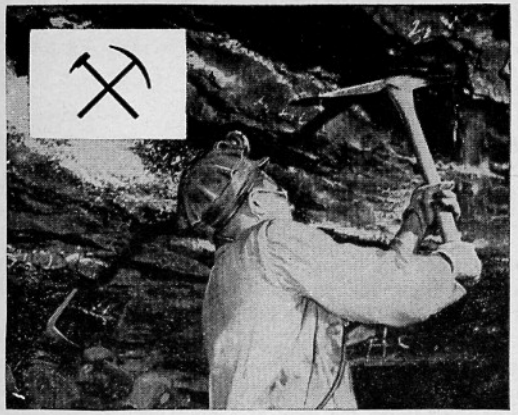
To read a map, then, we have to learn what these various signs mean. Map signs and symbols usually look something like the actual things for which they stand. The signs are simple to draw and are easily recognized. In order to better understand the use of signs, look at Figures **15.1** through **15.14** in which the conventional signs are paired with pictures of the things they represent.

For example, Figure **15.1** shows a pick crossed with a sledge hammer, the sign for a mine. These two tools are used in mining. Figure **15.2** shows the sign for a schoolhouse, a black block with a flag flying from it. Most schools have a flag on a flagpole, and so the sign gives you the idea of a school.

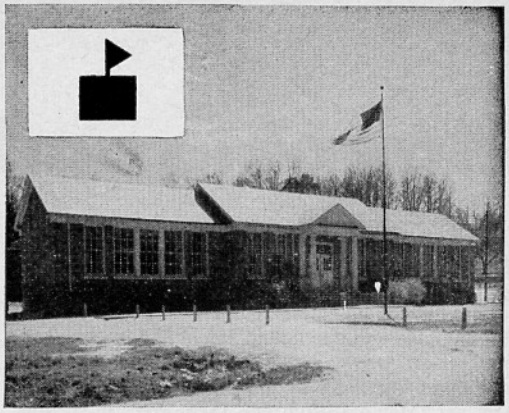
Let us put these signs on a map and see what they look like. Figure **15.15(2)** shows you the mapping signs for the things you see in the photograph of the land in Figure **15.15(1)**. Identify the signs shown.

The map, however, is still incomplete. So far, we just have our objects on a flat, blank piece of land; but our land is not like that. It has much more on it than these signs alone can show us.

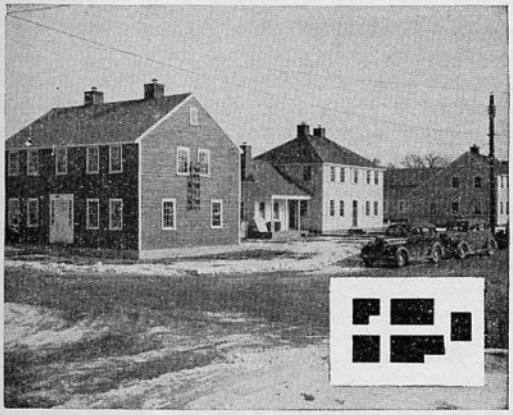
On a football field, we see the players not on a blank area, but against a background marked off with lines. These lines mean something to us, and we can tell where the players are by watching how far they are from these lines; the goal lines, the yard lines, and the side lines. The lines form a pattern which connects the different objects on the field. On the map on which our



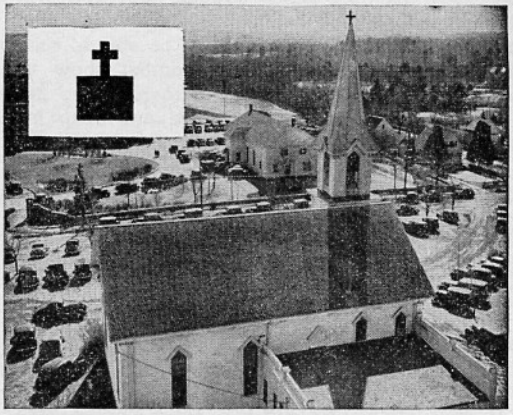
15.1 Mine.



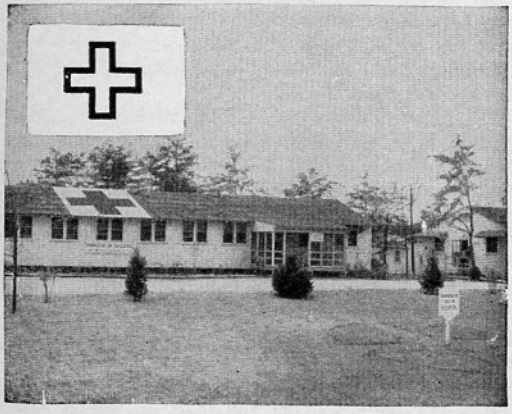
15.2 Schoolhouse.



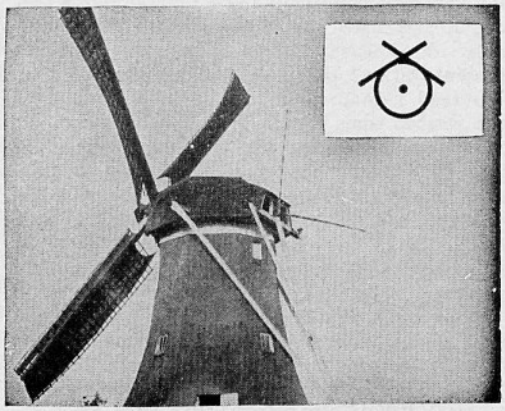
15.3 Buildings.



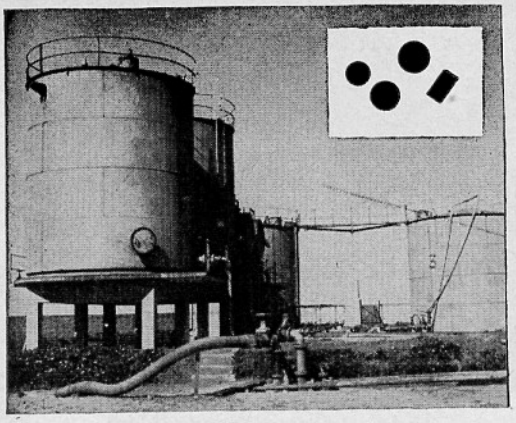
15.4 Church.



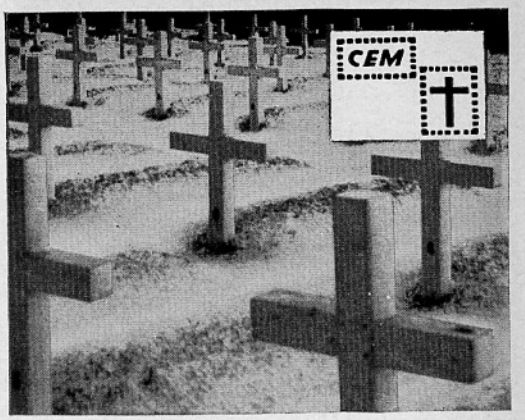
15.5 Hospital.



15.6 Windmill.



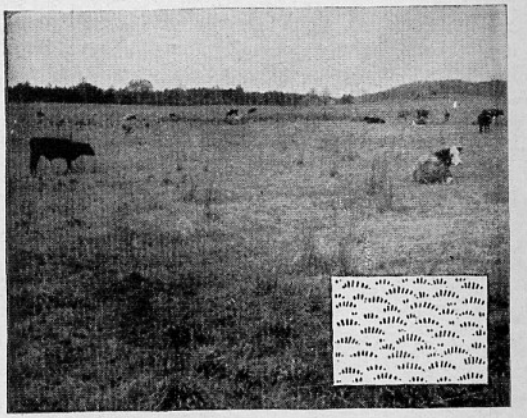
15.7 Oil Storage tanks.



15.8 Cemetery.



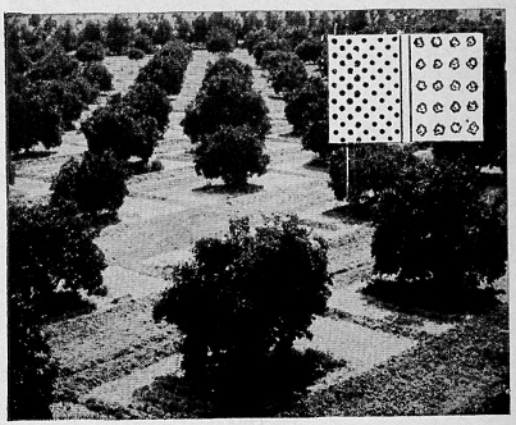
15.9 Cultivated fields (green or brown).



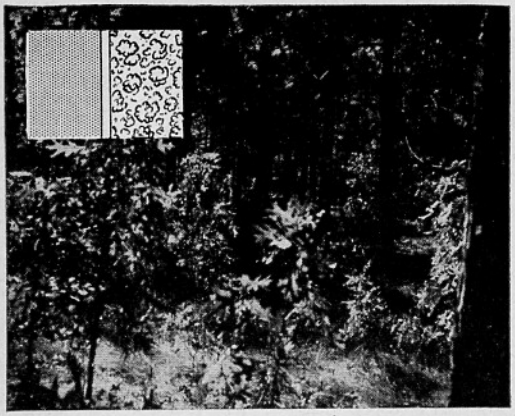
15.10 Grassland (green).



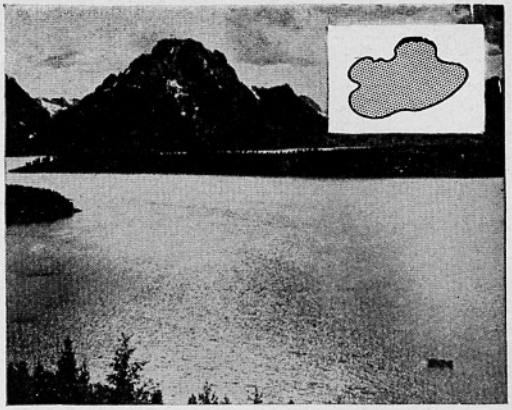
15.11 Swamp (blue).



15.12 Orchard (green).



15.13 Woods (green).



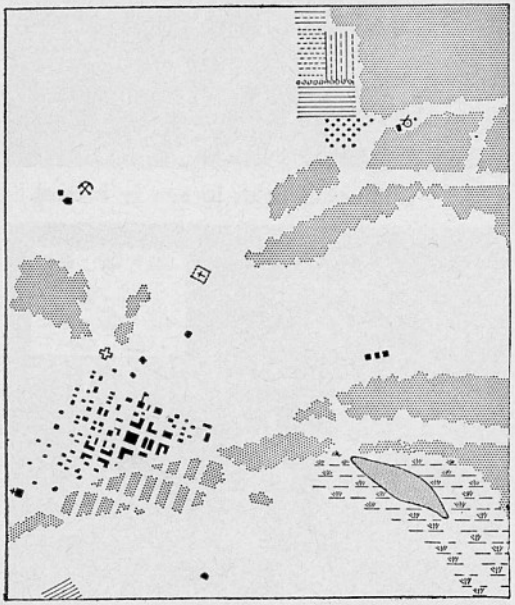
15.14 Lakes or ponds (blue).

signs are placed, there are already certain main lines which make a general pattern. These main lines are also shown by signs, and they stand for such important land marks as streams, roads, railroads, and fences. We try to make these lines look different from one another, so that we don't get them confused. At the same time we try to make them resemble the objects they are supposed to represent. Figures **15.16** through **15.25** are examples of these main lines and the signs used to show them on a map.

The heavy line in Figure **15.16** is a primary or first class highway; the second line is a secondary highway; these are sometimes red on your map. The two solid parallel lines mean other surfaced roads. The two dashed parallel lines in Figure



15.15(1)



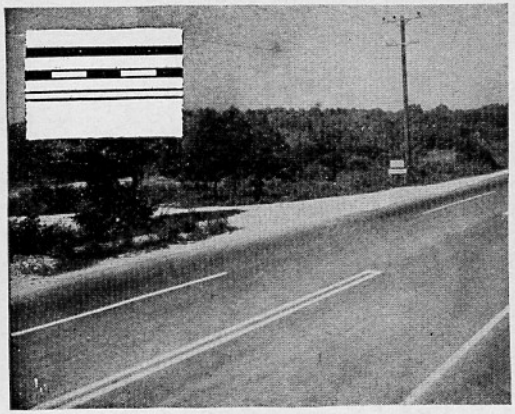
15.15(2)

15.17 mean dirt road, while the signal dashed line means a trail or footpath.

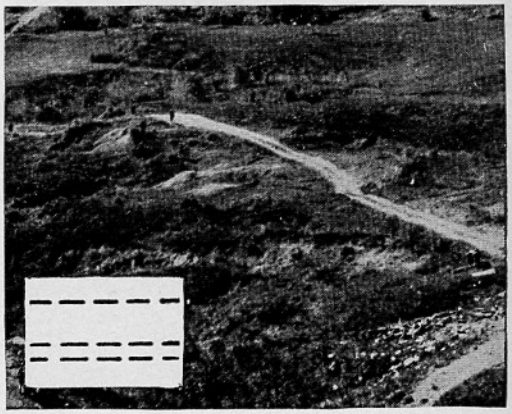
Telegraph or telephone wires are often on tall T-shaped poles across the country. The map sign is also T-shaped. (See Figure **15.24**.)

In Figure **15.25** the sign is given for a barbed-wire strand fence, not the kind that is a military entanglement. The sign for a smooth wire fence is a series of small o's connected by dashes. (For example, o-o-o-o.)

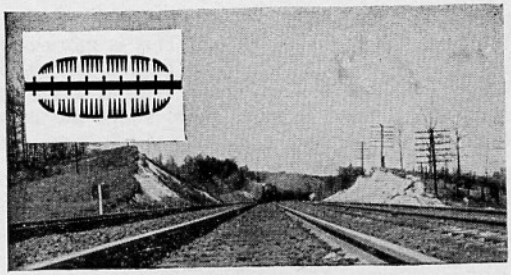
This covers the signs that are most used in mapping. It is important to remember the colors used with these signs. All water, such as swamps, rivers, lakes, is in blue. Woods and other heavy vegetation are in green. Cuts, fills, and some cultivated fields, are in brown. Some good roads



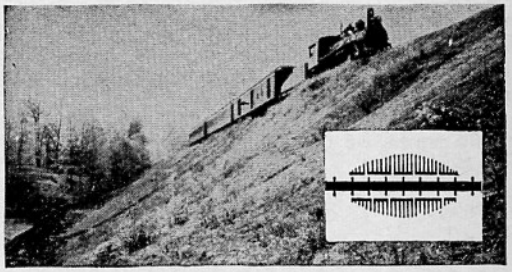
15.16



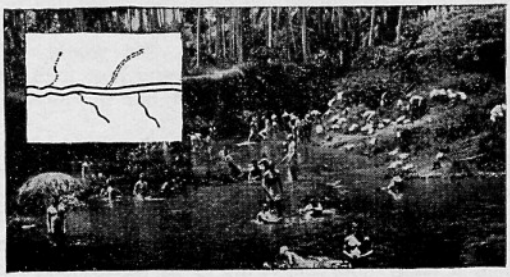
15.17



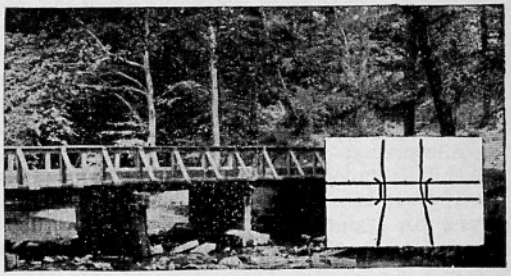
15.18 Cut (brown).



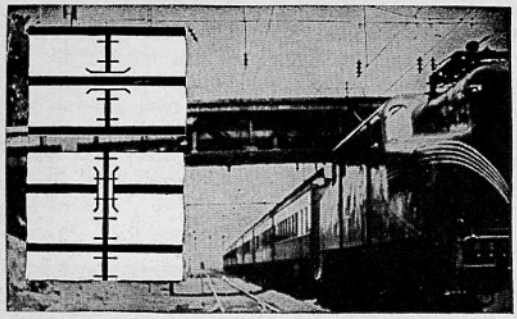
15.19 Fill (brown).



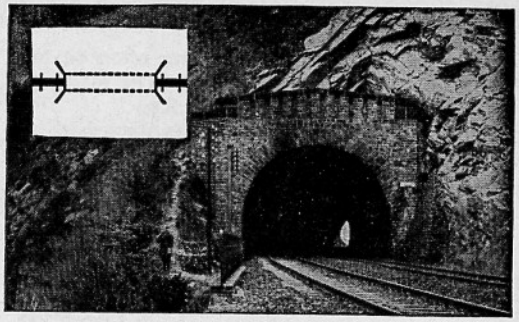
15.20 Stream (blue).



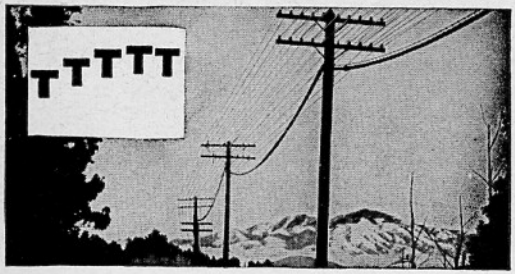
15.21 Bridge.



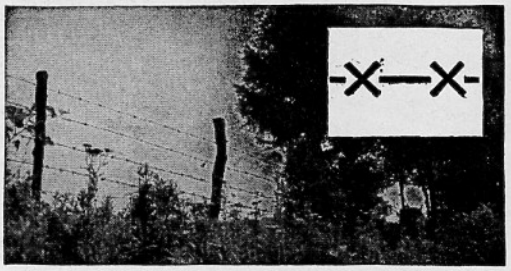
15.22 Pass over railroad; pass under railroad; grade crossing.



15.23 Tunnel.



15.24 Telegraph, telephone wires.



15.25 Barbed wire strand fence.

may be in red. Other roads, railroads, buildings, bridges, and most man-made objects are printed in black.

If we put all these signs on a map and give them names, we find ourselves with the land picture you see in Figure **15.26**. This is more like it! Now we have a pattern of ground on which our signs begin to make sense. This is a simple map, but it tells us much more about the area it represents.

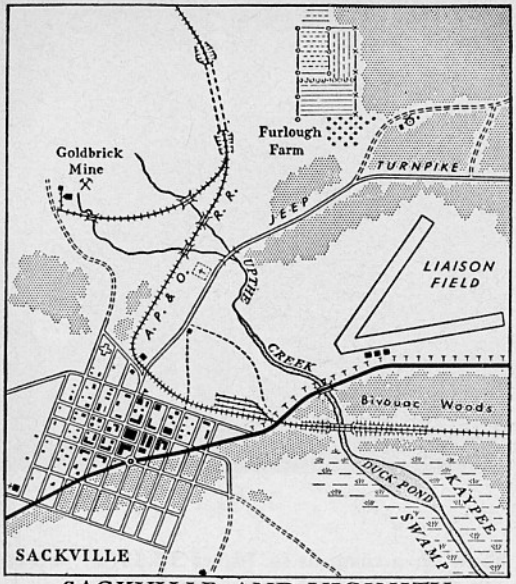
Elevation and Contour

So far, everything on our map is flat. We must now find a way to learn something about the different ground levels. It means something to us to know that a hill is in a certain place, but we would further like to know how high it is. A picture of a hill taken from above will not show this, but there is a way for the map to give you this information.

A hill is broader at its base than it is at its top. Let us take an object which is like a hill, a cone, for example, and see what we can do to a picture of it from above to let us know how high it is.

A. To Judge Height. First, suppose there are two boulders on the side of the cone, as in Figure **15.27(1)**. When we look at this from above, Figures **15.27(2)** and **(3)**, we can still tell that there are two boulders there. We would not know which boulder was higher and how high up the cone either boulder was if we had not already seen the cone from the side.

Next, let us suppose that we walk up this cone until we are 10 feet higher than the base (Figure **15.28**. Now let us walk *around* the cone, staying 10 feet high all the way around. Finally, we will come back to the place we started from. If we had a leaky flour bag with us as we walked, we would have left a mark on the hill which would



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15.26

look like Figure **15.28(1)**. From above, this line would look like it does in Figure **15.28(2)** and **(3)**.

Now what do we know about this mark as we look at it from above? We know that anything on it is 10 feet higher than the base of the cone. Notice that one of the boulders is right on this line; therefore its elevation, or height, is 10 feet. We know that anything between the line and the base of the cone, is *lower* than 10 feet.

Let's move up the cone until we are 10 feet higher and do the same thing again. The result is another flour line (Figure **15.29**). What do we know about this line in Figure **15.29**? We know that everything on it is at an elevation of 20 feet, and that the elevation of everything between it and the first line is somewhere between 10 and 20 feet. Now the second boulder is about halfway between the two lines, so we can judge that its elevation is about 15 feet.

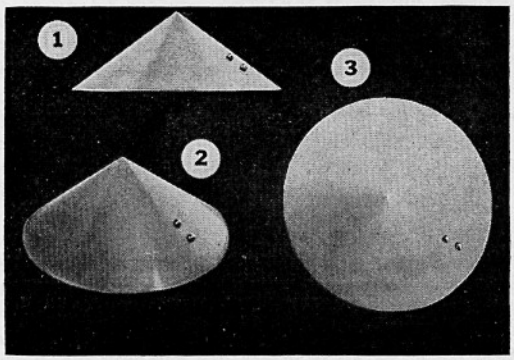
B. To Judge Shapes. These lines tell us still more—the shape of objects. They tell us that the cone is round, for example. If the object is not round, an object other than a cone, these lines can tell us that, also. Suppose we stretch one side of the cone so that it looks like Figure **15.30(1)**. If we do our flour bag stunt again, from above the lines look like Figures **15.30(2)** and **(3)**. We can tell which side it bulges on.

We find, then, that these lines can tell us two things, elevation and shape. Maps have many such lines, and if you understand what they mean, they are easy to read and very helpful. On maps these lines are called *contours* or *contour lines.*

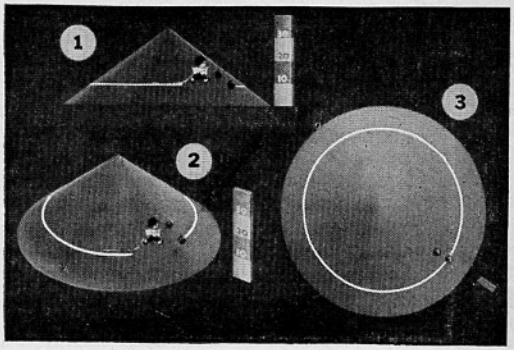
Let us see what happens when we place contour lines on a map. The dashed line in Figure **15.31(1)** encloses the hill which overlooks the town of Sackville. In Figure **15.31(2)** we have lifted the hill right off the map so we can examine it more closely.

First, let us make flour marks on the hill, just the way we did on the cone. From the side, it looks like Figure **15.32(1)**. As we rise into the air we can see more of these lines, as in Figures **15.32(2)** and **(3)**.

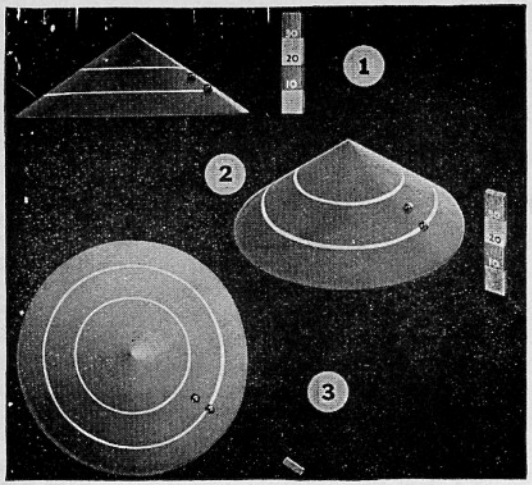
Finally, we have a view from directly above, and we can see that the shape of the hill is



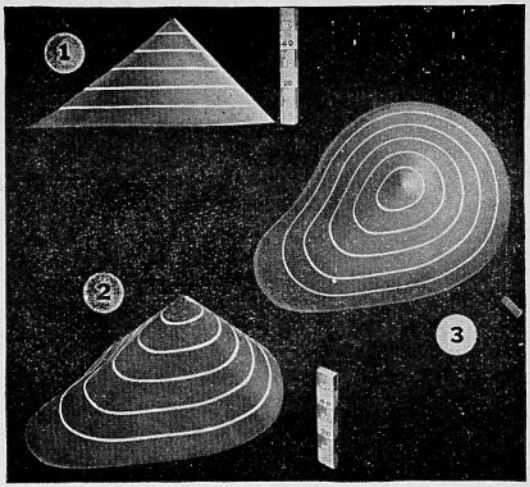
15.27



15.28

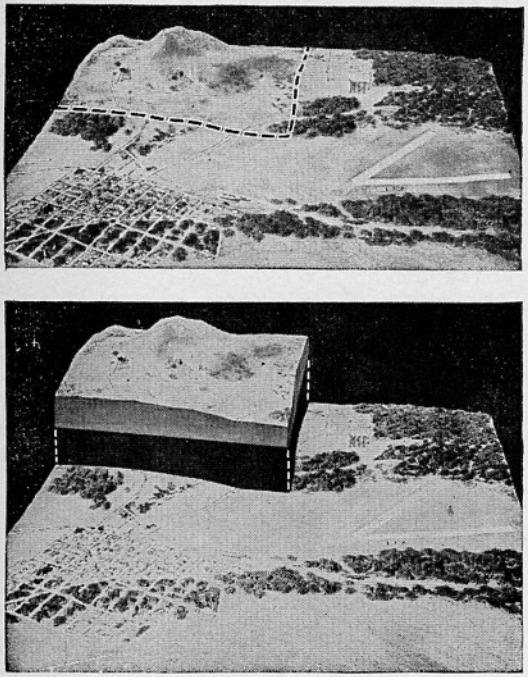


15.29



15.30

shown in Figure **15.33(1)** just as the shape of the cone was shown in Figure **15.30**. If we take these lines out of the photograph and put them on a map, as in Figure **15.33(2)**, we can tell which parts are high and which low.



15.31(1) and (2)

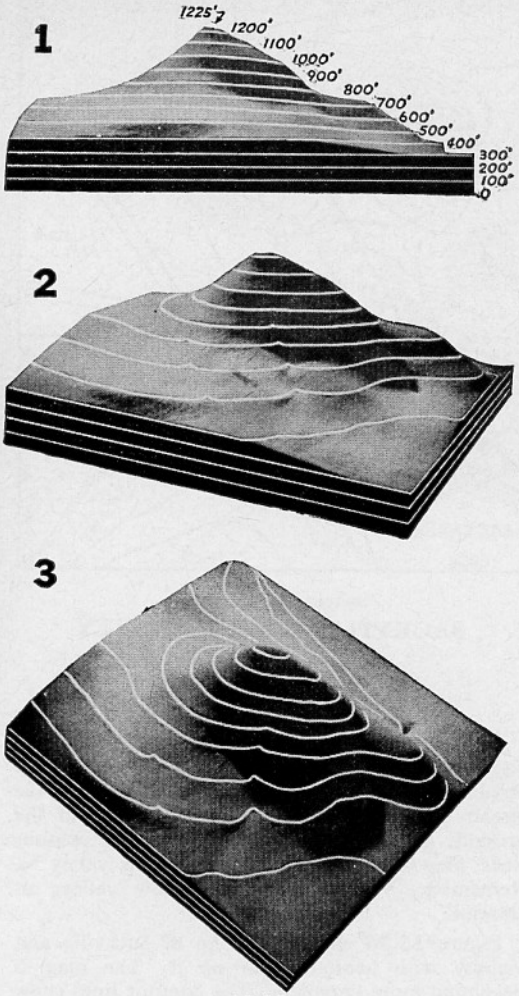
It would clutter up the map too much to have the number showing the elevation of each contour line, so only a few of them are numbered. To make it easy to count these lines, every *fifth* line is heavier than the others. The distance between contour lines on each map is shown by means of a note at the bottom of the map. This note may read, for example:

Contour interval: 10 feet.

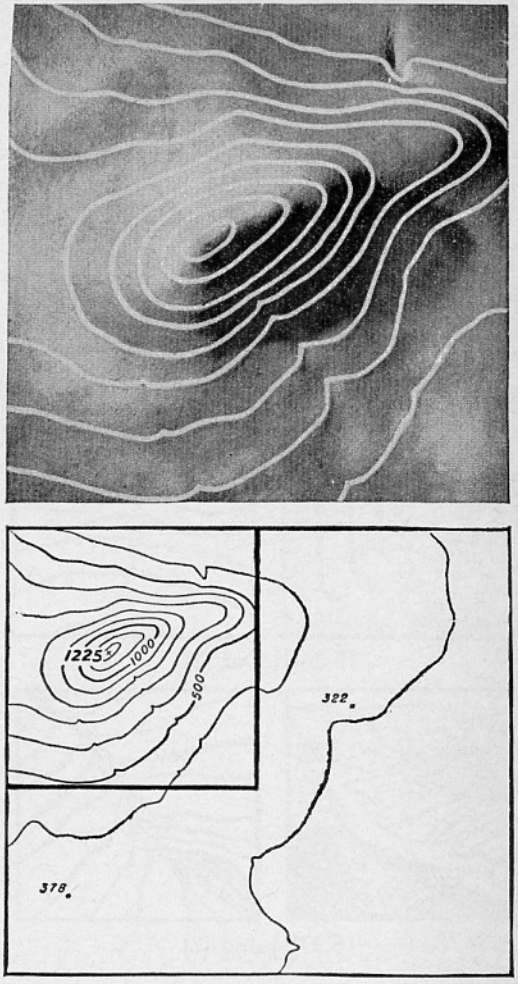
This means that the distance between any two neighboring contour lines on that map is 10 feet in an up-and-down (vertical) direction. The contour interval is noted on maps just below the graphic scales. On our map of Sackville, the contour interval is 100 feet.

Since the highest point on the hill in Figure **15.33(2)** does not fall exactly on a contour line, this point is labeled with the exact elevation. On maps, such elevation numbers are found often. Some objects take their names from these numbers. If there are a number of road junctions on a part of a map, and we wish to name one of them in a particular way, we may call it RJ 124 (that is, the road junction which is marked as being at an elevation of 124 feet).

C. Begin at Sea Level. It may be seen also that the elevation of the base of the hill in Figure **15.32(1)** is 300 feet rather than 0 feet. The reason for this is that elevation is figured from sea level. In other words, we compare the elevation of all land *anywhere* to the average sea level.



15.32



15.33(1) and (2)

In Figure **15.34**, although the hill is far from the sea, the base of the hill on the land is 300 feet above sea level. Sea level is zero for all elevation measurements.

D. Other Contour Information. It is clear that these contour lines are very helpful things to have, and they can help us in other ways. Suppose we have a high spot of ground that breaks off suddenly and becomes a cliff. From the ground, as in Figure **15.35(1)**, it is easy to tell this is a cliff. It is also easy to tell this by examining the contour lines of the map. When a hill or cliff is steep, the contour lines appear *close* together, as in Figure **15.35(2)**. This arrangement of contour lines on a map always shows a sharp rise in the ground.

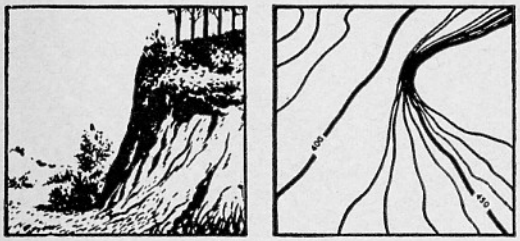
If, however, the lines are spaced evenly and fairly far apart, it means that the hill rises gradually.

If there are two hills with a saddle between them, as in Figure **15.36(1)**, the contour lines, as in Figure **15.36(2)**, tell us exactly what they look like.

A special kind of valley is formed by a stream,



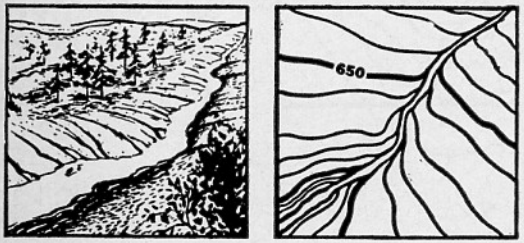
15.34



15.35(1) and (2)

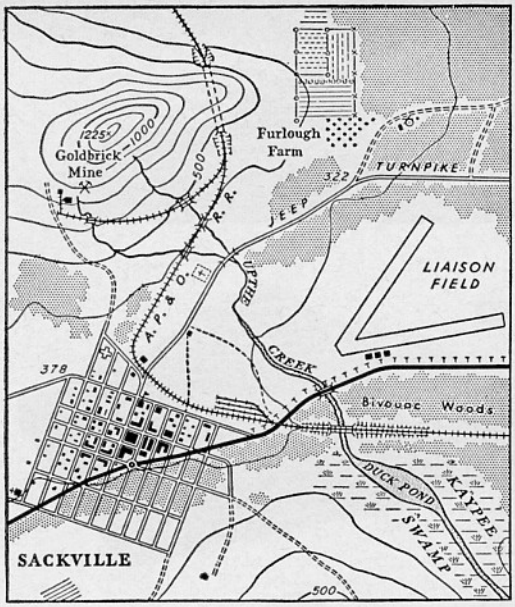


15.36(1) and (2)



15.37(1) and (2)

and contour lines in the area are usually regularly spaced (see Figure **15.37(2)**. They form "V's" where they cross the stream. It is important to remember that these "V's" all point *uphill,* or *upstream.*



CONTOUR INTERVAL 100 FT.

SACKVILLE AND VICINITY

15.38

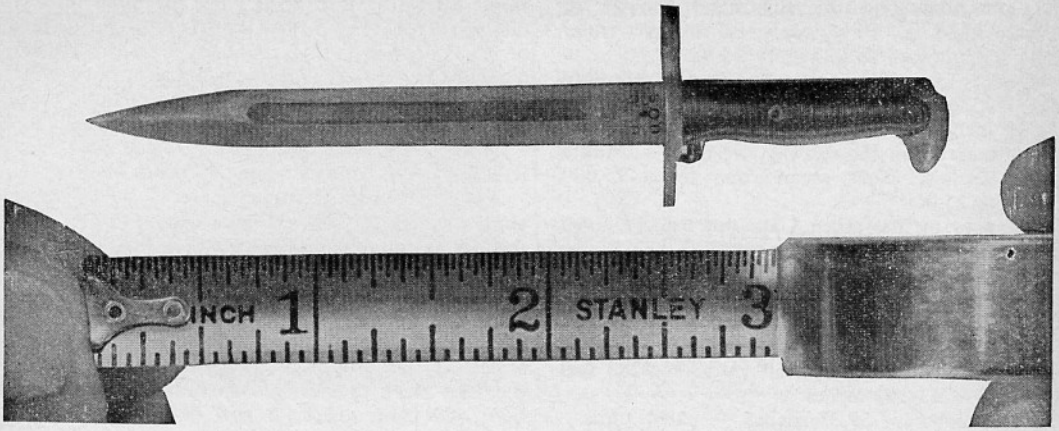
Contours, then, can tell us several things about streams. They can tell us the location of a stream or valley; they can tell us which way the stream is flowing, which shows the slope of the ground; and by the spaces between the contour lines they can tell us how steep the valley is. Remember, V-shaped contours show valleys or streams.

Figure **15.38** shows the map of Sackville and vicinity with contour lines on it. The map is becoming more complete. The contour lines show the shape of the ground. We can tell now that the land has a hill, with the ground sloping very gradually from its base toward the town and toward the airfield.

Measuring Distance

We have now put a map together and looked at many of its parts, so that at this point we can learn a good deal about a region by reading a map of that same region.

Distances on a map can be measured. The reason for this is that a map is a true picture of the land. Figure **15.39** is a picture of the M1 bayonet, and we want to find out how long the



15.39

blade is. If we know *how much* smaller the picture is than the real bayonet blade, we can find out how large the blade is. By measuring the blade on the picture in Figure **15.39**, we find that it is two and one-half inches long in the picture.

Now suppose someone *tells* us that the picture is just one-quarter the size of the real bayonet. We can now figure out how long the blade is. If the picture is one-quarter the size of the real bayonet, the real bayonet is *four times as large as the picture.*

Let us put these figures to work. The picture of the blade is two and one-half inches long. The real blade is four times as long; so the real blade is four times two and one-half inches, or ten inches long.

$$4'' \times 2\tfrac{1}{2}'' = 10''$$

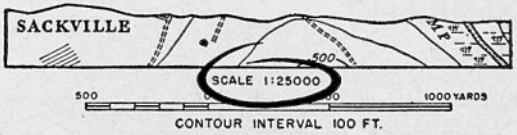
In the same way, *a map always tells you how much smaller it is than the real land.* A map can tell you this in two ways.

A. By Scale. One way is the same as we have just used on the picture of the bayonet.

A distance is measured on the map. The map *tells* you how much smaller this distance is than the actual ground, by means of a number found in the bottom margin about in the center (Figure **15.40**). This number is called the *scale.*

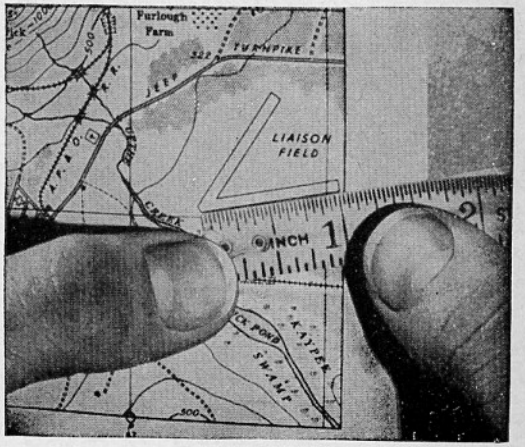
The scale number may be shown in two ways, both meaning the same thing. It may be written as a fraction, 1/25,000, or it may be written 1:25,000. In either case, it is the same as saying that 1 inch on the map is equal to 25,000 inches on the ground; just as in our picture of a bayonet, one inch on the picture was equal to four inches on the real bayonet. The scale of that picture of the bayonet would have been 1/4 or 1:4.

Let us try this out on our map. We want to



SACKVILLE AND VICINITY

15.40



15.41

find out how long the right-hand runway of Liaison Field is. First, place an ordinary ruler along the runway, as in Figure **15.41**.

It reads one inch. Now our scale reference says 1:25,000, or one inch on the map equals 25,000 inches on the field. So for each inch we have measured on the runway, we must substitute 25,000 inches. That means one times 25,000 inches, or 25,000 inches.

Distances on the ground are not usually given in inches. By the equivalents listed below, we can change inches into other units of measure.

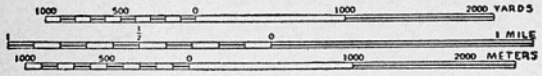
Linear measure:

1 foot (′) = 12 inches (″).
1 yard = 3 feet = 36 inches.
1 statute mile = 1760 yards = 5280 feet = 63,360 inches.
1 meter = 39.37 inches = 1.094 yards
1 kilometer = 1000 meters = 1094 yards = .62 miles.
1 mile = 1.61 kilometers.

For example, let us divide 25,000 inches by 12, 36, and 39.37 and find out the number of feet, yards and meters in the runway:

25,000 divided by 12 equals 2083 feet.
25,000 divided by 36 equals 694 yards.
25,000 divided by 39.37 equals 635 meters.

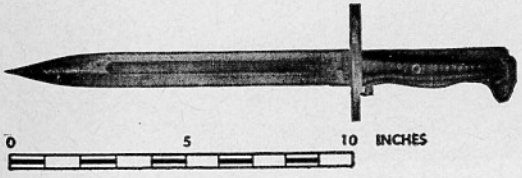
B. By Graphic Scale. Another method for finding distances is by use of the graphic scale. This method is even easier to use than the one we have just discussed. Just below the notation



15.42

of scale, 1:25,000, are located several objects which look like rulers (Figure **15.42**). They *are* rulers, special kinds made just for that particular map. These rulers have already done your arithmetic for you.

Let's look at our bayonet picture again with such a ruler and see how it works. The ruler is a special one made just for this particular picture. All we have to do is place this ruler on the picture of the bayonet with the zero at the tip of the blade, as in Figure **15.43**. We can see at a glance that the real bayonet blade is ten inches long. The special ruler has shown us the real length of the bayonet.

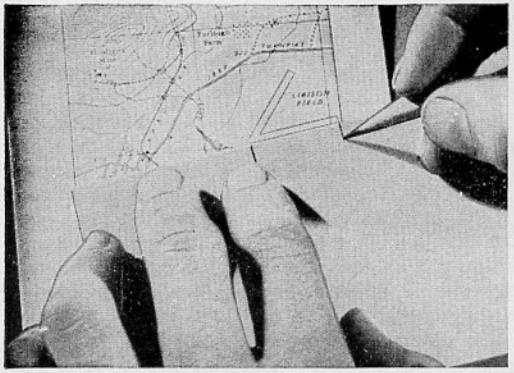


15.43

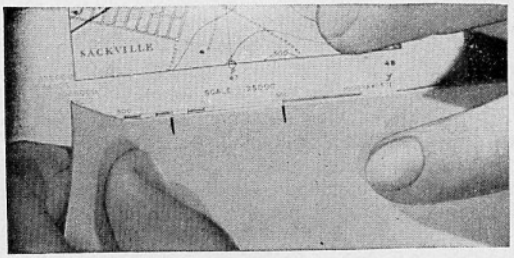
This special ruler is called a *graphic scale* and it is used with a map in the following manner:

A straight strip of paper is placed on the map alongside the airfield (Figure **15.44(1)**). We then place marks on the paper at both ends of the field. The paper is then placed beside our graphic scale on the map which shows how long the field really is (Figure **15.44(2)**).

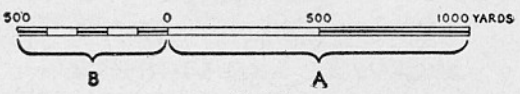
There is another thing to notice about this scale. It has two parts (Figure **15.45**). From the zero mark to the right it reads in large numbers, 500 yards apart (A part of Figure **15.45**).



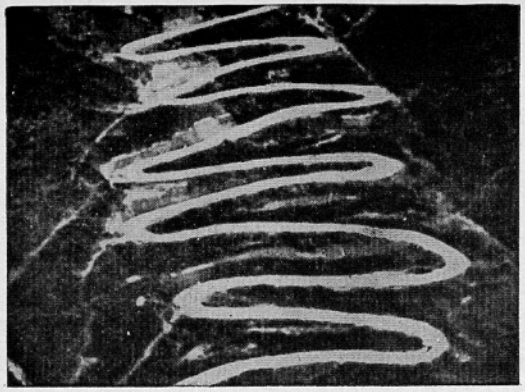
15.44(1)



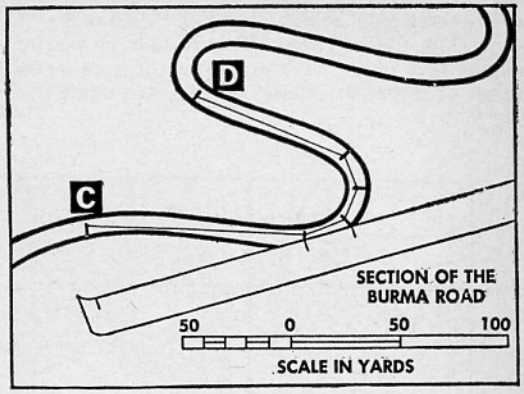
15.44(2)



15.45



15.46(1)



15.46(2)

From the zero mark to the left it breaks down this large distance into smaller distances (B part of Figure **15.45**), 100 yards apart, so that we can measure more accurately.

For example, in Figure **15.44(2)**, the marks on our strip of paper are farther apart than the distance between the zero and the 500-yard mark on the graphic scale. If we place the right-hand mark at the 500-yard point on the graphic scale, the left-hand mark overlaps into the "B" part of the graphic scale. We see that it is about at the second mark to the left of the zero, or at the 200-yard mark. By adding 200 yards to the first 500 yards we can say that the runway is about 700 yards long.

For purposes of allowing different units of measure to be used, three graphic scales are usually found on a map. These scales are usually measured in miles, yards, and meters. Refer again to Figure **15.44(2)**, imagining, *this* time, that it measures meters, instead of yards. You would follow exactly the same procedure to determine the length of the field in meters that you followed to find its length in yards. The paper strip would be placed along the meter scale, with the right hand mark at the 500 meter point. The left hand mark would again overlap into the "B" area. Add "B" to "A" and you have the total length of the field in meters.

In order to measure a curved or irregular line, for example, a section of the Burma Road (Figure **15.46(1)**), we divide the curved line of the road section, between C and D, into small straight sections (Figure **15.46(2)**). Then we lay the edge of a strip of paper on the tick marks, one after the other, adding each section to what we already have marked. We finish with a straight piece of paper with the total length of the curved road on it. We measure this with the graphic scale, in the same way as we measured the runway.

C. Watch The Fraction. It is important to be sure which is the larger scale, a 1:25,000 map or a 1:50,000 map. The answer is: the 1:25,000 map. The numbers are *fractions,* and 1:25,000 of something is bigger than 1:50,000, just as ½ is larger than ¼. That is clear enough to us, but these numbers are a little tricky and it is easy to make mistakes and forget that the *larger* the number in the lower part of the fraction, the *smaller* the scale of the map. It may be easier to remember that a *large* scale map covers a *small* area and a *small* scale map covers a *large* area.

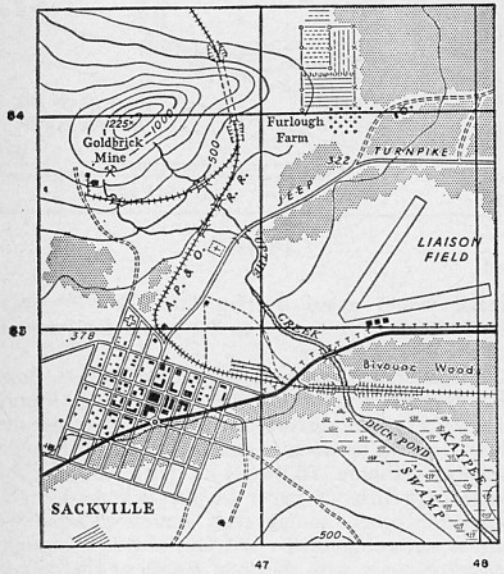
Determining Location

In a town or city, it is easy for us to tell someone that the church is at the corner of 6th Avenue and 3rd Street. If you made a date with someone to meet you at the church, you could be pretty sure that both you and your date would be able to find the place.

In the Marine Corps, however, we are faced with a different problem. We must be able to give to someone else the location of a lone tree in the middle of a large field, or a machine gun or sniper in a woods, or a guard along a stream. There are no streets in those places, but our maps

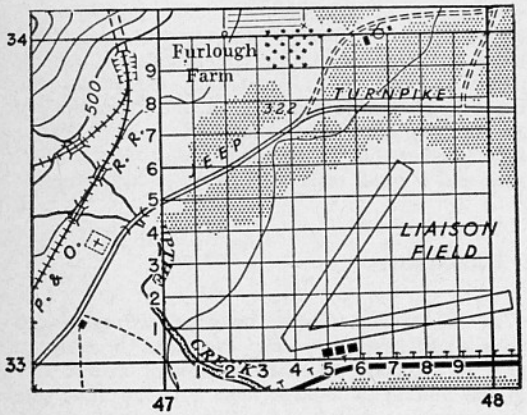
have a system of letting us tell someone else where these points are.

A. The Grid System. This is done by placing on the face of the map a network of lines in the form of squares. These squares are somewhat like the blocks formed by the street system in a city. Any point on the map can be located in relation to these lines or "streets." The method of describing a location is practically the same as we use in town with real streets. The only differences are in the way we name our "streets" and in the way we "spell-out" the description.



SACKVILLE AND VICINITY

15.47(1)



15.47(2)

Such a method is called a *grid reference system* and the pattern formed by the lines is called a grid. There are several types of grids used on our maps. The most common is the Universal Transverse Mercator Grid. You will also find many maps bearing British Grids. But don't get confused by this—as far as grid referencing is concerned, all grids look alike in that they are made up of lines forming squares. Figure **15.47 (1)** shows our map with a military grid on it.

The "streets" in a grid all have very simple names. The names are all *numbers.* When we use these numbers to locate a point on the map we say we are giving a grid reference. This would be like giving a street address in a town. Before we can use these numbers, however, we must learn a few simple facts and rules.

Every *tenth* grid line is made heavier in weight. This is to help you find the line you are looking for.

Each grid line on the map has its own number. This number appears in the margin of the map at both ends of the line. It also appears within the map on the line itself. Look at the numbers labeling the grid lines in the margin of Figure **15.47(1).** You will notice that some figures are larger than others, like $^{20}33$ or $^{2}47$. As far as we are concerned, we can ignore the smaller sized figures; they have nothing to do with grid referencing. Always use only the LARGE figures to "name" a grid line.

On some maps, two large figures are used to identify a line; on others only one figure is used; in a few rare cases, three figures are used. The number of large figures depends upon the scale of the map and the grid used on the map. Don't be confused by all this. Regardless of what scale map you have in your hands, use only the LARGE figures to identify a grid line for referencing purposes, whether the number consists of 1, 2, or 3 large figures. By following this simple rule, you can never make a mistake.

To locate a point by the grid reference system is a simple matter. For example, let us work out, step-by-step, the grid reference for the letter "R" in the word "CREEK" on the map shown in Figure **15.47(1).** Four steps are required. *First,* read the LARGE figures labeling the first vertical grid line to the left of the point (47). *Second,*

mentally divide the distance between "line 47" and "line 48" into *10* parts (see Figure **15.47(2)**). Estimate how many tenths (to the nearest tenth) there are between "line 47" and the letter "R", the point being referenced. The estimated tenths is 1. *Third,* read the LARGE figures labeling the first HORIZONTAL grid line BELOW the point (33). *Fourth,* mentally divide the distance between "line 33" and "line 34" into *10* parts. Estimate the nearest number of tenths between "line 33" and the point being referenced. In this case, the point falls almost on "line 33". The estimated tenths is *0*.

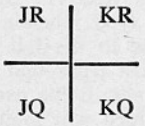
The grid reference is written as a continuous number, as *471330*. Notice that the grid reference always has an even number of digits in it. If there is an uneven number of digits, someone has made an error in copying the grid reference number.

In working this sample grid reference, we were following a simple rule of map reading. The rule is "READ RIGHT UP" and helps us to remember which number to read first in giving a grid reference or in following out a grid reference.

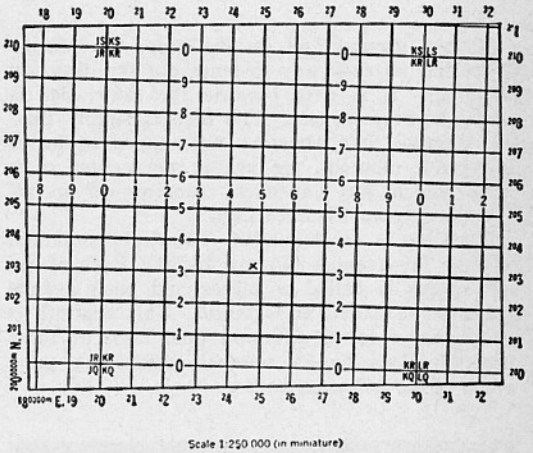
Suppose your platoon leader tells you to meet a patrol at a point which he refers to as 477336. Mentally break the number down to read 47-7-33-6. You look at the map (Figure **15.47(2)**) and read RIGHT until you come to the VERTICAL grid line which is numbered *47*. Still going to the RIGHT estimate *7* tenths of the distance between "line 47" and the next vertical line to the right, which, of course, is "line 48." Then from this point read UP until you come to the horizontal line which is numbered *33*. Still going UP estimate *6* tenths of the distance between "line 33" and the next horizontal line above, which, of course, is "line 34". If you've followed these steps correctly, you will find the patrol sitting around waiting for you at the north end of the upper runway of Liaison Field.

If you understand everything that has been explained, you know how to give and you know how to follow a reference given on a map at the scales of 1:50,000, 1:25,000, or larger. Sometimes you can use our street system just to locate quickly a big, easily identified object. Just as you might tell a friend to meet you at the downtown library rather than give him an exact address, you can identify a particular thing on a map by a general location. You just use the two streets that form the *lower left hand corner* of the grid square containing the thing you describe. For example, in Figure **15.47(1)**, if you say the duck pond (4732), the particular pond you are describing is known. Our READ RIGHT UP rule still applies, for you have moved right to line 47 which is part of the square around the pond, and up to line 32.

On some maps you will find some letters printed on the face of the map at the intersections of heavy grid lines, like:



These maps are at the scale of 1:100,000 or 1:250,000. The grid lines on such maps are usually labeled with only one large number (see Figure **15.48**). If you have studied these instructions carefully, you will remember that a reference for a point taken from such a map is made up of four numbers, like *4733*. But, the reference is not complete until you add, in front of the number, the two letters which label the corners of the heavy lined square in which the point of reference falls. Thus, the grid reference for the point marked "X" in Figure **15.48** would be KR4733.



15.48

There are a few more things we should know about this map street system.

The grid lines are sometimes called *easting* lines or *northing* lines. Instead of saying that the grid lines are up and down lines or vertical lines, we simply say they are easting grid lines; and instead of saying they are side to side lines or horizontal lines, we simply say they are northing grid lines. The numbers which make up a

grid reference are sometimes called *coordinates.* You will also hear them referred to as grid coordinates. A coordinate is made up of an easting ordinate (read first) and a northing ordinate. The easting ordinate is the part of the number of the grid reference (we worked out above) made by reading RIGHT. It consists of the number in large type labeling the first vertical (easting) grid line to the left of the point and the estimated tenths from that line to the point. The northing ordinate is the part of the reference (the last part) which you made by reading UP. It consists of the number in large type labeling the first horizontal (northing) grid lines below the point of reference and the estimated tenths from that line to the point. In the reference 471330 which we figured out to be the identification of the letter "R" of the word "CREEK" on the map shown in figure **15.47(1)**, the easting ordinate is *471* and the northing ordinate is *330.* Another point is that the unit of measure and the distance between lines of the grid will not be the same on all military maps. The unit of measure may be either meters or yards, depending upon the grid appearing on the map. The distance between grid lines, which we call the grid interval, may be either 1000 units or 10,000 units, depending upon the scale of the map. Maps at the scales of 1:25,000 and 1:50,000 use a grid interval of 1000 units. Maps at the scales of 1:100,000 and 1:250,000 use a grid interval of 10,000 units. A note appearing in the margin of each map will tell what unit of measure and what interval is used for the grid on the map. Read this note before you use the grid.

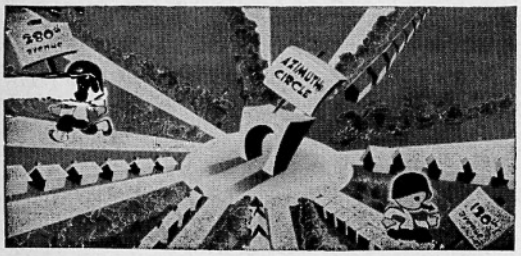
For example, figure **15.47(1)** has the 1000 meter grid on it. We can tell from the map that the circle in town is about 1000 meters from the first building alongside the airfield runway, because it is about the same distance as that between two grid lines. This is another way to tell distances on a map, and you can use it instead of the graphic scale.

Use of the Compass

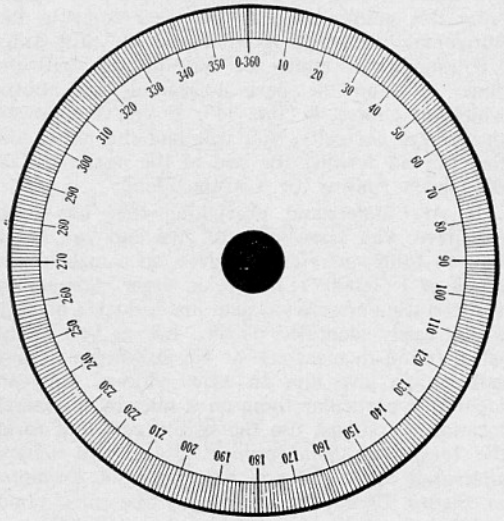
On the ground and on the map, the Marine Corps has an easy way to point out the direction of things. It is easy because the same idea is used wherever we are. The idea is simply this: We suppose that wherever we happen to be at any given moment, we are in the center of a circle which has "avenues" running off in all directions, as in Figure **15.49.**

A. What is An Azimuth? The circle is marked off into 360 avenues (Figure **15.50**). Each of the 360 spaces is called a *degree* and each avenue has a name called an *azimuth.* This azimuth is just a name for a *direction line;* each of these direction lines has a number, depending upon which of the 360 avenues it is.

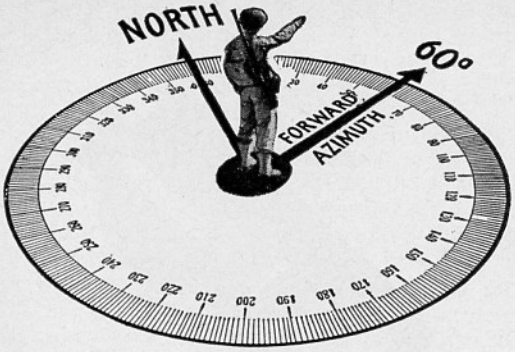
We can march off on one of these avenues, or azimuths, starting at the center of the circle. The avenues all start *where you are,* whether you are in a jungle, on a hill, or on a highway, just as



15.49



15.50

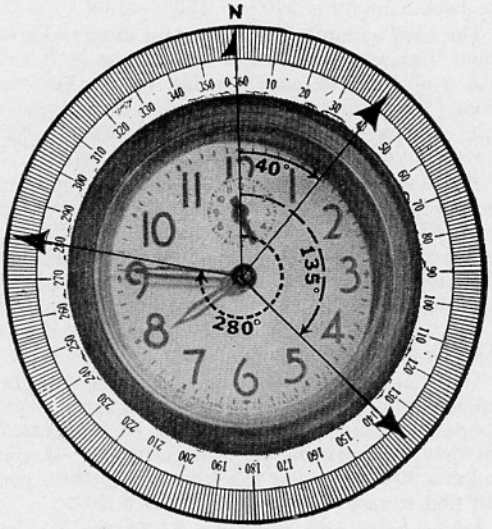


15.51

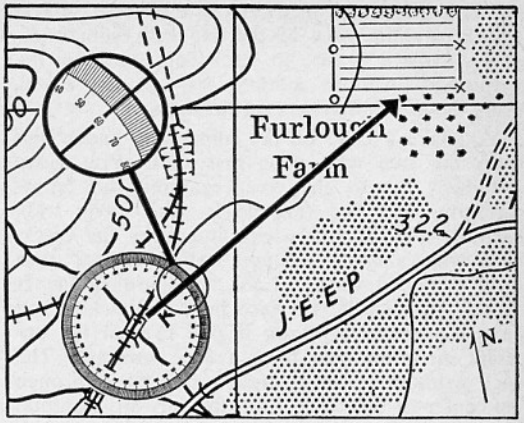
with the man in Figure **15.51.** The man has been told to go along the avenue marked "azimuth 60 degrees" (written as 60°), and he is pointing his finger at it. You can think of him in the center of the circle with 360 avenues or azimuths running out from him like the spokes from the hub of a wheel. To make it easier to locate an avenue, every 10th avenue is numbered.

There are two important things to remember about this circle of avenues.

(1) The zero—0—avenue *must always point* NORTH. In a moment we will talk about how to find north, but right now don't worry about it.



15.52

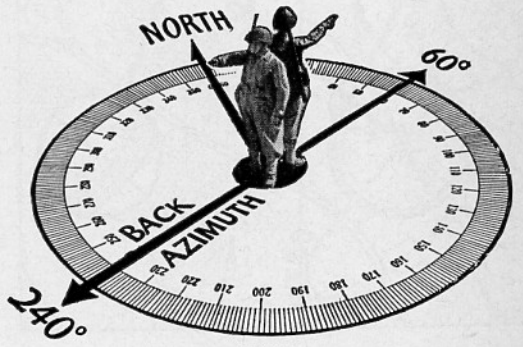


15.53

(2) *The avenues are numbered* CLOCKWISE. That means we number them in the direction that we number hours on a clock. Figure **15.52** shows what we mean by *clockwise direction.*

With this knowledge, let's put this circle to work for us. You are told that there is a sniper in a tree in the orchard at Furlough Farm, and also told that if you crawl up the creek to where the railroad crosses it at the foot of the hill, you can see the sniper's tree on an azimuth of exactly 60 degrees (60°), Figure **15.53** shows the situation.

From the map, you find where the railroad crosses the creek and go there. You remember that the center of the circle of azimuths is right where you are. The first thing to do is to point

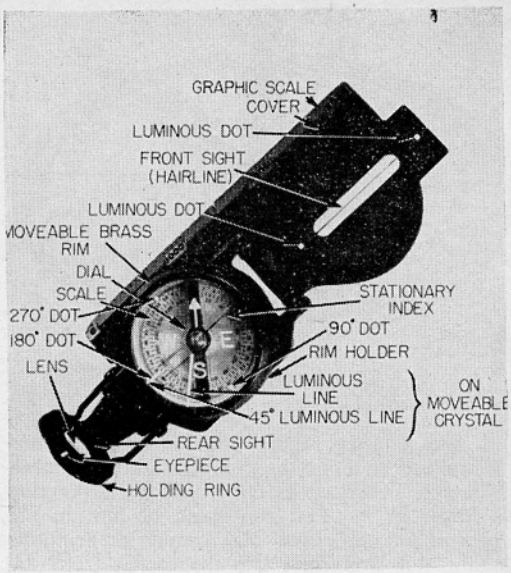


15.54

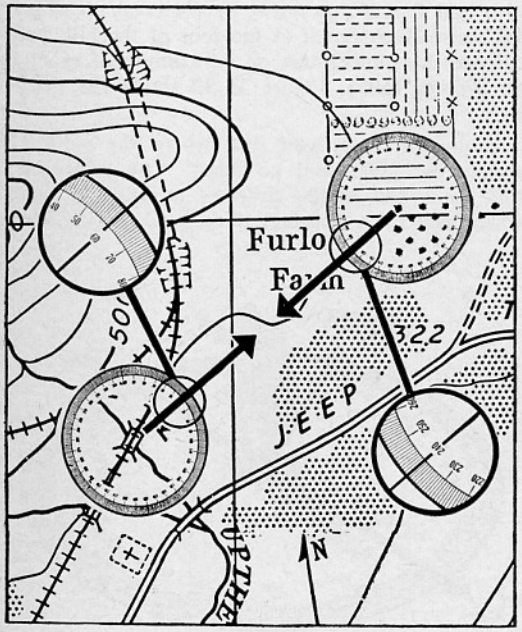
the zero mark on the circle at the north. (You will learn later how to do this with your compass). Now it is easy to see which tree is on the avenue or azimuth marked 60° on the circle, using the azimuth system of direction.

You take a bead on the sniper and knock him from the tree with your first shot. You move cautiously up to the tree, examine the fellow carefully, and find that he is dead. You walk back to the railroad where it crosses the creek. Now what azimuth did you walk back on? Was it 60°? No, it wasn't. Look at Figure **15.54.** It shows you that if you face in one direction you have a *forward azimuth;* if you face in the opposite direction, you have a *back azimuth.* The back azimuth is on a straight line back through the center of the circle from the forward azimuth. Figure **15.55** shows you that at the railroad, with the zero of the circle pointing north, the azimuth on the circle reads 60° from there to the tree; and that at the tree, with the zero of the circle still pointing north, the azimuth on the circle reads 240° from the tree to where the railroad crosses the creek.

The back azimuth of a line is its forward azimuth plus 180°, or if this sum is greater than 360°, the back azimuth is the forward azimuth minus 180°. For example, if the forward azimuth of a line is 60°, the back azimuth is 60° + 180° = 240°. If the forward azimuth of a line is 310°, the back azimuth is 310° − 180° =130°.



15.56



15.55

The back azimuth is an important thing to know about, because if you know how to use it, it will take you back to your starting point. For example, if you are sent on a mission at night to a point in strange country your back azimuth will show you the direction in which you return.

B. The Lensatic Compass. We come now to the compass, that useful instrument which finds north for us and finds our azimuth for us. The compass has on it the circle of numbered avenues or azimuths which we have been talking about in the last few pages. In other words, the compass is our direction-finding tool, and it has everything on it to help us find our way.

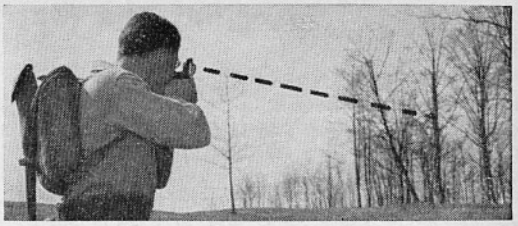
There are several types of compasses, but the one which we shall use here is called the *lensatic compass.* There are other kinds of compasses, but they all work on the same principle. If you understand how to use the lensatic compass, you will find it easy to learn to use the others.

Let us refer now to Figure **15.56** for a good look at the lensatic compass. The most important

thing about that compass is that no matter how you turn it, *as long as you hold it level,* the arrow *always points in the direction of magnetic north.* It won't let you down if you remember one thing: *never use it near any metal object if you can help it.* Metal objects will make the compass needle (arrow on this compass dial) point in the wrong direction. Whenever you use a compass, then, make sure you are well away from such metal objects as your helmet, rifle, truck, a wire fence, or any metal object which will bother your compass needle.

Besides the compass needle which points north, there is another important part of the compass. That is the numbered circle of avenues or azimuths right on the face of the dial. Everything on the compass is designed to help you line up your compass with things on the ground and on your map and to help you read the azimuth numbers.

C. Compass Reading. Compass reading is easy, if it is done correctly. It is important to hold the compass correctly. Remember to point the compass in the general direction you want to go before you try to use it, and hold it level. Figure **15.57** shows the compass ready to be used in daytime sighting. Figure **15.58** shows how to hold the compass so that it is steady. Notice that it is held with the eyepiece close to the eye. Figure **15.59** shows how to line up a tree. You look at the tree through the slit in the eyepiece and through the slit in the cover with the hairline in it. The glass eyepiece is used only to read the azimuth numbers on the dial. It is there only so you will be able to glance down and read these numbers at the same time you line up an object with the compass. The view you get when you use the compass correctly is shown in Figure **15.60.** The Marine here has lined up the tree in his compass sights and he has found that the tree is on an azimuth of 60 degrees.

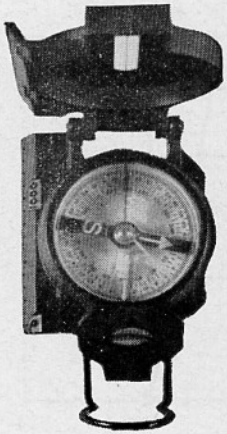


15.59

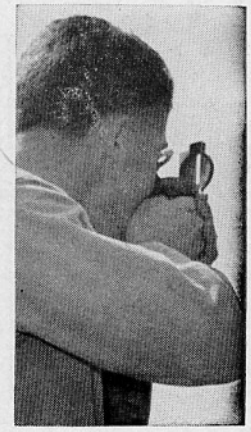
D. Finding The Back Azimuth. With a compass you can see how easy it is to find a back azimuth. You can do it two ways.

First, read your back azimuth right off the dial, by taking the number which is opposite the forward azimuth on a straight line through the center of the dial.

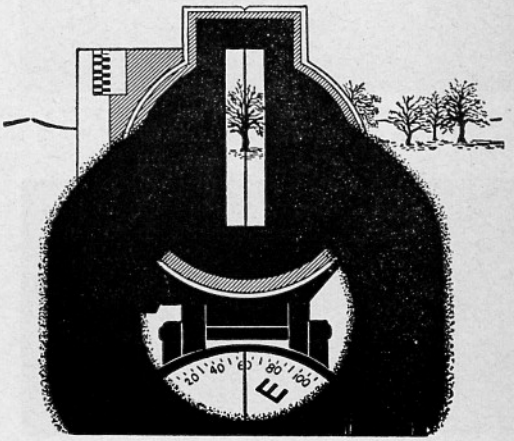
The second way is to sight from the point you have reached, back to the point you started from. The main difference between these two methods is that in the first, you do not have to be able to see your starting point in order to get the back azimuth.



15.57



15.58



15.60

Aligning the Map With the Ground

Before the compass and the map are ready to be used together, the map must be placed in a position so that the directions on the map are lined up with the directions on the ground. There are two ways to do this, one of them without the aid of a compass and the other with the help of a compass or of some other way of finding north. This act is called *orienting the map.*

A. By Inspection. The first method of lining up your map is called "by inspection", which simply means "looking at the ground with the map in front of you." This can be done when you have found objects on the ground which you recognize on your map and which you can see.

For example, in Figure **15.61(1)** you hold your map so that the crossroads on it line up with the crossroads on the ground in front of you. Your map is then oriented.

If the objects on the ground are not as simple as crossroads, such as in Figure **15.61(2)**, you can still line up your map by inspection. You must know your approximate position on the map, and then turn your map in front of you until the distant object (the tower) on the ground lines up with the same object on the map and with your position on the map. The dashed line in Figure **15.61(2)** illustrates this lining up process. Your map is then oriented.

B. By Compass. Another way to line up your map is by using the compass. The compass needle points to magnetic north. The difference between magnetic north, grid north, and true north, is shown on your map by a declination diagram (see Figure **15.62(1)**).

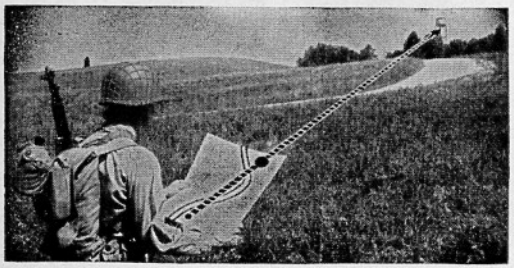
The line with the half arrowhead represents *magnetic north.* The line marked "GN" is *grid north,* parallel to the vertical grid lines. (You have probably already noticed that maps such as we have been studying are printed with north toward the top of the sheet.) The third line on the declination diagram represents *true north* and is marked with a star. The three lines are not always in the same positions shown in Figure **15.62(1).** The position of these three lines, in relation to each other, will vary on maps in different parts of the world.

The angle between grid north and magnetic north is called the G-M (grid-magnetic) angle. The numerical value of this angle is printed with the declination diagram, as in Figure **15.62(1).** There are two ways to use this angle and a compass to orient your map with the ground.

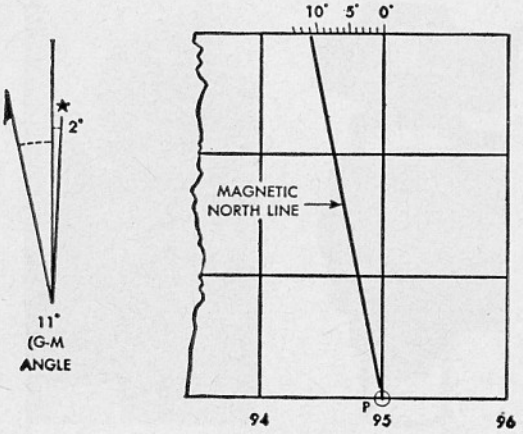
To use the first method, you must draw the magnetic north line on your map. This is easily done with most new maps where you find at the top margin a scale marked off in degrees and at



15.61(1)



15.61(2)



15.62(1) and (2)

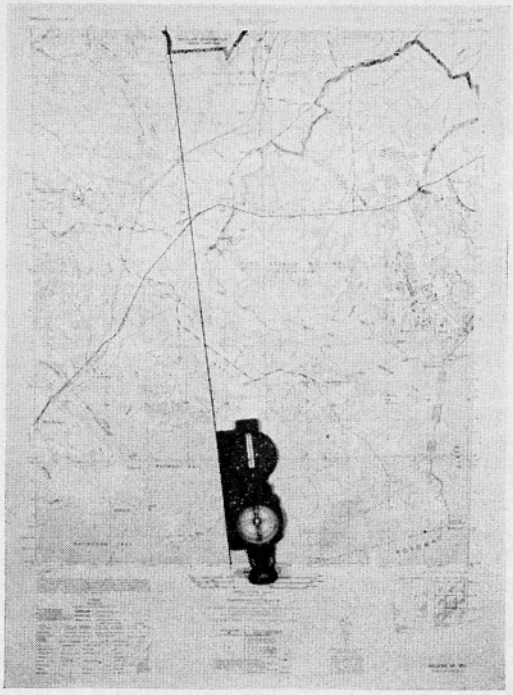
the bottom margin a circle marked "P", called the *pivot point* (Figure **15.62(2)**). Read the number of degrees of the G-M angle on the declination diagram. Then draw a line from the pivot point to that number of degrees on the scale.

In Figure **15.62(2)** the magnetic north line is drawn to the 11° mark, the amount of the G-M angle on the declination diagram shown in Figure **15.62(1)**.

Before you use a map, ask your platoon leader to see that the magnetic north line you have drawn is correct. Do not try to draw the magnetic north line by extending the magnetic north prong on the declination diagram. The diagram may be exaggerated, especially if the angles are very small. Some maps have a caution printed beside the declination diagram:

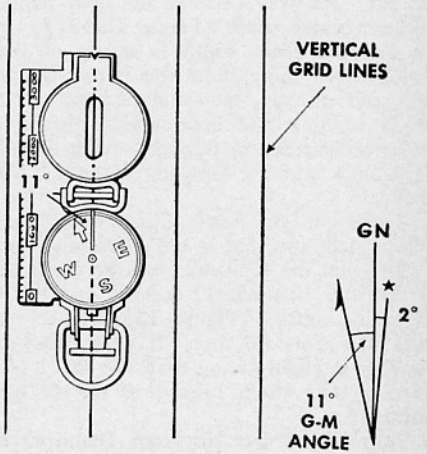
Use only to obtain numerical values.

With the magnetic north line drawn in, lay your map on a flat surface with the top pointing in the general direction of north. Open your compass and place it on the map so the edge of the meter scale lines up with the magnetic north line (Figure **15.63**). Turn the map until the compass needle lies under the stationary index. The map is then oriented.



15.63

If your map does not have a pivot point and scale, or if it is folded so as to cover the magnetic north line, you can use the compass another way to orient the map with the ground. Lay your map on a flat surface as in the first method. Place the open compass so that the edge of the meter scale lies on top of a vertical grid line (Figure **15.64**). Read the G-M angle on the declination diagram and note whether magnetic north is

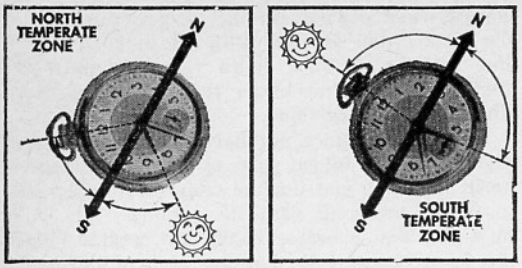


15.64

right or left of grid north. Turn the map until the compass needle points to the right or left of the stationary index by the amount of the G-M angle. If the declination diagram shows magnetic north right of grid north, then the map should be turned until the compass needle points right of the vertical grid line. In Figure **15.64** the declination diagram shows an 11° G-M angle, with magnetic north left of grid north. The map in the illustration is oriented because the compass needle ponts 11° to the left of the grid line.

C. Without A Compass. Even without a compass, however, you can orient your map with a north line. There are ways to find north without a compass.

1. By day in the North Temperate Zone, one way to find north is with an ordinary watch in



15.65(1) and (2)

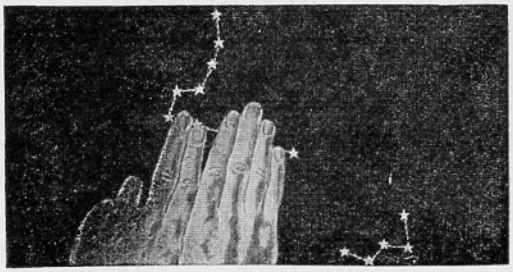
good running order. Simply point the hour hand at the sun. Halfway between the hour hand and 12 o'clock is due south (Figure **15.65(1)**). Directly opposite from south is north, of course. The only tricky thing about this is that the watch should read on sun, or standard time. If your watch is running one hour ahead of sun time (such as on wartime or daylight-saving time), use the 1 o'clock number instead of the 12 o'clock number.

2. By day in the South Temperate Zone, we use the watch, too, but a bit differently. In this case you point the 12 o'clock on the watch at the sun. Halfway between 12 o'clock and the hour hand is due north. (Figure **15.65(2)**). Again, be sure it is standard time. If your watch is on wartime or daylight-saving time use the 1 o'clock number on the watch instead of the 12 o'clock number.

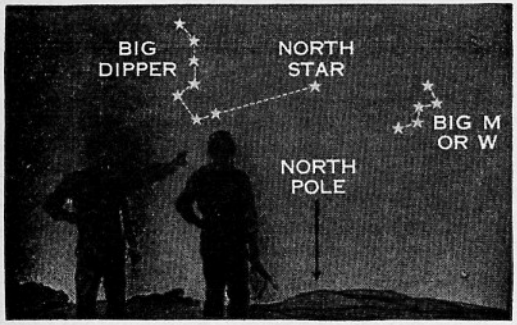
3. At night in the Northern Hemisphere we find north without a compass by means of the stars. In the northern hemisphere one way to use the stars is to find the Big Dipper. The Big Dipper is made up of seven fairly bright stars in the shape of a dipper with a long curved handle, as in Figure **15.66(1).** If you can see the Big Dipper, use as pointers the two stars which form the side of the cup farthest from the handle. These point in the direction toward which you would pour from the dipper. These pointers aim at a bright star which is about five times the distance between the two stars of the Dipper cup. This bright star is the North Star, and is directly over the North Pole.

If you hold a finger away from your eyes so it just fits between the two pointers, and then, keeping your hand the same distance from your eyes, measure five finger-widths from the end pointer, your farthest finger will just touch the North Star (see Figure **15.66(2)**).

Sometimes, however, you cannot see the Big Dipper, although you may be able to see other



15.66(2)

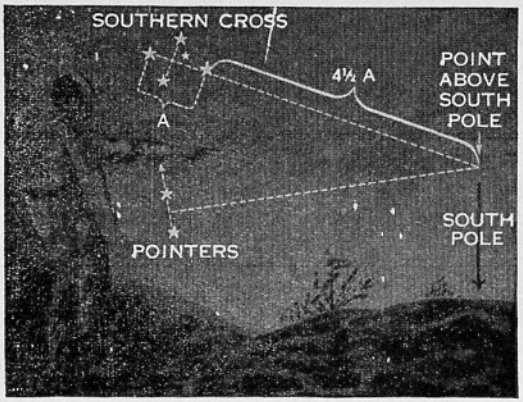


15.66(1)

stars. In that case we use a star pattern called the Big "W" or the Big "M". Look at it in Figure **15.66(1).** Notice that it is on the other side of and about the same distance from the North Star as the Big Dipper. The top of the "W" is open in the direction of the North Star. On a clear night you will always be able to see, in the northern hemisphere, either the Big Dipper or the Big "W". Sometimes you will be able to see both. In either case, you can find the North Star.

The Big Dipper and the Big "W" appear to rotate around the North Star during the night. Only occasionally are they in just the positions shown in Figure **15.66(1)** and **(2).** Their position in relation to the North Star and to each other does not change.

4. Southern Hemisphere. In the Southern Hemisphere you can find true South by relation to the Southern Cross. Two bright pointer stars in the vicinity of the Southern Cross serve as



15.67

locators to help pick out the right group of stars (Figure **15.67**).

There are five stars in the Southern Cross. The outer four are fairly bright and form a cross. Imagine this cross as the frame of a kite. Put a straight tail on the kite four and one-half times as long as the length of the kite itself, using finger-widths for a measuring stick, as with the Big Dipper in Figure **15.66(2)**. The end of this tail will be close to a position directly over the South Pole (Figure **15.67**). Usually you won't be able to see a star in that immediate vicinity because there is no bright star that can be seen directly above the South Pole.

There is another way to find the approximate location of the South Pole without measuring the four and one-half distance along the kite tail of the Southern Cross. Imagine a straight line perpendicular to the center of a line between the pointers. This perpendicular line intersects the extension of the Southern Cross kite tail. The point of intersection is approximately above the South Pole. This method is shown in Figure **15.67.**

The Southern Cross and pointers appear to rotate about the South Pole during the night, just as the Big Dipper and Big "W" do in the northern sky.

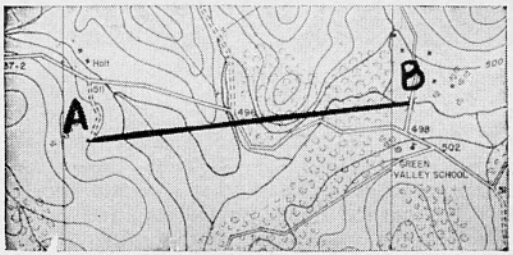
The Map and Compass at Work

We know enough now about the compass and the map to start to use them together in a practical way.

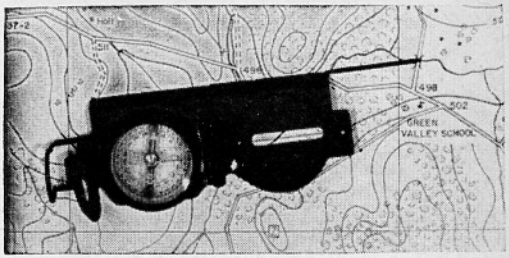
A. Azimuth on the Map. We have learned how to find the azimuth of an objective on the ground by sighting with the compass. Now we come to the problem of learning to find the azimuth of something on a map.

For example, how do you find what the azimuth is from the house (point A) to the bridge (point B) in Figure **15.68(1)**? First you draw a line lightly on your map between the house and the bridge. Next, you orient your map using the magnetic line and your compass as explained earlier in the chapter. Then lay your compass on the map so that the edge of the graphic scale and the pencil line coincide. You read the azimuth 84° on the compass (Figure **15.68(2)**) and you have your answer.

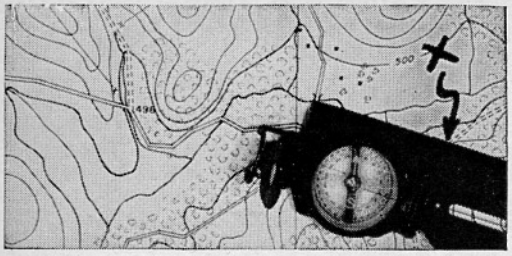
Suppose that you wanted to show on the map that a machine gun was on the path at an azimuth of 105° from the bridge. To find the correct point on the map, you would proceed as follows: First orient your map; then lay your



15.68(1)



15.68(2)



15.69

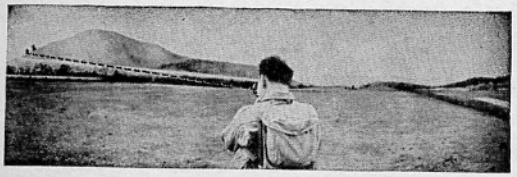
compass so that the "0" indicator on the graphic scale is directly over the bridge (Figure **15.69**). Pivot the compass, keeping the "0" indicator at the bridge, until the stationary index lines up with 105° on the dial. Draw a line along the edge of the graphic scale from the bridge until it crosses the path. The machine gun is located where the line crosses the path ("X" in Figure **15.69**).

B. Finding Your Location. Many times you will need to know accurately your location on a map. If your location is somewhere between the airfield and the creek on the Sackville map, to find your exact location:

1. Orient your map with a compass.

2. Find two things on the ground in front of you which you can also find on your map.

3. With your compass, take an azimuth on a point, for example, the building at the mine. Sight through the compass, line up the building with the hairline in the compass (Figure **15.70 (1)**), and read the azimuth through the glass eyepiece (305°).



15.70(1)

4. Find the back azimuth by subtracting 180° from 305°. (305° − 180° = 125°).

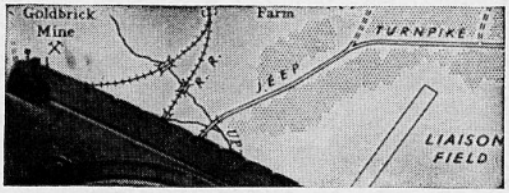
5. Lay your compass on your map, with the "0" indicator on the graphic scale directly over the building at the mine (Figure **15.71(1)**). Then pivot the compass slowly until 125° on the dial lines up with the stationary index. Draw a line along the edge of the graphic scale.

6. You are somewhere along this line on your map, but you still need to know exactly where. Repeat the procedure with a second point, for example the tip of the left-hand runway of the airfield (Figure **15.70(2)**). A forward azimuth

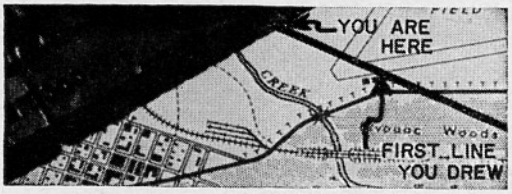


15.70(2)

reading shows it to be 67°. Lay the "0" indicator of the graphic scale directly over the tip of the runway on your oriented map, line up the stationary index with 247° (67° + 180° = 247°), draw your line along the graphic scale until it crosses the first line you drew. These two lines cross at your exact location. (See Figure **15.71(2)**).

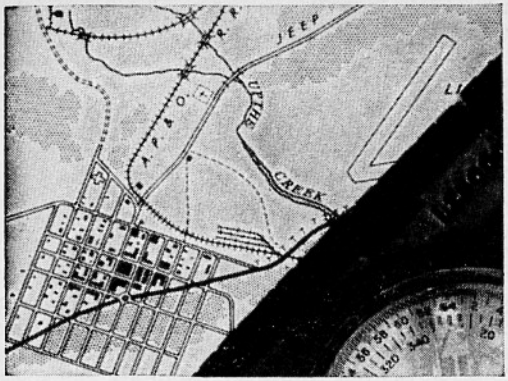


15.71(1)



15.71(2)

C. Finding An Objective. Suppose you are somewhere southeast of Sackville and your platoon leader tells you to go to a certain bridge. He points out the bridge on the map and draws a line on the map from your position to the bridge. By laying your compass on the oriented map you find that the bridge is on an azimuth



15.72

of 51° from where you are (see Figure **15.72**). Your job is to get to the bridge. That means that you must march along that azimuth.

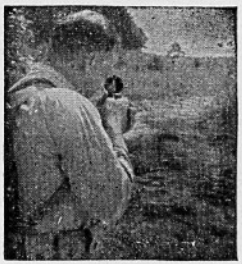
First you take your compass, sight on an azimuth of 51°, and discover that you cannot see the bridge at all from where you are. You know, however, that it is somewhere up there ahead, along that line on which you are sighting. You can see the edge of the woods (Figure **15.73(1)** on your line of sight. So you head for the edge of the woods (Figure **15.73(2)**), and when you get there you find the bridge in front of you (Figure **15.73(3)**).

If it so happened that you could not see the bridge from the edge of the woods, you would do the same thing again, picking out a tree, fence, or other object along your line of march, until you finally reached a point where you could see the bridge.

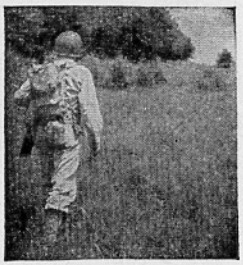
We cannot always march in a straight line because we may encounter obstacles such as the pond in Figure **15.74(1).** The method for detouring around an obstacle is shown in Figure **15.74(2).** A very important rule to remember is that when you make a right turn, you *add* the number of degrees in the turn to your azimuth. When you make a left turn, you *subtract* the number of degrees in the turn from your azimuth.

You begin your march on an azimuth of 70°. After making a 90° right turn, you are marching on an azimuth of 160°, (70° + 90° = 160°).

You count your paces as you march along line "A" in Figure **15.74(2)**, because you must march the same distance on line "B" to arrive back on your original line of march. When you have gone far enough along line "A" to clear the pond, you make a 90° left turn and you are again marching on an azimuth of 70°, (160° − 90° = 70°). When you have gone far enough to clear the south end of the pond, you make an-



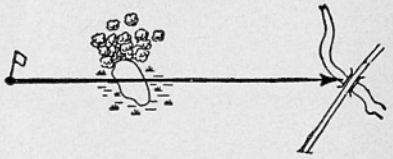
15.73(1)



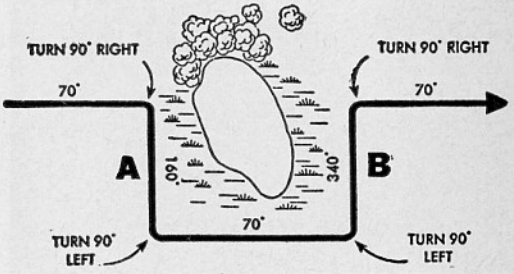
15.73(2)



15.73(3)



15.74(1)



15.74(2)

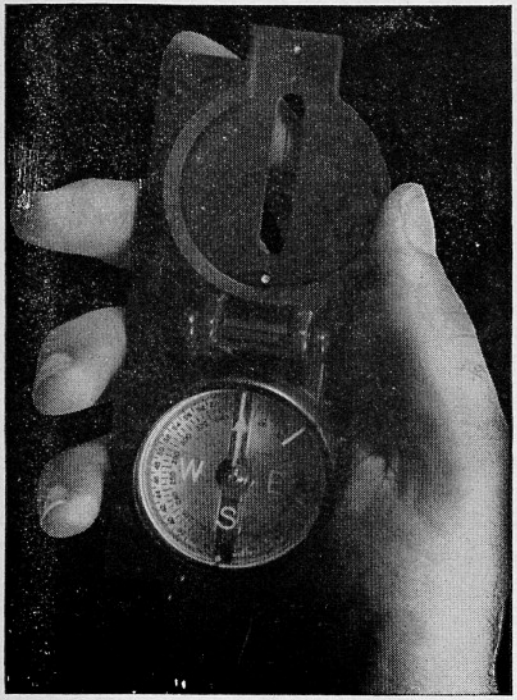
other 90° left turn and you are marching on an azimuth of 340°, (70° − 90° = − 20°). We do not use negative azimuths in the Marine Corps, so you must subtract your negative azimuth from the total degrees in a circle to obtain the correct azimuth; 360° − 20° = 340°). You now march on line "B" the same number of paces you marched on line "A" and when you make a 90° right turn, you are on your original line of march on an azimuth of 70°, (340° + 90° = 430°). We do not use azimuths larger than 360° in the Marine Corps, so to obtain the correct azimuth, you must subtract the total degrees in a circle from 430°, (430° − 360° = 70°).

The Compass at Night

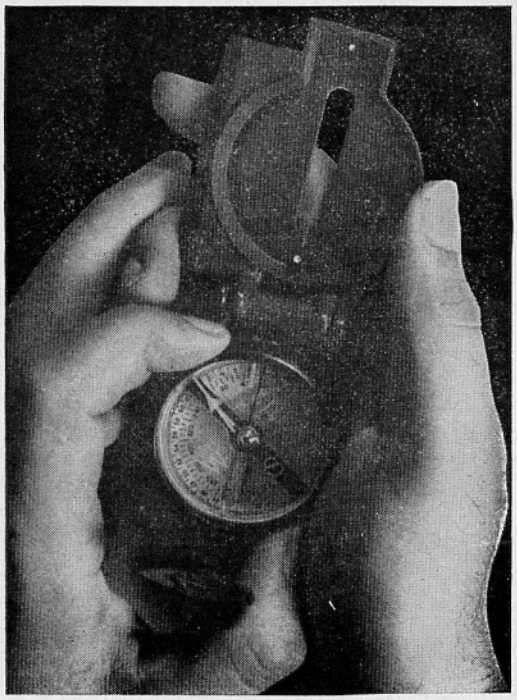
The lensatic compass has two glass faces, one under the other. The top glass face rotates, the under one does not. The top glass face rotates with a clicking sound; each click means it has turned 3°. On the top glass are two lines visible at night. One line is about three times as long as the other. These two lines are 45° apart.

On the under, or stationary glass face, are three luminous dots and a black line (stationary index). Each of these marks are 90° from each other, or one-quarter of the way around the face of the dial. On the compass dial itself the letters, E. S. W. and the arrow for North are luminous. On the inside cover lined up with the hairline sight, are two more luminous dots. Beneath the dial on the inside of the case is a fixed luminous sector which permits reading azimuths at night.

To follow an azimuth accurately at night, we must be able to pick up aiming points ahead of us, just as we do in the daytime. At night, this



15.75(1)



15.75(2)

is not easy to do. You cannot see very far ahead, therefore, your aiming points will be very near you. If it is so dark that you cannot find an aiming point, send another man out a little ahead of you. Direct him to move either to the right or left, until he is on your line of sight. Be sure he does not move until you have reached him. Then do the same thing over again until you find some aiming point in the area ahead or you reach your objective.

Usually, it is not necessary to follow a given azimuth exactly. In combat, the time element will not always allow the use of this time consuming method. If it is impractical to use the sights on your compass, we have an easy way to follow an approximate azimuth.

To follow an approximate azimuth, you set your compass in the following way:

1. Turn the movable glass until the long luminous line is directly over the black line (stationary index) on the lower fixed glass, as in Figure **15.75(1).**

2. Turn the movable glass 17 clicks to the left (counterclockwise). This is a total of 51°.

3. Rotate the whole compass until the North arrow is directly under the long luminous line on the movable glass, as in Figure **15.75(2).** Your compass is now set on an azimuth of 51°.

Now all you have to do to march on this azimuth in the darkness is to keep the North arrow under the long luminous line, and follow the line formed by the stationary index on the lower fixed glass and the two luminous dots on the cover.

Notice the way the compass is held in Figure **15.76.** You do not aim through the eyepiece as before. You simply point the compass in the direction you are going by lining up the long luminous line on the upper glass and the North arrow. Then line yourself up with the two luminous dots on the cover and the stationary index and pick out an aiming point that falls on an extension of that line. You walk to your aiming point and repeat the process until you reach your objective.



15.76

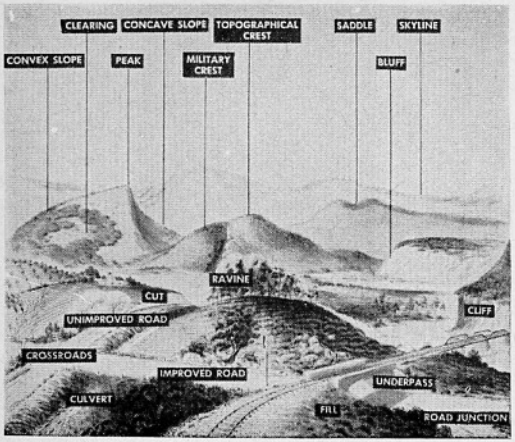
Because all metal objects exert a magnetic pull on the needle of your compass (causes it to move), carry only essential metallic objects with you on a compass march. Keep all metallic objects far enough from the compass so that they will not cause the needle to move from magnetic North. In Figure **15.76,** you will notice that the rifle has been slung over the left shoulder and the compass is held in the right hand in front and as far away as possible from the rifle and helmet. If the military situation permits, remove your helmet and place your rifle aside before taking a reading with your compass to ensure a correct reading.

Use Your Map and Compass

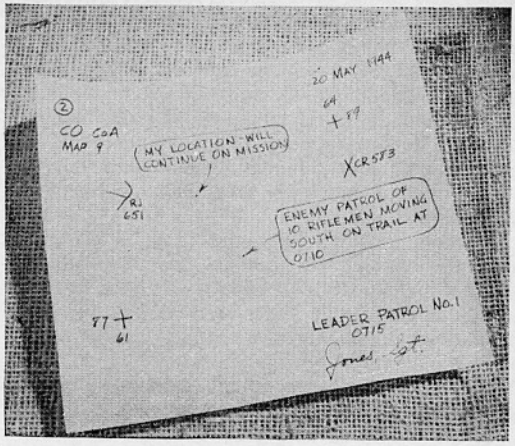
When you are sent out on a reconnaissance or scouting assignment you will find information which must be sent back to your commander. That is your mission. It is necessary, then, to know how to send back this information.

A. Name Things Exactly. First, you must know the names of things on the land. It is not necessary to know what names things are called by, until you have to tell someone else about them. Then it is very important that you know exactly what the names of land forms are. Figure **15.77** is a sketch showing the names of various land forms. Learn these names. It is important that you be able to describe things accurately and in the right words so that the men you work with can understand what you mean.

B. The Overlay. An overlay is used to send back information obtained by reconnaissance. An overlay is simply a tracing, on a plain piece of transparent paper, of a section of a map. To make an overlay, lay a piece of transparent paper over the section of the map you are interested in, and draw on it the corners of the grid squares, as in Figure **15.78.** These crosses are called register marks and they are put on the overlay to show whoever uses it just where to place it on



15.77



15.78

their map. The register marks should be numbered with the numbers of the grid lines so that whoever uses the overlay will know exactly where to place it. Once the register marks are on the overlay, you need only to indicate on it the objects you are concerned with. Write your message right on the overlay, with the usual information that is commonly put on ordinary written messages.

The person who gets the overlay places it on his map so that the register marks line up on the grid lines, and he can read the message.

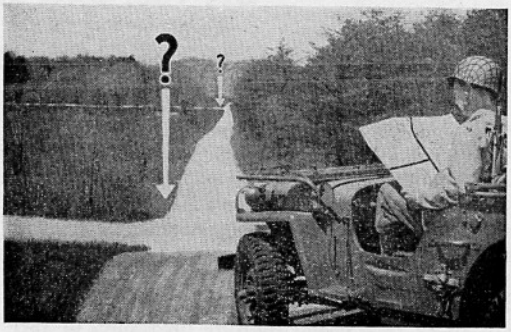
C. On The Road. It is very easy to get lost when you drive along a highway, even in the United States where there are all kinds of signs and directions for the use of the motorist. It is even easier to lose your way in strange country and in wartime. Maps and compasses are important instruments to keep you on the right road.

You must keep your map oriented, preferably by inspection, if you are to find the right roads on your map (Figure **15.79**). Also, you must check your mileage gauge at all important points, and keep a record of it in a notebook or on your map, so that you always know how far you've gone.

The mileage gauge is especially important in a case like Figure **15.80.** Here the driver finds two left intersections on the road, a mile apart. His map is out of date and shows just one road. Which one should the driver take? By measuring the distance from his starting point to the junction on his map the driver can find out how far he should have traveled before taking the turn. Now if he had been careful enough to watch his mileage gauge before he started on his trip he would be able to figure out how far he had come and he would know which of the two roads was the right one. If he had failed to note his mileage gauge, he would not know which road to take.



15.79



15.80

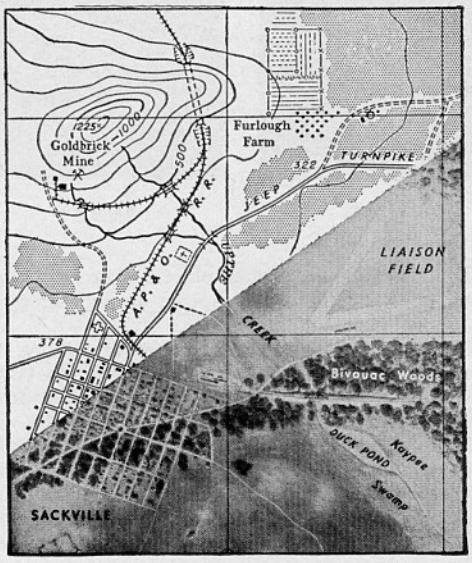
Aerial Photographs and Photomaps

The map you have learned to use is a topographic map, with the ground features drawn to scale. Another kind of map, and one you are likely to see often, is a photomap; made by photographing the ground from an airplane. Your photomap may be a single aerial photograph, or several put together to represent a larger area. It will have on its margin various items of information, the most important of which are the arrow indicating magnetic north, and the scale. The photomap may have a grid on it. If it has, you use it as you use the grid on a topographic map.

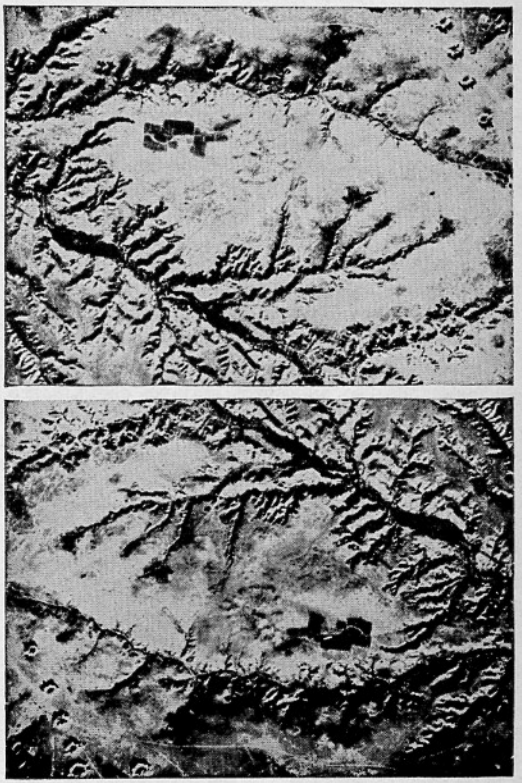
In some ways photomaps are not as easy to use as drawn maps. They do not indicate elevations clearly, because they do not have contour lines. Roads enter a wood, disappear beneath the trees, and reappear going in a different direction. On the other hand, the information on photomaps is more likely to be up-to-date. Probably your photomap was made from pictures taken only a few days ago. If it shows a wood or a road, you know it is there, while a wood shown on a topographic map may have been cut down after the map was made, or a new road may have been built.

Figure **15.81** is a map of Sackville, half as a topographic map and half as a photomap. Although the two parts of the map appear very different, you can easily follow the roads, the railroad, and the creek.

A. How to Read a Photomap. To read a photomap or an aerial photograph, hold the photograph so that the shadows of objects fall *toward* you. Figure **15.82** shows what happens when you hold an aerial photograph the right way and the wrong way. In Figure **15.82(1)** it is viewed correctly; the shadows fall toward you. You see a barren area near the Mareth Line in Tunisia, cut by deep stream lines. Figure **15.82(2)** shows the same area, but now the stream lines have become ridges. *Remember,* there is only one correct



15.81



15.82(1) and (2)

way to look at an aerial photograph, and that is with the shadows falling toward you.

B. Tone and Color. One of the qualities which help to identify things on a photomap is *tone*. This means shades of gray formed by comparative roughness or smoothness of surfaces. Rough surfaces, such as woods and brush, look dark. Tall grass looks darker than close-clipped grass. Smooth surfaces, such as concrete roads, look light.

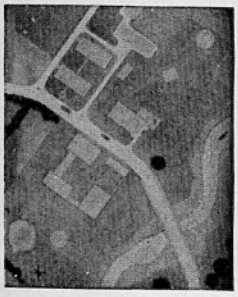
Color has some effect too. Thus, a roof painted white or some light color looks light, while a black or dark-colored roof may look dark, though both roofs may be smooth. Things that look dark or light to your eye look pretty much the same on a photomap.

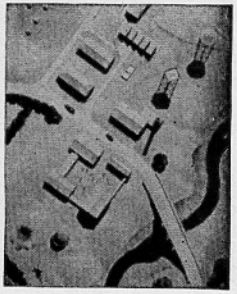
C. Shape and Shadow. The shape of an object helps tell you what it is. A wood is irregular in shape; an orchard is regular, though both have trees. Roads and railroads both are long and narrow, but roads curve more sharply than railroads and have other roads joining them at right angles.

The shadow of an object usually is a helpful telltale. Looking straight down from a plane the camera makes the top of a silo and the top of a water tower look alike; but the silo's shadow is a solid patch running away from its base, while the tank's shadow is a dark patch some distance away, perhaps with the shadows of its supports also showing.

Shadows may tell you how high an object is. For example, if you compare the length of a steeple's shadow with that of a telephone pole you have some idea how high the steeple is.

Shadows are especially useful for informational purposes because an object may be camouflaged without hiding its shadow. Figures **15.83(1)** and **(2)** illustrate how much can be learned from the shadows of objects.

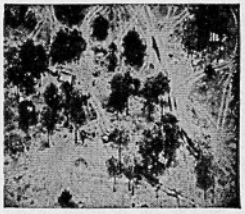




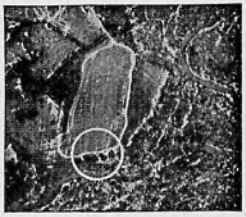
15.83(1) and (2)

D. Size and Relation. Often you can identify an object by its relative size, for instance, a chicken house from a barn or an irrigation ditch from a canal. The width of a road may be judged by comparing it with the width of vehicles on it.

Sometimes the relation of an object to nearby things gives you a clue to what it is. A large building with a baseball diamond near it is likely to be a school. A similar building, with railroad tracks running close by it, is more likely to be a factory or a warehouse.



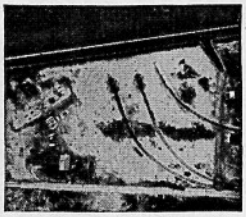
15.84



15.85



15.86



15.87

E. Other Clues. Other objects may be recognized by their general appearance on photographic maps:

1. Any light patch in a darker area may be freshly-turned earth, a trench, or a foxhole (that is why you conceal the fresh earth of your foxhole).

2. A small cluster of buildings may be a farm or a small village. If the buildings are of fairly uniform size and lie on both sides of a road it is probably a village. If they are mixed sizes, and most of them on one side of the road, it is likely to be a farm.

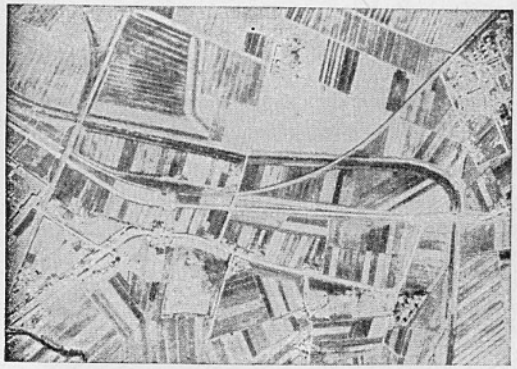
3. A hedge may look like a brush-grown fence, but it will have a more uniform width from being trimmed.

4. Military objects and activities in an area may be identified in aerial photographs from the shape and layout of the objects and from their shadows and tracks. Figure **15.84** is an aerial photograph of a military unit's bivouac area.

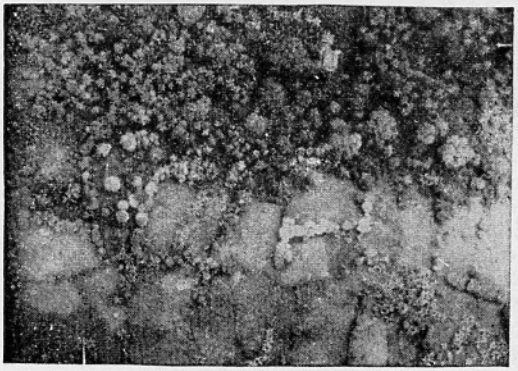
5. When four track patterns are visible on an aerial photograph such as in Figure **15.85**, it may mean artillery if the area is suited for artillery positions, because field artillery is usually employed in groups of four or six guns.

6. Figure **15.86** shows what trenches look like in an aerial photograph, and Figure **15.87** indicates the presence of a battery of railroad artillery.

7. Growing crops appear in roughly rectangular patches of different shades of light and dark, with the edges sharply marked. Figure **15.88** is such an area. This is the kind of pattern you often find in European or North American countryside.



15.88



15.89



15.90

8. Different kinds of trees and woods can be detected in an aerial photograph. Figure **15.89** is an aerial view of typical jungle terrain such as is found in portions of the South Pacific.

Figure **15.90** shows a number of objects and forms in an aerial photograph. These are identified as follows:

(1) Plowed field.

(2) Bridge. Another bridge is just below it. Note shadow of its spans on the water.

(3) Railroad.

(4) Crossing of large highway and country road. Roads are usually light-toned and even in width.

(5) Building. It is hard to see without a magnifying glass, but you can see its shadow.

(6) Neck of woods, bordering on a meadow. The denser the woods, the darker they appear on the photograph.

(7) Footpath crossing the meadow. You can tell it from a road, because it is so much narrower than the light-colored lines which are roads.

(8) Orchard, with evenly spaced trees.

(9) Mud flat. A mud flat usually is darker than the water and has light spots caused by pools of standing water.

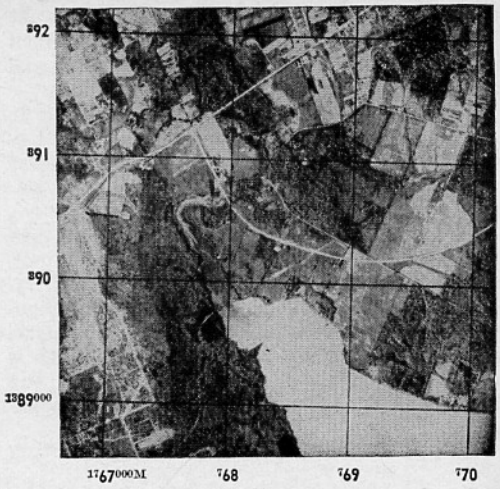
(10) Small stream, identified by its meandering course. When a small stream flows through a wood, you can tell it is there, even though you cannot see it, by the wavy line of heavier vegetation along it.

(11) Brick factory. Spoked round buildings are kilns.

(12) Fence line. Usually the texture of the ground on two sides of a fence is different, so one side is lighter than the other. Also, a fence line is darker than the space around it, because brush grows close to it.

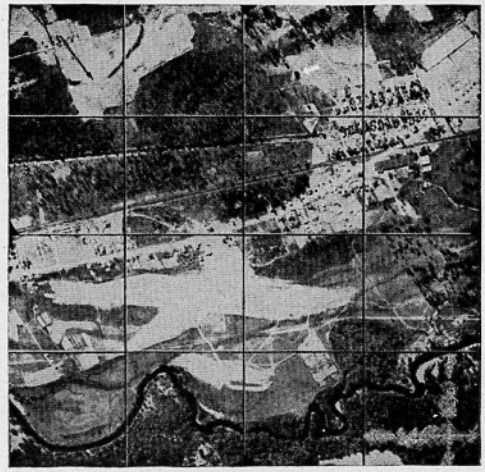
(13) Village. You can see several of its streets.

F. Grid Coordinates. It was explained at the beginning of this chapter that your photomap may have a grid and marginal information printed on it such as you have learned to use on a topographic map. If the photomap does have such a grid, as in Figure **15.91,** you use the same system to describe grid coordinates as with a topographic map.



15.91

Sometimes you may be given an aerial photograph with a grid like the one shown in Figure **15.92.** These grid lines are marked with letters instead of numbers. To locate an object with this type grid, you first identify the square it is in by giving the letters of the lines crossing at the lower left corner of the square. You give the letter of the vertical line first, then the letter of the horizontal line. To locate a point within a square, you mentally divide the square into tenths. Now, just as you learned before, count the number of tenths the point is from the left grid line of the square. Then count the number of tenths it is above the bottom grid line of the square.



15.92

For example, in Figure **15.92** an arrow points to a large building in square MN. The building is about four tenths right from line M and about four tenths up from line N. The coordinates of the building, therefore, are MN44, without either decimal or dash.

There are two important things to remember about grids on aerial photographs. First, north is *not* always toward the top of the photograph. In Figure **15.92,** the north arrow (square KN) points toward the lower right-hand corner of the photograph. Second, the grid is for locating points, not for measuring distances. The ground distance between grid lines won't be exactly the same in different squares of the photograph because of distortions in aerial photographs.

G. To Orient An Aerial Photograph. If you have a topographic map of the same area, turn your photograph until roads and other features on it lie exactly parallel to those on the map;

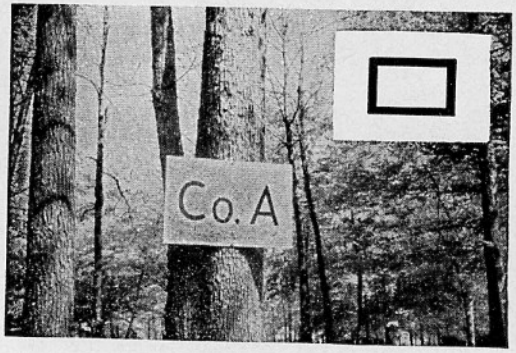
then draw a north arrow parallel to the one on the map.

If you have no topographic map, orient your photograph by turning it until its roads parallel those found on the ground. Then lay your compass on it and draw a line in the direction your compass needle points when the dial is at rest. That is your magnetic north line.

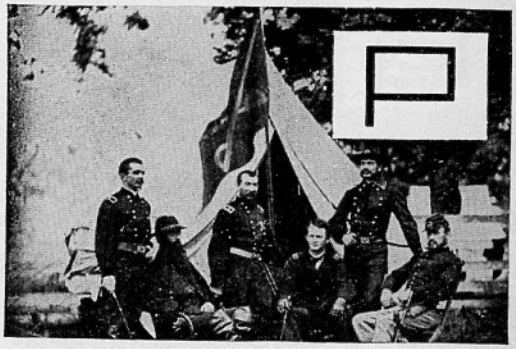
Military Symbols on the Map

When a military organization moves onto the land, it also moves onto the map of that land. There are map symbols for military activities. The symbols for different kinds of military units are not only very simple, but they are connected with the nature of the military activity itself.

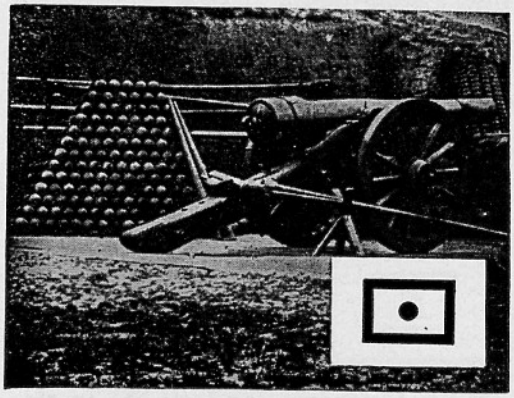
A. Unit Symbols. The basic symbol for a military unit is a rectangle (Figure **15.93**). We put a little staff on the rectangle (Figure **15.94**) and make a flag out of it; that means a command post or headquarters. The flag represents the unit commander's flag. Also see Figures **15.95** through **15.106.**



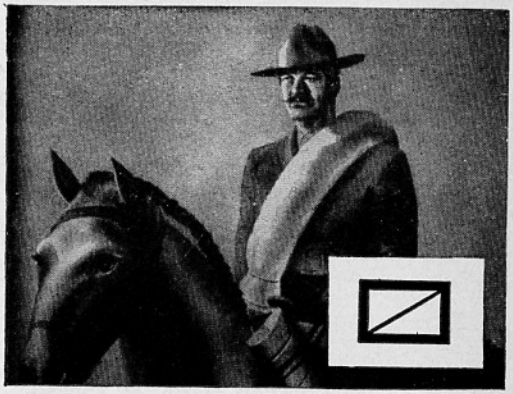
15.93 Unit.



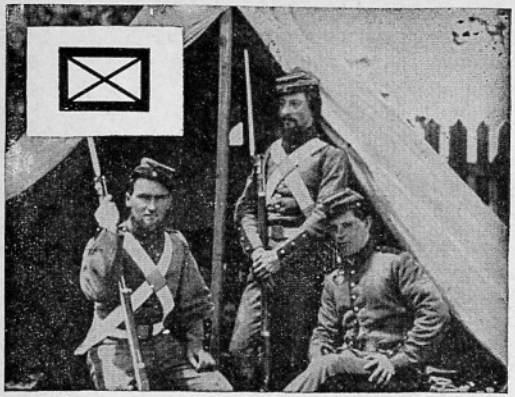
15.94 Command post, headquarters.



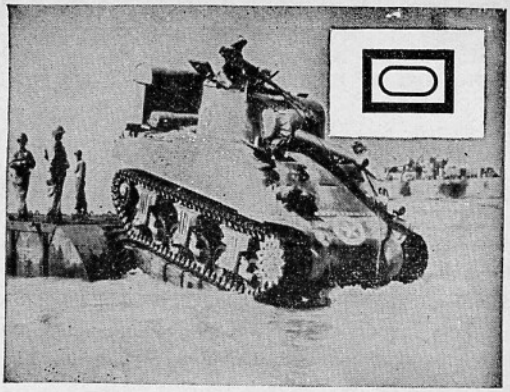
15.95 Field artillery. The dot represents old fashioned cannon ball.



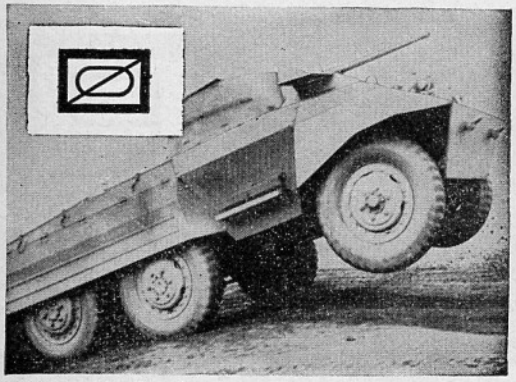
15.96 Cavalry. Slanted line represents blanket roll cavalrymen used to wear.



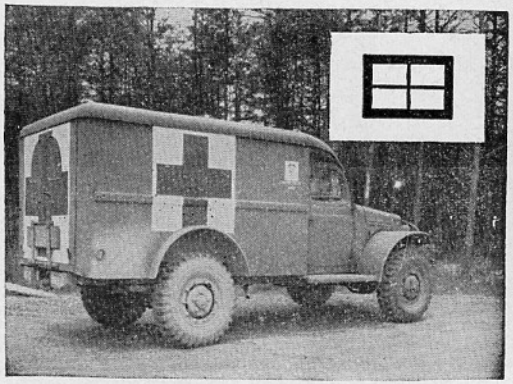
15.97 Infantry. Cross lines represent chest straps of old infantrymen.



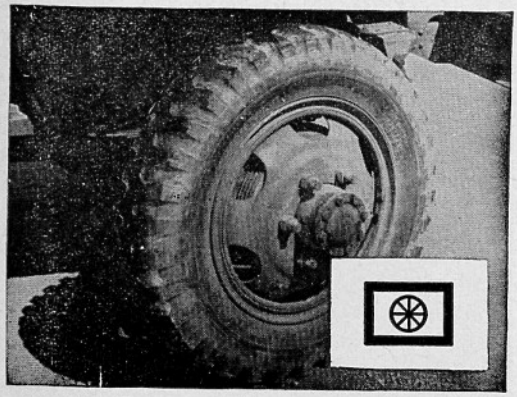
15.98 Armored command. Oval represents outline of a tank tread.



15.99 Mechanized cavalry. This is a combination of two previous symbols.



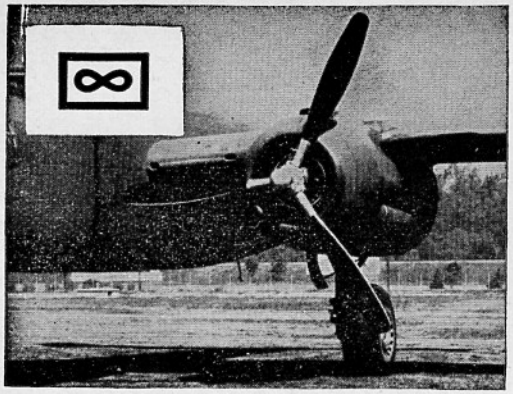
15.100 Medical department. The cross represents the red cross.



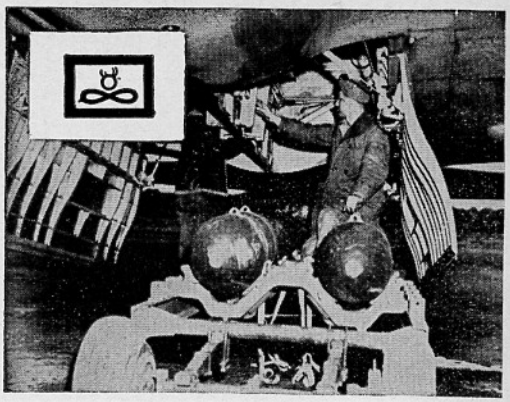
15.101 Transportation corps. A spoked wheel is symbol for this.



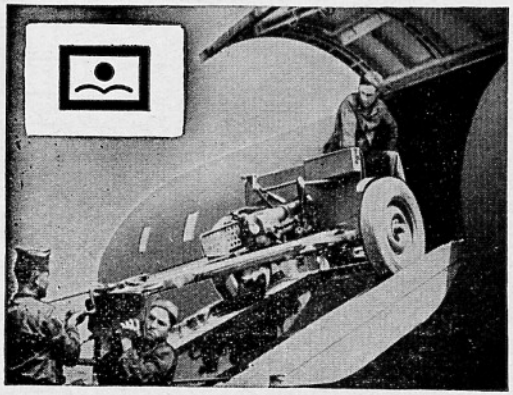
15.102 Ordnance. This looks like an old fashioned bomb in flames.



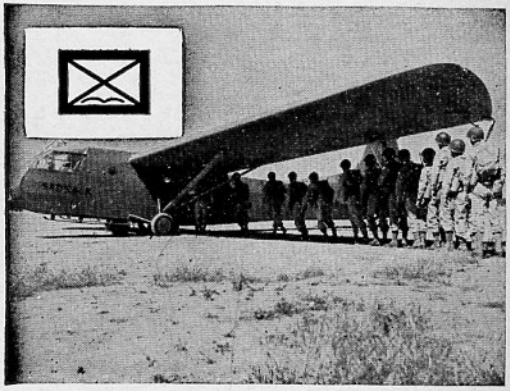
15.103 Air forces. This represents old two-bladed propeller.



15.104 Ordnance attached to air forces. This combines two previous symbols.



15.105 Airborne artillery. Artillery cannon ball and bird wings.



15.106 Airborne infantry. This combines infantry symbol and bird wings.

B. Arms Abbreviations. Some arms are shown simply by abbreviations of their full titles.

Antiaircraft Artillery .....

Military Police ..... MP

Veterinary Corps .....

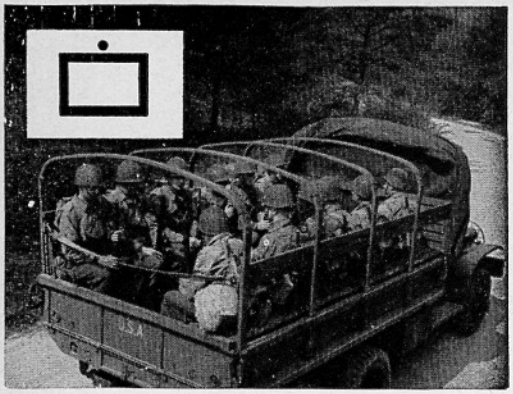
Corps of Engineers (Revolved "E") .....

Military Government ..... MG

Replacement Unit ..... Repl.

C. Unit Size. Symbols are also used to show the size of a military unit.

Unit	*Symbol*
Squad	•
Section	••
Platoon	•••



15.107

Detachment ..... •

Company, troop, battery or air flight I

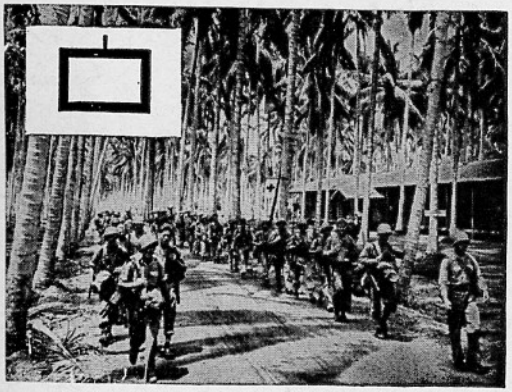
Battalion, cavalry squadron, or air squadron II

Regiment, group, or air group III

Brigade, combat command, regimental combat team, or air wing X

Division, or Air Division XX

Corps XXX



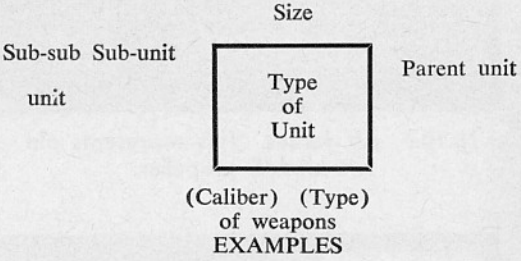
15.108

Army, or Air Force XXXX

Army Group, or Air Command .....X XXXX

Figure **15.107** shows a squad while Figure **15.108** shows a company.

D. Using Unit Symbols. We combine basic symbols and abbreviations to indicate a specific unit. The following diagram shows the method used:



EXAMPLES

This is a troop unit .....

This makes it infantry .....

This makes it a platoon of infantry .....

This makes it a platoon in the 1st Marine Regiment I

This makes it a platoon in Company A, 1st Marines ..... A I

This makes it the 2d Platoon, Co A, 1st Marines ..... 2A I

This is an observation post .....

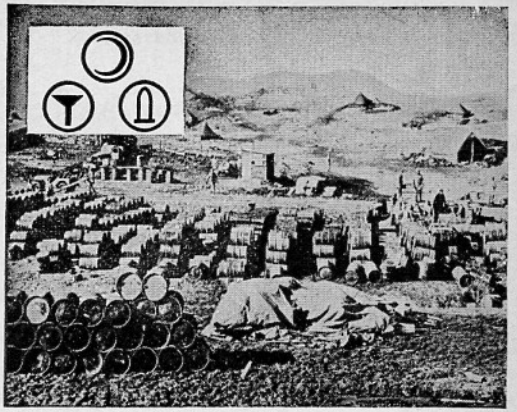
This makes it an artillery observation post .....

This makes it an observation post of B Battery ..... B

E. Activity Symbols. The symbol for an observation post is a triangle, and we indicate whose observation post it is in the same manner we use



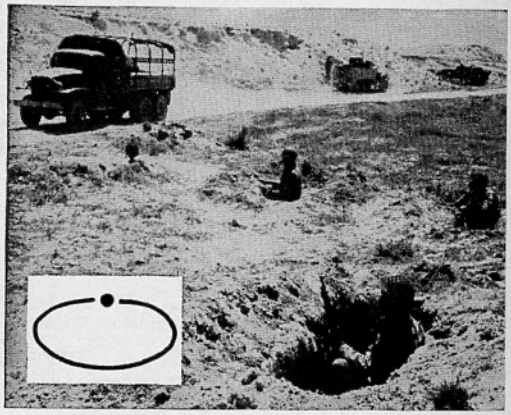
15.109



15.110



15.111



15.112

with the rectangle. For example, the symbol for the observation post of "A" battery, 2d Artillery Regiment is shown in Figure **15.109.** Supply points are indicated by circles. Inside the circles, other symbols show what kind of supplies are there. In Figure **15.110,** the crescent (moon shape) means rations, because food and water are usually brought up during the night for the next day; the funnel stands for gasoline and oil; and the shell stands for ammunition.

Figure **15.111** shows the symbol for gassed areas.

To show a unit defense area, we draw a line around it with the symbol for whatever size unit it is. A squad defense area is shown as a line with the squad symbol in it (Figure **15.112**).

F. Other Symbols. The following is a selected list of other military symbols:

Light machine gun, automatic rifle .....

Heavy machine gun (cal. .30) ..... 30 OR

Machine gun (cal. .50) ..... 50 OR

Antiaircraft machine gun, heavy ..... 50 OR

Antiaircraft machine gun, heavy, quadruple mount ..... 50 OR 4 4

Rocket launcher or recoilless rifle ....

Rocket launcher, 3.5 inch ..... 3.5 OR

Sector of fire, heavy MG ..... (heavy portion of solid line indicates danger zone when fire is placed on final protective line)

Recoilless rifle, (75mm.) ..... 75 OR

Mortar, (81mm) ..... 81 OR

Mortar, medium (4.2 inch) ..... 4.2 OR

Mortar, heavy (155mm) ..... 155 OR

Howitzer, light (105mm) ..... 105 OR

Howitzer, medium (155mm) ..... 155 OR

Tank, light .....

Tank, medium .....

Tank, heavy .....

Tank, emplaced or dug-in .....

String of antipersonnel mines .....

Barbed wire, general (depth of wire in feet may be indicated) .....

Concertina, multiple .....

Booby trap .....

Road block .....

Fort, general .....

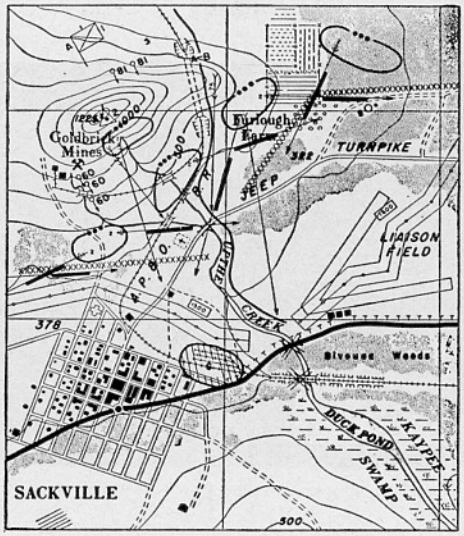
Fortified area, general .....

SP gun, medium tracked .....

Antitank ditch .....

Mine belt (numerals in rectangle indicate number of mines in belt) letter "D" in rectangle indicates dummy mine field. Boundaries drawn to scale to indicate actual extent of belt.





SACKVILLE AND VICINITY

15.113

G. Color of Symbols. On military situation or operation maps, the enemy troops and installations are shown in red; while friendly troops and installations are shown in blue.

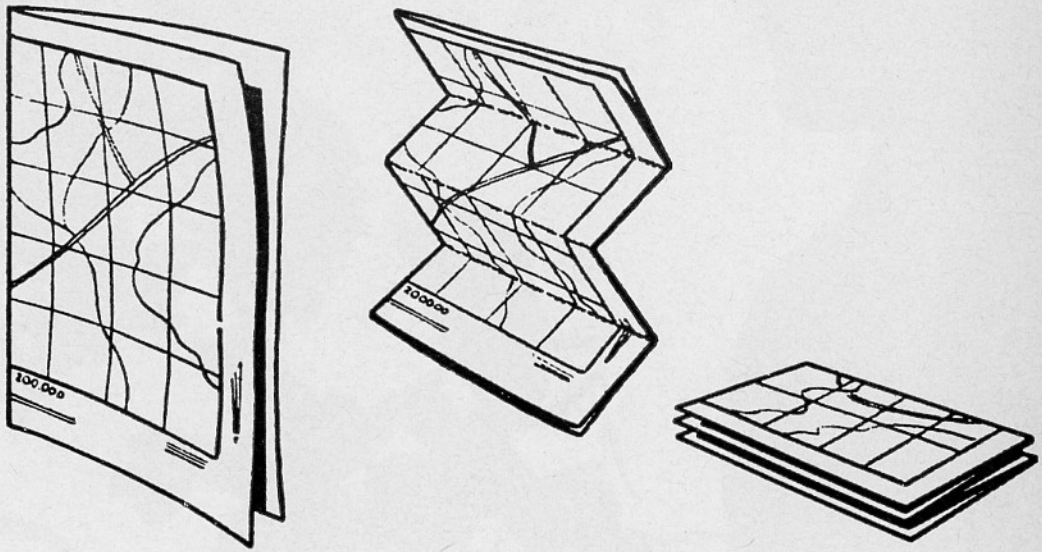
Figure **15.113** shows what the map of Sackville and vicinity looks like with military symbols on it.

Take Care of Your Map

In the field a map is as important as your weapons. Take as good care of it. Fold it small enough to slip into your shirt to protect it from rain. Fold it with face outward so that you can read parts of it without unfolding the whole map. The accordian fold (Figure **15.114**) makes it easy to use.

When you mark your map, mark it lightly. It may have to last you a long while. Many marks on it will confuse you. Erasures of heavy lines will smear it and make it difficult to read.

Keep your map out of the enemy's hands. Any marks on it may give him valuable information. If in danger of capture, burn it. If you can't burn it, tear it into small bits and scatter them widely; or fold it as small as possible and bury it.



15.114



Chapter 16

Scouting and Patrolling

AFTER your outfit goes into combat, there will be times when you are sent out as a scout or a member of a patrol. Your commander needs information about the enemy, the ground you are fighting on, and friendly troops near you. He has to get information that is accurate, detailed, and up to the minute, so that he can make his plans. When he appoints you to be a scout or patrol member, he is going to depend a great deal upon the accurate information you bring back to him. You are to be his best source of information.

This important job means a lot to your outfit. The lives of your entire platoon may depend some day upon your success or failure as a scout. The rules for good scouting and patrolling are given in this chapter. (See Chapter 13 for duties of platoon scouts in the approach march, which differ from these general rules for scouting and patrolling.)

Scouting by Day

When you go out as a scout in daylight, there are several tricks which are important to you. These tricks come under the names of cover, concealment, camouflage, and the principles of movement.

A. Cover. Cover is protection against the fire of the enemy. You are of no use as a scout if the enemy sees you and hits you.

1. Cover can be a natural object like a tree, rock, ditch, or an embankment. It also can be a shell hole or a demolished building. It is easy for you to pick out cover such as your surroundings afford.

2. It is not enough to know this, however. You may be a scout in a place where no such objects are located. You must learn to study the ground and find protection where, at first, there seems to be none. The slightest depression or hump in the ground may give you shelter from the enemy's fire.

3. Some cover will be good for one purpose and worthless for another. For instance, a reverse slope will give you protection from rifle or machine gun fire, but will not give full protection from the high-angle fire of mortars and howitzers.

4. This brings up another important part of cover. You must study the ground ahead carefully when you are about to move forward under fire from your position. Select as your next position one that offers cover. Then move to it, and move fast.

5. When you're near the selected position, hit the deck and roll over rapidly a few times. This is done to fool any of the enemy who may have seen you rush out. When the enemy sees you go down, you are some distance from your selected position and he will not be able to spot your position accurately.

6. If time permits, artificial means can be used to obtain or improve cover. This means you can dig trenches, erect barricades, and so on. Artificial means are always used in a defensive position.

B. Concealment. Where the word "cover" is used to mean protection from enemy fire, the word "concealment" means protection from observation by the enemy. Concealment may be natural or artificial. Natural concealment is that given by trees, grass, leaves, and so on, without any man-made changes. Artificial concealment is that which you construct yourself. You must become an expert in the use of concealment to be a good scout. Here are some rules to help you conceal yourself:

1. Remain motionless while you are observing. Movement can attract the eye of the enemy and give away your position.

2. Use all available concealment. Always act as though you were being watched and use the best available concealment.

3. Observe from the prone position. This position, lying flat on your stomach, gives you a low silhouette and makes it harder for the enemy to see you.

4. Expose nothing which glistens. Reflection of the sun flashing on bright objects like a wrist watch, knife, or bright button will attract the observation of the enemy at once.

5. Blend with the background. Be sure that the color of you and your clothes does not contrast too much with your surroundings. Something like a bleached khaki uniform on green grass can be seen quickly.

6. Stay in the shade. When you are in the shade, you throw no shadow and you'll be harder to see.

7. Break regular outline of objects. If you put garlands around your rifle, twigs in your helmet, and use other tricks of camouflage, you break the regular shape of objects and make them harder to recognize.

8. Keep off the skyline. If you outline yourself against the sky at any time, you can be observed from even a great distance.

9. When you are observing as a scout look around one of the *sides* of an object unless you can look *through* it.

10. You fire around the right side of an object, unless you are left handed.

11. You *never* look or fire *over the top* of concealment or cover unless the outline of the concealment already is broken, or you can otherwise blend in with a suitable background.

12. When an airplane approaches, you take a prone position, face down, and remain motionless. If the airplane comes upon you by surprise, stand still and cover your hands so that their whiteness will not show. Do not look up, otherwise the occupants of the plane will observe the whiteness of your face.

13. A small, thin bush in the shadow of a large bush makes a good observation point. Lone trees or rocks, fence corners, and other outstanding landmarks are easily picked out as targets by enemy observers. Remember this when you are concealing yourself.

C. Camouflage. You already have seen by reading the above rules on cover and concealment that camouflage will be an important part of your scouting. There are four things involved in successful individual camouflage. They are: ability to recognize and take advantage of all forms of natural concealment available; knowledge of the proper use of the available vegetation, soil, and debris for camouflage purposes; knowledge of the proper use of artificial or issued camouflage materials; and camouflage discipline. Listed below are some practical camouflage rules (see Chapter 14).

1. You paint splotches across your nose, mouth and cheeks for scouting in areas where there is vegetation. You can paint your hands with lampblack, burned wood, cork, crankcase oil, grease paint, or petroleum-jelly with soot in it. Dried mud shows up light and many black substances glisten and reflect light, so be careful what you choose to paint your face and hands with. Green grass, crushed in your hands, and applied to your skin, will make a stain that lasts about 10 hours. No exposed skin should be overlooked in splotch painting. The back of your neck, chest, lower arms, and both the backs and palms of your hands should be painted.

2. If you are to take a position among rocks or in open ground, tone your skin to a solid blending color instead of using splotch painting.

3. Cover any of your equipment that can reflect sunlight.

4. White garments blend in with snowy areas, especially on a cloudy, windy day.

5. You can make your own camouflage clothing from gunny sacks or sand bags if you have no other way. An improvised suit can be made in the field, when a standard jungle suit is not available, by painting ordinary utilities with irregular splotches. A dye, paint, grease, or oil may be applied with an improvised dauber, or a pattern may be stamped on with a block of wood.



16.1 Camouflage for the helmet.

6. Fig. **16.1** shows how to camouflage your helmet. A few leaves and a net conceal the shine of the helmet and break its outline.

7. You are going to be tired sometimes when you start out on a scouting mission. But use extra camouflage care when you are tired. *Fatigue leads to carelessness.* Marines who have been scouts in the Pacific can tell you what camouflage carelessness, which is lack of camouflage discipline, can lead to when involved in important scouting missions.

D. Movement. Some of the principles of movement already have been mentioned. As a scout you move from one concealed location to another and there are rules to help you move around successfully. Some of these rules are as follows:

1. Remain motionless when you are not changing your position.

2. When you are observing, lift your head slowly but steadily, without making any quick movements.

3. Select your next stopping place from each position. Avoid isolated or obvious places of concealment. Before you leave one position, make certain that your next stopping place does not contain an enemy. Hit the deck a few yards from your position and *roll to it.*

4. When you are changing your position by running, spring up and run with your body bent low and drop to earth quickly. Take advantage of any walls, ditches, or similar cover.

5. Figs. **16.2, 16.3, 16.4** and **16.5** show a scout's tricks of rushing from a prone position, dropping to a prone position, creeping, and crawling. (The uniform shown in the pictures is not necessarily correct. Equipment and uniform of a scout conform to his mission and the terrain he is to cover.)

Scouting by Night

When you go on a night scouting mission some of your problems, such as cover, concealment, movement, and camouflage, are going to be something like a day scouting mission. Night scouting presents additional problems, however.

A. Night Vision. You have to adapt your eyes to seeing at night. This is night vision. The human eye adapts itself for seeing in the dark by enlarging the pupil in order to let in more light. If you are tired or have a vitamin deficiency, your night vision will not be as good as it could be.

You prepare your eyes for a night mission by staying in darkness for about an hour before you go out. If you cannot stay in the dark, keep out of the lights around you as long as possible and avoid looking straight at them. If it is possible, wear red goggles, or keep one eye covered.

B. Appearance and Size. Darkness not only makes it hard or impossible for you to see objects, but it also changes their appearance and apparent size. Details are blotted out. As a scout you have to train yourself to identify objects by black outlines at night.

1. A tree seen against the night light looks much smaller than it does in the daytime because the twigs at the tips of the branches cannot be seen at night. For the same reason, an airplane caught in the beam of a searchlight looks larger than the same plane when it is seen as a black mass against a dimly lighted sky.

2. Night glasses, which may be issued to you, make it possible to see objects or parts of objects that would otherwise be too small to be seen at all, and help to identify objects already spotted.

3. Any kind of light is quickly visible at night. Under ordinary conditions, a lighted match can be seen for several miles. Under ideal conditions of darkness and atmosphere, a candle is said to be visible for 10 miles.

C. Sounds. When you are a scout at night, the *sounds* of things will be very important. You depend mostly upon your ears to get information about the enemy and you have to exercise every care to keep the enemy from hearing you.

1. When scouting at night, stop frequently to listen. If you are required to wear a helmet, remove it when you stop so that sounds are not distorted by the helmet over your ears.

2. By practicing a great deal, you can learn to listen for long periods in perfect silence. This is what you have to do when you are scouting.

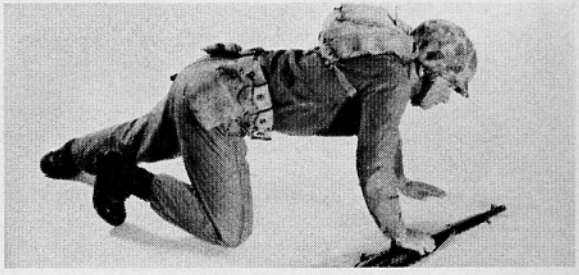
3. Remember that sounds are transmitted a greater distance in wet weather and at night than in dry weather and in the daytime.

4. If you hold your ear close to the ground, you can hear much better such sounds as persons walking and the noise of vehicles.

D. Smells. Use your nose as well as your ears. Your sense of *smell* may warn you of enemy fires, cooking, picket lines, motor parks, gasoline and oil engines, bodies of water, and the presence of troops.

E. Touch. Your *sense* of touch is going to

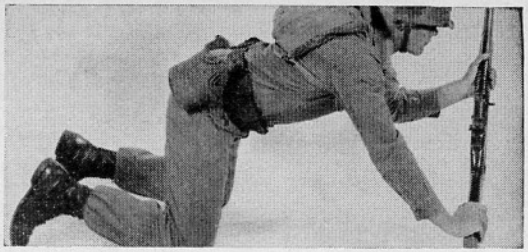


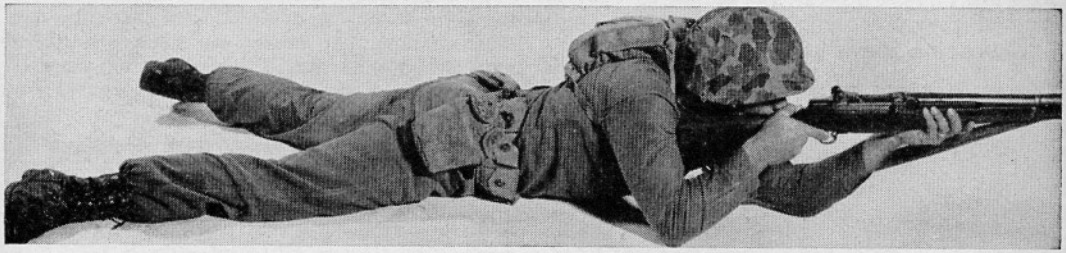


16.2 Rushing from a prone position: Upper left, keep all parts of body flat on ground; upper right, raise head slowly to select new position; middle left, lower head slowly, draw arms in, cock right leg forward, preparing to rush; middle right, raise body with one movement by straightening your arms; lower left, spring to your feet, stepping off with your left foot; lower right, run in a zig-zag line toward the new position which you have selected. Hold yourself crouched low, with left hand near the balance of the rifle and your right hand at small of the stock.







16.3 Dropping to prone position: Lower left, opposite page, stop rush and plant both feet in place; lower right, opposite page, drop quickly to knees, slide hand to heel of rifle; upper left, above, fall forward, breaking the fall with the butt of the rifle, upper right, get feet, knees and belly flat on ground, rolling into firing position, get head down if you don't mean to fire; bottom, ready to fire.





16.4 How to creep: Upper picture, your body is kept free of the ground with your weight resting on forearms and lower legs, your rifle is cradled in your arms to keep the muzzle out of dirt; lower left, move forward by alternately advancing the elbows and knees, and your knees always must be kept in a position well behind the buttocks; top



16.4 (cont.) notice that you present a higher silhouette in creeping than in crawling, but creeping allows you to move faster.

mean much to you when you are a scout at night. Learn to operate and adjust your equipment by the sense of touch alone. You also are going to have to use your hands instead of your eyes to feel and recognize objects in the dark.

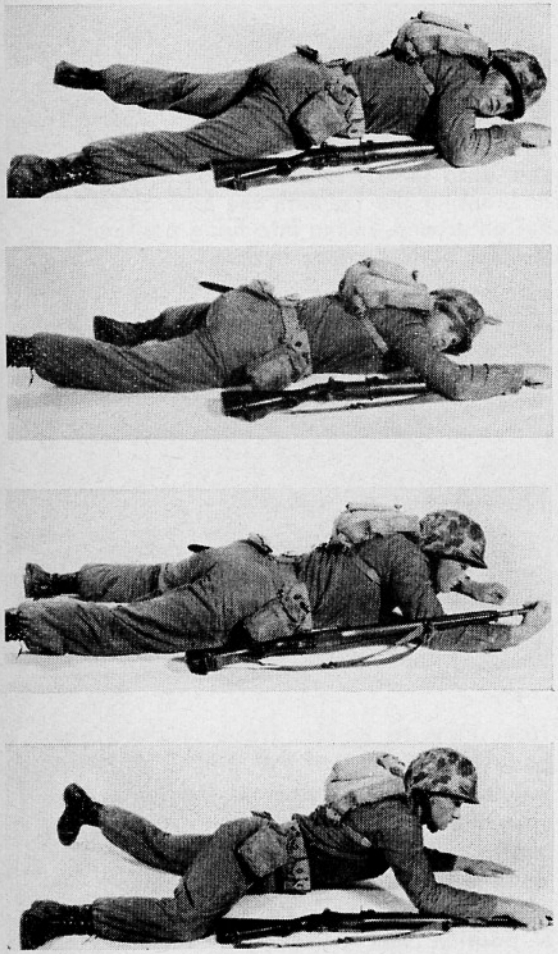
F. Concealment. Concealment at night is provided by darkness, unless there is bright moonlight. If the moon is giving light, however, you have to use the same methods of concealment that you use in daylight.

G. Movement. The principles of movement at night are somewhat different from those for daytime scouting. At night, you must be able to move in absolute silence, for your safety depends on your silent movement. The five principles of night movement are:

1. Move by bounds you have determined in advance.
2. Run at night *only in an emergency.*
3. Stop frequently and listen intently at each stop.
4. Take advantage of sounds which may distract the enemy to cover up your own movements.
5. If you fall down, don't cry out. Fall as silently as possible.

H. How to Move at Night. Experience has taught the Marine several things about movement at night. These aids to movement are given here in pictures. When you need them, remember them.

1. Fig. **16.6** shows how to walk at night. You balance the weight of your body on your rear foot, until a secure spot is found for your forward foot. You lift your forward foot high to clear any stiff grass, brush, wire, or other obstruction that might cause you to stumble. With your weight still balanced on the rear foot, you lower your forward foot gently, with toe first. You lower your foot, toe first, because your toe is more sensi-



16.5 How to crawl: Upper left, body and cheek are flat against ground, rifle is dragged along on toe of the butt with finger over muzzle to keep it out of the dirt; upper right to move forward, push arms forward and cock left leg forward; lower left, pull yourself forward with arms, push with the left leg; lower right, you can move faster by alternating legs, but this makes silhouette higher and the rifle gets in the way of the right leg.

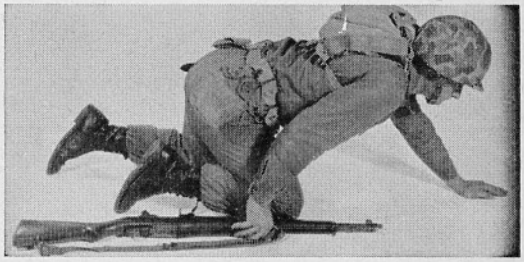


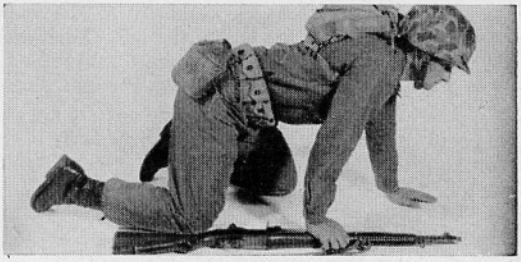
16.6 How to walk at night.



16.7 Dropping to prone position at night.



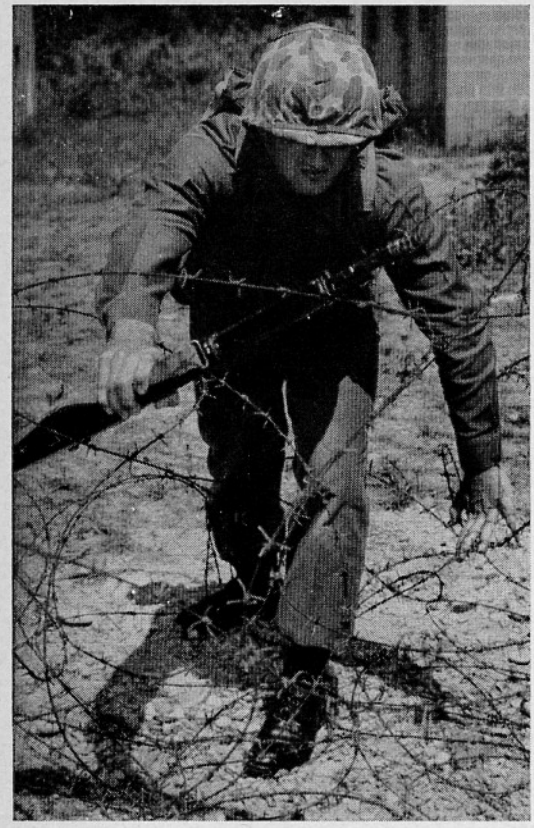








16.8 Creeping at night: Upper left, get on all fours, rifle on right; upper right, feel with left hand for spot free of rocks and twigs; middle left, leave left hand in place, move left knee forward; middle right, leave rifle on ground, feel forward with right hand; left, place right knee in spot cleared by right hand, draw rifle up.



16.9 Passing over wire.



16.10 Passing under wire.

tive and can feel an obstruction more quickly than the rest of your foot. When you have located with your toe a spot free from anything that might make a noise, you lower your heel gently. Then your weight is balanced on that foot and the other foot is advanced.

2. Fig. **16.7** shows how to drop to a prone position at night. Hold your rifle as shown in the picture and go down slowly on your right knee, stopping yourself carefully with your left hand. Move your left leg carefully to the rear and place your right leg beside the left. Then roll into firing position or lie flat against the ground.

3. Fig. **16.8** shows how to creep at night. You



16.11 How to cross a narrow trench.

get down "on all fours" with the weight of your body resting on your hands and knees. Place your rifle on the ground on your right, with the operating handle up. With your left hand, feel for a place free of rocks and twigs in front of your left knee. Leave your left hand in place and move your left knee forward to the place you have cleared. Do the same with your right hand and knee. As you move, clear spots for your rifle and lift it forward.

4. You crawl at night much the same as you do in the daytime, being careful not to silhouette yourself. Crawling at night must be done silently, however, and it is slow and tedious.

I. Other Precautions. In addition to these aids to movement in night scouting, there are other methods which you can use to avoid detection.

1. If you feel that you are about to sneeze, press upward on the end of your nose with your fingers. This may stop the sneeze.

2. If you feel a cough coming, press slightly on your "Adam's apple." This may stop it.

3. Sometimes you may have a ringing noise in your head that interferes with your hearing. Try yawning to stop this.

4. If it is necessary for you to whisper, expel most of the air from your lungs before you do. This does away with the hissing sound usually made by a whisper.

5. If the enemy has been using gas, keep away from depressions in damp and rainy weather. Gas can remain in these places quite a while.

6. Whenever you stop, *look and listen.*

7. Do not look at an object too long. This strains your eyes.

8. If caught in a flare, drop quickly in the split second that the enemy is blinded after the flare light. If you hear the flare discharged, drop to the ground before it bursts. Never look at a flare; you will impair your night vision for nearly an hour.

9. When you come upon patrols or persons, consider all of them to be unfriendly until you identify them. When you meet someone, crouch low in order to get him silhouetted against the sky and to offer him only an indistinct target if he proves to be an enemy. If you are fired upon, do not return the fire except to avoid capture.

10. If you are carrying a luminous compass or watch, be sure that the dial has some covering on it.

J. Passing Obstacles. The proper passing of obstacles such as wires and trenches is another thing you need to know about night scouting. Whenever possible, avoid enemy obstacles, which are frequently covered by their weapons.

1. All of your movements near wire must be slow and cautious because of the danger of booby traps and mines. Fig. **16.9** shows you how to pass over wire. Walk over low wire at night by grasping the first strand with one hand and reaching forward with the other hand to feel for a clear spot on the ground. Feel for a spot where you can place your foot without touching another strand, or a mine, booby trap, or any object that might make a noise. When you find such a spot, lift your foot up and over, close to the hand grasping the wire. Place your foot beside your other hand to avoid catching it on another strand. If you are armed, sling your rifle across your back and follow the same procedure.

2. Fig. **16.10** shows you how to pass under wire. You can move under wire on your back by feeling ahead and above for the strands of wire, and inching yourself along, holding the wire clear of your body. Be careful not to tug on the wire or jerk it. You might make a noise or set off a booby trap. If you have a rifle with you, you can put it on your stomach, with the bayonet beside your head, or you can place it between your body and right arm, and have the bayonet resting on your shoulder.

3. When cutting wire, if you are alone, cut the wire near a picket to avoid having a loose end fly back. When you are operating with another Marine, one of you can hold the wire in both hands while the other cuts the wire between the hands. Then you bend or roll back the wire to make an opening sufficient for passage. When cutting wire, wrap a cloth around it to muffle sound. If a gap is cut in enemy wire, it is well to leave top wires intact. This lessens chances of discovery.

4. The proper way to cross a narrow trench at night is shown for you in Fig. **16.11.** You should crawl silently up to the edge of the trench, look into it and remove all loose dirt and rocks from the edge. Then spring up from the prone position, as shown to the left in Fig. **16.11,** and jump across, sinking quietly to the ground on the other side. Remain there, quite still, for a moment and listen before you proceed any farther.

If the trench is too wide for you to jump it in this manner, you must climb into it silently and slowly and then climb out the other side, using the revetment of the trench for support.

Observing

When you are sent out as a scout you are on a mission to observe and report. So far, we have studied ways to protect yourself and get around on your job. Now we come to the job itself.

A. Selecting Observation Posts. You usually will occupy two or more observation posts while you are on a scouting mission. When you see a place you want to use for an observation post, study it closely before you occupy it just to be sure it is not already occupied by the enemy.

After you have occupied the post, avoid unnecessary movement. Leave the observation post by a route different from the one you used to approach it. Be careful not to make paths that would reveal your position.

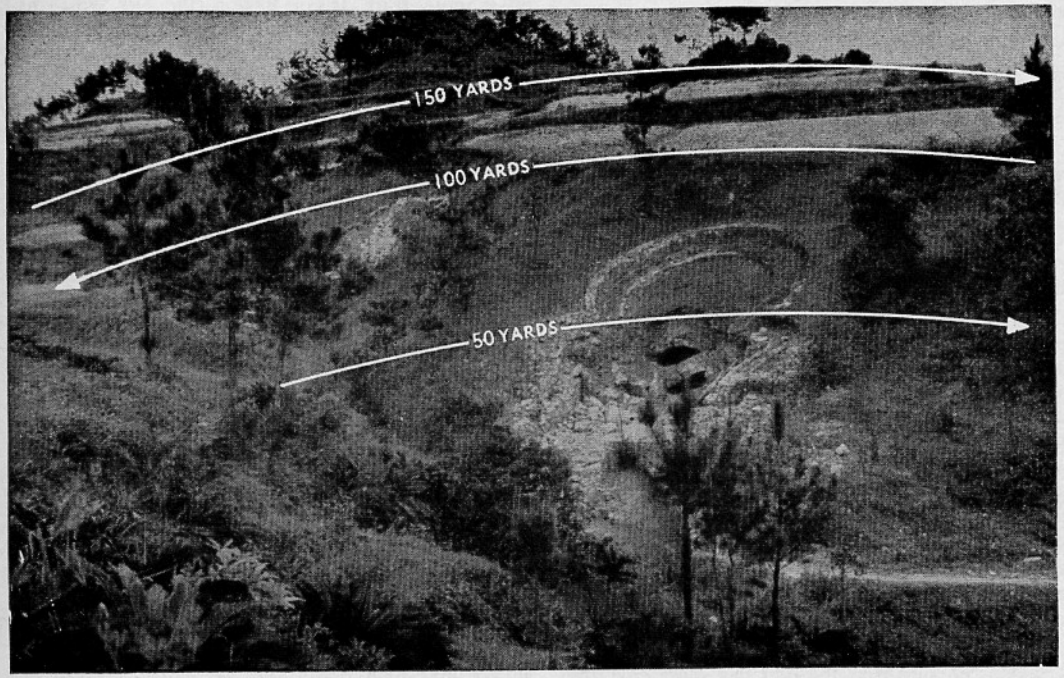
When you search the ground about your observation post, there are certain methods you can use to insure that you do a good job.

1. In daylight, look first at the ground nearest you. Your most dangerous enemy will be there. Begin close to your post and search a narrow strip 50 yards or less wide, going from left to right parallel to your front. Then search from right to left a second and similar strip farther away but overlapping the first. You continue in this manner until your entire field of view is covered.

2. At night, you should search the horizon with short, jerky movements, and short pauses. Look a little to one side of an object and then to the other side to see it best on a dark night. By getting your eye close to the ground, you can see the object more clearly. Low-powered field glasses also increase the range.

3. Look at Fig. **16.12,** which shows you how terrain is searched. You can see troops as far away as 2,000 yards in the daytime. At 1,200 yards, you can distinguish infantry from mounted troops. At 600 yards, you can count the files of a squad, and at 400 yards the movements of arms and legs can be seen plainly.

B. Interpretation of Signs. You can tell a trained scout from an untrained scout by his powers of observation. A trained scout, when he returns from a mission, can describe what sort of country he has passed through, all noticeable landmarks, and any indications of the enemy in the



16.12 How to search terrain.

vicinity. This scout has acquired a keen sense of interpretation by constant practice in observing. His ability to do this is valuable. He has learned that the enemy, in his movements, leaves slight indications which show his strength, the character of his troops, their condition, and direction of march.

1. The size of a bivouac area usually indicates the number of the enemy there. You can check laundry, ration tins, dumps, and so on for clues as to the size of the enemy force.

2. Tracks on a road can show you what kinds of troops or vehicles are in the body and their direction of march.

3. The state of the bivouac and the amount of abandoned material about can reveal the enemy's condition to you. For instance, if you find food left uneaten, you can assume that he is well supplied. If all scraps of food have been eaten, you can assume that he is short on supplies.

4. You can check a track for the time it was made. A freshly made track has sharp edges and ordinarily has signs of moisture which disappear in about 15 minutes.

5. You can tell whether a footmark was made by a running or walking man. A running man digs his toes into the ground. His walking footprint is fairly even.

6. Hoofmarks in pairs, overlapping or close together, indicate a horse moving at a walk or trot. If the horse was trotting, the tracks are deeper. The hoof prints made by a galloping horse will be separated about three and a half feet.

7. You can easily tell the direction of travel of a car by the way its tracks pass across ruts or track water from puddles.

8. You can estimate the speed of a vehicle by the amount of mud splattered about or the dirt scattered by it. Slow moving wheels leave shallow, smooth tracks. Faster moving wheels cut deeper.

9. You can observe carefully your own unit, when you are on the march, in camp, or deployed, in order to develop your power to estimate the size of enemy forces, even at a distance. Here are a few of the things you can learn: If a column is so far away that you cannot count it, you can estimate its size by the length of time it takes the column to pass a given point; infantry on the march usually raises a low, thick cloud of dust; a broken cloud indicates artillery on the move; automobiles or motor trucks raise a heavy, rapidly moving cloud of dust.

Reporting

You send messages in the field to get information to your commander. A message can be either oral, that is by word of mouth, or it can be written. But whether it is spoken or written, you must learn to give accurate, clear, and complete information, and you have to get it to your commander in time for him to use it. Fig. **16.13** shows a message that is correctly written.

A. Oral Messages. You send an oral message when it is impractical to write out a message, when the information is just one simple idea, or when there is great danger that the enemy might seize a written one. Oral messages have to be as simple and clear as possible, and you should avoid having a series of numbers or names in them. Always have the person who is carrying an oral message for you repeat it back to you so that you can be certain he has it correctly memorized.

B. Written Messages. When you write a message, you should include all information of value about the enemy and about yourself. You should be brief, accurate, and clear. Distinguish carefully between facts and opinion. If you send in hearsay information, give the source somewhat in this manner: "Friendly farmer states four-man patrol crossed bridge at 365.4-427.3 at 0930 traveling south."

1. There are five kinds of facts which your commander always wants to know about the enemy. These are: his strength; his composition and arms; his actions or the direction in which he is moving; his position at the time observed; and the time that it was when you observed him.

2. Number and place in a separate paragraph each item of information you write. This makes it clearer for your commander when he reads it.

3. If you suspect that your commander did not get a message you sent, include a summary of it in your next message.

4. You indicate for your commander the place from which the message is being sent. You can do this by reference to an important terrain feature, by map coordinates, by the magnetic azimuth from each of two definitely located points, or by the azimuth and distance from one known point. Sometimes you can describe your position best by using a simple sketch or overlay which also makes other information in your message clearer.

THESE SPACES FOR MESSAGE CENTER ONLY

TIME FILED | MSG CEN No. | HOW SENT

U. S. MARINE CORPS MESSAGE

(PRECEDENCE) (SUBMIT TO MESSAGE CENTER IN DUPLICATE) (CLASSIFICATION IF OTHER THAN CONFIDENTIAL)

No. 5 DATE 9 MAY 1944

ACTION To CO CO B INFO. To

MSG NO 4 SENT TO CO A X SAW ENEMY FOOT PATROL OF 5 MEN ON ROAD 200 YARDS WEST OF RJ 303 MOVING NORTH AT 1205 X WILL CONTINUE ON MISSION X

LEADER PATROL NO 3
OFFICIAL DESIGNATION OF SENDER

1210
TIME SIGNED

AUTHORIZED TO BE SENT BY RADIO OR VISUAL IN:

Brown, Sgt.
SIGNATURE AND RANK OF WRITER

CLEAR

MOD CLEAR
SIGNATURE OF OFFICER

☆ GPO 16--30938-4

16.13 A properly written message.

5. Your commander will want to know what you plan to do next, so you include in your message your intentions. If you plan to remain in observation, continue on your mission, or take other action, you must tell your leader. If you think the message might fall into enemy hands, you can have the messenger give this information orally.

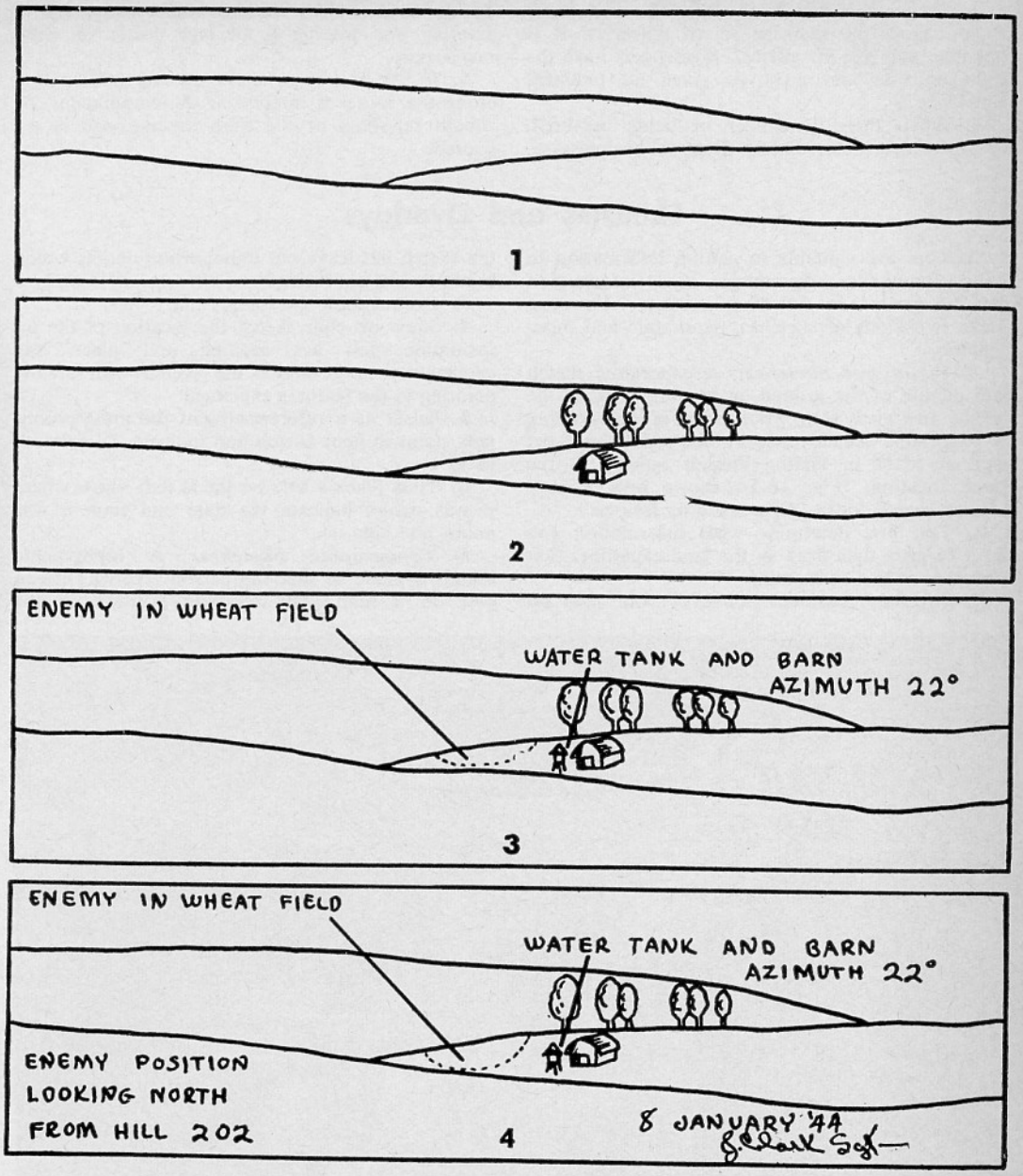
6. After you have written your message, reread it carefully. If it is possible, have someone else read it to see that it is complete and easily understood.

C. Messengers. Information will be valuable to your commander only if he receives it in time to act upon it. If you are in doubt about when to send a message, send it at once. This means that a messenger is employed. Here are some suggestions about messengers:

1. When you are in friendly territory or close to friendly troops, one messenger is all you need. However, if you are in enemy territory or when it may be necessary to pass through heavy artillery concentrations, you should use two messengers if possible. They should leave at different times and travel by separate routes.

2. The messenger must know where the message is to be delivered and the route to take. If there is a map available, he locates himself on the ground and selects landmarks to help him find his way.

3. A messenger always travels light and takes only the necessary food and arms.



16.14 Method of making a panoramic sketch: (1) Draw the more or less horizontal lines of landscape; (2) put in the prominent points; (3) put notes above sketch, give azimuth from position to most prominent point in sketch: (4) give sketch a title and show where made, date and time, sign it.

4. If he is delayed or lost, the messenger should show the message to an officer, if it is possible, and ask his advice. Messengers have the right of way and must be given all practical assistance.

5. When there is danger of being captured, the messenger immediately destroys his message. To avoid detection, he uses different routes in entering and leaving a message center or command post.

6. If the messenger picks up any information along the route of interest to the commander, he should report it at the time the message is delivered.

Sketches and Overlays

Sketches are valuable in getting information to your commander. Sometimes your information can be carried in no other manner. You can make two kinds of sketches, panoramic and topographic.

A. Panoramic Sketches. A panoramic sketch is a picture of the ground, or terrain, showing the height and view from your point of observation. A panoramic sketch made by one scout can assist another scout in finding himself quickly in the same location. Fig. **16.14** shows how a panoramic sketch looks. It is made as follows:

1. You first determine what information you want to give, then draw in the landscape lines that are more or less horizontal.

2. Put the prominent points of your area on the sketch but leave out unimportant details which might be just confusing.

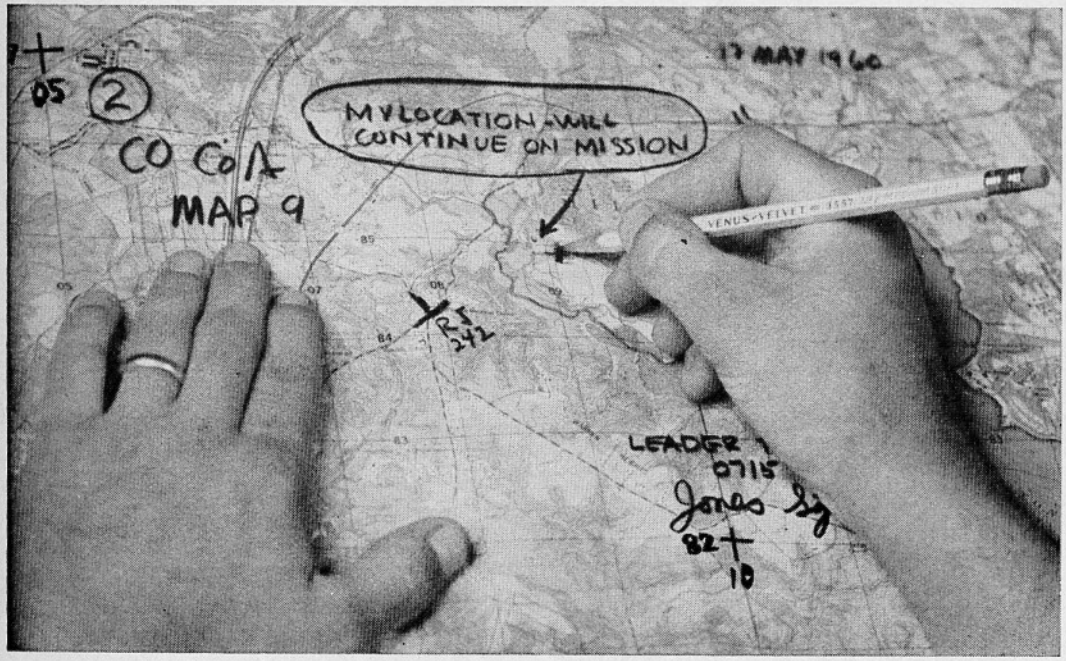
3. Do not show the foreground.

4. Show on your sketch the location of the information you are sending and place any explanatory notes above the sketch with arrows pointing to the features explained.

5. Select as a reference point the most prominent point in your sketch and indicate the azimuth to it.

6. Then place a title on the sketch, show where it was made, indicate the date and time it was made, and sign it.

B. Topographic Sketches. A topographic sketch is made so that the person receiving it can plot on a map your scouting position or the



16.15 A brief and accurate overlay.

information you desire to convey. To make a topographic sketch you need a map similar to one your commander has in his possession. This is the way you make a topographic sketch:

1. You find the azimuth from your position to the position of an object you can easily see and describe. Estimate the distance by the most accurate means available.

2. Draw the azimuth line from you to the object. Mark the azimuth above this line and the distance below the line.

3. At the proper end of the line show the object and at the other end indicate your own position.

4. Find the azimuth and the distance to some other point on your map or to the position of the command post. Then draw this line on the sketch and indicate the azimuth, the distance, and the object to which it is drawn. Sign the sketch.

C. Overlays. The topographic sketch is drawn on a piece of transparent paper, which is called an overlay. The overlay can be placed over a map or chart on which locations such as targets or enemy positions are shown. Your commander can take the overlay you made with your map, place it over his map and clearly see the information you are giving him. You can use any kind of thin paper—tracing paper, overlay sheets from a message book, or toilet paper—for your overlay. Fig. **16.15** shows you a brief and accurate overlay. Here is the way to make a simple one:

1. Place your map on a hard, flat surface.

2. Put the transparent paper over the part of the map you are using and fasten the paper with clips, thumbtacks, or pins.

3. Next, identify the section that you are reporting on. To do this, you *trace in the intersecting grid lines at two opposite corners of the overlay and give their correct number designations.* If there are no grid lines on your map, trace in at least two clearly defined map features, such as road junctions, towns, or streams. This lets your commander know the exact area on his map that is covered by your overlay.

4. On the overlay, sketch in the objects or information you wish to tell your commander about. If some of the information on the map is needed to complete your information, be careful to make your sketches so that the map's information shows through when the overlay is on it.

5. Put all your explanatory notes along the margin of the overlay with arrows pointing to the objects mentioned.

6. Indicate on your overlay the position on the map from which you saw the object or obtained the information.

7. Indicate the title and scale of the map from which the overlay was made so that your commander will know to which map the overlay belongs.

8. Give the date and hour you obtained the information shown on the overlay.

9. Sign the overlay.

Operating Procedure as a Scout

There are a few other things you need to know to be a good scout:

A. Travel Light. When you go out on a scouting mission, carry only the necessary equipment.

1. In the daytime, your clothing and equipment should reflect no light and should blend with the background.

2. At night, your equipment should make no noise. Wear tennis shoes, cap, and woolen clothes instead of field shoes, helmet, and cotton clothes. Cotton tears too easily for night scouting missions.

3. On all scouting missions your equipment includes a compass, watch, wire cutters, paper, pencil, trench knife, and grenades. At night you may also have a black-jack, hand axe, and garroting wire.

B. Don't Wander About. Remember that when you are on a scouting mission you do not get lost, you *lose direction.* Do not get excited or wander about and tire yourself if this happens. Try to locate a tree from which you can identify landmarks. If no trees are available, seek high ground for this purpose. If you see no familiar landmarks and have no compass, wait until nightfall and use the stars or prevailing winds to determine direction.

C. Don't Talk. If you should be captured, remember that according to the international rules of warfare you are required to give only your name, rank, service number and date of birth. Do not give false answers to other questions; just refuse to answer them.

D. Keep Cool. Always be alert to avoid an ambush. If you are seen, keep cool, pretend that you don't know you are seen, and try to form some plan of escape. If you are fired upon, you might pretend to have been hit and seek cover. This may fool the enemy. You fire back only in self-defense. A scout is sent out to *get information,* not to fight.

Patrolling

When your company is in combat, small groups are sent out from time to time on the special missions which are called patrols. A patrol is a detachment of troops sent out from a larger body on a mission of reconnaissance, security or combat.

A. Types of Patrols. There are two general classes of patrols—reconnaissance and combat—either of which might have a mission of security. The classification is derived from the mission assigned a patrol.

1. *Reconnaissance Patrols.* Reconnaissance patrols are sent out to gain information about the enemy or the terrain. Such patrols engage in combat only when it becomes necessary to accomplish their assigned mission or in order to protect themselves. In general, they avoid combat and accomplish their missions by stealth.

Reconnaissance patrols have a great variety of missions, but their primary mission is to obtain and report information in time for it to be of value to the commander who dispatched the patrol.

Some missions that may be assigned to reconnaissance patrols are: (1) to locate and observe the characteristics of a hostile position or installation, (2) to reconnoiter a route of march for a larger force, (3) to reconnoiter a safe and fordable stream crossing for an advancing unit, (4) to reconnoiter a certain terrain feature or the general nature of the terrain in a given locality, (5) to maintain contact with a rapidly withdrawing force. The missions mentioned are by no means all inclusive but are given as examples.

2. *Combat Patrols.* Combat patrols are assigned missions which usually require them to engage actively in combat. They are fighting patrols. Every combat patrol, no matter what its specific mission, has a secondary mission—that of gaining information about the enemy and the terrain.

A combat patrol may be dispatched with the mission of: (1) capturing several prisoners, (2) destroying an enemy installation, (3) protecting an exposed flank of an advancing unit, (4) seizing and holding a piece of commanding ground to prevent enemy occupation of the terrain feature, (5) ambushing the enemy. Again, the missions mentioned are not all inclusive but are given merely as examples.

B. Patrol Formations. In Chapter 12 you saw a number of fire team formations. While on patrol as a unit, as part of a squad or as part of a larger force, the fire team leader may use any or all of these formations from time to time. The factors determining which formation he will use include: mission, terrain, visibility, control, and security. He must be able to move his team in any direction and to quickly change to another formation by signals. Each member of the patrol is assigned a sector of observation. In order to be sure of security when the patrol halts, each member takes up a firing position from which he can observe the sector assigned him.

C. Scout as a Patrol Member. The tricks of scouting which you have learned are needed also on patrolling missions. Every man in a patrol should be a good scout, but since you are a member of a team, you must learn to use your scouting knowledge as a member of a unit. This requires that you have extra training.

As a patrol member, you must respond quickly to the decisions and orders of your leader. You must have complete confidence in all members of the patrol and confidence that your team will succeed in its mission.

Your patrol goes in a formation which can be changed to suit conditions you meet. The leader of your patrol tells you, by signal, where to place yourself in the formation as you proceed.

One member of the patrol remains inside the group where he can always see the patrol leader. Other members on the points and flanks move in and out to look for any cover which might hold an enemy. These men on the points and flanks can carefully observe an area up to 100 yards in open terrain to protect the entire patrol.

Members of your patrol automatically move closer together in thick cover, fog, and at night. When you are in open country in daylight and the weather is clear, you can move farther apart. However, your flank groups usually are not more than 100 yards from the center of the advancing patrol.

Your patrol leader tries to locate himself so that his signals can be seen quickly by all members of the patrol. He uses the arm-and-hand signals shown in Chapter 12 during the daytime. At night he uses touch, or voice signals which can be heard only a short distance. Such signals might be the rustle of paper, bird calls, or the snapping of the edge of a match box with a finger nail.

D. Patrol Reports. When your patrol returns, the leader makes a report to cover your activities. This report is written, unless there is not enough

time to write it, and the patrol leader must also be prepared to answer questions which his commander or intelligence officers may ask. In case you should be a patrol leader, following is the information you are expected to give either by word of mouth or in writing:

1. Routine Information. Certain information is gathered as a matter of course and delivered without specific questions being asked:

(a) The name or number of your patrol; its size and mission, is given first.

(b) The time the patrol departed and the routes it took is reported.

(c) You detail the character of the terrain you covered; that is, was it dry, swampy? Could vehicles cross it?

(d) Tell what you observed. That is, give the number, composition, equipment, and attitude of the enemy.

(e) Where and when the enemy was observed. This includes what the enemy was doing when you saw him, the direction of his movement, if he was moving, and any changes in his dispositions which the enemy made.

(f) The location and condition of enemy defenses is described.

(g) If your patrol met any of the enemy, give the results of the encounter.

(h) The return route and time of the patrol's return is furnished, and the condition of your patrol, including the disposition you made of any dead or wounded, is described.

(i) Finally, you give your conclusions, including to what extent your mission was accomplished.

2. Special Information. In addition to this routine information, the patrol leader should be able to answer special questions from his commander or an intelligence officer:

(a) Your commander might ask you to show on his map just where you went.

(b) You might be asked to give the routes of approach to your outfit's position.

(c) You also might be asked if you saw any assembly places close to your front lines from which an assault could be launched.

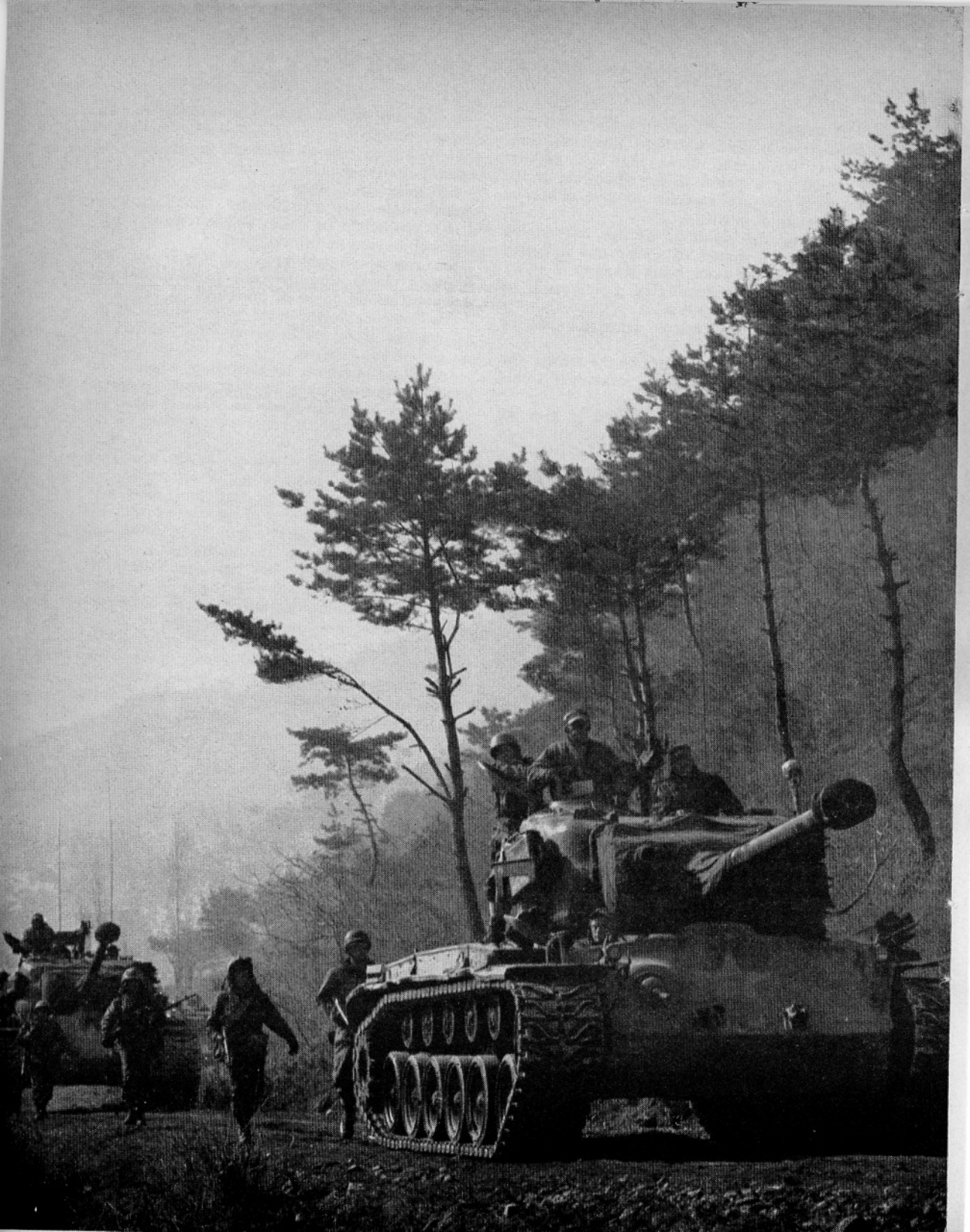
(d) Someone might want your opinion as to whether the enemy could use armored vehicles on the ground you covered.

(e) Other questions could concern whether the security measures taken by your outfit are good, or whether there are some particular weaknesses in our positions which you have observed during the patrol.

3. Importance of Overlay. When it is possible, the patrol leader turns in an overlay or sketch with his report. In fact, the report may sometimes be in the form of an overlay with the points mentioned above accurately plotted and explanatory notes added on the margin.

An overlay should show pertinent items that can be depicted more clearly by a sketch than by words. Such information might be the routes covered, areas investigated, the position of enemy weapons and troop dispositions, the nature of the ground, and the location of enemy mine fields. Information in overlay form can be transferred quickly to the situation maps your commander has in his possession.





Chapter 17

Tank-Infantry Coordination

MODERN warfare emphasized the need for supporting weapons that infantry could direct and control. The tank is one answer to that need. When tanks operate with the infantry, it is necessary that infantry protect them and that they protect the infantry. This, of course, has resulted in the development of tank-infantry teams. The following principles are given in order to better insure the success of the attack by mutual protection of tanks and infantry. It is the job of the squad leader and his squad to be the eyes for the tank, to control its fire, and to protect the tank from enemy foot soldiers and enemy antitank weapons. It is also their job to control the tank by telling it what to do and the manner in which it can be done most successfully.

Infantry Protection of Tanks

In order to protect the tank from enemy foot soldiers, certain operating procedures must be followed by the squad. Visibility and the terrain over which the tank is to move dictate the location of the squad in relation to the tank.

A. Close In Protection. When the contours of the ground and ground vegetation restrict observation or where visibility is poor due to fog or smoke, the squad must give close-in protection to the tank. Using this method, at least one fire team should cover the rear and flanks of the tank. The remaining two fire teams follow the tank at 40 to 60 yards, depending upon the terrain. (See Fig. **17.1.**) The fire team nearest the tank does not normally move in front of it except when leading the tank through mine fields or against antitank obstacles.

B. Short Range Fire Support. In open terrain where visibility is good, tanks may be protected by small arms fire up to a range of 300 yards. (See Fig. **17.2.**) The squad protecting a tank in this manner employs fire and maneuver in following the tank. At least one fire team must be in a position to cover the tank by fire at all times while the rest of the squad maintains an interval up to a distance of 300 yards.

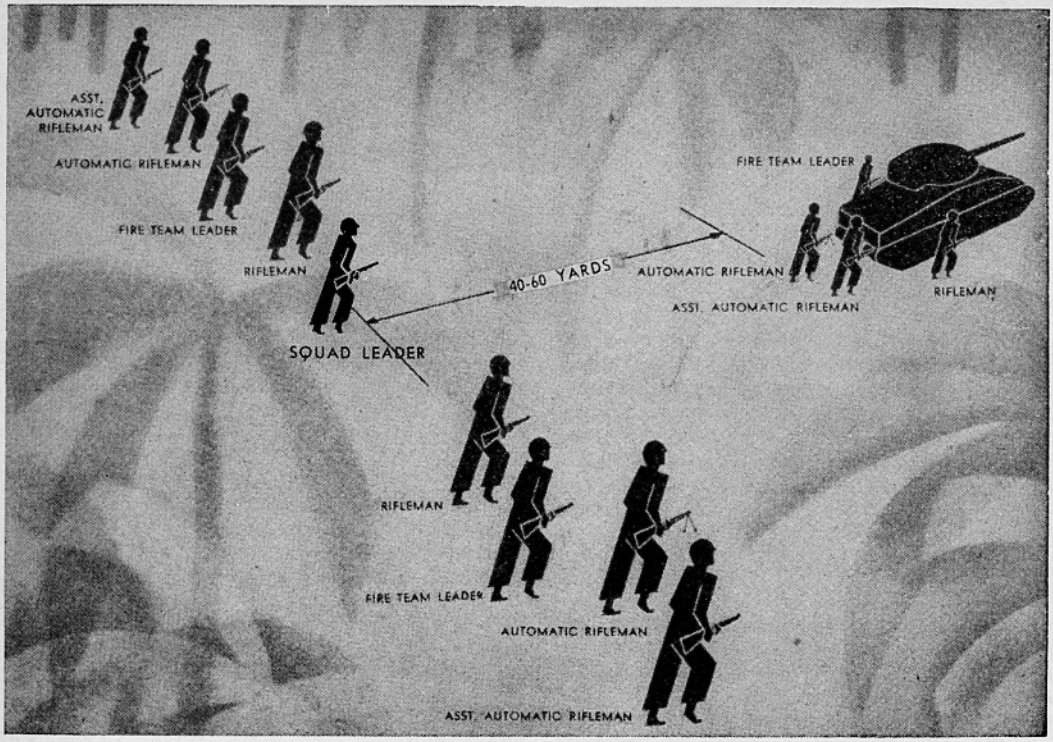
C. Long Range Fire Support. In flat open terrain or in a situation where there is good observation of ground around the tanks, they may be protected by long range small arms fire and artillery time fire. In such a case, no infantry moves with the tank. Weapons fire around the tank so that no enemy foot troops can approach it. The tank, with long range fire protection, can move as far to the front as the range of the weapons and visibility of the protecting troops will allow.

D. Infantry Riding on Tanks. Infantry may ride on tanks when it becomes necessary to move troops rapidly through a break in the enemy's main line of resistance, or when tanks are on an armored patrol. The infantry (six to eight men on a tank in the latter case, and any number up to 20 in the event of exploiting a break-through) observes in all directions constantly so that no enemy foot troops can attack and disable the tank. When the tanks stop the infantry dismounts and prepares to fight on the ground.

E. Responsibility for Type of Support Used. As the attack advances the squad leader may have to change the method of protecting that tank in his area as the visibility and situation demand. The squad leader whose squad is protecting the tank is responsible that proper protection is maintained. He takes position where he can best control the actions of his squad.

F. Suitable Targets. So that the supply of ammunition for tanks may not be wasted, infantry must know what targets tanks should engage.

Enemy tanks, antitank guns (and other crew-served weapons), automatic weapons (including



17.1 Switch position of the fire team leader and assistant automatic rifleman in the leading fire team.

those in pillboxes or any fortified position), concentration of enemy troops, and probable locations of any of the above are good targets for tanks. If several targets are present at once, the targets should be engaged in the order in which they are listed above.

C. Mutual Support of Tanks. Tank units operate by fire and maneuver the same as infantry. This is particularly true when operating against antitank guns. The maneuvering tanks and infantry approach the antitank gun from the flank, if possible, and knock it out.

Tank-Infantry Communication

If tank-infantry teamwork is to be successful, it is of utmost importance that all of the communication between them remains effective and continuous.

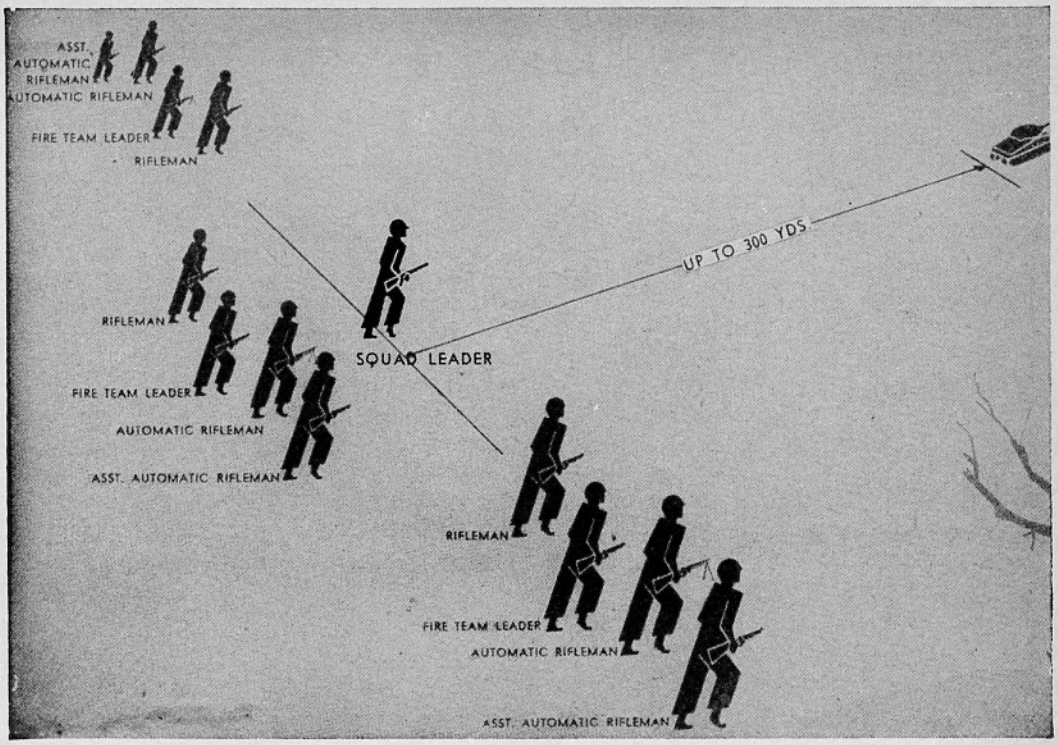
A. Radio. Infantry units can communicate with tanks by use of the radios normally carried on platoon or company level.

B. Sound Powered Phone. The sound powered phone is the main link between infantry and tank units. It is located in an armored box on the right rear of the tank. A few general rules for using the sound powered phone are:

1. When receiving fire, take cover while talking over the phone. There is sufficient wire to allow movement to either side of the tank or to hit the deck.

2. Talk slowly and distinctly so as to be understood.

3. When finished with the phone, put it and the wire back in the box and close the box securely.



17.2 Small arms fire up to ranges of 300 yards can support a tank in open terrain.

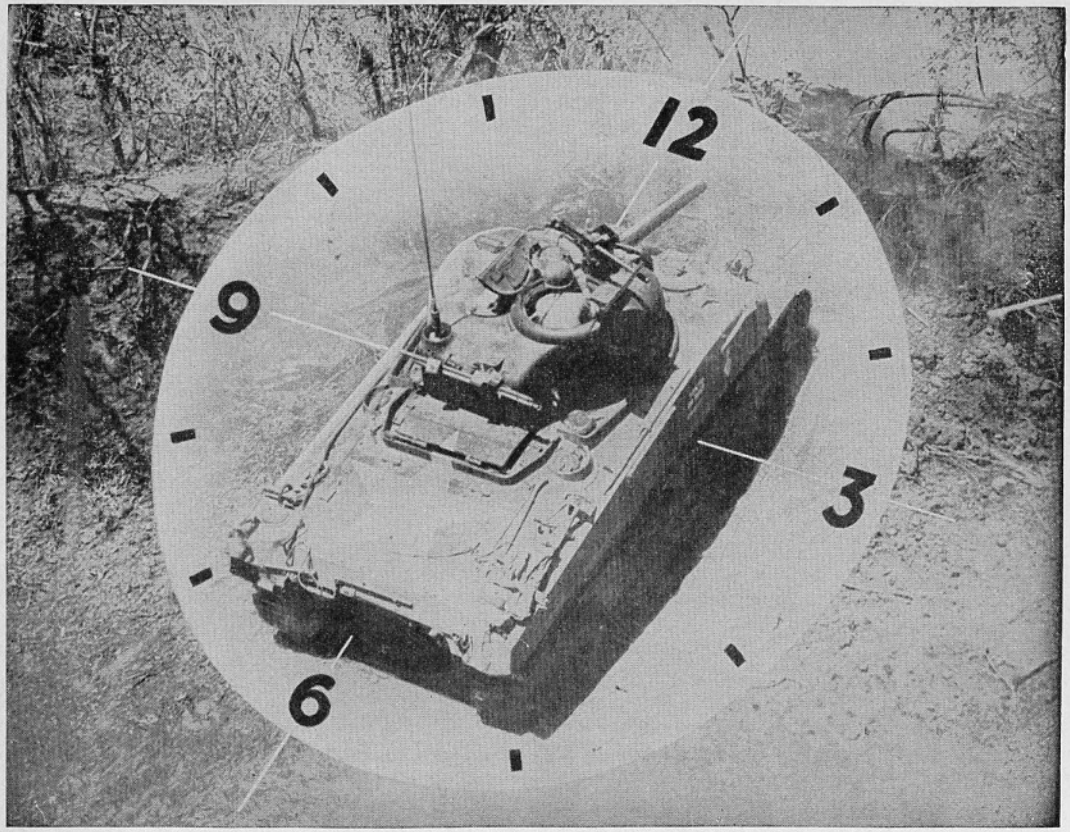
C. Arm and Hand Signals. A tank can be directed by arm and hand signals. The same arm and hand signals used by infantry units can be employed with tanks, to change direction, halt, move out, cease firing, and so on. To point out an antitank gun by arm and hand signals the infantryman should point his rifle in the direction of the gun, holding the rifle in his right hand and slapping his right forearm with his left hand. A machine gun is pointed out in the same manner, except that, with the rifle pointed toward the gun, the left hand is slapped upon the top of the helmet.

D. Flag Signals. A system of flag signals may be used. The tank can fly different colored flags from its turret. For example: blue flag—tanks want the infantry to answer the sound powered phone; white flag—the infantry can advance in front of the tank; purple flag—the tank must leave the infantry for repairs, refueling, or the like.

Target Designation

In order to bring the heavy fire power of the tank into effective play, infantrymen must know several means by which targets can be pointed out. Some of them are:

A. Clock Method (Oral). The tank commander wants to know the range, direction, description, and whether or not the infantry can observe his fire. Direction is told by the clock system with the bow of the tank facing toward 12 o'clock. (See Fig. **17.3.**) Also an accurate description of the target should be given so the tank commander will know what type of ammunition to use.



17.3 The clock system for designation of target.

B. Periscope Method. When a tank is buttoned up and contact by radio or phone is not available, targets may be designated by turning one of the tank's periscopes in the direction the infantry desires the tank to look. An infantryman must place his hand in front of the periscope and point to the target.

C. Tracer Method. If an infantryman can observe the fire of the tank, the tank may fire tracers from its co-axial machine gun and the infantryman can adjust the tracer fire until it is on the target and then call for the tank cannon to fire.

D. Smoke and Smoke Streamers. Targets may be designated by the use of rifle or hand smoke grenades. If the target is difficult for the tank to locate, the infantry must scout out the target, locate it definitely, and then shoot or throw a smoke grenade on the target. This maneuver gives the tank an aiming point.

Tank Capabilities and Limitations

In order to make the most effective use of tanks, the squad leader should know something of a tank's capabilities and also of its limitations, some of which are listed below:

A. Capabilities. **1.** The tank has heavy fire power and shock action, both of which are very effective against enemy personnel, equipment, and installations.

2. The tank is fast and has a moderately high degree of maneuverability on suitable "tank terrain."

3. The tank is not vulnerable to enemy small arms fire or light mortar fire. It requires a direct hit of an antitank shell, or a large mortar or artillery shell to disable it.

B. Limitations. **1.** A tank is relatively "blind" and vulnerable to enemy infantry attacks and land mines.

2. Unless waterproofed, a tank cannot run in water deeper than about 4 feet.

3. Most tanks are unable to negotiate grades steeper than 60 percent or 27 degrees.

4. Because of engine noise, a tank is practically "deaf" to outside noises.

5. Because of its blindness and deafness, a tank is difficult for infantry to control.

6. A tank is large, cumbersome and hard to conceal.





Combat in Built-up Areas

COMBAT in built-up areas requires the exercise of the highest degree of initiative, skill, cunning, and courage on the part of the rifle squad leader and individuals of the squad. Because of the partially destroyed buildings and excessive amounts of debris which are ever present in this type of fighting, control of an attacking echelon, even on the level of the fire team, is most difficult. In many situations, squads and fire teams must operate independently in their assigned zones of action. Techniques described in this chapter are the result of the experiences of the Allied forces during World War II.

Individual Conduct

When fighting in towns and cities it is essential for you as a member of a team to observe certain rules affecting individual conduct. If you develop the correct automatic reactions to all situations, you will help keep casualties to a minimum. A few of the rules are as follows:

1. All movement must be fast. When not moving, you must be in a covered position.

2. When climbing, use simple methods. One is the *Push up method.* Two men face each other. The man to be lifted stands between them. The men lifting bend over and put one hand under the instep of one foot and the other hand on the knee of the man to be lifted. The two men lifting now straighten up, shift the hand from knee to foot and push up. The man being lifted keeps his legs together and holds them stiff. His feet are kept away from the wall so that weight will be placed on his hands as he is lifted. This maintains balance. The weapons should be carried in the hand.

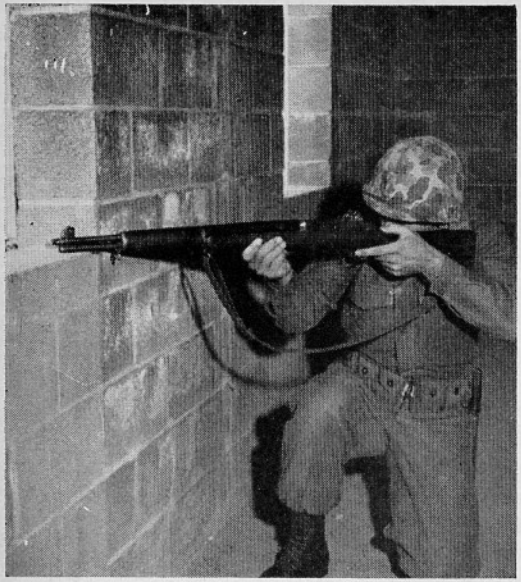
Another lifting method is the *Rifle and sling pull up.* To get the last man up on a roof, have two men lower rifles. The man to be lifted grasps the slings, and as the others pull, he walks up the side of the wall (see Fig. **18.1**).

3. When firing, stay away from openings through which you are firing (Fig. **18.2**). Use all available cover.

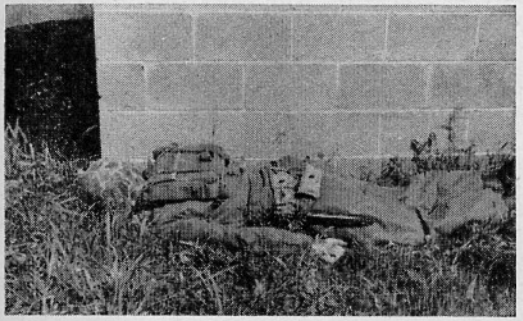
4. To get maximum protection from available cover, it will be necessary sometimes to fire from the left shoulder. Fire from sides, not over, objects.



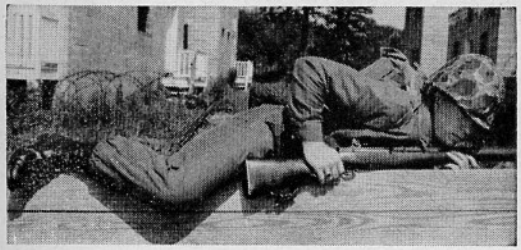
18.1 Rifles and slings are used to pull a Marine over an obstacle.



18.2 Fire from the left shoulder if firing from the right exposes you more.



18.3 Lie prone to look around corners.



18.4 Go over obstacles in a fast roll. Take cover quickly.



18.5 Use your buddy's back as a step to gain quick entry through windows.



18.6 This Marine is about to "mouse hole" a building with a pole charge.

5. When observing around corners, lie flat on the deck (Fig. **18.3**).

6. When observing from roof tops, do not get silhouetted. Remember to have a background with which you will blend.

7. When going over any type of obstacle, move fast. Roll your body over the object (Fig. **18.4**), and move immediately to a covered position.

8. Work in pairs at all times. This provides covering fire for individual movement and assistance in entering buildings (Fig. **18.5**).

9. The bayonet is seldom used. It hinders climbing and movement in buildings.

10. To search a building, a minimum number of men is used. Too many men get in one another's way. To search a room, use two men. First, throw a grenade into the room. Follow the explosion of the grenade closely to take advantage of the concussion and fragmentation effect on the enemy. The first man into the room puts his back to the nearest wall and covers the room. The second man enters immediately and searches the room carefully for any signs of the enemy.

11. When no entrance is available into a building, or movement is stopped within a building by walls, demolitions may be used to force an entrance (Fig. **18.6**). This is called "mouse holing."

The Attack

There are two methods of attack when fighting in cities and towns:

A. Against Steady Resistance. The first method is used against continuous enemy resistance. In this case, you stay out of the streets and all open areas. Movement is from house to house. Each building is searched and completely cleared of the enemy. No building is by-passed.

B. Mopping Up. The second method is used for mopping up small scattered enemy groups. When attacking against this type of resistance, you move in the streets until fired upon by the enemy. Formation is a column of files on each side of the street, each column observing the opposite side of the street. Each individual in the squad moves from one covered position to another covered position. Scouts should be well out to the front, but close enough to be controlled by the squad leader. When the squad is hit by enemy fire, all hands take cover and prepare to attack the located enemy resistance. Once the attack is underway, keep out of streets and open areas. There are a few specific points to remember in mopping up operations:

1. When attacking a building, attack from the top down (Fig. **18.7**). In this way, you will have gravity working with you, and the enemy will not be trapped in the upper floors. A trapped enemy fights more stubbornly than one that has an avenue of escape. Drive the enemy down and out, then eliminate him by fire on the outside of the building.

2. A "killing zone" should be set up around any building under attack. This means surrounding the building by fire to prevent movement in or out of the building.

3. Attack the blind side of a building if one is available.

4. Once your attack has put you inside the building, be systematic. Get to the top of the



18.7 Attack a building from the top down.

building first, and then search room by room through the entire building.

5. Covering fire must be used to cover all movements. If the wind is favorable, smoke can be used to blind the enemy (Fig. **18.8**); use it with covering fire to protect all movements in the open.

6. Once a building is cleared of the enemy, all-around security must be put out and a hasty defense set up against counterattack.

7. Each building that is cleared of the enemy must be marked as friendly. The marking should be placed on the rear of the building on one of the upper decks so that adjacent units and following troops will not fire at movement seen in the buildings (see Fig. **18.9** for one kind of marker).

8. Orders issued must be clear and detailed. Each man should know thoroughly his part of the attack.

Squad Tactics

If the attack of a building is to be successful, it must be well planned, properly coordinated, and executed with surprise and thoroughness. There are several points to be remembered:

1. Before attacking, the squad leader must make an accurate reconnaissance of the building to be attacked.

2. The rifle squad is ordinarily organized into two parts for the attack: a *searching party,* consisting of one fire team; a *covering party,* consisting of two fire teams.

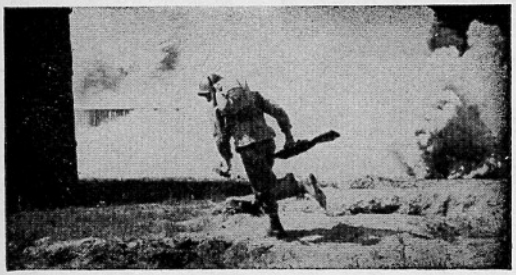
3. The searching party makes the initial entrance and searches the building under attack. If the building is too large for one fire team to search, an additional searching party may be used. When more than one searching party is operating in one building at the same time, each must be given a definite area of responsibility. This is necessary to avoid conflict between them.

4. The covering party gives covering fire to facilitate the advance of the searching party.

5. The searching party secures an initial foothold, normally one room. The fire team leader and BAR man remain in the initial foothold position, maintaining communications to the rear and holding this initial entrance area so that reenforcements will have a safe place to enter. The other two men (buddy team) in the searching party work immediately to the top of the building and systematically search downward.

6. When the building is cleared, the searching party fire team leader posts security, then signals to the squad leader that the building is clear.

7. The squad leader moves the remainder of his squad into the cleared building and organizes a hasty defense. The building is marked as friendly. The squad is then reorganized and prepares to continue the advance as before.



18.8 Smoke screens a Marine running to place a satchel charge against a building.



18.9 A cloth or paper marker shows that a building is secured, preventing other troops from mistaking friendly activity.

Weapons Used

Since the weapons your outfit uses have certain capabilities and limitations when used in towns, they are usually assigned to specific kinds of jobs.

1. Your M1 rifle, when actually used inside buildings or in close quarters fighting, is usually fired from the hip. This makes it possible for you to fire more rapidly at unexpected targets.

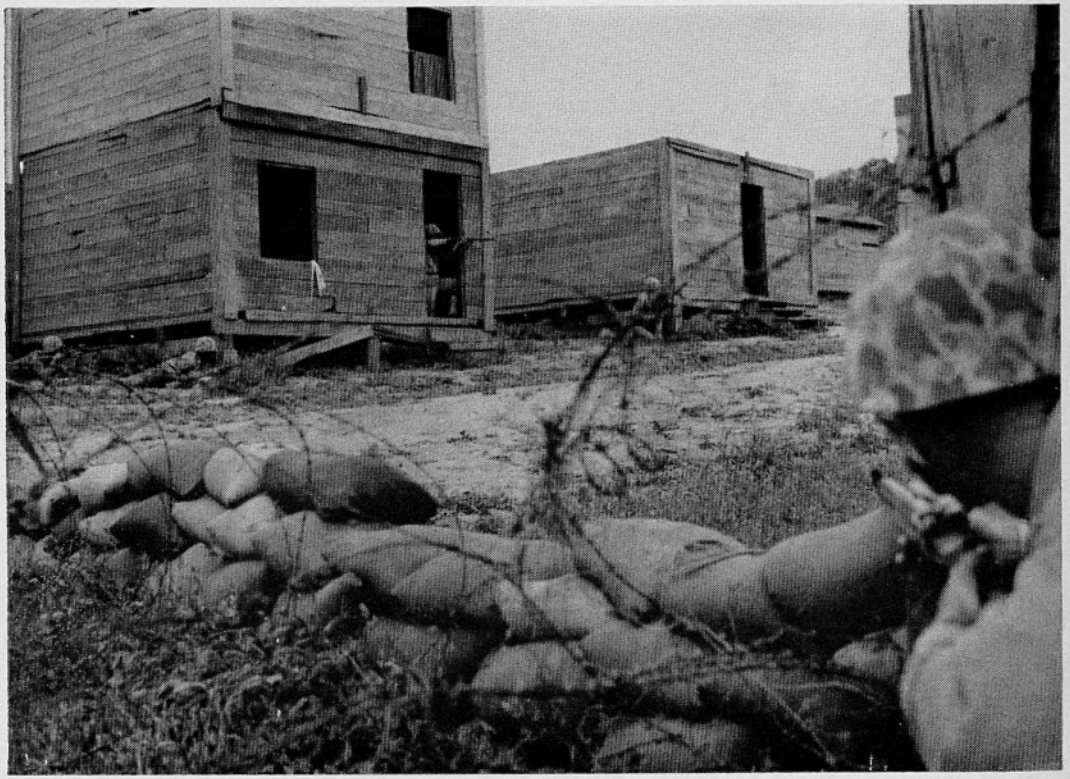
2. You can safely use a Browning Automatic Rifle only on the ground floor of buildings. Its weight makes it clumsy and hard to handle inside. However, the BAR makes a good weapon for covering fire.

3. The hand grenade is a good weapon in village fighting. Before you enter a room, throw in a grenade to force the enemy to take cover and allow you to enter without being exposed to aimed fire. Smoke (WP) grenades are very good to smoke the enemy out of basements, underground passages, and so on.

4. Rifle grenades and rockets fired from "bazookas" are effective against barricades, sandbagged emplacements, emplacements behind the walls of buildings, and against armored vehicles.

5. Mortars are used against groups of enemy personnel, automatic weapons that have been spotted, and rooftop targets.

6. Machine guns establish "killing zones" in streets and open areas, and furnish a base for covering and supporting fires.




W/FUZE PD M525

Basic Communications

MILITARY Communications is a broad and extensive subject. Every Marine should know a few basic facts concerning the following communication equipment and means of communication.

A. Field Telephone.—The handset of this phone is similar in appearance to the cradle type commercial phone (see Figure **19.1**). However, using a military telephone is not like using a civilian or commercial telephone. There is no time for idle chatter; messages must be brief and to the point. Prior to placing a telephone call, mentally prepare the subject matter of your conversation so that it will be kept brief. In placing a call, signal the operator by turning the generator handle for several turns. Give the operator the telephone designation of the party desired. Wait a reasonable time for the party to answer. When talking, turn the handset switch with the thumb and talk directly into the transmitter. When listening only, release the handset switch to conserve the phone battery. When the conversation is completed, ring off by two or three turns of the generator handle. Classified information should never be discussed over the telephone. In combat situations, wire lines are very susceptible to tapping by the enemy.

B. The Handy-talkie Radio.—This small handcarried radio set resembles a hand telephone (see Figure **19.2**). It will provide two-way radio communication over a distance of about a mile. When the set is turned on, a hissing sound can be heard in the earphone. Always listen before starting to talk so as not to interfere with other conversations. Know what you are going to say before starting to talk. When talking over the radio, press down on the push-to-talk switch on the side of the case and talk into the microphone. Speak distinctly and in a normal tone. Do not start talking until the hissing sound has disappeared. Release the push-to-talk switch immediately after completion of the conversation, otherwise you will be unable to hear the other station. Always assume that the enemy is listening when talking on the radio in combat.

C. Wire Lines.—Learn to recognize the appearance of field wire. During combat when wire communications are most vital, field wire is often cut by enemy action. Often it is cut unavoidably by the movement of our own armored vehicles. On some occasions breaks in field wire will be caused by thoughtlessness on the part of our own personnel. If driving a vehicle, avoid running over field wire on the ground or running into elevated wire. Should a break in a wire line be discovered report the location of the break to the nearest unit headquarters.

D. The Phonetic Alphabet.—When talking over the telephone or radio certain words in the conversation may be misunderstood because of similarity in sound to other words. In order to clarify any misunderstanding by the receiving party, the sender spells out words that might be misunderstood by means of the phonetic alphabet. On the next page the words used in the phonetic alphabet are indicated opposite the corresponding letters of the alphabet.

E. Numeral Pronunciation.—Numbers usually are important in military messages and should be spoken clearly in telephone and radio conversation. The pronunciation of numerals should be exaggerated to avoid misunderstanding by the receiving party. Each digit of large numbers is pronounced separately except in the case of even hundreds and thousands when the word "hundred" or "thousand" is used. The proper method of pronouncing numerals and some examples of numeral pronunciation are shown on this and the opposite page.

F. Messengers.—At any time in the field, a Marine may be called upon to deliver a message. The message may be oral or it may be a written message as shown in Figure **16.13,** Chapter 16. A messenger receiving an oral message repeats it to the sender so that there will be no misunderstanding. The messenger then repeats it to himself until he has committed it to memory. Messengers will help other means of communications to function when it is possible to do so without interfering with their own tasks. The messenger

must know his principal and alternate routes prior to departure. Cover, concealment, length, and condition of the various routes available must be taken into account. Through difficult terrain messengers may be instructed to follow wire lines, maintaining their direction at night by letting a wire pass through the hand. In delivering any type of a message to a unit on the battalion level or above, the messenger always reports to the unit message center first upon arrival and upon departure. A messenger should know the following to enable him to properly perform his duties:

(1) Names of unit commanders and staff officers.

(2) How to read a map, locate points and orient himself on a map, and interpret military symbols.

(3) How to use the compass.

(4) How to recognize officers' insignia and organization symbols.

(5) How to use the Field Message Book.

The Phonetic Alphabet

LETTER	EQUIVALENT PHONETIC
A	Alfa
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliett
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	Xray
Y	Yankee
Z	Zulu

Numeral Pronunciation

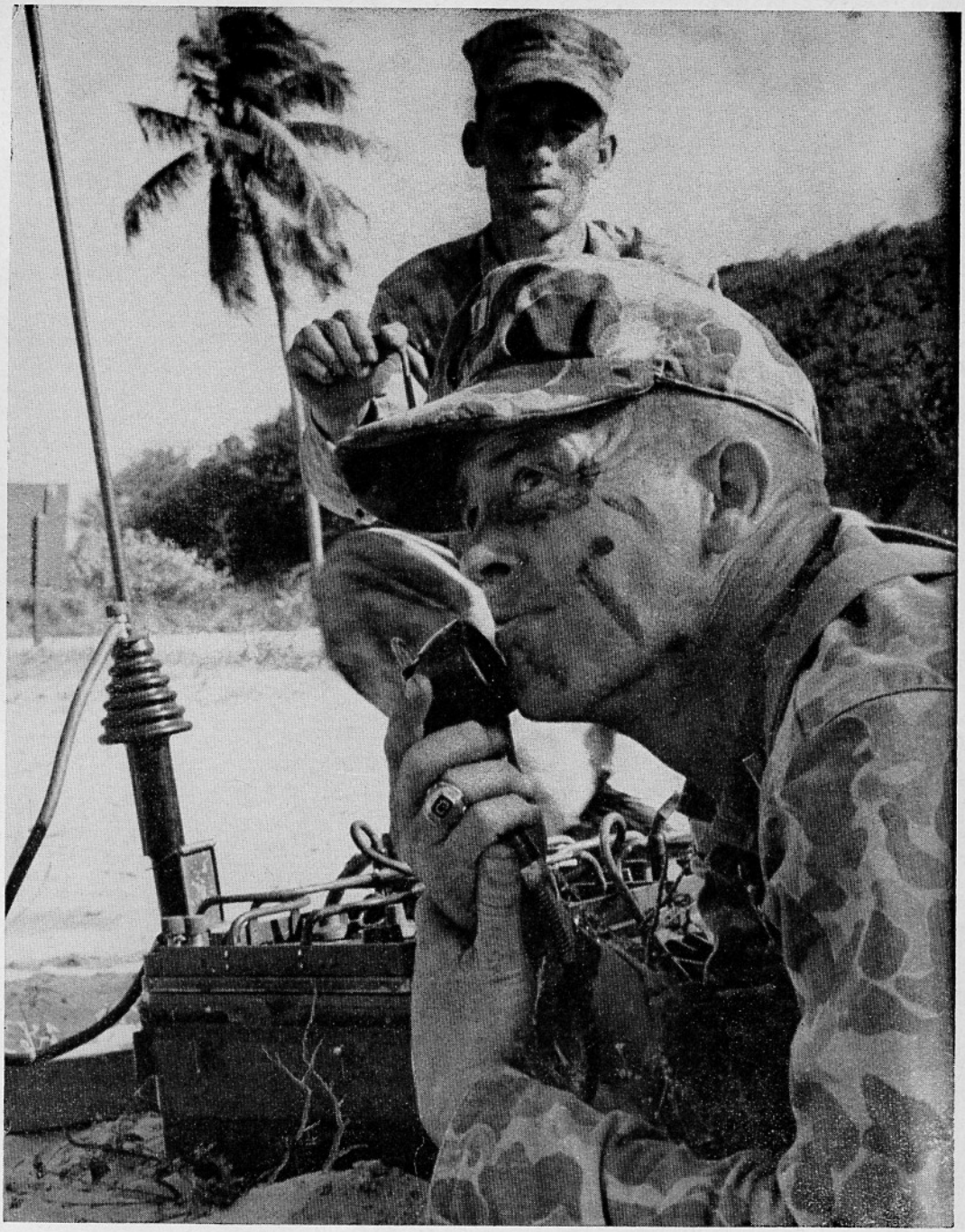
NUMBER	PRONOUNCED
1	Wun
2	Too
3	Thuh-ree
4	Fo-wer
5	Fi-yiv
6	Six
7	Seven
8	Ate
9	Niner
0	Zero
70	Seven Zero
84	Ate Fo-wer
131	Wun Thuh-ree Wun
500	Fi-yiv Hun-dred
1,468	Wun Fo-wer Six Ate
7,000	Seven Thou-sand
16,000	Wun Six Thou-sand



19.1 Field Telephone



19.2 Handy-Talkie



Chapter 20

Chemical Warfare

YOUR enemy may use gas at any time, so a gas mask is going to be part of your equipment. This chapter is about the gases which your enemy may use and the use of the protective equipment issued you by the Marine Corps.

A gas attack can be disastrous if you are not prepared for it. But the equipment that has been furnished you, and the methods that you are taught for using this equipment, can save you from death or injury.

A chart of the chemical warfare agents—that is, the gases which the enemy might use—is shown in Fig. **20.18.**

Before you can protect yourself against a gas attack, you have to know how to recognize the attack when it comes. This chart lists the types of gases, and their characteristics.

Be sure that you are thoroughly familiar with the information contained in this chart before you go into a combat area.

Chemical Warfare (General)

The individual as well as being equipped with a properly fitted gas mask must also be equipped with the basic knowledge concerning war gases, their uses and effects. He must also know the defensive measures he can take to protect himself and his equipment. You must remember that in chemical warfare we are concerned with chemical agents only as a chemical not as an explosive agent to propel bullets or fragments of steel. The chemicals are used to cause casualties to men and material, to screen activities and to cause damages by incendiary actions. All war gases are either of a Persistent or Non-persistent class. A *Persistent* agent is one used primarily to disable personnel and to delay or restrict their use of terrain and material. This agent would probably be a blister gas and would be effective from 10 minutes to 12 hours. A *Non-persistent* agent is one used in high concentrations to kill or disable personnel before any preventive action can be taken by them. The agent used would be effective for less than 10 minutes.

4. Use and Behavior of Chemical Agents. To the individual as well as to the unit the important thing in chemical warfare is the ability of each person concerned in recognizing chemical agents and preparing the proper defense against them. The enemy will use chemical agents in one or a combination of the following manners:

1. Casualty attacks. This attack would be the surprise employment of chemical agents to produce a maximum number of casualties to personnel. The desired effects would be achieved through the release of high concentrations of war gases in a short period of time. Surprise must be achieved in this attack since well trained troops through the proper use of the gas mask and other protective equipment would neutralize the desired effects. Usually a non-persistent agent would be used, but either a persistent or non-persistent agent could be employed.

2. Harassing attacks. This is a chemical attack which would force troops to wear their gas masks and other protective equipment over a long period of time. An agent would be used that would prolong the decontamination procedure and add to the general discomfort of the troops under attack. Non-persistent war gases might be used in this type of attack, but it is more likely that a persistent agent would be used.

3. Neutralization attacks. This type of attack would be much like a fire-fight with the rifle, with the winner moving into the area gained. Such an attack would make supplies unusable and would cause a great amount of material to be abandoned. However, the personnel used to occupy the abandoned area would be working under a calculated risk since persistent agents would be used.

B. Employment of Chemical Agents. The characteristics and behavior of each group of chemical agents would dictate the when and how of its use in any field operation employing the use of chemical agents. Since any chemical attack depends primarily on surprise to achieve the desired effects, it is important for the individual to learn the ways in which war gases could be released. Also affecting the use of war gases would be the terrain, wind and general weather conditions.

C. Effects of Chemical Agents. The effects of any chemical agent on the body will vary. Some agents are more harmful than others, and sometimes the same chemical agent may be more harmful at one time than at another. The direct effects of chemical agents are constant in nature, but the reaction of individuals to different chemical agents may vary in many cases. The following paragraphs give the effects of chemical agents on the individual when he is subjected to a concentration of gas and is *unprotected*:

1. Blister gases. Gases of this classification act primarily on the eyes and skin, especially hot and moist skin such as the crotch and armpits. Further damage will be sustained by the respiratory tract when breathed. When absorbed, they may cause poisoning of the system. Arsenic is a property of some blister gases and gases containing this substance would be more dangerous than others. The harmful effects are usually delayed for several hours. Pain may occur immediately in some cases.

2. Choking gases. As the name implies, choking gases primarily irritate the breathing passages, especially the lungs. The damage may be delayed in some cases as much as one or two days, and the victim will suffer effects somewhat similar to those caused by pneumonia. In liquid form it may cause burns to the eyes or a blistering of the skin.

3. Blood and nerve poisons. In high concentrations, these war gases may act within a few seconds and after only a few breaths. These gases affect the nervous system and blood stream. Lower concentrations are also dangerous, but sometimes the effects are delayed for several hours. They may cause an intense flow of tears and irritation to the nose and throat.

4. Vomiting gases. These gases irritate the nose, throat and eyes, and will cause headaches, vomiting, coughing, sneezing and discomfort. In field concentrations of this gas, permanent injury is unlikely. Concentrations in closed areas will be dangerous. After being subjected to this type of gas and then applying the gas mask, extreme discomfort may result. The gas mask should not be removed.

5. Tear gases. Tear gases cause pain to the eyes and tears will flow freely. They may also sting the skin, especially the freshly shaved face, the neck and any moist surface of the body. Contamination of the eyes with either liquid or solid tear gases causes severe pain.

6. Screening smokes. Field concentrations of screening smoke are usually harmless. Liquid screening smoke may cause burns to skin and clothing. Smoke other than that from friendly forces may be poisonous. You should apply the mask and test for gas.

7. Incendiaries. Burns will result from incendiaries which are like any flame burn. Greater injuries will be sustained from a combination of incendiary and delay action high explosives.

D. Individual Defense Against Chemical Agents. Individual defensive measures would be those actions you would take to reduce the risk of injury by chemical agents to yourself and your equipment. You would have two actions to take as your individual defense measure:

1. Put on your personal protective equipment, which protects your eyes, nose, throat, lungs and body.

2. Within your own area, avoid gross contamination. Above all remember that the gas mask is your number one protection against a chemical attack. Other protective equipment would also be issued for protection against chemical agents, such as, protective clothing, eyeshields, protective ointments, protective covers and shoe impregnite.

In addition to the security that you would gain from the correct use of your protective equipment, a change in your position to an upwind area, higher area, and/or gas-proof shelter would also afford some additional protection.

E. Detection Devices. Various detection devices have been designed for both the detection and identification of war gases. These devices indicate the presence of war gases by a change of color. They would be used to indicate the presence of gas as well as to indicate the completeness of decontamination. Some of the devices which will be issued, either as unit equipment or personnel equipment, are; detector kit containing various gas detection devices, paint, paper and crayons. A thorough search can be made and the presence of gas indicated without the individual depending upon the senses alone to do the work.

Remember that war gases smell different to different individuals, some of the newer gases are odorless, and the odors of battle might well mask odors of poison gases. Taking unnecessary gas precautions is to be avoided, but a relaxation of precautions before all danger is gone is hazardous. Surprise is the basic element in a gas attack.

F. Decontamination Material and Procedure. In emergencies you may be called upon to perform any or all of the personal decontamination measures. You may be called upon to act as a member of a decontamination team, in which case specially trained personnel will act as supervisors. The chart (Fig. **20.19**) covering decontamination agents and procedure are the ones with which you as an individual should become more familiar. Other larger scale decontamination procedures will be handled by unit organizations specially trained to handle larger areas of contamination.

G. Other Individual Protective Equipment. There are other types of equipment for protection against chemical agents which might be issued to you before you enter a combat zone. Some of these are:

1. Shoe Impregnite is a paste which is issued in 8-ounce cans or collapsible tubes. To use the impregnite properly, clean the shoes, remove the laces, and rub the paste thoroughly on both the inside and outside surfaces. Flex the upper leather vigorously for about 15 minutes, keeping a heavy coat of impregnite on the shoe at all times. Let the shoes stand for a few hours before being worn. Continue to treat your shoes thus, once a week.

2. Protective ointments, when rubbed into the skin, will serve as a protective coating and neutralize blister gas vapor or small drops of liquid. Ointment may also be used after a person has been exposed to blister gases if it is rubbed well into the contaminated skin areas, as soon as possible and before reddening appears.

3. Protective clothing, when issued, consists of parka, trousers, socks, gloves, and drawers, all impregnated for protection against chemical agents. These clothes, like other protective equipment, are issued before particular operations.

4. Eyeshields may be issued. They protect the eyes when the gas mask is not worn.

Use and Care of the Mask

The field protective gas mask you are issued is the best thing of its kind that science has produced. It is different from the older lightweight gas mask in that it has a lighter canister that screws directly in the facepiece.

A. Carrying the Mask. You can carry your mask in several positions and you use the position most favorable to the occasion and your other equipment. The positions of carry are *side carry, leg carry, chest carry,* and *back carry*. For drill purposes, the side carry is ordinarily taught, since it is the most useful and usual for infantry and other ground troops.

1. Side Carry. The side carry position is the one which places your mask where you can reach it quickly. You sling the gas mask carrier at side carry in the following manner:

Hold the carrier in your left hand by the shoulder chape, about waist high with the carrier closure to your right (shoulder chape has one dee ring; body chape has two dee rings). See that all the straps are untangled. Straighten the shoulder strap and hold it extended with your right hand gripping the snap, as shown in figure **20.1.** Swing your right arm to the left with the shoulder strap passing around your left elbow and behind your head. Bring the shoulder strap over your right shoulder and fasten the snap. Then adjust and fasten the body strap, (Fig. **20.2**). The carrier may be shifted to the front or the rear if desired for convenience in carrying. The shoulder strap should be adjusted so that the distance between the top edge of the carrier and your armpit is about the width of your hand. With field pack, sling the pack first and then sling the mask.

2. Leg Carry. When you place your mask on your leg, you begin as you would for the side carry, but you swing the carrier to your left rear; reach around in back of your body with your right hand and grasp the shoulder strap. Fasten the shoulder strap around your waist and fasten the body strap around your left leg, as shown in figure **20.3.** The shoulder strap should be adjusted to fit snugly around your waist. The body strap is shortened, wrapped around your leg, and fastened to the dee ring nearest the carrier.

3. Back Carry. When you place your mask on your back, you hold the carrier waist high in front of your body, grasping the body chape with your left hand and the shoulder chape with your right hand. The flap of the carrier is away from your body, as shown in figure **20.4.** Swing the

carrier over your right shoulder to a position well up on your back, above the pack if it is carried. Release the shoulder chape; reach around your right side with your right hand; grasp the shoulder strap and bring it around your right side under your right arm, across your body and fasten it to the body chape. Then reach over your right shoulder with your right hand and grasp the shoulder chape, assisting, if necessary, with your left hand. Reach around your left side with your left hand and grasp the body strap, (Fig. **20.5**), keeping it untwisted; bring it around your left side, under your left arm, across your body and fasten it to the shoulder chape. Both straps should be adjusted so that the carrier is held well up and in the middle of your back.

4. Chest Carry. For the chest carry hold the carrier by the shoulder chape, waist high with the carrier closure to your right. Fasten the body strap to the shoulder chape and fasten the shoulder strap to the body chape. Slip your right hand underneath the strap nearest your body at your right side and grasp the straps at the intersection; repeat with your left hand. Then slip the straps up over your elbows, flex your arms outward and raise overhead. Bend your head down and forward and slip the crossed straps over your head. Place the carrier on your chest and straighten the straps. (Fig. **20.6.**)

B. Unslinging the Mask.

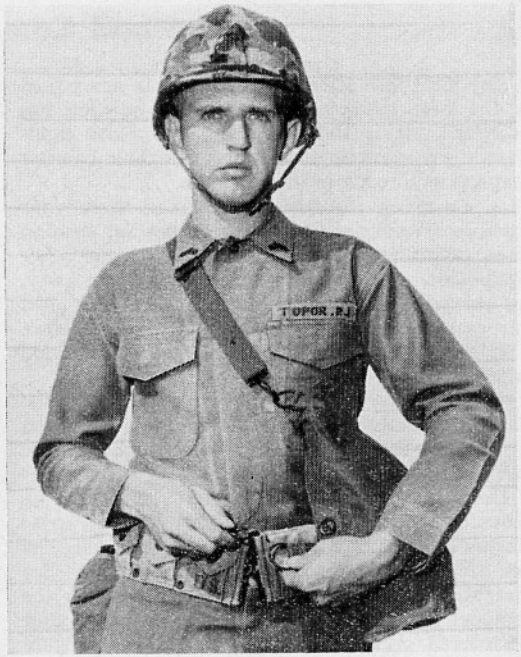
1. Side or Leg Carry. To unsling the mask, first unfasten the body strap. Then unfasten the shoulder strap and hold the carrier with your left hand by the shoulder chape.

2. Back Carry. To unsling the mask, unfasten the body strap from the shoulder chape. Then unfasten the shoulder strap from the body chape while retaining a hold on the body chape with your left hand. Reach over your right shoulder with your right hand and grasp the shoulder chape. With both your hands swing the carrier over your shoulder to the starting position.

3. Chest Carry. To unsling the mask, grasp the body chape with your left hand (over your right shoulder) and unfasten the snap with your right hand, then grasp the shoulder chape with your left hand and unfasten the body strap with your right hand. Bring the carrier down to waist



20.1 Side carry, first step.



20.2 Side carry, final step.

height with your left hand with the carrier closure facing your right.

C. Putting on the Mask. To adjust your mask quickly, keep your hands free by disposing of any equipment or weapons you may be carrying, if possible, without letting them touch the ground where they might become contaminated. Hold your helmet by placing its strap over your left forearm.

1. As shown in figure **20.7,** steady the carrier with your left hand and open the carrier closure with your right hand.

2. The next step is to reach in the carrier with your right hand and grasp the canister. Lift up on the canister to free the chin pocket of the facepiece and pull the mask out of the carrier, holding the mask horizontally, as shown in figure **20.8.**



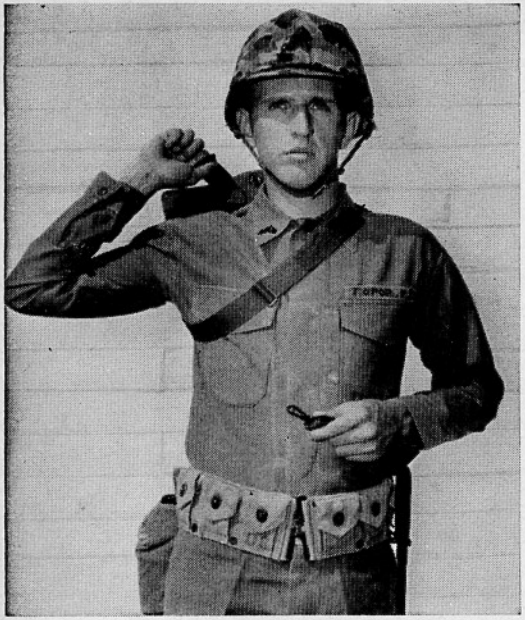
20.3 Leg carry.



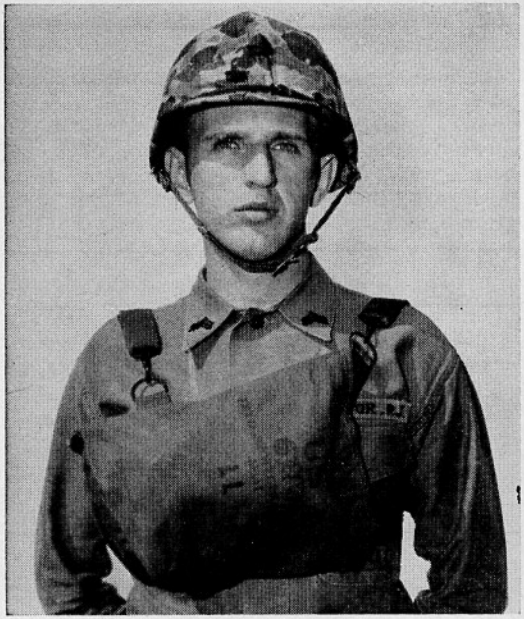
20.4 Back carry, first step.

3. Turn the mask around and grasp the facepiece with both of your hands, sliding first your left (neck strap must be held in the palm of your left hand so it can not enter the facepiece) and then your right thumb up inside the facepiece at the edge and under the lower and the middle head harness straps, the fingers being placed straight and together on the facepiece above the eyepieces, as shown in figure **20.9.**

4. Then bring the facepiece up in front of your face. Thrust out your chin and hold your head still while you set the chin pocket of the facepiece firmly on your chin. Sweep the head harness smoothly over your head, as shown in figure **20.10.** Check to make sure all the head harness straps are straight and fairly taut.



20.5 Back carry, final step.



20.6 Carrier in chest carry position.



20.7 Putting on mask, first step.



20.8 Second step.



20.9 Third step.



20.10 Fourth step.



20.11 Fifth step.



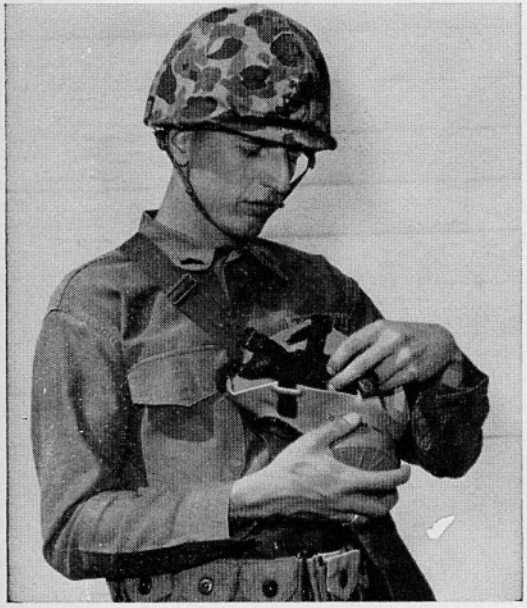
20.12 Putting on mask, final step.



20.13 Removing mask, first step.



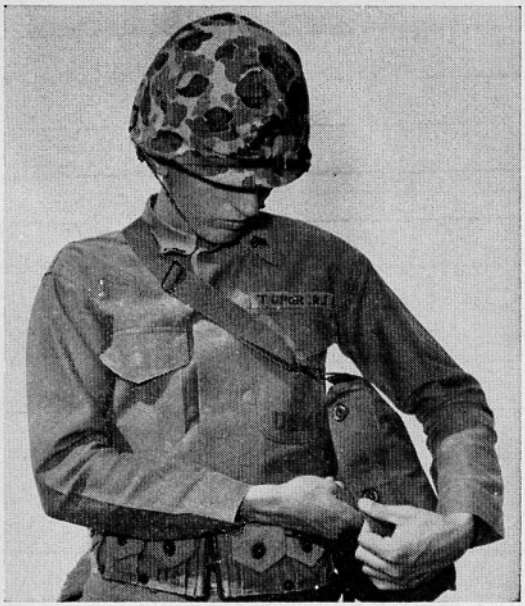
20.14 Removing mask, second step.



20.15 Third step.



20.16 Fourth step.



20.17 Removing mask, final step.

5. Close the outlet valve by placing the heel of your right hand firmly over the small opening in the bottom of the valve, as shown in figure **20.11**. Then exhale vigorously. This clears the facepiece of any gas which might be in it.

6. Next check the mask to make sure it fits and that no air can enter. You do this by placing the heel of your left hand over the canister air inlet to close off the air supply, as shown in figure **20.12**. Then inhale. No air should enter and the facepiece should tend to collapse against your face.

7. Now place your cap or helmet back on your head. Fasten the flap of the carrier and pick up any weapons or other equipment you temporarily disposed of.

8. Always remember, when the word GAS is given you are to immediately stop breathing. The ability to hold your breath for 30 seconds or more under conditions of excitement should be developed. Do not take another breath, even if your breath has just been exhaled, until your facepiece is adjusted and cleared.

D. Precautions Before Removal. Never remove the mask from your face until you receive the word to remove your gas mask. Remember that the newly developed gases are odorless and colorless and the air about you must be tested with a detector kit to see that no gas remains around you.

E. Removing the Mask. After you have received word to remove gas masks, you take the following steps:

1. Lift the headgear with your left hand. With your right hand, unfasten your head harness neck straps. With your right hand grasp the facepiece below the eyepiece, as shown in figure **20.13**.

2. Remove the facepiece with a downward, outward, and then upward motion.

3. Place the facepiece in the crook of your left elbow and replace your headgear, using both your hands as shown in figure **20.14**.

4. If your mask is contaminated it must not be replaced in the carrier. It should be hung up to air or be decontaminated otherwise.

5. If the facepiece is free from contamination it is placed in the carrier by opening the carrier with your right hand. Then grasp the canister with your right hand, the eyepieces toward your body and the facepiece up; fold the head harness into the facepiece with your left hand, as shown in figure **20.15**.

6. Then open the carrier with your left hand and start the mask into the carrier opening with the chin pocket first, as shown in figure **20.16**.

7. Push the mask to the back of the carrier and turn the canister to place the facepiece in an upright position. Press the air out of the carrier and fasten the closure, as shown in figure **20.17**.

F. Checking Your Mask. You have learned how to check your mask to be sure it fits. This is not the final test of its serviceability, however. If the facepiece fails to collapse to your face, and a leak is indicated, first check to see that the canister is screwed tightly into the facepiece. If the facepiece still fails to collapse to your face, you must make a careful, visual inspection of the entire mask. Visual inspections also should be made each time you are issued a new mask, and at times after that for cleanliness and the condition of the parts. Make this inspection yourself as follows:

1. Remove the facepiece and place it in the crook of your left elbow.

2. Check the carrier for the protective items that are to be carried in it, such as protective ointment and antidim (a tube of compound which, when applied to the eyepieces, prevents them from becoming clouded).

3. Next examine the gas mask. Carefully check the eyepieces, outlet valve, facepiece, head harness and the canister.

CHEMICAL WARFARE AGENTS

SYMBOL	NAME	FORM	IDENTIFICATION MARKS*	ODOR	TACTICAL CLASSIFICATION	PHYSIOLOGICAL CLASSIFICATION	PROTECTION	FIRST SYMPTOMS	FIRST AID
H (HS)	MUSTARD	GAS	2 GREEN BANDS	GARLIC, HORSERADISH OR MUSTARD	CASUALTY	BLISTER GAS	GAS MASK; PROTECTIVE CLOTHING; PROTECTIVE COVERS; EYE SHIELDS	Irritates eyes, burns lungs, nasal passages, and throat.	Blot off excess; use protective ointment; wash with soap and water. Irrigate eyes with water from canteen. For Lewisite in eyes use Bal ointment.
L (MI)	LEWISITE	GAS	2 GREEN BANDS	GERANIUMS	CASUALTY	BLISTER GAS			
HN	NITROGEN MUSTARDS	GAS	2 GREEN BANDS	SLIGHTLY FISHY OR SOAPY	CASUALTY	BLISTER GAS			
AC (HCN)	HYDROCYANIC ACID	GAS	1 GREEN BAND	BITTER ALMONDS	CASUALTY	BLOOD AND NERVE POISON	GAS MASK IN EXCELLENT CONDITION	Dizziness, shortness of breath.	Rapid removal to fresh air; artificial respiration.
CK	CYANOGEN CHLORIDE	GAS	1 GREEN BAND	PUNGENT AND IRRITATING	CASUALTY	BLOOD AND NERVE POISON	GAS MASK	Irritation of nose and throat; coughing, choking, and AC symptoms.	Wipe off liquids, remove contaminated clothes. Put Pearl of Amyl Nitrite in mask if unconscious; artificial respiration.
PS	CHLOROPICRIN	GAS	2 GREEN BANDS	FLYPAPER OR ANISE	CASUALTY	CHOKING GAS	GAS MASK	Coughing, crying, and vomiting.	Rest, lie down, warmth (use coat or blanket).
CC	PHOSGENE	GAS	1 GREEN BAND	MUSTY HAY OR GREEN CORN	CASUALTY	CHOKING GAS	GAS MASK	Coughing, choking, eyes water.	Rest, lie down, warmth; no movement by patient.
SA	ARSINE	GAS	1 GREEN BAND	GARLIC	CASUALTY	BLOOD AND NERVE POISON	GAS MASK	Weakness, giddiness, headache, nausea, and vomiting.	Apply mask. Rest until given medical attention.
CN	CHLORACETOPHENONE	GAS	1 RED BAND	APPLE BLOSSOMS	HARASSING	TEAR GAS	GAS MASK	Eye and skin irritation, crying.	Allow fresh air to blow into eyes; don't rub eyes.
DM	ADAMSITE	GAS	1 RED BAND	COAL SMOKE	HARASSING	VOMITING GAS	GAS MASK	Headache, vomiting, sneezing; sick, depressed feeling.	Loosen clothing. Lie in shade. Sniff chlorine from bleach.
WP	WHITE PHOSPHORUS	SMOKE	1 YELLOW BAND	BURNING MATCHES	SCREENING SMOKE	INCENDIARY	NONE	Burns, pieces adhere to skin and clothing.	Put under water or keep wet. Pick out particles. Do not apply grease or salve.
FS	SULPHUR TRIOXIDE IN CHLOROSULPHONIC ACID	SMOKE	1 YELLOW BAND	BURNING MATCHES	SCREENING SMOKE		GAS MASK	Irritates skin.	Wash skin with soap and water.
HC	HC MIXTURE	SMOKE	1 YELLOW BAND	SHARP, ACRID	SCREENING SMOKE		NONE NEEDED	Harmless.	None needed.
TH	THERMIT	INCENDIARY	1 PURPLE BAND		INCENDIARY		COVER WITH EARTH, SAND	Burns.	Flood with water. Cover with clean dressing.
NP or IM	THICKENED GASOLINE	INCENDIARY	1 PURPLE BAND	BURNING OIL	INCENDIARY		NONE	Burns.	Flood with water. Cover with clean dressing.
	G-SERIES	GAS	1 GREEN BAND	ALMOST ODORLESS	CASUALTY	BLOOD AND NERVE POISON	GAS MASK; PROTECTIVE CLOTHING	Shortness of breath; pin-pointing of eyes.	Artificial respiration; injection of Atropine.

NOTE: Symbols in parenthesis are old symbols but are still found in gas shells of early manufacture.

*One band indicates a non-persistent agent. Two bands indicate a persistent agent under average conditions. Generally, the persistency of all gases increases as temperature decreases. These bands are found on the shell or grenade containing the chemical.

DECONTAMINATING AGENTS AND HOW THEY ARE USED

BLEACH (CHLORIDE OF LIME)



HOW USED: Either in pure form, as dry mix (2 parts bleach to 3 parts earth), or wet mix (slurry; 1 pail water to 6 shovelfuls bleach). If possible, leave on surface 24 hours. One pound bleach makes enough slurry to cover 1 square yard of average contamination.

ACTION: Reacts with blister gas liquid to form nonvesicant compound, but pure form in direct contact with pools of liquid mustard gas reacts violently to cause flame and heavy vapor. Generally used as dry mix or wet mix. Is chemically active, causing vigorous corrosion.

STORAGE: Keep in tightly closed container, away from moisture.

DECONTAMINATING AGENT M4 (DANC)



HOW USED: Mix powder and solvent; apply solution with small decontaminating apparatus or with swabs. Remove residue in a few hours. Directions for mixing are on container.

ACTION: Neutralizes blister gases. Generally less injurious than bleach to leather, fabrics, and metal, but corrodes metal and damages most paints, rubber, and plastics unless removed promptly.

CAUTION: Solvent (acetylene tetrachloride) is sufficiently toxic both in vapor and liquid form as to require care in handling. Effects are cumulative.

WASHING SODA (SODIUM CARBONATE)



HOW USED: Add 1 pound of soda to 10 gallons of very hot water; stir rapidly; apply hot to contaminated surfaces.

ACTION: Destroys blister gases, but much slower than bleach, DANC, or caustic soda.

CAUSTIC SODA (LYE)



HOW USED: Caustic soda is used in solution with water. Especially effective for destroying lewisite. Decontamination faster with concentrated solutions.

ACTION: Destroys blister gases, but does not destroy mustard gas as rapidly as bleach.

CAUTION: Both solid and solution damage skin, eyes, and clothing. Do not use for personal decontamination. Caustic soda corrodes surfaces.

WATER OR STEAM



HOW USED: Apply under high pressure; action of hot water is speeded if soap or other detergent is used.

ACTION: Removes dirt or grease containing gas.

FUELS AND SOLVENTS



HOW USED: Spray fuel on contaminated surface and ignite; solvent (like gasoline, kerosene, or oil) is applied with swabs. Do not spread contamination.

ACTION: Ignited fuel destroys gas by burning; solvents merely DILUTE gas, but if diluted enough, most contamination disappears. Residues remain dangerous.

PROTECTIVE OINTMENT



HOW USED: By individual Marine for limited personal decontamination.

ACTION: Neutralizes blister gas by chemical action. Normally requires 15-minute contact, except on skin.



Chapter 21

Cold Weather Indoctrination and Training

Introduction

A. ***General.*** The dangers and difficulties of cold weather areas are exaggerated in the movies and popular fiction. Trappers, traders, prospectors, sportsmen, soldiers, and Marines have lived, worked, and fought in the Far North. They were not supermen. What they have done you, too, can do. The only difference between you and those who have lived in cold weather areas is knowledge—knowledge of the country and knowledge of the ways to make use of its advantages and overcome its difficulties. Studying this Guidebook is your first step toward gaining the knowledge other men have had to get from years of experience.

The clothing and equipment issued to you is the best in the world. It has been specially designed for your protection and use in these areas. Your training and indoctrination will also prepare you for everything you will meet during your new experience.

Prepare yourself for your main job; to overcome the enemy. Realize that everything possible has been done to eliminate the hazards of nature. If you learn to handle nature right, she is your ally; however, she will punish the person who neglects to consider her.

B. Problems of Cold Weather Warfare. Two opponents face the Marine in cold weather warfare: the enemy, who must be defeated, and nature, which must be made an ally. Proper clothing and equipment can overcome cold, wind or snow. Training teaches the individual how to use natural conditions for movement, concealment, and protection. It also teaches him how to operate efficiently in all types of terrain whether the weather is good or bad. The trained Marine moves, fights, lives and works easily and confidently because he knows his job.

C. Nature of Cold Weather Warfare. The principles of combat remain the same in cold weather warfare; however, techniques of application may vary. The wide, empty spaces of many cold weather areas permit unrestricted movement for troops sufficiently equipped and trained to operate in these circumstances. Dispersion is simplified; hostile artillery and mortar fire can be evaded. A mobile force can gain surprise and strike quickly, deep in the enemy rear areas and disappear into the emptiness, safe from pursuit.

The Individual in Cold Weather Warfare

A. Initiative. There is always the opportunity to use your initiative. Each Marine is more of an individual with chances for independent action. Initiative is shown not only in combat, but also in the small things you can do to make life more comfortable and more interesting. You must always be ready to learn new "tricks of the trade," to improve yourself and your abilities.

B. Teamwork. In isolated areas, teamwork is most important. Individuals are paired together as "buddies" to ensure a high standard of efficiency, safety and morale. In cold weather operations never send one man out on a mission—keep "buddies" together at all times.

COLD WEATHER WARFARE REQUIRES STRONG-MINDED, INDEPENDENT, AND PHYSICALLY STRONG MEN. YOU CAN MEET THE CHALLENGE.

The NCO in Cold Weather Warfare

A. Leadership. If you are not now an NCO you should be preparing to become one. Operations in undeveloped areas require a high standard of leadership. In cold weather operations certain qualities of junior leadership become more important than in conventional areas. The climate and terrain of cold weather areas pose many problems which can be overcome only by the most aggressive and far-sighted leadership.

1. Traits. All leadership traits—knowledge, courage, initiative, decisiveness, tact, justice, dependability, hearing, endurance, enthusiasm and unselfishness—are of importance in cold weather operations. However, conditions increase the necessity for certain traits to a pronounced degree. Traits of utmost importance are:

a. **Initiative,** or seeing what needs to be done and doing it. This is nowhere more important than in cold weather areas. The ability to act *independently* must always be encouraged. Remember, the difficulties encountered are common to both you and the enemy. Use and encourage *initiative* and the ability to *improvise.*

b. **Endurance,** or mental and physical stamina. Extremes of climate and the isolation of northern areas increase the necessity for great mental and physical endurance. These conditions may cause early physical and mental fatigue but they can be overcome by determination, forcefulness, and aggressiveness.

c. **Unselfishness** is shown by the leader who does not take advantage of a situation for personal gain or safety at the expense of the unit. *The physically competent, vigorous leader who can resist the natural desire of first providing for his own comfort will be a successful and respected leader of his group.*

2. Principles. Leadership principles apply to leaders in cold weather operations. These principles are:

a. Know your job.

b. Know yourself and seek self-improvement.

c. Know your men and look out for their welfare.

d. Keep your men informed.

e. Set the example.

f. Make sure that the task is understood, supervised, and accomplished.

g. Train your men as a team.

h. Make sound and timely decisions.

i. Seek responsibility and develop a sense of responsibility among subordinates.

j. Employ your command in accordance with its capabilities.

k. Take responsibility for your actions.

Although all the principles must be applied to achieve good leadership, the following ones are of utmost importance to the leader in cold weather warfare:

a. **Know your job.** Every action must demonstrate to the men your capabilities as a leader and your desire to make the task of the group easier. Share the work, frequently visit sentry posts in adverse weather, and show your men you are a member of the team. Earn the right to command by a thorough understanding of the technical and tactical aspects of your job.

b. **Know your men and look out for their welfare.** The leader must know the mental and physical capabilities of his men. In this way he will be able to use them efficiently. An example of this is assigning, through the "buddy system," an experienced Marine to guide or assist the inexperienced one.

3. Personal supervision. a. **Supply economy.** In cold weather areas the problem of obtaining supplies is a major one. Consequently, supply economy must be enforced at all times. All clothing and equipment must be checked frequently and kept in first-class condition. Continuous individual supervision on the leader's part is essential.

b. **Hygiene and sanitation.** Under adverse conditions the standard of personal hygiene and group sanitation will gradually decrease if not carefully supervised. Lowered sanitation standards are a sure indication that supervision is lacking and that morale is falling. Men cannot be allowed to become lazy about their personal habits. *Follow the rules of personal hygiene and*

sanitation and enforce them under all conditions.

(1) *Make sure that the task is understood, supervised, and accomplished.* Orders issued must be well thought out. When required, you must be prepared to take the leading part in carrying them out. Issuing an order is only the first and a relatively small part of the leader's responsibility. His principal responsibility lies in supervision, to make sure that the order is properly executed. The cold can be friendly but at the same time it does not allow for errors or carelessness. Be an *active* leader, not merely an issuer of orders.

Essentials for Fighting in Cold Weather

You, as an individual Marine, must be prepared to fight to destroy the enemy and, in turn, to avoid unnecessary destruction. Your individual weapons enable you to destroy the enemy; protective measures help you avoid destruction.

A. Individual Weapons. The chapter on the M1 Rifle contains the statement, "Your life and the lives of your buddies may depend on the way you use it," (the M1). In cold weather operations, you must take special precautions to ensure that your weapon functions when you need it.

1. Care, cleaning and maintenance. Your weapons will function under cold weather conditions, provided they are cared for as directed. Normal lubricants thicken in cold weather, and the results are a stoppage or sluggish action. DURING THE WINTER WEAPONS MUST BE STRIPPED COMPLETELY AND CLEANED WITH A DRY SOLVENT TO REMOVE ALL LUBRICANTS AND RUST PREVENTION COMPOUNDS. A thin lubricating oil may then be used, the most desirable being ANO-366. Only a *very light* coating should be applied, however. In extreme cold temperatures, weapons may function best if no lubricant is used.

You must care for your weapons at all times. One of the main problems is to ensure that snow and ice do not get into the working parts, sights, or barrel of the weapon. Even a small amount of ice or snow may disable a weapon. A rifle stand should be constructed, or the rifles should be stacked or pushed butt end into the snow when not in use. Careful handling of your weapon is essential, especially when you are moving or lying in snow. Muzzle and breech covers must be used. Before and after a weapon is fired it must be examined carefully and cleaned. Special attention should be paid to the barrel, which may be blocked, causing it to burst when fired. Snow on the outside, if not removed, may drop into the breech and later form ice and disable your weapon. A small tapered stick carried in the pocket will help in cleaning the sights, the face of the bolt, and the operating surfaces.

Condensation forms on weapons when they are taken from the extreme cold into any type of heated shelter or near a bonfire. This condensation is often referred to as "sweating." When the weapons are taken out into the cold the film of condensation freezes. The ice so formed may seriously affect the operation of any weapon. For this reason they must be left outdoors or stored in unheated shelters. If there is not too great a difference in temperature, weapons may be taken inside but they should be placed near or at the floor level where the temperature will be lower. When weapons are taken into a heated shelter, "sweating" may continue for as long as one hour. Therefore, when time is available, wait one hour, remove all condensation, then clean the weapon. The problem of ice and snow will necessitate *frequent checking and cleaning of your weapon.*

Remember: Always check weapons before and after firing. Should a part of your weapon become frozen, do not use force. Warm the part slightly, if possible, and move it gradually until unfrozen. If it cannot be warmed, try to remove all visible ice or snow and move gradually until action is restored. An application of kerosene or gun oil will help. Ice in the barrel can be removed with warm oil if slow thawing is not possible.

Before loading your weapon always move the action back and forth a few times to ensure that it is free. Also, check your ammunition. When firing, do not let the hot parts of the weapon come in contact with the snow. The snow will melt; when it cools, ice will form. When changing machine gun barrels do not lay them on the snow; rapid cooling may warp them.

B. Ammunition. Extreme cold does not affect the accuracy of weapons nor the performance of small arms ammunition. Ammunition should be kept in the same temperature as the weapon, and carried in the pockets of the outer parka and in the rucksack. Ammunition, clips and magazines need to be cleaned of all oil and preservatives and checked frequently. All ice, snow and condensa-

tion must be removed. Cartridge containers, magazines, and ammunition drums must be kept closed in order to prevent the formation of rust or ice. Frequent periodic inspections should be made to check serviceability.

1. Storage. Stored ammunition should be left as packed, raised off the ground, and covered with a tarpaulin. Ammunition so stored should be suitably marked in order to locate and identify it in the event it becomes covered with snow.

2. Resupply. Resupply of ammunition may be restricted. All ranks and units must be made aware of the necessity for ammunition economy and fire discipline. Loaded clips, magazines, or single rounds dropped into the snow are quickly lost; therefore extremely careful handling of ammunition is essential.

C. Protective Measures. There are certain problems relating to protective measures in cold weather operations with which you as an individual Marine will be concerned. The principles are covered in Chapter 14. In cold weather areas, the techniques may have a varied application.

1. Firing positions. The general rule in the preparation of firing positions in cold weather areas is, "if you cannot dig down, then build up." Digging firing positions in soft or hard snow is relatively easy and quick. In a static position every effort must be made to improve the position and, if time permits, to dig into the frozen ground. The use of explosives and fires to thaw the ground will help. A position in the snow is only temporary and, naturally, cannot withstand artillery and continuous small arms fire or thaws. Icing of the position or use of tree trunks and branches will afford added protection.

The digging of positions in snow and the types constructed are, in general, similar to those constructed in the ground in warm weather. Foxholes, trenches, and other types are used.

Every effort must be used to keep improving your position; snow blocks, ice blocks, sandbags, and branches can be used to strengthen it. Remember, concealment from view is *not* cover from fire.

2. Camouflage and concealment. Camouflage and concealment may also offer a special problem in cold weather warfare. In winter the whiteness of the countryside emphasizes any item which does not blend in naturally with the surroundings. Furthermore, your every movement by vehicles or on foot leaves tracks in the snow which the enemy can see and interpret for many days after they are made. Before every movement, you must consider how these tracks can be kept to a minimum or how to make them mislead the enemy. On the other hand, nature may assist you by covering your tracks with newly fallen snow or by providing a storm in which all movement will be concealed. Remember that camouflage and concealment from air observation must always be considered.

3. Visibility. An additional problem is introduced by ice or vapor fogs which are very common in extreme low temperatures. These fogs may result from the following causes: vehicle exhausts, cooking, breathing, and firing. Fogs of this nature hang overhead and may mark your position. They may also limit your own visibility and hinder the firing and operation of equipment. If possible, select or move your position to a place where warmer air or wind eliminate or decrease the density of the fog.

Essentials for Living in Cold Weather

Earlier in this chapter it was stated that you would be provided with excellent cold weather clothing and equipment. You must learn how to use it properly so that you can operate as an efficient member of your fighting team. Read this carefully so that you do not become a cold weather casualty. Clothing and equipment, heat and shelter, and rations are in general your living necessities.

A. Clothing. **1. Purpose of clothing.**

a. **Protection of body against climatic factors.** You must assist your body in its adjustment to extreme climates by the use of clothing. Clothing does this by insulating your body against the cold, outside air. Your clothes are not "warm" in themselves; they simply hold your body heat in. Although the purpose of clothing is the same in all climates, the problem of protection becomes acute when cold or extreme cold temperatures are involved.

b. **Balancing heat production and heat loss.** When more heat is lost than is being produced, you will either shiver or use up the heat stored in your body tissues. Clothing is an insulating barrier to control heat losses between the body and the surrounding cold air. Clothing is added

to prevent unreasonable heat losses; or it is removed to prevent overheating indoors, or when heat production exceeds loss as during muscular work.

c. **Balancing moisture.** The body is always losing water from the skin as invisible perspiration. When heat production exceeds loss, as during work, a visible perspiration or sweat appears. Sweating may also occur as an emotional response even without excess heat production. When perspiration evaporates, it carries heat away from the body. If clothing prevents evaporation of perspiration, the body overheats and becomes uncomfortable; moisture accumulates in the clothing, and may freeze there. Therefore, in dressing for cold temperatures, it is often as important to remove or loosen clothing to prevent excessive moisture as it is to add it for protection against the cold.

d. **Protecting the Body.** Clothing not only protects you against the cold but it also gives you protection in various other ways. Snow and rain bounce back—at least for a while—from your outer clothing. This outer clothing also reduces the effects of the wind (windchill). The springy quality of cold weather clothing gives excellent protection against the scratches of brush or branches of trees while moving, and lessens the force of flying blocks and splinters of ice or frozen ground caused by projectiles during combat.

2. Principles of clothing design. Certain principles are involved in the design of adequate cold weather clothing to control heat loss from the body, to facilitate moisture loss, and to protect the body.

a. **Insulation.** Any material that resists the flow of heat is known as an insulating material. Dry air is an excellent insulator and, in addition, it is light. Materials which hold quantities of motionless air are the best insulators. Wool contains thousands of tiny pockets within its fibers. These air pockets trap the air warmed by your body and hold it close to the skin. The principle of trapping air within the fibers of clothing provides the most efficient method of insulating the body against heat loss. Fur keeps you warm in the same way; warm, still air is trapped in the hair and is kept close to the body.

b. **Layer principles.**

(1) Several layers of medium-weight clothing keep you warmer than one heavy garment, even if the single heavy garment is as thick as the combined layers. The secret lies in the layers of air which are trapped between the layers of clothing. These air layers, as well as the minute air pockets within the fibers, are warmed by your body heat.

(2) The layers of clothing are of different design. Wool underwear is the most porous and has many air pockets. These air pockets trap and hold the air warmed by your body. To keep the cold, outside air from reaching your body-warmed, still air, your outer garments are made of wind-proof water-repellent fabric.

(3) The layer principle permits rapid adjustment of clothing through a wide range of temperatures and activities. The addition or removal of a layer of clothing permits you to maintain your body heat balance. Maintaining this balance is all-important.

(4) The layer principle allows maximum freedom of action. You can easily reduce the amount of clothing during strenuous activity if, for example, you know that heated shelters are available after the exercise is finished. Hearing, seeing, and working abilities are easily improved as necessary by removing outside layers.

c. **Ventilation.** Cold weather clothing is designed so that it not only reduces heat loss but also, by ventilation, prevents you from becoming overheated. When you become overheated, perspiration results. Perspiration moistens clothes and fills the air spaces with moisture. Water conducts heat approximately 25 times as readily as does air. Thus, perspiration reduces the insulating qualities of your clothing. As perspiration evaporates, it cools your body just as water evaporating from a wet canteen cover cools the water in the canteen. To combat these effects, cold weather clothing is designed so that it can be thoroughly ventilated at will. The neck, waist, hip, sleeve, and ankle fastenings can be opened or closed. When opened, cool air enters next to the body just as cool air comes into a house when the windows are open. If the windows are opened at opposite ends of a room, cross-draft ventilation results. In the same way, if your clothing is opened at the waist and neck, there is a circulation of fresh air. If this gives too much ventilation, you might open the neck to allow warm air to escape without permitting complete circulation. When these steps to increase ventilation are insufficient, layers of clothing may be removed.

3. Use of clothing in cold weather.

a. Basic principles of keeping warm.

(1) *Keep the clothing clean.* This is always true from the standpoint of sanitation and comfort; in winter, in addition to these considerations, it is necessary for maximum warmth. If your clothes are matted with dirt and grease, much of their insulation property is destroyed; the air

pockets in your clothes are crushed or filled up and the heat can escape from your body more readily. Underwear requires your closest attention because it will get the dirtiest. Wash your woolen underwear and socks in lukewarm water, or, if warm water is not available, rinse them in cold water. Never use hot water and never boil woolens. When your outer clothing gets dirty, wash it with soap and water. Make sure that you get all the soap out of your clothes. Soap left in your clothes lessens the water shedding quality of your outer garments. Be especially careful not to get grease on your outer clothing because it will destroy much of the normal insulation, and, in addition, make your clothing more inflammable.

(2) *Avoid overheating.* In cold climates you must not get too hot. When you get hot you sweat and your clothes get damp. These damp clothes give poor insulation. In addition, as your perspiration evaporates it cools your body even more. Some sweating cannot be avoided. You will perspire some, even when you are not working. When you are indoors don't wear too many clothes, and make sure that the shelter is not overheated. Outdoors, if the temperature rises suddenly or if you have been working hard, you will get very warm. Adjust your clothing at once. This can be done either by ventilation (by opening your parka or jacket partially) or by taking off some of your clothes. Ventilation can be quickened by raising and lowering your garment on your shoulders, thus pumping cold air in between the layers.

Remember: In cold temperatures it is better to be slightly chilly than to be excessively sweaty.

(3) *Wear clothing loose in layers.* Your winter uniform must be roomy. Never wear anything that is tight; it does not provide the still air that is needed to retain your body warmth. Furthermore, tight clothing or foot-gear restrict blood circulation and invite frostbite or trenchfoot. If your boots fit comfortably with one pair of socks, never wear them with two pairs. The second pair might only cause the boots to fit too tightly and restrict circulation; you may end up freezing your feet instead of keeping them warm. Similarly, a field jacket which fits snugly when worn over a wool shirt alone will be too tight when a sweater or wool jacket is also worn under the jacket. If your outer jacket already fits tightly, you will only restrict circulation by putting additional layers under it.

(4) *Keep your clothing dry.* Under winter conditions, moisture will soak into your clothes from two directions—inside and outside. Dampness resulting from perspiration has already been discussed. Dampness from outside sources is another matter; dry snow and frost that collect on your uniform or your sleeping bag will be melted by the heat you radiate.

Your outer clothing is water repellent and will shed most of the water collected from melting snow and frost. The surest way to keep dry, however, is to prevent snow from collecting. Before entering your tent, whisk or shake the snow off your uniform and boots; do not try to rub it off, you will only work it into the fabric. Always when possible, remove your footwear and beat the frost from your boots.

In spite of all your precautions, there will be times when you will get wet. Drying your clothing may become your main job at times. On the march, hang your damp mittens and socks on your pack; even in below freezing temperatures, wind and sun will help to keep your clothing dry. You might also place damp socks or mittens under your parka close to your body; the body heat will dry them out. In bivouac, hang each piece of damp clothing inside the tent, near the top. Use drying lines or improvise dry racks. Do not dry clothes too close to a fire. Do not try to dry your shoes and socks while you are still wearing them by placing your feet close to the fire. Your shoes might burn or scorch before your feet even feel warm.

4. Footwear.

a. **General.** Footwear is the most important part of your cold weather clothing. Your feet are the most vulnerable part of your body. Cold attacks feet most often because they get wet easily (both externally and from perspiration) and because restriction of circulation is so easy.

b. Principles in winter use.

(1) The Marine Corps has two standard types of footwear used in cold climates; the first and the one most commonly used is the Boot, insulated, rubber, which is described in a succeeding paragraph.

(2) The second type of cold weather footwear is the mukluk, a canvas and rubber boot designed for wear in dry cold at extremely low temperatures (−20° and lower). Mukluks collect very little frost because they are not waterproof. For this reason, however, they should never be worn in weather warmer than 20 degrees below zero. Use them in deep, dry snow but never in wet snow. The mukluk operates on the layer principle to keep your feet warm and the following sock-combinations are recommended:

1 pair cushion-sole socks
2 pairs of wool, heavy weight (ski) socks

1 pair of felt socks
2 pairs of felt insoles

A word of caution when wearing the mukluk. *Always* brush loose snow from the mukluk before entering a warm tent or building. Snow remaining on the boot will soon melt and wet the mukluk. The wet mukluk will freeze once you leave the shelter and will no longer furnish protection for your feet.

Remember: Never wear shoes and socks that are tight. If blood circulation is restricted, your feet will be much colder. Too many socks, worn too tightly, might easily mean freezing of your feet. AVOID LACING FOOTWEAR TIGHTLY.

(3) The rules about avoiding overheating and keeping dry are difficult to follow so far as your feet are concerned because your feet sweat easier than any other part of your body. Footwear is also exposed to external dampness. Your shoes are designed to decrease these disadvantages as much as possible. The dry-cold boot (mukluk) has a porous outer shell to allow foot moisture to escape. The wet/dry-cold rubber boot has a waterproof outer shell.

Remember: Always carry a dry change of insulation. Change both insoles and socks whenever your feet get wet. Remove snow and frost before entering heated shelter. Dry your shoes at the first possible opportunity.

Keep your footwear clean. Dirty, matted socks are cold socks; change them daily. Wash both your socks and feet frequently.

Exercise your feet. When it is extremely cold never keep your feet still very long. Stamp or double time a few steps back and forth; flex and wiggle your toes inside your boots. Muscular action produces heat and keeps your feet warm. Always massage your feet when you change your socks.

If possible, break in your shoes for three or four days before making long marches.

Remember: It's feet first when you start to get cold. Protect them well.

5. Handwear.

a. **Types of handwear.**

(1) You are issued two kinds of handwear for use in extreme cold; gloves and mittens and their inserts. Mittens are warmer than gloves since the fingers are together and keep each other warm. However, in delicate work, you have to use fingered gloves.

(2) In extreme cold you will wear arctic mittens over the wool trigger-finger inserts. In more moderate weather, wear mittens without the inserts. Adjust the mittens by using the drawstraps.

(3) For work that requires actual use of the fingers, you will wear leather shell gloves with wool inserts.

b. **Use of handwear.**

(1) The general rules concerning use of clothing applies to the handwear. Keep them *clean,* avoid *overheating,* wear them *loose* in layers, and keep them *dry.*

(2) Always wear the outer shell with minimum insulation necessary to provide protection and thus avoid perspiration. Inserts should never be worn by themselves; they wear out quickly. To make sure that your inserts wear evenly, change the inserts to opposite hands daily.

(3) Avoid loss of outer handwear by suspending them from the back of the neck with the tape provided. If necessary, you can improvise by using a shoe lace or a piece of telephone wire.

(4) Avoid tight fitting sleeves. They may cut down circulation and cause your hands to become cold.

(5) Always handle cold metals with covered hands to prevent metal burns.

(6) To keep your hands warm when wearing mittens, curl your fingers inside your mittens against the palm of your hand, with your thumb over the fingers. Exercise your hands by swinging your arms in a vertical circle. Frostbitten hands can be warmed by placing them next to the skin under the armpits.

(7) Always carry an extra pair of inserts. Mend tears promptly. Do not ruin your gloves by drying them in a place that is too hot.

B. Current Marine Corps Cold Weather Uniforms.

1. Superiorities of the new cold weather uniforms. Uniforms for wet-cold and dry-cold weather are undergoing continuous study and experimentation. The new cold weather uniforms represent a marked improvement over the former standard uniforms. Extensive field and laboratory tests indicate that they have the following superiorities:

a. Better insulating qualities and at the same time less weight.

b. A system of fabric surfaces which eliminates creeping and drag in material, consequently requiring a Marine to expend less energy in activity.

c. A new wool frieze insulating material which does not compress like pile, and is washable.

d. Additional pocket space for carrying cargo in trousers.

2. Substitutions for new standard cold weather uniform. It will be readily understood that all components of the new cold and extreme cold weather uniforms are not going to be ready for the field at once. It is therefore probable that

you will be issued items of cold weather clothing other than those shown or described on the following pages. However, if this clothing is worn properly and the principles are followed as set forth in this chapter, you will be able to stay reasonably comfortable and carry out your duties efficiently. Remember, no matter what combination of clothing is worn you should choose an outer garment that is water-repellent and wind resistant. These garments are made from tightly woven water-repellent treated cotton fabrics. Your inner garments are for insulation and are made of wool and/or mohair.

3. Items of cold weather uniform.

a. The below listed articles comprise the standard cold weather uniform:

Boot, insulated, rubber, pr.
Cap, field, cotton, M1951.
Drawers, winter, M50.
Glove-inserts, wool, pr.
Glove-shells, leather, pr.
Hood, parka, field, M1951.
Jacket, shell, field, M1951.
Laces, shoe-pac, 72", pr. (Used as emergency thong.)
Liner, jacket, field, M1951.
Liner, trouser, field, M1951.
Mitten-shells, trigger finger, type 1.
Mittens, inserts, trigger finger, M1948.
Shirt, flannel, green (Optional).
Socks, wool, cushion sole, O.D. pr.
Suspenders, trouser M50, pr.
Trousers, shell, field, M1951.
Undershirt, winter, M50.

b. The following are supplementary items for operation in extreme cold:

Boots, mukluk, w/2 felt insoles, pr.
Hood, parka, M1951 (may also be worn w/jacket, shell, field, M1951).
Insoles, ventilating, pr.
Liner, parka-shell, M1951.
Liner, trouser, arctic, M1951.
Mittens, arctic, M1949.
Parka-shell, M1951.
Socks, felt.
Socks, wool, heavy weight, L. 12".
Trousers, shell, arctic, M1951.

4. Description of individual items.

a. **Underwear** (see Fig. **21.1**). The new standard underwear, illustrated in Figure **21.1**, is a two piece suit designed to fit loosely over the body in a manner similar to pajamas and in contrast to the former standard garments which were form fitting. The new underwear gives you added insulation, increased freedom of movement, and better ventilation. Drawers have a loose fitting elastic waistband. Loops located at the waist are included for attaching suspenders in order to maintain the drawers in proper position. The new design also provides sufficient material so that the small amount of shrinkage which occurs will not cause the underwear to become tight and binding.

b. **Cap, field cotton, O.D. w/visor** (see Fig. **21.4**). This is a cotton cap with a wool liner. This cap has ear flaps that fold up into cap when not in use.

c. **Trousers, shell, field M1951** (see Fig. **21.3**). These trousers are worn as the outer garment for cold weather and as an intermediate garment in conjunction with the trousers, shell, arctic, M1951 (see Fig. **21.6**) in extreme cold weather. They are water repellent and wind resistant. They are supported by the suspenders, trouser M50. They have a waist draw string, cuff draw string and tie straps at the thighs for ventilation. They also have cargo pockets.

d. **Liner, trouser, field M1951** (see Fig. **21.2**). This is a separate garment composed of wool frieze which is normally buttoned to and becomes a part of the trousers, shell. The frieze which replaces the pile liner in older cold weather clothing, has excellent insulating qualities; it is very light, more resilient and washable, and offers more freedom of movement than pile.

e. **Jacket, shell, field, M1951** (see Fig. **21.5**). The field jacket shell is designed to be worn as the outer layer of the cold weather uniform and the intermediate layer of the extreme cold weather uniform. It is made of cotton sateen with an inner lining of cotton oxford. The jacket is fastened by means of a slide fastener closure and has a supplementary snap closure in front. Drawstrings are provided at the waist and skirt. The jacket is also provided with buttons for the attachment of an inner wool frieze liner (liner, jacket, field, M1951) (see Fig. **21.4**). The hood, jacket, field M1951 (not shown) is attached to this jacket by means of buttons on the shoulder. The hood, parka, M1951 may also be worn with this jacket (see Fig. **21.5**).

f. **Boot, insulated, rubber.** The new boot, illustrated in Fig. **21.3**, is designed on the vapor barrier theory of insulation. Both the inner and outer surfaces of the boot are made of rubber, completely waterproofed, with one-half inch of wool insulation sealed into the sole and top. This insulation does not get wet from either outside moisture or perspiration from the foot. In wearing this impermeable footgear, perspiration is not allowed to evaporate, but rather a small amount collects in the cushion sole socks, which remains damp *but warm*. This dampness is not harmful to

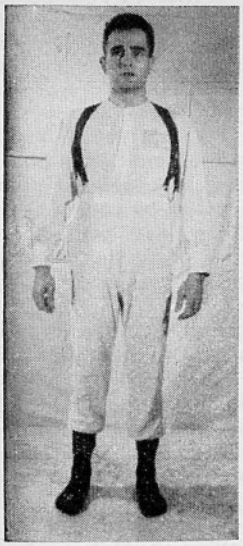


Fig. 21.1



Fig. 21.2



Fig. 21.3



Fig. 21.4



Fig. 21.5



Fig. 21.6

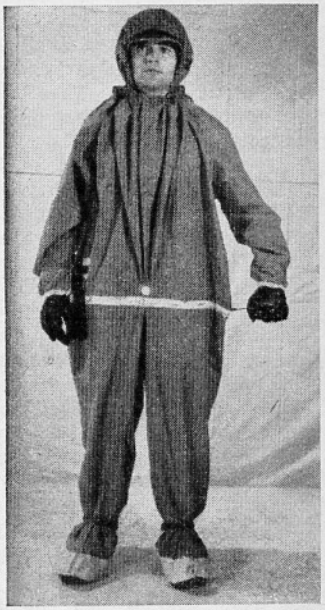


Fig. 21.7

the foot, but you must become accustomed to the sensation of dampness. Extensive tests have proved that the boot can be worn with assurance, and due to the fact that no heat is lost by evaporation, instances of frostbite and trenchfoot are practically eliminated. Proper care of the feet is still important, however, and frequent drying and massaging are recommended. *The insulated boot is designed for wear with only one pair of cushion sole socks.* Additional socks should not be stuffed into it, and damp socks need not be changed as frequently as with the shoe pac in order to maintain warmth. Experience has also proved that small amounts of water which may leak over the top of the boot do not cause prolonged chilling due to the fact that this water is soon warmed to body temperature. This boot has also demonstrated its value in reducing foot injuries from exploding land mines.

g. **Glove-shell, leather, and glove inserts wool** (see Fig. **21.4**). These two items are normally worn together. The glove may be removed to allow more freedom of hands; however, care must be exercised to avoid wetting the inserts for this will cause them to lose their insulating qualities. The wool insert, if used without the gloves, will soon wear out.

h. **Extreme cold weather uniform.**

(1) The uniform shown in Fig. **21.6** is worn only in extreme low temperatures. It is composed of the parka, shell M1951 (which can also be worn with the jacket, shell, field); the trousers, shell arctic, M1951; parka, shell M1951; and mittens, arctic M1951. These items are worn over the normal cold weather uniform as described in preceding paragraphs.

(2) It will be noted in Fig. **21.6** that the mittens, arctic are leather mittens with a pile back. This pile back is used to warm the nose and face especially if there is evidence of frostbite. The mitten is worn in conjunction with the mittens, inserts, trigger finger.

(3) While the model shown in Fig. **21.6** is wearing the boot, insulated rubber, it is with this uniform that the mukluk is normally worn.

i. **Suit, amphibious landing, cold weather, M1951** (see Fig. **21.7**). This is an expendable rubber suit that can be worn over the regular cold weather clothing during an amphibious landing. Once you are ashore you remove and discard this suit.

C. Sleeping Equipment. The complete sleeping bag consists of three parts: the water-repellent case, the outer sleeping bag (arctic type), and the inner sleeping bag (mountain type). When the weather is only moderately cold, the outer arctic sleeping bag is not required. In addition, an insulating sleeping pad may be issued to you. It can be inflated to the general shape of the arctic sleeping bag using an inflating valve at the end of the pad.

When the bag is used, it is first fluffed up to loosen the down and feather insulation. Since cold penetrates from below and the insulation inherent in the bag is compressed by your weight, you need additional insulation under you. If an insulated sleeping pad is not available, use dry shelter halves, extra clothing, packboards, harnesses, fiber ammunition or food containers, tree branches or boughs. In general, the more insulation you have under you, the warmer you will sleep.

Remove your outer clothing. Use the extra clothing for insulation *under* you. You can easily make yourself cold by sleeping with too many clothes on. As you turn over in sleeping, this clothing restricts circulation especially at the shoulders and makes them cold. In addition, sleeping with the outer clothing on increases your bulk and places tension upon the bag, thus decreasing the size of the insulating air spaces between layers and reducing the efficiency of the insulation.

The bag is equipped with a slide fastener. Under ordinary conditions the bag is closed and opened by pulling the slide. In an emergency, however, the slide can be jerked quickly over the upper end, releasing the entire closure at once.

Keep your sleeping bag dry. Open it wide, pump fresh air into the bag, and always ventilate it after use, since moisture from your body accumulates in the bag. Whenever possible, sun or air it in the open. Otherwise, you may get snow on the bag during the day and your body warmth will melt it during the night. Never breathe into the bag. If your face becomes too cold, cover it with a muffler or sweater.

Remember, though your sleeping bag is a useful and comfortable item of your equipment, do not think you cannot survive without it. At times you will have to part with it. Long cross-country movement, carrying heavy loads of extra ammunition or rations might make it necessary to leave it behind for a while. In close contact with the enemy, it is dangerous to use the bag since it can be a trap in case of surprise. Therefore, condition yourself to sleeping without the bag if you have a heated tent or an open fire, even in extreme cold temperatures.

D. Pocket Equipment. For your general well being and for preventing injuries, you have several small items which you can carry in your pockets

so that they are always available. Your knife is an essential item in everyday life in cold weather conditions. Your emergency thong should also be carried to repair broken laces or torn clothing, to construct shelters, and for many other uses.

The watertight match box and matches might save your life in an emergency. Sunburn preventive cream is necessary for use in bright sunshine. Chapstick prevents your lips from getting chapped. Sunglasses will prevent snow blindness, or sunburn of the eyes.

E. Care and Maintenance of Special Items.

1. Binoculars and other liquid-free optical instruments are not affected by cold weather. However, condensation does form when instruments are exposed to warm air. Therefore, they should be left outside whenever possible.

2. Cold lowers the efficiency of all batteries and eventually they may freeze. Keep batteries warm and if possible carry them close to the body in order that full efficiency will be available when needed.

F. Heat and Shelter. Heat and shelter, in combination, form a major factor contributing to efficiency and comfort in cold weather.

1. Precautions and economics. A tent becomes your home. Housekeeping and living in a tent will limit your freedom. The necessity for teamwork and control is essential.

You must, at all times, economize on fuel for both cooking and heating. A properly supervised tent should seldom undergo extremes of cold or heat. Nothing is more irritating than to have personnel continuously entering and leaving the tent. This can be kept to a minimum with proper planning. Build windbreaks whenever possible or dig your tent down into the snow. Overheating must be avoided; it wastes fuel and only causes discomfort. From time to time it may be necessary to increase the heat if many items of clothing are to be dried. Plan these times and try to combine a drying period with a time when personnel may sponge off their bodies. Watch your stoves at all times, a flash fire can make you homeless in a very few minutes. A fireguard is required whenever stoves are burning inside your tent.

Remember: Tentage is a vital part of your cold weather equipment. Your ability to work, live, move and fight under these conditions depends upon adequate shelter. Keep your tent (or other shelter) as close as possible to the scene of your activity whether that activity be combat or administrative work. In that way, rotation of men is possible, and maximum *continuity of effort* can be maintained. If, for some reason you must abandon your tent, use one of the temporary shelters.

Remember: Never abandon your tent except in extreme emergency.

2. Ventilation. Your cold weather (hexagonal) tent has built-in ventilators in the peak. Keep these open and unblocked by ice. In addition, the tent has some natural ventilation, especially if the fabric is clean and dry, but it does not allow enough fresh air to enter. If your tent is tightly closed, moisture forms on the inside. This moisture will fall on your clothes and equipment and will cause dampness and hoarfrost. Furthermore, carbon monoxide from your cooker or stove and carbon dioxide from your own breath soon accumulate to uncomfortable and dangerous amounts.

Remember: Keep your tent flap slightly open at the bottom whenever possible; build a draft tunnel for your stove whenever you have the opportunity.

3. Requirements for improvised shelter. There are often occasions when tents or other regular shelters are not available.

In winter you cannot stay in the open for long periods unless you are moving. The need for an improvised shelter may arise for several reasons; e.g., as a result of a fire, or to gain speed on a short patrol, you may have to leave your tent behind. Sometimes the vehicles carrying tents cannot reach your camp site as a result of bad weather or enemy action. In cases of emergency, you must find a way to protect yourself against the cold weather.

If suitable natural shelters such as caves or rock shelves are available, you need not build. But this, unfortunately, is seldom the case. Be sure to choose a good location.

Choice of a camp site will depend on protection from wind and nearness to fuel, building materials, and water. Forests or bushes, if available, will provide the best area. If no timber is close by, choose a location protected from drifting snow; stay out of the lee of slopes or cliffs, where snow may drift quickly and heavily and bury your shelter. Naturally, enemy action is an important factor in selecting a camp site. Select one in which you cannot be surprised by the enemy. He will normally follow your trails. Place your shelter so that you can see any movement along the trail you have used.

The kind of improvised shelter you will build depends upon the material available. If there are evergreen trees nearby, the lean-to shelter might be the best. It can also be built in open terrain

using canvas, ponchos, animal skins, or other material. Snow caves and snow houses can be built, too.

No matter what the reason or the area, by intelligent use of what you have available, you can construct some sort of shelter. In most cold weather areas, nature provides you with wood for fuel and shelter. Your comfort will depend upon *your* initiative and ability to improvise.

4. Shelter (tent) discipline.

a. Keep your weapons on hand. In extreme cold, rifles have to be left outside in order to avoid condensation. However, for security reasons, it is advisable to take at least one weapon inside the shelter. Also keep at least one shovel or knife inside. They might be needed for digging out the shelter door after a storm.

b. The use of fires and lights in your shelter must be carefully supervised. Security, fuel economy, and the prevention of fire and of asphyxiation is essential. Extinguish lamps before retiring at night. Fill and light all lamps and cooking stoves outdoors if possible. Prepare a strong base for the stove so that it cannot move when snow melts under it. Make a stand or bracket for your lamp or candle and place them so that they cannot be knocked over. Extinguish sparks on the tent or lean-to roof at once. A light covering of snow, usually placed on the roof for camouflage, helps prevent any smoldering. Do not smoke in your sleeping bag.

c. Do as many tasks as possible before retiring in order to save time in the morning. Clean all mess gear, refill stoves, prepare firewood, and check all weapons. Perform elimination functions in a routine manner to avoid disturbing others unnecessarily and to avoid wakefulness.

d. On breaking camp, the first thing to do in the morning is to drink something warm before breakfast. Breaking camp must be carried out carefully. Beat and clean the tent well before packing. Remove tent pegs carefully without forcing. All boughs, material, and other marks must be covered before you leave the area.

5. Heat discipline and fire prevention. Heat discipline presents a more important problem under cold weather conditions. Overheating the shelter is very common by the uninitiated. It *must* be avoided since it causes sweating and increases fire hazard.

a. There are many ways to save fuel. Avoid overheating. Combine cooking and heating. Melting of snow and ice uses large amounts of fuel. Avoid it if you can; obtain water from other sources. In cooking, use liquid fuel sparingly. Use local fuels when available. In extreme cold it is necessary to keep the fire burning in order to keep the men warm, especially when living in hastily made or temporary shelters. The drying of wet clothing and the provision of hot drinks for combat reliefs are necessary throughout the night. A fire-guard and good ventilation are necessary.

b. *Fire prevention* during both summer and winter seasons is extremely important. The combination of the low humidity of the area with the drying effect of continuously heated shelters is conducive to fire. Shifts in wind and the accumulation of frost or soot in the smokestack lead to backfiring and the blowing of flaming fuel into the shelter. The excessive spilling of fuels, carelessness in using stoves, and the knocking over of fuel containers, lamps, and candles are additional dangers. The stamping of feet to shake off snow or frost may cause stoves and small heating units to spill and spread fire. The strict enforcement of all regulations is necessary in order to avoid fire hazards. No set rule can be given for each occasion. Common sense in the handling of all kinds of fires, fuels, and inflammable materials is essential.

c. Beds made from green logs must be placed under the stove when camping on the snow. Fire reflectors are used not only to get more warmth, but also to keep the fire burning evenly and to help avoid sparks.

d. When lighting the gasoline-type stove, be most careful as it may flare up and either damage the tent or set it on fire. Clean all stovepipes frequently, especially when using wood. Cleaning must be done every day in order to maintain a good draft and help avoid chimney fires.

6. Drying clothing. "KEEP DRY," IS THE FIRST LAW OF THE NORTH. The drying of clothes and footwear is thus important. Every opportunity must be used by each individual to dry his clothing. If this is neglected the result might be disastrous.

Remember: You must always have dry extra clothing in your rucksack.

When drying outside using an open fire do not dry downwind from the fire. Check drying clothes frequently. Never place clothing too close to the fire or stove in the shelter. Leather and felt are most vulnerable to extreme heat. Remember the old slogan: "Where the butter melts, there the leather burns."

G. Rations.

1. Importance of food and water. Food and drink are the fuels which supply both heat and energy to the human body. More food is required in extreme cold weather than in temperate climates as more body heat is required. This

does not mean that you will be given more bulk but rather more calories. In actual fact, your rations in a majority of cases will be more concentrated, that is, smaller in size but will contain more body fuel. Strange as it may sound, because of the insulation quality of your clothes and the amount of energy expended in either carrying or hauling your equipment, sweating will occur. Besides robbing the body of heat, sweating removes much needed water and may cause extreme dehydration. Early fatigue is a sign of this condition.

Remember: Consume all your rations and drink at least 50 per cent more water than you normally do.

Maintenance of health by the provision of warmth and energy is the chief purpose of your rations. Your body accomplishes this by converting food into heat.

2. Individual messing. At times you will have to prepare and eat your rations by yourself or with your "buddy." Most components of individual rations can be eaten cold. Some ration components such as soup or tea must be heated. Whenever possible cook yourself a hot meal. In order to maintain a balanced diet eat all your rations, not just the most palatable items.

Warning: Heating tablets are not adequate in extremely cold weather. You may have to prepare and eat one item at a time, but a hot meal will be worth the effort.

Hygiene and Sanitation

A. Camp Sanitation. Under most conditions, standard methods of excreta disposal can be utilized. In severe winter conditions simplicity of construction of "heads" and availability to the men are most important. In severe cold, feces deposited by troops freeze quickly, become pulverized by wind and snow, and may contaminate a large area. On the march a snow hole is used. It is placed near a rock or terrain feature that protects other troops from placing a tent on the same spot. Disposal bags are used at every opportunity to prevent the scattering of contaminated material. These are collected and stacked under sack covers for later disposal.

In bivouac areas a field head may be built in the snow. It is placed in close proximity to the shelter, downwind. If it is placed too far away, during severe weather or in darkness, some individuals might break sanitation discipline. Usually, three or four shelter groups can use the same head.

There is no physical hazard in using an open head even in extremely low temperatures. However, protection against wind and blowing snow is necessary. When leaving the camp site, the heads are filled with snow and marked. This prevents the erection of a tent on the spot.

B. Care of the Body. In cold weather you must pay special attention to the care of your body. If you allow yourself to become dirty, fail to eat proper food, become forstbitten, or abuse your body in any other way, your efficiency as a Marine will suffer. Lowered efficiency increases the possibility of your becoming a casualty.

1. Cleanliness. Because of the extremes in temperature and lack of bathing and sanitary facilities, keeping clean in cold weather is not easy. Dirt not only serves as a breeding ground for disease, but also reduces the insulation value of your clothing thus making you more susceptible to cold injury. Even perspiration, which cannot be totally avoided, decreases the insulation value of clothing and causes chilling. Do not overlook the morale value of bodily cleanliness. You will feel better and work better with clean clothes and a clean body. Insure bodily cleanliness by the following practices:

a. If you cannot wash your underwear often, wear the underwear you have in rotation, even though it has been worn since washing.

b. Bathe at least once a week when possible.

c. Even if bathing facilities are not available, you can clean yourself thoroughly with the equivalent of two canteen cups of water, using half for soaping and washing and half for rinsing. Use a sponge, piece of towel, or any other clean cloth as a washcloth; soap yourself, then wipe off the soap with clean water. If circumstances prevent your using water, give yourself a rub-down with a wool shirt, or other dry cloth. Clean your feet, crotch, and armpits every day.

d. Keep your beard shaved or clipped close. Do not allow your hair to grow too long. Comb it daily. A beard or long hair adds very little in insulation value and soils your clothing with the natural hair oils. In winter you will find a beard or mustache a nuisance since they serve as an admirable base for the build-up of ice from your condensed breath.

e. Pay special attention to care of your feet. Wash your feet and change socks every day, when

possible. If this is not possible, take off your socks, massage your feet, and dry them. You can dry clean your feet efficiently by sprinkling them liberally with foot powder and then rubbing the powder off.

f. Keep your sleeping bag clean. Use cotton liners if issued. Wear only the minimum of clothing in the bag and never get into it with damp underwear. Change into dry underwear before going to sleep and hang your other set up to dry. Perspiration will soil your sleeping bag as it does your clothes. Therefore, air the bag as frequently as possible. As soon as you get up in the morning open the bag wide and pump air in and out to remove the moist air within.

g. Clean your teeth every day. If you do not have a toothbrush, wrap a clean piece of gauze or other cloth around your finger and rub your teeth with it. You can also chew the end of a twig into a pulp and use it in lieu of a toothbrush.

Health Hazards and First Aid

The secret of good health in cold weather lies in prevention, not cure. Simple preventive measures, which anyone can apply, will keep you in good health and fighting trim. Only the undisciplined Marine becomes unfit as a result of avoidable ailments. The following paragraphs will give you the symptoms of several cold weather ailments, means of avoidance, and emergency treatment that you can give prior to the arrival of the corpsman or surgeon.

A. Avoiding Cold Injuries. Cold injuries, which include frostbite, trenchfoot, or general chilling of the body, are all due to one cause; lack of insulation against the cold weather environment. Your clothing will protect you if you use it properly.

1. Frostbite. Frostbite is the freezing of some part of the body. It is a constant hazard in subzero operations, especially when the wind is strong. As a rule, the first sensation of frostbite is numbness rather than pain. You can see the effect of frostbite, a white spot on the skin, before you can feel it.

Remember: Unless he is already a casualty and unable to help himself, only a negligent person gets serious frostbite. Frostbite which necessitates medical attention should normally be investigated with a view toward disciplinary action.

It is easier to prevent frostbite or stop it in its very early stages than to thaw and take care of badly frozen flesh.

a. **To prevent severe frostbite—**

(1) Dress to protect yourself against cold and wind. In high wind and when exposed to aircraft prop blast, protect your face.

(2) Keep dry. This applies to sweating as much as to any other wetness.

(3) In extreme low temperatures be careful not to touch metal with your bare skin.

(4) Exercise exposed parts of your body frequently.

(5) Always use the buddy system. Watch your buddy's face to see if any frozen spots show and have him watch yours. Thaw any frozen spots immediately using your bare hand or other source of body heat.

b. **In case of frostbite, follow these first aid procedures:**

(1) Move the casualty into a heated shelter if possible.

(2) The frozen part should *not* be warmed rapidly. Local heat should not be used. To avoid interference with the circulation by constriction, care must be exercised in the wrapping of the frozen extremity in blankets or clothing for transportation. Within a heated shelter leave limb exposed at room temperature, preferably not higher than 78° F. Avoid the pressure of blankets on the frost-bitten extremities. Do *not* open blisters. Protect with sterile dressing if indicated. Do *not* use Vasoline gauze. Supply warm drinks, food and clothing. In cases of prolonged exposure to severe cold, rapid warming of the body is indicated. Use artificial respiration if necessary.

(3) Every attempt should be made to employ body heat to aid in thawing. Hold a bare warm palm against frostbitten ears or parts of the face. Grasp a frostbitten wrist with a warm bare hand. Hold frostbitten hands against the chest, under the armpits, or between the legs at the groin. Hold a frostbitten foot against a companion's stomach or between his thighs.

(4) When frostbite is accompanied by breaks in the skin, apply a sterile dressing. *Do not use* strong antiseptics such as tincture of iodine. *Do not* use powdered sulfa drugs in the wound.

(5) Never rub frostbite. This may tear frozen tissues and cause further tissue damage. Never apply snow or ice; cold injury is increased by so

doing. For the same reason, never soak frozen limbs in kerosene or oil.

(6) *Do not* try to thaw by exercising. Exercise of frozen parts will increase tissue damage and is likely to break the skin.

(7) Use litter or sled evacuation in cases of frozen lower extremities to prevent further injury. Get the casualty into a casualty evacuation bag if available and evacuate to a heated shelter rapidly.

2. Trench foot. Trench foot is a cold injury resulting from prolonged exposure to temperatures just above freezing. In the early stages of trench foot, your feet and toes are pale and feel cold, numb, and stiff. Walking becomes difficult. If you do not take preventive action at this stage, your feet will swell and become very painful. In extreme cases of trench foot, your flesh dies and amputation of the foot or of the leg may be necessary.

Because the early stages are not very painful, you must be constantly alert to prevent the development of trench foot. *To prevent this condition—*

a. Keep your feet dry by wearing waterproof footgear and keeping your shelter dry.

b. Clean and dry your socks and shoes at every opportunity.

c. Dry your feet as soon as possible after getting them wet. Warm them with your hands, apply foot powder, and put on dry socks.

d. When you must wear wet shoes and socks, exercise your feet continually by wiggling your toes and bending your ankles. Do not wear tight shoes.

In treating immersion foot, the feet should be handled very gently. They should not be rubbed or massaged. If necessary, they may be cleansed carefully with plain white soap and water, dried, elevated, and allowed to remain exposed. While it is desirable to warm the patient, the feet should always be kept cool by exposure to room air. Get the casualty to medical aid as soon as possible. He should be carried and not permitted to walk on damaged feet.

3. Severe chilling. If you are totally immersed in cold water for even a few minutes, your body temperature will drop. Longer exposures to severe dry cold on land can also lower your body temperature. The only remedy for this severe chilling is warming of the entire body. Warm by any means available, although the preferred treatment is warming in a hot bath (110°F.). Severe chilling is often accompanied by shock so get the victim to an aid station as soon as possible.

4. Constipation. Constipation should be no more common in the Arctic than elsewhere. It is an individual problem which depends upon your diet, the amount of water you drink, amount of exercise you take, and your habit patterns, more than any climatic factor.

a. **To avoid constipation—**

(1) Have a bowel movement at the same time each day. If you establish a set routine, constipation is less likely. *Do not put off going to the head because the head might be cold.* If you delay a bowel movement you are inviting constipation.

(2) Get some exercise every day. Constipation is a chair-borne disease.

(3) Eat a balanced diet with adequate roughage.

(4) Avoid the habitual use of laxatives.

If you are on a high protein diet, such as pemmican, you will not have your normal number of bowel movements. This is nothing to worry about. You can go for a longer time without a bowel movement, under these conditions, and suffer no ill effects.

5. Carbon monoxide poisoning. Whenever a stove, fire, or gasoline heater is used indoors, there is danger of carbon monoxide poisoning. Therefore, a steady supply of fresh air in your living and working quarters is vital. Carbon monoxide is a deadly gas even in a low concentration and is particularly dangerous in that it is odorless.

Generally, there are no symptoms. With mild poisoning, however, these signs may be present: headache, dizziness, yawning, weariness, nausea, and ringing in the ears. Later on, your heart begins to flutter or throb. But the gas may hit you without any warning whatever. You may not know anything is wrong until your knees buckle. When this happens, you may not be able to walk or crawl. Unconsciousness follows; then death. You may be fatally poisoned as you sleep.

In case of carbon monoxide poisoning, get the victim into fresh air at once but keep him warm. In winter, fresh air means merely circulating air that is free from gas. Exposure to outdoor cold might cause collapse. If the only fresh air is outdoors, put the patient in a sleeping bag for warmth. Never exercise a carbon monoxide victim because this will further increase his requirements for oxygen. If a gassed person stops breathing or breathes only in gasps, start artificial respiration immediately. In the latter case, the operator's movements must be carefully synchronized with the victim's gasps. Breathing pure oxygen removes carbon monoxide from the blood

faster than does breathing air. So serious is carbon monoxide poisoning that a victim who survives it must be kept absolutely quiet and warm for at least a day. Hot water bottles and hot pads are helpful in maintaining body temperature. Breathing pure oxygen hastens recovery.

Remember: Ventilate your shelter properly and avoid carbon monoxide poisoning.

6. Battle casualties. If any member of your group is injured, the most important course of action is to get him to competent medical aid as soon as possible. Give the casualty such first aid treatment as you are qualified to give, protect him from the cold, and get him to an aid station with the minimum of delay. Guard against shock by keeping the wounded man warm. Put him in a casualty bag, sleeping bag, or the best available substitute. Use chemical heating pads or other auxiliary sources of heat within the bag. Give him warm drinking water or other hot drinks, except in case of abdominal puncture.

Remember: In combat your duty is to fight; and Corpsmen take care of casualties.

However, in extreme cold, if Corpsmen are not available, give a hand to your buddy. Bandage the wound, give him warm drinking water if available, find him some kind of cover against enemy fire and the wind, make a good ground insulation, and put him into a sleeping bag or wrap him well in extra clothing.

Note: Mark the site clearly, so that Corpsmen can find him; then return to the fight.

Glossary

Ahkio—A lightweight boat-shaped sled, constructed of wood or plastic, which can be towed by men mounted on skis or snow shoes. There are two standard sizes of 100 lb. and 200 lb. capacity.

Arctic—Those portions of the earth's lands and adjacent seas that are north of the northern limit of forest are generally considered to be the Arctic. The boundary of the Arctic is identified climatically by the mean temperature of 50° F. for the warmest month, which conforms closely with the northern limit of forest.

Buddy System—The practice of individuals habitually living and operating in pairs in the interest of safety.

Carbon Monoxide—Colorless, odorless, extremely poisonous gas. It is formed by incomplete combustion in gasoline engines and oil stoves. Closed vehicle cabs and tightly sealed shelters often collect dangerous quantities.

Chapstick—A medicated salve dispensed in stick form for application to the surface of the lips for prevention of chapping, sun and snow burns.

Cold Injury—An inclusive term embodying all types of injury to flesh caused by below normal body temperatures. Cold injury includes what is commonly known as immersion foot, trench foot, macerated foot and frostbite.

Disposal Bags—Heavy waterproof bags into which personnel defecate, due to the impracticability of preparing pit heads in swampy or frozen ground.

Fuel Tablets—Concentrated chemical fuel dispensed in tablet form for quick heating of frozen rations.

Layer Principle—A clothing principle by which insulation is attained by trapping dead air space between successive layers of clothing.

Lean-To—A temporary one-sided shelter constructed of poles leaned against a cross member. The top and two sides are covered with canvas, branches and boughs.

Mukluk—A canvas and rubber boot designed for wear in dry cold at extremely low temperatures.

Muskeg—A mossy bog with dense tufts of grass.

Packboard—A light weight rectangularly shaped frame, fitted with shoulder straps and bindings. It facilitates carrying loads on men's backs by proper distribution of weight.

Permafrost (Permanently frozen ground)—A thickness of soil at a variable depth beneath the surface of the earth in which a temperature below freezing has existed continuously for a long time (from two to thousands of years).

Rucksack—Canvas bag with light metal frame and shoulder harness, used for carrying up to about 50 lbs. of clothing and equipment on the back. One type is the knapsack used by mountain and ski troops.

Ski-Joring—Towing of one or more skiers by animal or vehicle.

Snow Blindness—Defective vision or temporary blindness caused by the glare of the sun upon snow.

Snow Shoe—A frame of webbing worn on the foot to increase flotation on soft powdery snow.

Subarctic—Those land areas which extend south from the northern limit of forest to the northern limit of the developed transportation net are considered operationally to be the subarctic. Although treeless, such coastal areas as the Aleutians are subarctic rather than arctic. Climatically, the subarctic region has an average mean January temperature below 32°F., an average mean temperature of above 50°F., for the warmest month, and less than four months with an average mean temperature above 50°F. In North America, the climatic definition of subarctic includes some developed areas, which operationally lie in the zone of winter warfare.

Tundra—The level or undulating treeless plains characteristic of northern arctic regions in both hemispheres.

Vapor Fogs—Moisture vapor rising from humans, animals, open water and operating vehicles during periods of extreme cold.

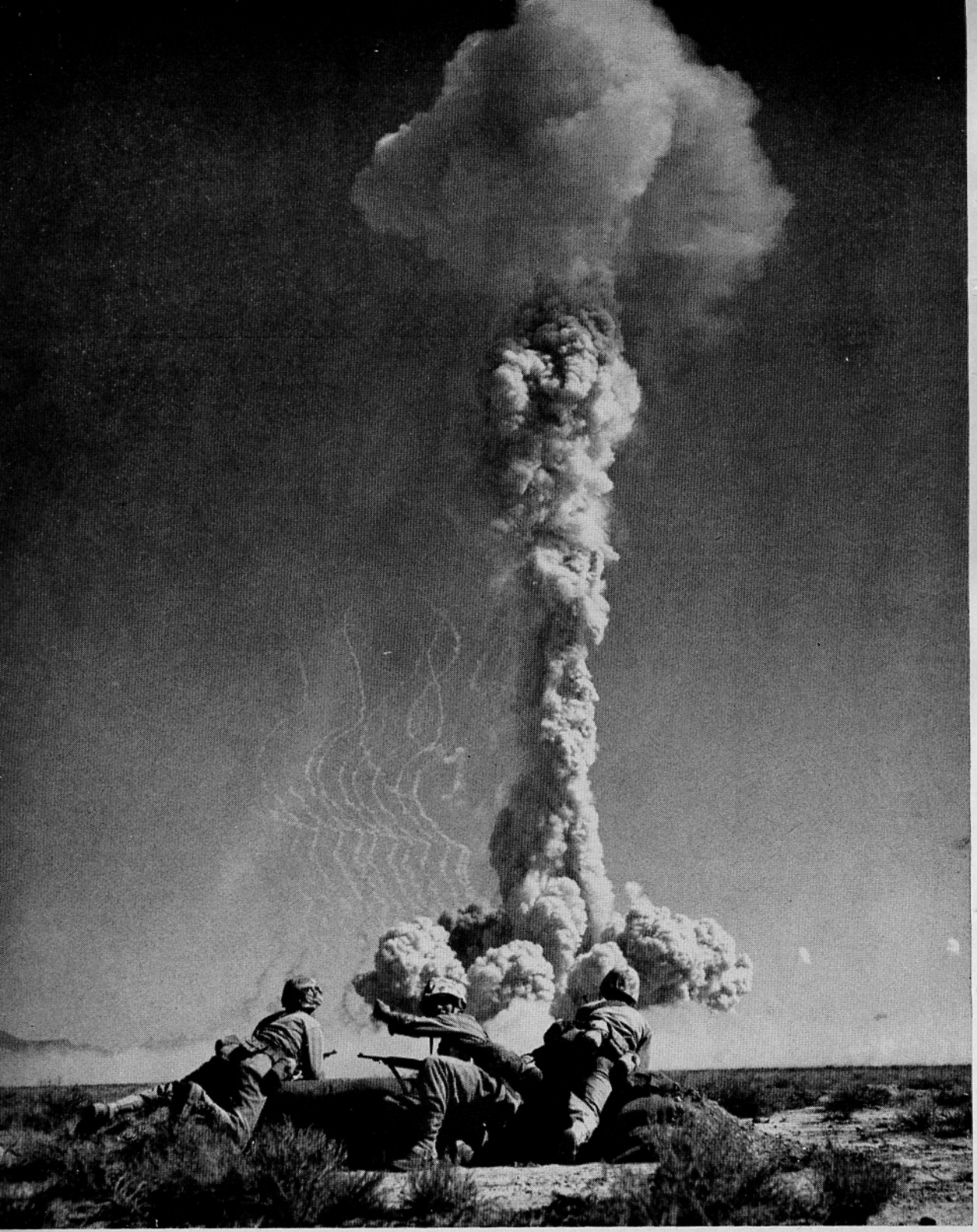
Wanigan—A small shed or house-like structure mounted on a sled. Used for sleeping, working, eating, or storage.

Williwa—A sudden violent gust of cold land air common along mountainous coasts of high latitudes.

Windchill—The combined cooling effect of wind and air temperature on heated bodies.

Winterization Kit—A set of auxiliary attachments or devices by which equipment and weapons are modified to improve their operating characteristics in cold temperatures.





Chapter 22

Nuclear Warfare

THE three hazards of nuclear warfare are not new to Marines. The first two effects of heat and blast are much the same as those from regular high-explosive weapons, but they can be a thousand times more powerful. The third effect of a nuclear explosion — nuclear radiation — is also something with which we have dealt before. Small amounts of nuclear radiation come to earth every day from outer space. Doctors have used X-rays, radium, and radioisotopes for years in the diagnosis and treatment of illness. Of course these items are carefully controlled. This is because nuclear radiation can penetrate the skin and damage body cells. Naturally, large doses of such radiation are harmful and can cause sickness or even death.

A Marine in nuclear warfare must protect himself against the three effects of blast, heat, and nuclear radiation. A Marine's best protection, even in nuclear warfare is still the foxhole.

The Nature of Nuclear Explosions

1. A nuclear weapon is just another means of causing an explosion. As mentioned above, the heat (thermal radiation), and blast effects are similar, but much greater than those of a regular high explosive. (see Figure **22.1**). Nuclear radiation, then, is the only casualty producing effect resulting from a nuclear explosion which is not present in other types of explosions.

2. There is another *difference* in the *nature* of *nuclear attacks* and regular large-scale high-explosive attacks. That is the time involved. In a regular attack, bombs and artillery shells may destroy many buildings and kill hundreds of people, but this will be over a period of several hours. In a nuclear attack, however, a large area is struck instantly and the destruction occurs within seconds. Therefore the time required to seek cover may not be available.

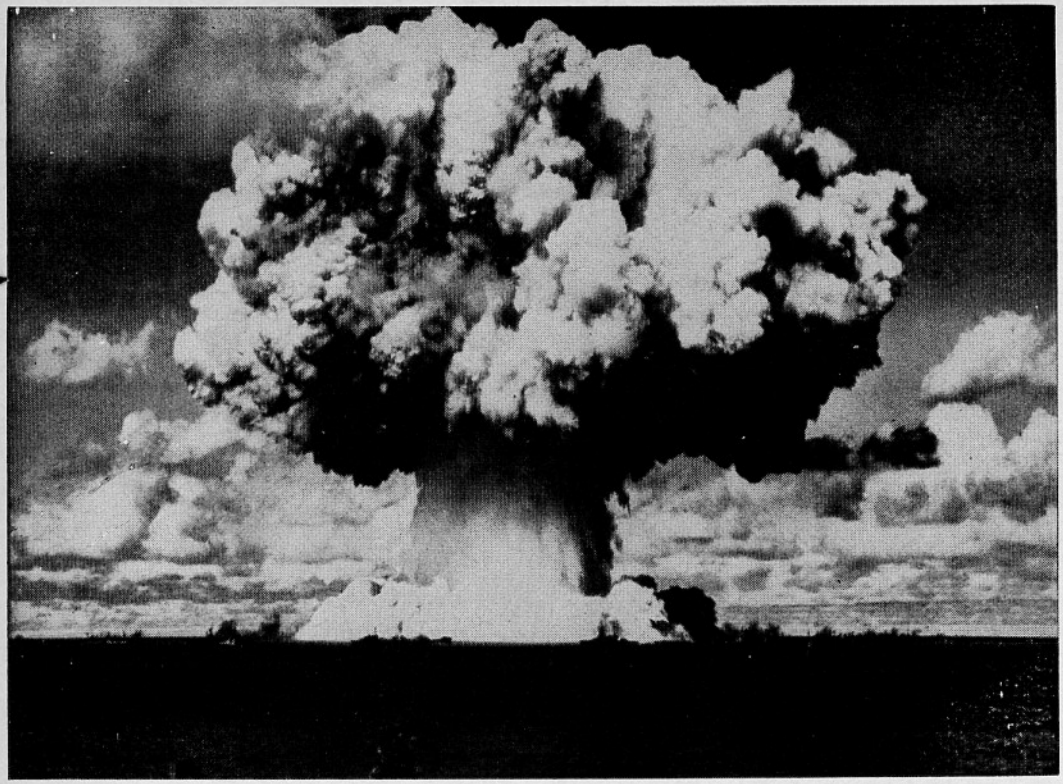
Effects of Nuclear Explosions

1. ***General.*** We have already seen that a nuclear explosion produces the three effects of BLAST, HEAT, and NUCLEAR RADIATION. The more a Marine understands these effects, the better he will be able to defend himself against them.

2. ***Blast.*** The blast effect of a nuclear weapon is caused by the violent changes in air pressure which begin to develop only a fraction of a second after the explosion. These changes create a blast wave which travels in all directions with tremendous force. Very high winds accompany the blast wave. The blast wave and the winds collapse buildings, uproot trees, and fill the air with flying and falling debris. The blast wave is about one-half the total energy released by a nuclear explosion.

3. ***Heat.*** The heat and light given off during a nuclear explosion are known as thermal radiation. The fireball of the explosion reaches temperatures hotter than the surface of the sun and emits great quantities of ultraviolet, infrared, and visible light rays. Wood, cloth, and other inflammable material in the area may be ignited. Nuclear weapons of the power of those used in WW II can generate enough heat to blister and burn exposed skin up to 1½ miles away from the center of the explosion. In built up areas, secondary fires will result from broken gas mains, ruptured fuel tanks, and short circuited electrical wires.

4. ***Nuclear Radiation.*** There are two kinds of nuclear radiation: *initial* and *residual.* Nuclear weapons can be detonated so that residual radiation is confined to the area of the explosion, or so



22.1 A typical nuclear burst.

that significant fallout and neutron-induced radioactivity result. A Marine should know about both types of nuclear radiation.

a. *Initial nuclear radiation.* This is the radiation given off for about one minute after the explosion. It can kill but it lasts only a short time. In built up areas, such as cities, it will cause casualties, but not as many will result from flash burns, fires, collapsed buildings, and flying debris. In open areas a foxhole or similar shelter may protect an individual from blast and heat but may not provide total protection from nuclear radiation. By the time the blast effect of a nuclear weapon is past, the danger from *initial* nuclear radiation is over.

b. *Residual nuclear radiation.* This is the type of radiation that remains or falls back to the surface of the earth after the explosion of a nuclear weapon. Not all nuclear explosions will cause residual nuclear radiation. Whether or not residual nuclear radiation is produced, and the amount produced, depend on the kind of weapon used, the yield (energy released) and the height of the burst. The major source is "fallout". This is caused when the fireball from a surface or subsurface burst (See Figure **22.3**) rises into the atmosphere. Great quantities of dirt, stone, water, and dust particles are vaporized and sucked up from the surface into the cloud that forms after the explosion. When this material solidifies, radioactive particles created by the explosion attach themselves to it. As the cloud drifts downwind, this radioactive material falls back to earth, causing radiological contamination—hence the term "fallout." Large areas can thus be contaminated. Surface bursts, subsurface bursts and certain air bursts also produce what is known as neutron induced radioactivity. This is caused by free neutrons from the explosion combining with the weapon fragments and the soil, making them radioactive. When present, this type of radio-

activity will be in the immediate area of the explosion and may remain for a long time. Because these "hot" areas *could* exist following *any* nuclear explosion, you should *not* move into or across an area where a nuclear weapon exploded until it has been checked and found safe to cross.

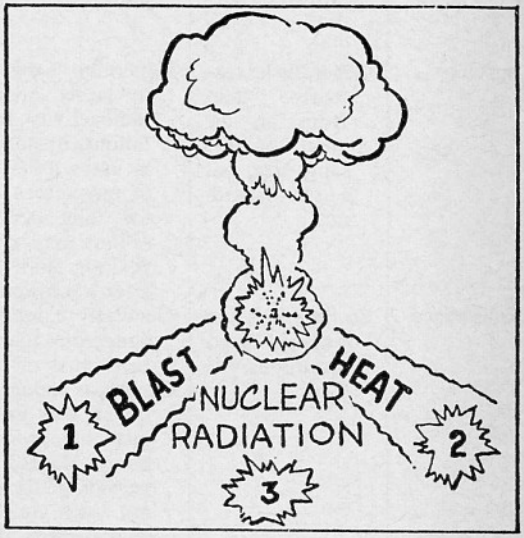
Types of Nuclear Explosions

1. ***General.*** In general, the three types of nuclear explosions are referred to as air, surface, and subsurface bursts. The type of burst determines to a great extent the amount and kind of damages that will be done. See Figure **22.4** for a comparison of the effects caused by the three types of burst.

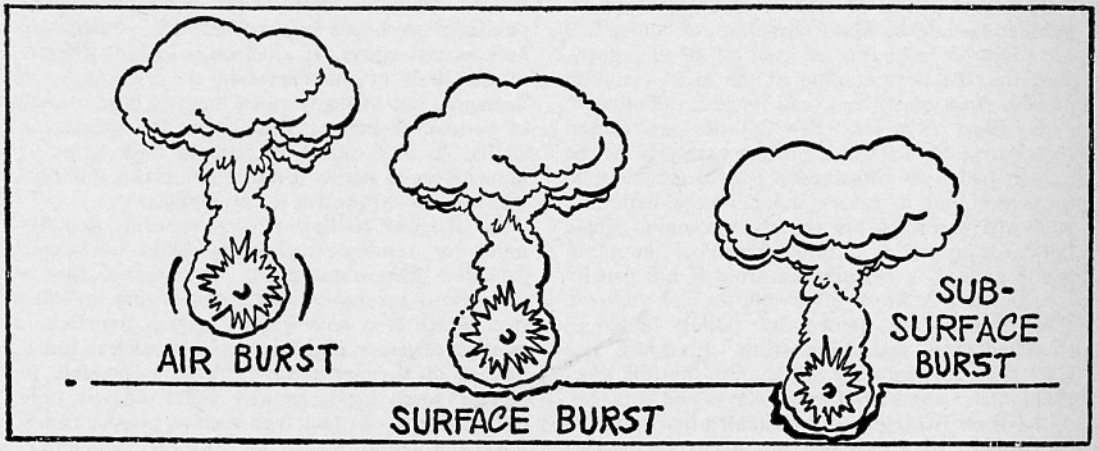
2. ***Air Burst.*** This is a burst in which the fireball does not touch the surface of the earth. The greatest damages are from blast and heat. The only hazardous radiation is the initial nuclear radiation and the neutron-induced radiation in the immediate area of the burst.

3. ***Surface Burst.*** This is a burst on or above the surface which permits a portion of the fireball to touch the surface. Blast damage is reduced but damage from heat is about the same as from an air burst of the same size. About the same amount of initial nuclear radiation is also present. Residual nuclear radiation occurs as fallout downwind from the burst. There is also some neutron-induced radioactivity in the immediate burst area.

4. ***Subsurface Burst.*** This burst has the center of the explosion below the surface of the ground or water. Most of the blast effect takes the form of a ground or water shock wave. Therefore, air blast effect is cut down as is the heat effect. As in a surface burst, considerable radiological contamination is produced in the burst area and also as fallout.



22.2 The effects of nuclear explosions.



22.3 The three types of nuclear explosions.

Type of burst	Initial nuclear radiation	Residual nuclear radiation contamination (target area and/or fallout)	Blast	Heat (thermal radiation)
Air	Extensive and hazardous. Hazard exists, however, only during explosion.	Negligible except as induced radioactivity in soil in target area following low air bursts.	Extensive	Extensive.
Surface	Generally less extensive than from an air burst of the same size, but still hazardous.	Generally extensive. Occurs in target area as induced radioactivity in soil and as fallout in target area and in areas miles downwind of of target area. Hazard lasts for long periods of time; fallout may not reach your position until several hours after explosion.	Concentrated in smaller area than in an air burst.	Affects smaller area than does an air burst.
Subsurface .	So little it is not considered hazardous.	Generally extensive and more dangerous than from a surface burst of the same size. Occurs as induced radioactivity in soil and as fallout, just as from a surface burst. Hazard lasts for long periods of time; fallout may not reach your position until several hours after explosion.	Concentrated in smaller area than in either air or surface bursts.	Negligible because most of it is absorbed or deflected by ground or water.

Figure 22.4 Comparison of hazardous effects of the three types of nuclear explosions.

Types of Injury

The three effects of nuclear explosions can all produce casualties. Many casualties, of course will have injuries from two, or even all, of the effects. Described below are some of the more common injuries from blast, heat, and nuclear radiation.

1. ***Blast Injuries.*** Few injuries are caused *directly* by the blast of a nuclear explosion as the human body can withstand pressures greater than those required to knock down strong buildings. Ruptured eardrums are the most common single injury occurring as a direct result of the blast. While painful, a ruptured eardrum is not usually incapacitating. Most blast injuries are *indirect,* that is they are caused by falling buildings, shattered glass, and flying debris. Blast will also start fires by rupturing gas mains, shorting electrical systems and overturning stoves and furnaces.

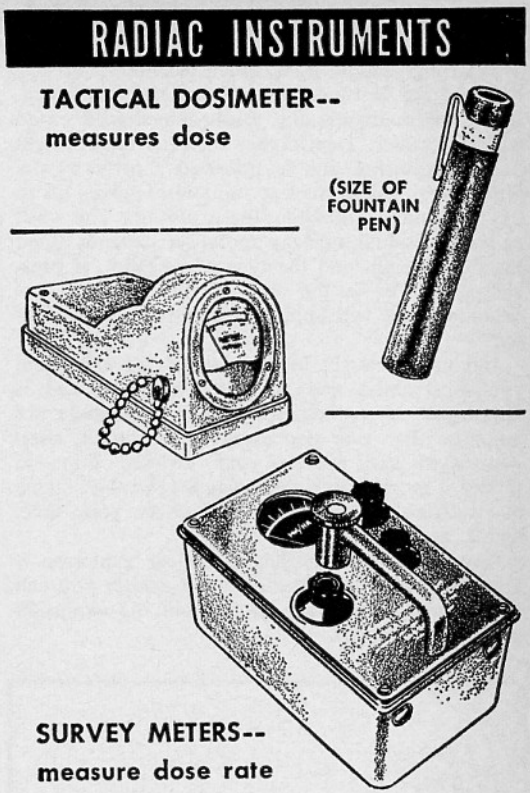
2. ***Heat Injuries.*** It is estimated that about 30 per cent of the casualties resulting from the two nuclear explosions in Japan were due to burns. People within two miles of the explosion received painful flash burns on exposed skin. Secondary fires burned others. If a person is looking directly at the flash of the explosion the eyes may be damaged, but in many cases there is little chance of permanent injury. Temporary flash blindness, similar to that caused by camera flash bulbs, is more likely to occur. Flash blindness of this type will last only from five to 20 minutes.

3. ***Nuclear Radiation.*** Overexposure to either initial or residual nuclear radiation can cause radiation sickness and death. The damage done is determined by the *amount* received and the *time* over which it is received. It takes a tremendous amount of either initial or residual nuclear radiation to do serious harm. Thus it is possible to receive some exposure and suffer no, or only minor, injury. In fact, you receive nuclear radiation from natural sources all your life. The difference is in the amount received in a given time.

The effects of nuclear radiation are not noticeable during exposure. But enough nuclear radiation will cause illness or even death. The symptoms are nausea, vomiting and a weak feeling. These may appear in a few hours. In minor exposure cases they soon disappear. They may or may not occur again, depending on the dose. *Anyone slightly exposed will quickly recover. One who receives a moderate overdose may be ill for weeks or months, but will recover.* Very heavy doses will eventually result in death.

a. *Detection and measurement.* There are specially designed electronic instruments for the detection and measurement of nuclear radiation. (See Figure **22.5**).

The instruments are of two types: (1) *survey meters,* used to locate contaminated areas and measure the amount of contamination and; (2) *dosimeters,* used to record total dosage received by one Marine or a small group. Tactical dosimeters are worn much like a fountain pen in the shirt or jacket. They show how much radiation the wearer and the Marines with him have received. Specially trained Marines operate the survey meters and inform your commanding officer where and how much nuclear radiation is present. Based on this information he will make decisions as to whether or not an area should be entered and for how long. Remember, *even minute particles of nuclear radiation can be detected, but much greater amounts are required to produce casualties.*



22.5 Nuclear radiation detection and measuring equipment.

Before Explosion

You will be warned before a friendly nuclear weapon is used. You may not get warning of an enemy attack. In either event, the important thing is to *take cover* just as you would if regular high explosives were being used. If no cover is immediately available—*hit the deck!* Lie face down and cover your exposed skin. If cover is available, the more material and distance between you and the explosion, the better. A standing foxhole is better than a slit trench and a covered foxhole is still better. (See Figure **22.6**). A well constructed dirt covered foxhole will remove nuclear radiation by about 90%. Steel and concrete afford excellent protection also.

Clothing affords protection too. It cuts down the effects of heat and lessens the possibility of flash burns. Any additional material such as a raincoat, poncho, shelter half, or even a board, will give additional protection from heat and also keep radioactive dust particles from falling directly on you. Radioactive dust can later be removed by shaking the outer garment in the wind or brushing. Equipment should also be secured and, if possible, covered. This will prevent the equipment from being blown around in the blast and ease the task of decontamination. Digging in is the best way to secure equipment. Your personal gear should be placed in your foxhole with you. Gloves and gas masks will help protect your exposed skin.

The Explosion Phase

A strong, intense light, much brighter than sunlight, is your first indication of a nuclear explosion. Almost immediately the mushroom-shaped cloud will be formed. Heat comes with the intense light of the explosion and is followed shortly by the blast wave. Initial nuclear radiation is given off in the first minute following the explosion. The existence of residual nuclear radiation depends upon the burst height and the type of weapon. If present, it will be in the area of the explosion immediately and will appear downwind later as fallout.

If you get caught in the open by an explosion, you must think and act fast. Every second is important. If a ditch, wall, or your foxhole are no more than *one* step away—take shelter, close your eyes and protect your exposed skin. If shelter is more than a step away *hit the deck* facing *away* from the explosion and cover your face, hands, and neck.

If you are warned that a nuclear explosion is about to occur, pick the strongest shelter you can get to in a hurry, face away from the explosion area and get down.



22.6 Deep, covered foxholes are best protection.

After the explosion, stay sheltered until heavy material has stopped falling—about 90 seconds. The danger from the blast wave and *initial* nuclear radiation will also be past at that time. Prepare to continue your mission. Your commanding officer will pass the word on the areas of contamination, the amount of dosage, and what you are to do next.



22.7 Personal decontamination.

After the Explosion

A nuclear explosion does not end the fight. Afterwards, you will attack or defend, depending on the mission of your unit. You must be prepared to follow up a friendly nuclear attack on the enemy—or to defend against a follow up of his nuclear attack. You must also take action against fallout. Improve your shelter and remain under cover until told to come out. If dirt seeps into

your foxhole, scoop it out and dig deeper, piling the fresh earth over the contaminated dirt that fell inside. Be ready to give first aid to yourself and your fellow Marines. Treatment of burns and injuries from a nuclear explosion is the same as for any other similar wounds. There is no first aid for exposure to nuclear radiation. Treatment for radiation sickness is conducted by medical personnel. Therefore, continue your mission. You may be assured that if the symptoms of radiation sickness appear, the medical department will take care of you. If you suspect you may have eaten or drunk contaminated food or water, quickly force vomiting and seek medical aid. If the instruments shown in Figure **22.5** show you have contaminated particles on your person, you will be sent to a decontamination station for a change of clothing and bathing. A monitor will check you and make sure all contamination is washed away. GI soap, brushes, and warm water will do the job. (See Figure **22.7**).

Summary

The two charts below summarize the effects of a nuclear explosion and the action you should take to enable you to continue fighting as a Marine on the nuclear battlefield.

EFFECTS of a NUCLEAR BURST		
BLAST	**SUDDEN SHOCK**	Shock pressure from burst is not enough to kill. Flying objects and falling debris cause almost all injuries. Keep down, close to shelter.
HEAT	**1 FLASH HEAT**	Bare skin can be burned at great distances from explosion. Your clothes or any other material which will cast a shadow gives protection. Keep minimum amount of skin area exposed.
HEAT	**2 FIRES**	Flash heat starts forest and brush fires. Fuel and short-circuits start others. Fight these fires in the normal manner.
NUCLEAR RADIATION	**1 INITIAL NUCLEAR RADIATION**	Most radiation occurs in the first minute after explosion. By the time objects have stopped falling, there is no danger from initial nuclear radiation. In most cases, if you are not wounded or burned, you need not worry about initial nuclear radiation.
NUCLEAR RADIATION	**2 FALLOUT**	From an air burst*, it is not dangerous. If fallout follows another kind of burst*, you will be told what to do.

INDIVIDUAL ACTION *to protect against a* NUCLEAR BURST		
BEFORE BURST		If ALERT is sounded, follow unit SOP. If warned before explosion, pick strongest shelter you can find in a hurry. Underground shelters, basements, deep foxholes, and tanks give good protection.
DURING AND AFTER BURST	**1 TAKE COVER**	If you see BRILLIANT LIGHT brighter than sunlight, DIVE FAST to put something (dirt, tree, wall) between you and explosion. FALL FLAT on ground, face down, if you cannot reach shelter in 1 step. CLOSE EYES. Keep head covered. Protect FACE and HANDS. Stay until blast effect is over or until heavy material has stopped falling.
DURING AND AFTER BURST	**2 STAY CALM**	Be ready for orders and instructions. Help your leaders to re-form your unit. Your life and your unit depend on your doing the right thing at the right time.
DURING AND AFTER BURST	**3 CONTINUE MISSION**	The nuclear burst is only one part of the enemy's plan. Be ready for more to come. Expect an enemy attack after an explosion near your position. Be prepared to attack following an explosion on enemy positions.

*Air burst: weapon explodes in air. Surface (at ground level) or subsurface (below ground level) **bursts reduce blast and heat effects but increase** fallout.



Chapter 23

Small Arms (General)

Introduction

THE purpose of this chapter is to present the general basic principles of military small arms weapons. It does not describe weapons in detail but instead describes underlying functions and principles which are common to all weapons of a selected class. Included are general instructions on care, cleaning and safety precautions.

Principles of Small Arms

A. Small Arms Classification. The class of small arms weapons includes all weapons with a bore diameter (caliber) of 0.60 inches or less. All small arms may be classified as either *hand weapons, shoulder weapons* or *machine guns.*

Hand and shoulder weapons are individual weapons; machine guns are crew served. There are some machine guns in use that can be fired from the shoulder, but they are still classified as crew served.

1. Hand Weapons. Hand weapons are those weapons which are held in one hand for firing (pistols and revolvers). They are primarily used for defensive purposes because of their short range.

2. Shoulder Weapons. Shoulder weapons are those which are braced against the shoulder when firing to absorb the shock of recoil and to increase the probability of hitting the target (rifles, submachine guns, shotguns).

3. Machine Guns. A machine gun is a gun that fires small arms ammunition on the automatic principle. The difference between the automatic rifle and a machine gun is not sharp, but the machine gun is usually distinguished by having some form of fixed mount, such as a tripod or wheels and trail which sustain the force of recoil, and by means of which the direction of fire may be clamped. The machine gun is referred to as being light or heavy. Light machine guns are usually air cooled in which sustained rate of fire is low. Heavy machine guns are usually water cooled in which the sustained rate of fire is high.

B. Operating Characteristics. The operations of loading, firing, and unloading a firearm are generally familiar to everyone. In a technical description of the operation of a weapon, however, it is necessary to divide the operations into elementary functions and to describe those parts of the weapon which perform the operations.

1. Feeding. The placing of a cartridge in the receiver ready for chambering.

2. Chambering. When the bolt has stripped the new round from the feed mechanism and is moving it forward into the chamber.

3 Locking. That phase of operation which deals with the positive locking of the breech end of the barrel to make the weapon safe for firing.

4. Firing. Ignition of the primer when it is struck by the striker of a firing pin.

5. Unlocking. It occurs after the firing of the round. It is the opening of the breech end of the barrel.

6. Extracting. Pulling the empty case from the chamber.

7. Ejecting. Expelling the empty case from the receiver.

8. Cocking. Preparing the firing mechanism for the next firing phase.

C. Weapon Operating Systems. The type of operation which supplies the force for weapons to function may be manual, recoil, blowback, or gas.

1. Manual. Manually operated weapons require the shooter to provide the force for all phases of operation. Thus they cannot be automatic or semi-automatic, and only a limited number of

rounds can be fired per minute. The U. S. rifle caliber .30 M1903 is a manually operated weapon.

2. Inertia or blowback. Inertia or blowback operated weapons use part of the expanding powder gases in the barrel to force the bolt to the rear. The weight of the bolt backed up by a strong spring keeps the bolt closed during the moment of firing and while the gas pressure is high. The Thompson Sub-Machine Gun is a blowback type weapon. A blowback operated weapon usually has no positive locking devices.

3. Recoil. Recoil operation utilizes the rearward push of the cartridge case against the face of the bolt to move the bolt, barrel and other parts rearward. There are two types in use today. The short recoil, in which the bolt, barrel and barrel extension move rearward locked together for a short distance, where the bolt unlocks and continues independently to the rear. The automatic pistol caliber .45 M1911A1 and the Browning Machine Guns use this system. This type of operation is used where the rate of fire is high. In the long recoil system, the bolt, barrel and barrel extension move rearward the entire distance locked together. The barrel and barrel extension unlock from the bolt and as they move forward a new round is chambered and the bolt is tripped and closed. This type is used where the rate of fire is not high, such as the automatic shotgun and automatic artillery. In both types the barrel must move, an easy identification feature.

4. Gas. Weapons operated by gas use part of the expanding powder gases in the barrel to move a piston which is housed in a cylinder. This piston provides the force needed to make the piece function. The M1 rifle and BAR are examples of gas operated weapons.

D. Glossary of Small Arms Terms.

Chamber Pressure. The pressure on the chamber walls resulting from the expanding gases of the fired cartridge.

Muzzle Velocity. The speed at which the bullet travels when it leaves the barrel; e.g., the muzzle velocity of the BAR is 2800 FPS (feet per second).

Rate of Fire. The number of rounds fired in one minute. See cyclic rate of fire; sustained rate of fire.

Sustained Rate of Fire. The actual rate of fire that a weapon can continue to deliver for an indefinite length of time without seriously overheating.

Cyclic Rate of Fire. The theoretical number of rounds a weapon can fire in one minute, disregarding the limits of overheating and the capacity of the magazine. The U. S. Browning Automatic Rifle Caliber .30, M1918A2, given unlimited ammunition and with no malfunctions, could theoretically fire 550 rounds per minute. This means that the BAR takes 1/550 of a minute to fire each round.

Care and Cleaning

A. General. The Marine today is armed with the finest infantry weapons devised by man, but unless he gives them the proper care, they are no better than the clubs carried by cave men. Seventy-five per cent of the stoppages that occur on a modern automatic or semi-automatic weapon can be traced back to improper care and cleaning. In general, the care and cleaning of your weapon is a simple job, but there are a few things to remember under unusual conditions. Let us first take a look at some of the tools that you use to care for your weapons:

1. Cleaner, rifle bore. This fluid dissolves corrosive primer salts left in the bore of weapons after firing.

2. Oil, lubricating, preservative, special. Used for day by day protection of weapons at all temperatures down to -50 degrees F.

3. Rod, cleaning. A steel or brass rod with a swivel handle on one end and provisions for holding a cleaning patch or cleaning brush on the other, used to clean the bore of a weapon. Some rods may be taken apart making them compact for carrying.

4. Patch, cotton flannel. A two-inch square piece of cloth used with the cleaning rod to clean the bore of a weapon. Patches are usually packed in a waterproof envelope holding 20 patches.

5. Brush, wire. A brush having brass bristles used with a cleaning rod and rifle bore cleaner to clean the bore of a weapon after firing.

6. Toothbrush. Used to clean out corners and crevices.

B. Cleaning of Weapons in Garrison. The daily care of your weapon is a small job requiring only a few minutes of your time. Then you will have a weapon that will pass inspections and stand by you when you need it. Here is all there is to it:

1. Inspect your weapon. Be *sure* the chamber is empty.

2. Field strip it.

3. With a dry rag, wipe off all old oil and dirt.

4. Use your toothbrush to clean the corners, screw heads, etc.

5. Run a dry patch through the bore to remove the old oil and dirt. Repeat this process until several patches come out clean. If the bore is still dirty, proceed as you would to clean the weapon after firing.

6. Run a lightly oiled patch through the bore. Don't forget the chamber.

7. Put a light coat of oil over all metal parts on your weapon, being careful not to trap perspiration off your fingers under the oil, where it can start rust.

8. If your weapon is magazine fed, inspect the interior of the magazine by depressing the follower. If the interior is dirty or rusted, disassemble, clean and oil lightly. You can avoid many stoppages by always handling your magazines so that they will not become dirty or dented.

9. Assemble your weapon and store it in a dust-free place. REMEMBER:

DO

1. Clean your weapon at least once a day.

2. Clean the chamber with the same care as the bore.

3. Use a toothbrush to clean the small, hard-to-reach parts. Your squad leader may miss it, but will your weapon forget it?

4. Run a patch all the way through the bore before you try to pull the rod back out.

DON'T

1. Don't use unauthorized cleaning materials. They will damage your weapon.

2. Don't handle parts carelessly after you have oiled them. Perspiration from your hands will cause rust.

3. Don't place a patch or plug in the muzzle of your weapon. The barrel will rust due to moisture trapped by the patch. Serious injury may result if you should forget to remove the patch or plug and attempt to fire the weapon.

4. Don't wrap your weapon. The wrapping will hold moisture and rust your weapon.

5. Don't attempt to disassemble your weapon beyond authorized stripping. You may damage certain parts beyond repair.

6. Don't damage the face of the bolt with a cleaning rod that is too long. The rod should be long enough to pass through the bore and chamber but not so long that it strikes the face of the bolt. If a long rod is used, remove the bolt or cover the face of the bolt with a cloth stuffed into the receiver.

C. Cleaning Weapons Before Firing. Before you fire your weapon you should do the following:

1. Clean your weapon as you would in garrison but *DO NOT* put oil in the bore, chamber, or on parts of the weapon that will come in contact with the ammunition.

2. In the field make sure there is no dust, dirt, mud or snow in the bore. Failure to observe this precaution may result in serious injury.

3. If your weapon is magazine fed, check to see that magazines are clean and operative.

D. Cleaning Weapons After Firing. After your weapon has been fired the task of cleaning it is even more important than the every day care you give it in the barracks. When the primer of the military cartridge explodes it covers the bore with potassium chloride, a substance like table salt. This salt in the bore holds moisture and starts rust. As rusting progresses it eats into the metal in the bore, leaving a hole or pit. Pits not only weaken the metal but allow gas to escape around the bullet, cutting down muzzle velocity and accuracy. Therefore barrels that are badly pitted must be replaced. If properly cared for, a weapon may be fired for years without pitting. Here is how it's done:

1. Follow steps 1 to 4 as you would when cleaning your weapon in garrison.

2. Run a patch soaked with rifle bore cleaner through the bore, following this with a wire brush, then by several dry patches. Repeat this process until the dry patches come out clean. Clean the chamber the same way.

3. Clean the face of the bolt, piston and cylinder (on gas operated weapons), and inside of receiver with a patch soaked in bore cleaner. Clean the bore cleaner off with several dry patches.

Repeat this process until all traces of carbon are removed.

4. Follow steps 6 to 8 as you would when cleaning your weapon in garrison.

5. Important. Repeat this entire process daily for at least three days after the weapon has been fired.

REMEMBER:

DO

1. Clean your weapon as soon as possible after firing.

2. Clean your weapon daily for the next three days.

3. Run the wire brush all the way through the bore. Pumping it back and forth in the barrel will ruin the brush.

4. Clean the chamber, face of bolt and other places where carbon has accumulated with rifle bore cleaner.

DON'T

1. Don't use commercial type bore cleaner.

E. Care of Weapons in Arctic Climates. In the cooler regions of the earth, grease and oil thicken and cause much trouble. These materials, while fluid at normal temperatures, usually become thick or almost solid as the temperature drops below freezing. Consequently, they can slow down or stop the operation of weapons. For this reason, the proper type of lubricants must be used and then only in small quantities.

Much difficulty is caused by bringing cold weapons into a warm room or tent. When the cold metal of the weapon comes in contact with the warm moist air, condensation takes place, leaving drops of moisture on the weapon. These drops of moisture will cause rust, or will freeze when the weapon is taken out-of-doors. If possible, weapons should be stored in unheated sheds. Snow, blown or drifted into the weapon, will cause no harm as long as the temperature is below freezing. But when the weapon becomes heated by firing the snow melts and the moisture spreads to other surfaces. When the weapon cools, the moisture will freeze and lock the mechanism tightly, preventing further operation. Occasional operation of the weapon by hand may keep its parts from freezing together.

F. Care of Weapons in Tropical Climates. In those tropical parts of the world where large water areas exist, there is a large amount of moisture in the air and extra precautions must be taken to prevent your weapon from rusting. At times it will be necessary to clean your weapons more than once a day.

G. Care of Weapons in Desert Climates. Due to the fact that there is little moisture in the air, rust is a small problem on the desert, but where vegetation does not cover the earth, a large quantity of dirt, dust and sand is constantly swept through the air by wind. This material sticks to exposed oil and grease on your weapons. A grit of this nature, caught between moving parts, increases friction. A large amount will jam the moving parts and prevent their functioning. If the weapon does function under these conditions, the parts will almost certainly become worn, resulting in stoppages and require frequent replacement of parts. Remember, in desert climates, use as little oil as possible and clean your weapon often.

H. Care of Wooden Parts of Your Weapon. The wooden parts of your weapons should receive the same amount of care as those made of metal. Wood that is allowed to dry out will crack or rot. This can be prevented by applying linseed oil. Care should be taken when applying linseed oil not to get it on the metal of your weapon. Linseed oil on metal drys into a sticky film that is hard to remove. To apply linseed oil, simply place a little in the palm of your hand and rub it into the wood until the wood is dry and shiny. Wipe excess linseed oil off the wood before assembling the weapon. Never put varnish, enamel, or silicon on the wood.

I. Repairs. When you find a part broken or missing on your weapon, report it at once. Your weapon will be repaired by a qualified ordnance repairman. Above all do not attempt to detail

strip or repair your weapon yourself. Modern military weapons are expensive and made by precision methods. Without the proper skill and tools, attempts by you to repair your own weapon can be damaging to the weapon and dangerous to you.

J. Special Instructions. Due to the difference in operation and construction of some weapons, additional steps and precautions are required for their care that are not covered by this chapter. These special instructions will be covered in the chapter on the particular weapon.

Safety Precautions

A weapon is just as safe as the man behind it, regardless of how well built it is or how many safety features it has. Unless the man who handles it respects it as a deadly weapon, it is a source of danger to him and everyone near him. Many tragic accidents can be avoided if everyone will remember a few simple safety precautions when handling firearms.

A. General Rules.

1. Consider every weapon to be loaded until you examine it and find it to be unloaded. Never trust your memory in this respect. There is an old saying among hunters that "*the empty gun shoots the loudest.*"

2. Never point a weapon at anyone you do not intend to shoot, or in a direction where an accidental discharge may do harm.

3. Never fire a weapon until it has been inspected to see that there is nothing in the bore or chamber. Firing a weapon with any obstruction in the bore may burst the barrel, resulting in serious injury to you or your buddies.

4. Never grease or oil your ammunition. Some foreign weapons are designed to use greased or oiled ammunition, but the use of such ammunition in your weapon will result in dangerously high pressure in the chamber and barrel.

5. Never place a cartridge in a hot chamber unless you intend to fire it immediately. Excessive heat may cause the cartridge to ignite, resulting in an accidental discharge.

6. Do not allow your ammunition to be exposed to the direct rays of the sun for any length of time.

7. Always unload your weapon if you leave it where someone else may pick it up.

8. Examine all live or dummy ammunition. Turn in all cartridges with loose bullets, dents, or those which appear to be defective in any way.

9. Whenever you handle a weapon *T-H-I-N-K* of what you are doing. Accidents don't just happen; they are usually caused by carelessness.

B. Rifle Range Precautions. These rules generally apply to all ranges, however, each range will have its own set of rules:

1. Danger flags will be displayed at various prominent positions on the range during firing.

2. The bolts of all rifles, shotguns, machine guns, and slides of all pistols will be open when not on the firing line.

3. The bolts of all BARs and Thompson Sub-Machine guns will be in the forward position with magazine removed, when not on the firing line.

4. All loading and unloading is executed on the firing line with the muzzle of the weapon pointed toward the target. Weapons will never be loaded in the rear of the firing line.

5. No weapon is to be loaded until the command *LOAD* is given.

6. All firing must be controlled by signals or commands. Firing will not begin on any range until the officer in charge has given the command to load and commence firing.

7. At the command CEASE FIRING all firing immediately ends and the weapons are set at SAFE (or cleared if ordered).

8. No weapon will be removed from the firing line until it has been inspected to see that it is clear of ammunition and the safety set at *SAFE.* It will also be checked to see if the bolt is open (except the BAR and TSMG which will have the bolt forward, magazines removed).

9. No person is allowed in front of the firing line for any purpose until directed by an officer who first orders all weapons to be cleared and ascertains that the order has been carried out. No weapon is carried in front of the firing line.

10. No snapping in or magazine drill or test (on weapons or equipment) is permitted behind the firing line.

11. Target personnel must not leave the designated safety area until the signal or command to do so is given.

12. No ammunition will be removed from the range except upon order of the Range Officer.



The Pistol

A. ***General.*** The automatic pistol, caliber .45 M1911A1, is a recoil operated, magazine fed, self-loading hand weapon. The pistol is a comparatively short range weapon and has the following characteristics:

WEIGHT WITH FULL MAGAZINE	2.76 lbs.
MAGAZINE CAPACITY	7 rounds
MUZZLE VELOCITY	802 feet per second
MAXIMUM RANGE	1600 yards
LENGTH	8.59 inches
LENGTH OF BARREL	5.03 inches
TRIGGER PULL	5 to 6½ lbs.
MAXIMUM EFFECTIVE RANGE FOR TROOPS	50 yards

Nomenclature and Stripping

A. Nomenclature. The nomenclature of the pistol is given in detail in Figures **24.1** and **24.2**.

B. Stripping. Stripping is divided into two classes, field stripping and detail stripping. As the pistol is detail stripped only in an armory or by qualified personnel, field stripping will be the only class explained here. To field strip the pistol:

First, be sure your pistol is unloaded. Point the pistol in a safe direction, remove the magazine by pressing the magazine catch, pull the slide to the rear and inspect the barrel and chamber for live rounds. Release the slide and lock the safety lock. Rest the butt of the pistol on a flat surface, barrel and receiver group in a vertical position, butt down and pointing towards you.

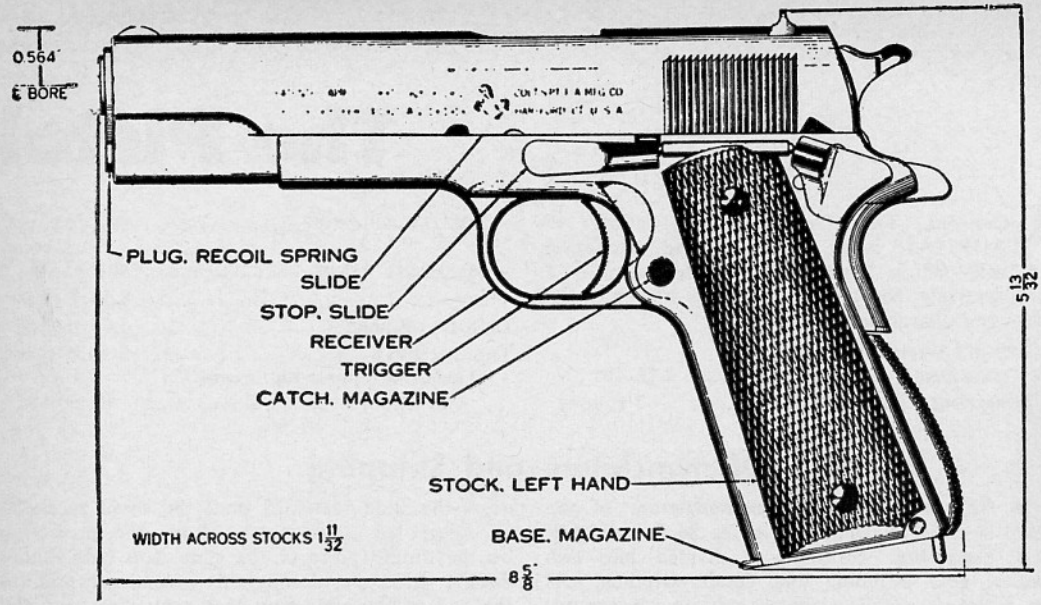
Press the recoil spring plug inward and turn the barrel bushing clockwise. Keep pressure on the recoil spring plug so that it will not fly out of the slide under tension of the recoil spring and be lost or strike the operator. (See Figure **24.3**). Remove recoil spring plug from recoil spring by turning counter-clockwise. After removing the recoil spring plug, turn the barrel bushing counterclockwise and remove the barrel bushing from the slide. Push the safety lock down and draw the slide rearward until the small recess in its lower left edge stands above the projection on the thumb piece of the slide stop (see Figure **24.4**). After positioning this recess, press in on the end of the slide stop that protrudes from the right side of the receiver above the trigger guard and remove the slide stop.

This releases the barrel link, allowing the barrel with the barrel link, the link pin and the slide to be drawn forward from the receiver, carrying with them the recoil spring and recoil spring guide (see Figure **24.5**). Remove the recoil spring and the recoil spring guide from the slide by pulling them up and out to the rear. Separate these two parts by pulling the recoil spring guide from the recoil spring with a twisting motion. Next push the barrel link down flat against the barrel, then the barrel with the barrel link may be drawn forward from the slide and by pushing out the barrel link pin the barrel link is released from the barrel. The pistol is now field stripped. (See Figure **24.6**). This is sufficient stripping for proper care and cleaning and further stripping should not be done by the individual.

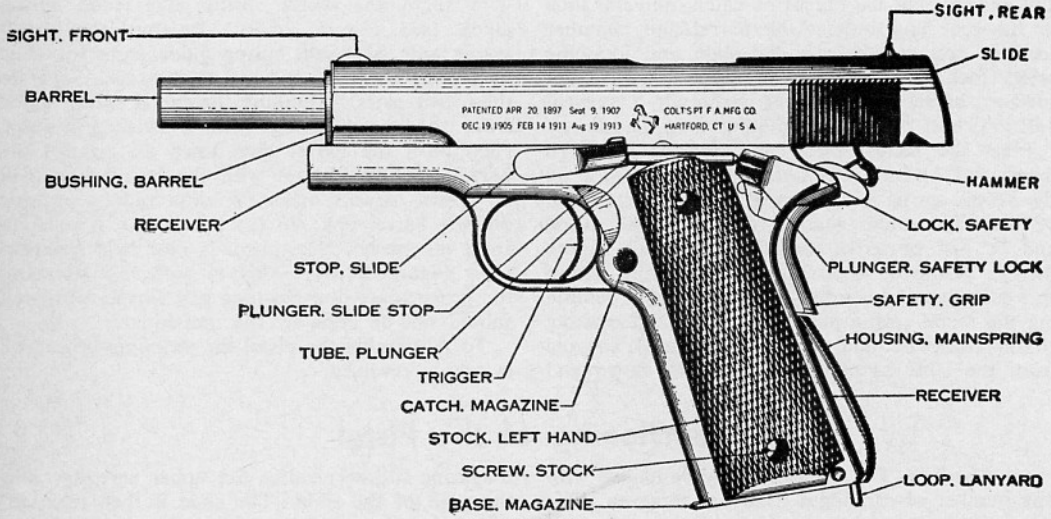
To reassemble the pistol the stripping procedure is simply reversed.

Functioning of the Pistol

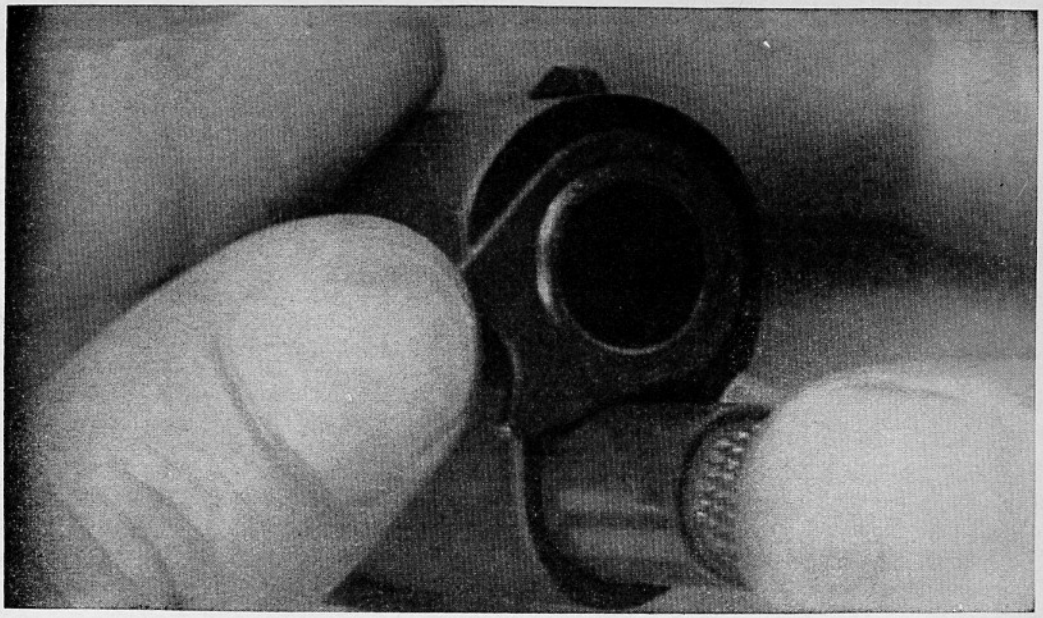
A. Loading. The magazine may be loaded with any number of cartridges from one to seven. The charged magazine is inserted in the receiver and the slide drawn once to the rear. This movement cocks the hammer, compresses the recoil spring, and when the slide reaches the rear position, the magazine follower raises the upper cartridge into the path of the slide. The slide is then released, and being forced forward by the recoil spring, carries the first cartridge into the chamber of the barrel. As the slide approaches its forward position, it encounters the rear extension of the barrel



24.1 Basic Nomenclature (Mechanism in Forward Position).



24.2 Basic Nomenclature (Mechanism in Recoil Position).



24.3 Field Stripping (Removal of Recoil Spring Plug).

and forces the barrel forward; the rear end of the barrel swings upward on the barrel link, turning on the muzzle end as a fulcrum. When the slide and barrel reach their forward position they are positively locked together by the locking ribs on the barrel and their joint forward movement is arrested by the barrel lug encountering the pin on the slide stop. Pistol is then ready to fire.

B. Firing. When the hammer is cocked the hammer strut moves downward, compressing the mainspring. The sear, under action of the long leaf of the sear spring, engages its nose in the notch of the hammer. In order that the pistol may be fired the following conditions must exist:

1. The grip safety must be pressed in, leaving the trigger free to move.

2. The slide must be in its forward position, properly interlocked with the barrel so that the disconnector is held in the recess on the under side of the slide under the action of the sear spring, transmitting in this position motion of the trigger to the sear.

3. The safety lock must be down in the unlocked position so that the sear will not be blocked but will be free to release the hammer and the slide will be free to move back.

C. Recoil Action. On squeezing the trigger, the sear is moved and the released hammer strikes the firing pin which transmits the blow to the primer of the cartridge. The pressure of the gases generated in the barrel by the explosion of the powder in the cartridge is exerted in a forward direction against the bullet, driving it through the bore, and in a rearward direction against the face of the slide, driving the latter and the barrel to the rear together. The downward swinging movement of the barrel unlocks it from the slide and the barrel is then stopped in its lowest position. The slide continues to move to the rear, opening the breech, cocking the hammer, extracting and ejecting the empty shell and compressing the recoil spring until the slide reaches its rearmost position when another cartridge is raised in front of it and forced into the chamber of the barrel by the return movement of the slide under pressure of the recoil spring.

The weight and consequently the inertia of the slide and of the barrel, are so many times greater than the weight and inertia of the bullet that the latter has been given its maximum velocity and has been driven from the muzzle of the barrel before the slide and barrel have recoiled to the point where the barrel commences its unlocking movement. This construction therefore delays the opening of the breech of the barrel until after the bullet has left the muzzle and therefore prac-

tically prevents the escape of any of the powder gases to the rear after the breech has been opened. This factor of safety is further increased by the tension of the recoil spring and mainspring, both of which oppose the rearward movement of the slide.

While the comparatively great weight of the slide of the pistol ensures safety against premature opening of the breech, it also ensures operation of the pistol because at the point of the rearward opening movement where the barrel is unlocked and stopped the heavy slide has attained a momentum which is sufficient to carry it through its complete opening movement and makes the pistol ready for another shot.

When the magazine has been emptied, the pawl-shaped slide stop is raised by the magazine follower under action of the magazine spring into the front recess on the lower left side of the slide, thereby locking the slide in the open position and serving as an indicator to remind the shooter that the empty magazine must be replaced by a loaded one before the firing can be continued. Pressure upon the magazine catch quickly releases the empty magazine from the receiver and permits the insertion of a loaded magazine.

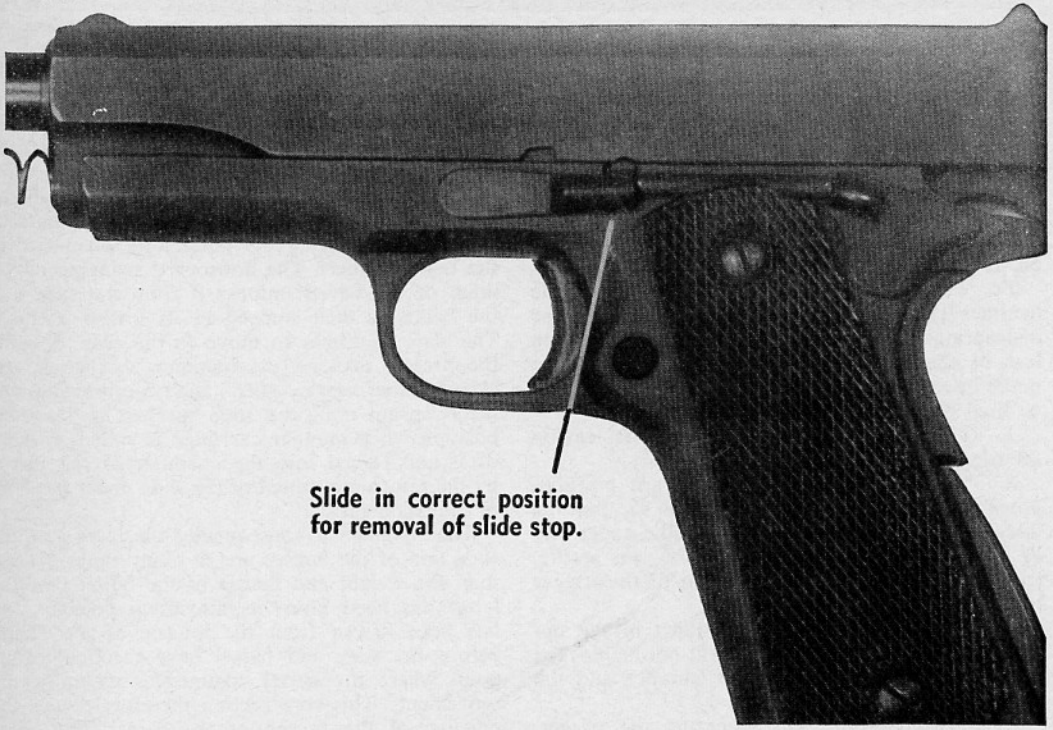
To release the slide from the open position, it is only necessary to press upon the thumbpiece of the slide stop, then the slide will go forward to its closed position, carrying a cartridge from the previously inserted magazine into the barrel and making the pistol ready for firing again.

Care and Cleaning

(See Chapter 23)

Safety Devices and Precautions

A. Safety Devices. It is impossible for the firing pin to discharge or even touch the primer except on receiving the full blow of the hammer. The pistol is provided with two automatic safety

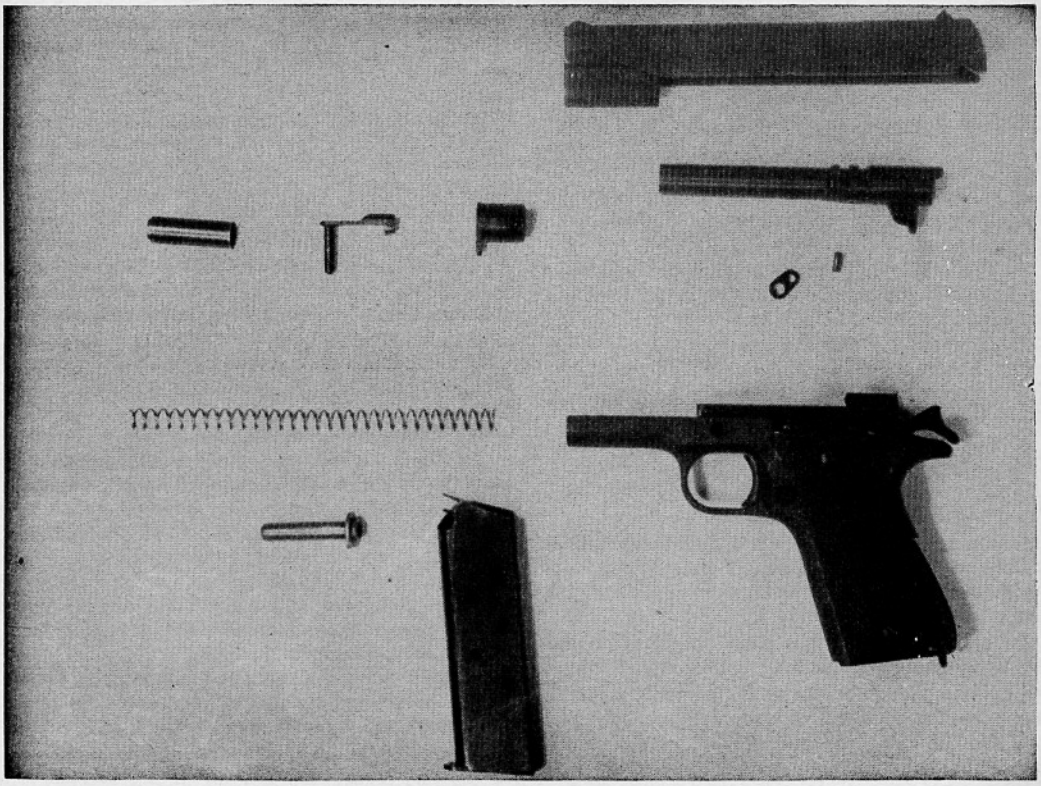


Slide in correct position for removal of slide stop.

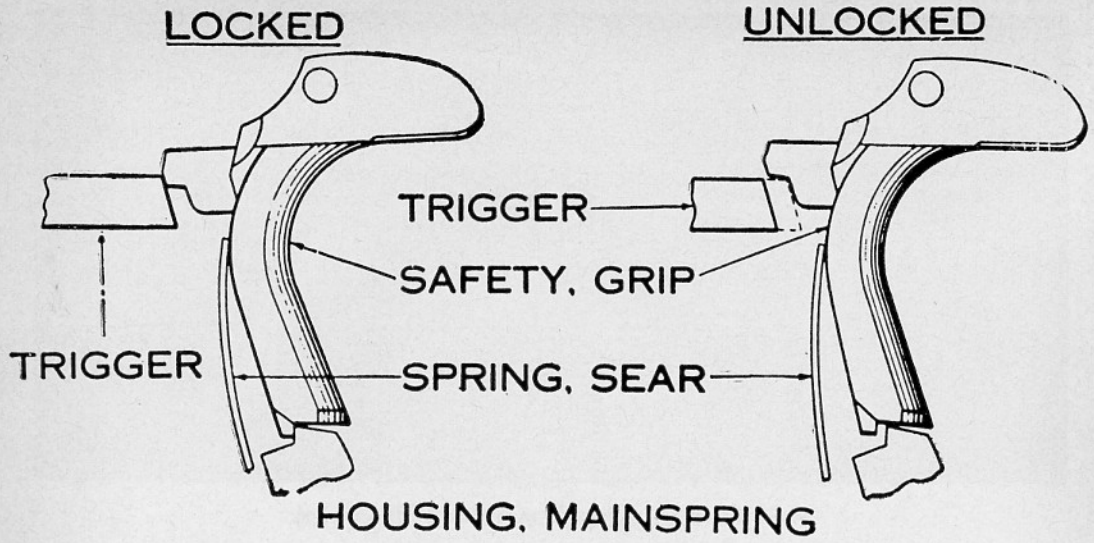
24.4 Field Stripping (Removal of Slide Stop).



24.5 Field Stripping (Removal of Slide Group).



24.6 Field Stripping (Completed).



24.7 Grip Safety Mechanism.

devices to prevent this action taking place until it is intended: (See Figures **24.7** and **24.8**).

1. The disconnector, which positively prevents the release of the hammer unless the slide and barrel are in the forward position and interlocked. This device also controls the firing and prevents more than one shot from following each squeeze of the trigger.

2. The grip safety which at all times locks the trigger unless the handle is firmly grasped and the grip safety pressed in.

In addition, the pistol is provided with a third safety device, the safety lock, by which the closed slide and the cocked hammer can be positively locked in position.

B. Individual Safety Precautions. In addition to the safety precautions explained in Chapter 23 the following should be observed by all men armed with the pistol:

1. Execute UNLOAD every time the pistol is picked up for any purpose. Never trust your memory. Consider every pistol as loaded until you have proved it otherwise.

2. Always unload the pistol if it is to be left where someone else may handle it.

3. Never place the finger in the trigger guard until you intend to fire or snap for practice.

4. On the range, do not insert a loaded magazine until told to do so.

5. On the range, do not load a cartridge into the chamber until immediate use is anticipated. If there is a delay, lock the pistol and only unlock it while extending the arm to fire. Do not lower the hammer on a loaded chamber; the pistol is much safer cocked and locked.

6. In reducing a jam first remove the magazine.

7. To remove a cartridge not fired, first remove the magazine and then extract the cartridge from the chamber by drawing back the slide.

8. Safety devices should be frequently tested. A safety device is a dangerous device if it does not work.

9. In the field, when early use of the pistol is probable, it should be carried loaded and locked in the hand or holster.

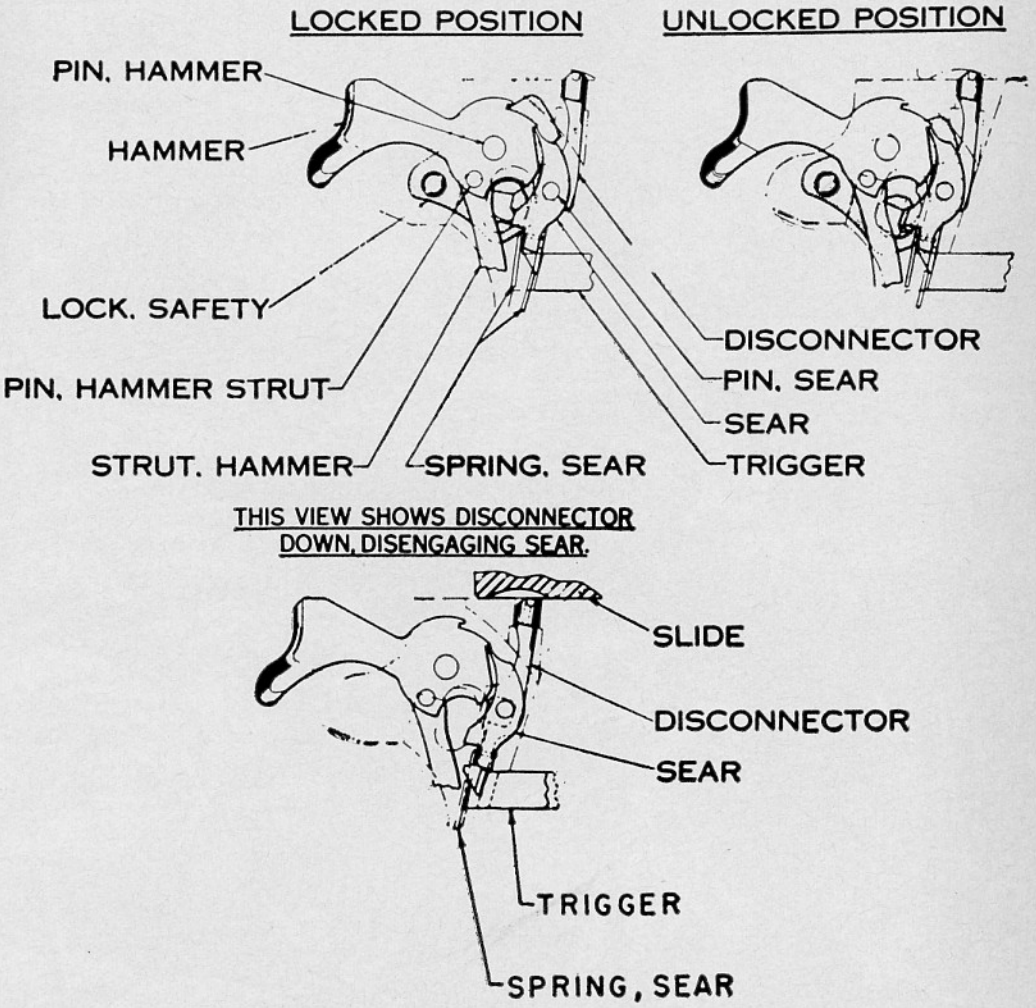
10. When the pistol is carried in the holster loaded and locked, the butt should be rotated away from the body when drawing the pistol in order to avoid unlocking the safety lock.

C. Tests. **1. Safety Lock.** Cock the hammer and then press the safety lock upward into the safe position. Grasp the stock so that the grip safety is depressed and squeeze the trigger three or four times. If the hammer fails, the safety lock is not safe and must be repaired.

2. Grip Safety. Cock the hammer, being careful not to depress the grip safety. Point the pistol downward and squeeze the trigger several times. If the hammer falls or the grip safety is depressed by its own weight, the grip safety is not safe and must be repaired.

3. Half-cock Notch. Draw back the hammer until the sear engages the half-cock notch and squeeze the trigger. If the hammer falls, the hammer or sear must be replaced or repaired. Draw the hammer back nearly to full cock and then let it slip. It should fall only to half-cock.

4. Disconnector. Cock the hammer. Shove the slide one-quarter inch to the rear; hold slide in that position and squeeze the trigger. Let the slide go forward, maintaining the pressure on the trigger. If the hammer falls, the disconnector is worn on top and must be replaced. Pull the slide all the way to the rear and engage the slide stop. Squeeze the trigger and at the same time release the slide. The hammer should not fall. Release the pressure on the trigger and then squeeze it. The hammer should then fall. The disconnector prevents the release of the hammer unless the slide and barrel are in the forward position safely interlocked. It also prevents more than one shot following each squeeze of the trigger.



24.8 Safety Lock Mechanism.



Chapter 25

Hand Grenades

MODERN hand grenades were first used, mainly against enemy machine gun nests and open trenches, during World War I. In World War II hand grenades were widely used, especially in the Pacific Theatre where combat was very often at close quarters.

This chapter tells you about the common types of hand grenades, their parts, and how you use them.

A grenade is a small bomb. It may be filled with either explosives or chemicals or it may be an empty container used for throwing practice. Hand grenades are of various sizes, shapes and types to serve a variety of purposes. What a grenade does depends upon the type of fuze, body and filler used.

The following general types of hand grenades are in use and are the ones ordinarily available in training and combat:

FRAGMENTATION GRENADES, which contain an explosive charge in a body that shatters into small pieces, causing wounds.

OFFENSIVE GRENADES, which have a paper body enclosing a high explosive filler. They are designed for concussion effect with little fragmentation.

CHEMICAL GRENADES, which contain chemical agents designed for various purposes including smoke for signaling or screening, gas for poisonous or irritating effects, or chemicals for burning or incendiary effects.

PRACTICE GRENADES, which use a body and fuze like the fragmentation grenade with a small powder charge designed to familiarize you with fuze action during grenade practice. The body does not burst.

TRAINING GRENADES, which have a removable safety pin and pull ring but no filler or fuze. They are the same size and weight as the practice grenade.

Parts of the Grenade

There are three principal parts to a hand grenade: the body, the filler, and the fuze assembly.

A. The Body. The body of a grenade is the outer case or the container for the filler. It may be made of iron, tinplate, paper, or steel depending on the type of grenade.

B. The Filler. The filler of a grenade varies according to the type of grenade. In chemical grenades, certain chemical compounds are the fillers; in a fragmentation grenade, E-C blank fire powder, or more recently TNT is used. When the filler is either ignited or detonated by the fuze, the action of the grenade is started. The fillers most commonly used in grenades are:

1. TNT, a high explosive, which is used in the offensive grenade and in the newer fragmentation grenades.

2. EC blank fire powder, a commercial type powder, which is granulated, and pink or yellow in color. It is less powerful than TNT and explodes by being ignited rather than by being detonated.

3. CN, which is commonly known as tear gas. It produces a severe burning sensation in the eyes and causes severe weeping.

4. DM, a gas which causes a burning sensation in the nose and throat and a heavy or tight feeling in the chest. Vomiting and mental depression are other effects of DM. The gas is poisonous, but is not considered deadly in ordinary concentrations in the open. A new grenade blends both DM and tear gas.

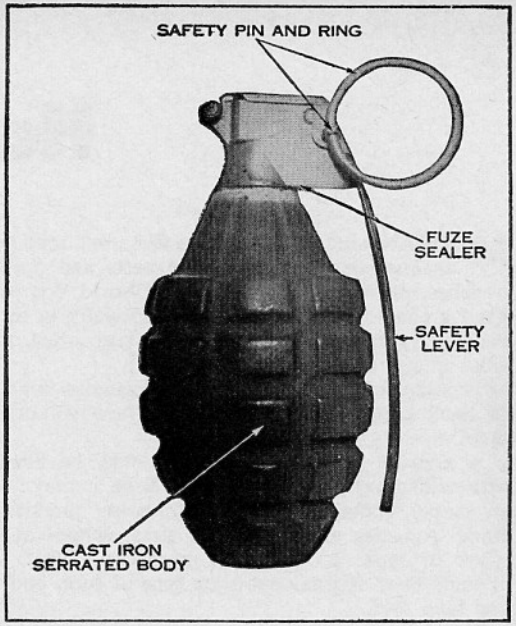
5. HC, which produces a white smoke. It is not injurious when breathed in light concentrations for a short period of time. It is used for signaling and screening.

6. TH, or thermite, is a mixture of chemicals which when ignited burns at a temperature of 4330°F. TH grenades are used to start fires or destroy material by melting metal parts.

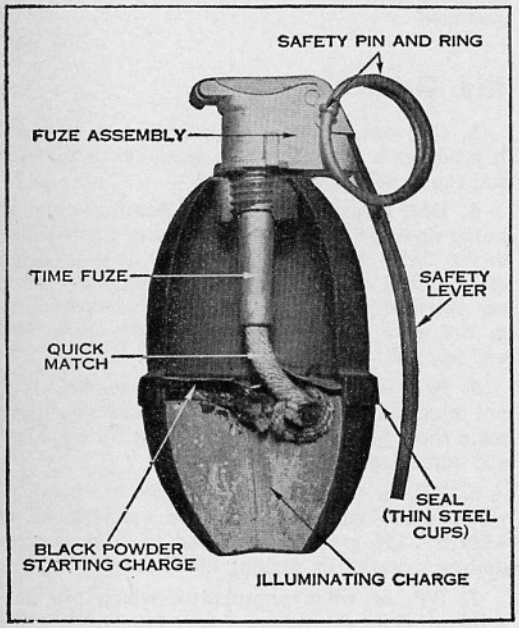
7. WP, or white phosphorus, which produces a dense white smoke upon exposure to air. The grenade bursts and scatters particles of white



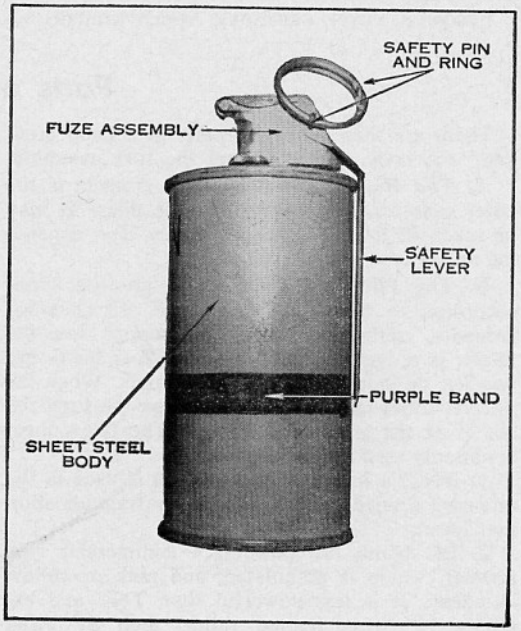
25.1 Fragmentation Hand Grenade M26A1.



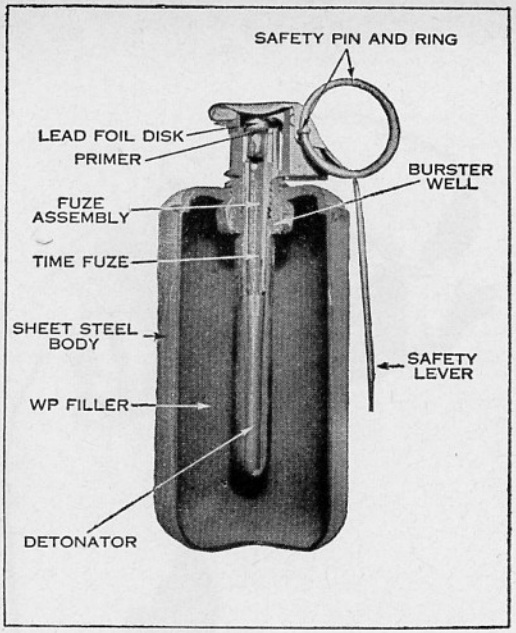
25.2 Fragmentation Hand Grenade MK2.



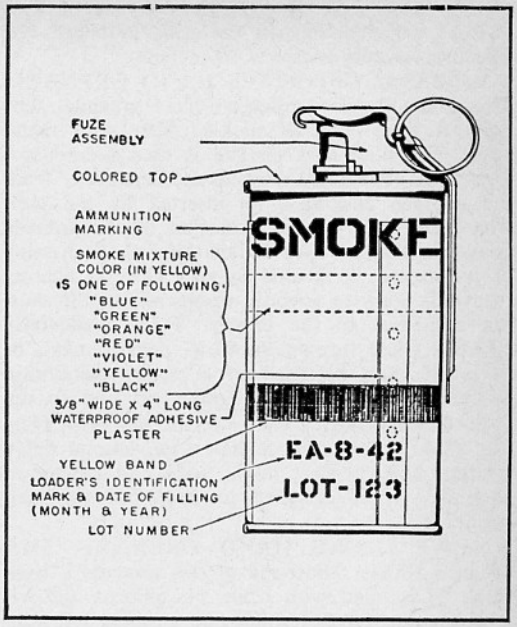
25.3 Illuminating Grenade MK2.



25.4 Incendiary Grenade AN-M14.



25.5 Smoke Hand Grenade M15.



25.6 Colored Smoke Hand Grenade M18.

phosphorus. The particles ignite spontaneously upon exposure to air and may start fires, cause casualties if they get on the body or act as a screening agent.

8. Colored smoke which contains smoke producing chemicals and a dye which gives the smoke its color. Such grenades are used as signals.

C. The Fuze Assembly. The fuze assembly is the mechanism that fires the grenade. Hand grenade fuzes are of two major types, igniting and detonating. Igniting type fuzes burn and are used when the filler can be started by burning as in the case of all chemical type grenades except WP. The M200A1 and M210 are igniting fuzes. The M210 functions noiselessly. Detonating type fuzes themselves explode and in turn explode fillers such as TNT with which they are used. The M6A4C and the M204 are detonating fuzes. The M204 functions noiselessly. All hand grenade fuzes are both time and automatic. "Time" means that the grenade goes off a certain length of time after its action is started. "Automatic" means that the fuze begins to function automatically as it leaves the hand, if the safety pin has been removed. Igniting type fuzes commonly have a time delay of two to three seconds. Detonating type fuzes have a time delay of four to five seconds.

Characteristics and Capabilities

The essential characteristics and capabilities of hand grenades are as follows:

1. FRAGMENTATION HAND GRENADES. (Figures **25.1** and **25.2**).

a. M26A1. This is the standard fragmentation grenade. The body is smooth sheet metal and is shaped like a lemon. Inside the body is a serrated wire coil and a filler of Composition B. When detonated, the coil, body, and fuze fragments are hurled in all directions. Some may travel as far as 185 meters. The effective casualty radius is 15 meters. This grenade is used on both the offensive and defensive and is especially good at night since a target can be struck without perfect aim and the position of the thrower is not disclosed.

b. MK2. This grenade is now limited standard. It has a cast iron body that is deeply grooved in crisscross fashion. It has the same uses as the

M26A1 and functions in the same manner. The effective casualty radius is 10 meters.

2. MK3A2 OFFENSIVE HAND GRENADE. This is the standard offensive hand grenade. The body is a cylinder of pressed fiber with metal ends. The filler is TNT and it uses a detonator type fuze. The fuzes are shipped separately from the grenade and must be inserted by the user. The main force of the explosion of the grenade goes into shock waves rather than in the hurling of fragments. It is used in very close-in fighting to avoid injury to friendly troops while still causing casualties to the enemy. It is particularly effective when thrown inside a room, bunker, or cave. It may be used as a small demolition charge to destroy enemy equipment and so on.

3. INCENDIARY GRENADE, AN-M14, (Figure **25.4**). This grenade has a two-second delay igniting fuze, a sheet metal body and a filler of thermite. It is designed to start fires or melt metal.

4. WP SMOKE HAND GRENADE, M15, (Figure **25.5**). The body of this grenade is light steel. It is filled with white phosphorus and has a detonating fuze. Particles of burning WP scatter over an area 25 yards in diameter when the grenade bursts causing severe burns on contact and giving dense smoke.



25.7 Holding the Grenade.



25.8 Throwing grenade from standing position.

5. HC SMOKE HAND GRENADES, AN-M8. The HC grenade has a sheet metal body with holes in top and sides sealed with tape. When the filler is ignited it burns off the tape and the grenade produces a white smoke. It is used for signaling and screening.

6. COLORED SMOKE HAND GRENADE, M18 (Figure **25.6**). The colored smoke grenade resembles the HC smoke grenade. It is available in four colors: red, green, violet, and yellow. The top of the grenade is colored to indicate the colored smoke produced. The fuze is an igniting type. The grenade is used for signaling. A similar grenade is the RED SMOKE HAND GRENADE, AN-M3. It is much larger than the M18 and is provided with flaps which may be bent out to prevent the grenade from sinking in snow or mud.

7. GAS GRENADES. These grenades are made in several variations. The CN or tear gas type is made in a cylindrical shape resembling the HC smoke grenade and may be designated M7 or M7A1. It is also made for riot use in a baseball size and shape designated M25. (The CN-DM grenade is called the M6). It resembles the M7 and M7A1 CN grenades in appearance and functioning. All these gas grenades use an igniting type fuze.

8. A summary of hand grenades is shown in the table on page 310.

Methods of Use

You can become skilled in the use of grenades only by practice. Distance and accuracy are only developed by training. There are a few general rules in grenade throwing which should be observed.

A. Holding the Grenade. The grenade is held in the hand with the safety lever in the palm so that the lever is in the junction between the thumb and forefinger as shown in figure **25.7.** The fingers clasp the body firmly with the top finger below the top serration on fragmentation grenades. The forefinger of the other hand is hooked through the safety pin ring. The pin is pulled with a twist and without changing the grip of the throwing hand. The thumb must press the safety lever firmly after the pin is pulled and until the grenade is thrown.

B. How To Throw. (Figures **25.8** to **25.11.**)

1. The grenade should be thrown with a free and natural motion. Although you use the throwing motion that is most natural, you usually throw the grenade like a baseball.

2. You release the grenade with a snapping motion of the wrist just before your arm is fully extended and let it roll off the tips of the fingers. This will cause it to spin during its flight to the target.

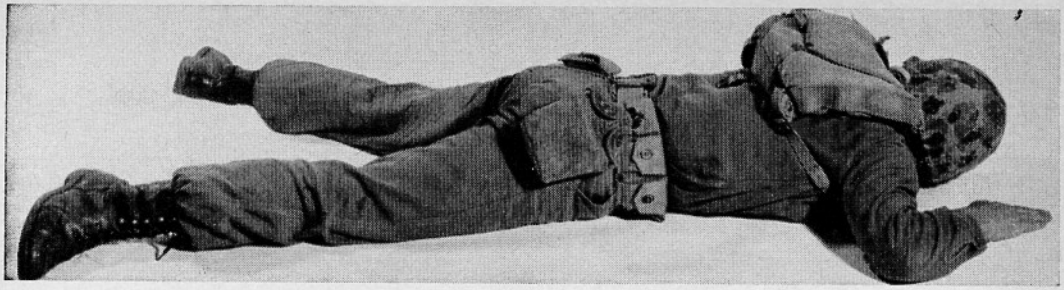
3. Follow through on your throwing motion beyond point where grenade is released.



25.9 Throwing grenade from kneeling position.



25.10 Throwing grenade from prone position.



25.11 Throwing grenade from prone position—(continued)

Safety Precautions

When you throw or handle live hand grenades remember and observe the following safety precautions:

1. A fuze containing a detonator should be handled with extreme care at all times. The detonator contains a charge of mercury fulminate composition and this explosive is very sensitive to heat, shock, or friction.

2. It is not necessary to touch the detonator of the fuze assembly. The detonator is powerful enough to blow the fingers from your hand or to cause other serious injury.

3. Do not pull out the safety pin until you are ready to throw.

4. Do not release the safety lever before you throw.

5. Do not recover or tamper with a live grenade that fails to fire. These duds can be recovered and destroyed only as prescribed by existing regulations.

6. Do not take any grenade apart unless you are ordered to do so.

7. In throwing grenades in built-up areas, woods, or jungle, use care to avoid hitting intervening obstacles such as walls, trees, and vines.

8. When live fragmentation grenades are thrown, take the following precautions:

(a) All personnel within a radius of 250 yards must wear steel helmets.

(b) Fragmentation grenades must be thrown to obtain ground bursts.

(c) Grenades must be thrown so that they explode at least 40 yards from all individuals who are not behind cover.

9. Except where incendiary action is desired, incendiary type grenades should not be ignited within five feet of dry grass or other inflammable material. They also should not be fired closer than 30 feet from personnel. The thrower, or friendly troops, should not be directly downwind unless they are protected by gas masks.

10. Practice hand grenades are practically free from danger when properly used. However, they require the same degree of care in handling and operation as the standard live grenades.

(a) The practice grenade may be thrown a safe distance by the average thrower, but everyone should take cover for the purpose of training. Your steel helmet should be worn.

(b) Dud practice grenades should not be recovered until at least 10 minutes have elapsed, and they should be handled only by experienced personnel. Do not dispose of the safety pin and ring until grenade is thrown.



HAND GRENADES

Summary of Hand Grenades

Grenade	Body	Filler	Fuze	Delay (seconds)	Color and markings	Size of complete grenade (centimeters)		Weight of complete grenade (ounces)	Range (avg throwing distance) (meters)	Use	Effective casualty radius (meters)
						Length	Diameter				
Grenade, hand, training, MK1A1	Cast iron, serrated	None	None	None	Black No markings	11.4	6	21	30	Practice	None
Grenade, hand, practice, M30	Cast iron	Black powder (21 grains)	Igniting, M205A1, 2	4 to 5 (Avg 4.5)	Blue, no markings on body	9.9	6	16	40	Practice	None
Grenade, hand, practice, M21	Cast iron, serrated	Black powder (21 grains)	Igniting, M205A1, 2	4 to 5 (Avg 4.5)	Blue, no markings on body	11.4	6	21	30	Practice	None
Grenade, hand, fragmentation, M26A1	Sheet metal	Composition B (5.5 ounces)	Detonating M204A1, A2, M125 (T1011E3)	4 to 5 (Avg 4.5)	Olive drab, yellow marking	9.9	6	16	40	Casualty	15
Grenade, hand, fragmentation, MK2	Cast iron, serrated	Flaked TNT (2 ounces)	Detonating M204A1, A2	4 to 5 (Avg 4.5)	Olive drab, yellow marking	11.4	6	21	30	Casualty	10
Grenade, hand, offensive, MK3A2	Asphalt impregnated fiber	Flaked TNT (8 ounces)	Detonating M206A2	4 to 5 (Avg 4.5)	Black, yellow band	13.4	5.4	15.6	40	Concussion (blast, demolition, and casualty)	2
Grenade, hand, irritant, CN, M7A1	28 gage rolled steel cylindrical	CN mixture (12.5 ounces)	Igniting, M201, M201A1	2	Gray body CN GAS 1 band (all in red)	14.2	6.3	19	35	Riot control, training	
Grenade, hand, irritant, CN-DM, M6	28 gage rolled steel cylindrical	CN-DM mixture (10¼ ounces)	Igniting, M201, M201A1	2	Gray body CN-DM GAS, 1 band (all in red)	14.2	6.3	17	35	Riot control, training	
Grenade, hand, irritant, CN-DM, M6A1	28 gage rolled steel cylindrical	5 ounces CN 4½ ounces DM	Igniting, M201, M201A1	2	Gray body CN-DM GAS, 1 band (all in red)	14.2	6.3	17	35	Riot control, training	
Grenade, hand, riot, CN, M25A1	Plastic spherical	CN mixture (3½ ounces)	Bursting	1.4 to 3	No marking on body. 1 red band on container		7.5	7.5	50	Riot control, training	
Grenade, hand, incendiary, AN-M14	28 gage rolled steel cylindrical	Thermate (TH3) (26½ ounces)	Igniting, M201, M201A1	2	Blue gray body TH INCENDIARY 1 band (purple)	14.2	6.3	32	25	Incendiary	
Grenade, hand, smoke, WP, M15	18 gage rolled steel cylindrical	White phosphorus (15 ounces)	Detonating M206A1, A2	4.5	Gray body WP SMOKE, 1 band (yellow)	14	6	31	25	Casualty, incendiary, screening, signaling	15
Grenade, hand, and rifle, smoke, WP, M34		White phosphorus (12.3 ounces)	Detonating M206A2	4.5	Gray body WP SMOKE, 1 band (yellow)	14.2	6	27.2	35	Casualty, incendiary, screening, signaling	25





Chapter 26

The 3.5-inch Rocket Launcher

THE new 3.5-inch rocket launcher is sometimes known by its nickname, the "super bazooka." It replaces the smaller bazooka, or 2.36-inch rocket launcher. The 3.5-inch rocket launcher is an antitank weapon with a real "knock-out" punch. It is used by the rocket launcher squads of the rifle companies in attack against enemy mechanized units and strong points.

The 3.5-inch launcher, like the older 2.36-inch weapon, can be fired from the standing, kneeling, sitting, and prone positions. Except for these new features and its increased size and destructiveness it is very similar in all other respects to the smaller rocket launcher. The launcher is a rather simple weapon in comparison with other weapons. Its main function is to activate the rocket's igniter and to guide the rocket's initial flight toward the target.

The launcher is a smooth bore open tube, 60.25 inches long. When a rocket is loaded in the breech end, an electrical circuit is completed. A magneto-type firing device in the trigger grip then provides the current for igniting the rocket.

When ignited, the rocket is propelled through the launcher tube by the jet action of the rocket's motor. There is no recoil since the rear of the launcher barrel is open and the rocket's forward propulsion thus does not depend upon gas pressure built up inside the launcher tube.

Since no gas pressure is built up in the launcher, the barrel is made strong enough only to prevent denting or bending when it is handled. It is heavy enough, however, to prevent excessive heating at a normal rate of fire.

When the propellant in the motor is ignited, gases and flames are blown from the breech of the launcher. The area behind the launcher within a distance of 25 yards must be clear of personnel or of inflammable material. The gunner and loader take special precautions to avoid injury from this back blast.

There are three models of 3.5-inch rocket launchers, the M20, M20A1, and M20A1B1. These three launchers function identically and are similar in appearance. The launchers are made principally of aluminum.

Here are some general facts about the M20 rocket launcher and the rockets fired from it:

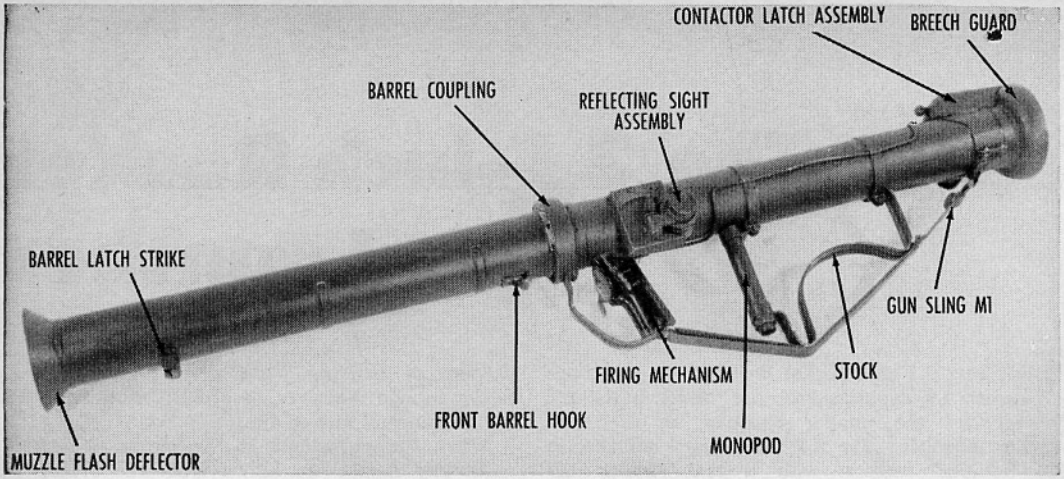
LENGTH OF LAUNCHER.....about 60 inches
TYPE OF ROCKETS FIRED.....
3.5-inch H.E. A.T. and practice
WEIGHT OF ROCKETS.....8.61 pounds
MAXIMUM RATE OF FIRE.....8 rounds per minute
SUSTAINED RATE OF FIRE.....4 rounds per minute
MAXIMUM RANGE.....900 yards
MAXIMUM EFFECTIVE RANGE AGAINST POINT TARGETS.....400 yards
ARMOR PENETRATION.....
approximately 11 inches homogeneous armor plate

Nomenclature and Component Parts

The nomenclature of the launcher is shown in Figure **26.1.** The main parts of the launcher are the front and rear barrel group, the firing mechanism, the monopod stock assembly, and the sighting equipment.

A. Front and rear barrel group.

The front and rear barrels are joined to form a single unit by means of the barrel coupling screw on the rear end of the front barrel and the barrel coupling nut on the forward end of the rear bar-



26.1 Nomenclature of the M20 launcher.

rel. The barrel joint is locked by the barrel coupling lock.

For ease in carrying, the barrels are uncoupled and secured to each other, side by side, by means of the barrel hook and eye and the barrel latch and strike. The two barrels are shown in the carrying position in Figure **26.2**.

A muzzle flash deflector on the front barrel at the muzzle end serves to divert particles of unburned powder which otherwise might strike the gunner's face.

There is a contact spring on each side of the rear barrel. Either contact spring may be used to hold the bare end of the blue contact wire from the rocket.

The contactor latch assembly engages the contact ring assembly on the tail assembly of the rocket motor. This contact holds the rocket in proper firing position in the launcher and completes the firing circuit of the rocket. The breech guard facilitates loading.

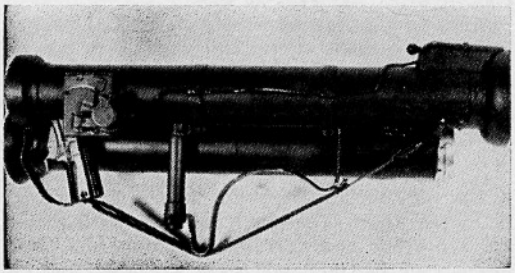
B. Firing Mechanism. The firing mechanism is housed within the trigger grips. It consists of a magneto, trigger, and safety mechanism.

1. The magneto consists of two magnets, a coil of wire, and a steel armature. When the trigger is moved the armature rocks in the coil and generates the current to ignite the rocket.

2. When the trigger is squeezed the magneto generates current. The trigger returns to its original position under spring action when released. It also generates current as it returns.

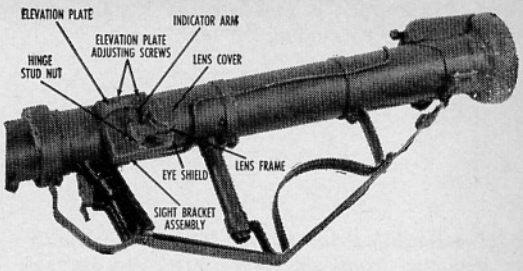
Your launcher may be equipped with a new type firing mechanism which will not generate current until the trigger has been pulled a short distance. It then snaps very much like the released hammer of a rifle, generating a fast double pulse of current. However, it does not generate current when released but simply returns to its original position under spring action. This new firing mechanism resembles the older one shown in Figure **26.1**.

3. The safety switch is located on the left side of the grip. It has two positions. In the lower, or "SAFE" position, the trigger is blocked. The upper position of the safety switch is its "FIRE" position. In this position the block is held clear of the trigger. The two positions are marked on the left grip.

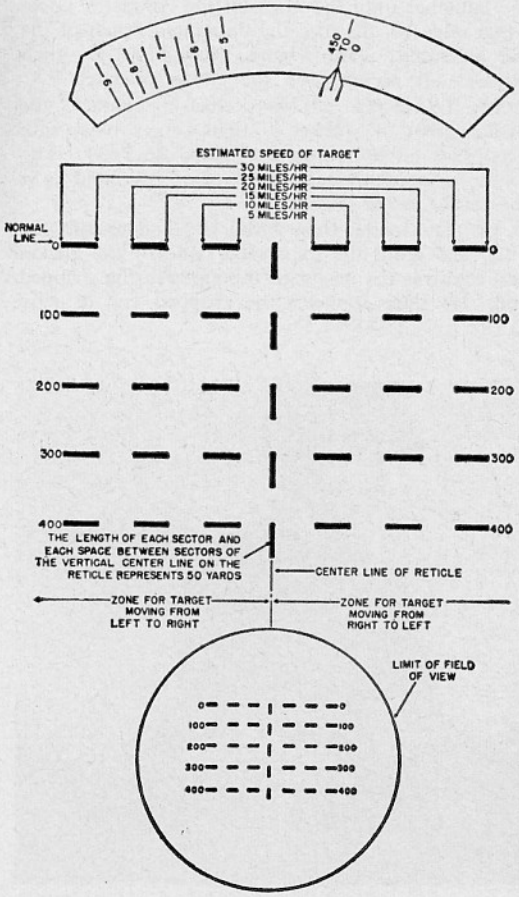


26.2 M20 Launcher in carrying position.

4. Let us trace the electric current that fires the rocket. When current is generated, it leaves the hand grip and moves through an insulated wire in the conduit tube to the contact spring mounting clamp. The clamp carries the current to the contact springs. This part of the circuit is insulated from the barrel. The long blue contact wire of the rocket picks up the current at the contact springs and carries it to the electric igniter of the rocket. To complete the circuit, the short contact wire conducts the current from the igniter to the inside of the tail assembly of the rocket.



26.3 Reflecting sight of launcher.



26.4 Ladder type reticle pattern and elevation plate used with it.

The blade of the contactor latch, engaged in the contact ring assembly of the tail assembly, picks up the current. The current then passes to the barrel, and back to the hand grip.

C. Monopod Stock Assembly. The monopod stock assembly consists of a shoulder rest stock and a monopod. The height of the monopod can be adjusted by rotating the sleeve body (knurled portion) of the monopod.

D. Reflecting Sight Assembly. The reflecting sight assembly is used for making elevation settings and estimating leads in sighting the rocket launcher on a target. It is shown in Figure **26.3.**

When the sight is not being used the lens cover should be snapped down over the front lens. The sight, itself, should be folded back against the sight bracket.

The lens of the sight has a reticle pattern which is shown in Figure **26.4.**

The sight reticle pattern shown in Figure **26.4** has a dashed vertical line, a dashed horizontal normal line and four dashed horizontal range lines. Each segment of the vertical line and each space between the segments represents 50 yards of range. Each segment of the horizontal lines and each space between the segments represents an angular lead of 5 mph. When firing at ranges up to 450 yards, the indicator arm on the elevation plate is set on the index marked 0 to 450 and the appropriate range line in the pattern is used. When firing at ranges from 500 to 900 yards, the indicator arm is set at the desired range and the normal line is used.

When firing at moving targets with sight, always keep the vertical line, which represents the point of impact, ahead of the target. Estimated

speed of the target is graduated at 5 mph intervals, up to and including 30 mph.

The sight also has zones for targets moving from left to right and right to left.

Operation

A. Assembling for firing. To fire the launcher, join the front and rear barrels to form a single unit. This is done as follows:

1. Raise the barrel coupling lock lever which is located just behind the barrel coupling nut of the rear barrel.

2. Place the barrel coupling screw of the front barrel into the barrel coupling nut of the rear barrel and turn in a clockwise direction.

3. Release the barrel coupling lock lever. The two barrels are locked together.

B. Loading. The sequence of loading the launcher is shown in Figure **26.5(1)** through **(5)**. It is as follows:

1. The loader makes sure that the bore is clean.

2. The gunner puts the safety in its "SAFE" position.

3. The gunner places the launcher on his shoulder.

4. The gunner commands: LOAD. At the same time he drops his right hand from the trigger and taps the loader, supporting the launcher with his left hand. During the entire loading operation the gunner keeps his right hand off the trigger.

5. The loader repeats the command and shifts his weight to the left without changing his position on the ground.

6. The loader grasps a rocket with his left hand, palm up (See Figure **26.5(1)**) and removes the shorting clip from the contact ring assembly of the rocket.

7. The loader grasps the rear of the launcher with his right hand, palm down, his thumb under the barrel and his fingers on the forward end of the contactor latch.

8. The loader presses down on the contactor latch to clear the way for the rocket as shown in Figure **26.5(2)** and inserts the head of the rocket into the breech of the launcher. He then releases the contactor latch.

9. The loader then removes the safety band from the fuse. (See Figure **26.5(3)**). He may use both hands for this as the rocket is held in the launcher by the spring-actuated contactor latch. *The safety band is never removed before the head of the rocket is placed in the launcher.*

10. The loader moves his left hand to the tail assembly but not over the rocket motor nozzle. He presses down again on the contactor latch and at the same time slides the rocket forward into the launcher until the blade of the contactor latch, when released, fits into the unpainted notch of the tail assembly. (See Figure **26.5(4)**). He then releases all pressure on the contactor latch.

11. To insure effective electric contact, the loader gives the rocket a slight rotary twist with his left hand as shown in Figure **26.5(5)**. The loader does not place any part of his hand over the rocket motor nozzle.

12. The loader then withdraws and uncoils the blue lead from the expansion cone of the rocket and removes the insulated tubing from the stripped end. He then connects the stripped end of wire



26.5(1) The loader grasps the rocket in his left hand and removes shorting clip from contact ring assembly.

to either one of the two contact springs. He then checks to see that no part of the uninsulated portion of the contact wire touches any metal before touching the contact spring.

13. The loader taps the gunner and calls: UP.

C. Firing. After the launcher is loaded, the gunner checks the range setting and moves the safety to the fire position. He places the first and second fingers of his right hand on the trigger and aligns the sight on the target. He squeezes the trigger with a smooth, steady, rearward pressure, holding his breath while aiming and squeezing the trigger. It is important to maintain the sight picture until the rocket has cleared the tube. There is a much longer period than that required for the rifle. Care must be exercised when firing through brush and trees since impact with a twig or branch may deflect the rocket. A heavy branch may detonate it.

D. Immediate Action. If the launcher fails to fire, use the following immediate action.

1 Check to make sure that the safety is on the "FIRE" position.

2. Attempt to fire the rocket again by squeezing the trigger while keeping the launcher sighted on the target.

3. If the rocket still does not fire, make certain that the uninsulated end of the blue contact wire



26.5(2) Loader presses down on contactor latch to clear the way for rocket.



26.5(3) Removes safety band using both hands.



26.5(4) Again presses down on contactor latch; pushes rocket in until contact notches of fin line up.



26.5(5) Gives rocket slight rotary twist to insure effective electrical contact.

engages the contact spring of the launcher, that the contactor latch blade is engaged in the contact groove in the tail assembly of the rocket, and that the blade and notches are clean. Sight the launcher on the target and again squeeze the trigger.

4. If the rocket still does not fire remove the rocket from the launcher as described below for unloading.

E. Unloading.

1. Before unloading the launcher, move the safety switch to the "SAFE" position.

2. If a misfire has occurred perform the immediate action described above, then wait at least 15 seconds.

3. Remove the rocket contact wire from the contact spring of the launcher, depress the forward end of the contactor latch housing assembly and carefully withdraw the rocket just sufficiently to expose the ejection pin of the rocket. If the ejection pin tends to bear against the breech guard of the launcher, press it back and hold it. Install the safety band over the ejection pin.

4. Again depress the forward end of the contactor latch housing assembly to clear the rocket head, and completely remove the rocket from the launcher.

5. Coil the blue contact wire and place it inside the expansion cone at the rear of the rocket. Repack the rocket in its fiber container.

6. If the ejection pin should be prematurely ejected, replace the ejection pin if this can be done without forcing. Install the safety band over it. The rocket is then safe to handle. Warning: Without the ejection pin in place, the rocket must be handled nose up, with extreme care. If the ejection pin cannot be replaced, the rocket must be destroyed as soon as practicable.

F. Assembling the launcher for carrying.

1. Hold the barrel coupling lock lever in the unlocked position and unscrew the front barrel from the rear barrel. Release the lock lever.

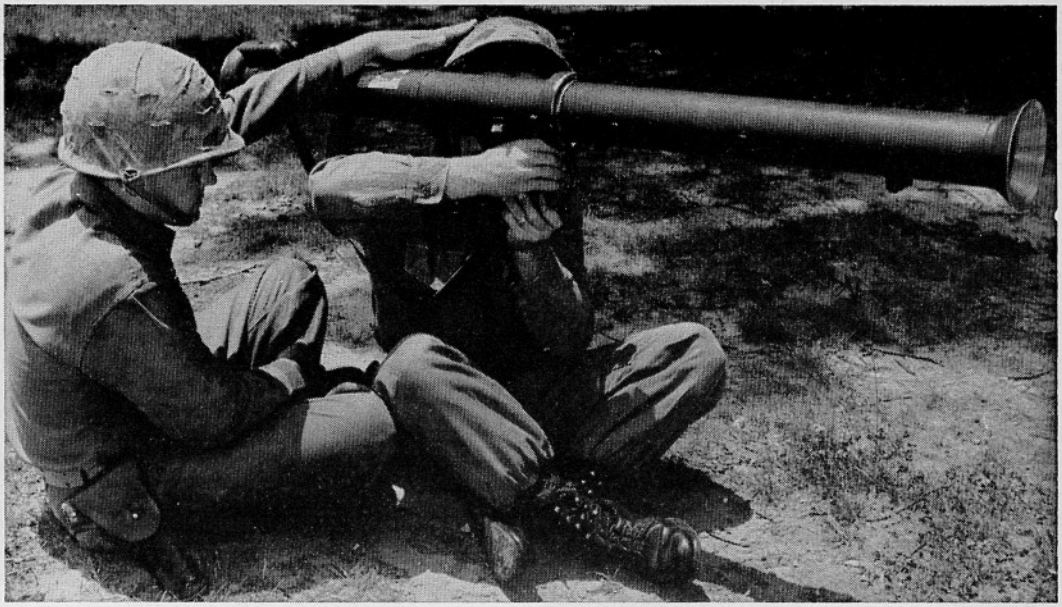
2. Engage the barrel hook and eye and press the barrels together until the barrel latch snaps into position in the latch strike.

Positions

The positions of the gunner and loader for firing from prone, sitting, kneeling, and standing are shown in Figures **26.6(1)** through **(6)**. For the gunner the positions are similar to those used to fire other shoulder weapons. The exact position is limited largely by the conformation of the body.



26.6(1) Prone position.



26.6(2) Sitting position No. 1.



26.6(3) Sitting position No. 2.



26.6(4) Kneeling position No. 1



26.6(5) Kneeling position No. 2



26.6(6) Standing position.

Make sure that your position is comfortable, relaxed, and steady.

1. The launcher is fired at moving targets at ranges up to 200 yards. Therefore, for antitank fire take the position that gives the greatest flexibility. Sitting position No. 1 and kneeling position No. 1 (See Figures **26.6 (2)** and **(4)**) are preferable to the alternate sitting and kneeling positions as they afford better flexibility. The prone position, although offering a low silhouette, is not suitable for firing at a moving target since it hinders the necessary smooth, steady, easy swing in the direction of the movement of the target necessary to obtain the desired lead.

2. For stationary and area targets the steadiest position is the best position. In this case rest the elbows and body if possible. For ranges beyond 300 yards the prone position is not recommended because of the extreme elevation of the launcher.

3. When assuming any position, there is some direction toward which the launcher naturally points. In a correct position, this direction is toward the target. Therefore, shift the body until the launcher points naturally at the target area.

Do not cant the launcher.

Practice and fire from a right hand position.

Keep the muzzle up and toward the target at all times.

Safety Precautions

1. The gunner and loader may wear steel helmets.

2. The gunner and loader may wear face masks for protection against a possible back blast from the rocket propellant as the rocket leaves the muzzle of the launcher.

3. The safety band should not be removed until the head of the rocket has been placed in the launcher and is held by the blade of the contactor latch.

4. When the propellant in the rocket is ignited, gases and flames are blown from the breech of

the launcher. Therefore, to avoid injury when firing from a prone position, the gunner must place his body so that it is at an angle of 45° to the line of aim.

5. The area directly in rear of the launcher must be clear of personnel or of inflammable material for a distance of 25 yards.

6. During the operations of loading and sighting, the gunner should always keep the muzzle of the launcher toward the target.

7. Always set the safety of the launcher at "SAFE" before unloading it.

8. Boxes containing rockets should not be dropped, thrown, tumbled, or dragged.

9. The waterproof seal of the fiber containers should not be broken until ready to use the ammunition. Items unpacked but not used should be restored to their original condition and packing, and resealed.

10. Rockets should be protected against moisture and extremes of temperatures. They should not be stored where temperatures are over 120° F.

11. Place rockets in their containers in shaded places. Do not expose rockets to the direct rays of the sun until they are ready to be loaded into the launcher.

12. Do not allow a rocket to remain in a hot launcher prior to firing.

13. Do not fire rockets at temperatures beyond the limits marked theeron. This is −20° to 120° F., for present models.

14. Rockets with damaged fins will not be fired since this will result in unstable flight and erratic ranges. Be careful when loading rockets into the launcher to prevent damage to blades of the tail assembly.

15. Rockets must not be disassembled.

16. Do not handle duds.

Care and Cleaning

A. For ordinary care and cleaning it is not necessary to disassemble the launcher. Disassembly is only for the purpose of inspection, maintenance and repair and should be performed by specially qualified personnel.

B. General Lubrication Instructions.

1. Lubrication should be accomplished carefully and sparingly. Excess oil should be wiped off. This is particularly important with regard to the barrel.

2. Excess oil attracts grit and foreign matter which will cause rapid wear of the moving parts.

3. Use rifle-bore cleaner or dry-cleaning solvent to remove the protective lubricant film on exposed metal surfaces. Gasoline will not be used. Dry all parts thoroughly before lubricating.

C. Points to be lubricated. Under normal conditions all bearing surfaces of moving parts should be lightly lubricated. This is best accomplished with an oiled cloth.

1. Clean and lubricate the bore after each firing or weekly if not in use.

After firing, and on three consecutive days thereafter, thoroughly clean the bore with rifle-bore cleaner, making sure that all surfaces are well coated. Do not wipe dry.

On the fourth cleaning, clean the bore with rifle-bore cleaner. If the piece will probably be fired within the next 24 hours, do not wipe dry. If the piece will not be fired within the next 24 hours, wipe dry and lightly coat the bore with oil.

When the weapon is not being fired renew the oil film in the bore weekly.

2. The following parts should be oiled weekly and after firing: firing mechanism barrel coupling lock, contactor latch, and monopod. In order to lubricate the firing mechanism weekly, lift the trigger spring washer assembly toward the trigger to expose the opening in the rocket arm cover for the toggle pin. Inject approximately 10 drops of oil into this opening.

3. Monthly.—Lubrication of the firing mechanism should be accomplished with the trigger grips removed. Clean the parts of dirt and corrosion. Apply a film of oil to all metal parts of the firing mechanism. Corrosion on the armature will be disregarded. No further disassembly of the firing mechanism other than to remove the grips and safety switch will be accomplished.

The barrel latch, barrel coupling lock, and monopod should be cleaned monthly with rifle-bore cleaner or dry-cleaning solvent. Any rust spots should be removed with crocus cloth. Wipe thoroughly dry and apply a film of lubricant.

D. Prior to firing.—Run a clean, dry wiping cloth through the barrel until, by the appearance of the cloth, it is indicated the film of oil has been removed from bore.

E. When used in wet weather.—Disassemble trigger grips and dry all electrical contact points and wires with a dry cloth. Clean and oil as previously described.

F. Care in handling sight.

1. The sight is rugged and suited for the designed purpose. It will not, however, stand rough handling or abuse. Inaccuracy or malfunctioning will result from mistreatment.

2. The optical unit of the sight is sealed with an atmosphere of nitrogen, and contains a desiccating agent to prevent fogging. Disassembly of optical elements is therefore prohibited, since such disassembly cannot be done without injury to the sight.

3. To obtain satisfactory vision, it is necessary that the exposed glass surfaces of the reflecting sight and other parts be kept clean and dry. Keep the lens cover closed at all times when the sight is not in use.

4. Under no circumstances should polishing liquids, pastes, or abrasives be used for polishing the glass.

5. For wiping optical units, use only lens-tissue paper, especially intended for cleaning optical glass.

Types of 3.5-inch Rockets

There are three types of 3.5-inch rockets in use today. These are high explosive antitank rockets, smoke, and practice rockets.

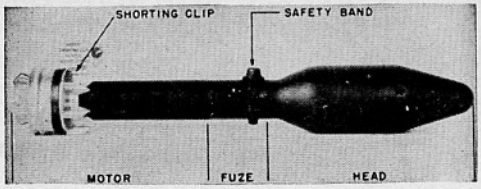
A. High Explosive Antitank Rockets (H.E., A.T.) 3.5-inch.

There are three H.E., A.T., 3.5-inch rockets. These are the M28, M28A1, and M28A2. The M28A2 rocket, however, is the only one in general use. These rockets are quite similar in all respects except for slight differences in the construction of the tail assembly of the motors. Figure **26.7** shows the M28A2 rocket. All of these rockets are 23.5 inches long, weigh 8.61 pounds, and are lusterless olive drab in color with yellow markings. They consist of a head, fuze, and motor.

1. The head has a nose (ogive) and body. It contains an internal cone which provides for shaping the explosive charge.

2. The fuze is a base-detonating fuze of the simple inertia type which functions with a nondelay action upon impact.

An ejection pin, which passes through the fuze body and prevents movement of the internal parts, is provided to prevent accidental functioning during handling. The safety band covers the head of the ejection pin. The ejection pin is held in a "SAFE" position by the safety band assembly. When the safety band is removed, the ejection pin moves outward to a "locked" position. The fuze cannot arm with the ejection pin in either the "safe" or "locked" positions. When the rocket is loaded, the ejection pin is pushed into an intermediate position. This is the only position in which the fuze can become armed. If the rocket is unloaded, the ejection pin returns to the "locked" position. When the safety band is replaced, the ejection pin is placed again in the "safe" position. When the rocket is fired an internal set back sleeve moves rearward and the ejection pin is free to be completely ejected when the rocket leaves the launcher. When the ejection pin flies out, the fuze is "armed".



26.7 3.5-inch H.E. A.T. Rocket M28A2.

3. The motor consists of a body, closure, trap and spacer assembly, propellant, igniter with electric squib (cap) and leads, nozzle closure (blow-out plug), and a tail assembly.

B. Practice Rockets, 3.5-inch. There are three practice rockets which are the counterparts of the three H.E., A.T., rockets except that the practice rockets have an inert bursting charge and inert dummy fuze. They have the same propellant. These are the M29, M29A1, and M29A2. The M29A2 is the only one in general use. All practice rockets are painted blue with white markings.

C. Smoke, WP Rocket. The Smoke WP, M30 rocket is similar in configuration to the M28A2 and M29A2 rockets. It is used for casualty producing and screening action.

THE 3.5-INCH ROCKET LAUNCHER





The Flame Thrower

THE flame thrower is not actually a new weapon. It is an up-to-date adaptation of a very ancient weapon of war. Primitive man drove wild beasts from his camp by throwing blazing fagots at them. The Indians used flaming arrows to burn out early settlers. In modern warfare, flame throwers have been used on a large scale to drive the enemy from fortifications and caves. As a Marine you may be called upon to use the flame thrower. In this chapter is the basic information needed to operate this weapon.

Characteristics and General Data

A. Characteristics. The flame thrower, which is known officially as Flame Thrower, Portable, M2A1, can be carried by one man. It has two main parts, the gun group and the tank group. Fuel is propelled into the target by a charge of highly compressed air. As fuel leaves the gun of the flame thrower, it is ignited by contact with flame from an ignition cylinder. (See Fig. **27.1.**)

B. General Data:

1. ***Ranges:***

OPEN FIELDS OF FIRE (THICKENED FUEL) .....40 yards
(LIQUID FUEL) .....20 yards

2. ***Duration of fire:***

FUEL — (CONTINUOUS DISCHARGE) .....6 to 9 seconds
IGNITION CYLINDER — (FIVE CHARGES IN EACH CYLINDER)6 to 12 seconds per charge.

3. ***Weights:***

PORTABLE FLAME THROWER M2A1, (EMPTY) .....43 pounds
(FILLED WITH FUEL) .....68 to 72 pounds
TANK GROUP (EMPTY) .....35 pounds
GUN GROUP ..... 8 pounds

4. ***Capacity:***

FUEL ..... 4 gallons

5. ***Pressures:***

PRESSURE TANK—(POUNDS PER SQ. IN.) .....1700 to 2100
FUEL TANKS—(POUNDS PER SQ. IN.) ..... 350 to 390

Capabilities

A. Capabilities.

1. The M2A1 can get through ports and embrasures of pill boxes and bunkers and fill these fortifications with flame and smoke. The flame and smoke burn, smother, and blind the enemy hidden within. Not only does the flame thrower cause casualties, but it causes shock and panic and drives the enemy from his fortified position.

2. The flame thrower can set fires in parts of shelters that can be burned and it can explode ammunition or explosives the enemy may have there.

3. The M2A1 flame thrower also has the ability to "shoot around corners." You can fire from a blind angle. The billowing and swirling movements of flaming gases carry your fire to a target even when you cannot see it. Blazing, thickened fuels also ricochet from wall to wall in fortifications.

4. If the enemy sees you coming toward his fortified position with a flame thrower, he may close the ports in his emplacement. But this is to your advantage even if your flames cannot get inside. The enemy blinds himself and puts his emplacement out of action when he closes the ports, allowing demolition parties to place their destructive charges without being subjected to fire from the emplacement.

5. When the enemy digs in, the flame thrower is an excellent weapon for the mopping up operations necessary to clean them out of their entrenched positions.

6. The flame thrower may also be used to wipe out enemy nests in street or jungle fighting.

Nomenclature

As in all other weapons you use, it is necessary for you to know the names of the parts of the M2A1 flame thrower and how these parts function. The nomenclature of the M2A1 flame thrower is shown in figures **27.2, 27.3** and **27.4.** The best way for you to learn the names of the parts is to compare an actual flame thrower with the parts shown in the pictures.

A. The Tank Group. The tank group shown in figures **27.2** and **27.3** is carried on your back as shown in figures **27.5** and **27.6.** It consists of:

1. Two fuel tanks holding a total of four gallons of fuel. The tanks are joined by a tank connector to form a single fuel container.

2. A pressure tank charged with compressed air, which is used to propel fuel from the fuel tanks through the gun to your target. The tank is large enough to assure ample pressure and uniform range while you are firing.

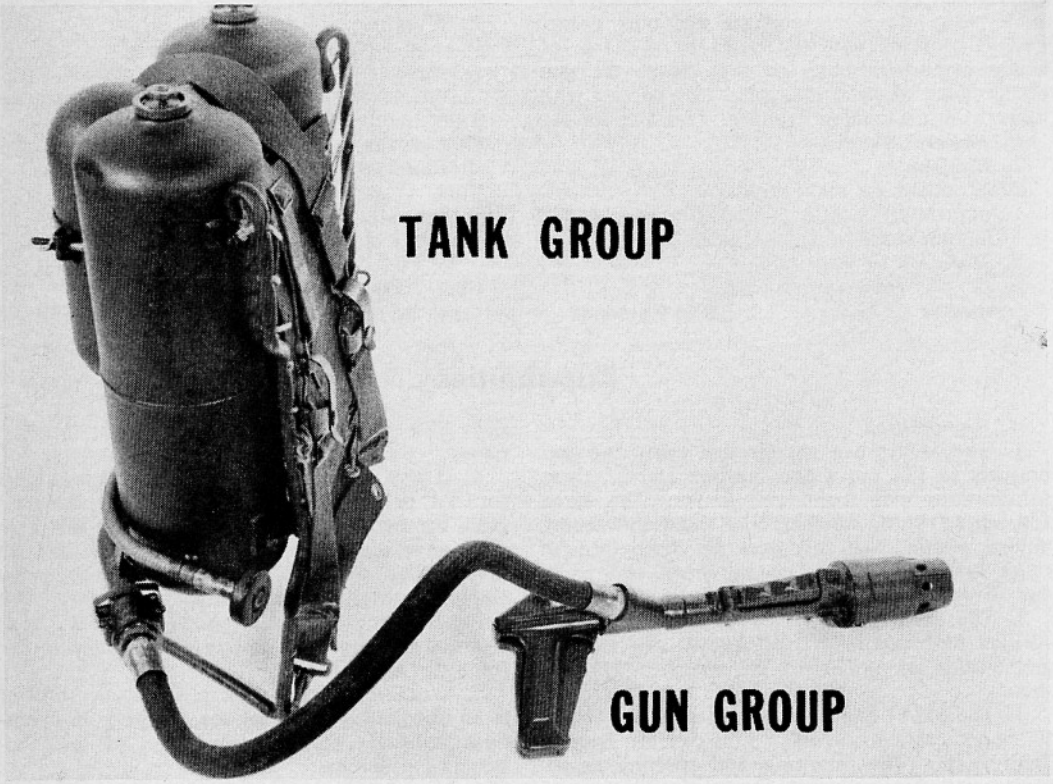
3. A pressure tank valve, which releases air through the pressure regulator to the fuel tanks. You can open this valve without help.

4. A pressure regulator, which automatically assures delivery of air to the fuel tanks at the proper pressure. The regulator is located so that it cannot be damaged easily.

5. A carrier, which supports the tank group on your back and shoulders and secures it to your body (see figures **27.5** and **27.6**). The carrier has body and shoulder straps and quick-releasing fasteners.

B. The Gun Group. The Gun Group shown in figure **27.4** is carried, aimed, and operated by hand (see figure **27.7**). It ignites the fuel and directs the flame to the target. It includes the following parts:

1. The Fuel Hose, which carries fuel from the tank group to the gun.



27.1 Principal parts of Flame Thrower, Portable M2A1.

2. The Gun, which ignites the fuel and directs it to the target. The gun has two parts:

(a) **The fuel valve,** which discharges fuel through the barrel. This valve is operated by squeezing the valve lever and the grip safety which are on opposite sides of the valve grip. The valve also includes a barrel from which the fuel is ejected.

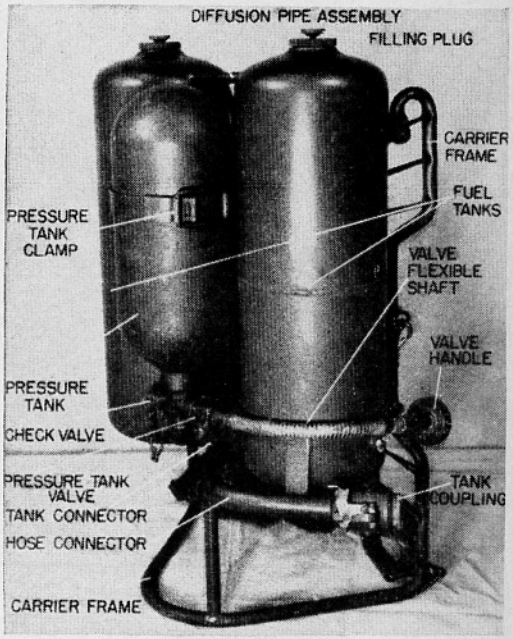
(b) **The ignition head,** which is on the front of the barrel. The ignition head ignites the fuel as it passes from the nozzle of the barrel. Each time you press the trigger on the front grip, one of five charges of an igniting mixture in an ignition cylinder is set afire. This pilot flame is the means by which the fuel is ignited as it is propelled from the gun.

Fuels

A. Ingredients. **1. Thickened fuel** consists of one can of thickener (Napalm 5¼ pound can) to 20 U. S. gallons of gasoline.

2. Liquid fuel consists of, by volume, 20 to 25 per cent any U. S. grade of motor fuel or aviation gasoline and 75 to 80 per cent light fuel oil. The light fuel oil can be either No. 1 fuel oil, No. 2 fuel oil, automotive diesel oil, or kerosene. One part gasoline to four parts of cleaned crank case drainings may be used also.

B. Characteristics of Fuels. Thickened fuels give up to twice the range of liquid fuels. The stream of thickened fuel is comparatively narrow. Most of the glue-like mixture clings to and burns, in or on the target, for as long as six minutes. Liquid fuels on the other hand, are largely consumed in flight to the target. If the location of small openings in the target is known, the stream of thickened fuel can be spotted by accurate aiming so that most of the fuel enters directly into the openings. While it does not billow around corners as does liquid fuel, thickened fuel strikes the target with force enough to ricochet inside. It clings to clothing and skin while burning. It also has excellent incendiary effects. The initial flame and smoke are less from thickened fuel than from liquid fuel, but the lower visibility, greater range, and much longer burning period of thickened fuel compensates for its smaller screening effect.



27.2 Tank group nomenclature.

Operation

Effective use of the M2A1 portable flame thrower can be achieved only by diligent practice with the weapon. Untrained operators or assistants should never be sent on a mission.

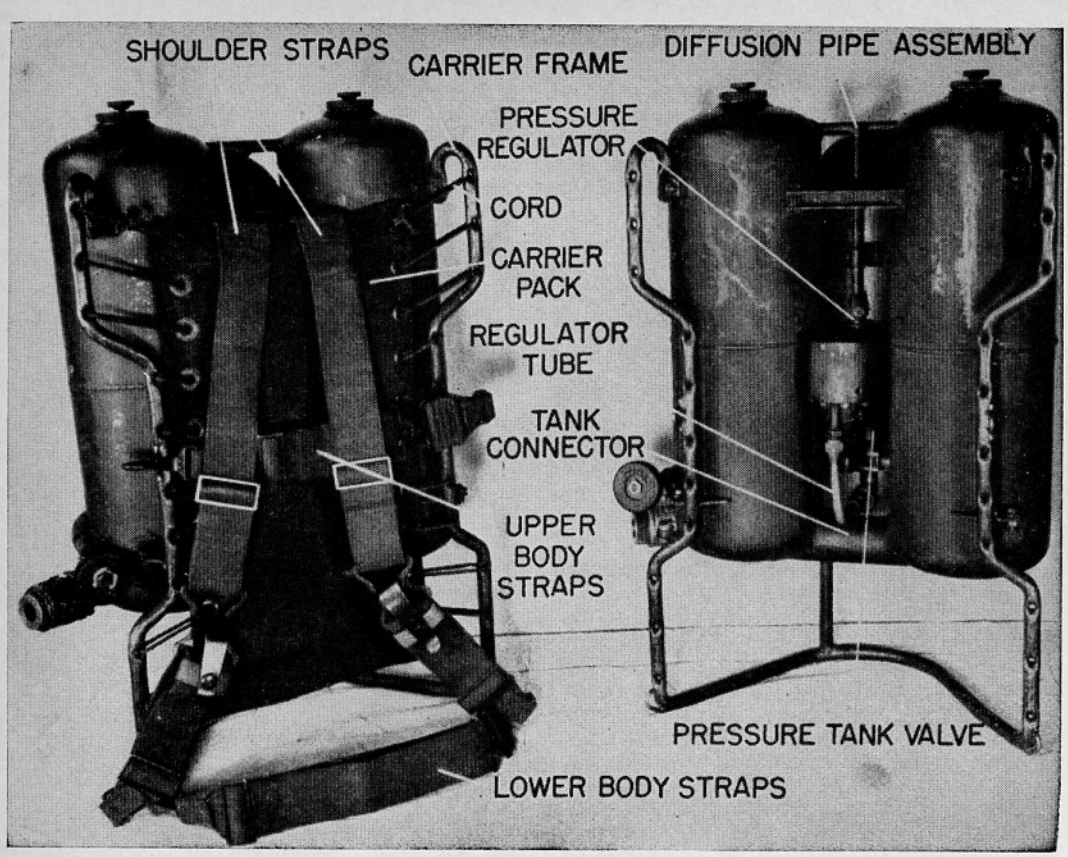
A. Positions and Rules. The flame thrower can be fired from any position that permits sufficient freedom to aim the weapon; this includes standing, kneeling and prone.

1. Angle of the Tanks. When firing, the bottom of the tanks should be lower than the top and neither tank should be tilted to one side. Otherwise only a small part of the fuel may be blown from the tanks.

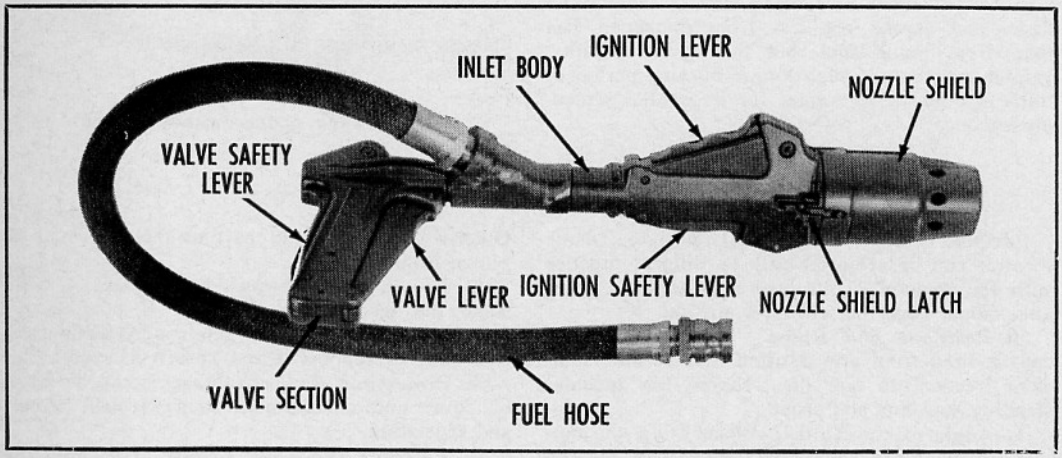
2. Recoil. Stability must be sufficient to withstand the recoil from the gun. If possible the operator should hold the gun snugly against his right side to support it and absorb its recoil.

3. Protection. Full advantage should be taken of cover and concealment such as shell craters and vegetation.

B. Carrying the Tank Group. The tanks are supported on the operator's back and secured by



27.3 Rear view of tank group.



27.4 Gun group nomenclature.

two shoulder straps and two pairs of body straps. The straps may be adjusted to fit the operator.

The shoulder straps pass over the shoulders and under the armpits. The lower body straps are clasped tightly in front of the body. The upper body straps are clasped across the chest to prevent the shoulder straps from slipping and the tank group from rolling off the back. (See figures **27.5** and **27.6**). Adjustment of the various straps should be made until the unit is carried with the bottom of the fuel tanks at the small of the operator's back. The tank group should fit snugly so that it does not shift if the operator changes position rapidly.

C. Carrying the Gun. The procedure for carrying the gun is as follows:

1. Carry the gun with the hose at the right side.

2. Grasp the valve grip with the right hand and the front grip with the left hand, being careful not to operate the controls until ready to fire.

3. Keep the gun pointed away from friendly personnel at all times.

4. Do not face the front of the gun at any time. Even when no fuel is being ejected, the incendiary charges of the ignition cylinder can cause severe burns.

Preparation for Firing

A thorough inspection of all parts of the flame thrower is the first step to be taken in making preparations for firing. Make certain that connections are clean, tight and all parts in proper working order before taking the following steps:

A. To Fill Fuel Tanks.

1. Unscrew filling plug on top of each tank.

2. Place funnel in one opening and pour fuel from a bucket into fuel tank.

3. To put heavy thickened fuel from storage tank or drum into fuel tank of flame thrower, a pressure system must be used. Only qualified personnel should do this.

4. When filling fuel tanks leave a void (empty space) at top of each tank the length of middle finger. If this is not done, all the fuel will not be blown from the flame thrower.

B. Charging The Pressure Tank. Charging the pressure tank and setting the pressure regulator should be done only by qualified personnel.

C. Connection of Gun Group to Tank Group.



27.5 Carrying tank group, front view.



27.6 Carrying tank group, rear view.

When connecting gun group to the tank group place the tank group on the ground with the tank coupling up.

1. If the tank is filled with thickened fuel, allow it to rest in the above position for one or two minutes.

2. Remove coupling plug from tank group.

3. Place unthreaded end of fuel hose in tank coupling and lock in place.

D. Loading with Ignition Cylinder.

1. Unscrew and remove ignition shield.

2. Place ignition cylinder on end of barrel, being careful not to grasp ignition cylinder by ends.

3. Raise nozzle end of gun so cylinder slides down against the spring case of the ignition head. If necessary, rotate the cylinder so it slips down all the way. Do not force cylinder into place as forcing may ignite it.

4. Rotate spring case and ignition cylinder clockwise as far as they rotate freely.

5. Place ignition shield over cylinder, engage the slot in the shield on the spring case pin.

6. Turn shield, screwing it onto ignition head body. Make sure the threads engage during the first turn of the shield. When the slot on the shield engages the latch on the ignition head the gun is loaded.

7. If shield cannot be turned by hand tight enough to engage latch, unscrew shield. Then turn shield backwards until threads engage and repeat step 6.

8. The flame thrower is now ready to be fired.

Procedure for Firing

A. Firing. Operators and assistants should learn to judge range by frequent practice under varying conditions. Operators should be trained to move in close to the target and fire at point blank range to get the best results.

1. Opening Pressure-Tank Valve. The release of pressure into the fuel tank causes a hissing sound. Therefore, open the pressure-tank valve while still out of hearing range of the enemy. Do not, however, open it too soon because of the



27.7 How tc hold the gun group.

possibility of pressure leaks. To prevent frothing of the fuel, keep the tank group in an upright position. When opening pressure-tank valve, be sure to turn the valve handle all the way in a counterclockwise direction. Stiffening of the fuel hose occurs when the pressure-tank valve is opened.

2. The Trigger. Press the trigger vigorously. A flash should appear at the muzzle of the gun. This shows that an incendiary charge of the ignition cylinder has been ignited. Release the trigger. If the flash does not appear, press the trigger again, or as often as necessary up to five times, until a flash appears.

3. Fuel Valve. Immediately after pressing the trigger, compress the valve lever and grip safety vigorously with the right hand. Burning fuel will be propelled from the gun.

4. Adjusting Fire. Direct the flaming fuel at the target. Continue to squeeze the valve lever and grip safety throughout the burst. When thickened fuel is fired, follow the fuel with the eyes to the side of the stream in order to observe and correct aim. (If eyes are directly behind the stream the flame may obscure the target.) To cease fire, release the controls.

5. Soaking The Target. When liquid fuel is used, it may be desirable to soak the target with fuel first and ignite it afterward. To do this, squeeze the valve lever once or twice before pressing the trigger. Then follow with an ignited burst.

B. After Firing. When the operator has returned from his mission, he should remove and discard the ignition cylinder, as follows:

1. Point gun at the ground.

2. Press latch.

3. Unscrew the ignition shield and allow ignition cylinder to fall out. CAUTION: (Be careful, keep the hands away from the front end of ignition shield as it is hot from firing).

4. Close the pressure-tank valve by turning valve handle clockwise to conserve remaining pressure in pressure tank.

5. Point the gun away from personnel and blow out the remaining fuel, if any, from the fuel tanks by squeezing the valve lever and grip safety until there is no further discharge. Do not use trigger during this operation.

Safety Precautions

A. Special safety rules apply to the Flame Thrower, Portable, M2A1. They are as follows:

1. Since very high pressure is used, do not detach any of the flame thrower parts until you are certain they are not under pressure.

2. Never point the gun in a direction where accidental discharge would cause injury or damage.

3. Carry extra ignition cylinders only in metal containers.

4. Keep the flame thrower clean and avoid rough handling.

5. Do not fire if your clothing has fuel on it.

6. Do not operate controls until ready to fire on target.

7. The maximum depression during firing should not exceed 20 degrees.

8. Never fire into a strong wind. A strong wind will shorten the range and may blow the flame back upon the operator.

9. The fact that gasoline is highly inflammable must always be kept in mind. Inspections for leaks should be made frequently, particularly at pipe and hose joints.

Care and Cleaning

After the flame thrower has been fired, the following steps should be taken:

A. Remove and discard ignition cylinder.

B. Close the pressure tank valve and blow out remaining fuel and pressure.

C. Remove and clean the ignition shield.

D. Make certain that fuel tanks and passages are completely drained. Use gasoline to remove thickened fuel before it hardens and closes passages.

E. Clean atomizer hole by holding fuel valve fully open and inserting fine wire into atomizer hole of the nozzle.

F. Check fuel hose for cracks or other signs of deterioration.

G. Open the pressure tank valve and leave it open.

H. Clean all other parts and lubricate.



Chapter 28

Rifle Grenades

RIFLE grenades are the Marine rifleman's best weapon for use against tanks, pill boxes, and, in some cases, enemy personnel. They also are effective as signaling agents, for screening effect, and as an incendiary against inflammable targets. They are similar to hand grenades, but have greater range since they are fired from the muzzle of the rifle by use of a special blank cartridge. Certain types are much more powerful than hand grenades.

This chapter describes the capabilities, uses, and types of rifle grenades as well as the safety precautions, procedures, positions and accessories necessary to fire them.

Capabilities and Use

Rifle grenades are versatile weapons and can perform many jobs if the right grenade is used for the particular task at hand. They may be fired singly or in groups, at low or high angle, and they can cover the dead space between the distance you can throw a hand grenade and the minimum range of mortar and artillery fire.

Accessories

To fire rifle grenades you need your rifle, a special cartridge, a grenade launcher, and a special sight.

1. RIFLE GRENADE CARTRIDGE (Figure **28.1**). This is the M3 caliber .30 rifle grenade cartridge which provides the propelling force for the grenade. It has a five-pointed crimped end and can be identified easily by sight or touch. *Only this cartridge will be used to fire rifle grenades. Field expedients will not be employed.*

2. RIFLE GRENADE LAUNCHER M7A3 (Figure **28.2**). The grenade launcher is merely an extension to the barrel of your rifle with graduated annular grooves which are used to obtain different ranges when firing grenades. A clip latch on the launcher fits over the bayonet stud and secures the launcher to the rifle. A stud attached to the frame of the launcher depresses the valve in the gas cylinder lock screw of the rifle when a grenade is fired. This allows excess gas created by the M3 cartridge to escape so it will not damage the rifle.

When the launcher is attached you cannot fix the bayonet to your rifle but you can fire regular ammunition, *so long as no grenade is on the launcher.* Because of the added weight, the zero of the rifle with a launcher will differ from the regular zero. After firing grenades and then

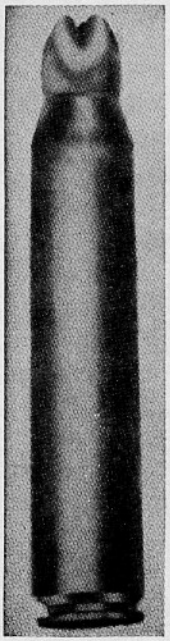


Figure 28.1. M3 grenade cartridge.

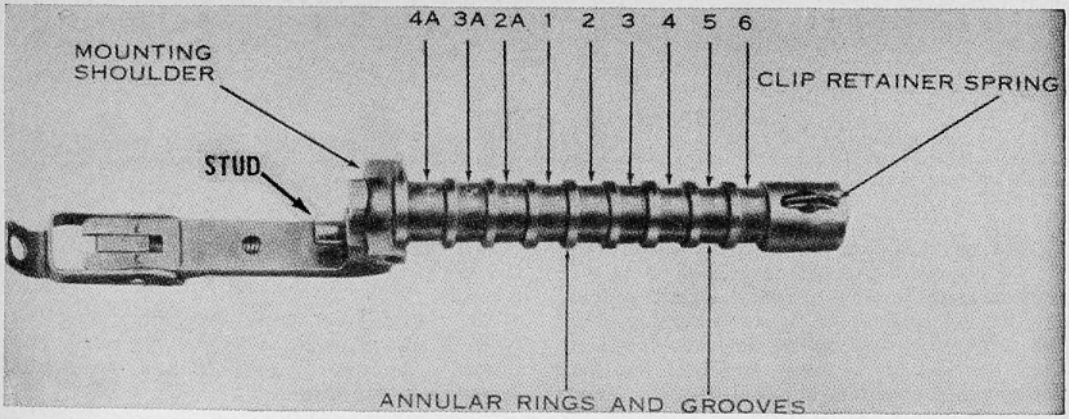


Figure 28.2. M7A3 grenade launcher.

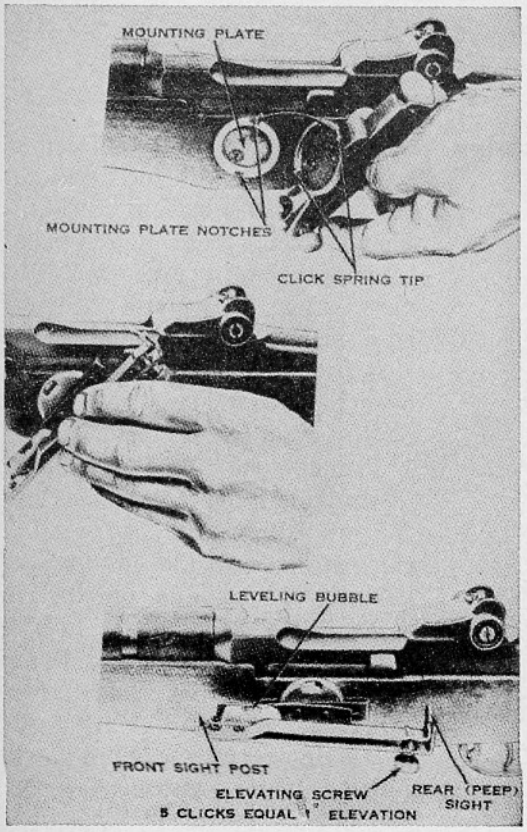


Figure 28.3. M15 grenade sight.

switching to regular ammunition, the rifle will fire single-shot until the gas cylinder lock screw returns to normal position. If the rifle does not fire semi-automatically after two rounds, the gas cylinder lock screw must be cleaned.

The M7A3 grenade launcher is 5¾ inches long and weighs ¾ of a pound. It has nine annular grooves and a retainer spring for holding grenades on the launcher. When attached, the stud on the launcher frame rests on the valve of the gas cylinder lock screw of the rifle. When a grenade is fired, the launcher recoils slightly to the rear. The stud opens the valve and thus permits excess gas to escape. The launcher then returns to its original position and the valve closes. The slide and spring assembly in the launcher frame permit the recoil and return action.

3. RIFLE GRENADE SIGHT M15 (Figure **28.3**). The M15 sight provides angular measurement of elevation for firing rifle grenades. It can be used for low angle (direct fire) and high angle firing. The two main parts are the mounting scale plate and the sight bar assembly. Two wood screws secure the mounting scale plate to the left side of the rifle stock. The lip of the mounting plate has two identical sets of calibrations in 5° increments from 0° to 60° Serrations on the lip permit click measurements of 5° changes in elevation. The sight bar assembly is five inches long and consists of a front sight post, a rear peep sight mounted on a sight leaf, a leveling

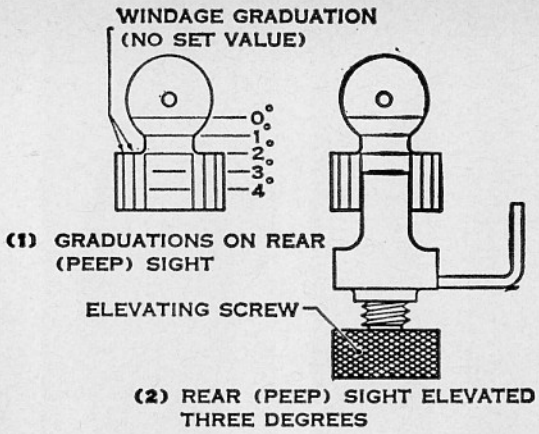


Figure 28.4. Rear peep sight of the M15 sight.

bubble and an elevating screw. The front sight post and the rear peep sight are used for direct fire just as the regular sights on the rifle are used. At the rear of the peep sight are four 1° graduations. (See Figure **28.4**). These are used for making 1° changes in low angle fire. Five clicks on the elevating screw will make a 1° change.

For high angle fire the sighting bar assembly is rotated until the index line on the body bracket is lined up with the desired setting on the mounting scale plate. The desired angle of elevation is set on the sight, the firing position is assumed, and the rifle is held so that the leveling bubble is centered. This places the rifle at the desired angle for firing.

To zero the grenade sight:

a. Set windage and elevation at zero.

b. Place the rifle in a stationary rest and, using the regular rifle sights and regular zero, aim the rifle at a point about 200 yards away.

c. Place the grenade sight rear peep sight at a setting of zero and rotate the sight bar assembly to a setting of zero.

d. Look through the grenade sight and note the point of aim.

e. If required, adjust the mounting plate by loosening the two screws, until the grenade sight point of aim coincides with the regular rifle sight point of aim.

f. Tighten the screws and verify.

g. Horizontal adjustment is made by loosening the two sight leaf screws, adjusting the peep sight and tightening the screws.

Classes and Types of Rifle Grenades

1. Rifle grenades may be considered in four general classes:

a. Practice.

b. High Explosive Antitank.

c. Antipersonnel.

d. Chemical and Pyrotechnic.

2. Types of rifle grenades:

a. Practice grenades.

(1) M11A4 Practice Rifle Grenade (See Figure **28.5**). This grenade can be used repeatedly to give rifle grenadiers practice in direct and indirect fire. It has a range of from 150 to 200 yards and, since it does not explode, may be used against a buttoned-up tank in training. It is made of cast iron, with an ogive and has a stabilizer tube, fin assembly and safety pin. It weighs about one pound and has no filler or fuze. Markings are: black body with white lettering.

(2) M29 Practice Rifle Grenade (See Figure **28.6**). This grenade is similar to the M11A4 in use, markings, and material. It weighs 1½ pounds and has a maximum range of about 150 yards.

b. High Explosive Antitank Rifle Grenade M31 (See Figure **28.7**). The body of this grenade is thin sheet metal. The fin assembly, stabilizer tube and adapter are of aluminum. It weighs 1½ pounds and contains a shape charge filler of Composition B. It is painted olive drab with yellow markings. This grenade arms when fired. When the fuze initiator in the nose strikes a solid object, it sets off the detonator in the adapter at the rear of the body. The detonator explodes the filler, and the explosion, due to the shape charge effect, is directed forward in a form of tremendous heat and force. The maximum *effective* range of the M31 HEAT rifle grenade is about 125 yards. It will penetrate more than 10 inches of armor or 20 inches of reinforced concrete.

c. Antipersonnel Rifle Grenades (See Figure

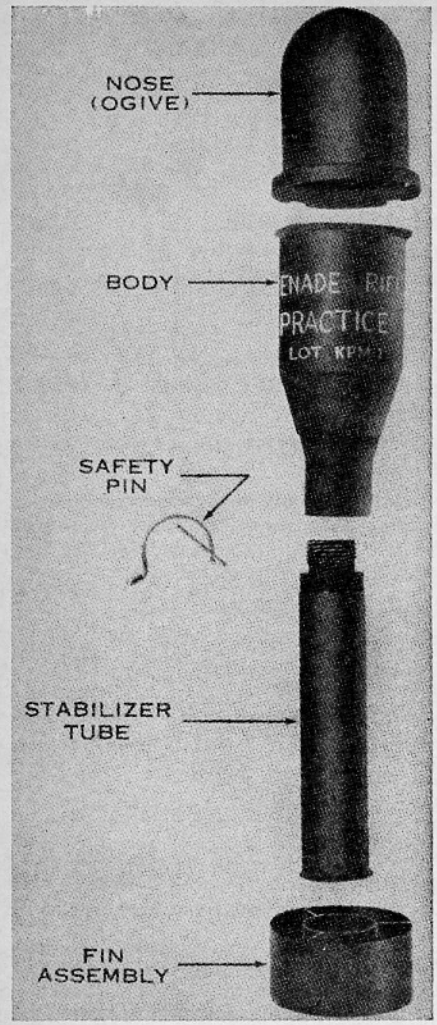


Figure 28.5. M11A4 practice rifle grenade.

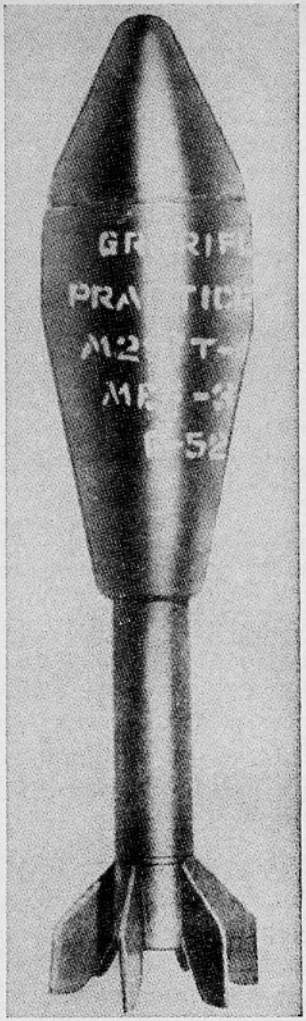


Figure 28.6. M29 practice rifle grenade.

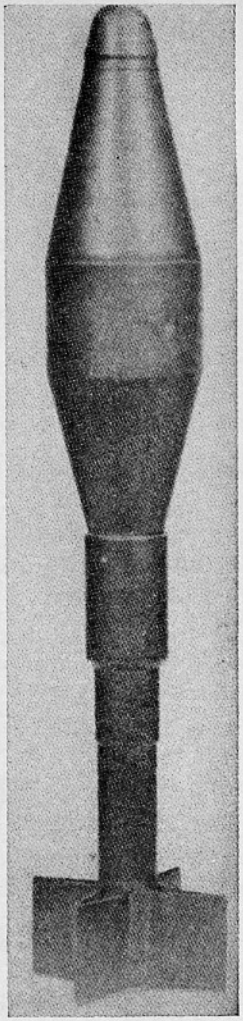


Figure 28.7. M31 HEAT rifle grenade.

28.8). The M1A2 Grenade Projection Adapter converts a regular hand grenade into a rifle grenade. The adapter can be used to fire the M26 and MK2 fragmentation, the M30 and M21 practice, and the M34 WP hand grenades. The adapter is made of sheet metal and consists of a fin assembly, a stabilizer tube and three claws. One claw is extra long and has an arming clip and clip retainer for holding the safety-lever of the grenade after the safety pin has been removed. The adapter is about seven inches long. The grenade is placed in the adapter before it is put on the rifle. The safety clip must fit into the arming clip and the grenade must be fully seated. After insur-

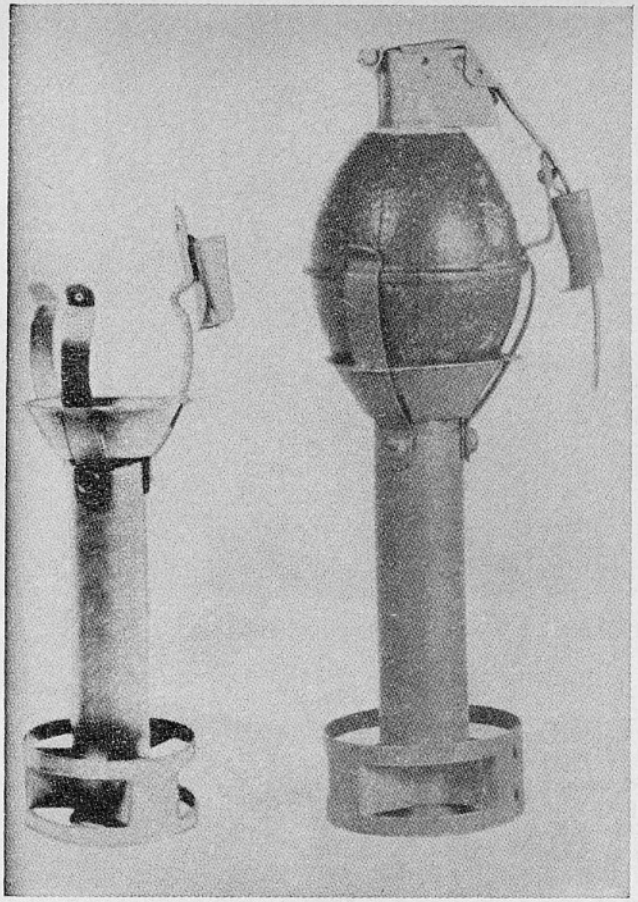


Figure 28.8. M1A2 grenade projection adapter with M26 hand grenade.

ing that the grenade is safe, the rifle is loaded with the M3 cartridge, the grenade and adapter are placed on the rifle, and only then is the safety pin removed. The rifle is fired and the grenade is launched. The inertia causes the arming clip to break away from the arming clip retainer and fall free. The safety lever is released and the grenade functions in the normal manner. With the adapter, fragmentation grenades may be projected up to 175 yards. White Phosphorus grenades will travel up to about 100 yards.

d. Chemical and Pyrotechnic Rifle Grenades (See Figure 28.9).

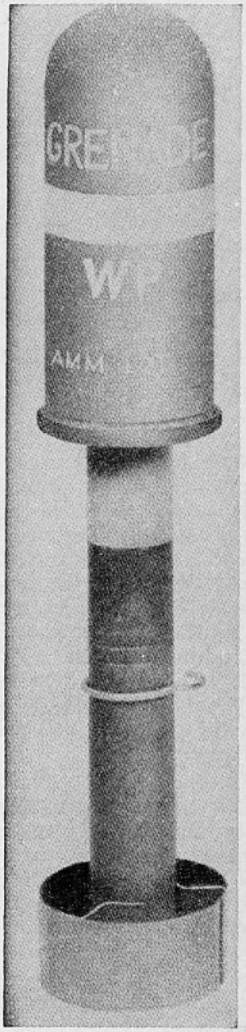


Figure 28.9. M19A1 white phosphorus rifle grenade.

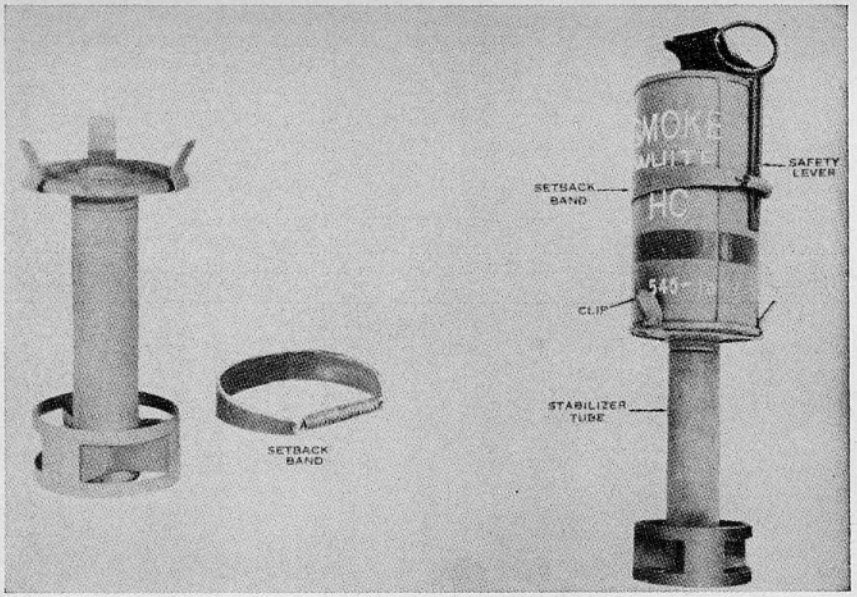


Figure 28.10. M2A1 chemical grenade projection adapter.

(1) M19A1 WP rifle grenade consists of a body, stabilizer tube, and fin assembly made of sheet metal. It weighs 1½ pounds and has 8½ ounces of white phosphorus filler. It is painted gray with yellow markings and has a safety pin in the stabilizer tube. It is fired in the same manner as other rifle grenades and explodes on impact, throwing burning particles of white phosphorus over an area about 20 yards in diameter. A dense white cloud of smoke is generated. The maximum range is about 200 yards. The M19A1 WP rifle grenade is excellent for producing casualties, screening purposes, and starting fires.

(2) Chemical hand grenades such as the M7A1 CN and the M6A1 CN-DM, the AN-M14 incendiary grenade, and pyrotechnic smoke hand grenades may all be projected by using the M2A1 chemical grenade adapter. (See Figure **28.10**) This adapter is similar in construction and use to the M1A2 grenade projection adapter.

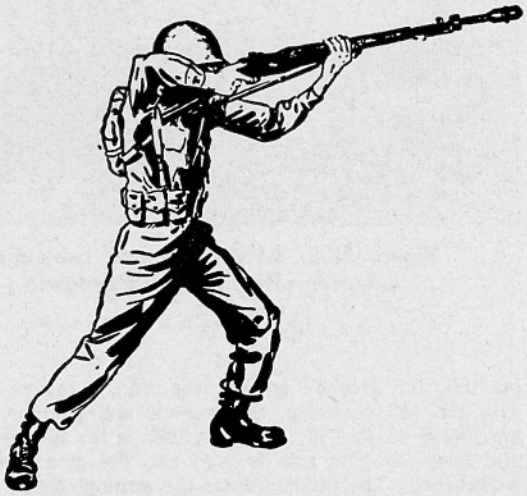


Figure 28.11. Standing position, low angle.

Firing Positions and Sight Setting

1. GENERAL. You may fire all the rifle grenades described above at low angle direct fire using the standing, kneeling, or prone positions. Except when prone, fire the rifle with the butt held firmly against the right shoulder. *Do not fire from the shoulder when in the prone position* since the body



Figure 28.12. Kneeling position, low angle.

cannot recoil freely with the rifle. Do not use the sling when firing low angle direct fire. Keep the head and eyes well away from the rifle and slanted to the left. This will enable you to look through the sight and to avoid the recoil of the rifle.

2. STANDING POSITION. (See Figure **28.11**). Face the target and then execute a half right face. Spread your feet about 20 inches apart, left foot pointing toward the target. Grasp the rifle with the left hand about two inches below the upper sling swivel. This will avoid pinching. Place the butt of the rifle well into the shoulder and sight through the M15 sight. Do not get too close to the sight or you may be struck during recoil. Lean well forward, bending the left leg. Track your target by pivoting at the waist.

3. KNEELING POSITION. (See Figure **28.12**). This position is very similar to the standing position except that you kneel on the right knee. Do not sit on the right heel or use the left knee to support the left elbow. To do so makes tracking difficult. Lean well forward in order that your body may recoil with the rifle.



Figure 28.13. Prone position, low angle.

4. PRONE POSITION. (See Figure **28.13**). This position has several disadvantages and should be used only when the standing or sitting positions are impossible to use. A butt rest, such as a tree stump, rut, or hole in the ground must be used. It is difficult to see through the sight and to track targets. The right forearm is placed over the stock and the rifle must not be canted.

5. HIGH ANGLE FIRING. When firing at angles above 24° only the sitting or kneeling positions can be used. The butt of the rifle must rest on the ground.

6. SIGHT SETTING.

a. Estimate the range to the target.

b. Obtain the desired angle of elevation from the rifle grenade data card.

c. Set the M15 sight to the nearest 5° mark below the desired elevation setting by rotating the sight assembly bar.

d. Turn the elevating knob to place the last 1° to 4° of elevation required on the sight.

Safety Precautions

Grenades are dangerous. Here are a number of rules to follow when handling or firing rifle grenades.

1. Never tamper with duds. Report them to your squad leader or platoon commander.

2. Wear your helmet when firing.

3. Use *only* the M3 rifle grenade cartridge to fire grenades.

4. Never alter a grenade in any fashion.

5. If you drop an armed grenade and thus allow the striker to function, yell "GRENADE", pick it up and throw it into a safe area. Then take shelter. Remember that you can throw a grenade farther than you can run in 4 or 5 seconds.

6. Do not pull a safety pin until you are ready to fire a grenade. Once the pin is pulled, go ahead and fire. Never attempt to replace a pin.

7. Keep grenades clean and dry. Check inside the stabilizer tube for foreign matter before placing the grenade on the launcher.

8. Check the launcher for burrs and grit before firing. Make sure it is secure on the rifle.

9. If an M3 cartridge fails to fire, replace it carefully. If the new cartridge fails to fire, carefully remove the grenade (and adapter, if used) and fire the grenade from another rifle.

10. Should a time fuze start functioning while the grenade is on your rifle, *fire immediately into a safe area.* Do not attempt to remove the grenade.



Chapter 29

Demolitions and Mine Warfare

DEMOLITIONS are no longer the weapons of the specialist only. World War II and the Korean Conflict have shown the need for these weapons in the hands of all units.

The infantry must do the job of knocking out pillboxes, bunkers and cave positions. In addition, infantrymen must be able to lay and breach mine fields.

This chapter deals with the demolitions and mines normally available to the infantry battalion, standard U. S. firing devices, and booby traps.

Types of Explosives

You will need a basic knowledge of the explosives used for demolition charges. The most common explosives you will encounter are TNT, composition C-4 and detonating cord.

A. TNT. TNT (Trinitrotoluene) is a powerful high explosive used for general demolition work throughout the Marine Corps. Its insensitivity makes it ideal for combat use. It is a solid cast block, pale yellow in color, issued in one-pound blocks. (See Fig. **29.1**.) This one-pound block consists of two half-pound blocks in an olive drab cardboard container.

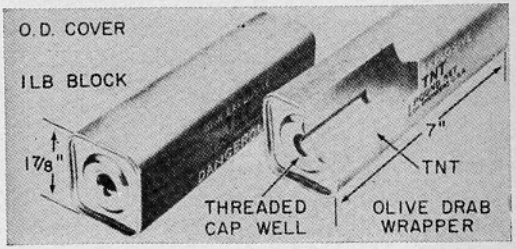


Fig. 29.1

At one end of the block there is a hole to receive a blasting cap. TNT may readily be used under water. It is easily detonated by military blasting caps, either electric or non-electric.

B. C-4. Composition C-4 is a white, putty-like, odorless plastic explosive. It is more powerful than TNT. It has many desirable characteristics as a military explosive. Some of them are: Remains plastic over a wide range of temperature; can be molded to fit irregular-shaped objects; may be used under water. C-4 will normally be encountered by the Marine in the field in the form of the M-37 Demolition Kit. (See Fig. **29.2**.) The kit consists of a canvas bag with a web shoulder strap. Within this bag there are two smaller bags, each containing four 2½-pound blocks of C-4, for a total of eight blocks to the kit. Two priming assemblies, M-15, come with each kit. These consist of a five-foot length of detonating cord with a booster crimped to each end. These primers are packed in a pocket on the inner flap of the kit. C-4 is easily detonated by

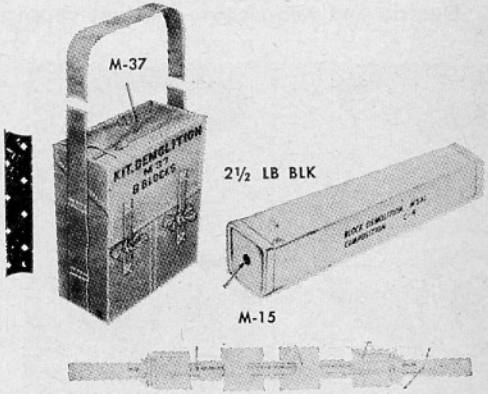


Fig. 29.2

standard military means.

C. Detonating Cord. Cord, Detonating (PETN) consists of a flexible tube filled with PETN contained within a white, yellow, or yellow and black waterproof textile covering. It will detonate even when the cord is water-soaked, provided the detonation is started from a dry end. It may be detonated with either special electric or non-electric blasting caps.

Detonating cord detonates at a high rate (21,000 ft/sec) and with sufficient force to detonate other explosives to which it has been properly attached. Detonating cord is used to prime charges and to simultaneously explode a number of separate charges. It is particularly useful for detonating explosives placed underground. For field use, detonating cord is issued in 100- and 500-foot rolls.

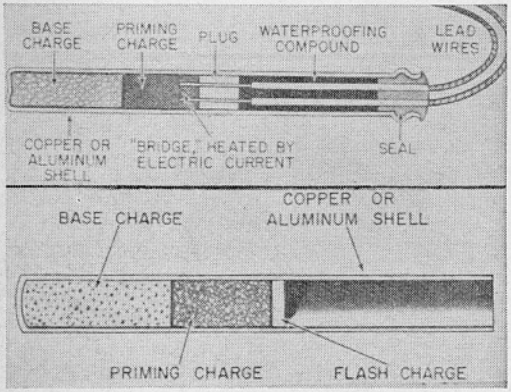
Blasting Caps and Fuzes

A. Blasting Caps (Fig. 29.3).

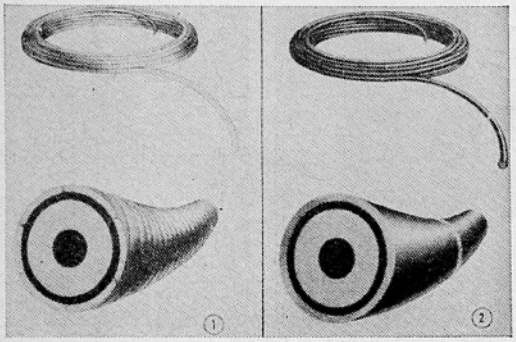
1. *General.* A blasting cap, used for priming explosives, consists of a thin, tubular metallic shell of non-corrosive material about 2½ inches long and ¼ inch in diameter, containing an initiating composition and a charge of TETRYL or PETN, which are sensitive high explosives. Blasting caps are used for initiating high explosives and as the detonating element for certain types of land-mine fuzes. The caps are designed to be inserted into cap wells. The electric type is fitted with lead wires which may be attached to a firing wire which in turn is attached to a blasting machine. The non-electric type may be crimped to any standard firing device or to a time blasting fuze (safety fuze) fitted with a fuze lighter.

2. *Storage and handling.* Blasting caps are extremely sensitive and may explode unless handled carefully. They must be protected from shock and extreme heat and must not be tampered with. Never store them with any other explosives. Do not carry caps and explosives on the same truck, except in an emergency.

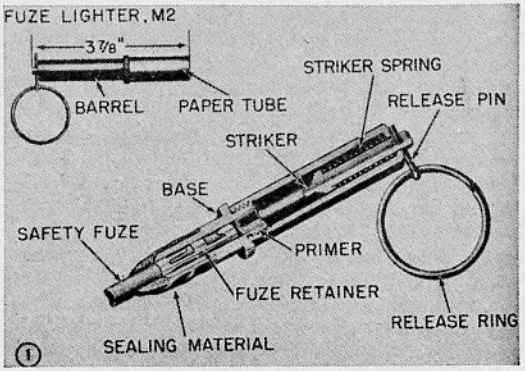
B. Time fuzes. There are two types of time fuzes: The blasting time fuze and the M700 safety fuze (Fig. **29.5**). Blasting time fuzes are usually orange in color and the M700 safety fuze is usually green. Both fuzes contain black powder and have a waterproof covering which permits use under water for short periods of time. Both fuzes may be lighted by an ordinary match or an M2 fuze lighter. The burning time of the blasting fuze varies between 30-45 seconds per foot, whereas the M700 safety fuze burns at a uniform



29.3 Electric and non-electric blasting caps.



29.5 Blasting Time Fuze; Safety Fuze M700.



29.6 Weatherproof Fuze Lighter, M2.

rate of 40 seconds per foot. However, you should burn and time a one-foot length of a fuze to determine its true burning rate before using it in an actual detonation. The two fuzes may be used interchangeably. The main difference between them is that the blasting time fuze has a fabric cover, while the M700 safety fuze has a plastic covering which makes it more durable.

C. Weatherproof fuze lighter, M2 (Fig. 29.6).

1. *Description and use.* The M2 weatherproof fuze lighter is used to facilitate the lighting of the time fuze and the safety fuze M700. It will ignite a time fuze under all weather conditions, and even under water if it is properly waterproofed. When the striker-retaining pin is pulled, the striker hits a percussion cap, which in turn ignites the fuze. A sealing compound may be used to waterproof the joint between the fuze and lighter.

2. *Operation.*

(a) Slide the pronged fuze retainer over the end of the fuze and seat it firmly.

(b) If necessary, apply a sealing compound to waterproof the joint between the fuze and the lighter.

Preparing Charges

High explosive charges are detonated by primers. A primer is one block or cartridge of the charge with a cap or detonating cord properly attached. The operation of attaching the cap or detonating cord is called "priming." To avoid misfires, primers must be made properly and must be placed in close contact with the remainder of the charge. Various methods of priming are described as follows:

A. Non-Electric Priming. The crimping of a non-electric blasting cap to a piece of time fuze is without a doubt the most hazardous operation you will encounter while working with explosives. The following is the procedure you must follow:

1. *Time the fuze.*

(a) Always cut off and discard six inches from each end of a roll of time fuze before using. (The ends absorb moisture).

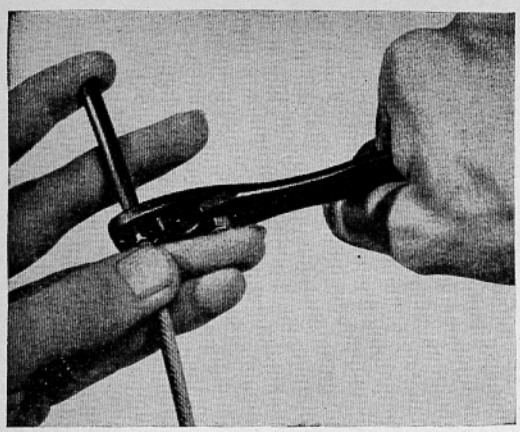
(b) Cut off a one-foot piece and check the burning rate, (in seconds). If the fuze burns one foot in less than 30 seconds, it should never be used. (As per manufacturer specifications). If it

PRINCIPAL U. S. EXPLOSIVES (Used by Marine Corps)

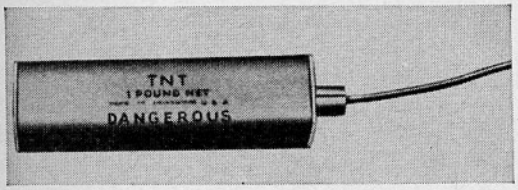
Name	Principal use	Smallest cap required for	Velocity of detonation (ft per sec)	Relative of effectiveness as external charge (TNT-1.00)	Intensity of poisonous fumes	Water resistance
TNT	Main charge, booster charge, cutting and breaching charge, general and military use in forward areas.	Special blasting cap, electric or non-electric	21,000	1.00	Dangerous	Excellent
Composition C3			26,000	1.34	Dangerous	Good
Composition C4			26,000	1.34	Slight	Excellent
Ammonium Nitrate	Cratering and ditching		11,000	0.42	Dangerous	Poor
PETN	Detonating cord	Spec. blasting cap*	21,000	1.00	Slight	Good
	Blasting caps	N/A				
TETRYL	Booster charge	Spec. blasting cap*	23,400	1.25	Dangerous	Excellent
	Blasting caps	N/A				
Composition B	Shaped charge and AT mines	Spec. blasting cap, electric or non-electric	25,500	1.35	Dangerous	Excellent
Amatol 80/20	Bangalore torpedo		16,000	1.17	Dangerous	Poor
Black powder	Time blasting fuze	N/A	(unknown)	0.55	Dangerous	Poor

*Electric or non-electric

Fig. 29.4



29.7 Method of using Cap Crimpers.



29.8 Cap and fuze secured with adapter.

burns more than 30 seconds per foot, it may be used.

(c) Cut the fuze long enough to make sure you can reach a place of safety before the charge explodes. (A minimum of 36″ for training).

2. *Cap the fuze.*

(a) Remove one cap from the cap box.

(b) Hold the cap, open end down, and shake it gently to remove any foreign matter. *DO NOT TAP THE CAP WITH OR AGAINST ANY OBJECT.*

(c) Holding the fuze vertically with the cut end up, the blasting cap is gently slipped down over the fuze so that it is in contact with the black powder in the end of the time fuze. *DO NOT TWIST OR FORCE THE FUZE INTO THE CAP.*

(d) When the cap is properly seated, it is crimped in place with the cap crimpers. The crimp should be made ⅛ to ¼ of an inch from the open end of the cap.

(e) The person doing the crimping should wear a helmet and hold the cap pointed away from the body and over the head.

3. *Priming TNT.*

TNT may be primed by inserting a cap with fuze attached into cap well. It is secured in place with either a priming adapter, tape, or twine.

4. *Priming C-4.*

C-4 may be primed by molding the explosive around the fuzed cap. (See Fig. **29.9**).

B. Detonating cord may be used to fire single or multiple charges. It will detonate both TNT and C-4, provided it is properly attached.

1. *Priming TNT.*

Detonating cord may be attached to TNT by crimping a non-electric blasting cap to one end of the detonating cord and securing as per fuze and cap. It may be tied to the block by a clover hitch with one extra turn. (See Fig. **29.10**).

2. *Priming C-4.*

C-4 may be molded around a blasting cap crimped to detonating cord or it may be attached to a knot placed in the end of the detonating cord. This knot is a 10″ loop with an overhand knot. (See Fig. **29.11**).

3. To attach blasting cap to detonating cord, fold over six inches to the end and tape cap in the loop thus formed. (See Fig. **29.12**).

C. Electric Priming. Normally done by Engineer Troops.

Prepared Charges

Special charges for certain types of demolition are sometimes needed. Among these are the following:

A. Bangalore Torpedo (Fig. 29.13). The M1A1 Bangalore Torpedo consists of a series of loading assemblies which are used singly, or in a series, with nose sleeve and connecting sleeves. Each loading assembly is a five-foot length of steel pipe, 2⅛ inches in diameter and weighing 13 pounds, of which approximately 8½ pounds are explosives. Each loading assembly is equipped with a threaded cap well in each end for priming.

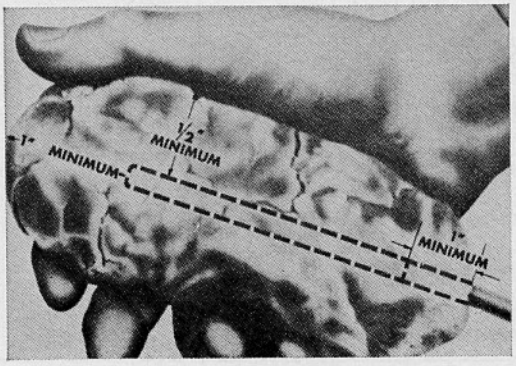


Fig. 29.9

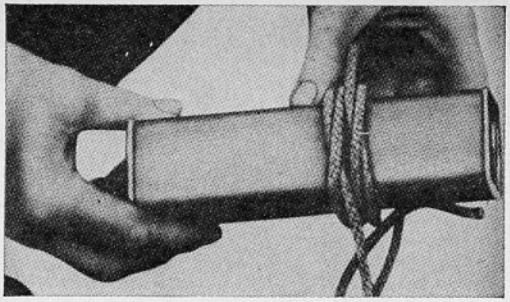


Fig. 29.10

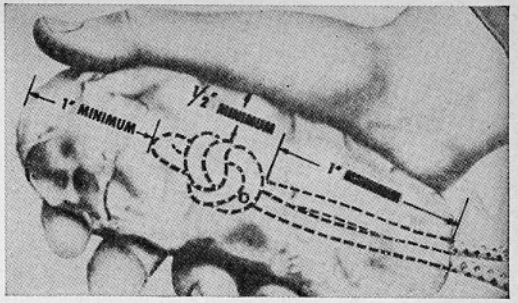
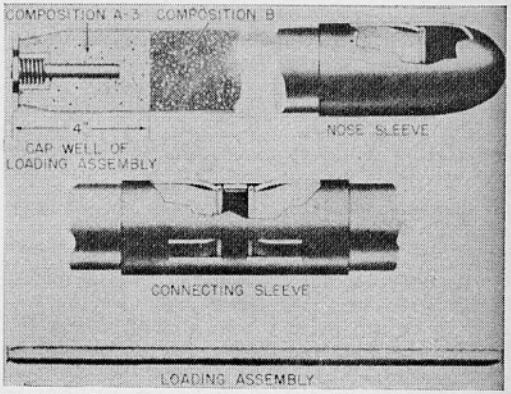


Fig. 29.11

B. Shaped charges are charges shaped to concentrate most of the explosive force in a small area. Standard shaped charges have a cone-shaped top and a conical recess in the bottom. They are provided with supports to hold the charge at the proper distance from the surface of the material to be penetrated. They are used on such objects as concrete bunkers, obstacles and armor plate.

C. Cratering Charge. A cratering charge is a 40-pound charge packed in a watertight, cylindrical, metal container. A cap well and a detonating cord tunnel are attached to the container to accommodate the primer. To insure detonation, a booster is provided within the charge. A metal ring is provided on top of the container for lowering the charge into a hole. The cleat above and to the side of the cap well is used when the charge is primed either non-electrically or electrically.



29.13 Components of an M1A1 bangalore torpedo.

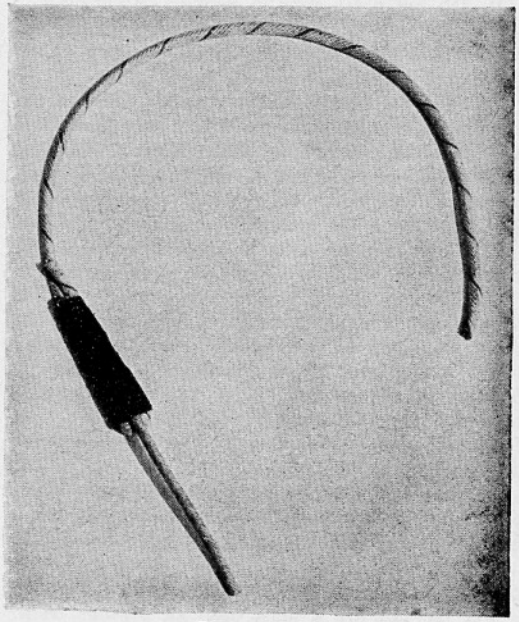
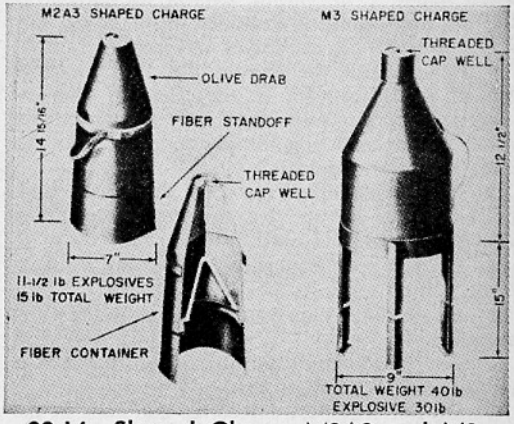
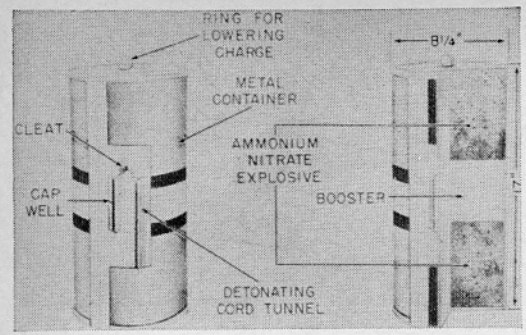


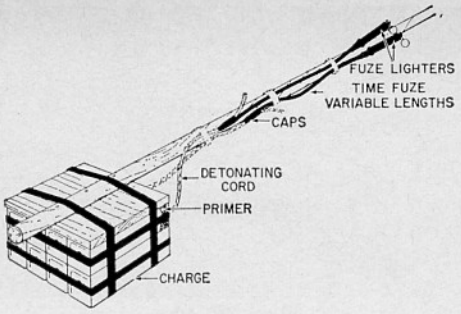
Fig. 29.12



29.14 Shaped Charge M2A3 and M3.



29.15 Ammonium nitrate cratering charge.



29.16 A pole charge primed with detonating cord.

Ammonium nitrate is used in cratering charges because its slow velocity of detonation results in the desired pushing or heaving effect.

Ammonium nitrate cratering charges can be exploded by the special blasting cap, electric or non-electric, or by detonating cord. However, due to frequency of misfires, it is recommended that an additional primer, consisting of a one-pound charge, be placed on top of the 40-pound can in each hole.

General Safety Precautions

Explosives are dangerous when not handled properly. Carelessness, rough handling and disregard for safety rules cause unnecessary waste, premature explosions, misfires, and, in many cases, serious accidents. Demolition explosives and related items are packed to withstand conditions ordinarily encountered in the field, being packed for shipment and storage in moisture-resistant containers and suitable packing boxes. However, containers and boxes must not be handled roughly. When handling or storing explosives, adhere to the following safety precautions at all times:

1. Never handle explosives carelessly.

2. Never divide the responsibility for the preparation, the placement, or the firing of charges. Make one person responsible for the supervision of all phases and appoint alternates to take his place whenever necessary.

3. Protect demolition materials from mud, sand, dirt and water. If they become wet or dirty, they should be cleaned at once.

4. Do not open explosives in or near a magazine.

5. Do not store caps and explosives in the same magazine.

6. Do not smoke or permit an open flame near explosives.

7. Do not transport explosives and caps in the same vehicle, unless absolutely necessary.

8. Do not leave explosives or caps exposed to direct sunlight or to any other source of heat.

9. Do not carry caps in pockets of clothing.

10. Do not shoot into explosives with any firearm, or allow shooting in the vicinity of an explosives magazine.

11. Do not open kegs or wooden cases of explosives with metallic tools. Use a wooden wedge and wooden, rubber or fiber mallet. Metallic slitters may be used for opening fiberboard cases, provided that the metallic slitter does not come in contact with the metallic fasteners of the case.

12. Do not use empty explosives cases for kindling fires, for heating purposes, or cooking.

13. Do not permit any paper product used in the packing of explosives to leave your possession. Accumulations of fiberboard cases, paper case liners, cartons, or paper should be destroyed by burning after they have been carefully examined to make sure that they are empty.

14. Do not use explosives that are obviously deteriorated.

15. Do not attempt to reclaim or use fuzes, blasting caps, or any other explosives that have been water-soaked, even if they have dried out.

16. Do not make up primers in a magazine or near large quantities of explosives.

17. Do not fire a blast until all persons, vehicles, and surplus explosives are in a safe place.

Using Demolitions

A. General. To keep an attack moving, it may be necessary for an infantryman or for an attached demolition man of the assaulting element to breach or reduce obstacles with hand-placed explosive charges. The standard item of explosive adaptable to any type of demolition is the TNT block. Plastic types of explosives, while also adaptable to all types of demolitions, find their special usefulness where unusually shaped obstacles are to be attached and where limited space is available for placement and tamping of explosives. Shaped charges are especially useful: (1) to create a tubular hole in the obstacle so that additional explosives may be then employed to breach the entire obstacle; (2) to avoid excessive tamping required for large quantities of TNT; or (3) to concentrate the explosive effect in a single direction.

B. Package Charges. Charges are readily put into place if the explosives are prepared in convenient packages of appropriate size and shape. Explosives can be packaged in sandbags to make elongated cylindrical charges for boreholes. Blocks of TNT or other explosives can be stacked together and bound with tape or twine or wrapped in canvas, cloth, or paper. A satchel charge may be improvised by tying or taping explosives blocks to a board provided with a handle. Large charges may use an entire case of explosives. For large charges, two blocks are removed from the case and primed. This is called dual priming. (Lessens the possibility of a misfire). A charge consisting of several cases of explosives may also be prepared by lashing the cases together. The detonation of a single case or primer will explode the entire charge.

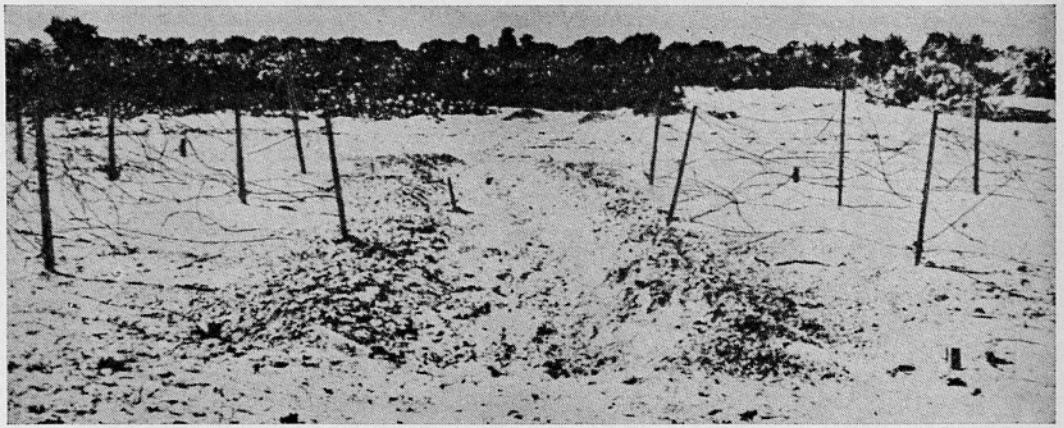
C. Pole Charges. Pole charges are convenient for placing charges against pillbox embrasures, hard-to-reach stringers of bridges, underwater piles of bridges and in other locations not easily accessible. Pole charges usually consist of the explosive charge, detonating cord, fuze lighter, time fuze, non-electric blasting cap, and a pole. The charge may be prepared in the same manner as a package charge and propped into position by the pole.

D. Breaching barbed wire. Barbed wire entanglements are built of standard barbed wire, concertinas or barbed tape. They are constructed as high fences, deep and low entanglements, or a combination of both. They are normally four to seven feet in height and may consist of one or more strands or rings of barbed wire. The enemy frequently erects more than one band of wire and employs both mines and alarm devices. The following breaching methods are suitable:

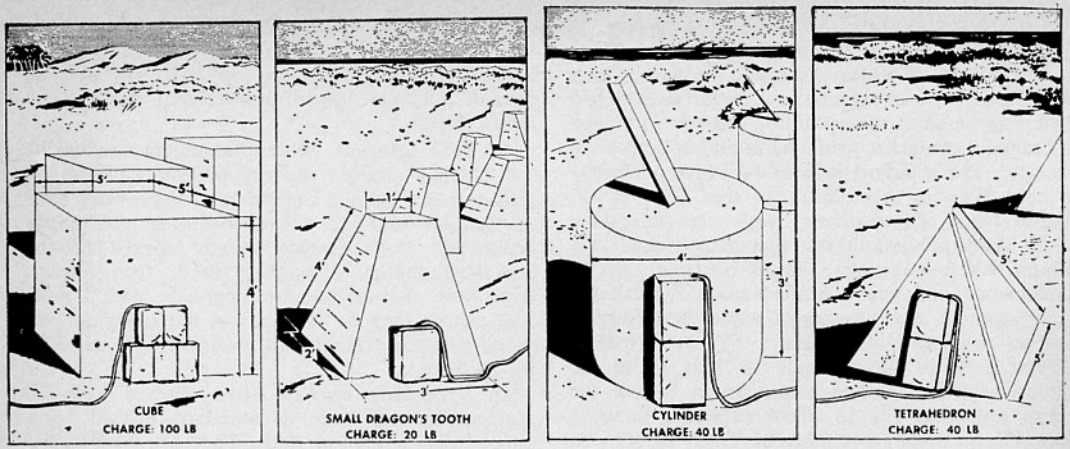
1. *Bangalore torpedo.*

(a) *General.* The bangalore torpedo is especially designed for attacking barbed wire entanglements. It makes a clear, useable lane in standard barbed wire, cutting anti-personnel mine trip wires as well as the barbed wire. It provides the most effective method for passage of such obstacles. The torpedo is used as follows:

(1) Carry torpedo in convenient lengths, depending on the size of the breaching party. Ap-



29.17 Lane through barbed wire cleared by a bangalore torpedo.



29.18 Explosive packs needed to destroy typical small concrete obstacles.

proach the obstacle with caution, watching for anti-tank and anti-personnel mines around it.

(2) To avoid detonating the torpedo by pushing it into an anti-personnel mine, attach a dummy section to the nose. Use a branch, length of wood, or empty pipe for this purpose.

(3) Push the nose section into the entanglement. Connect second section, push forward, and add the rest of the sections in the same manner. To breach an entanglement in one operation, you must use enough assemblies to reach entirely through the emplacement, preferably placed alongside the center picket.

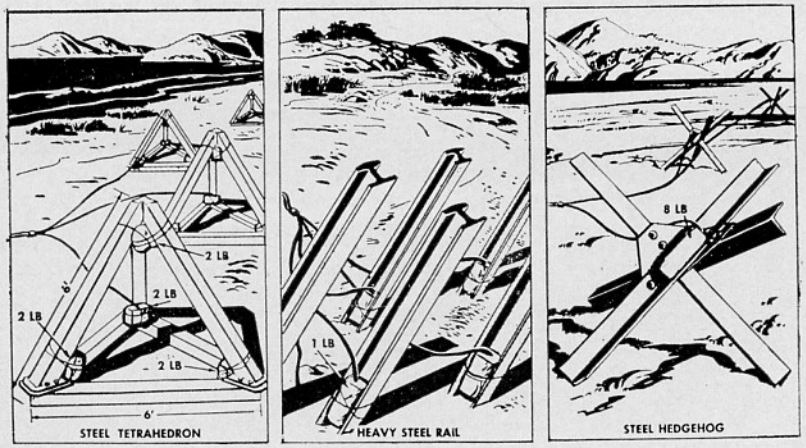
(4) Extremely deep entanglements may be breached in two or more operations. Clear as deeply as possible with the first torpedo, then advance through the breach thus formed and place the next bangalore.

(5) Fire bangalore only after all members of breaching party are at least 30 yards away and well protected with sufficient cover.

(b) *Effect.* The standard bangalore clears a 10- to 15-foot lane in wire entanglements (Fig. **29.17**). It explodes anti-personnel mines and some anti-tank mines in a lane slightly narrower than the lane cut in the wire. Anti-tank mines



29.19 Size and placement of charges used against common wooden obstacles.



29.20 Placement of charges for destruction of steel obstacles.

may be left in a sensitive state and care must be exercised in clearing mines adjacent to the lane. The chief disadvantage is that secrecy is lost when the bangalore is detonated; detonation should therefore be delayed until the last possible moment before the assault.

2. ***Shaped Charges.*** For use against barbed wire, the shaped charge is placed in a horizontal position with the recessed end pointed toward the entanglement. Its effectiveness may be increased by packing nuts, bolts, nails or other metal shrapnel into the recessed cone. It is an inefficient means, however, and does not completely clear an entanglement. It must be followed up by other means of clearing. (See Fig. **29.17**)

E. Breaching small concrete and rock obstacles. Concrete obstacles vary considerably in size, shape, quality of concrete, amount and type of reinforcing, spacing, total depth of the group of obstacles, and type of ground in which they are emplaced. Characteristic obstacles are posts, coffins, cubes, cylinders, eggs, dragon's teeth and tetrahedrons of plain or reinforced concrete. Small masonry and rock structures are similar to concrete obstacles and should be attacked by the same methods. These methods also apply to small concrete obstacles found on beaches.

1. ***Hand-placed charges.*** Hand-placed charges are the quickest and most effective method of attacking small obstacles. About two pounds of explosive per cubic foot of obstacles should be used. The best results will be obtained by placing the explosive charges in such a manner as to attain the greatest area of contact between the obstacle and the explosive. The charge should be placed on the ground against the center of the largest face of the obstacle. Depending upon the configuration of the obstacles, the charge may have to be propped against it or tied to it. The charge should be placed on one side of the obstacle so debris is thrown to the side and out of the cleared gap. Figures **29.18 (1, 2, 3, 4)** show several typical concrete and rock obstacles and placement of charges.

2. ***Shaped charges.*** Shaped charges are especially useful against concrete and rock obstacles to create boreholes for hand-placed internal charges. The force of the explosion of the shaped charge is concentrated in a single direction against the obstacle and the need for tamping is eliminated.

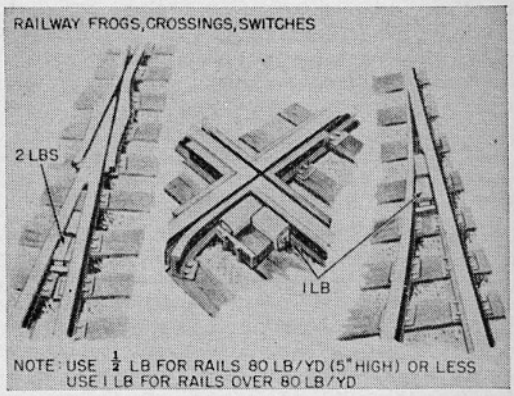
F. Log obstacles. In general, methods of breaching concrete obstacles are also effective against steel or wood obstacles such as rails, tetrahedrons, hedgehogs and posts. Plastic explosive is recommended since it can be easily wrapped or molded around steel or wood forms, insuring good contact. However, this may be difficult with odd-shaped obstacles. An example of the charges for a typical obstacle is shown in Fig. **29.19**. Quantities should be increased or decreased according to the thickness and the material. Generally, the charge should be placed at a joint where the obstacle is weakest. When obstacles are driven into the ground, the charge should be attached to the obstacle as close to the surface of the ground as possible.

G. Breaching Steel Obstacles. Steel obstacles which may be encountered are rails, tetrahedrons, hedgehogs, fence-type obstacles, and curved-rail obstacles. They are cleared by the following means: *Hand-placed charges.* Methods of attacking individual steel obstacles by the use of hand-placed charges are the same methods used for individual log obstacles. Fig. **29.20** shows several steel obstacles and the placement of charges to destroy or cut them.

H. Destroying railroad tracks and roadways. Railroad weak points are curves, switches, frogs and crossovers. These points may be easily destroyed with a small amount of explosive. Placement of charges is shown in Fig. **29.21**.

I. Attacking a fortified emplacement.

1. ***General.*** Of all the obstacles described in this chapter, the one most likely to be breached or reduced by a Marine infantryman acting as a demolition man is a fortified position commonly referred to as a pillbox or bunker. These positions are usually constructed of concrete or heavy timbers, logs and earth. During an attack these positions will be assaulted under enemy fire by a rifle squad, unless the position has been re-



29.21 Placement of charges for demolition of railroad switches, frogs and crossovers.

duced by aircraft or gun fire. When attacking while under fire, it is necessary for all Marines of the squad to be able to carry out the task of blasting the emplacement.

2. ***Preparing charges.*** Before assaulting the emplacement, a package or pole charge should be prepared. M5A1 demolition blocks, which make excellent charges, are packed in canvas bags or may be made as outlined in paragraph B. The charge should be primed and ready to fire prior to moving in on the emplacement. (See Fig. **29.16** for a pole charge ready for firing.) This preparation eliminates excessive time in an exposed position. If possible, dual non-electric firing systems should be used to insure detonation of the charge.

3. ***Positioning the charge.*** Under cover of small arms fire and smoke, the demolitionist moves to a position where he is going to place the charge. It is important that the charge is placed in the proper position to give the desired effect. Generally it is desired that a maximum of casualties occur in the emplacement and that the emplacement itself be rendered useless for further combat. All emplacements have openings that weaken the structure. These openings are the most vulnerable to attack by explosives. Embrasures (firing ports) are stepped to prevent small arms fire from ricocheting into them. The wider the angle of the embrasure, the weaker the surrounding concrete. A charge placed in an embrasure will have a good chance of causing heavy casualties to personnel within the emplacement as well as rendering the position temporarily useless. In addition to embrasures, air intakes, entrances and exits also serve as suitable positions for placing explosive charges. After the charge is in place, the demolitionist moves to a safe position. Other members of the squad stay clear until after the explosion.

Mines

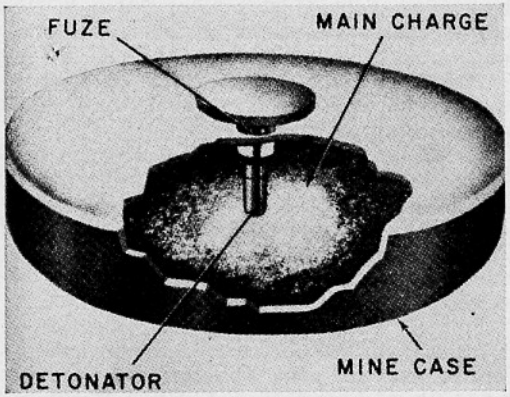
In the past, land mines warfare has been a traditional engineer specialty. With increased stress being placed on the employment of land mines in recent warfare, it can no longer be considered an exclusive engineer or pioneer responsibility. In both offensive and defensive operations, consideration is given to the employment of obstacles to aid you in carrying out your mission. They are used to delay and hamper the enemy, to force him to attack in areas where he will suffer heavy casualties, and to provide security. Because land mines are portable, easily and quickly installed, and easily removed, they are the best artificial obstacles. Moreover, because of their destructive powers, mines are also weapons. While mines are a great hazard to the enemy, they are of greater danger to the Marine who does not understand them. Familiarity with mines, fuzes, and booby traps does not breed contempt, but rather a healthy respect.

All Marines are required to know the types and functions of mines. In addition, all Marine infantrymen must be able to lay, arm, disarm and remove anti-tank mines used for local security of the rifle, machine gun and mortar squads.

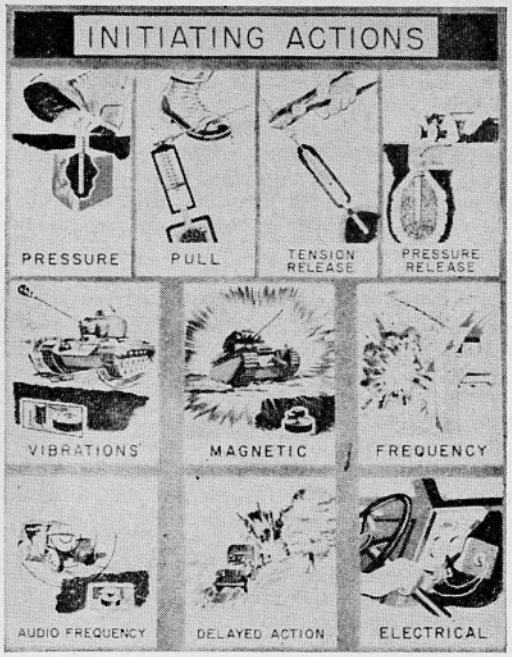
A. What is a mine? A mine is an encased charge of explosive or other material such as a chemical charge, designed to destroy or damage vehicles, boats, or aircraft, or to kill, wound, or otherwise incapacitate personnel. It may be detonated by the action of its victim, by the passage of time, or by a controlled means.

B. What is in a mine? Most mines contain a fuze which produces a flame or concussion to start the detonating action of the mine. A detonator is a small but powerful explosive set off by the fuze. The main charge is either a less sensitive explosive safe to handle more roughly, or a chemical toxic agent or incendiary agent (Fig. **29.22**). Some mines may also contain a booster which is used when the main charge is too insensitive to be set off by the detonator. Some safety device is usually included to prevent accidental detonation of the mine.

C. How do mines work? Mines are set off by a series of events called a firing chain. The firing chain starts when an initiating action, usually



29.22 Components of a typical mine.



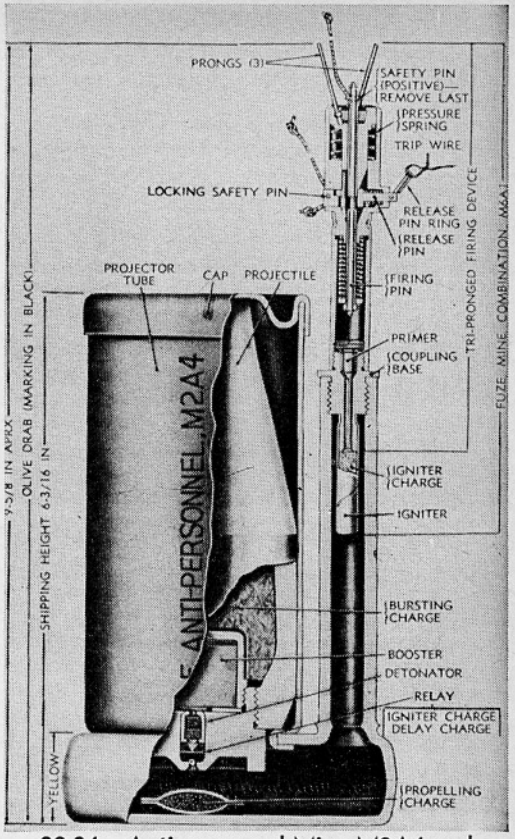
29.23 Initiating actions.

outside the mine, acts on the fuze and causes it to function. The fuze produces a small flame or concussion that sets off the detonator. The detonator produces a slightly more powerful explosion that sets off the booster charge. A still larger explosion, produced by the booster, sets off the main charge (see Fig. **29.23**).

D. What do mines look like? Mines can be varied in shape. To help you to know how the mines your outfit might use will look, some of them are pictured and described here.

1. *Anti-personnel mine. M2A4.*

(a) *General.* This mine (Fig. **29.24**) is one of the fragmentation bounding type. The shell in the M2 series mine is a modified 60-mm. mortar shell. The shell, which contains a high-explosive charge with a delay fuze and booster, is contained in a tube (projector). The projector is fitted to a base which contains a black powder propelling (expelling) charge. Also fitted to the base is a short tube which forms a fuze well for a combination (pressure or pull) fuze. As shipped, a coupling base, which contains a primer and is fitted with an igniter, is in place in the fuze well of the mine and closed by a hexagonal cap. As laid, the coupling base (after removal of the hexagonal cap) is fitted with the firing mechanism



29.24 Anti-personnel Mine M2A4 and combination mine fuze M6A1.

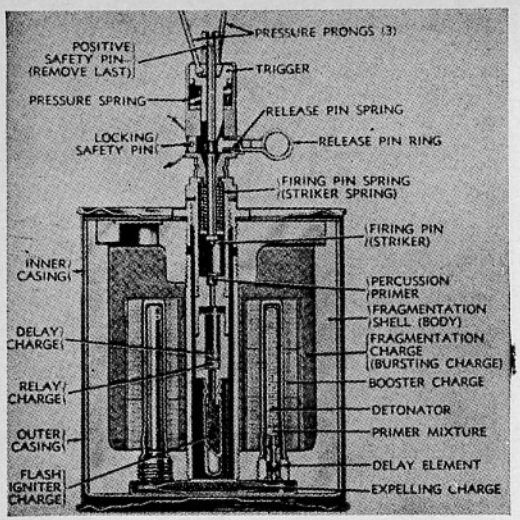
of the fuze.

(b) *Functioning.* The firing mechanism is initiated by the pull on a trip wire attached to the release pin ring, thus releasing the firing pin. Also, pressure on one or more prongs of the head will depress the trigger pin. This operates the release pin, which in turn releases the firing pin. A pull of three to 10 pounds on the release pin ring or a force of eight to 30 pounds on one or more of the prongs protruding from the top of the head thus depressing the head about 9/32 of an inch will cause the M6A1 fuze to function.

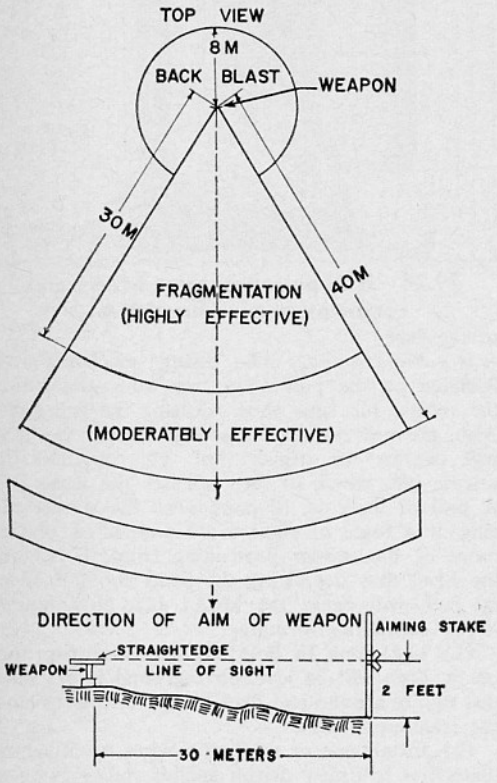
(c) *Laying and arming.*

(1) Lay mine in hole so that tips of prongs on the fuze will be just above ground level. Pack dirt tightly around and over the mine to just below the release-pin level.

(2) Install one or more trip wires by attaching them first to firmly driven anchor stakes (with at least 50 pounds pull power) and then to the



29.25 Anti-personnel Mine M16.



29.26 M18 Casualty Area.

release-pin ring, leaving enough slack in the trip wires to allow the top of the fuze to rotate in order to receive a direct pull on the release pin rings by any one of the trip wires. This is necessary for proper functioning of the fuze.

(3) Remove locking safety pin by pulling on the cord to which it is attached.

(4) Finish filling hole with dirt up to tips of prongs, making sure that dirt around the trip wire(s) and around the cord attached to the positive safety pin is loose enough to permit their free movement.

(5) Remove the positive safety pin by pulling on the end of the cord attached to it, thus arming the fuze.

(d) *Disarming.*

(1) Insert positive safety pin first, then insert locking safety pin.

(2) Disconnect trip wires.

(3) Unscrew firing mechanism from fuze, taking care not to remove from the mine the coupling base containing the primer.

2. *Anti-personnel mine M16.*

(a) *General.* This mine (Fig. **29.25**) is of the bounding fragmentation type. It consists of a cylindrical cast-iron shell containing high-explosive detonators, boosters, and a bursting charge with an axial fuze well. The shell is contained in a sheet steel cup which is in turn contained in an outer sheet steel container enclosing the mine body. At the bottom of the steel cup and in a recess in the bottom of the shell is a black powder propelling (expelling) charge. A hexagonal shipping plug closes the fuze well during shipment. When laid, the mine is fitted with the M605 Combination (pressure or pull) fuze. The mine is completely waterproof. It is readily detected by magnetic mine detectors. A pressure of eight to 20 pounds on either of the three prongs of the fuze compresses the pressure spring, and three to eight pounds on a trip wire pull the release pin outward to a position where the firing pin is released.

(b) *To lay and arm the M16. Check the safety pins to insure that they move freely in the safety pin holes.* Be sure that the rubber gasket is properly placed around the fuze cavity.

(c) *Screw the fuze assembly into the fuze well* and tighten it down securely against the rubber gasket.

(d) *Place the mine in the hole* (about six inches deep and five inches wide). It can be installed so that it will detonate by pressure only, or it can be installed with trip wires to prevent detonation either by pressure on the pressure prongs or by pull on the trip wires.

(e) *Cover the mine with spoil* (dirt) from the hole, pressing it firmly into place around the sides of the mine. Leave the release-pin ring and the pressure prongs exposed. Arrange the pull cords on the safety pins for easy withdrawal.

(f) *Remove the locking safety pin.* Now the interlocking pin can be removed from the positive safety pin, which is located between the prongs.

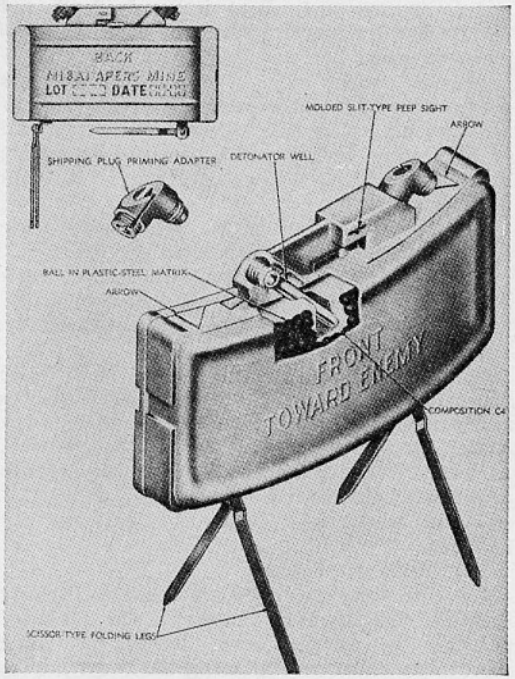
(g) *Remove the positive safety pin,* thus arming the fuze. WARNING: If the positive safety pin is hard to remove, this indicates that the striker has been released, and the fuze should be replaced with a new one.

(h) *Disarming.* If the mine does not appear to be damaged, insert the original or a like safety pin (cotter), a length of steel wire, or a nail of proper diameter through the positive safety pin hole (located between the prongs of the fuze). Then, insert the safety pin, length of steel wire, or a nail through the locking safety pin hole (located in the head of the fuze, opposite the release-pin ring). Next, remove the trip wires.

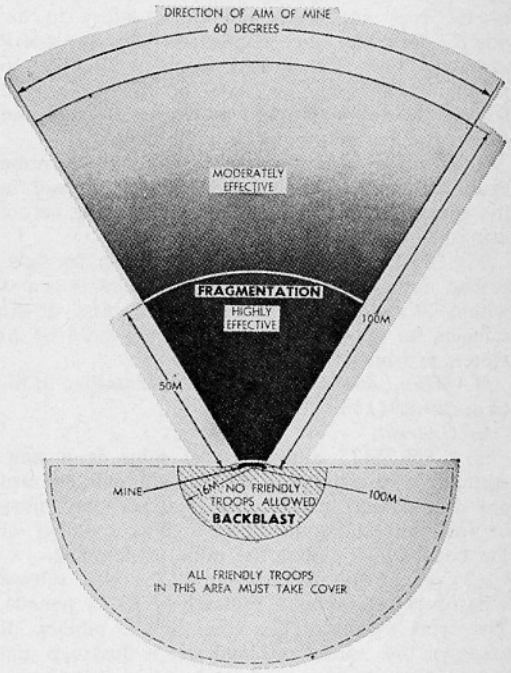
3. *Anti-personnel mine M18 and M18A1 (Claymore mine).* The anti-personnel mine M18 and M18A1 (Fig. **29.27**) is a directional fixed fragmentation mine which is used primarily in defense against massed (human wave) infantry attacks. It is also effective against thin-skinned vehicles such as Jeeps, automobiles, trucks, etc. It perforates the outer body of such vehicles, injuring or killing the occupants. When detonated, the mine delivers a large number of steel fragments simultaneously in a fan-shaped beaten zone approximately two meters high and 30 (50, for the M18A1) meters wide at a range of 30 (50) meters. Both models have a molded slit-type peepsight on top for aiming the mine.

The M18 or M18A1 does not have a fuze like the M2A4 and M16 mines. Therefore, it must be fired with blasting caps. Each mine has two cap wells. A cap can be placed in either cap well for electric or non-electric firing as a controlled weapon, land mine or booby trap. The mine is issued in a bandoleer type case with the mine in one section and the electrical firing mechanism and electric blasting cap in the other section.

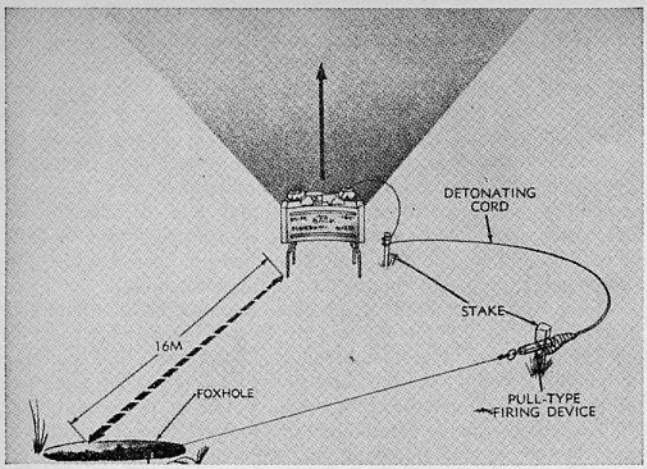
The M18 weighs 2.5 pounds and contains .8 pounds of plastic explosive while the M18A1 weighs 3.5 pounds and contains 1.5 pounds of Composition C-4 explosive. The fragments of the



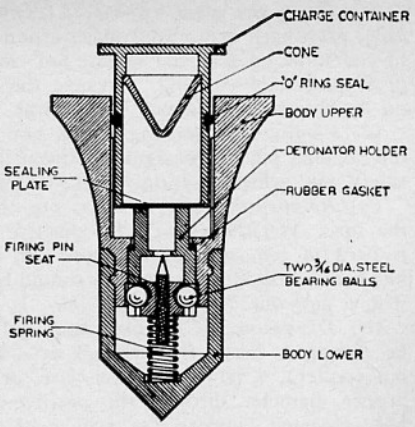
29.27 Anti-personnel Mine M18A1.



29.28 Casualty area, Anti-personnel Mine M18A1.



29.29 M18A1 Anti-personnel Mine set up for controlled firing.



29.29(1) M-25 Blast Type Anti-personnel Mine.

M18A1 are effective up to a range of 100 meters and can travel up to 250 meters forward of the mine (see Figs. **29.26** and **29.28**). The back blast to the rear and sides can cause injury to exposed personnel by concussion or secondary missiles. The firer should be in a foxhole 16 meters to the rear or sides of the mine. All friendly troops within 100 meters to the rear and sides of the mine should be under cover.

This mine must be employed with extreme caution. Marines must be thoroughly trained in the operation and application of this mine before using it.

Fig. **29.29** shows the M18A1 set up for controlled non-electric firing. When the enemy comes within 20 meters, you should fire the mine. If the mine is set up with trip wires, they should be 20 meters in front of the mine.

4. *Mine, Anti-personnel, Non-Metallic, M25.* (Fig. **29.29(1)**).

a. *General.*

(1) The M25 anti-personnel mine is a non-metallic type mine that is relatively safe to arm and disarm, and it will cause great personal injury to feet, knees, hands, or any other member of the body which causes the mine to detonate.

(2) The firing mechanism is the ball release type operating under a pressure of 17-22 pounds. The total weight of the mine is 3½ ounces. It employs two safety mechanisms; a dust cap and safety clip.

b. *The mine consists of four components; body, charge, firing mechanism, and safety mechanism.*

(1) *Body.*

(a) The body is of molded phenolic plastic, and is approximately three inches in depth and 1-⅛ inches in diameter. The body consists of two parts, an upper half and lower half.

(1) The upper half is open to receive the charge container and is ribbed internally to prevent jamming if dust is present. Also contained in the upper half is space for the detonating assembly which is slipped into the recess with its firing spring.

(2) The lower half of the body supports the firing mechanism. It is joined to the upper half by means of cement and an integral screw thread. The detonator is dropped into the detonator holder and cemented into place to waterproof the body.

(2) *Charge.*

(a) The charge is contained in a plastic case approximately 1½ inches in depth and ¾ inches in diameter. The charge weighs ⅓ ounce. The charge itself is tetryl. The top of the container has a small ⅛-inch-deep lip below which a groove is cut into the container wall. A rubber "O" ring seal in this groove acts as a dust and dirt excluder.

(3) *Firing Mechanism.*

(a) The firing mechanism is of the ball-release type and fires an M46 detonator. The action of pressing the charge down forces the firing mechanism downward, allowing the two retaining balls to escape, thus permitting the actuating spring to push the firing pin into the detonator.

(4) *Safety Mechanism.*

(a) During transit, and until the mine is laid, the charge container is replaced by a polyethylene plug which sits firmly in the upper body recess. Between the "O" ring and the upper lip of the charge container, a snap-action safety clip is fitted. This clip is of such a size and shape as to prevent the firing while the charge container is being inserted into the mine body.

c. *Employment.*

(1) The M25 is suitable for employment in soils which can be described as soft mud, sandy loam, and hard clay. The mine will be physically unaffected and firing loads will be unchanged after six months in these types of soils.

d. *Laying and arming.*

(1) The laying and arming of this mine is done in one continuous sequence as follows:

(a) Holding the mine body in one hand, remove the dust cap and insert the charge container with safety clip.

(b) Applying pressure to the mine body shoulders only, force the mine into the ground, using the finger of the hand.

(c) Resistance to penetration can be overcome by loosening or removing the soil with a bayonet or similar instrument.

(d) Remove the safety clip with a horizontal motion, ensuring that the rubber "O" ring on the charge container does not show above the body recess.

e. *Disarming.*

(1) The mine can be easily and safely disarmed by replacing the safety clip and then lifting the charge container out of the body recess. This can be done by hand or any improvised forked device that will fit between the lip of the charge container and the body of the mine.

5. *Anti-tank mines.*

(a) *Anti-tank mine, HE, Heavy, M15.* This mine is intended for use against heavy tanks. The mine is loaded with 22 pounds of Composition B, and requires no booster other than the M120 booster, which is incorporated in the bottom of the main fuze well.

This mine has two secondary fuze wells, one located in the side and one in the bottom. The secondary fuze wells are threaded to fit any firing device (booby trap) and activator, M1.

(1) *Functioning.* When the shutter of the arming plug is in the ARMED position, a force of 300 to 400 pounds on the pressure plate of the mine depresses the belleville spring of the mine, causing the shutter to depress the pressure plate of the fuze.

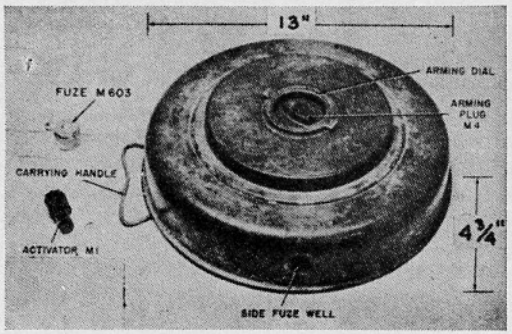
The pressure plate of the fuze depresses the belleville spring of the fuze, which snaps into reverse, driving the firing pin into the detonator and exploding it. Explosion of the detonator explodes the booster (M120), which in turn explodes the main charge.

NEVER USE FORCE. If force is needed to turn the arming plug from safe to arm, remove the arming plug and check to see if the fuze is functioning properly. If it is functioning properly, replace the arming plug. If force is still needed, unscrew the arming plug until the shutter moves freely.

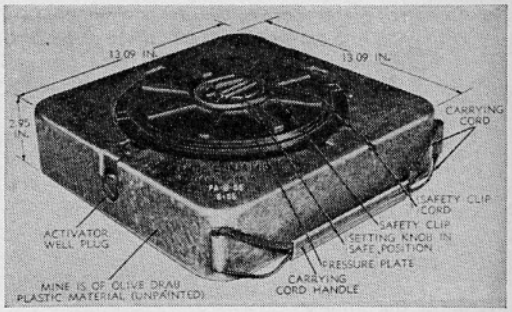
(2) *Effectiveness.* When buried three inches deep, this mine will disable a medium tank by breaking the track. When laid flush with the ground, it will disable a medium tank by breaking the track and bogies (road wheels or other parts of the suspension system).

(b) Antitank mine, NM, M19.

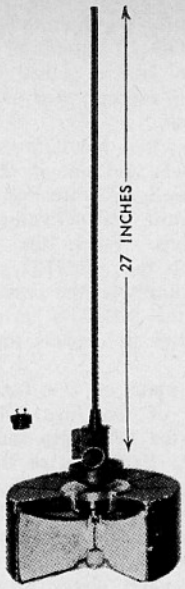
(1) *General.* The non-magnetic M19 antitank mine is a plastic-cased mine containing Composition B (Comp B). Being of nearly all plastic construction, it is non-detectable by magnetic mine detectors. The M606 fuze is used with this mine and is an integral part of the pressure plate.



29.30 M15 Anti-tank Mine.



29.31 M19 Anti-tank Mine.



29.32 M21 Anti-tank Mine.

The M19, like the M15, has two secondary fuze wells threaded to fit the M2 activator, standard coupling base and firing devices.

(2) *Functioning.* When the setting knob on top of the setting plate is in the safe position ("S"), the mine cannot function by action of the main fuze since the M50 detonator is out of line with the firing pin and the position of the step plate prevents depression of the pressure plate. Turning the setting knob to the armed position ("A") aligns the M50 detonator with the firing pin and rotates the step plate to a position in which the pressure plate can be depressed, permitting functioning of the main fuze. The mine is packed and shipped with a safety clip in place to prevent accidental movement of the setting knob. After the safety clip has been removed and the setting knob turned to the armed position ("A"), a force of 350 to 500 pounds on the pressure plate depresses the belleville spring of the fuze. The belleville spring snaps into reverse, driving the firing pin into the M50 detonator and exploding it. Explosion of the M50 detonator initiates the booster pellet which in turn explodes the main charge of the mine.

(c) *Anti-tank Mine M21.*

(a) *General.*

(1) The M21 with fuze M607 is unlike other anti-tank mines which are actuated only by pressure of tank tracks or wheels of vehicles. The M21 derives its effectiveness against steel armor from the energy produced by the high explosive charge propelling a mass of steel in an upward direction at a high velocity with sufficient force to penetrate the tank belly armor.

(2) The M21 anti-tank mine is nine inches in diameter, 4½ inches in height, and contains 10½ pounds of Composition B explosive. The weight of the mine without the M607 fuze is 17¼ pounds.

(3) The M607 fuze used with the M21 anti-tank mine has an extension rod and extension rod adapter.

(a) With the extension and extension rod adapter assembled to the fuze, the tilting of the extension rod with a minimum horizontal force of 3.75 pounds, acting through an angle of 20 degrees, will detonate the mine.

(b) When used without extension rod and the extension rod adapter, a minimum downward pressure of 270 pounds on the M607 fuze will detonate the mine.

(b) *Fuzing and arming.*

(1) Remove the closing plug assembly from the bottom of the mine with the screw driver end of the M26 arming wrench and inspect the booster cavity for foreign material. If any is found, remove it prior to inserting the M120 booster. Insert the booster, either end first, into the booster cavity, then reassemble the closing plug securely with the arming wrench. Remove the shipping plug assembly with the arming wrench. Inspect the fuze cavity and remove any foreign material. Remove the closure assembly from the fuze and assemble the fuze, hand tight, into the fuze well of the mine. Place the mine in a prepared hole 10 to 12 inches in diameter and six inches deep. The hole must be firm and level so that the mine will lie squarely. Press dirt firmly around the mine up to the level of the top of the fuze cap. Do not let dirt enter into the pressure ring. Screw the extension rod into the extension rod adapter. Screw this assembly hand tight, to the pressure ring of the fuze. To arm the fuze after the mine has been properly placed, remove the pull ring assembly, the band, and the stop. This mine should not be armed until just before camouflaging.

(c) *Disarming.*

(1) Reverse the arming procedure.

Booby Traps

A. What are booby traps? A booby trap is an explosive charge which is exploded when an unsuspecting person disturbs an apparently harmless object or performs a presumably safe act. Booby traps usually are made from materials available in a combat area. Normally they are improvised to be most suitable to serve conditions that prevail at the same time and place. An elementary booby trap consists of a small charge of high explosive, a detonator and a firing device. Booby traps are an outgrowth of the "nuisance mine" technique.

B. Booby trap construction. The components of a booby trap must be joined together in a definite and precise arrangement to develop a continuous chain of action until complete detonation of a main explosive charge occurs. Basically, a booby trap consists of a firing device, a detonator and a mine charge. The firing device may be attached directly to the detonator or connected to it by means of a detonating cord, time fuze, or electric wires, depending on the type of device. The main charge may be bulk explosive, or it may be a mine, grenade, artillery or mortar shell, or other standard charge. Initiating action, usually by personnel disturbing an apparently harmless object, acts upon the firing device, which sets off the detonator. The detonator detonates the main charge. The main charge provides the striking power of the booby trap.

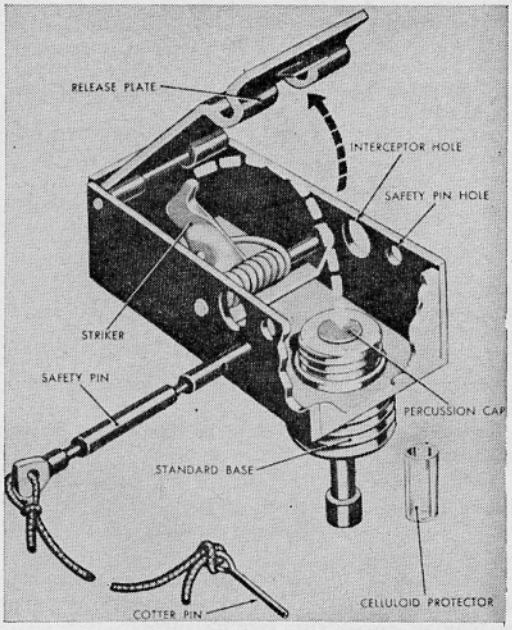
C. Firing devices. There is a wide variety of triggering mechanisms available for use in constructing booby traps. Called fuzes, igniters, switches, or firing devices, they serve as control mechanisms to hold detonations in check until proper signals are given.

All U. S. standard firing devices use a standard coupling base to facilitate ease of assembly and wide variety in the choice of a base charge. The two types of booby trap firing devices used by the Marine Corps are described as follows:

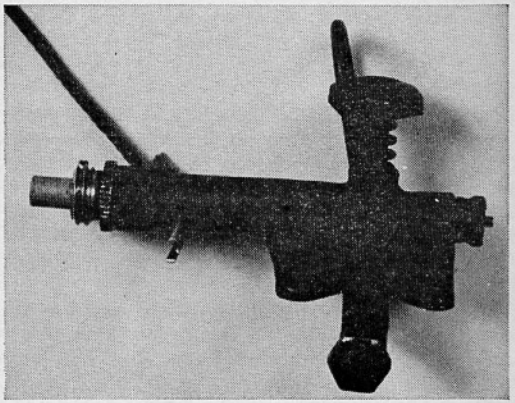
1. *Firing device, pressure-release type, M5.*

(a) Description. This mechanism consists of a small steel rectangular box with a hinged lid (Fig. **29.33**). A spring-loaded striker is held in position by the lid. A special locking safety pin holds the lid in the closed position. This device uses a standard base screwed into an opening in the bottom. A positive safety hole (interceptor hole) is located on the side of the box. The device is adaptable for many kinds of booby traps.

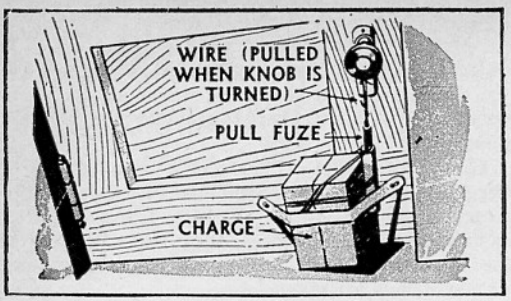
(b) *Functioning.* A load of at least five pounds resting on the release plate is required to restrain this device. Some mines and elements weigh less than five pounds and are thus not heavy enough to hold down the release plate of the device. When the load is removed or allows the striker to raise the release plate at least 5/8 inch, the striker, impelled by its spring, rotates about a pivot, strikes



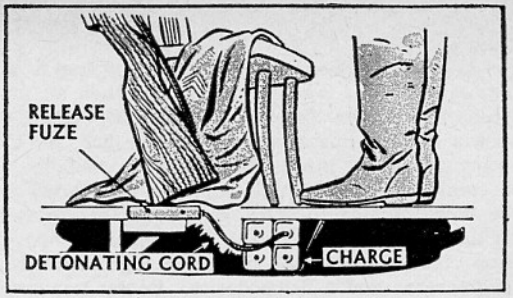
29.33 Pressure-release type firing device, M5.



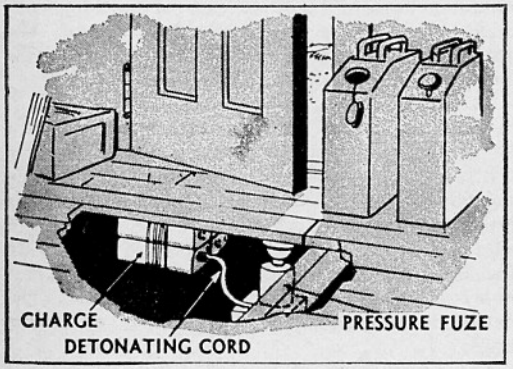
29.34 Firing device, Mark 1, Model 1.



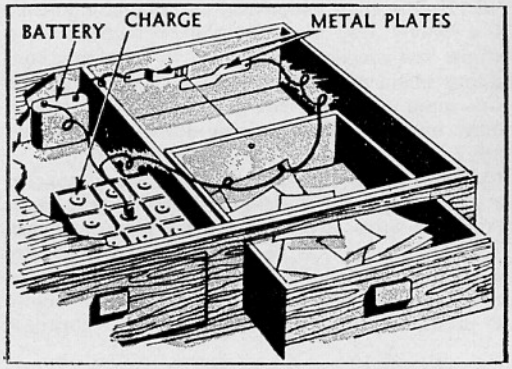
Booby trap, pull-type fuze



Booby trap, release-type fuze



Booby trap, pressure-type fuze



Booby trap, electric circuit fuze

29.35

the percussion cap and detonates the activator and any charge to which it may be attached.

2. ***Firing device, Mark 1, Model 1*** (Fig. **29.34**). The Mark 1, Model 1, firing device is a dual-action mechanical trigger mechanism which is designed to fire a percussion cap in a standard coupling base. The device may be used in booby traps when any of the four firing actions are desired: pressure, pressure-release, tension-release or pull firing. A pressure of 11 to 16 pounds on the trigger button or trip wire will activate the firing device. When the firing device is activated, the striker is released from the trigger pin and forced forward by the striker spring. The striker hits the percussion cap, detonating the main charge.

Marines must be thoroughly trained in the operation and employment of the Mark 1, Model 1, prior to using this firing device.

D. What do you do about mines and booby traps? This question can be answered in three sections: What the enemy hopes you will do; what you should do; what you should not do.

The enemy has purposes in setting mines and booby traps. He wants you to stop advancing, to be confused, and to be afraid. Don't play into his hands.

Every effort will be made to warn you of mine field and booby traps. Believe all these warnings. Stay in the areas that are marked safe. Stay on roads and do not try to find a short cut. It doesn't pay.

1. ***Rules—What to do.*** Mine fields and booby traps are so dangerous that every attempt should be made to follow the ways of handling them safely.

(a) Look where you're going.

(b) Look at both ends of a wire before you touch it.

(c) When you find a mine or booby trap, mark it and report it to an officer or NCO.

(d) Be especially careful in buildings and at road junctions, turnposts, parking areas, defiles, water points and by-passes around road blocks and blown bridges.

(e) Carry a 50-yard length of rope or signal cable in all vehicles. This can be used to remove or detonate mines from safe distances.

(f) Learn and observe all marking signs. Fences that mark boundaries of mine fields have

red triangles on them. Safe lanes through mine fields are indicated by red and white signs. The rear half of this safe lane sign is red with an amber colored light. The front of this sign is white with a green light. Round white markers are placed over individual mines.

2. ***Rules—What not to do.*** The rules for what you don't do with mines are as important as the ones for what you do with them. They are as follows:

(a) Don't cut a taut wire and don't pull a slack one.

(b) Don't attempt to disarm or remove a mine or booby trap unless you are trained to do this job.

(c) Don't move or touch abandoned vehicles, supplies, equipment and don't collect souvenirs.

(d) Don't drive or walk in areas not marked clear of mines.

(e) Don't stand on running boards of vehicles.

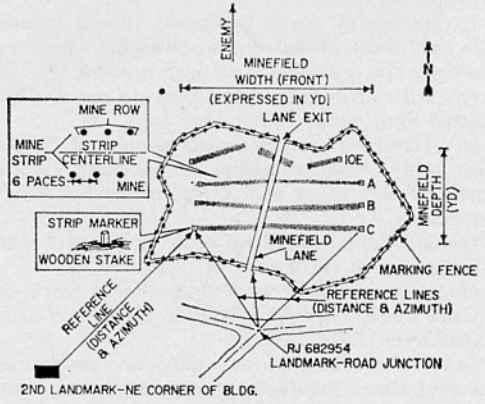
(f) Don't open doors or windows without first examining both sides.

Installing a Mine Field

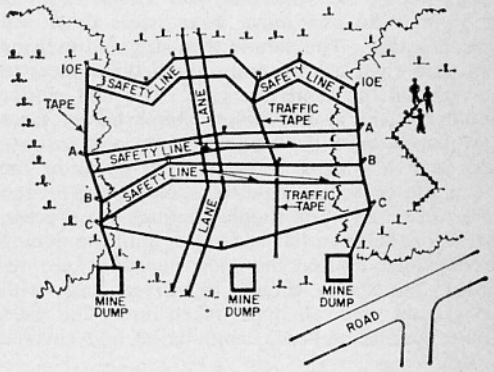
A. General. By definition, a mine field is an area of ground containing mines which are either installed according to a basic pattern or scattered without regard to pattern. Mine fields are classified by function and are further classified by types of mines installed. Mine fields containing only anti-personnel mines are known as anti-personnel mine fields and are installed for protection against enemy infantry. Mine fields installed primarily for protection against enemy armor are called anti-tank (AT) mine fields. These fields usually contain APers as well as AT mines to prevent the passage of foot troops and easy removal of AT mines. The locations for mine fields are dictated by the overall plan of operation, the terrain, and the location of other obstacles. To be most effective, a mine field must be anchored to natural or artificial obstacles. Mine fields should be situated on likely avenues of enemy approach. They should require more time and be more hazardous to breach than to flank. A standard pattern mine field (Fig. **29.36**) consists of a minimum of three regular mine strips which are designated in alphabetical order, beginning with the one nearest the enemy, or front strip. In addition, there is an irregular strip on the enemy side of A, called the "irregular outer edge" or "IOE". A mine cluster is the basic unit of the standard pattern mine field. It may contain from one to five mines.

B. Laying the field. Fig. **29.37** shows a mine field completely staked out and taped. Referring to this figure, let's take it step by step to get the general idea. Keep in mind that the front of the field is the enemy's side.

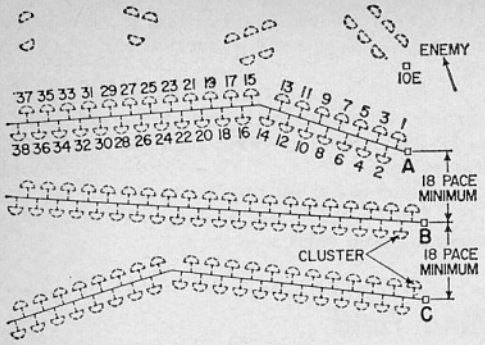
1. The right rear boundary is staked first (Strip C). Twenty paces to the right of strip C the protective fence is started, bottom strand first, counterclockwise.



29.36 A standard mine field fenced, marked and referenced.



29.37 Mine field completely taped, including safety and traffic lines, and safety lanes.



29.38 Mine clusters.

2. The right boundaries of succeeding strips are staked at least 18 paces apart. Fig. **29.37** shows safety line tapes. When the forward row in a mine strip is to contain trip wire-actuated mines, a safety line tape is placed in front of that row to the limits of the trip wires. Trip wires must not touch or cross safety lines. Safety lines are laid approximately parallel to the centerline of the next strip forward.

3. The turning points (where the strip changes direction) and left boundary of IOE are staked and the centerline tape laid. Then the lettered strips are similarly staked and taped.

4. Safety lines and traffic lanes are taped and marked, if applicable.

C. Laying the mines. In laying the mine clusters along the centerline, you should begin at the right stake and move three paces down the centerline tape. You should then stop and indicate with your right hand a point about three paces to the right of the centerline tape. The first cluster should be laid at this point. After taking three more paces down the tape, you stop and indicate with your left hand a point three paces to the left of the centerline tape the spot for the second cluster of mines. You should continue this process, alternating between left and right, until the mining is completed. After the mine locations are recorded, the stakes should be driven flush with the ground and all tape taken up. The field should then be policed, camouflaged and covered by fire.

1. ***Detection by probing.***

(a) Probing is the method of detecting mines by penetrating the earth with a sharp instrument such as standard mine probe, a bayonet, or a stiff wire. Probing is the best way to locate buried nonmetallic mines, particularly the small anti-personnel type. However, probing is slow, monotonous work, particularly in frozen ground.

(b) When probing, the Marine moves on his hands and knees, looking and feeling upward and forward, to locate trip wires and pressure prongs. Sleeves are rolled up to increase sensitivity to contact with trip wires. After looking and feeling, probes are made every two to six inches, depending on the type of mine being encountered, on about a one-yard front. The probe is pushed gently into the ground at an angle of less than 45° from the horizontal. If pushed straight down, the tip of the probe may detonate a pressure mine. When a solid object is touched, probing stops, and earth is carefully removed to determine what has been found. If a mine is found, enough earth is carefully removed to determine the type of mine and its exact location.

(c) When probing is done by teams, each man probes as stated above. Each man is assigned a one-yard front, starting from left to right. When the first man has advanced a minimum of 25 yards, the second man commences probing. When he has advanced 25 yards the third member of the team commences, and so on. Each team probes an area of eight yards wide.

When more than one team is working in a field, there should be a minimum of 25 yards between the starting point of each team. When mines are found, they are marked for removal.

2. ***Safety procedures.***

(a) Personnel should not run in mine fields or in suspected fields.

(b) In mined areas, personnel should investigate only those objects and installations which are necessary for completion of their mission.

(c) All mines are considered to be booby-trapped until proven otherwise.

(d) Hand removal of mines should be undertaken only when necessary for secrecy, intelligence, or prevention of damage to installations in the vicinity.

(e) All mines and fuzes must be handled with extreme care at all times.

(f) Only one man at a time should work on any one mine. ALWAYS WORK ALONE WHEN WORKING ON A MINE.

(g) The location of any mine or booby trap not neutralized should be plainly marked and immediately reported.

The 81-mm. Mortar

THE 81-mm. mortar platoon furnishes close high angle fire support to the rifle companies of the infantry battalion. The mortar platoon may be employed as a unit, or it may be divided and attached to the rifle companies as needed. The platoon consists of a platoon headquarters and four mortar sections, staffed by two officers and 93 enlisted men. Each of the four sections is divided into a section headquarters, forward observer team and two 81-mm. mortar squads. Since the mortar plays an important role in supporting the Marine in combat, he should learn all about the 81-mm. mortar. This chapter furnishes the Marine with the basic information he needs.

Characteristics and General Data

A. Characteristics:

1. The 81-mm. Mortar, M29, is a smooth bore, muzzle-loaded, high angle of fire weapon. (Fig. **30.1**).

2. The mortar barrel is a single unit while the mount consists of two units, the bipod and the base plate. (Figs. **30.2, 30.3, 30.4**).

3. The base plate consists of two units; the inner ring and the outer ring. (Fig. **30.4**).

4. The mortar breaks down into four separate loads; barrel, bipod, inner ring and outer ring.

5. The barrel is attached to the bipod by locking the shock absorber clevis to the mount attachment ring after inserting the barrel into the yoke assembly. (Fig. **30.5**).

6. The barrel is fastened to the base plate by inserting the spherical projection into the socket cap of the inner ring and rotating the barrel 90 degrees. (Fig. **30.6**).

B. General Data:

WEIGHTS:

Mortar, M29 complete	115 lbs.
Barrel, M29	28 lbs.
Bipod, M23A1	40 lbs.
Base Plate, M23A1, complete	47 lbs.
Inner Ring	24 lbs.
Outer Ring	23 lbs.

DIMENSIONS:

Overall length	51 in.
Maximum width	21.6 in.
Overall height on bipod	37.5 in.

ELEVATION:

Elevation (approx.)	700 to 1500 mils
Per turn of elevation crank (approx.)	10 mils

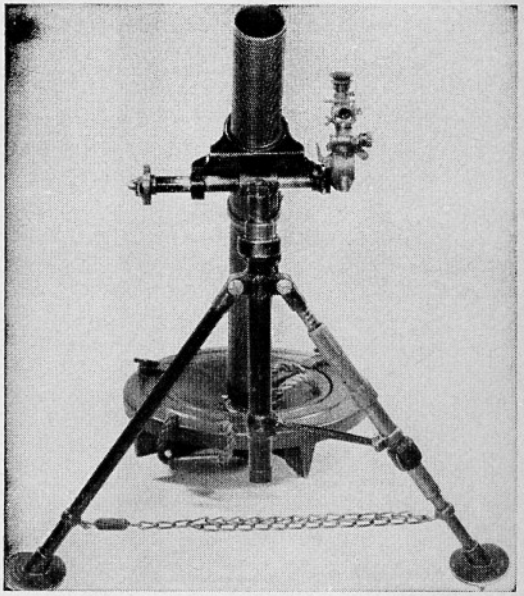


Fig. 30.1.

TRAVERSE:

Right or left from center (approx.)	95 mils
Total turns of handwheel for full traverse (approx.)	19 turns
Per turn of the handwheel (approx.)	10 mils
Total movement of bipod w/o moving base plate	6400 mils

RANGE:

Maximum	4000 yds.

RATE OF FIRE:

Maximum (for first minute of firing only).	30 rds/min
Sustained	18 rds/min

C. Functioning:

A characteristic of the mortar is its simplicity of functioning (see Fig. **30.7**). The mortar is fired by inserting a complete round into the muzzle, fin assembly down. The elevation of the barrel causes the round to slide toward the base of the barrel. Upon reaching the base, the primer strikes the firing pin located inside the base cap. This impact sets off the primer which, in turn, explodes the ignition cartridge. The flame from the exploding cartridge ignites the propellant

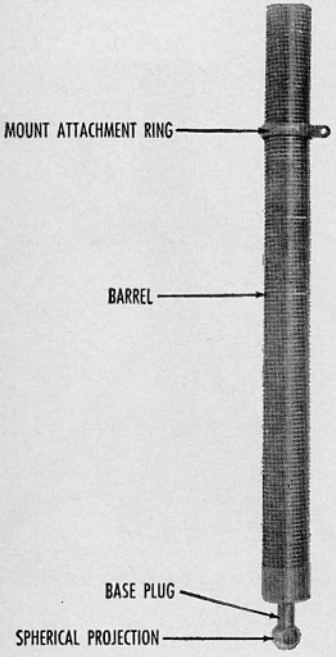


Fig. 30.2 Barrel.

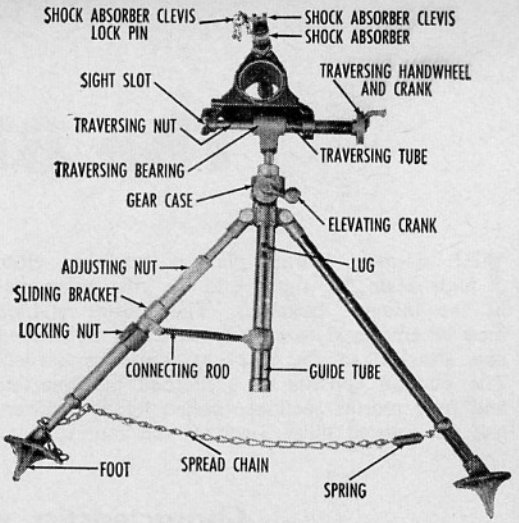


Fig. 30.3 Bipod.

increments. The pressure of the gas formed by the burning propellant drives the round up and out of the barrel. The body and shape of the round prevent the gas from escaping past the shell. A safety device (safety pin, timing device, etc.) prevents the fuze from becoming armed before it leaves the barrel. When fired, the round carries the fired primer and ignition cartridge case with it. The recoil shock from firing the mortar is transmitted to the ground through the base plate. The mortar is then ready for the next round.

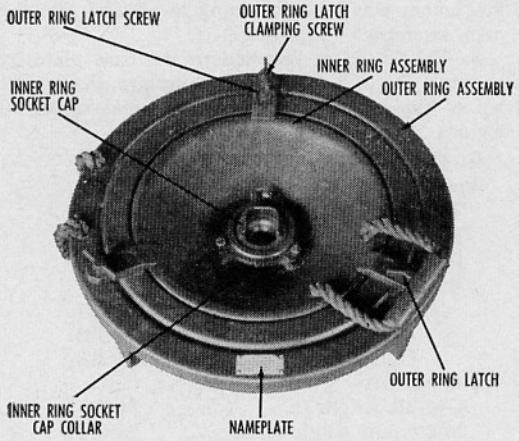


Fig. 30.4 81-mm mortar baseplate M23A1.

The M34A2 Sight Unit

The accuracy with which mortar shells are placed on the enemy depends a great deal upon the skill of the gunner in using the M34A2 Sight. This sight lays the mortar for deflection and elevation. The same sight should always be used with the same mortar. The sight unit consists of a telescope mount, elbow telescope and a telescope adapter. The M34A2 Sight is depicted in Figures **30.8** and **30.9(1)** and **(2)**.

A. Elbow Telescope

This is a 3-power telescope mounted in the telescope holder on top of the telescope adapter. The vertical line in the reticule is used to lay the mortar for direction. The elbow telescope can be tilted to a horizontal position, thus preventing water from obstructing the view in rainy weather.

B. Telescope Mount

The mount consists of an elevation mechanism and a dovetail bracket. The elevation mechanism is made up of an elevation knob and micrometer, an elevation scale and index, and an elevation level. The elevation scale is graduated in 100-mil intervals, and is numbered in 200-mil intervals from minus 200 mils to plus 1600 mils. The elevation micrometer is graduated in successive half-circles, each with fifty 2-mil increments from 0 to 100 mils. One full turn of the elevation knob moves the elevation scale 200 mils. The elevation level is attached to the main sight housing. A spring loaded latch on the dovetail bracket locks the sight to the mortar mount.

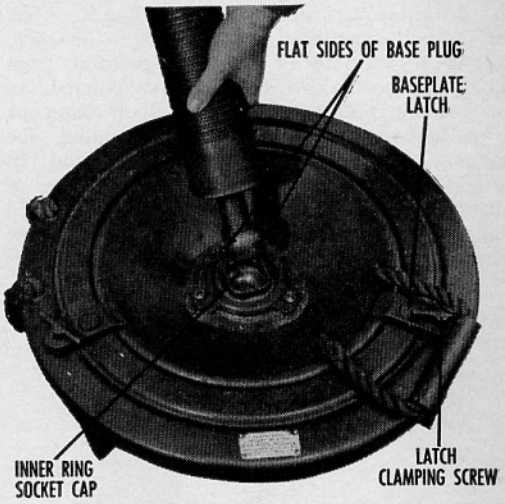


Fig. 30.6 Baseplate latches and inner ring socket cap.

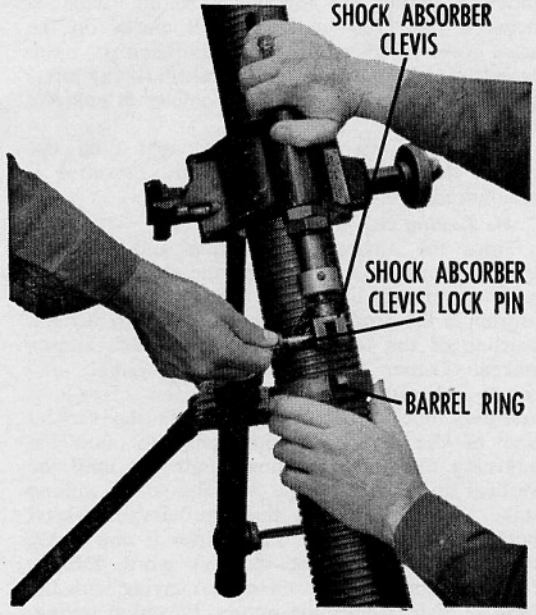


Fig. 30.5 Connection of mount and mortar.

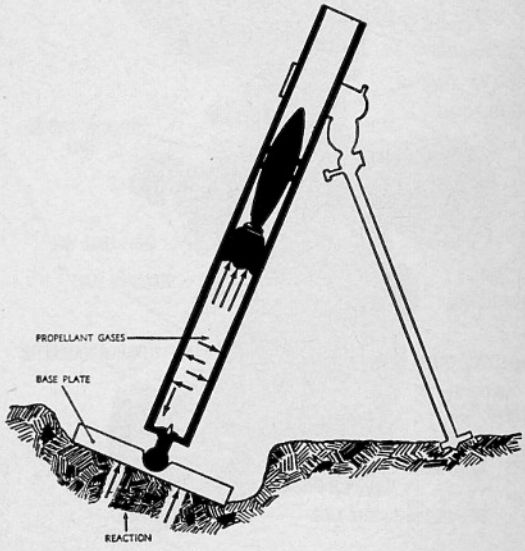


Fig. 30.7 Functioning of smoothbore mortar.

Use of the M34A2 Sight

A. Mounting the Sight

To mount the sight, remove it from the case, depress the spring loaded latch, and place it in the dovetail slot on the traversing mechanism. Normally, the sight is set on elevation 1100 mils and deflection zero mils when mounting it. After the mortar is mounted and the sight is attached, assume a kneeling or standing position from which the mortar can be easily manipulated. In the kneeling position, rotate the elbow telescope to a horizontal position. When assuming the standing position, leave the telescope in its upright position. Make sure the vertical line of sight is always vertical. To do this, align the two white markings on the right side of the elbow telescope.

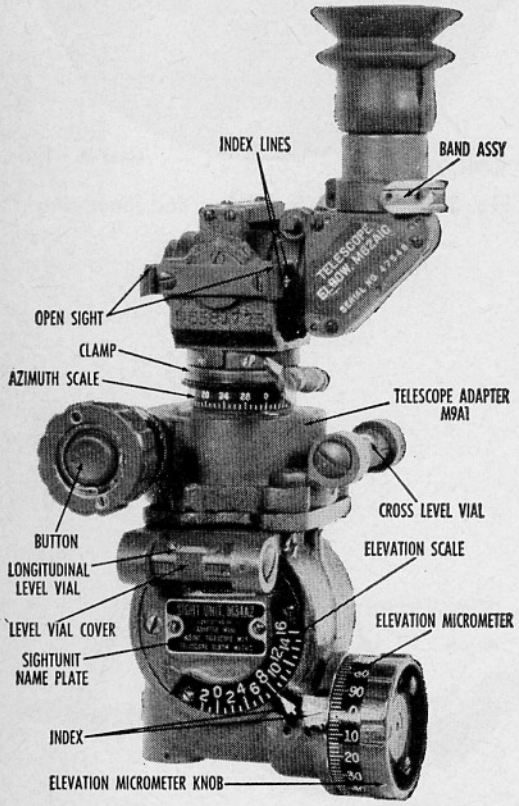


Fig. 30.8 Sight unit M34A2—left-side view.

B. Setting the Sight for Deflection

To place the deflection setting on the deflection scale, turn the deflection knob which, in turn, operates both the deflection micrometer and deflection scales. Both scales must be properly set to obtain the correct deflection. For example, to place a deflection of 2650 mils on the sight, turn the deflection knob until the fixed index opposite the moving deflection scale is between the 2600- and 2700-mil marks on the scale (every fourth 100-mil graduation is numbered from 0 to 28) and the 50-mil mark on the deflection micrometer is opposite the fixed index. Use care to prevent misreading the sight by 100 mils.

The setting of deflection on the sight moves the vertical line of the telescope sight off (to the right or left) of the aiming line. Deflection announced in the fire command is placed on the sight before the elevation.

C. Setting the Sight for Elevation

To set the sight for elevation, turn the elevation knob which, in turn, operates both the elevation micrometer and elevation scales. Both scales must be set to obtain the desired elevation. For example, to place an elevation of 1205 mils on the sight, turn the elevation knob until the fixed index opposite the moving elevation scale is between the 1200- and 1300-mil marks on the scale (every other 100-mil graduation is numbered from 2 to 16) and the 5-mil mark (by interpolation) on the elevation micrometer is opposite the fixed index.

Placing an elevation on the sight does not change the elevation of the mortar. Elevation is announced in the fire command.

D. Laying the Mortar

Since the angles of deflection and elevation have been placed on the sight, the elevation crank and traversing handwheel are turned on the mortar in the proper direction to place the vertical hairline of the telescope on the mortar's aiming stakes. Center the elevation level bubble and rotate the adjusting nut until the cross-level assembly bubble is centered. Check the vertical line of the sight and simultaneously turn the adjusting nut and traversing handwheel until the vertical line is laid on the left edge of the aiming stake. Recheck to see that the elevation level bubble is still centered. The mortar is now ready to be fired. Remember this key word, DEED, for the proper sequence in mortar laying with the M34A2 Sight; Deflection setting, Elevation setting, Elevation laying, and Deflection laying.

E. Removing Sight

Before returning the sight unit to the carrying case, set elevation 1600 mils and deflection 0, and place the elbow telescope in the vertical position. The sight unit must be properly seated before closing the cover.

Mounting, Loading and Dismounting

The following major components of the mortar are carried by mortar squad members as indicated: squad leader, sight; gunner (No. 1 man), bipod; assistant gunner (No. 2 man), barrel; No. 3 man, base plate inner ring; No. 4 man, base plate outer ring; Nos. 5 and 6, aiming posts and ammunition.

A. Mounting

The squad leader points out the direction of fire and location of the base plate stake and orders the direction stake and base plate stake to be placed in the ground. Crew members then perform the following actions.

1. No. 4 man puts the edge of the base plate outer ring against the base plate stake, aligning the left edge of the recess for the inner ring with the left edge of the base stake. (Fig. **30.10**).

2. No. 3 man then places the inner ring into its recess, making sure that the open end of the socket cap is toward the direction of fire.

3. The gunner, holding the bipod with his left hand on the traversing handwheel and his right hand on the sight slot, places the bipod about two feet in front of the base plate, kneels on his right knee, unhooks the chain and measures 13 to 15 links, rehooks the chain and, lifting the left leg of the bipod, spreads the legs to the full length of the chain.

4. The gunner then moves the guide tube to the left, placing the traversing mechanism in a horizontal position. He centers the sleeve by rotating the adjusting nut until he can place two fingers on the unpainted surface below the sleeve and tighten the locking nut.

5. The gunner rises and moves to the left rear of the bipod while supporting the bipod with the

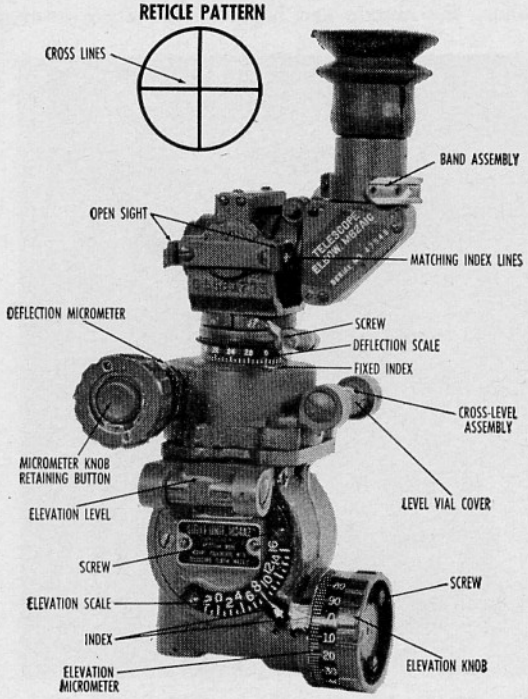


Fig. 30.9(1) Sight unit, M34A2.

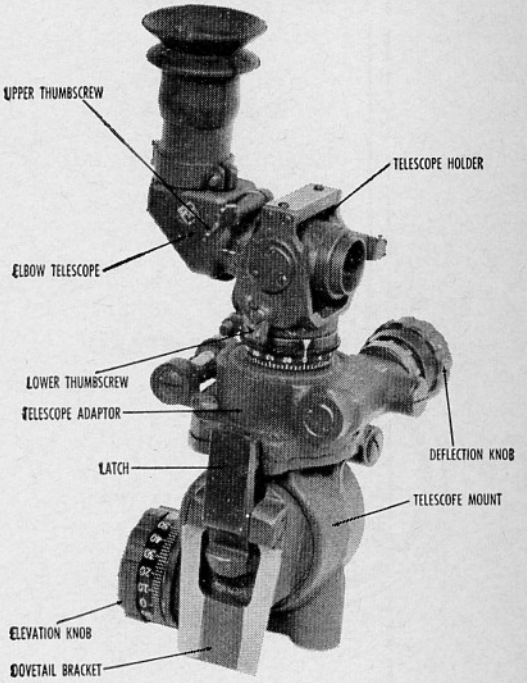


Fig. 30.9(2) Rear view.

right hand on the yoke assembly. He releases the clevis lock pin, raises the yoke assembly to a level position, keeping both hands on the shock absorber.

6. The assistant gunner inserts the barrel into the yoke assembly until the lug on the mount attachment ring fits into the shock absorber clevis. The gunner then locks the clevis with the clevis lock pin. The assistant gunner inserts the spherical projection of the base plug into the socket cap and rotates the barrel 90 degrees to lock it to the base plate. (Fig. **30.11**).

7. The gunner centers the traverse and runs up the elevating crank approximately 26 turns to center the elevating screw. He then mounts the sight as explained previously.

8. The gunner lays the mortar accurately on the direction stake with deflection zero on the sight. He then turns the sight to deflection 2800 and directs the No. 5 man in placing the two aiming stakes. The far stake is placed 100 yards from the mortar and the near stake 50 yards from the mortar. The gunner has them placed so that the vertical hairline in his sight telescope is aligned with the left edge of the aiming stakes. (Fig. **30.12.**) The mortar is ready to fire.

B. Loading.

When the fire order has been given and the mortar is laid, the gunner commands FIRE.

1. The assistant gunner receives a correctly charged shell from the No. 3 man and removes the safety wire. He holds the shell with both hands and inserts the shell into the barrel, fuze end up. In releasing the shell, he instantly withdraws his hands, cutting his right hand down under the muzzle and his left hand down away

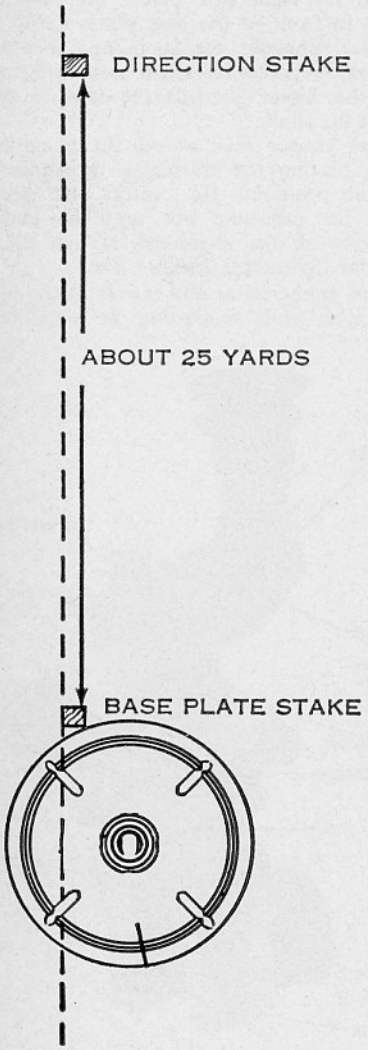


Fig. 30.10 Positioning of the base plate.



Fig. 30.11 Inserting the barrel into the yoke assembly.



Fig. 30.12. Placing Aiming Stakes.



Fig. 30.13. 81-mm mortar crew firing.

from the muzzle. *Care must be taken so that loading the shell doesn't disturb the lay of the mortar.* (Fig. **30.13.**)

C. Dismounting.

The command for dismounting is, OUT OF ACTION. Upon this command:

1 The gunner removes the sight and kneels on his right knee to the left of the mortar. The assistant gunner stands to the right of the mortar.

2. The gunner lowers the elevating screw and centers the traverse bearing. He then rises, faces the mortar and, keeping his left foot in front of the left leg of the bipod, he holds the shock absorber with both hands.

3. The assistant gunner rotates the barrel 90 degrees and raises it level.

4. The gunner pulls out the shock absorber clevis lock pin and holds it while the assistant gunner pulls the barrel out of the yoke assembly.

5. The gunner secures the shock absorber clevis to the lug on the guide tube with the shock absorber clevis lock pin. He then kneels on his right knee in front of the bipod, with his left hand on the gear case supporting the bipod. The left leg locking nut is loosened with his right hand and the left leg is closed to the right leg.

6. The chain is unlocked from the left leg and wound around both legs. It is hooked to the left leg.

7. The base plate inner ring is removed from the outer ring.

Misfires

When a round is loaded into the tube of a mortar and the mortar fails to fire, it is called a misfire. The following steps for handling misfires must be followed very strictly. *They are the only safe method for handling misfires.*

A. Causes of Misfires.

1. Defective primer or ignition cartridge.

2. Defective, damaged, or loose firing pin.

3. Firing pin fouled or obstructed by particles from previous round.

4. Fouled bore.

5. Excess oil in bore.

6. Ignition cartridge not fully inserted in container of the fin assembly.

7. Misaligned stabilizing fin.

8. Foreign matter or excess paint on bourrelet.

B. Clearing Misfires.

The gunner announces MISFIRE. When any doubt exists as to whether the cartridge has struck the firing pin, he kicks the barrel with his heel. (Fig. **30.14.**)

1. When conditions permit, the mortar crew should wait at least one minute before attempting to remove the round in order to prevent an accident by a possible delayed action of the ignition cartridge. If the heat of the barrel is excessive, it should be cooled by applying wet sandbags or water to the outside of the barrel.

2. After a one-minute wait, the following steps should be taken to remove the round: The gunner unlocks the mortar from the base plate. His right hand is placed around the spherical projection and his left hand below the mount attachment ring.

3. The assistant gunner places his right hand, palm up, under the barrel at the muzzle, and his left hand, palm down, on top of the barrel at the muzzle. The thumbs of both hands should be placed alongside the forefingers. Care must be taken to see that no part of either hand or any crew member is in front of the muzzle. (Fig. **30.15.**)



Fig. 30.14 Kicking barrel to dislodge misfire.

4. The gunner lifts the base of the barrel until the shell slides forward. Under no circumstances should the base of the barrel be lowered below the horizontal until the cartridge has been removed from the barrel. As soon as the shell has started forward, and not before, the assistant gunner



Fig. 30.15 Hand position in handling misfire.



Fig. 30.16 Removing a misfire.

places the thumb of each hand over the muzzle and stops the round as the point of the fuze reaches the muzzle. Figure **30.16** shows the position of the assistant gunner's hands as the shell slides forward.

5. The assistant gunner locates the safety pin, places a finger over the head of the safety pin and inserts the safety wire. He then removes the cartridge from the barrel and hands it to the No. 3 man, who inspects it to determine the cause of misfire.

6. If the primer of the ignition cartridge is dented, the shell should be laid aside for later destruction. If the primer is undented, the shell may be used again.

7. The gunner should then invert the barrel and shake it to remove any matter that may have caused the misfire. This might be part of the tail fin, remains of an ignition cartridge, etc. The assistant gunner then swabs the bore.

8. The mortar is relaid and firing is resumed.

9. If this procedure fails to remove the misfire, keep the barrel in a horizontal position, remove the bipod, and lay the barrel on the ground in a horizontal position until it can be turned over to ordnance personnel for disposal.

Ammunition

The ammunition for the 81-mm. mortar is classified as semi-fixed since the increments may be varied in number to vary the range of the shell. A complete cartridge consists of a fuzed projectile with a fin assembly and a propelling charge. The shells a Marine will most likely use in combat are High Explosive (HE) M362 or M43A1, Illuminating M301A1 and White Phosphorus (WP) M57 or M57A1.

A. The HE M362.

This cartridge will eventually replace other types of 81-mm. high explosive ammunition. It is shown in Fig. **30.17.** Some of its characteristics are as follows:

1. It has a range of approximately 4000 yards and a bursting area of 30x20 yards.

2. The weight of the cartridge is approximately 9 pounds with a filler of 2.10 pounds of Composition B. The length of the cartridge is 21 inches.

3. It is equipped with eight propellant increments which consist of paraffin-wax-treated cotton bags, containing flakes of propellant attached around the cartridge just forward of the fins.

4. Its color is olive drab with yellow markings.

5. This shell may be armed with a point detonating (PD) fuze which explodes on impact or it may be fused with a proximity fuze (VT) which bursts above the ground.

B. The HE M43A1.

This is a lighter weight high explosive shell. It is shown in Fig. **30.18.** Some of its characteristics are:

1. It has a range of 3300 yards.

2. It weighs 7 pounds. The filler of the cartridge is 1.23 pounds of TNT.

3. There are six increments on this cartridge.

4. It is painted olive drab with yellow markings.

5. It has a PD fuze.

C. The M301A2.

This cartridge is an illuminating shell used to

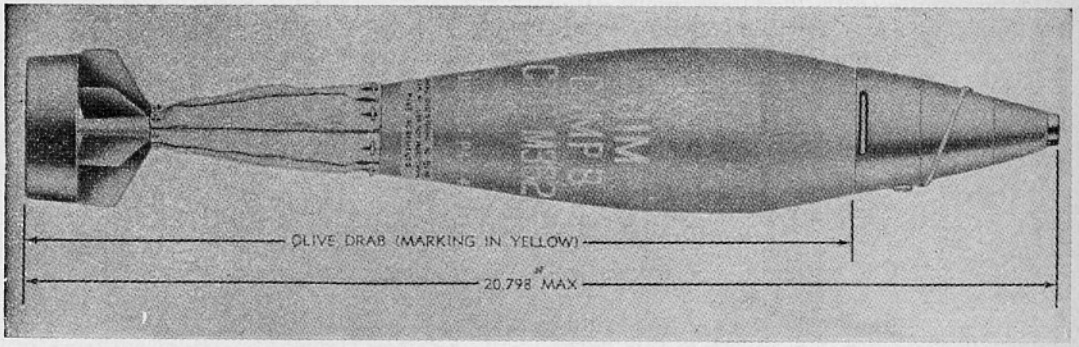


Fig. 30.17 Cartridge, 81 millimeter: HE, M362, w/fuze, PD.

light up forward areas. It is shown in Fig. **30.19(1)**. Some of its characteristics are:

1. It has a range of 2300 yards.

2. The cartridge weighs approximately 10.5 pounds.

3. It burns with an intensity of 50,000 candlepower for a period of one minute.

4. The fuze is a time fuze M84 with a setting from 0 to 25 seconds. The fuze controls the height of the burst.

5. The shell is painted gray with white markings.

D. Shell (WP) Smoke M57

The WP smoke cartridge is incendiary and casualty producing, and it is designed for use in maintaining smoke screens. It is shown in Fig. **30.20.** Some of its characteristics are:

1. It has a range of approximately 2450 yards.

2. It weighs 11.5 to 12.5 pounds, and is filled with 4.5 pounds of white phosphorus.

3. The fuze is PD, but may be equipped with a time fuze which allows the shell to burst in the air.

4. The shell is painted gray with yellow markings.

Ammunition is identifiable by color and markings. A new system of color coding is now being used; however, shells coded under the older system will be in use for several years. Mortar shell identification by color:

H. E. shells have been and will continue to be olive drab with yellow markings.

Illuminating shells (old), gray with one white band and white markings; (new) *White with black markings.

WP shells (old), gray with one yellow band and yellow markings; (new) *Light green with light red markings.

Practice shells (old), Blue or black with white markings; (new) *Blue with white markings.

Dummy shells (old), Black with white markings; (new) blue with white markings.

** (Presence of a high or low explosive burster expelling or spotting charge is indicated by a yellow or brown band, respectively.)*

E. ***The HE M374***

This high explosive cartridge gives greater range, accuracy and terminal effectiveness than the M362 series. It may be fuzed with either a point detonating or proximity fuze. Some of its characteristics are:

1. It has a maximum range of 4940 yards.

2. It weighs 9.34 pounds and is approximately 21 inches in length.

3. The propelling charge is divided into nine increments.

F. ***WP (smoke) M370***

It is a lightweight smoke producing cartridge with an appreciably greater range than the WP M57. Some of its characteristics are:

1. Its weight with the PD M524 fuze is 9.34 pounds.

2. Length of the complete round is approximately 21 inches.

3. Its charge is divided into eight increments.

4. Its range is 3987 yards.

G. ***The WP 375***

This cartridge is similar to the HE cartridge M374 and its ballistic data is the same. It gives greater range and accuracy than the M370.

H. ***M56A1***

This is a high explosive shell for use against material targets and personnel, having both a fragmentation and blast effect. Some of its characteristics are:

1. Its maximum range is 2486 yards.

2. Weight of the round with fuze is 11.4 pounds.

3. Its charge is divided intc four increments.

I. ***The TP M43A1***

This cartridge is for target-practice firing. It is similar to the high explosive M43A1 except for the projectile filler. The target-practice projectile is loaded with an inert material.

J. ***The M68***

This projectile is for training in the loading and firing of the 81-mm. mortar. It is completely inert and has no fuze. Some of its characteristics are:

1. It has a maximum range of 310 yds.

2. Its muzzle velocity is 172.8 feet per second.

3. It weighs 10.7 pounds and is 11.08 inches in length.

Care and Cleaning

Care and cleaning of the 81-mm. mortar and its accessories are important duties of all men in the mortar squad. The mortar is more likely to become unserviceable through lack of care rather than use.

A. Cleaning Materials.

The following are the authorized materials for cleaning and lubricating the mortar:

1. Rifle bore cleaner.

2. Issue soap.

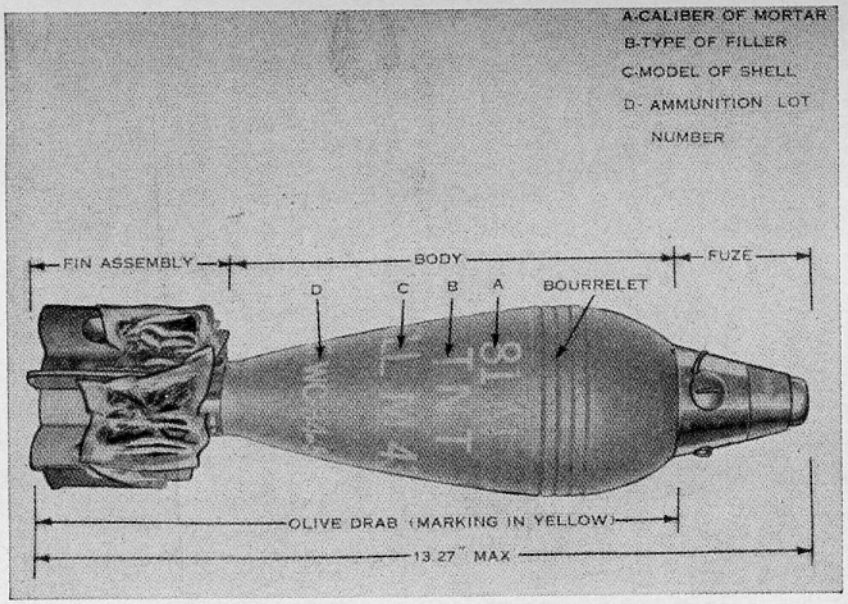


Fig. 30.18 HE Shell, M43A1, with PDF, M52.

3. Light lubricating oil.
4. Preservation oils.
5. Corrosion preventative compound, light.
6. Dry cleaning solvent.
7. Paint thinner.
8. Rags and waste.
9 Lens paper.

B. Care During Training.

When the mortar is being used for training purposes it should be cleaned at the end of the day in the following manner:

1. Wipe all dirt from the mortar, base plate and bipod. Use a clean lens paper on the sight lens.

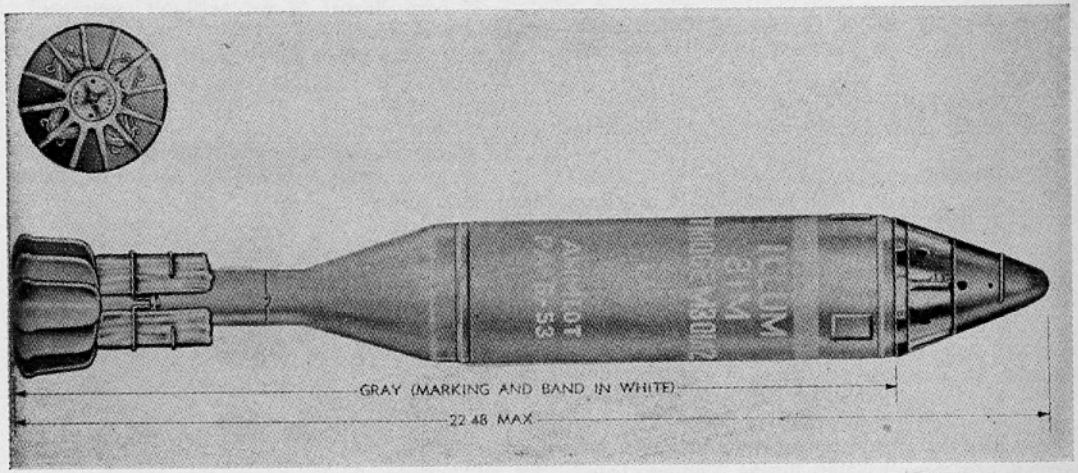


Fig. 30.19(1). Cartridge, 81 millimeter: illuminating, M301A2, w/fuze, time, M84.

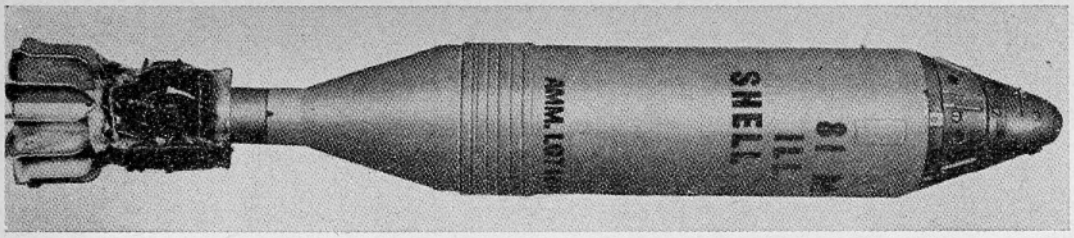


Fig. 30.19(2). Illuminating shell, M301, with time fuze, M84.

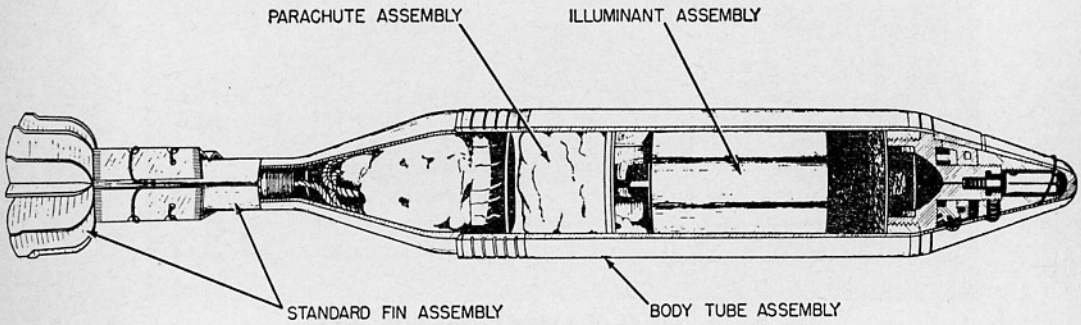


Fig. 30.19(3). Cut away view.

2. Coat all unpainted surfaces with a light coat of preservative oil.

3. The bore is cleaned with a cleaning staff which has clean waste attached to it. The staff is thrust in and out of the bore until the waste remains clean. The bore is then lightly oiled.

4. Take care not to leave waste on the firing pin.

5. The firing pin is cleaned by removing it and using the tools provided with the mortar's accessories.

C. Cleaning Before Firing

The mortar crew should complete the following actions:

1. Inspect the mortar completely for cleanliness.

2. Clean the bore and firing pin with clean waste. *Do not apply oil to these parts before firing.*

3. Oil metal moving parts lightly.

D. Cleaning After Firing.

The bore should be cleaned with rifle bore cleaner immediately after firing and for three consecutive days thereafter.

1. If bore cleaner is not available, soap and water may be used.

2. The firing pin is removed for cleaning.

3. If it is not possible to clean the bore immediately after firing, oil should be applied to prevent corrosion.

4. When cleaning the mount, all moving parts are cleaned with dry cleaning solvent, dried, and then lightly oiled.

Common Mistakes and Malpractices

Inaccuracies in mortar fire often occur from mistakes and malpractices. A mistake usually indicates carelessness and lack of concentration on the part of an individual. A malpractice indicates incomplete or incorrect training. The best preventative for mistakes and malpractices is the formation of proper habits during training. *Don't deviate from correct procedures. Know all there is to know about your weapon.* Following is a list of common errors made at the mortar position:

A. Mistakes.

1. Making a 100-mil error in deflection or elevation.

2. Moving in wrong direction from numbered

graduations on micrometer scales of the M34A2 sight.

3. Firing wrong cartridge.

4. Laying on wrong aiming stake.

5. Failing to center all bubbles.

6. Mis-setting time fuzes by reading in wrong direction from numbered graduations.

B. Malpractices.

1. Firing cartridges from oily barrels.

2. Failing to swab bore after prolonged fire.

3. Failing to set near aiming stake one-half the distance to the far aiming stake.

4. Attempting to load too rapidly.

5. Improper protection of the ammunition from the elements.

6. Exceeding maximum rates of fire and allowing the barrel to become extremely hot.

7. Not seating base plate of mortar on level ground.

8. Mortar crewmen not following established safety procedures.

Safety Precautions

A. Before Firing.

The gunner ensures that:

1. There is mask and overhead clearance.

2. Barrel is locked to base plate and the open end of the socket cap is pointing in the direction of fire.

3. Shock absorber clevis pin is secure.

4. Locking nut is secure.

5. Chain is taut and is hooked to the left leg.

B. During Firing.

During firing the gunner checks frequently to see that:

1. The shock absorber clevis lock pin is secure and the locking nut is tight.

2. The open end of the socket cap is pointed in the direction of fire.

C. Duties of Assistant Gunner and No. 3 Man.

1. The assistant gunner makes sure the bore is clean before firing. He swabs the bore after every 10 rounds or after every fire for effect.

2. The No. 3 man checks to see that:

a. Each cartridge is clean.

b. The fuze safety pin of each cartridge is present and in place, if applicable.

c. The increments are present and in proper condition.

d. The ignition cartridge is present and in proper condition.

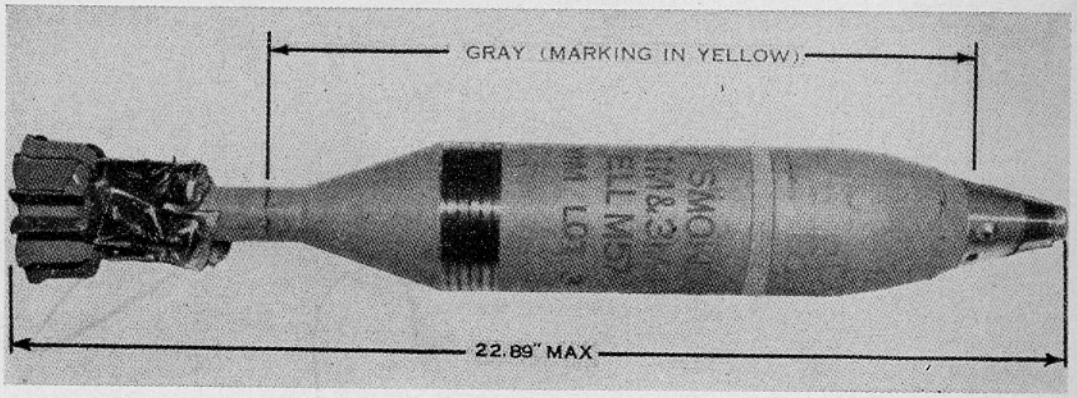


Fig. 30.20. WP smoke shell, M57, w/PD fuze.



Chapter 31

The Bayonet

THE modern amphibious assault requires a closely coordinated, well equipped, highly skilled team. The most important member of this team is the individual Marine. Other members of the team transport him to the target area, prepare the objective for him, and support him in the attack with a powerful array of modern weapons. But in the final assault, it is the individual Marine, with his rifle and bayonet, who closes with the enemy and destroys him.

The rifle and bayonet, in the hands of a Marine, become a deadly combination of spear, sword, club, and shield. At night this combination weapon can kill silently and with surprise. In hand-to-hand fighting when the rifle cannot be reloaded and the use of grenades would be impractical, it is the decisive weapon. At these times the aggressive bayonet fighter will win.

The assault is the critical moment of any battle. A spirited bayonet assault, executed by Marines eager to drive home cold steel, can strike terror into the ranks of the enemy. Skill and confidence in his ability to use the bayonet give a Marine the spirit to make a bayonet assault. With such spirit he truly becomes the spearhead and the most important member of the amphibious assault team.

In developing your skill with the rifle and bayonet, you must master the principles and movements described and illustrated in this chapter. They are not difficult. The Marine Corps system of bayonet fighting is based on natural movements. It can be compared with boxing since the hands move in the same pattern as a boxer's fists. But as a bayonet fighter your reach is greater than a boxer's. In one hand you have a pointed blade for slashing and stabbing. In the other hand is a weighted club for pounding and smashing. These weapons must be driven at the enemy in a fast, relentless attack until he is destroyed. Hesitation will give the enemy a chance to recover and make you the object of his attack.

Principles

A. ***Get the blade into the enemy.*** This is the main principle in bayonet fighting. Parrying the enemy's attack, smashing him with the butt of your rifle, and using proper form and footwork are all important. But they are actions taken to enable you to sink the blade. It is the blade that kills.

B. ***Be ruthless, vicious, and fast in your attack.*** Never pause until you have won. Follow each movement with another in a constant, aggressive cycle.

C. ***Seek vital areas, but don't wait for an opening. Make one.*** The throat is the best target. The belly is good, too. Your enemy will instinctively protect these areas. When he covers one, attack the other. If he succeeds in protecting both, go for his face, hands, or side with a hacking, slashing blade and cut your way to that vital area. A solid butt stroke in his groin will open his guard. Deliver it hard and close in for the kill.

D. ***Protect yourself.*** You can dodge and parry. Your rifle and bayonet make a good shield. But remember that the best protection you have is to strike the first blow and then follow through.

Guard Position And Attack Movement

A. ***General.*** **1.** Movements in bayonet fighting are natural. The description of the movements will state approximate distances. Adjust these distances to suit you. Don't lose balance just for the sake of form.

2. There are a number of steps in each basic



31.1 Guard position.



31.2 Executing the Slash.

attack movement. They are described for a right-handed man. If you are left-handed, simply move the opposite hand and foot from that one stated.

3. Your hands are used to firmly grasp the rifle but you swing them as if you were fighting with your fists. Footwork, feinting, and balance are more important to a bayonet fighter than to a boxer. For these reasons, each movement can be compared to a similar movement in boxing. But remember, there is no sportsmanship in bayonet fighting. You must kill, not simply defeat, your opponent.

B. *Guard Position.* As in boxing, all attacks with the bayonet begin from the Guard position. The movements of the attack follow and when the attack is finished the Guard is assumed again.

1. In the Guard position (Fig. **31.1**), the bayonet fighter is ready to move to the attack or to ward off his enemy.

a. To execute:

(1) Spread your feet comfortably and naturally. Keep the left foot about six inches forward of the right and your knees slightly bent.

(2) Bend the body slightly forward from the hips, keeping your weight evenly balanced on the balls of both feet.

(3) Hold the right elbow against the right side and the right forearm parallel to the deck. Grasp the small of the stock just behind the trigger guard.

(4) With the left hand, grasp the rifle just below the upper sling swivel with the fingers inserted between the sling and the rifle.

(5) Hold the rifle so that it bisects the angle made by the head and left shoulder. The cutting edge of the bayonet faces toward the enemy.

(6) Be relaxed but alert. Grasp the rifle firmly but not tensely.

2. Moving at the Guard Position

a. To close with your opponent, keep the rifle and bayonet at the Guard position and execute foot movements as follows:

(1) To move forward: step about 14 inches straight to the front with the left foot and follow with the right.

(2) To move to the right: side step about 14 inches to the right with the right foot and follow with the left.

(3) To move to the left: side step about 14 inches to the left with the left foot and follow with the right.

(4) To move to the left front: advance the right foot slightly forward of the left, pivot to the left front on the ball of the right foot and then advance the left foot.

(5) To move to the right front: shift the weight to the left foot, pivot to the right front and at the same time advance the right foot about 20 inches in that direction. Step forward with the left foot to assume the Guard position.

(6) To face about turning left: whirl 180° to the left by pivoting on the left foot.

(7) To face about turning right: whirl 180° to the right by pivoting on the right foot.

In moving while at the Guard position, remember to face the enemy. Move the leading foot the approximate distance and immediately follow with the other foot to maintain balance.

C. *Attack Movements.* There are eight basic movements in the Marine Corps system of bayonet fighting. Six are used to destroy the enemy. These are: the Slash, the Jab, the Vertical Butt Stroke, the Horizontal Butt Stroke, the Horizontal Slash, and the Smash. Two movements are used to ward off the enemy. These are: the Parry Right and the Parry Left. Each movement is described and taught from the Guard position. However, when you have mastered them all you will be able to execute one after another without returning to the Guard position.

1. *The Slash.* (Left hook in boxing).

a. To execute:

(1) Assume the Guard position.

(2) Step forward with the left foot about seven inches. Keep the right foot in position as a base. (Fig. **31.2**).

(3) Keep the right hand in place.

(4) Extend the left arm almost fully and swing the edge of the bayonet forward and down in a slashing arc aimed at the neck area of the enemy.

(5) Execute movements simultaneously so that the power of stepping and extending the arm add to the force of the slashing movement.

b. To recover:

(1) Pull the left hand back toward the body.

(2) Step forward with the right foot.

(3) Assume the Guard position.

c. The arm, hand, and foot movements of the Slash are similar to those of the left hook in boxing.

2. *The Jab.* (Left Jab in boxing).

a. The initial movements of the Jab (Fig. **31.3**) are identical to those of the Slash. An additional forward step and thrusting of the arms add force to the jabbing action of the bayonet. To execute:

(1) Assume the Guard position.

(2) Step forward with the left foot about seven inches. Keep the right foot in place, initially, as a base.

(3) Keep the right hand in place, initially.

(4) Extend the left arm almost fully and aim the point of the bayonet at the enemy's throat, belly, or other open area.

(5) Again step forward about seven inches with the left foot. At the same time extend both arms with a snap. Guide the point to the target with the left hand and bring the right foot forward for balance.

(6) Execute the second step with the left foot and the extension of the arms as one motion so as to add force to the jabbing action.

b. To recover:

(1) Advance the right foot.

(2) Pull the hands straight back from the extended position.



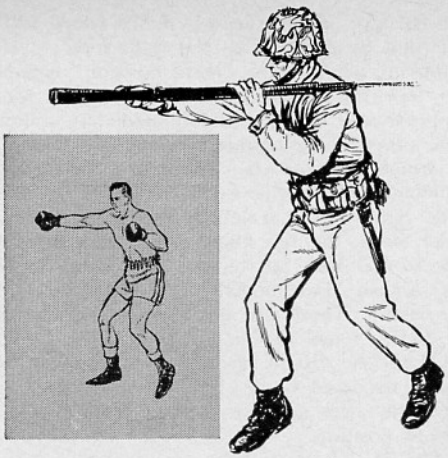
31.3 Executing the Jab.



31.4 Executing the Vertical Butt Stroke.



31.5 Executing the Horizontal Butt Stroke.



31.6 Executing the Smash.

(3) Assume the Guard position.

c. The Jab may be delivered against any part of the body, but the throat and belly are the areas to be sought. The movement compares to the left jab in boxing. It has short range but is extremely fast.

3. ***The Vertical Butt Stroke*** (Right uppercut in boxing).

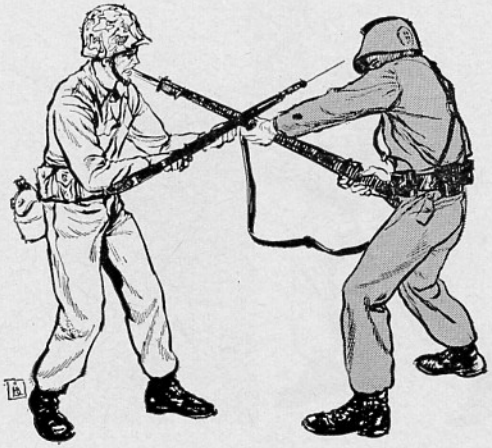
a. To execute:

(1) Assume the Guard position.

(2) Step forward with the left foot about seven inches.



31.7 Executing the Parry Right.



31.8 Executing the Parry Left.

(3) Use the left hand as a pivot for the rifle and drive the right hand forward and upward in a violent uppercut motion. (Fig. **31.4**). Aim the butt of the rifle at the groin, belly, or chin of the enemy.

(4) Execute the step and the uppercut motion at the same time to add force to the blow.

b. To recover:

(1) Pull the right hand back and down.

(2) Bring the right hand back until the elbow is against the side.

(3) Assume the Guard position.

c. The Vertical Butt Stroke is executed exactly as an uppercut in boxing.

4. ***The Horizontal Butt Stroke*** (Right Hook in boxing).

a. To execute:

(1) Assume the Guard position.

(2) Step forward with the left foot about seven inches.

(3) Pivoting hard on the left foot, swing the right hand up and around to the left in a fast hooking action. The rifle will be flat and on its side. (Fig. **31.5**). Use the left hand as a pivot for the rifle.

(4) Aim the toe of the rifle butt at the enemy's head, neck, or side. Put the force of the body's pivoting behind the blow.

(5) Plant the right foot as the blow is completed.

b. To recover:

(1) Bring the right hand back and down.

(2) Step forward with the left foot.

(3) Assume the Guard position.

c. The Horizontal Butt Stroke is executed as the right hook in boxing, with the additional force of a body pivot.

5. ***The Horizontal Slash*** (Left hook in boxing).

a. The Horizontal Slash is nearly identical to the Slash except that a slicing action is given to the blade. To execute:

(1) Assume the Guard position.

(2) Step forward with the left foot. Keep the right foot in place as a base and a pivot.

(3) At the same time bring the rifle and bayonet to an almost horizontal position.

(4) As the step with the left foot continues, rotate the body to the right by pivoting on the right foot. Pull the right arm across the body and make a hooking action with the left hand.

(5) Execute the step, pivot, hook and pulling of the rifle in one motion. This causes the blade to have a forceful slicing action. Aim the slice at the head, neck, or side.

(6) Finish the step with the left foot.

b. To recover.

(1) Bring the right hand back and down.

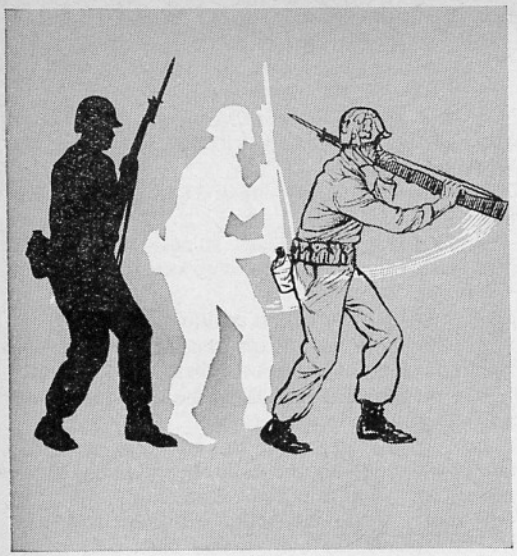
(2) Bring the left hand back.



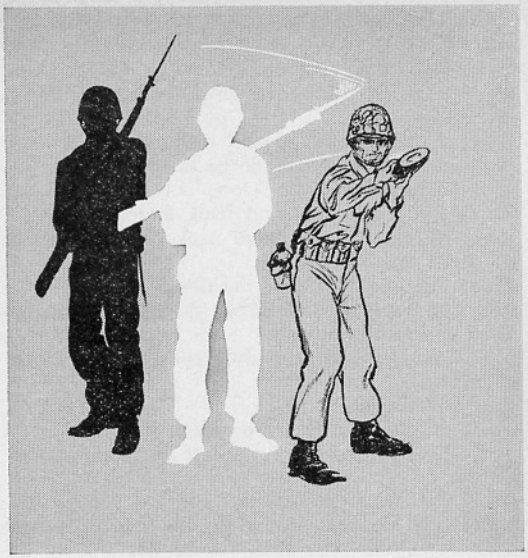
31.9 Composite sketch of the Slash.



31.10 Composite sketch of the Jab.



31.11 Composite sketch of the Vertical Butt Stroke.



31.12 Composite sketch of the Horizontal Butt Stroke.

(3) Rotate the body back to the left.
(4) Assume the Guard position.

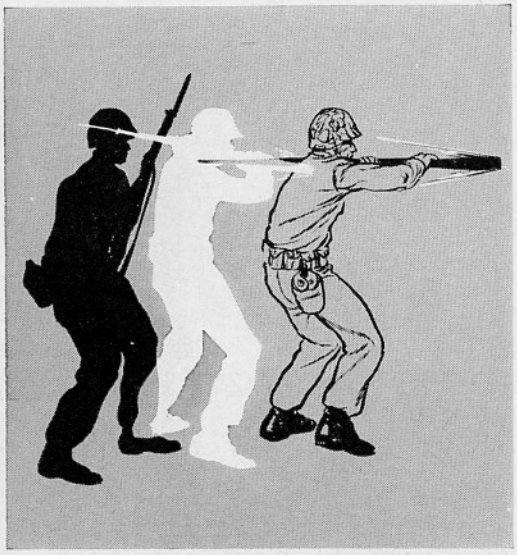
c. The Horizontal Slash compares to the left hook in boxing with the additional slicing action given the blade by pivoting to the right and pulling the right hand across the body.

6. The Smash. (Right Jab in boxing).

a. To execute:



31.13 Composite sketch of the Horizontal Slash.

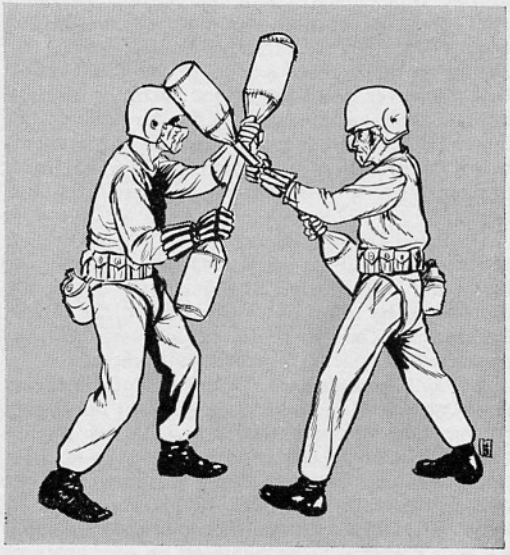


31.14 Composite sketch of the Smash.

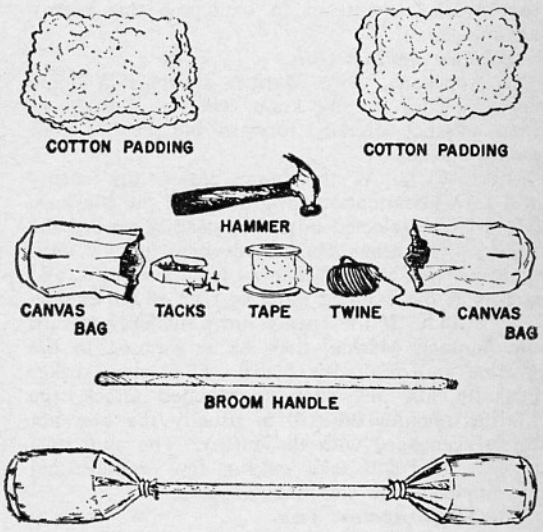
(1) Assume the Guard position.
(2) Deliver a Horizontal Butt stroke, but do not recover.
(3) Step forward with the right foot about seven inches, following with the left.
(4) Guide the butt plate into the enemy's head or face with the right hand.
(5) Drive the butt of the rifle forward by extending the arms.
(6) Execute the step and the smashing action at the same time to give force to the blow. (Fig. **31.6**).
b. To recover:
(1) Step forward with the left foot about 20 inches.
(2) Pull the right hand back and down.
(3) Assume the Guard position.
c. The Smash compares to the right jab in boxing with the additional power of the left hand transmitted to the butt of the rifle.

7. ***The Parry Right*** (Blocking a blow from the right in boxing).
a. To execute:
(1) Assume the Guard position.
(2) Step forward with the left foot about seven inches. Keep the right foot in place as a base.
(3) Keep the right hand in place as a pivot for the rifle.
(4) Extend the left arm forward and down across the body in a sweeping motion to deflect the enemy's weapon to your right. (Fig. **31.7**).
(5) *Immediately* follow through with an attacking movement.
b. To recover:
(1) Recover as prescribed for the attacking movement.
c. The Parry Right compares to the block of a left jab or left hook in boxing except that the rifle and bayonet are used to ward off the enemy's blow.

8. ***The Parry Left*** (Blocking a blow from the left in boxing).
a. To execute:
(1) Assume the Guard position.
(2) Step forward with the left foot about seven inches. Keep the right foot in place as a base.
(3) Keep the right hand in place as a pivot for the rifle.
(4) Extend the left hand forward and down away from the body to deflect the enemy's blow to your left. (Fig. **31.8**).
(5) *Immediately* follow through with an attacking movement.
b. To recover:
(1) Recover as prescribed for the attacking movement.
c. The Parry Left compares to the block of a right jab or right hook in boxing except that the rifle and bayonet are used to ward off the enemy's blow.



31.15 Practicing with the Pugil Stick.



31.16 Materials for making a Pugil Stick.

Series Of Movements

A. *General.* There is no fixed sequence of attacking movements. You attack the enemy's vital areas as openings appear, or as you make those openings. The order in which you make attacking movements is governed by what is natural for you and the position in which you have your rifle at any one time. If you miss your target with one movement, *immediately* follow it with another. You must constantly bore in with absolutely no thought of mercy. Your enemy will have none for you.

B. *Good Combinations.* Certain series of attacking movements are natural for everyone. These are:

1. Guard, followed by a Slash or Horizontal Slash, then a Jab, recovery, and return to Guard.

2. Parry Left, followed by a Horizontal Butt Stroke, then a Smash, recovery, and return to Guard.

3. Vertical Butt Stroke, followed by a Slash, then a Jab, recovery, and return to Guard.

4. Whirl to the left, deliver a Horizontal Butt Stroke, followed by a Smash, then a Horizontal Slash, Jab, recovery, and return to Guard.

5. Whirl to the right, Parry Right, followed by a Jab, recovery, and return to Guard.

6. Parry Left followed by a Horizontal Slash, Jab, recovery, and return to Guard.

7. Parry Left, followed by a Horizontal Butt Stroke, Smash, Slash, Jab, Vertical Butt Stroke, recovery, and return to Guard.

C. *Other Combinations.* You can develop other series of attacking movements as you gain skill in bayonet fighting. The only requirement is that the series be natural for you so you will not be thrown off balance.

Teamwork

A. *General.* Marines fight together. This is especially true in bayonet fighting. The bayonet fighting team, with a few simple tactics, can use the advantage of numbers before the enemy reinforces his position. If Marines are outnumbered, they work as a team to overcome this enemy advantage.

B. *Two Against One.*

1. Approach. Two Marines approach a single enemy. They do not know what he will do so they advance directly forward but neither converges on him.

2. Contact. As the range closes, the enemy will turn his attention toward one of the Marines. The Marine selected advances steadily toward the enemy. The other Marine advances quickly until opposite the enemy's flank. He then turns and strikes at the exposed flank or rear of the enemy.

3. Switch. If the enemy turns suddenly toward the flanking Marine, then he is exposed to the Marine he originally faced. This man strikes instantly. In any such coordinated attack, the Marine making the kill is usually the one not directly engaged with the enemy. The approach, contact, and kill take only a few seconds and are made in one continuous assault.

C. *Three Against Two.*

1. Approach. Three Marines approach two of the enemy. They do not know who the enemy will engage. They advance directly forward.

2. Contact. As the range closes the enemy will normally engage two of the Marines. These two maintain their frontal attacks. This leaves one Marine momentarily free. He advances rapidly until directly opposite the flank of the nearest enemy. He then veers suddenly and strikes that enemy on the exposed side as in the Two Against One maneuver. As soon as one enemy is disposed of, the other enemy is struck in the flank by the first Marine who can reach him. If either enemy being flanked turns to defend himself, he leaves himself open to the Marine making the frontal attack.

D. *Two Against Three.* If two Marines are confronted by three of the enemy, they dart to the flanks. This leaves the enemy in the center the last to be attacked. When one of the attacking Marines has disposed of his opponent, he immediately attacks the remaining enemy.

E. *One Against Two.* When two of the enemy confront one Marine, he does not wait but dashes forward and to the outboard flank of the nearest enemy. Under no circumstances does he let himself get caught between them. By moving to the outside of one or the other of his opponents, he keeps that man between himself and the other enemy. This way he concentrates on one opponent at a time.

Training

A. *General.* Train yourself as a bayonet fighter by developing skill in all the movements. Concentrate on being aggressive. Shout and yell as you close with your opponent. This will unnerve him and make you more eager to "close for the kill." Remember to keep your balance and to move with speed. Good timing and judgment of distance will come with practice.

B. *Learning the Movements.* Go through each movement step by step, until you have learned it thoroughly. Then execute the entire movement slowly and smoothly. After you do it properly, start speeding up your action. When you have mastered all the movements, start combining them in sequence. Learn a series of movements that follow one another naturally. Always start the series from the Guard, and return to that position after you complete your combined series of attacks.

C. *Coach and Pupil.* Get another Marine to watch you and correct any wrong move you make. Then correct him as he goes through the movements. Cover and pad your bayonets, then practice against one another. Practice teamwork against another "enemy." Learn to work in pairs and threes as a smoothly operating team.

The Pugil Stick

A. *General.* After you have learned all the movements and paired off in the Coach and Pupil phase, pugil sticks can be substituted for rifles. Wear a football helmet and some hockey gloves or boxing gloves. "Cup" type athletic supporters or Marine Corps body armor should also be worn. When equipped with these items, Marines can achieve realistic bayonet training without casualties. You can go "all out" against your "enemy" without fear of doing him permanent harm. (Fig. **31.15**).

B. *Making the Pugil Stick*

1. Dimensions:

a. Weight—about five pounds.

b. Total length—about 60 inches.

c. Width—six inches across pads.

d. Length of pads—10 inches.

2. Materials required: **(Fig. 31.16).**

a. One strong broom handle or tent pole about 1½ inches in diameter and 44 inches long.

b. Two canvas bags, six inches in diameter and 15 inches long. Old tent canvas or shelter half material may be used.

c. About 20 carpet tacks.

d. Cotton padding or waste. Salvaged mattress stuffing is ideal.

3. Construction:

a. Cut two circles of canvas about eight inches in diameter.

b. Cut two rectangles of canvas 15 by 22 inches.

c. Sew the rectangles into cylinders about six inches in diameter and 15 inches long. Close one end of each by sewing in the circular pieces. One bag is required for each end of the stick.

d. Stuff the padding into the bags.

e. Insert ends of the stick into the bags about eight inches.

f. Use tacks and twine to secure the bags.

g. Cover tacks and twine with tape.

C. *Use.* Fight with the pugil stick exactly as if it were a rifle and bayonet. Pair off and engage your "enemy." Team up and practice the tactics of team fighting in twos and threes.

D. *Contests.* Realistic bouts can be fought with pugil sticks for weapons and a judge for scoring.

1. Each bout goes until one Marine has three scores.

2. A score is made when a solid blow is delivered to the head, neck, belly or groin. Hits on other parts of the body are not scores.

3. No score will be counted if the man delivering a "killing" blow removes either hand from the pugil stick during his delivery.

4. More than one judge is desirable. When a judge sees a score he blows a whistle and stops the action. The contestants assume the Guard position. The judge announces who made the score and then directs action to continue.

E. *Speed.* You will be faster with the pugil stick than with the rifle. For this reason, do a lot of your practice armed with the rifle and bayonet.

The M1 Rifle

THE basic weapon of any infantry organization is the rifle. The basic weapon of Marine infantry units is the M1 Rifle (U. S. Rifle, Caliber .30, M1). If you are assigned to an infantry organization, you will probably be armed with an M1. About half of the members of all rifle companies are. Become thoroughly acquainted with your rifle and treat it well. Your life and the lives of your buddies may depend on the way you use it.

The M1 rifle is a *gas-operated, clip-fed, air-cooled, semi-automatic shoulder weapon.* Its principal characteristic is its rapid mechanical operation which enables the individual rifleman or a group of riflemen to deliver a large volume of accurate fire upon any designated point or area within range. The effective range of the M1 rifle is considered to be about 500 yards. Some of its other characteristics are:

WEIGHT	9.5 pounds
LENGTH WITHOUT BAYONET	43.6 inches
LENGTH OF BARREL	24 inches
AVERAGE RATE OF WELL-AIMED FIRE PER MINUTE	10-12 rounds
CHAMBER PRESSURE PER SQUARE INCH	50,000 pounds
MUZZLE VELOCITY PER SECOND	2600-2800 feet
CLIP CAPACITY	8 rounds
MAXIMUM RANGE (M2 CARTRIDGE)	3500 yards approx.

Nomenclature and Stripping

Before taking the rifle apart, you should know the nomenclature (that is, the names) of all visible parts. On your own rifle, find and learn the names of the parts shown in Figure **32.1.** Then, as you come to them, learn the names of the inner parts with the help of pages 379 through 382.

The M1 rifle has three main groups as you can see in Fig. **32.2:** the trigger housing group; the barrel and receiver group; the stock group.

A. Trigger Housing Group. Pictures I through VIII on page 379 shows the inner parts of the trigger housing group. Following is a discussion of how to remove the group from the rifle and how to disassemble it.

1. Grasp the rifle with your left hand so that the base of the trigger housing is included in the grip of your fingers.

2. Place the butt of the rifle against your left thigh, sights to left.

3. Grasp the rear portion of the trigger guard with the thumb and forefinger of your right hand.

4. Exert enough pressure toward the butt to unlatch the trigger guard from the trigger housing.

5. Swing the trigger guard away from the trigger housing to its extreme opened position. See Fig. **32.3(1).**

6. Pull out the trigger housing group. See Fig. **32.3(2).**

7. Close and latch the trigger guard.

8. Release hammer to fired position.

9. To relieve the tension on the trigger pin, hold the trigger group in your right hand with the right thumb on the sear, pull on the trigger with your right forefinger, brace the base of the trigger housing against a firm support, and press on the sear with the thumb of your right hand.

10. Holding a bullet or combination tool in your left hand, start the trigger pin from its seat.

11. Remove the trigger pin.

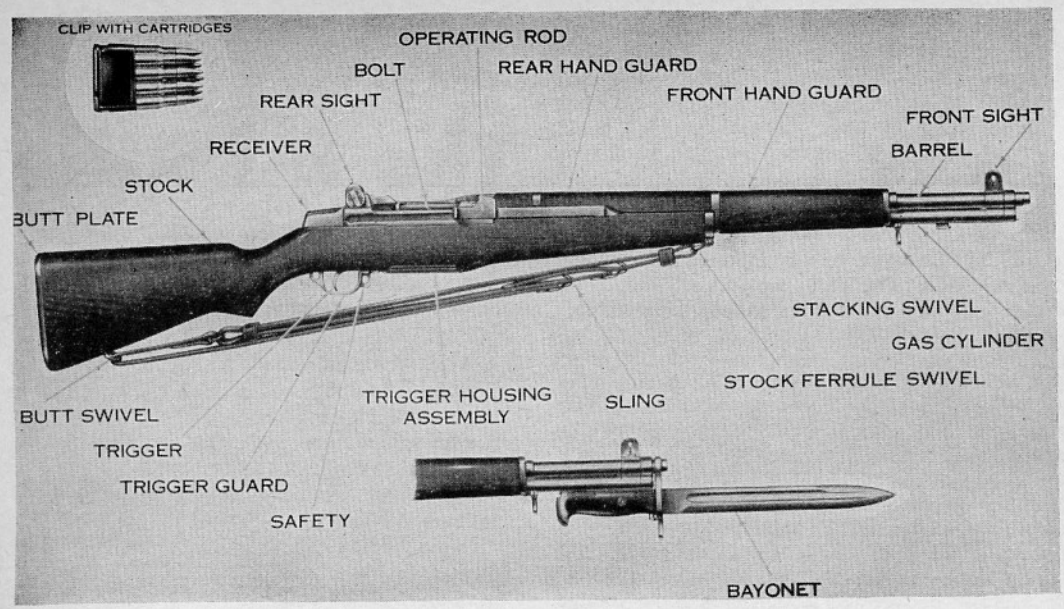
12. Let the hammer spring extend to its full length by gradually releasing the pressure of your right thumb and forefinger meanwhile steadying the hammer spring housing with the fingers of your left hand.

13. Remove the trigger assembly. Do not remove the sear pin or sear.

14. Remove the hammer spring housing, hammer spring, and hammer spring plunger. Separate these parts.

15. Push out the hammer pin from the left side, and remove the hammer.

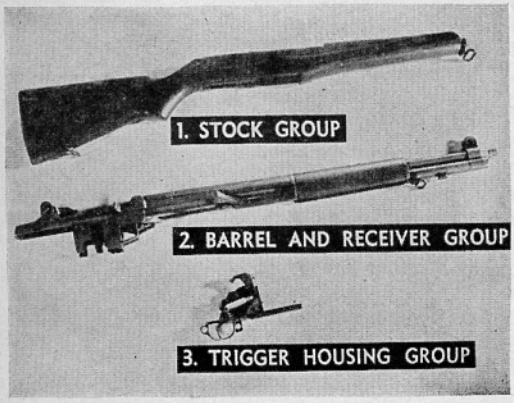
16. To remove the safety, push the stud out



32.1 Basic nomenclature of the M1 Rifle.

from its seat in the left side of the trigger housing, then lift the safety out from its slot.

17. To remove the trigger guard: (a) Hold the trigger housing in your left hand, with the base of the housing down and away from your body. (b) Swing the trigger guard to the open position with your right hand. (c) Slide the trigger guard toward your body until the hammer pin holes are over the center of the safety slot. (d) Rotate the trigger guard counter-clockwise with your right hand until the wings of the trigger guard clear the edge of the trigger housing. (e) Remove the trigger guard.



32.2 The three main groups.

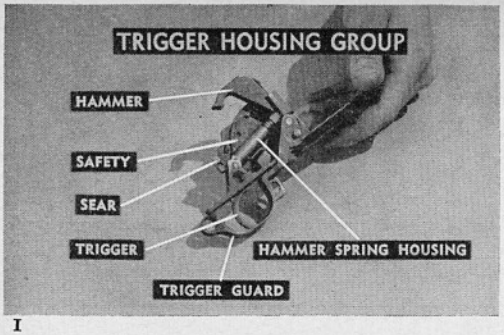
18. To remove the clip ejector: (a) Place the trigger housing on a solid surface with the left side up. (b) Insert the point of a bullet or combination tool in the dismounting hole in the left side of the trigger housing. (c) Push out, and remove clip ejector.

19. To re-assemble the trigger housing group, follow these steps in reverse order.

B. Barrel and Receiver Group. **1.** Separate the barrel and receiver group from the stock group by grasping the rifle over the rear end of the receiver with your left hand, muzzle to the left, then strike and grasp the small of the stock with your right hand. (See Fig. **32.4(1)** and **(2).** Pictures I through XVI on pages 380 and 381 show the inner parts of the barrel and receiver group.)

2. Place the barrel and receiver group on a smooth surface with the sights down. Be sure that the aperture is set at minimum elevation.

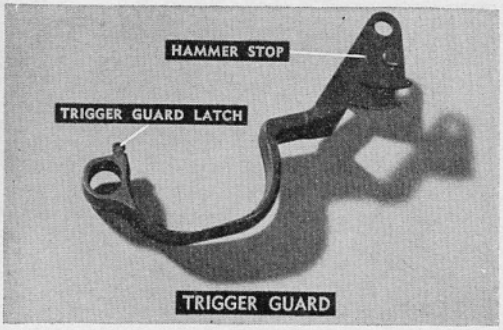
3. Grasp the follower rod with your left thumb and forefinger. (See Fig. **32.5(1).**) Disengage it from the follower arm by pressure toward the muzzle. (See Fig. **32.5(2).**)



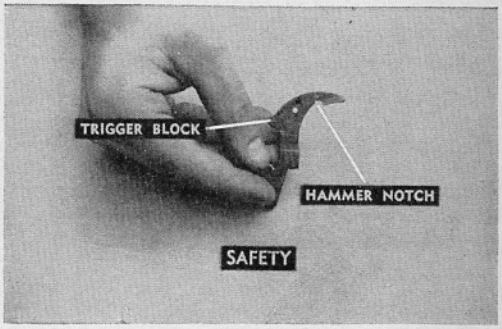
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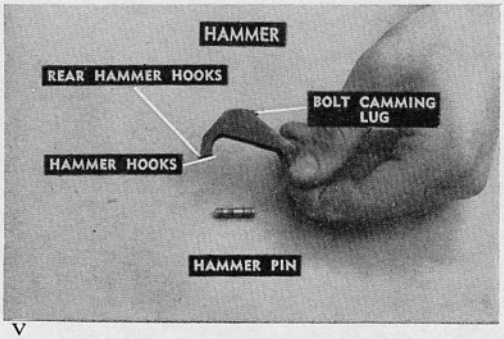
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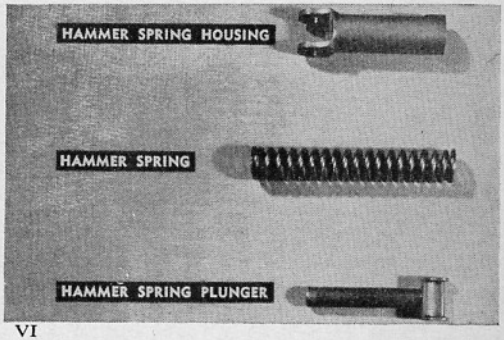
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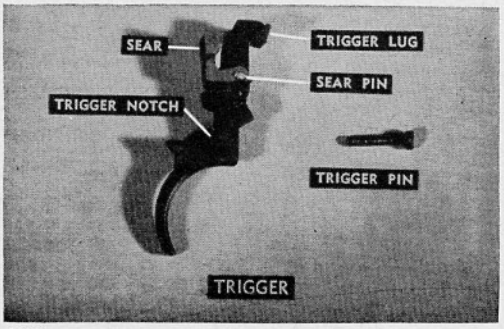
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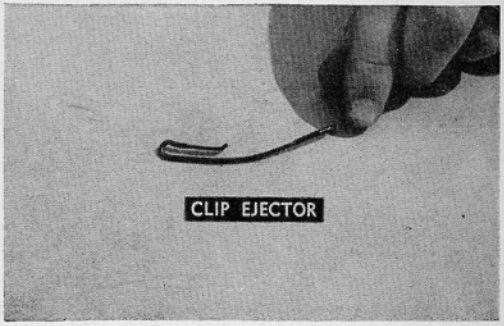
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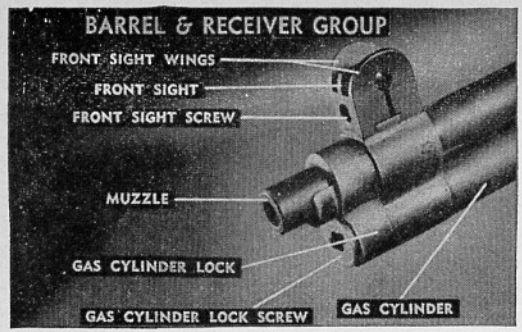
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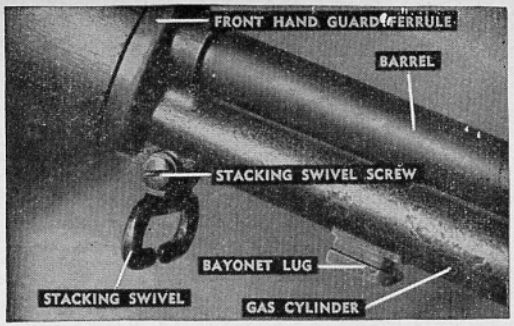
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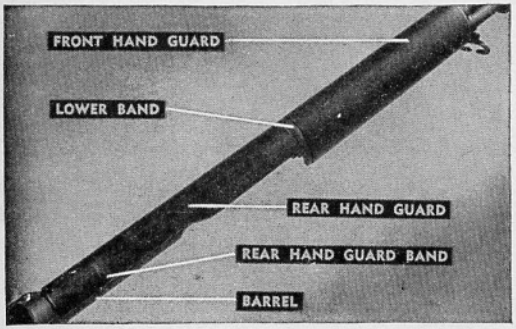
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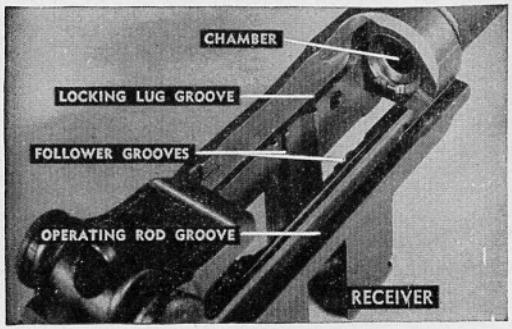
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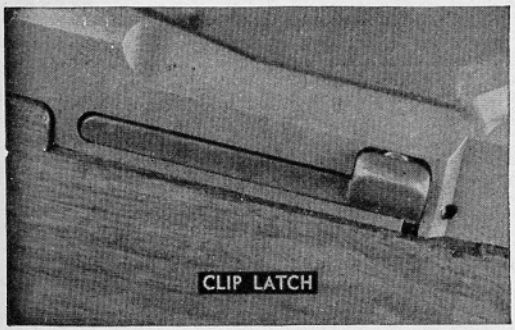
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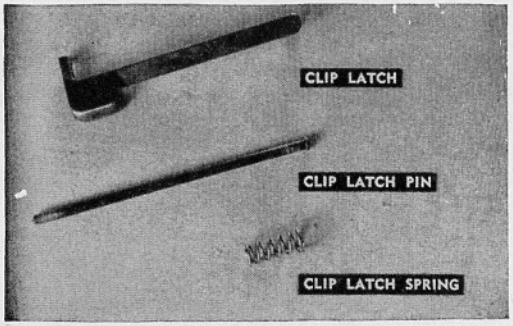
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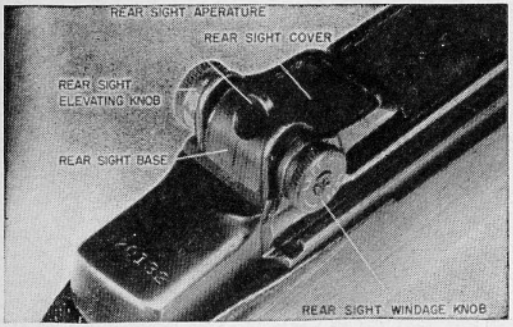
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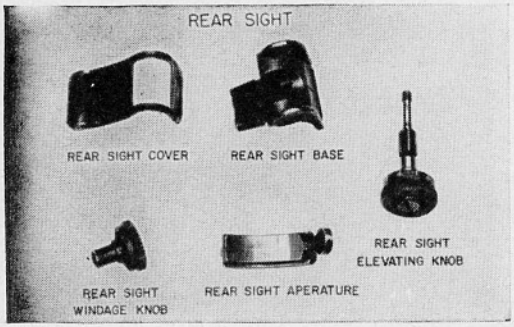
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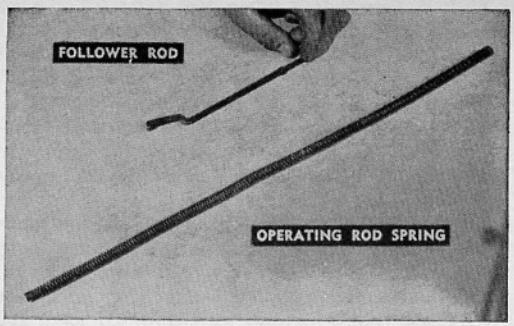
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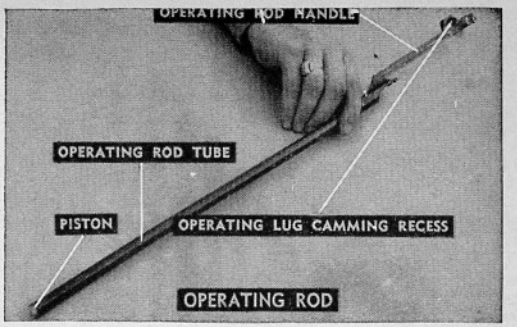
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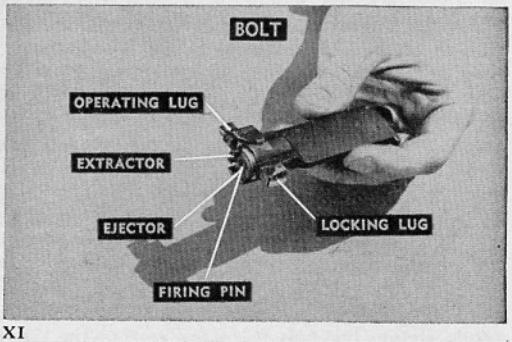
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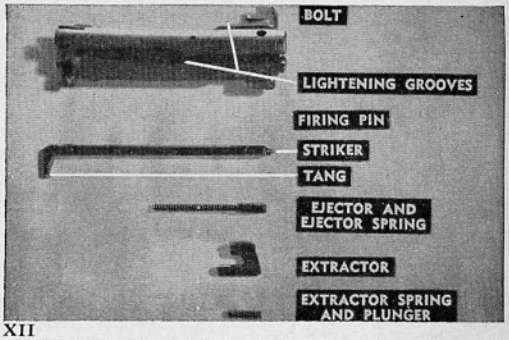
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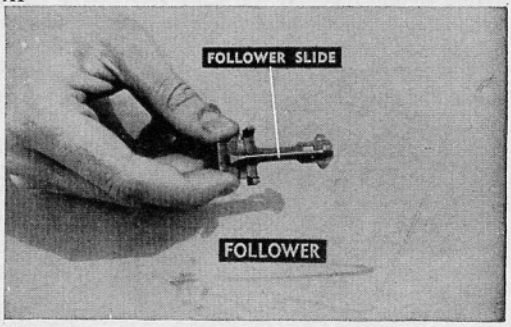
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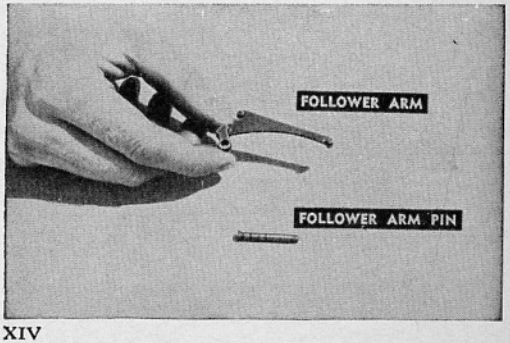
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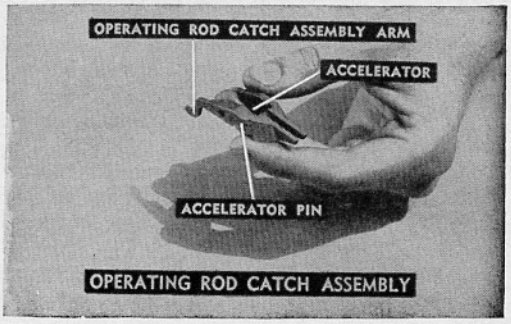
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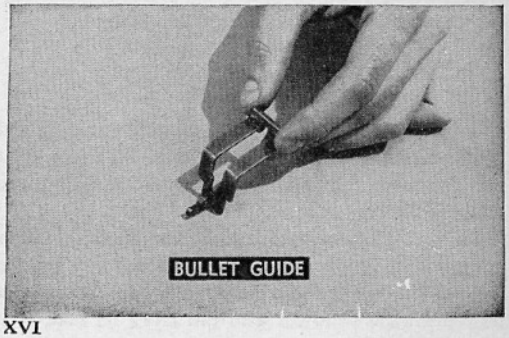
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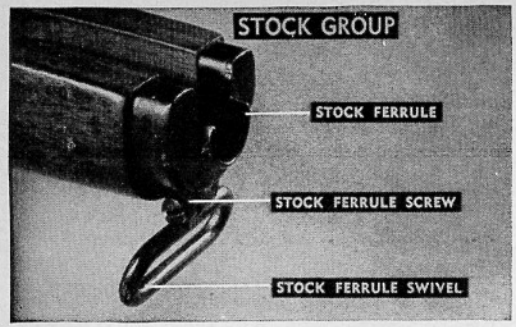
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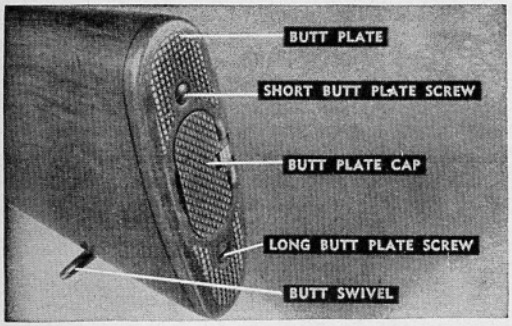
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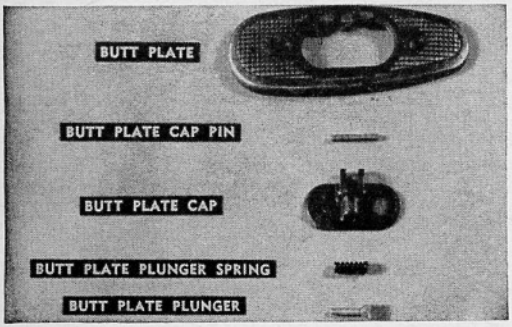
XVI



I



II



III

4. Withdraw the follower rod and operating rod spring toward the butt. (See Fig. **32.5(3).**) If the follower rod and operating rod spring are attached, *do not* separate them.

5. With the point of a bullet or a combination tool held in your right hand and applied on the side of the receiver farthest from your body, you now push the follower arm pin from its seat.

6. Use your left hand to pull the pin out from the side nearest you.

7. Grasp the bullet guide, follower arm, and operating rod catch assembly. Pull to the left until these parts are disengaged.

8. Lift out these three parts and separate them. *Do not* try to remove the accelerator from the operating rod catch assembly, since the accelerator pin is riveted in its seat.

9. Lift out the follower with the follower slide attached. *Do not* separate the follower from the follower slide.

10. To remove the operating rod, grasp the barrel and receiver group with your left hand and the operating rod handle with your right hand. You will notice that the operating rod is bent. *Do not* attempt to straighten it, for it is purposely bent to provide clearance at the enlarged portion of the barrel. Move the operating rod slowly to the rear, pulling upward and away from the receiver. When the lug on the operating rod slides into the dismounting notch of the operating rod guide groove in the receiver, the operating rod will disengage from the bolt. When the operating rod is disengaged, remove it with a downward and rearward movement. (See Fig. **32.6(1)** and **(2).**)

11. To remove the bolt, grasp the operating lug. While sliding the bolt from the rear to the front, lift it up and out to the right front with a slight counterclockwise rotary motion. (See Fig. **32.7.**)

12. Before you attempt to disassemble the bolt, learn the correct names of its parts as shown on page 381.

13. Grasp the bolt in your left hand. Hold the firing pin in place with your little finger, extractor to the right, front end up, with your thumb on the front end of the bolt. Hold your thumb in this manner to prevent the ejector from flying out and injuring someone or being lost. (See Fig. **32.8.**)

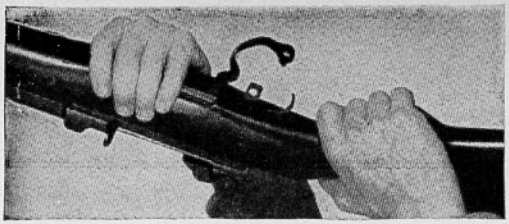
14. Insert the point of a bullet or the blade of a combination tool between the lower edge of the extractor and the cartridge seat flange on the bolt. (See Fig. **32.9.**) Pry the extractor out until ejector snaps out against your thumb. Remove ejector and spring.

15. Remove the extractor, extractor spring, and the plunger.

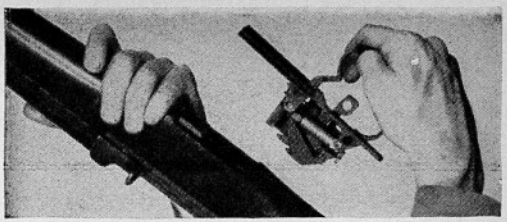
16. Remove firing pin from rear of bolt.

17. You can reassemble the barrel and receiver group by following the above steps in reverse order.

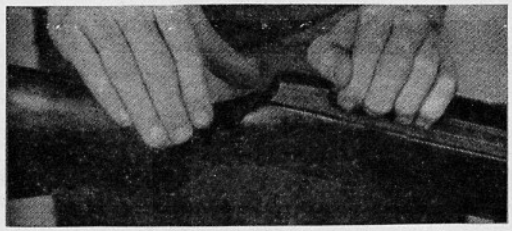
C. Stock Group. Pictures I through III on this page show in detail all of the parts of the stock group.



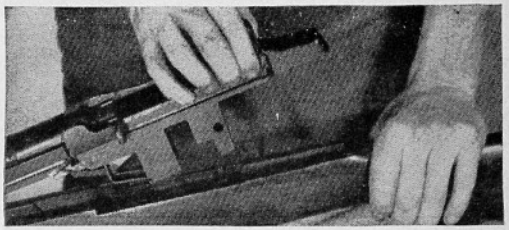
32.3(1) Swing trigger guard away from trigger housing.



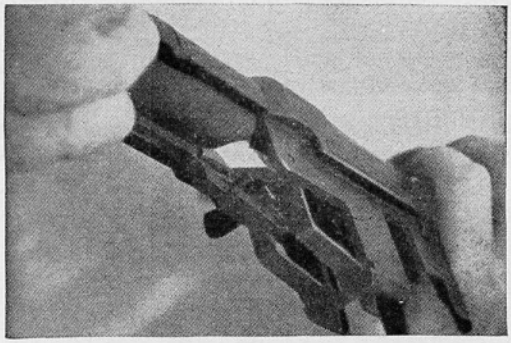
32.3(2) Pull out the trigger housing group.



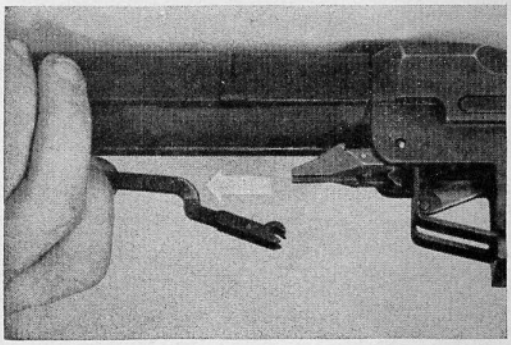
32.4(1) Grasp rifle over rear end of the receiver.



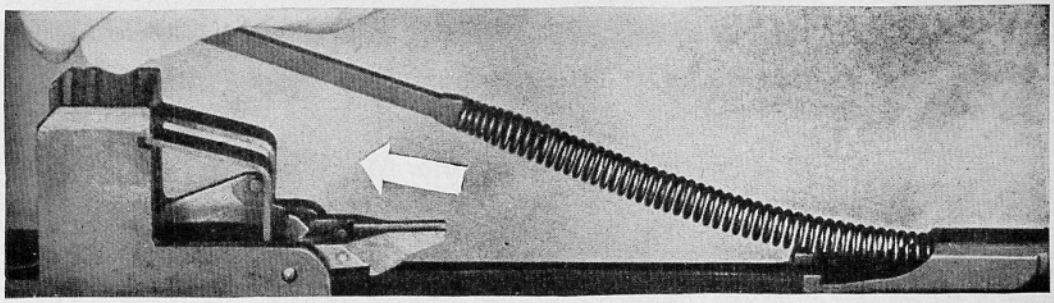
32.4(2) Strike and grasp the small of the stock.



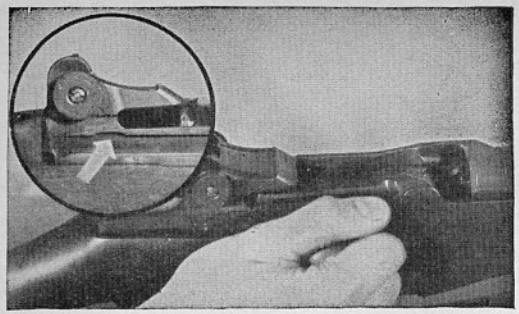
32.5(1) Grasp the follower rod with thumb and forefinger.



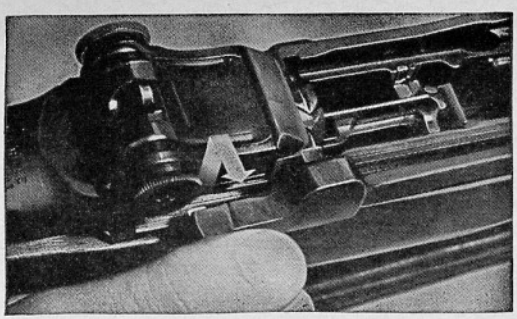
32.5(2) Disengage follower rod from arm by pressure toward muzzle.



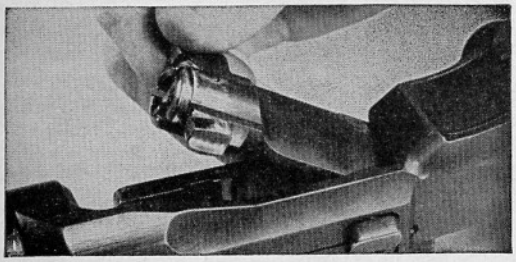
32.5(3) Withdraw follower rod and operating rod spring toward butt of rifle.



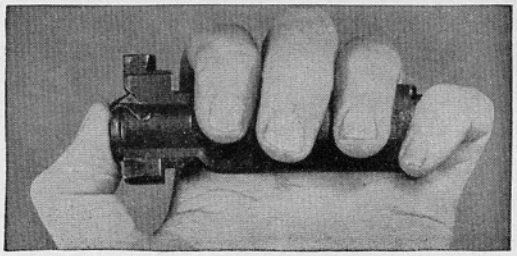
32.6(1) Pull back and up on the operating rod handle until it engages in the dismounting notch.



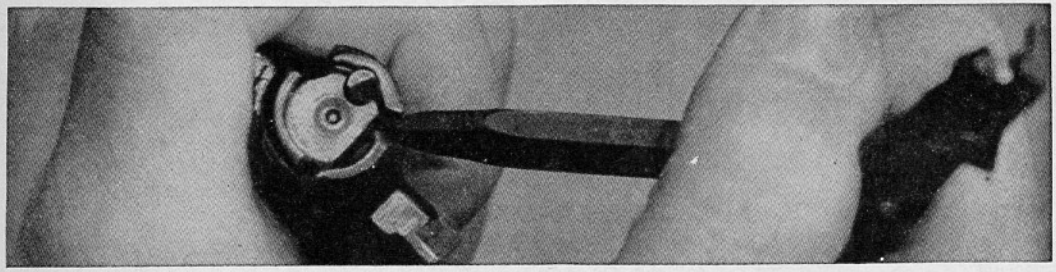
32.6(2) Then with an upward and outward movement disengage operating rod handle from bolt operating lug and receiver.



32.7 Lift the bolt up and out to the right front.



32.8 Hold little finger over firing pin. Hold thumb firmly over extractor.



32.9 Pry the extractor out until ejector snaps out against your thumb.

Functioning of the M1 Rifle

When you fire the M1, there is an instantaneous series of actions which operates to eject the empty cartridge case, cock the rifle, and put a new cartridge in the chamber of the rifle. This series of actions is called the "functioning." You must understand it thoroughly, so that you will know immediately what to do if at any time your rifle fails to operate correctly.

The functioning of the M1 consists basically of two steps; the rearward movement, which ejects the empty cartridge case and cocks the rifle, and the forward movement, which puts a new cartridge into the chamber, ready to be fired.

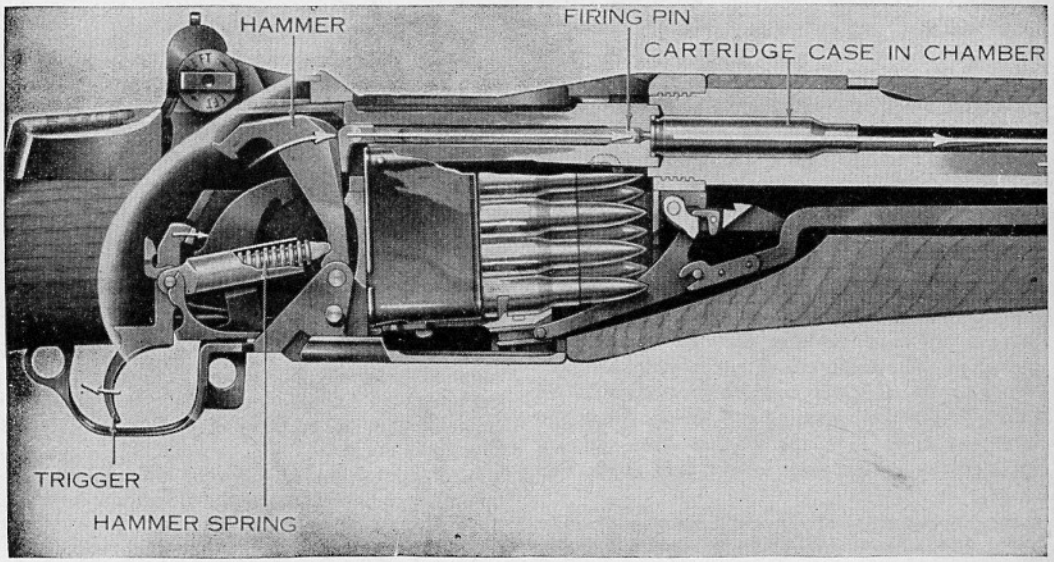
A. Rearward Movement. There are ten steps in the rearward movement: ignition, action of the gas, movement of the operating rod, unlocking of the bolt, withdrawal of the firing pin, extraction of the empty cartridge, ejection of the empty cartridge, cocking of the hammer, action of the follower, and termination of the rearward movement of the operating rod. These movements occur as follows:

1. Ignition. When the rifle is loaded and the bolt closed, the hammer spring is compressed and the trigger lugs are engaged in the hammer hooks, holding the hammer in the cocked position. If pressure is then applied to the trigger, the trigger lugs are disengaged from the hammer hooks, and the hammer is released and actuated by a strong hammer spring. The hammer rotates about the hammer pin, striking the firing pin, which then protrudes from the face of bolt and strikes and ignites the primer in the base of the cartridge. (See Fig. **32.10.**) The bolt must be in a fully locked position before this can take place, as the tang of the firing pin must be properly aligned with the slot in the bridge of the receiver. If bolt is unlocked, rotation of bolt to a fully locked position is also done by action of the bolt camming lug striking the cam surface in the rear face of the bolt. The shape of this cam surface is such that the bolt will be fully closed by positive camming action when the hammer is released. Of course, the safety must also be in its foremost position, so it will not block the hammer and trigger.

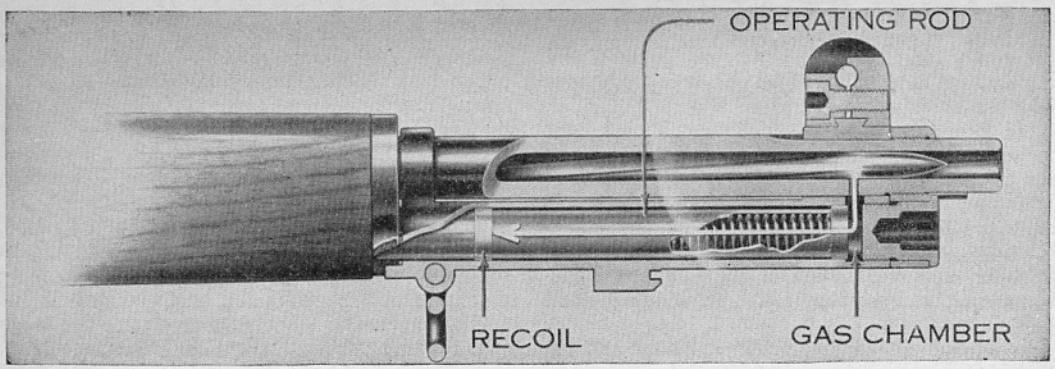
2. Action of the gas. When the bullet passes the gas port, some of the gases escape into the gas cylinder. Here the gas strikes the piston with sufficient force to drive the operating rod to the rear, compressing the operating rod spring (See Fig. **32.11.**)

3. Movement of the operating rod. The initial movement of the operating rod to the rear imparts no motion to the bolt for about the first 5/16 of an inch. The operating lug on the bolt merely slides in the straight section of the recess in the operating rod. This delay in the initial movement of the operating rod permits the bullet to leave the muzzle, thus decreasing the enormous chamber pressure in the barrel and chamber before the bolt is opened.

4. Unlocking the bolt. After the initial movement, the cam surface of the recess in the operating rod contacts the operating lug, camming it up,



32.10 The hammer strikes firing pin and ignites primer at base of cartridge.



32.11 Gas strikes piston and drives operating rod to the rear.

rotating the bolt counterclockwise, and disengaging the locking lugs from their corresponding locking recesses in the receiver.

5. Withdrawal of the firing pin. Rotation of the bolt also cams the hammer back from the firing pin and withdraws the firing pin into the bolt.

6. Extraction of the empty cartridge. The operating rod continues to travel to the rear, carrying with it the bolt, which slides along the receiver. The empty cartridge is carried from the chamber by the extractor. (See Fig. **32.12.**)

7. Ejection of the empty cartridge. The base of the empty cartridge case continually presses against the ejector. When the cartridge case clears the mouth of the breech, the ejector throws the empty round to the right, through the action of the compressed ejector spring. (See Fig. **32.12.**)

8. Cocking of the hammer. The rear end of the bolt rides over the hammer, forcing it back, compressing the hammer spring, and comes to rest near the end of the receiver. (See Fig. **32.13.**)

9. Action of the follower. With the bolt in its extreme rearward position the top cartridge is uncovered. The follower, actuated by the follower arm, and the follower rod which transmits this pressure from the operating rod spring, forces the cartridges upward in the clip so that the top cartridge lies in the path of the bolt. (See Fig. **32.14.**)

10. Termination of rearward movement. The rearward movement ends when the square shoulder of the operating rod contacts the front of the receiver.

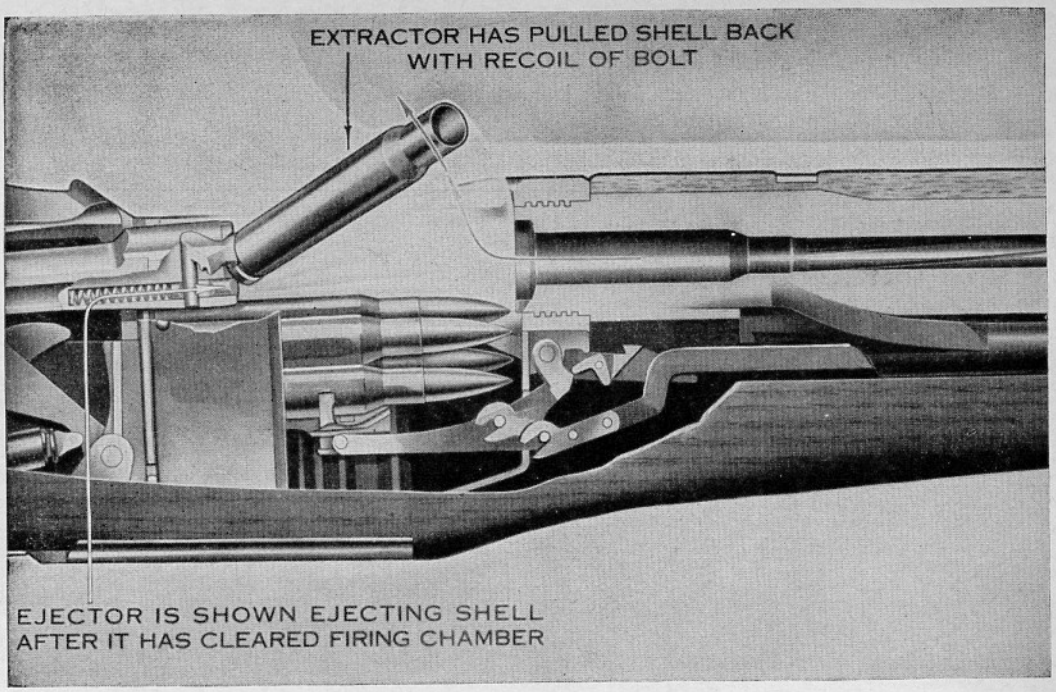
B. Forward Movement. In the forward movement of the bolt there are four steps: action of the operating rod spring, feeding, locking, termination of forward movement of the operating rod. These steps take place as follows:

1. Action of the operating rod spring. As the bolt starts forward, actuated by the compressed operating rod spring, the lower front face of the bolt contacts the base of the top cartridge of the clip, sliding it forward into the chamber. The hammer, actuated by the hammer spring, rides on the bottom of the bolt and tends to follow it, but is caught and held by the trigger lugs, which engage the hammer hooks if the pressure on the trigger has been released. If the trigger is still held back after firing, the sear will engage the rear hammer hooks. Subsequent release of the trigger disengages the sear from the hammer, which then slides into engagement with the trigger lugs. (See Fig. **32.15.**)

2. Feeding. When the bolt approaches its forward position, the rim of the cartridge is engaged by the extractor and the base of the live round forces the ejector into the bolt, thus compressing the ejector spring.

3. Locking. The operating lug on the bolt is cammed downward by the rear camming surface of the operating rod. This rotates the bolt clockwise, engaging the locking lugs in their locking recess. This locks the bolt.

4. Termination of forward movement. The operating rod continues to move forward for about 5/16 of an inch until the rear end of the straight section of the recess in the operating rod contacts operating lug on bolt. Thus the rifle is ready to fire again.



32.12 The ejector throws the empty cartridge out to the right.

Immediate Action and Stoppages

There may be times when your rifle does not operate properly or does not operate at all. This is called a "stoppage." If a stoppage occurs at a moment when you need your rifle badly, there are steps you can take to put the rifle back into use. These steps are called "immediate action," and you must learn to perform them quickly and automatically.

A. Immediate Action. Your rifle may fail to fire, the bolt may not lock, the bolt may lock but the rifle again fail to fire, or the rifle may not feed. In these cases, immediate action can be applied to the M1 rifle in the following ways:

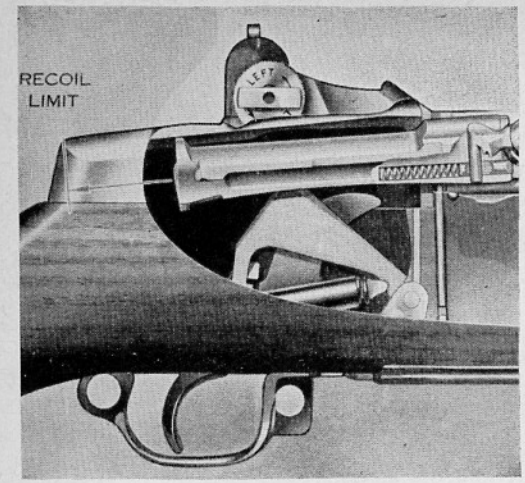
1. Rifle Fails to Fire. Use the little finger of your right hand, held palm up, to pull the operating rod fully to the rear. Release it quickly. If the operating rod goes fully home, re-aim and fire. The little finger is used instead of the forefinger in pulling the operating rod to the rear, so that no portion of the palm or wrist might be struck in case a hangfire exists and the operating rod is driven back rapidly.

2. Bolt Does Not Lock. If you have performed the above operation and the bolt cannot go fully to locked position, pull the operating rod to the rear again. Then check your rifle for a battered round, dirt, or obstruction on the face of the bolt, in the chamber, or in the locking recesses of locking lugs. Remove any obstruction, reload your rifle, aim, and fire.

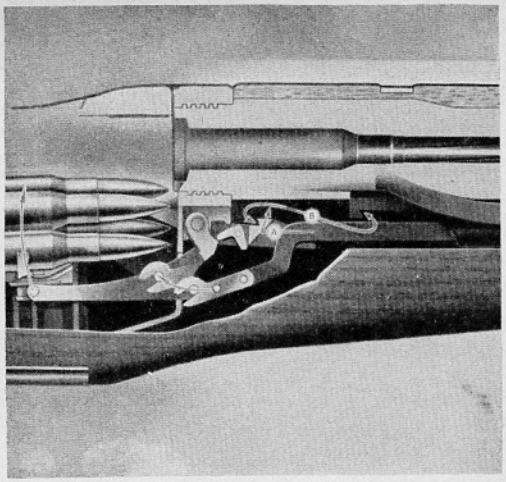
3. Bolt Locked, but Rifle Fails to Fire. You may perform the first step for immediate action and the bolt goes to locked position, but your rifle still fails to fire. In this case you pull the operating handle to the rear again. If no cartridge is ejected, examine for a round in the chamber. If there is a round, remove it. If there is no round, you can reduce a possible obstruction in the clip by rotating the upper cartridge. Then you reload aim, and fire.

4. Rifle Fails to Feed. By operating the bolt manually, you do your utmost to keep the rifle in action.

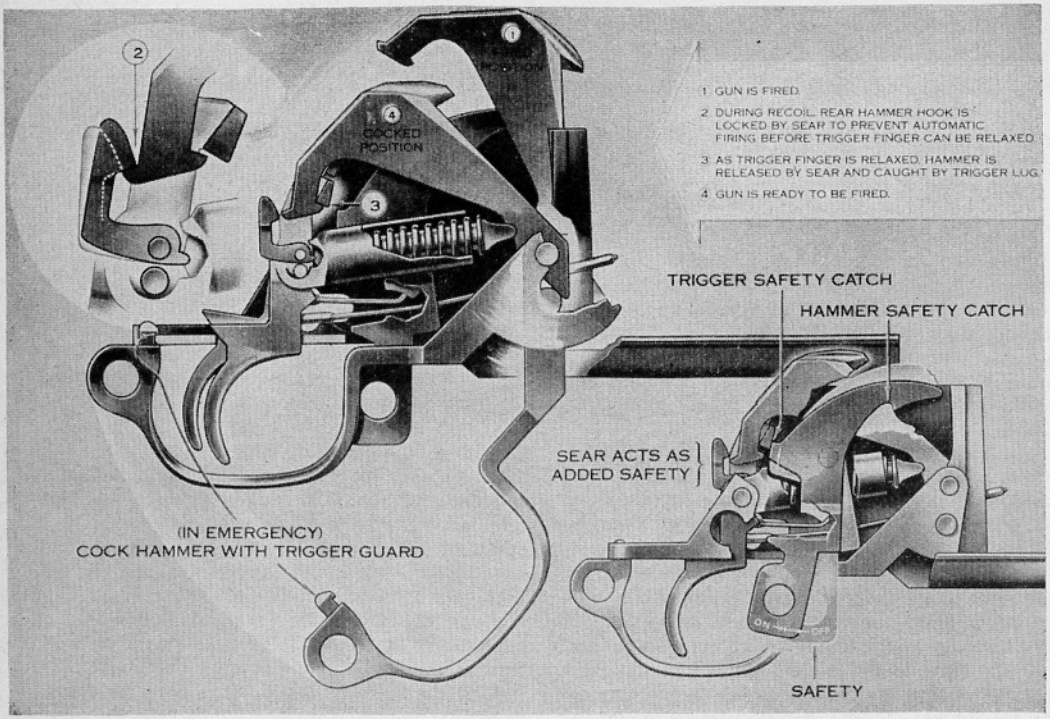
B. Stoppages. Stoppages result from three



32.13 Bolt rides over hammer, forcing hammer back and thus cocking it.



32.14 Follower, actuated by follower arm and rod, forces cartridge up in clip.



32.15 Trigger and safety functioning.

causes: failure to fire, failure to feed, and failure to extract. The methods for remedying these failures are as follows:

1. Failure to Fire. When your rifle fails to fire, the usual causes are defective ammunition, a defective firing pin, or bolt not fully in place.

(a) When defective ammunition is to blame for failure to fire, the primer will be deeply dented. This dented primer means that the round is defective. Discard the round.

(b) If the primer is just slightly dented or is not dented at all, the firing pin is short, broken, or unserviceable. The firing pin must be replaced to remedy this failure. If your rifle fails to fire and in addition the operating handle cannot be moved to the rear by a sharp blow with the heel of the hand, the firing pin may be broken. It would be wedged in the mechanism between the rear of the bolt and the top of the receiver. Remove the trigger housing to get it out. If the trigger housing cannot be removed easily, do not force it out. Just open the trigger guard as far as it will go. Turn the rifle barrel down and shake the piece. The broken firing pin usually falls out when this is done.

(c) If the bolt of your rifle fails to go home, you check for dirt or obstruction which prevents the bolt from locking. Remove the obstruction.

2. Failure to Feed. When your rifle fails to feed, a number of things might be wrong. The action of the bolt can indicate to you what is probably wrong. Failure to feed always results when the bolt fails to go fully home; it may result when the bolt does go fully home.

(a) If the bolt does not go fully home, dirt or an obstruction may be to blame. Check the rifle for a battered round, dirt in locking recesses, an obstruction on the face of the bolt, a dirty chamber, or a ruptured cartridge case which has not been completely removed. Remove this dirt or obstruction if it is present. A ruptured cartridge is removed with the ruptured cartridge extractor. The stoppage also may be caused by a loose clip which has lost its tension. This puts the cartridge out of alignment, with the nose of one bullet over another at the entrance of the chamber. In case this happens, discard the clip that is defective and has lost its tension.

(b) When your rifle fails to feed but the bolt goes fully home, this is usually what has happened: the empty case was not ejected but was fed back into the chamber. Lack of proper lubrication, excessive friction, or insufficient gas usually cause the stoppage when your rifle fails to feed despite the bolt going fully to its home position.

3. Failure to Extract. When your rifle fails to extract a cartridge case, any one of five things can be wrong. The causes for failure to extract are: the chamber of your rifle is extremely dirty, the ammunition is extremely dirty, the rifle is improperly assembled with the extractor plunger spring and plunger left out, the cartridge was chambered in a hot barrel, or the extractor is broken. The steps to be taken when your rifle fails to extract are as follows:

(a) Push the operating rod handle fully forward. Then retract it smartly to the rear.

(b) If the above act does not remove the case, use the combination tool or cleaning rod.

(c) Sometimes the extractor will rip through the case, leaving the empty case in the chamber. When this occurs, the bolt generally will attempt to feed another cartridge into the chamber. It therefore will be necessary to remove this round before the spent cartridge case can be removed.

(d) In case your rifle's chamber is dirty it should be cleaned thoroughly in the manner described below. If the ammunition gets wet or dirty, wipe it off at once. If light corrosion forms on cartridges, it should be wiped off. However cartridges should neither be polished nor oiled to make them look brighter.



Care and Cleaning

General information concerning the care and cleaning of small arms may be found in Chapter 23. The following information applies to the M1 Rifle:

A. Cleaning The Chamber. The chamber may be cleaned by using the chamber cleaning brush on the combination tool. Place the brush on top of a patch in the palm of the left hand. Close the left hand over the patch and brush and give the brush about three turns to the right. This causes the patch to wrap neatly around and cover the brush. A slight pressure with the forefinger of the left hand while turning the brush, will twist the end of the patch like the finished end of a hand rolled cigarette. This insures cleaning the full length of the chamber. Clean by twisting the patch covered brush in the chamber. After cleaning the chamber, inspect it by inserting the little finger and twisting it. If no discoloration shows on the finger, oil the chamber lightly.

B. Before Firing.

1. Before firing your rifle, clean it as explained in Chapter 23. Then apply a thin, uniform coating of rifle grease (lubriplate) to the following parts: Bolt lugs (locking and operating), bolt guideways, cocking cam on bolt, firing pin, operating guideway on receiver, and operating rod contact surfaces.

2. Make certain that clips are kept free of sand, grit, snow, mud, oil and other foreign matter.

C. After Firing.

1. Clean your rifle as explained in Chapter 23, making sure that all carbon is removed from the piston and operating rod.

2. Do not remove the gas cylinder for cleaning. Remove the gas cylinder screw and clean the gas cylinder as you would the bore.

3. If rifle bore cleaner is not available, an instrument with a sharp blade should be used to remove the carbon from the piston on the operating rod. Care must be taken to see that the edges of the piston are not rounded. The use of any type abrasive is prohibited.

Safety Precautions

A detailed explanation of safety rules to be followed in handling small arms will be found in Chapter 23.

Firing Positions

Correct positions for firing your M1 rifle are shown on the following pages. Study these pictures carefully.

THE PRONE POSITION





STEP TWO THE PRONE POSITION



DROP TO KNEES HOLDING RIFLE SECURELY

STEP THREE THE PRONE POSITION



KEEP RIGHT HAND ON STOCK NEAR HEEL AND BREAK FALL WITH BUTT OF RIFLE

STEP FOUR THE PRONE POSITION



HIT THE GROUND WITH THE LEFT ELBOW THROWN AS FAR RIGHT AND FORWARD AS POSSIBLE SO THAT IT WILL BE DIRECTLY UNDER PIECE WHEN POSITION IS COMPLETED

STEP FIVE THE PRONE POSITION



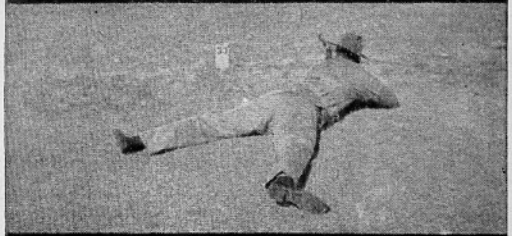
PLACE BUTT OF RIFLE IN SHOULDER AND PRESS CHEEK AGAINST STOCK

STEP SIX THE PRONE POSITION



GRASP SMALL OF STOCK WITH RIGHT HAND. ELBOW ON GROUND

STEP SEVEN THE PRONE POSITION



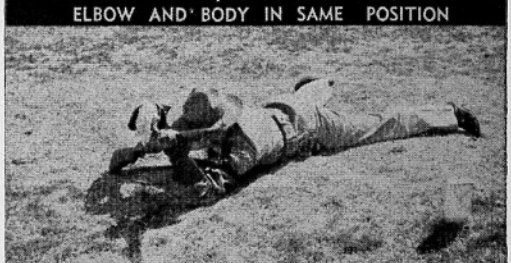
FEET WELL APART. SHOULDERS LEVEL WITH GROUND

STEP EIGHT THE PRONE POSITION



POSITION OF FINGER ON TRIGGER

WHILE RELOADING RIFLE MAINTAIN LEFT ELBOW AND BODY IN SAME POSITION

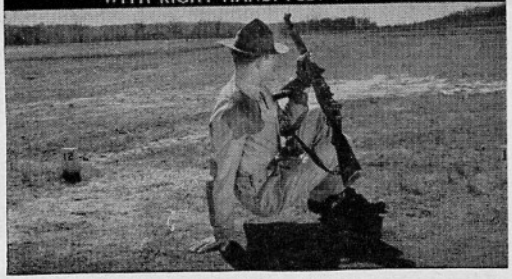


THE SITTING POSITION

STAND AT READY, LOOP SLING HIGH ON ARM. FEET CROSSED



DROP TO GROUND. BREAK FALL WITH RIGHT HAND. FEET IN PLACE



STEP THREE THE SITTING POSITION



PLACE FEET AT 45° ANGLE AND WELL APART. HOLD ANKLES STRAIGHT

STEP FOUR THE SITTING POSITION



PLACE LEFT ELBOW FAR DOWN ON INSIDE OF LEFT LEG

STEP FIVE THE SITTING POSITION



PLACE BUTT OF RIFLE IN SHOULDER AND PRESS CHEEK AGAINST STOCK

STEP SIX THE SITTING POSITION

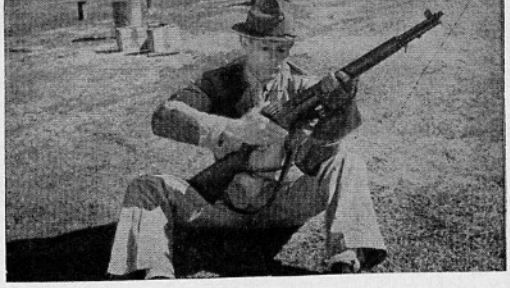


PLACE RIGHT ELBOW ON INSIDE OF RIGHT LEG, HAND GRIPPING SMALL OF STOCK, BALL OF FINGER ON TRIGGER

THE BACK SHOULD BE BENT WELL FORWARD. THE CLOSER YOUR ELBOWS ARE TO THE GROUND THE STEADIER YOU WILL BE



RELOADING RIFLE IN SITTING POSTION

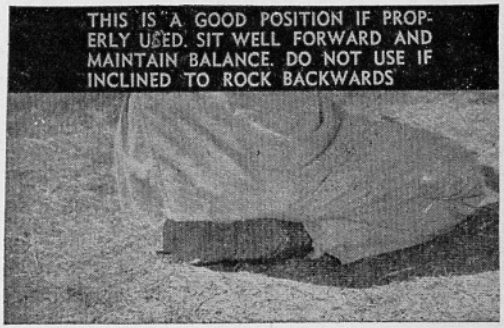


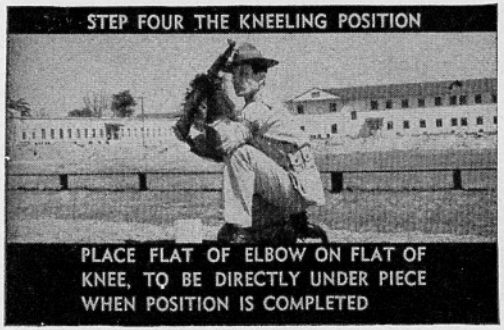
THE KNEELING POSITION





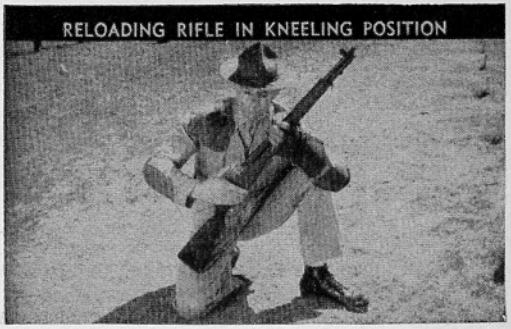




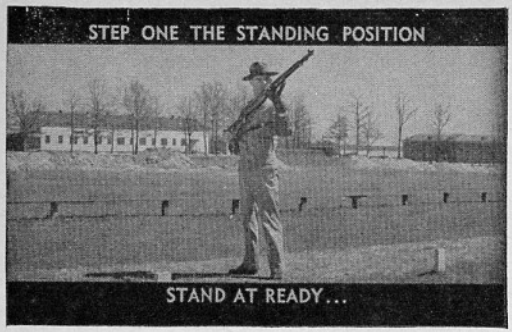




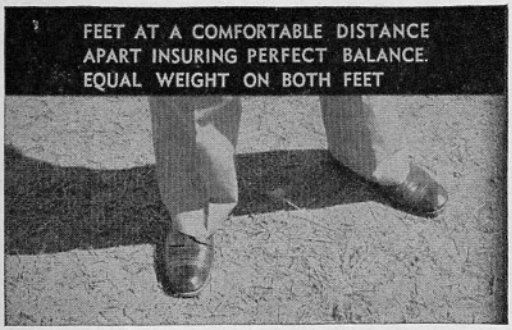




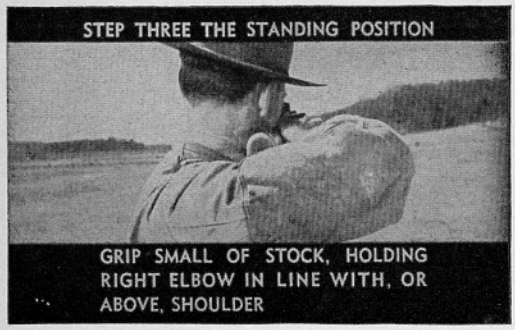
THE STANDING POSITION

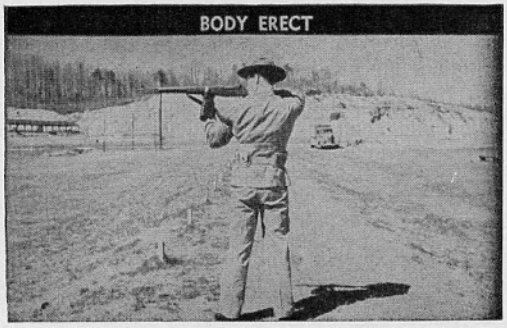












Sight Setting

The rear sight is adjusted for range by turning the elevating knob. This knob has numbered graduations for 200, 400, 600, 800, 1000, and 1200 yards of range and index lines between these graduations for 100, 300, 500, 700, 900 and 1100 yards. Adjustment for windage is made by turning the windage knob. Each windage graduation on the receiver represents an angular adjustment of 4 minutes. Elevating and windage knobs are graduated in "clicks" which represent 1 minute of angle or approximately 1 inch on the target for each 100 yards of range. Arrows on the knobs indicate the direction in which to turn them to obtain corresponding changes in the point of impact.





Chapter 33

The M72 Antitank Rocket

MODERN methods of weapon manufacture are producing new weapons with a very high power of penetration, yet of extremely light weight. Such a weapon is the M72, which is in reality an antitank rocket, packaged, sealed, and issued inside its own launcher. Because of its light weight, yet its high capability for destruction, it is an ideal weapon for the Marine rifleman—**in addition to his own rifle.** It does not replace other weapons but simply augments and increases the tremendous firepower already present in the Marine rifle squad.

Though the M72 was designed primarily for antitank use, it is ideal for employment against vehicles, bunkers, pillboxes, crew-served weapons, supply dumps, and communications centers. It may be used in the attack or in defense, and it is particularly effective when in the hands of tank-killer teams. When used as part of an ambush it can be deadly to enemy armor.

When firing the M72 **remember that it is a rocket.** Therefore **it will produce backblast. Make certain the area behind you is clear.**

Here are some facts about the M72:

Launcher

Length (firing position)	35 inches (approx).
Length (closed position)	25 inches (approx).
Weight (complete system)	4¾ pounds (approx).
Weight (launcher only)	2½ pounds (approx).
Firing mechanism	Percussion.
Sights:	
front	Reticle graduated in 25-meter range increments, 15 mile per hour lead.
rear	Peepsight with temperature adjustment.

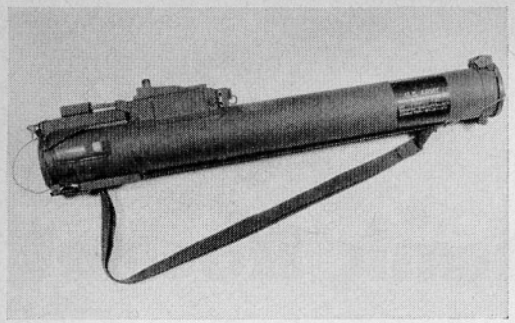
Rocket

Length	20 inches.
Weight	2¼ pounds (approx).
Muzzle velocity	475 feet per second at 70° F.
Maximum range	1,000 meters (approx).
Maximum effective range	200 meters (based on an average for both moving and stationary targets).

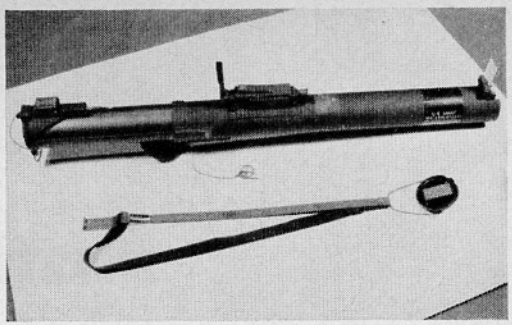
General Description

The 66-mm. High Explosive Antitank Rocket, M72, is a lightweight, self-contained, antitank system consisting of a HEAT rocket packed within its own launcher. (Fig. **33.1**). When issued, the launcher serves as a watertight container for carrying and protecting the rocket. When opened and placed into the firing position, the launcher serves to ignite and guide the rocket on its initial flight to the target. (Fig. **33.2**). The rocket is fixed inside the launcher, and attached to it, by means of the igniter. The HEAT rocket is a percussion ignited, fin stabilized, fixed munition (Fig. **33.3**).

A. *Launcher.* The launcher is made of two concentric tubes. The outer tube is made of a high strength, plastic impregnated glass fiber. It has the following parts affixed to it: The front sight (on the muzzle), and the trigger assembly,



33.1 M72 in closed position.



33.2 M72 opened and in firing position.

trigger safety, recocking latch, rear sight, detent, and rear cover (on the rear of the tube).

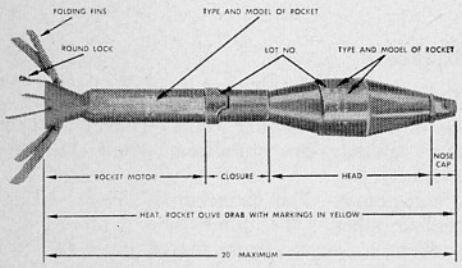
The inner tube is made of aluminum. It will extend from the outer tube and lock in the firing position. The inner tube houses the firing pin, the firing pin spring, safety pin, primer, and rear sight cover. The firing pin cable extends from the rear of the trigger assembly to the firing pin when the launcher is extended into the firing position. The HEAT rocket is positioned inside the rear tube and is attached to it by the flash tube. (See Fig. **33.4** and Fig. **33.5**).

B. *Rocket.* The 66-mm. HEAT rocket is made of a warhead, a point-initiating/base-detonating fuze, and a rocket motor. Attached to the rocket motor, at its nozzle, are six spring-loaded fins which are folded forward along the motor when the rocket is within the launcher. When the rocket clears the muzzle of the launcher, the spring-loaded fins flip toward the rear and provide stability in flight for the rocket. Once the rocket motor has been ignited, all of its propellant is burned before the rocket clears the launcher. This creates a thrust within the launcher which drives the rocket from the launcher. The momentum of the rocket carries it to the target.

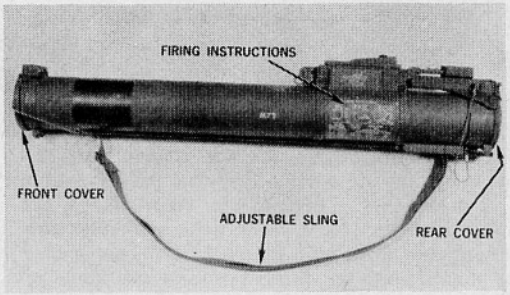
Inspection and Safety

Since the M72 is a munition inside a launcher, it cannot be inspected like a weapon capable of being emptied and reloaded. Therefore, inspection should be limited to careful examinations of the sealed unit. Check to see that all of the seals are intact and that the tube has not been cracked, punctured, or crushed. The rubber boots which cover the bar trigger and the detent should not be torn or punctured. The sling should be in serviceable condition. The rear cover retaining pin and the safety mechanisms should be in place. Examine the exposed portions of both front and rear sights for possible damage.

A. *Backblast.* The M72 is an open chambered weapon. Therefore, it has no recoil but **it has severe backblast.** The gases which propel the

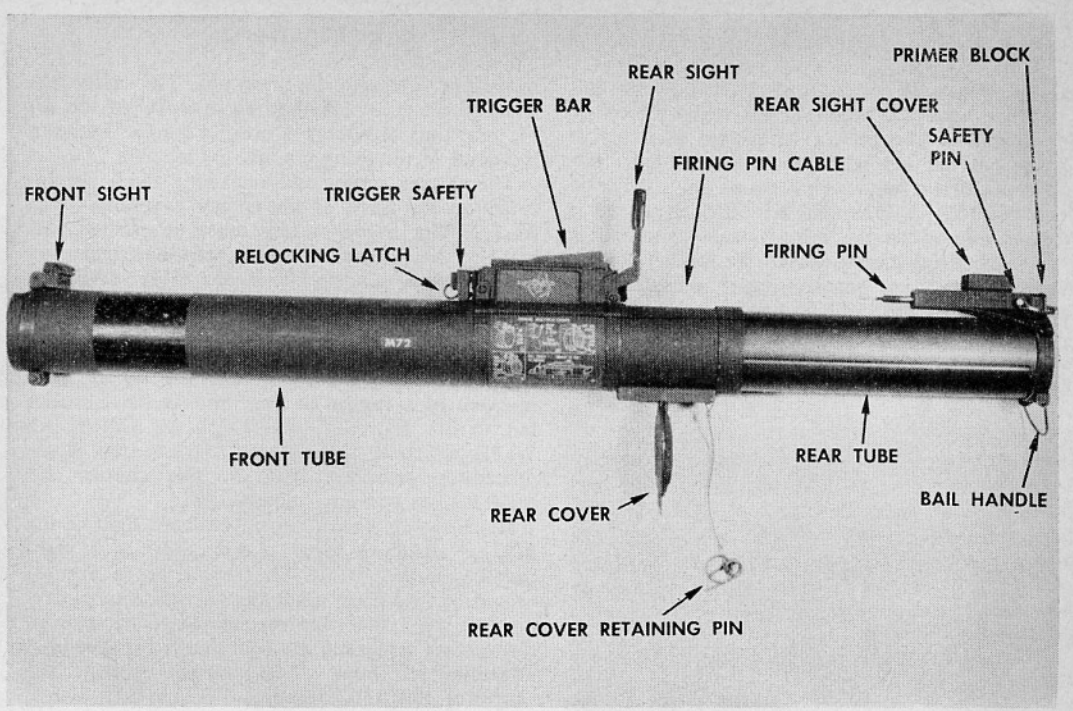


33.3 66-mm. High Explosive Antitank Rocket.



33.4 Outside nomenclature, closed position.

THE M72 ANTITANK ROCKET



33.5 Outside nomenclature, open position.

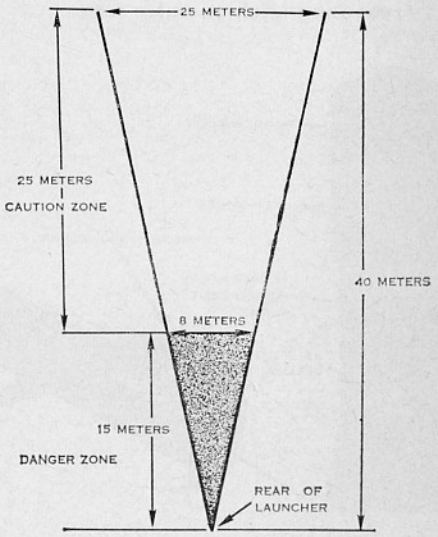
rocket escape to the rear of the launcher. They can cause extreme injury to persons and damage to equipment which might be close to the breech when the rocket is fired. The **backblast area extends 40 meters to the rear.** The danger zone is triangular in shape. **It is 15 meters in length and has a base of 8 meters.** People, equipment, and inflammable material must be clear of this area. The caution zone extends **another 25 meters and has a base of 25 meters.** Stones or other missiles propelled by the backblast could cause injury in this area. In training, the entire backblast area should be marked and cleared. (See Fig. **33.6**).

B. ***Additional Safety Precautions.*** In addition to clearing the backblast of personnel and equipment, you must observe the following safety precautions:

1. Cover all munitions from direct rays of the sun.

2. Do not fire when temperatures are lower than −25° F., or above +135° F.

3. Account for all duds launched in training.



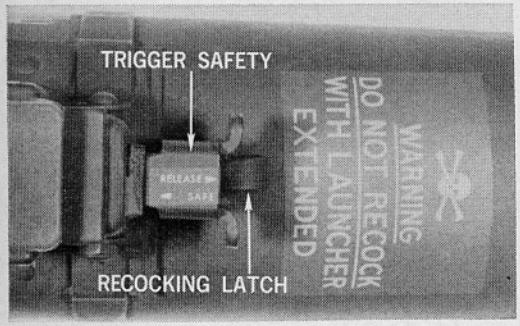
33.6 Backblast area.

Launcher Controls and Sighting Equipment

A. *Controls.* The controls of the launcher are simple to operate, requiring no maintenance or adjustment by the firer. The trigger assembly is located on the top rear of the outer tube. The trigger itself is a bar which requires only that it be depressed to fire. When the trigger is depressed it releases tension on the firing pin cable and thus allows the firing pin to strike the primer. (Fig. **33.13**). The firing pin housing is affixed to the top rearmost portion of the inner tube. Inside the housing are the firing pin, firing pin spring, primer block, safety pin, and a portion of the powder train leading to the rocket motor. The primer is located on line with the firing pin. The safety pin, when in place, blocks the line of travel of the firing pin, thus providing a positive barrier between the point of the firing pin and the primer.

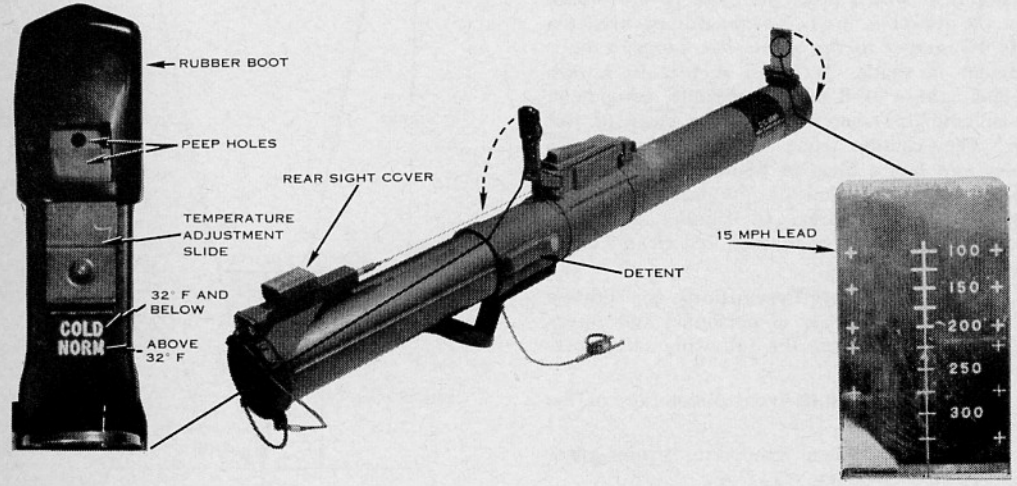
The trigger safety and recocking latch are located on the front of the trigger assembly. (Fig. **33.7**). The trigger safety must be pushed forward to the release position before the trigger can be depressed. DO NOT PUSH THE SAFETY FORWARD UNLESS THE LAUNCHER IS IN THE FIRING POSITION AND YOU INTEND TO FIRE THE ROCKET.

The recocking latch (Fig. **33.7**) is for use only in event of a failure to fire. Should the launcher fail to fire DO NOT RECOCK AT ONCE AS WITH OTHER WEAPONS. Follow the entire procedure described later in this chapter for malfunctions and immediate action.

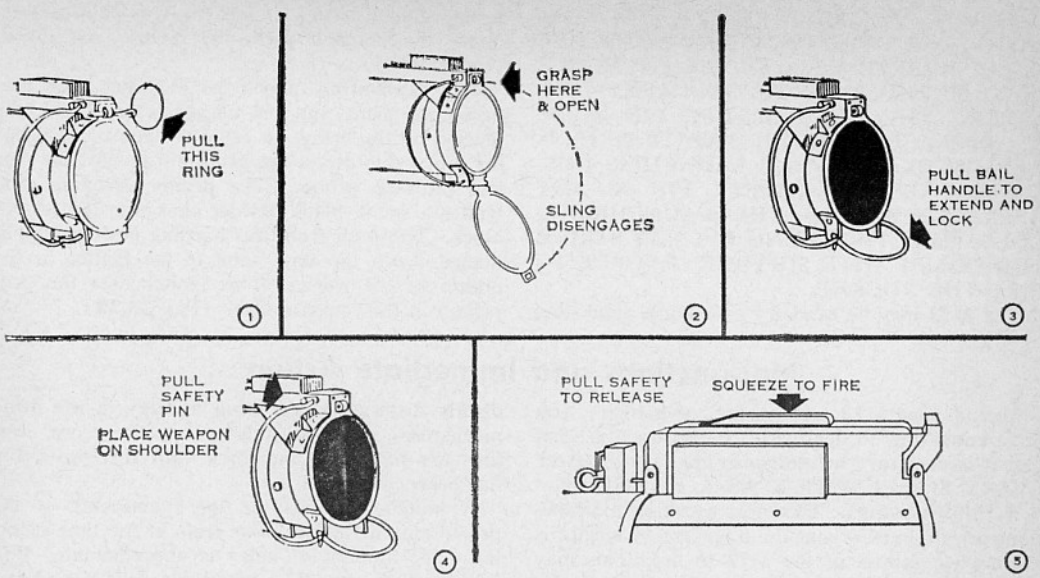


33.7 Location of trigger safety and recocking latch on outer tube.

B. *Sighting Equipment.* The front sight of the M72 is made of clear plastic and has a sight reticle stamped on it. The reticle has a vertical centerline which is graduated in 25-meter increments from 100 to 325 meters. On either side of the vertical centerline are lead marks for speeds of 15 miles per hour. They appear opposite the ranges of 100, 150, 200, 225, 275, and 325 meters, and are for the purpose of aiding the gunner in tracking a moving target. (Fig. **33.8**). The rear sight consists of two stamped metal parts and a rubber boot. The fixed part of the sight is marked



33.8 Front and rear sights.



33.9 Firing instructions.

with the words COLD and NORM. The fixed part of the rear sight has two peepholes punched in it. The second piece has a small window. The second piece of the sight is movable and slides up and down over the fixed part. The rubber boot fits over the top portion of the sight and serves to protect the gunner's eye from the sharp metal edges. Move the slide up or down to adjust the window with one of the peepholes. The sight can be adjusted in this way to conform with the temperature of the rocket. When the slide is aligned with the lower peephole and only the word NORM is visible at the bottom, the sight is set for any temperature above 32° F. When the window in the slide is aligned with the upper peephole and the word COLD is visible, then the sight is set for 32° F. and below. (Fig. **33.8**).

The sights are boresighted on the launcher at time of manufacture. No other adjustments are required.

Operation and Functioning

Instructions for operating the launcher are printed on the launcher. (Fig. **33.4**). Once the rocket is fired the remainder of the weapon is discarded. If there is likelihood that it will be found by the enemy, the used launcher should be destroyed, since a resourceful enemy will put it to good use.

A. ***Operation.*** Check the sight setting. Remove the rear cover retaining pin. Rotate the rear cover downward, allowing the sling assembly (including the front cover) to fall free. Then grasp the bail handle and extend the launcher by pulling to the rear until the detent locks the inner tube in position. Remove the rear safety pin and place the launcher on the shoulder. Push forward on the trigger safety until it reaches the release position. Aim the launcher. Depress the trigger bar to fire the rocket. (Fig. **33.9**).

In the event you prepare the launcher for firing but do not fire the rocket, you may return the weapon to the carry condition by reversing the preparation procedure. First, reset the trigger safety pin and remove the launcher from your shoulder. REPLACE THE REAR SAFETY PIN. Depress the detent and partially collapse the launcher. Fold the rear sight down so that it will slide into the sight cover as you completely collapse the launcher. Fold the front sight forward over the muzzle and replace the front cover and sling assembly. The M72 is back in its original state—but it is NO LONGER WATERTIGHT.

CAUTION: THE REAR SAFETY PIN MUST NOT BE REMOVED UNTIL THE LAUNCHER IS FULLY EXTENDED. IF THE LAUNCHER IS TO BE RETURNED TO THE CARRY CONDITION, THE REAR SAFETY PIN MUST BE REPLACED BEFORE THE DETENT IS DEPRESSED AND THE LAUNCHER COLLAPSED. IF THE SAFETY PIN IS NOT REPLACED BEFORE THE LAUNCHER IS COLLAPSED, THE FIRING PIN MAY STRIKE THE PRIMER WITH SUFFICIENT FORCE TO FIRE THE ROCKET.

The M72 may be carried by the sling. The sling is adjustable so that it will fit you comfortably. Carry the launcher with the muzzle end down. (Fig. **33.10**).

B. ***Functioning.*** Once the M72 has been prepared for firing and the trigger is depressed, the tension on the firing pin cable is released. The firing pin spring drives the firing pin toward the rear and into the primer. The primer detonates and ignites a small, black powder charge in the primer block. The flash from this burning powder is conducted down the flash tube to the igniter in the nozzle of the rocket. This igniter fires the propellant in the rocket motor. (Fig. **33.12**).

Malfunctions and Immediate Action

Should your M72 ever misfire, or hangfire, you must know how to deal with the malfunction. But first it is necessary to remember that you TREAT EVERY MALFUNCTION AS A HANGFIRE.

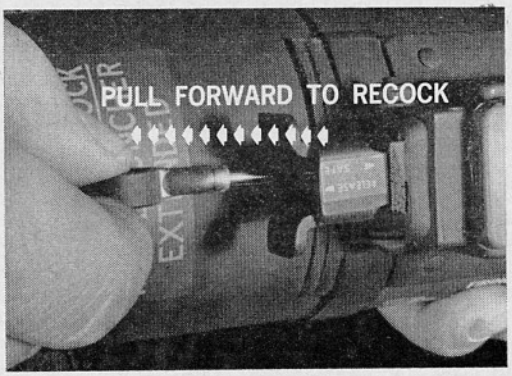
A. ***Malfunctions.*** The most common malfunctions are the misfire and the hangfire. A misfire is a complete failure of the M72 to fire. This may be due to a faulty firing mechanism or a faulty element in the propelling charge explosive train. A misfire is not dangerous, but you cannot immediately distinguish one from a delay in the firing mechanism, or from a hangfire. Therefore, misfires are treated as hangfires until that possibility has been eliminated.

A hangfire is delay in the functioning of the propelling charge explosive train at the time of firing. The amount of delay is unpredictable. But, in most cases, it will be between a split second and several minutes, and THE ROCKET COULD FIRE AT ANY TIME.

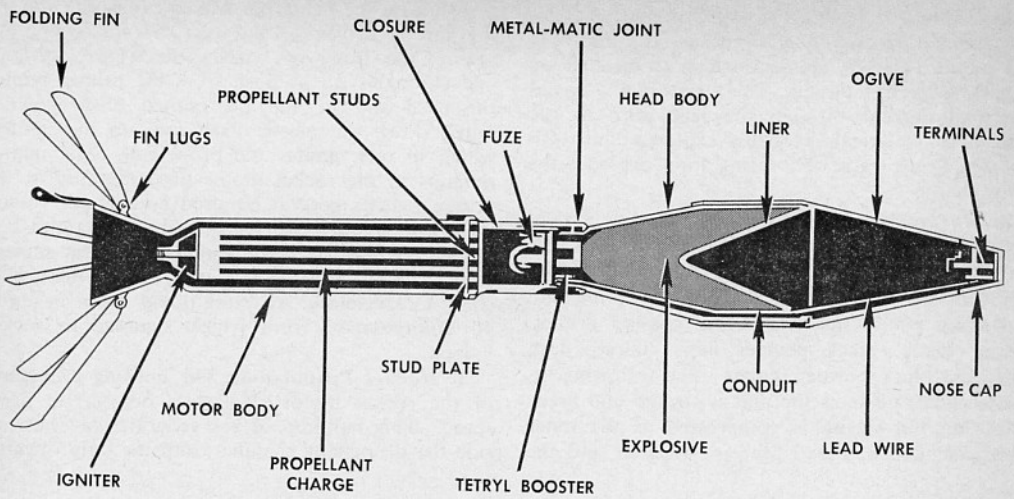
B. ***Immediate Action.*** When the launcher fails to fire, observe these procedures carefully. Squeeze the trigger again, keeping the weapon aimed at the target. If the rocket still fails to fire, return the trigger safety handle to the safe position, still keeping the launcher trained on the target. Keep aiming for 10 seconds, then, if the weapon has not fired, reinsert the safety in the firing pin housing. Keep aiming the weapon for another minute. If it still does not fire, squeeze the boot detent to retract the [weapon] at least one inch. Squeeze the recocking latch rod handle between the thumb and



33.10 Carrying the launcher.



33.11 Recocking during immediate action.



33.12 Cross-section and nomenclature of the 66-mm. HEAT rocket.

forefinger and pull it forward until it stops. Release it. (Fig. **33.11**). Grasp the bail handle and re-extend the launcher to the locked position. Withdraw the safety pin. ALL THIS TIME KEEP THE WEAPON POINTED AS NEAR ON TARGET AS YOU POSSIBLY CAN, AND THE BACKBLAST AREA FREE OF PEOPLE. AS YOU REMOVE THE LAUNCHER FROM YOUR SHOULDER AND WORK WITH IT, TAKE CARE TO KEEP YOUR BODY AND HANDS OUT OF THE BACKBLAST AREA AS MUCH AS YOU POSSIBLY CAN. After withdrawing the safety pin, re-aim and move the trigger safety handle to the release position, then attempt to fire. If the weapon still fails to fire, return the trigger safety handle to the safe position. Wait 10 seconds. Reinsert the safety pin. Keep the weapon on target for at least one more minute. Then collapse the launcher and turn it in or destroy it.

Ammunition

You do not draw separate ammunition for the M72, since the rocket and launcher are issued as a complete unit. But it is well that you have a good understanding of the rocket itself.

The rocket consists of a rocket head (or warhead), a fuze and a rocket motor. The motor contains the propellant and its igniter. A nozzle and fin assembly are rigidly attached to the rear of the motor. The fuze closure also serves as the coupling for the rocket head and motor. The rocket is known as high explosive, antitank. Hence the short title HEAT. The rocket is dependent upon the launcher only for ignition and initial guidance. Its penetration effect comes entirely from the rocket warhead.

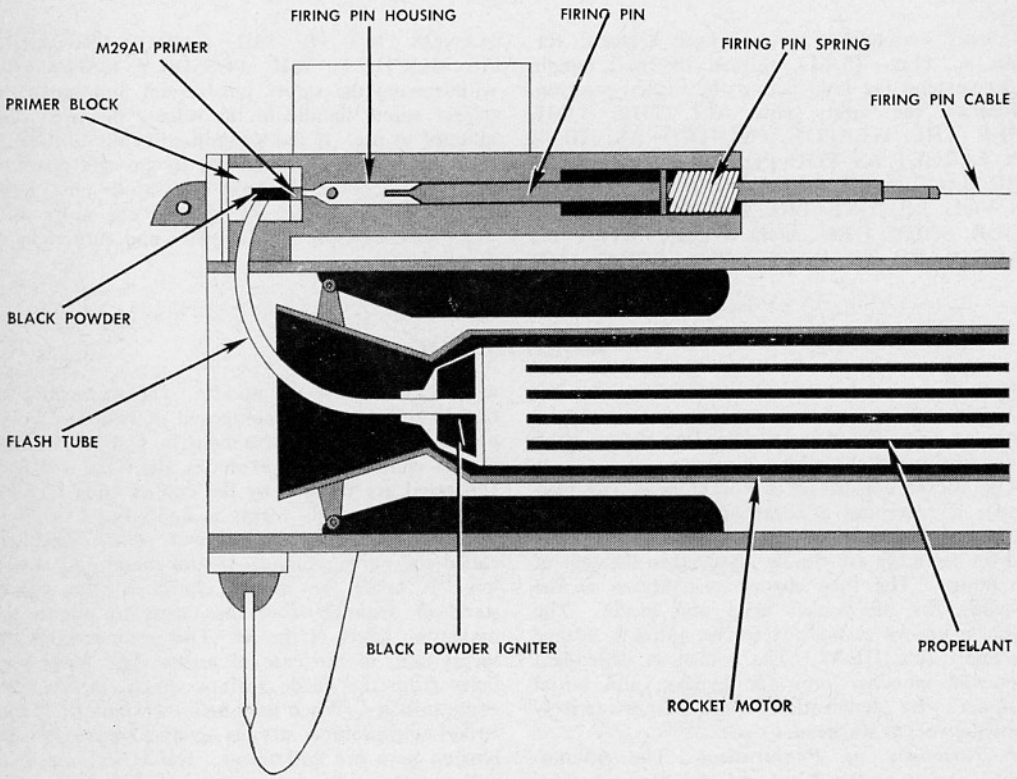
A. *Principle of Penetration.* The 66-mm. HEAT rocket warhead consists of a tapered, thin-gauge steel body. It is cone-shaped on either end, with a cylinder in the middle. The warhead contains a shaped charge composed of two-thirds of a pound of octol explosive held in place by a thin copper cone. When it explodes, the force and heat generated are focused by the copper cone to meet at one point. This forms a small but extremely powerful jet. The forward end of the warhead, called the ogive, is made of thin metal and is hollow. It holds the shaped charge at the proper stand-off distance from the target to obtain the maximum effect of the jet. The jet penetrates the target and, in the case of armor, jars loose particles from the inside surface which, in turn, become missiles. When used against a tank, if the jet strikes ammunition storage or the engine, an explosion or a fire will result. The HEAT warhead will penetrate the armor of any known tank. (See Fig. **33.12**).

B. ***Technical Characteristics.***

1. ***Nose Cap Assembly.*** The nose cap assembly has a piezo-electric element which is crushed on impact with the target. This transmits a small electrical current through the lead wire to the fuze. The electrical detonator explodes and initiates the firing train. The firing train explodes the main charge.

2. ***Rocket Motor Ignition.*** The ignition system has parts on both the rocket motor and the launcher. (Fig. **33.13**). It is composed of the following elements: firing pin housing, firing pin, and firing pin spring; M29A1 percussion primer, primer block, black powder flash charge, flash tube, and black powder igniter. The following sequence takes place as the unit is cocked and fired: the firing pin spring is compressed as the inner tube is extended; the trigger is squeezed and the pressure on the firing pin cable is released; the firing pin is driven to the rear by the firing pin spring; the firing pin strikes the M29A1 primer and detonates it; the flash from the primer ignites the flash charge; and the ignited black powder burns down the plastic flash tube to the igniter, which in turn ignites the propellant. The igniter remains in the rocket motor until pressure in the nozzle reaches several hundred pounds per square inch. This assures that the propellant is completely ignited. When the pressure reaches a great enough force, it blows out the igniter body and the rocket starts to accelerate. All these things occur in about 40 milli-seconds, from trigger squeeze to rocket launch.

3. ***Rocket Propulsion.*** The burning propellant of the rocket motor discharges hot gas at great speed. This build-up of gas generates pressure inside the propellant chamber, and the only opening



33.13 Rocket motor ignition system.

is the nozzle. Inrushing toward the nozzle, the gas generates thrust at the closed end of the chamber. This thrust drives the rocket forward, and it accelerates until all the gas escapes from the chamber via the nozzle. Even after all the propellant is burned, inertia keeps the rocket moving toward the target.

4. *Fuze.* The fuze is drop-safe and bore-safe. It requires about 28 feet of travel to arm. To make it function in event the ogive is not crushed and the rocket head only grazes a target, there is a spring-loaded firing pin activated only by graze force of impact. This fires a stab primer located next to the detonator and the same chain of events occur as if the piezo-electric element had been crushed in the ogive.

5. *Fin Assembly.* Six holding fin attachments are located on the rocket motor. These fins are folded toward the forward part of the rocket inside the launcher. They are spring-loaded and when the rocket clears the launcher, they flip into position and stabilize the rocket in flight.

Marksmanship

A tank usually has its heaviest armor located on the front slopes of its body. By comparison, the rear, the sides, and the bottom have much less protection. You should attempt to engage a tank from the side or rear whenever possible. The side is the largest target and has relatively little armor. You should always attempt for a hit at the "center of mass."

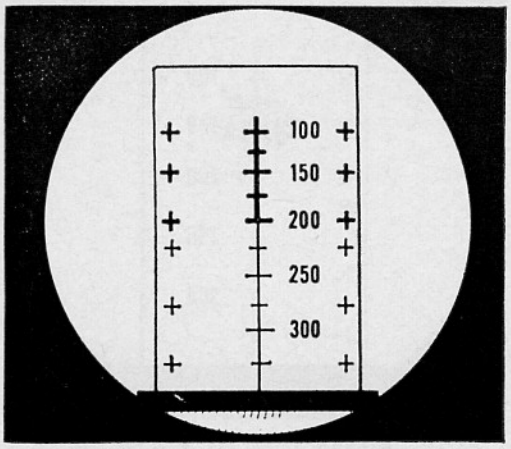
Three things enter into your ability to hit the target. Like firing your rifle, they are: sighting and aiming, trigger squeeze, and position. Here are some tips on all three:

A. *Sighting and Aiming.* The rear sight on the M72 Launcher is a simple peepsight. Before sighting, inspect the sight to insure the slide is in the correct position for the temperature conditions. Sight through the rear sight by placing your eye on line with the peephole and looking through it to the front sight reticle. (Fig. **33.14**).

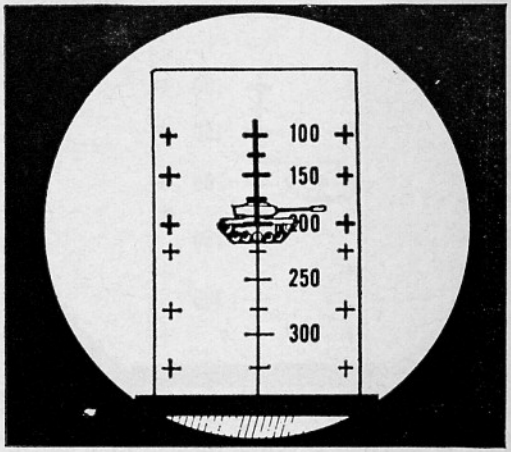
In sighting and aiming, you must first estimate the range to your target. Then place the launcher in the firing position on your shoulder. Look through the rear sight and place the front sight reticle on target. THE RANGE LINE THAT CORRESPONDS TO YOUR ESTIMATED RANGE IS THE ONE PLACED ON TARGET. For various types of targets, here are some specific rules to follow:

1. *Stationary Targets.* To engage a stationary target, estimate range; aim; find estimated range on reticle and place that point on target center of mass. (See Fig. **33.15**).

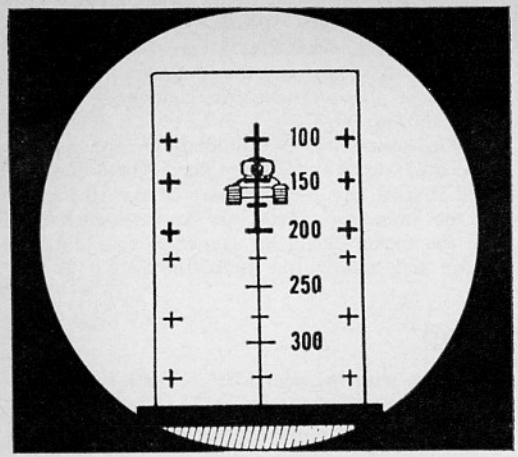
2. *Targets moving directly toward or away from your position.* Estimate range; find that range on reticle; place that point on center of



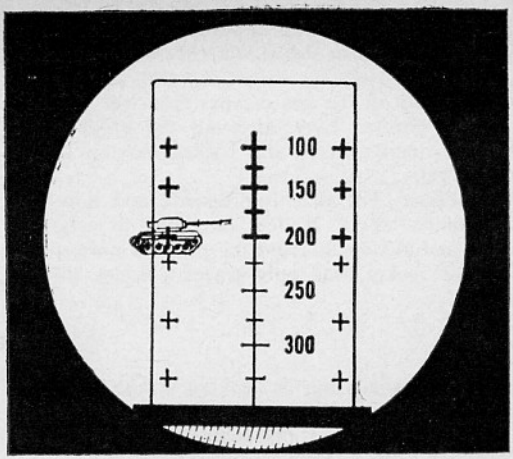
33.14 Front sight reticle.



33.15 Aiming at stationary target at 200 meters range.



33.16 Aiming at target moving directly toward gunner at 150 meters range.

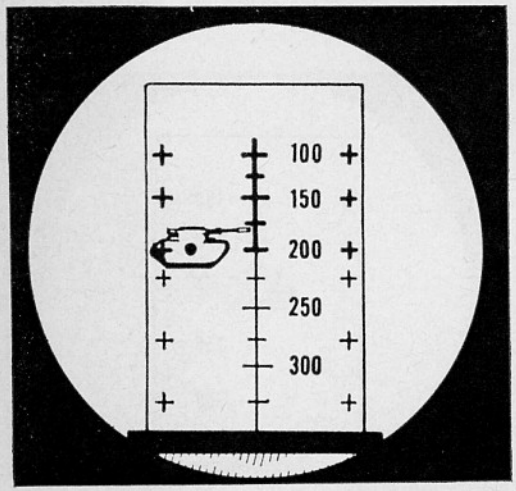


33.17 Aiming at target moving from left to right, 15 mph at 200 meters range.

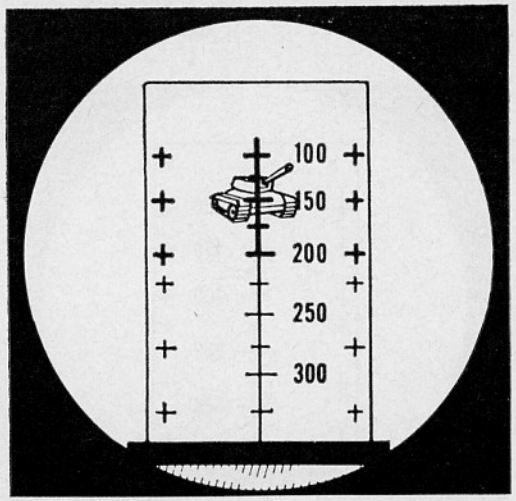
mass. This applies whether the target is moving away from or moving directly toward you. (See Fig. **33.16**).

3. ***Targets moving directly across your front.*** Estimate range; estimate speed of target; place vertical range line in front of target's direction of travel. If target is moving at 15 miles per hour, place the lead mark on center of mass. If speed is other than 15 miles per hour, you must approximate the amount of lead. (See Figures **33.17** and **33.18**).

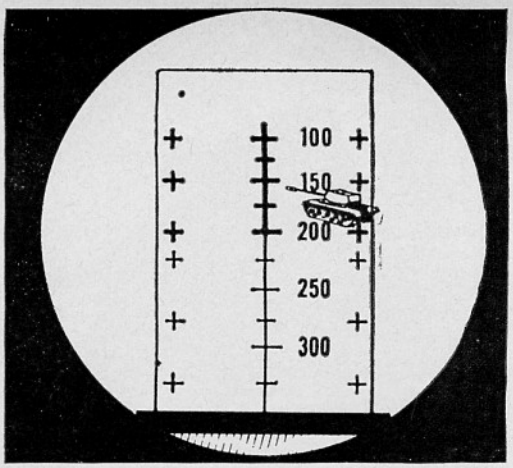
4. ***Targets moving at an angle toward or away from you.*** When the target moves toward you at an angle less than 45°, treat it as you would a target coming directly at you. Should the target move at an angle greater than 45°, estimate



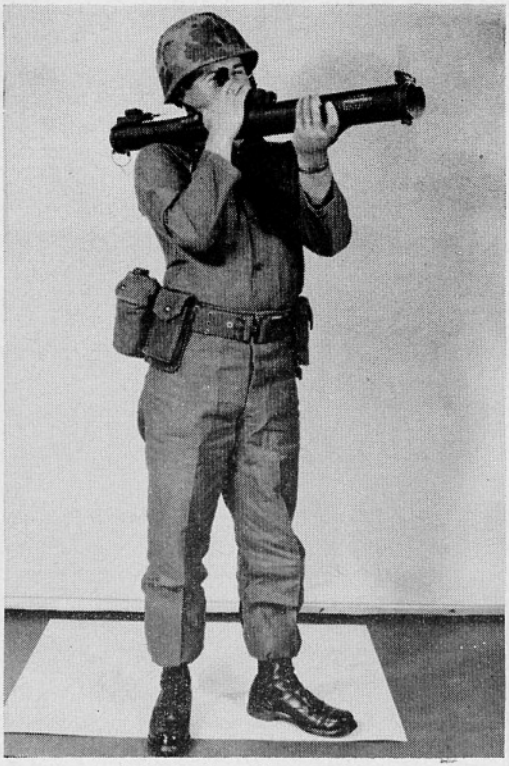
33.18 Aiming at target moving from left to right, 10 mph at 200 meters range.



33.19 Aiming at target moving toward gunner at an angle of 45° or less, range of 150 meters.



33.20 Aiming at target moving at an angle away from the gunner, at an angle of 45° or more, range of 175 meters.



33.21 Standing position.

the range, estimate speed, and apply one-half the lead to the center of mass. (See Fig. **33.20**).

B. ***Trigger Squeeze.*** The trigger on the M72 is unique in that it is a bar located on top of the launcher. To fire, press straight down. You may place your thumb under the launcher or alongside the tube, depending upon whichever is more comfortable. Squeeze the trigger with a slow steady pressure, keeping the sights properly adjusted on the target.

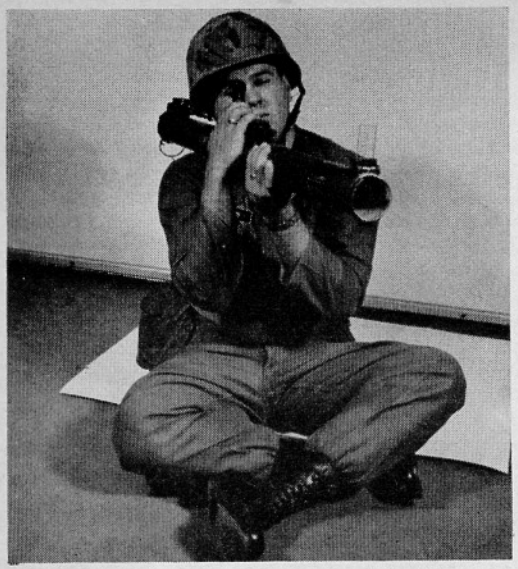
C. ***Positions.*** The M72 may be fired from the right or left shoulder. You may fire it from a standing, kneeling, sitting, or prone position. The main thing is to be steady, comfortable, and FREE FROM THE BACKBLAST AREA. The situation, the terrain, and your preference will govern the position you use. Try to use support when possible.

1. ***Standing.*** Face the target, then face half-right (or left if you shoot from the left shoulder) Spread feet a comfortable distance apart and place the launcher on the shoulder. Keep the hips level and the body balanced over them. Place the left (right) hand directly under the front portion of the launcher and hold the right (left) elbow against the side for stability. (See Fig. **33.21**).

2. ***Kneeling.*** There are two kneeling positions, open and closed. The open position (Fig. **33.22**) is



33.22 Kneeling position.



33.23 Sitting position preferred for engaging moving targets.



33.24 Sitting position.

better for moving targets, since it permits the body to pivot freely at the waist.

3. ***Sitting.*** There are two sitting positions. The first one is shown in Fig. **33.23** and is preferred for use in engaging moving targets, since it permits the body to track a target by pivoting freely at the waist. The second position is similar to the sitting position used in firing a rifle.

4. ***Prone Position.*** Lie down at an angle of not less than 45° to the line of fire in order to KEEP CLEAR OF THE BACKBLAST AREA. The back should be kept straight and the right



33.25 Prone position.

(left) leg directly on a line running through the right hip and right shoulder. Move the left leg as far away as possible and still remain comfortable. Keep both heels on the ground and both elbows well under the launcher. If you must track a moving target, be certain to maintain your body at sufficient angle to the backblast area so that the backblast is not directed at the legs and feet.





Chapter 34

M16 Rifle

DURING your early training you learned the Creed of the United States Marine, *"My Rifle."* In that Creed is included a solemn promise to hit, for it is only the hits that count. Every Marine has made that same pledge. Every Marine has been trained as a *rifleman,* for it is the rifleman who must close with the enemy and destroy him.

Each item of equipment in the modern amphibious assault—from the multimillion dollar aircraft carrier to the least expensive radio battery; every highly skilled man—from a jet pilot to the operator of a small, portable radio; all these exist for the purpose of getting you, the Marine rifleman, in position to close with the enemy and destroy him—in position to keep your promise to hit. Once there, the job you do will depend on how well you know your rifle, the care you give it, and the manner in which you use it. This chapter tells you the names of the parts of your rifle, the way to strip it and put it back together, the proper care to keep it operating, and how to reduce common stoppages.

Rifles used to be made, one at a time, of carefully selected hardwoods and machined steel. However, science has enabled us to mass produce rifles from lightweight alloys and plastics. But the basic weapon of a Marine is still the rifle, regardless of the model, the type, or the manner in which it is made. This fact will never change. The present rifle used by fighting Marines is the M16.

Become thoroughly acquainted with your rifle and treat it well. The success of your mission, your life, and the lives of your buddies, may someday depend on you and your rifle.

Description and General Data

A. *Description.*

1. The M16 Rifle is a 5.56-mm., magazine-fed, gas-operated, air-cooled, shoulder weapon. By changing the position of a selector lever, the rifle can be made to deliver either fully automatic or semiautomatic fire.

2. The rifle has a flash suppressor mounted on the muzzle. The barrel is surrounded by a heat resistant material, made of fiberglas, which has been shaped into a handguard and forearm.

3. A rubber pad is mounted on the butt of the stock. This pad helps absorb the recoil of firing.

4. Should the bolt fail to go all the way forward during operation, there is a "forward assist assembly" located on the rear of the upper rear receiver. Pressure on the assembly will assist the action spring in driving the bolt fully home.

5. A bipod can be attached to the rifle by clamping it on like a clothespin. The bipod clamps around the barrel just under the front sight and between the bayonet stud and the upper sling swivel.

B. *General Data.*

Weights.

Rifle without magazine and sling	6.5 lb.
Empty magazine (aluminum)	.2 lb.
Full magazine (20 rounds)	.7 lb.
Sling	.4 lb.
Firing weight (fully loaded with sling)	7.6 lb.
Bipod M3	.6 lb.
Bipod case	.2 lb.
Bayonet-knife M7	.6 lb.
Scabbard M8A1	.3 lb.

Lengths.

Rifle with bayonet-knife M7	44.25 in.
Rifle overall with flash suppressor	39 in.
Barrel (with flash suppressor)	21 in.
Barrel (without flash suppressor)	20 in.

Sighting Equipment.

Front	Adjustable click type post. Each click equals 2.8 centimeters per every 100 meters of range.
Rear	Adjustable, flip type. Normal range setting is for 0 to 300 meters. Long-range setting (L) 300 to 500 meters. Each notch of the windage drum equals 2.8 centimeters per every 100 meters of range.

Sight radius_____19.75 inches.

Rifling.

Number of lands____ 6.

Twist _____Uniform right hand one turn in 12 inches.

Operational Characteristics.

Muzzle velocity_____3,250 feet per second, (approx).

Muzzle energy (at the muzzle)____ 1,300 foot pounds, (approx).

Cyclic rate of fire ___700 to 800 rounds per minute.

Maximum rate of fire:

Semiautomatic ____45 to 65 rounds per minute.

Automatic _____150 to 200 rounds per minute.

Maximum range_____2,653 meters.

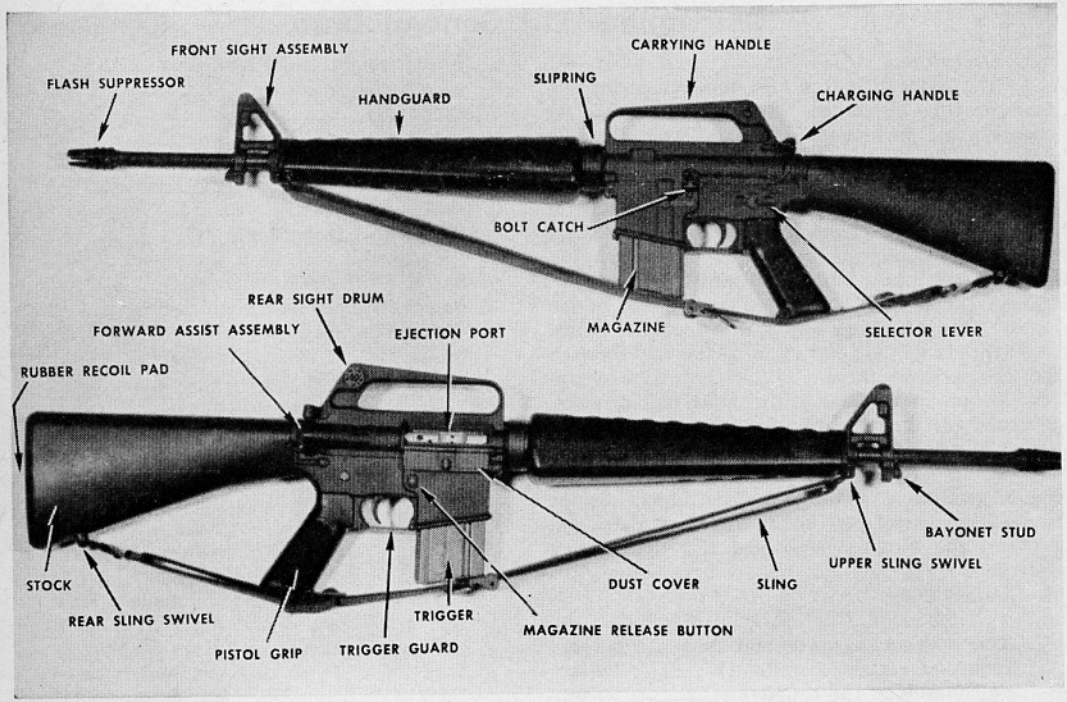
Maximum effective range _____ 460 meters.

Disassembly and Assembly

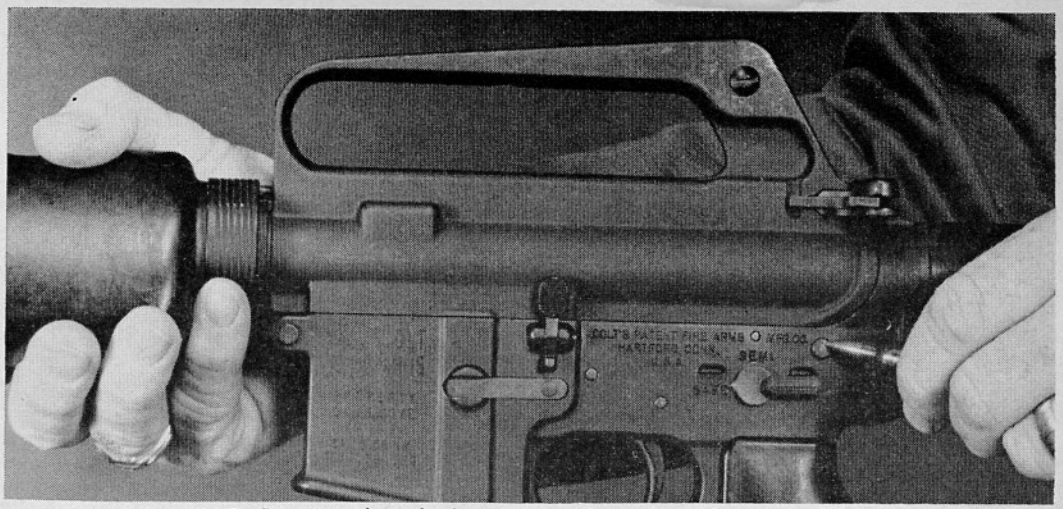
A. *Disassembly.* Before taking your rifle apart, you should know the nomenclature (that is, the names) of all parts visible on the outside. Using your own rifle and Fig. **34.1**, find and learn the nomenclature of all outside parts. Then, as you disassemble the rifle, learn the nomenclature of all parts described in this chapter. The better you know the names of the parts the sooner you can master the functioning of your rifle.

As each part is removed, lay it on a clean surface, working from left to right in order of removal. This establishes a pattern and makes assembly easier, since you simply put the parts together in reverse order.

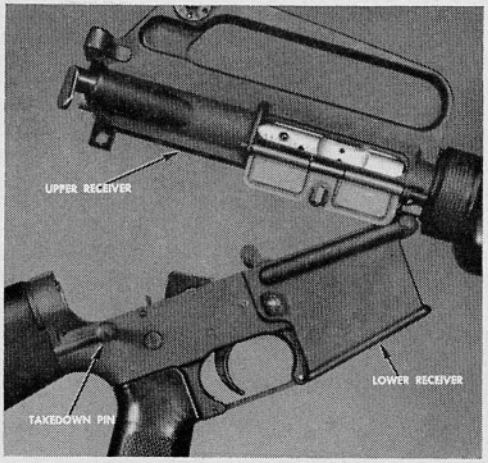
1. *Field Stripping.* This is the separation of the rifle into its major groups, removal of the bolt and the handguards. Field stripping is sufficient for daily cleaning of the rifle when it has not been fired or subject to bad weather, sand, or dust. The steps in field stripping follow.



34.1 The Rifle, 5.56-mm. Right and left side views.



34.2 Pressing the takedown pin to the right with a cartridge.



34.3 Upper receiver swings free of the lower receiver.



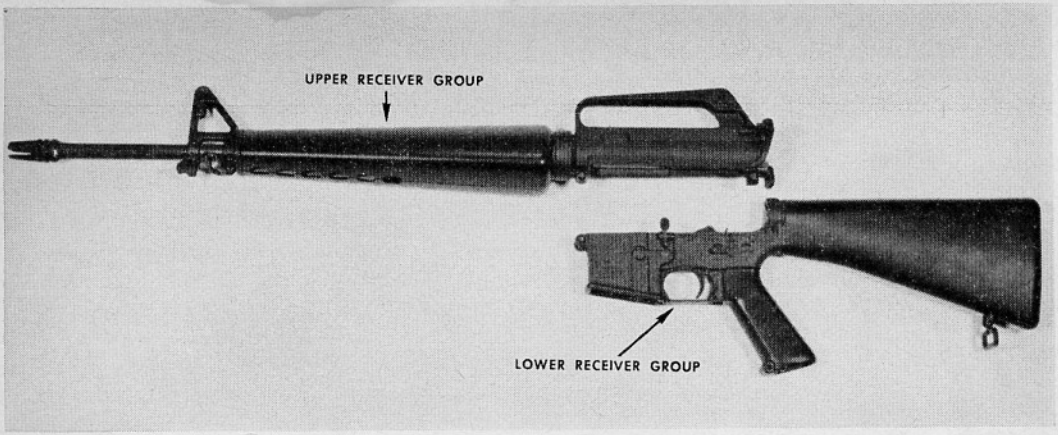
34.4 Pressing the receiver pivot pin to the right.

a. Place the rifle on a flat working surface, muzzle to your left, with the dust cover open and up. Next, push the magazine catch button on the right side of the receiver and remove the magazine. Then pull the charging handle to the rear and look inside the chamber to make sure the weapon is clear. If the weapon is clear, release the charging handle, allowing the bolt to travel closed. Put the selector lever on safe and remove the sling from the rifle.

b. Keep the muzzle pointing to your left and turn the rifle over. Use the nose of a cartridge to press the takedown pin toward the right side of the receiver (Fig. **34.2**) until the upper receiver swings free of the lower receiver (Fig. **34.3**). The takedown pin does *not* come out of the receiver.

c. Use the nose of the cartridge to press the receiver pivot pin to the right (Fig. **34.4**), then separate the lower receiver group from the upper receiver group and place it on your working surface, (Fig. **34.5**).

d. Keeping the muzzle to the left, pick up the upper receiver group. Grasp the charging handle between the thumb and forefinger of the right hand,

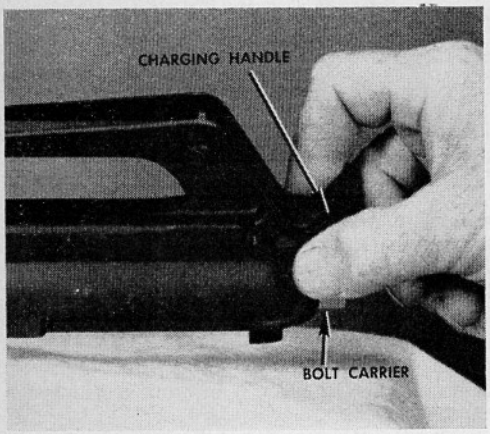


34.5 Upper and lower receiver groups.

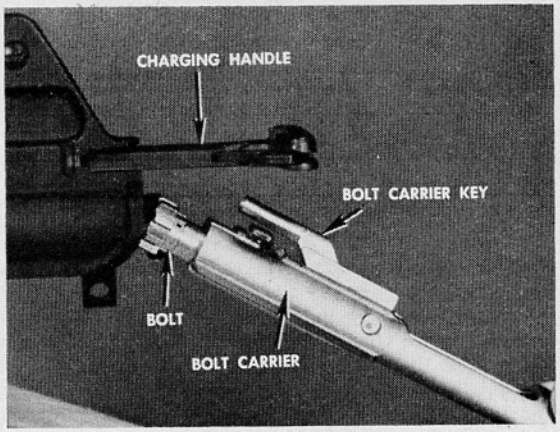
press in on the latch, and pull the charging handle to the rear, (See Fig. **34.6**). This action will withdraw the bolt carrier from the receiver. Next, pull the bolt carrier clear of the receiver as shown in Figure **34.7**, and remove it. The charging handle will then fall free of its groove in the receiver and can also be removed. (See Fig. **34.8**). Place the upper receiver on the working surface.

e. Now you are ready to disassemble the bolt carrier group. Hold the bolt carrier group in your left hand and press out the firing pin by using the nose of a cartridge, (Fig. **34.9**). Then raise the front end of the bolt carrier and allow the firing pin to drop from its well in the bolt. (Fig. **34.10**). Then rotate the bolt until the cam pin is clear of the bolt carrier key. Remove the cam pin by rotating it one-quarter turn and lifting it out of the well in the bolt and bolt carrier (Fig. **34.11**). After the cam pin is removed, the bolt will easily slide out of its recess in the bolt carrier. (Fig. **34.12**).

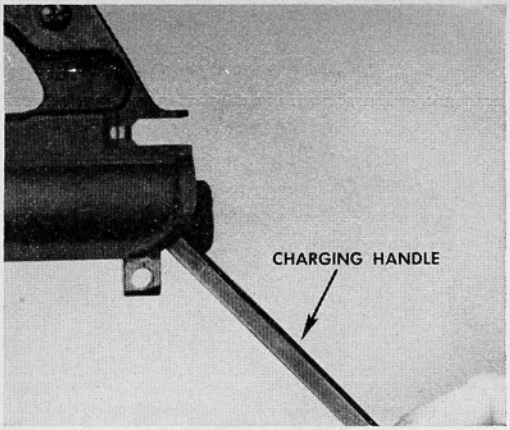
f. The last parts to be removed are the handguards. To remove them, place the upper receiver on the working surface with the muzzle up. Pull down on the slipring with the left hand until it clears the lower lip of the handguard. Pull out and down on one section of the handguard with the right hand, until the upper lip clears the handguard



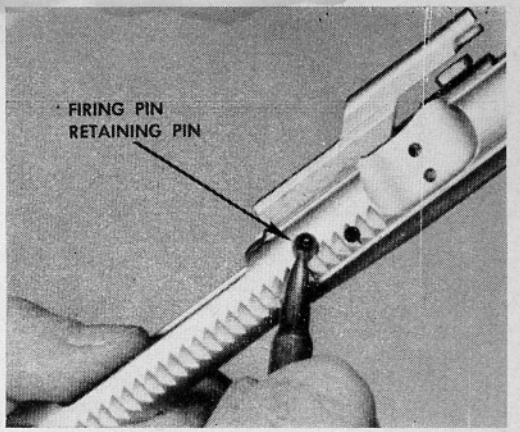
34.6 Pulling the charging handle to the rear.



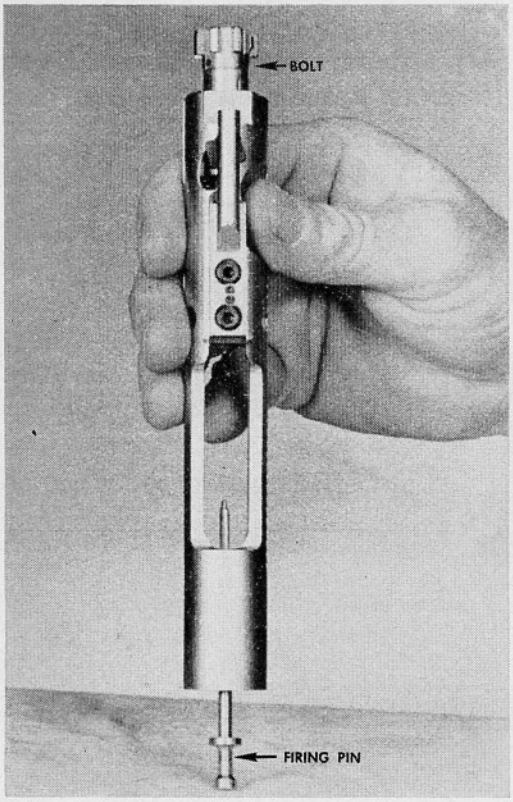
34.7 Removing the bolt carrier from the upper receiver.



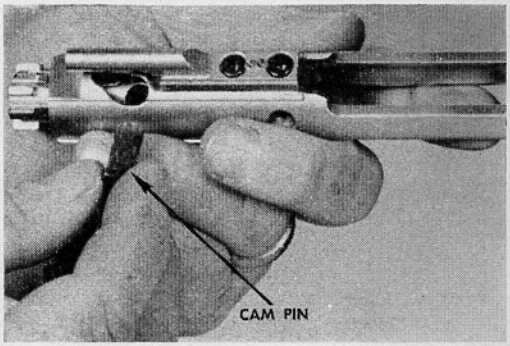
34.8 The charging handle being removed.



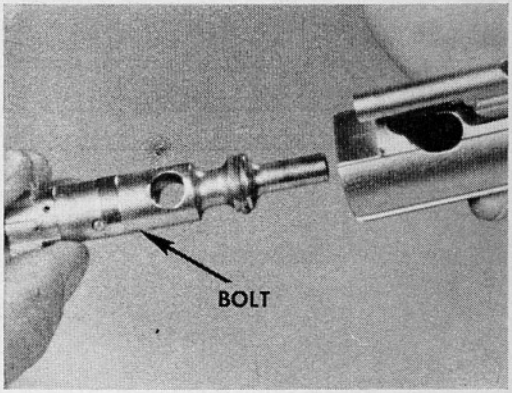
34.9 Pressing out firing pin retaining pin.



34.10 Removing the firing pin.



34.11 Removing the cam pin.



34.12 Removing the bolt from the bolt carrier.

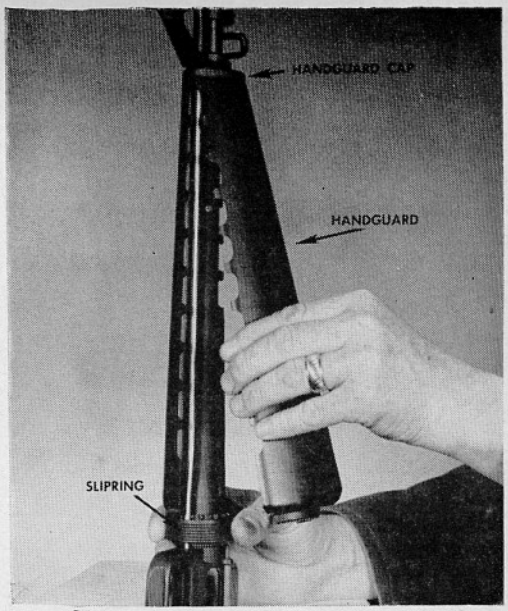
cap. (Fig. 34.13). Repeat the operation for the other section of the handguard. You will have to exert considerable pressure to force the slipring down.

g. You have now completed field stripping of the rifle (Fig. 34.14). You may reassemble it by simply reversing the steps covered thus far. Or it may be disassembled in detail as described in the next part of this chapter.

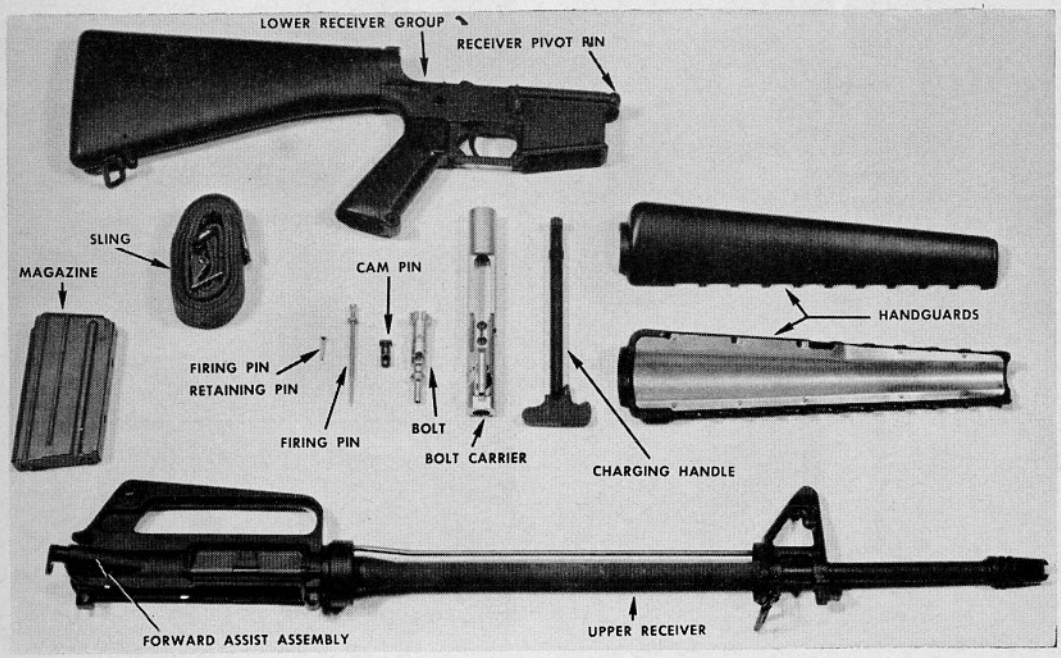
2. *Detailed Disassembly.* To disassemble the rifle in detail requires all the steps in field stripping, followed by removal of the operating parts from the lower receiver group. The steps required for removal of these parts are set forth below.

a. Place the lower receiver with the butt to your right, trigger down. Turn the selector lever to the SEMI position. Then place the thumb of the left hand on top of the hammer and pull the trigger with the index finger of the right hand (Fig. 34.15). Let the hammer move slowly until it is fully forward. Use the nose of a cartridge to press out the hammer pin from right to left (Fig. 34.16).

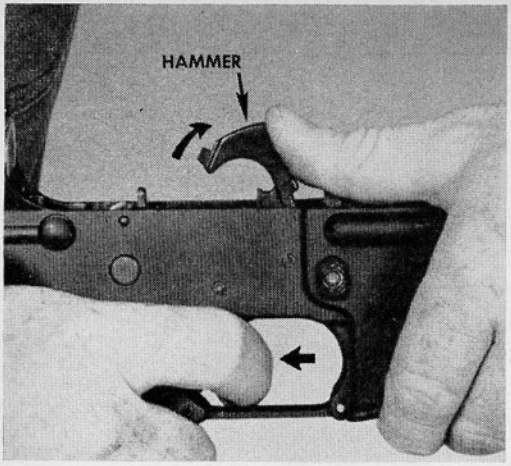
(Note: The firing pin may be used to push the hammer pin completely out of the recess, once the initial movement is begun. Use care when remov-



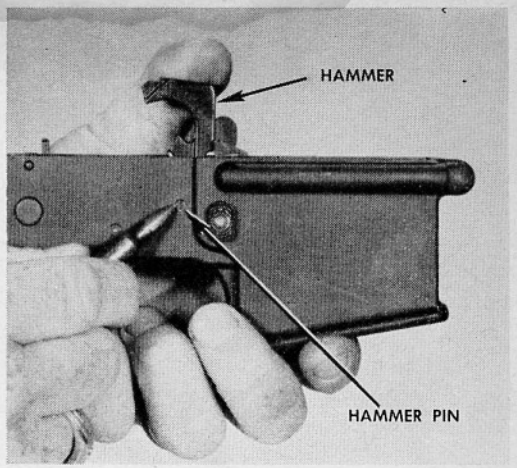
34.13 Removing the handguards.



34.14 Field stripping completed.



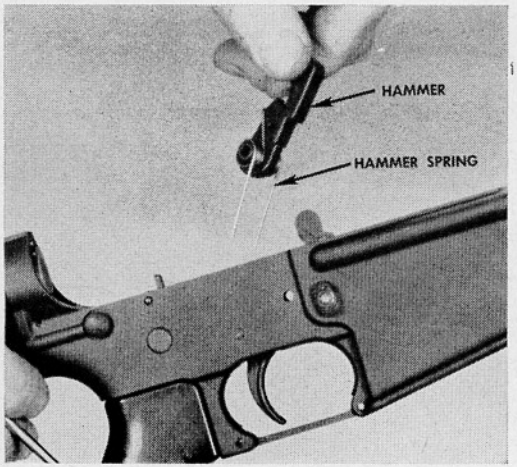
34.15 Lowering the hammer.



34.16 Pressing out the hammer pin.

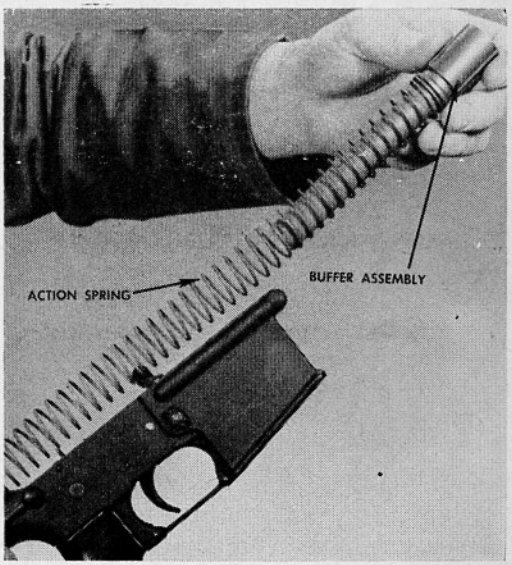
ing the hammer pin to prevent it from jumping out of the receiver. Allow the hammer to ride up until the pressure is gone from the hammer spring. Then remove the hammer from the receiver.) (See Fig. **34.17**). THE HAMMER SPRING IS ATTACHED TO THE HAMMER. DO NOT ATTEMPT TO REMOVE IT.

b. Using the index finger of the right hand, push in on the buffer cap. With the index finger of the left hand, push down on the buffer retainer. Then allow the action spring guide assembly to move forward slowly until clear of the buffer retainer.

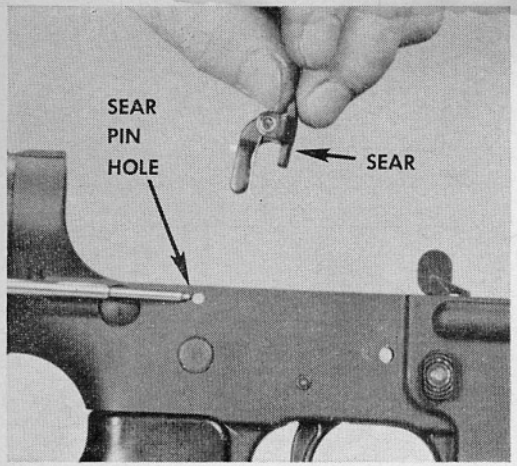


34.17 Removing the hammer and spring.

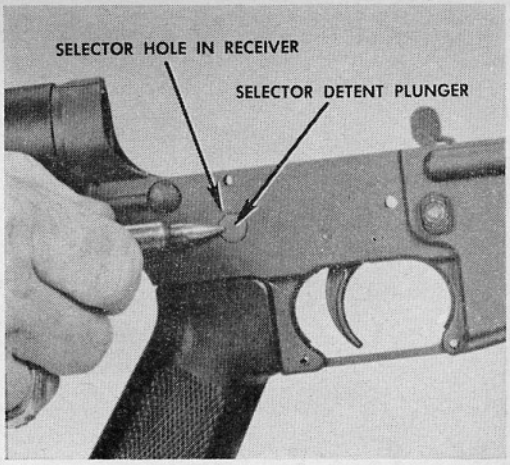
Remove the lower receiver along with the action spring (Fig. **34.18**). Place the action spring guide assembly and action spring on the working surface. BE SURE TO USE CARE IN REMOVING THE ACTION SPRING, SINCE IT IS UNDER TENSION.



34.18 Removing the action spring guide assembly and action spring.



34.19 Removing the automatic sear.

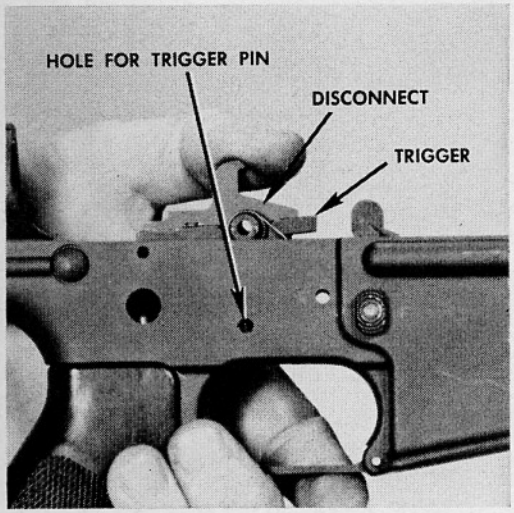


34.20 Removing the selector lever.

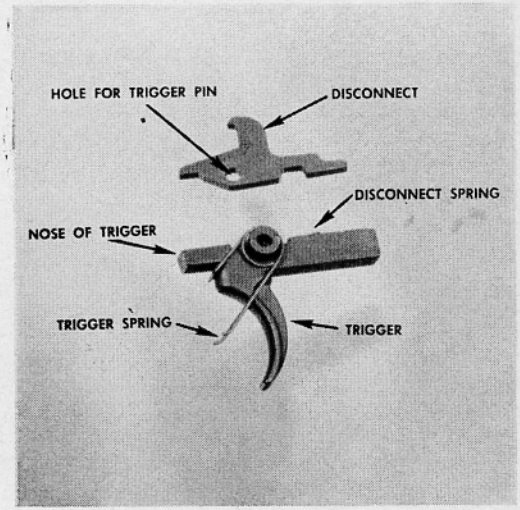
c. Using the nose of a cartridge, press the sear pin out from right to left and remove it from the receiver. Once the sear pin is removed, lift the automatic sear out of the receiver (Fig. **34.19**). You may use the firing pin to complete removal of the sear pin, if necessary.

d. Press out the selector from right to left with the nose of a cartridge (Fig. **34.20**). You must hold the trigger forward when removing the selector and considerable pressure is required to press out the selector.

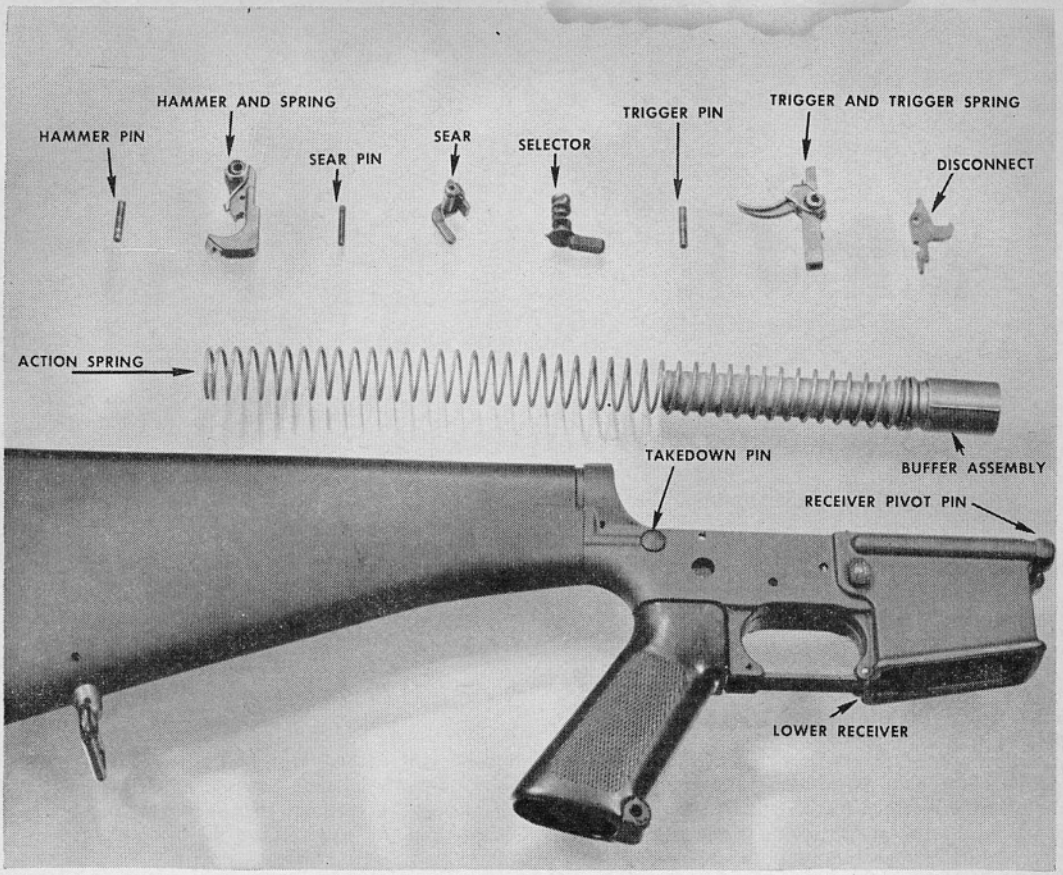
e. The last step in detailed disassembly is the removal of the trigger and disconnect. Use the firing pin to push out the trigger pin from either side. CAUTION: THE TRIGGER AND THE DISCONNECT ARE UNDER PRESSURE FROM THE TRIGGER SPRING AND WILL JUMP OUT UNLESS HELD DOWN. SIMPLY HOLD



34.21 Removing the trigger and disconnect.



34.22 Trigger and disconnect separated.



34.23 The lower receiver group disassembled in detail.

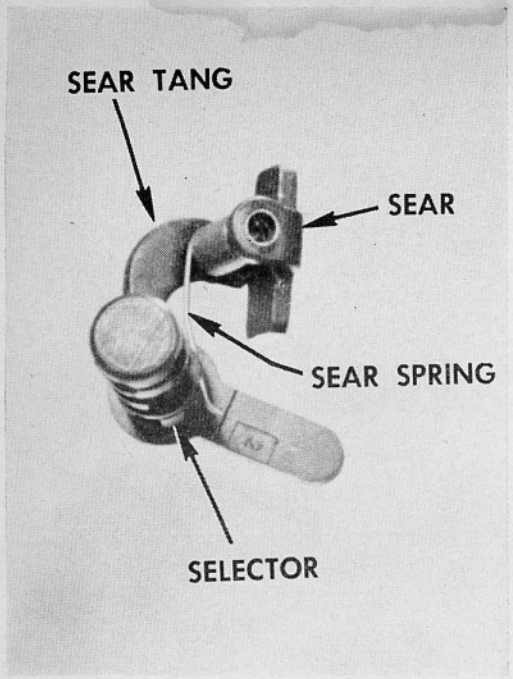
THE TRIGGER DOWN WITH THE THUMB OF THE LEFT HAND WHEN REMOVING THE TRIGGER PIN. Once the pin is removed, let the trigger rise slowly until the pressure is removed (Fig. **34.21**). When the trigger and disconnect have been removed they are separated as shown in Fig. **34.22**. This completes detailed disassembly.

B. ***Assembly.*** The rifle is assembled by reversing the steps described above. The following tips on assembly will help you put the rifle together and also to insure it is functioning properly.

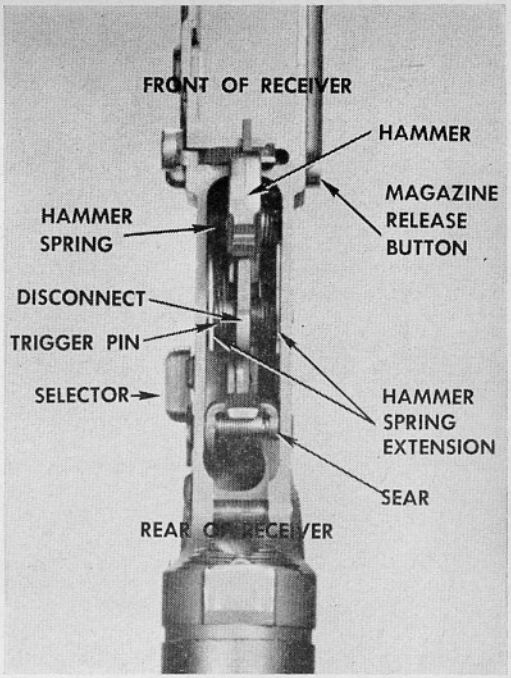
1. Place the trigger back in the lower receiver. By pressing down on the top of the trigger, compress the trigger spring until the trigger pin can be inserted through the left side of the receiver. Insert the trigger pin just far enough to hold the trigger in place. Then seat the disconnect in its slot on the trigger, pushing down until the hole in the trigger and the hole in the disconnect are aligned. Now press the trigger pin completely through the seat. Check the movement of the trigger to insure it does not bind.

2. Place the selector lever into the left side of the receiver. Hold the trigger forward, then, using the nose of a cartridge, press down the selector lever detent plunger and fully seat the selector lever. The detent plunger will snap into place on the selector lever.

3. Put the selector on AUTO and insert the automatic sear into its position in the receiver. Make sure the sear tang is in the slot on the left rear side of the selector lever, and that the long end of the sear spring is in the groove on the left front of the selector lever (See Fig. **34.24**). This insures that the automatic sear returns to the proper



34.24 Position of sear tang and sear spring on the selector lever.



34.25 Position of the hammer spring in the receiver.

position when the selector lever is turned from SEMI to AUTO. Now insert the sear pin into its hole in the receiver from right to left.

4. Insert the action spring guide assembly into the action spring, and push the open end of the spring into the well in the receiver extension until the buffer retainer snaps into position.

5. Replace the hammer in the receiver, making sure you have the hammer spring extensions straddling the disconnect and aligned in the grooves on either side of the trigger pin (See Fig. **34.25**). Push down and forward on the hammer, thus aligning the holes in the receiver and the hammer. Then use the firing pin to line up the holes exactly and press in the hammer pin. This completes assembly of the lower receiver group, but you should check at this point for proper assembly and functioning of the parts.

6. Now you are ready to assemble the bolt carrier group. Grasp the bolt carrier, key up and to the front, and insert the bolt into the front end of the bolt carrier—insuring that the ejector is down and to the left. Replace the cam pin into its well and rotate the cam pin one-quarter turn to align the holes in the bolt and cam pin. Grasp the lugged rim of the bolt and turn until the cam pin is directly beneath the bolt carrier key. Insert the firing pin through the open end of the bolt carrier and *seat fully*. Insert the firing pin retaining pin.

7. Grasp the upper receiver with the carrying handle up. Place the charging handle into the groove in the top of the upper receiver, latch to the left. The lugs on the charging handle must be seated in their grooves in the receiver. Now place the bolt carrier group into the open end of the receiver. Make sure the carrier key is in the slot on the underside of the charging handle. Push forward on the bolt carrier and the charging handle until they are fully seated.

8. Place the upper receiver group and lower receiver group together and reseat the receiver pivot pin.

9. Cock the hammer and put the selector lever on the SAFE position. Withdraw the takedown pin and close the rifle. Fully seat the takedown pin and replace the sling. The rifle is completely reassembled. Now you should make a complete function check of its operation.

C. ***Function Check.*** A complete function check

of the rifle consists of testing its operation with the selector lever set on each of the three positions—SEMI; AUTO; and SAFE. Before checking in any position, place the upper and lower receiver groups in the open position by pushing in on the takedown pin and swinging the two receiver groups apart. The magazine should be removed and the rifle cocked.

a. *Checking in the SEMI position*—Pull trigger. The hammer should fall. Hold trigger to rear, recock hammer and release trigger. Hammer should transfer from hammer hooks and disconnect to the hammer and sear engagement.

b. *Checking in the AUTO position*—Pull trigger. The hammer should fall. Hold trigger to rear and recock the hammer. Hammer is now under the automatic sear. Still holding the trigger to the rear, push forward on the automatic sear. Hammer should fall to the sear engagement.

c. *Checking in the SAFE position*—Pull trigger. Hammer should not fall. Now close the upper and lower receiver groups and push the takedown pin into place. Place the selector lever in the SEMI position. Pull the charging handle to the rear. Inspect the chamber for safety and release the charging handle. Pull the trigger. The hammer should fall. The function check is completed.

D. *Operation.*

1. *Loading.*

a. Remove the magazine. Place a round on top of the follower, nose toward smooth face of the magazine. Press down. Repeat until 20 rounds are in the magazine.

b. Cock the rifle. Place selector lever on SAFE. Insert the magazine into magazine feedway, pushing up until a click is heard.

c. Pull the charging handle all the way to the rear and release it. *Do not ride the charging handle forward.* As the bolt carrier moves forward under force of the action spring, it strips a round from the magazine and chambers it. If the weapon is not to be fired immediately, leave the selector lever on SAFE and close the dust cover. The dust cover will open automatically when the first round is fired.

d. The bolt catch will hold the bolt carrier to the rear after the last round is fired. To change magazines, press the magazine catch button, allowing the empty magazine to fall. Place the new magazine in the feedway and push up until it is fully seated. Press the bolt catch on the left of the receiver and allow the bolt carrier to go forward. This action will chamber a round from the fresh magazine and you are ready to commence firing.

NOTE: SHOULD THE BOLT FAIL TO GO FULLY HOME AT ANY TIME, PUSH SHARPLY ON THE FORWARD ASSIST ASSEMBLY WITH THE HEEL OF THE RIGHT HAND.

2. *Unloading.* To unload the rifle and make it safe, the selector is placed on SAFE. Then the magazine is removed. Pull the charging handle to the rear and inspect the chamber to make certain it is empty. Lock the bolt carrier to the rear by depressing the lower portion of the bolt catch. Return the charging handle to the forward position. NOTE: THE RIFLE IS CLEAR ONLY WHEN: NO ROUND IS IN THE CHAMBER; THE MAGAZINE IS REMOVED; THE BOLT CARRIER IS TO THE REAR; AND THE SELECTOR LEVER IS ON "SAFE".

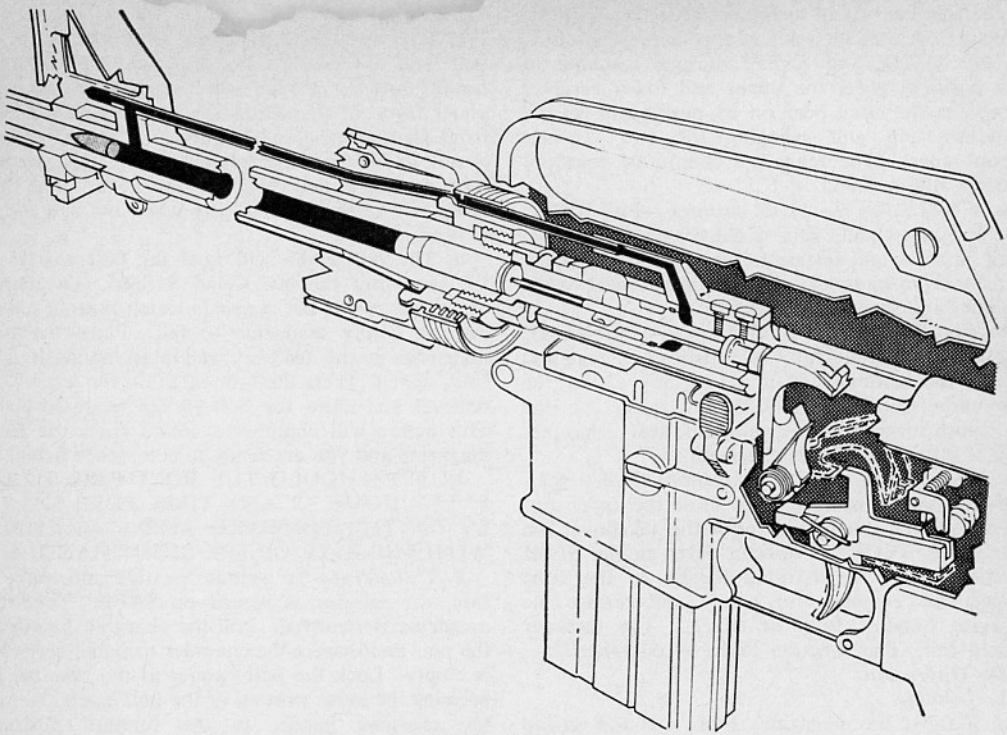
Functioning

When you fire a round from your rifle, the explosion of the powder drives the projectile through the barrel. The explosion is really gas, generated by the burning powder, expanding with extreme speed. The rifle uses a portion of this expanding gas as energy to eject the empty cartridge case and reload a fresh round. Through a series of cams, lugs, springs, and grooves, this energy makes the rifle function. This functioning consists of 10 basic steps, some of which take place at the same time as others. The functioning may be automatic or semiautomatic, depending on the setting of the selector lever. The way to learn how your rifle functions is to: completely master the nomenclature; then understand semiautomatic fire; and then note the difference between semiautomatic and automatic fire. The better you understand functioning, the quicker you can locate the cause of any stoppage and remove or repair it.

A. *Semiautomatic Fire.* There are 10 basic steps, or actions, that take place in functioning. They are:

(1) *Firing.*
(2) *Action of the gas.*
(3) *Unlocking.*
(4) *Extracting.*
(5) *Ejecting.*
(6) *Cocking.*
(7) *Feeding.*
(8) *Action of the buffer assembly.*
(9) *Chambering.*
(10) *Locking.*

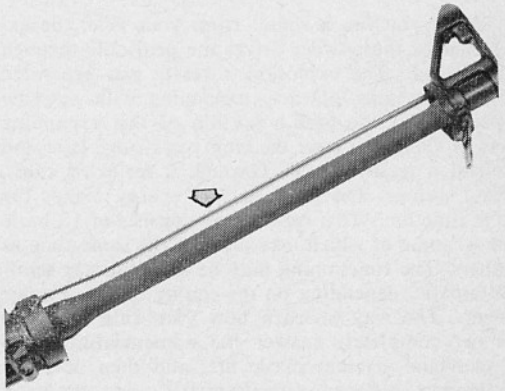
1. *Firing.* (See Fig. ***34.26***). When the trigger is pulled it rotates on the trigger pin. This de-



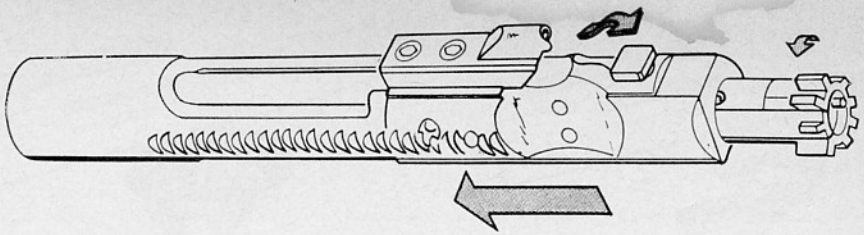
34.26 Firing.

presses the nose of the trigger and disengages it from the bottom of the hammer. The hammer is driven forward by the action of the hammer spring. It strikes the head of the firing pin, driving the firing pin forward through the bolt into the primer of the round, and the primer ignites the powder. The disconnect is attached to the trigger and rotates forward by action of the disconnect spring. When the hammer is cocked by the recoil of the bolt carrier, the disconnect engages the lower hook of the hammer and holds it. Thus the weapon fires only one round. When the trigger is released, the disconnect rotates down, disengaging the hammer and allowing it to rotate forward until caught by the nose of the trigger. This action of the disconnect prevents the hammer from following the bolt carrier forward and causing automatic fire.

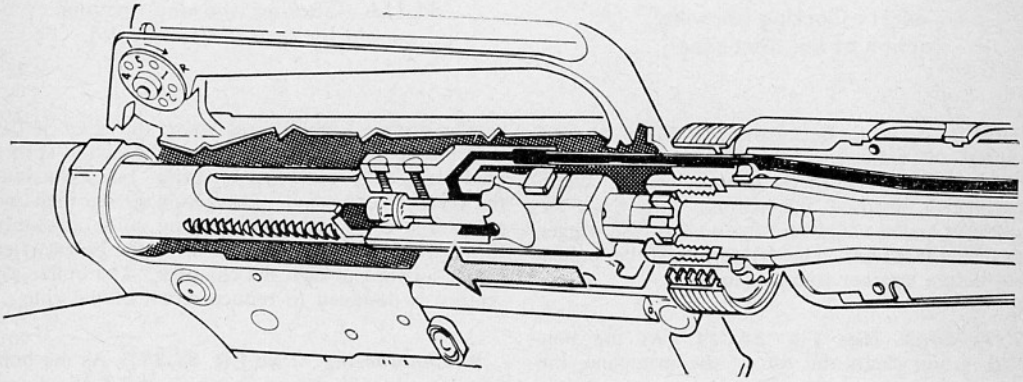
2. ***Action of the gas.*** (See Fig. *34.27*). When the primer ignites the powder, the explosion caused by the rapidly expanding gases forces the projectile through the barrel. Gas follows the projectile down the bore. As the gas passes the gas port (located on top of the barrel under the front sight) a small portion of it passes through the gas port and into the gas tube. The gas tube directs the gas into the cylinder between the bolt and bolt carrier, causing the bolt carrier to move rearward.



34.27 The gas tube.



34.28 Unlocking.



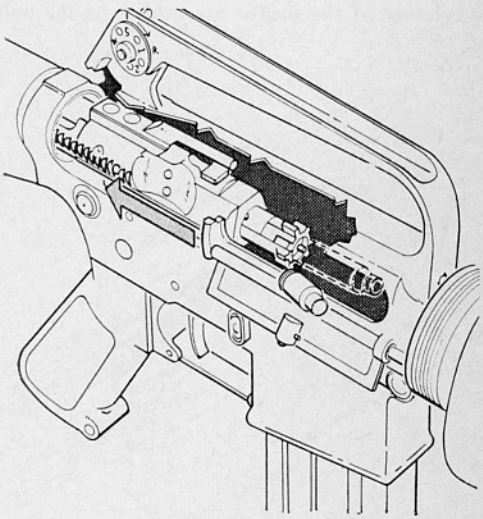
34.29 Extracting.

3. *Unlocking.* (See Fig. ***34.28***). As the bolt carrier moves to the rear, the cam track in its upper surface acts on the bolt cam pin, rotating the cam pin and bolt *clockwise* until the locking lugs of the bolt are no longer in line with the locking lugs of the barrel extension.

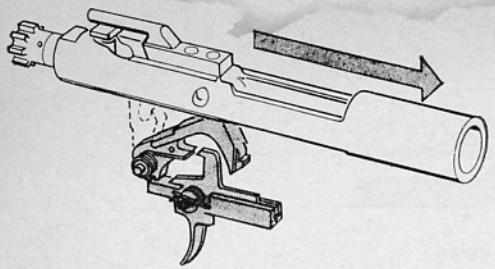
4. *Extracting.* (See Fig. ***34.29***). The bolt carrier continues to the rear, carrying with it the bolt. By means of the extractor, which is attached to the bolt, the expended cartridge is withdrawn from the chamber. The claw of the extractor is gripping the rim of the cartridge, holding the base of the cartridge against the face of the bolt.

5. *Ejecting.* (See Fig. ***34.30***). When the base of the cartridge is against the face of the bolt, the ejector spring is compressed. As the bolt carrier clears the ejection port, the empty cartridge case is thrown out by the expanding action of the ejector and spring.

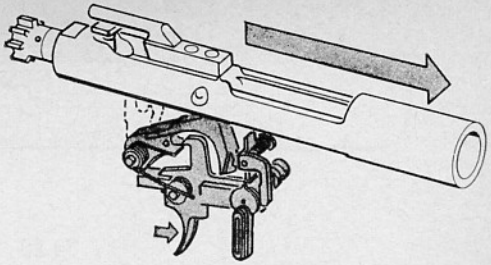
6. *Cocking.* (See Fig. ***34.31***). The rearward movement of the bolt carrier overrides the hammer,



34.30 Ejecting.



34.31 Cocking (showing action of the disconnect).



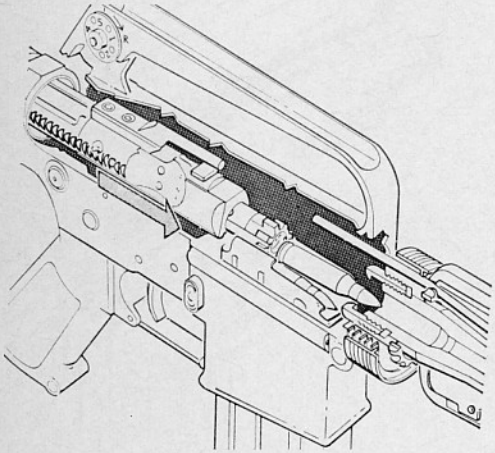
34.31A Cocking (showing hammer caught by nose of the trigger).

forcing it to rotate backward and down and to compress the hammer spring. The lower hook of the hammer is engaged by the disconnect. When the trigger is released, the hammer slips from the disconnect and is caught by the nose of the trigger (See Fig. **34.31A**). The trigger must be pulled again before another round is fired.

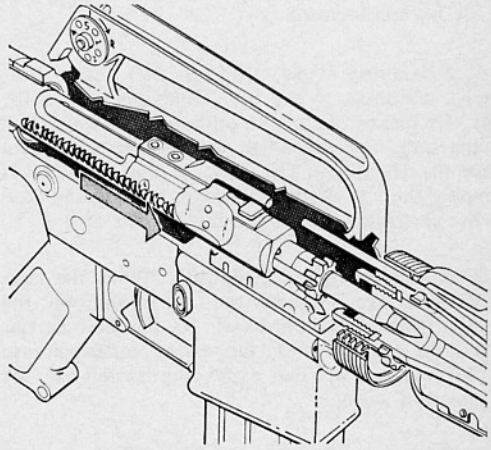
7. ***Feeding.*** (See Fig. ***34.32***). As the bolt carrier group clears the top of the magazine, the magazine spring expands. This forces the follower up, which, in turn, pushes a new round in the path of the bolt.

8. ***Action of the buffer assembly.*** As the bolt carrier group is moving rearward, the head of the buffer is struck. This blow sends the action spring guide assembly and action spring rearward into the receiver extension. The action spring then expands and sends the action spring guide assembly forward with enough force to drive the bolt carrier group forward toward the chamber. The buffer assembly is designed to reduce recoil of the rifle.

9. ***Chambering.*** (See Fig. ***34.33***). As the bolt carrier group is driven forward, the face of the bolt strips a round from the magazine and thrusts it into the chamber. At the same time the extractor claw grips the base of the new round and the ejector is compressed.

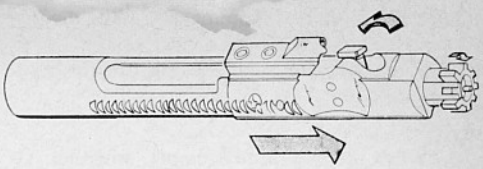


34.32 Feeding.



34.33 Chambering.

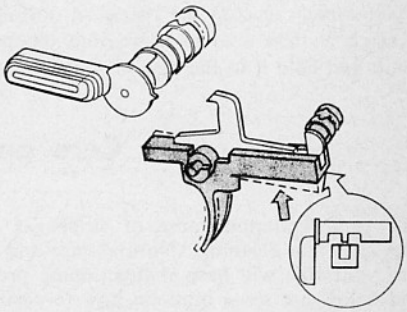
10. *Locking.* (See Fig. ***34.34***). When the bolt carrier group travels the last ½ inch forward, the bolt cam pin emerges from the guide channel in the upper receiver and moves along the cam track, rotating the bolt *counterclockwise* into the locked position. The rifle is ready to fire.



34.34 Locking

B. *Automatic Fire.* When the selector lever is set on AUTO the rifle will fire until the trigger is released or the magazine is empty. Listed below are the *changes* in functioning which take place when the rifle is fired with the selector on AUTO.

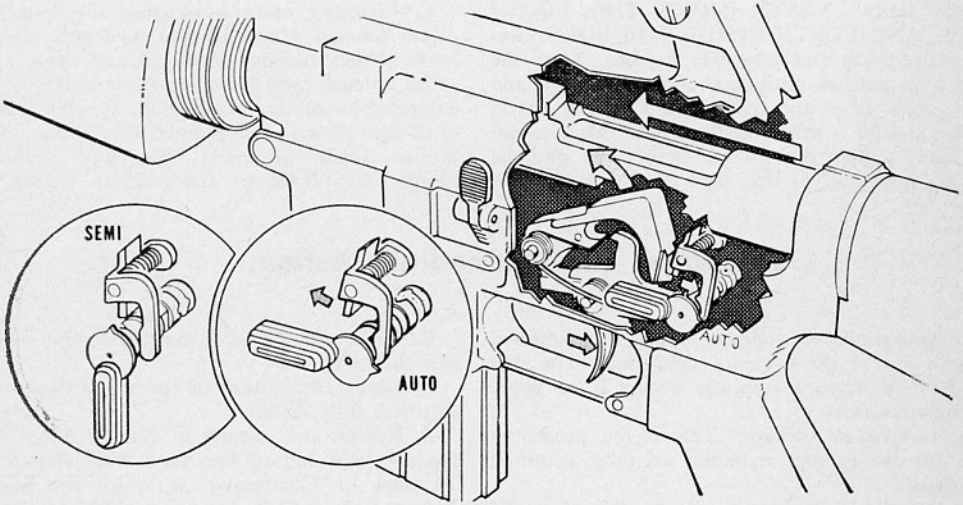
1. As the trigger is pulled, the cycle of operation begins. The rifle fires; gas acts; and unlocking, extracting, and ejecting take place as in semi-automatic fire. But, *as the hammer is cocked,* the center cam of the selector prevents the disconnect from engaging the hammer. (See Fig. **34.35**).



34.35 Showing the selector lever set on AUTO, the center cam blocking the disconnect. Inset shows end view of selector lever in the AUTO position.

2. The automatic sear then catches the upper hook of the hammer and holds it until the bolt carrier group moves forward. As the bolt carrier group strikes the top of the automatic sear, the hammer is released. The hammer drives the firing pin forward and the rifle fires again. (See Fig. **34.36**).

3. When the trigger is released, the hammer moves forward and is caught by the nose of the



34.36. Automatic sear.

trigger. This ends automatic fire until the trigger is pulled again. Feeding, action of the buffer assembly, chambering, and locking are the same as in semiautomatic fire.

4. When the magazine is empty, on either AUTO or SEMI setting of the selector, the follower rises to the top of the magazine under pressure of the magazine spring. The follower presses against the bolt catch, trying to push it toward the inside of the lower receiver. The explosion of the last round forces the bolt carrier group to the rear. When the bolt carrier reaches the rearward position, the bolt catch is then able to move into the path of the bolt and hold it to the rear.

5. Removing the magazine will not release the bolt catch, since it is held in position by pressure of the bolt. To release the bolt carrier group, press the head of the bolt catch located on the left side of the lower receiver. IF A NEW MAGAZINE HAS BEEN INSERTED AND YOU RELEASE THE BOLT CATCH, THE WEAPON WILL LOAD AND BE READY TO FIRE.

6. To keep the bolt carrier group to the rear when making the rifle safe, pull the charging handle to the rear. Then press on the LOWER portion of the bolt catch. Shove the charging handle forward and place the selector lever on SAFE. Thus the bolt is open, the chamber is clear, and the safety is on. The magazine should be removed. Then the weapon is considered clear.

Care and Cleaning

The most common cause of stoppages is improper care and cleaning. Normal care and cleaning of your rifle will keep it functioning properly. Listed below are some hints on how to clean your rifle and lubricate it. Remember to conduct the function check you learned earlier after you have cleaned and reassembled your rifle.

A. *Cleaning and Lubricating the Barrel.* Attach a stiff wire brush to the cleaning rod, dip it in bore cleaner, and push it *all the way through* the bore. Withdraw the brush and repeat the action several times. NEVER MOVE THE BRUSH BACK AND FORTH INSIDE THE BORE. Remove the brush and substitute patches. Swab the bore with patches until they come out clean and dry. Then clean the locking lugs in the barrel extension with a small bristle brush. After cleaning apply a light coat of oil to the bore and the locking lugs, and to that part of the barrel that is enclosed by the handguards.

B. *Clearing and Lubricating the Bolt Carrier Group.* Remove the bolt carrier group from the upper receiver and disassemble. Clean all surfaces with a patch dipped in bore cleaner. Clean the locking lugs on the bolt with a small brush and bore cleaner. Dry the locking lugs and oil lightly. Put one drop of oil in each hole on the right side of the bolt carrier and the open end of the bolt carrier key. DO NOT ATTEMPT TO REMOVE ANY DISCOLORATION CAUSED BY HEAT.

C. *Cleaning and Lubricating the Lower Receiver Group.* Normally you need only brush the parts as they remain assembled and apply a drop of oil on each pin. However, if your rifle has been subjected to salt air, water, mud, or sand, then you must completely disassemble the lower receiver group. Clean all parts thoroughly with bore cleaner, wipe them dry and oil them slightly.

Stoppages and Immediate Action

A. *Stoppage.* A stoppage is any unintentional interruption of the cycle of operation. The first thing to do when a stoppage occurs is to apply immediate action.

B. *Immediate Action.* This is the procedure used for the prompt reduction of most common stoppages.

1. Pull the charging handle to the rear and release it.

2. Strike the forward assist assembly to fully seat the bolt.

3. Strike the bottom of the magazine to make sure it is fully seated.

4. Re-aim and attempt to fire the rifle. Should the rifle still fail to fire, note what step, of the 10 steps of functioning, at which the stoppage occurred. Investigate the cause of the malfunction and correct it.





The M14 Rifle

DURING your early training you learned the Creed of the United States Marine, "My Rifle". In that Creed is included a solemn promise to hit, for it is only the hits that count. Every Marine has made that same pledge. Every Marine has been trained as a rifleman, for it is the rifleman who must close with the enemy and destroy him.

Each item of equipment in the modern amphibious assault—from the multimillion dollar aircraft carrier to the least expensive radio battery; every highly skilled man—from a jet pilot to the operator of a small, portable radio: all these exist for the purpose of getting you, the Marine rifleman, in position to close with the enemy and destroy him; in position to keep your promise to hit. Once there, the job you do will depend on how well you know your rifle, the care you give it, and the manner in which you use it. This chapter tells you the names of the parts of your rifle, the way to strip and assemble it, the proper care to keep it in operation, and the firing positions to use. Become thoroughly acquainted with your rifle and treat it well. The success of your mission, your life and the lives of your buddies, may someday depend on you and your rifle.

General Description

The U.S. Rifle, 7.62 MM., M14, is a *gas-operated, magazine-fed, air-cooled, shoulder weapon.* The magazine is made of aluminum alloy and has a capacity of 20 rounds. When the M14 is issued it is equipped to fire semiautomatically only. It can be converted to fire either semiautomatically or automatically by removing the selector lock and replacing it with a selector and selector spring. The rifle is equipped with a flash suppressor which deflects the muzzle blast in such a way as to reduce muzzle climb and the amount of dust kicked up when firing. There is a stud on the rear of the flash suppressor to accommodate the bayonet or a grenade launcher. Important characteristics of the M14 Rifle are:

WEIGHT	*Pounds*
RIFLE	9.1
SLING	.31
MAGAZINE	.27
AMMUNITION (20 ROUNDS)	.80
CLEANING GEAR (IN STOCK)	.61
TOTAL	11.09

LENGTH	*Inches*
OVERALL, WITHOUT BAYONET	44.14
BARREL	22.00

(The barrel has four lands and four grooves which turn to the right)

MUZZLE VELOCITY.....2,800 feet per second

CHAMBER PRESSURE.....50,000 pounds per square inch

CYCLIC RATE OF FIRE .....700-750 rounds per minute

MAXIMUM EFFECTIVE RATE (Number of well-aimed rounds per minute)

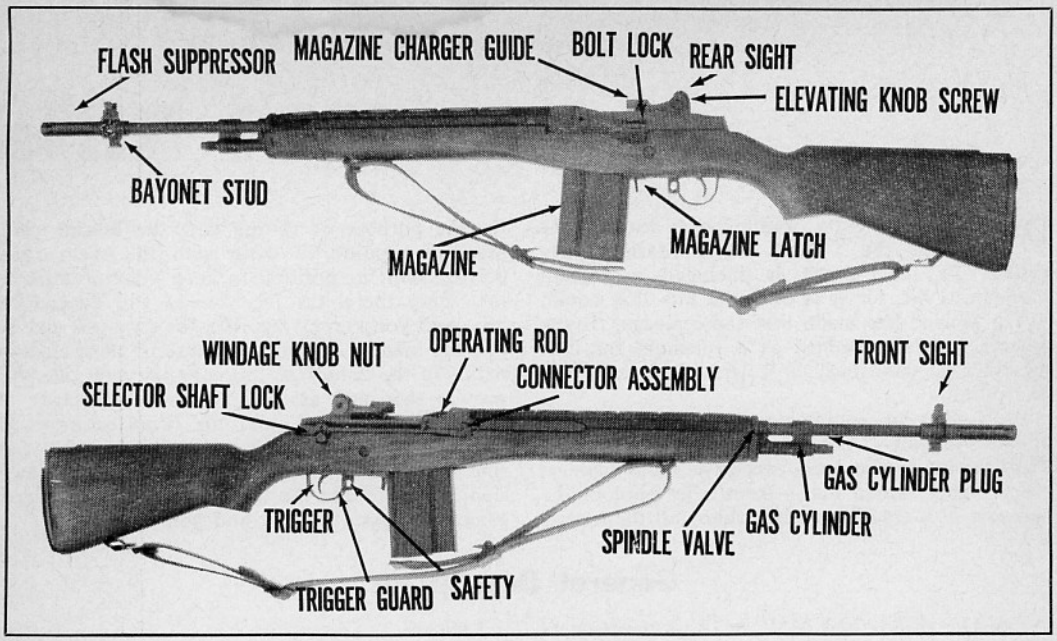
SEMIAUTOMATIC	20-30
AUTOMATIC	40-60

RANGE	*Meters*
MAXIMUM	3,750
MAXIMUM EFFECTIVE	460

Nomenclature, Disassembly and Assembly

Before disassembling your rifle, study Fig. **35.1** thoroughly. Learn the names of all the parts that are visible when the rifle is assembled. Then, as you take the rifle down, learn the names of each part by referring to this chapter.

The rifle is designed for easy disassembly. If you execute each of the steps correctly, no force is required, nor should any be applied. Spread a



35.1 The M14 Rifle.

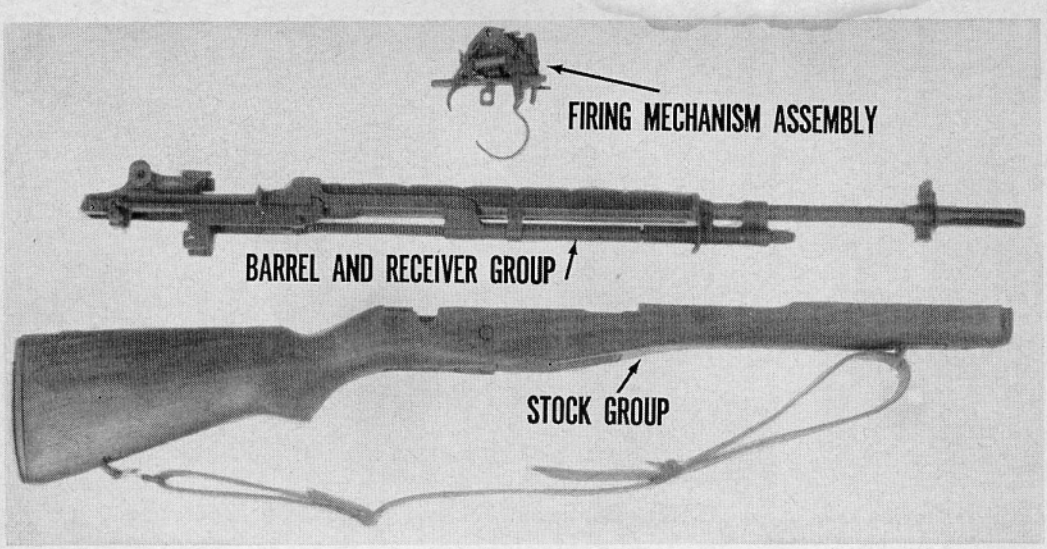
poncho or a newspaper on a flat surface and place the parts on it as you remove them. Lay out the parts in order of disassembly, from left to right. This will assist you when replacing them in the rifle.

Three Main Groups

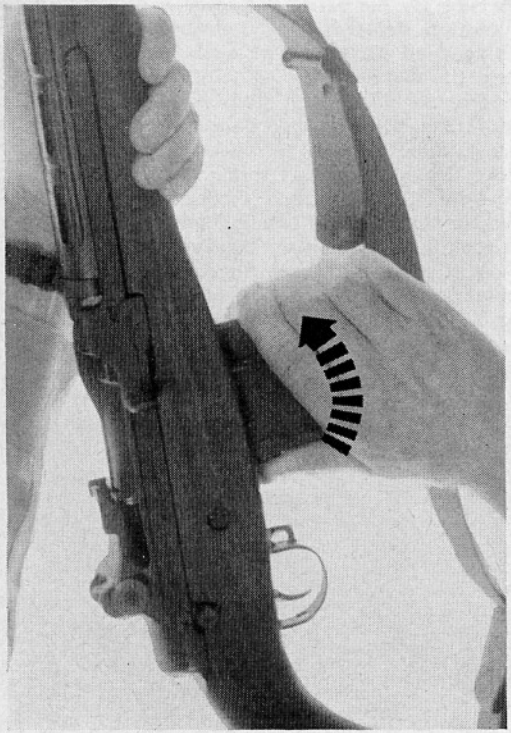
Look at Fig. **35.2.** You will note that the M14 Rifle has three main groups; the firing mechanism assembly, the barrel and receiver group, and the stock group.

The first step in handling any weapon is to clear it. To clear the M-14, first engage the safety. (If unable to place the safety in the safe position, continue with the second step of removing the magazine.) Remove the magazine by placing the right thumb on the magazine latch and curl the remaining fingers around the front of the magazine. Press in on the magazine latch, rotate the base of the magazine toward the muzzle end of the rifle (Fig. **35.3**), and remove it from the rifle. Using the back edge of the right hand, pull the operating rod handle to the rear. Inspect the chamber, making certain it is clear. Reach across the receiver with the right thumb and press in on the bolt lock. Verify the safety. Tilt the rifle and look inside the chamber and receiver to insure that they contain no rounds. When you know the rifle is clear, release the bolt lock and allow the operating rod handle to slide back into position. Next, grasp the rear of the trigger guard with the thumb and forefinger of the right hand. Pull downward and outward as far as the trigger guard will go (Fig. **35.4**). Lift out the firing mechanism assembly.

Now lay the rifle on the smooth flat surface with the sights up, muzzle to the left. Grasp the receiver over the bolt with the left hand and raise it three or four inches above the working surface. With the right hand, strike and at the same time grasp the small of the stock without loosening the grip on the receiver. This action will separate the stock group from the barrel and receiver group. You now have disassembled the rifle into the three main groups. To assemble them, simply reverse the procedure.



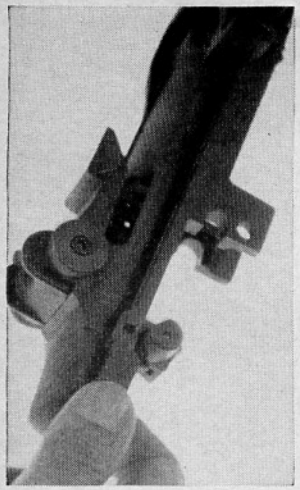
35.2 The three main groups.



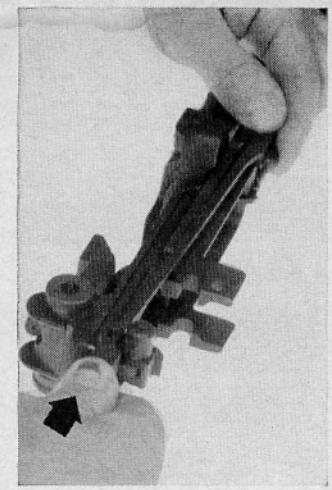
35.3 Removing the magazine.



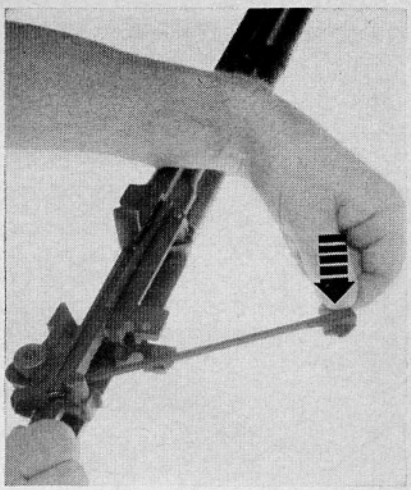
35.4 Opening the trigger guard.



35.5(1) Removing connector assembly.



35.5(2) Continued.



35.5(3) Continued.

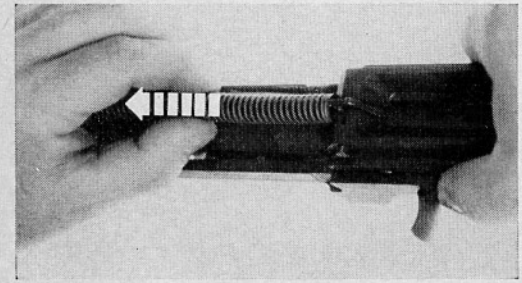
Disassembly

A. Barrel and Receiver Group. **1.** Lay the barrel and receiver group on its left side with the bolt closed. The operating rod handle should be up and the muzzle pointing away from you. Place the right thumb on the rear of the connector assembly and the first and second fingers inside the rear of the receiver as shown in Fig. **35.5(1)**. Push forward with the right thumb until the forward end of the connector assembly can be lifted off the connector lock (Fig. **35.5(2)**). Turn the connector assembly clockwise as shown in Fig. **35.5(3)** until the slot in the rear end is alined with the elongated stud of the sear release. Being careful not to bend the connector assembly or the sear release, slightly lower the front end of the connector assembly and lift the rear end off the elongated stud of the sear release.

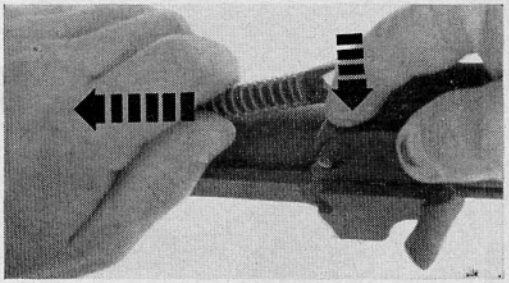
2. Now lay the barrel and receiver group on a flat surface, sights down and muzzle to the left. With your left hand, pull the operating rod spring toward the muzzle. This will release pressure on the connector lock (Fig. **35.6(1)**). With your right forefinger, push the connector lock toward yourself (Fig. **35.6(2)**). Then disconnect and remove the operating rod spring and guide.

3. Turn the barrel and receiver group over, sights up and muzzle pointing away from you. Pull back the operating rod handle until the guide lug on its inside surface is alined with the disassembly notch on the right side of the receiver (Fig. **35.7**). Rotate the operating rod downward and outward, then pull it to the rear. This will disengage it from the operating rod guide.

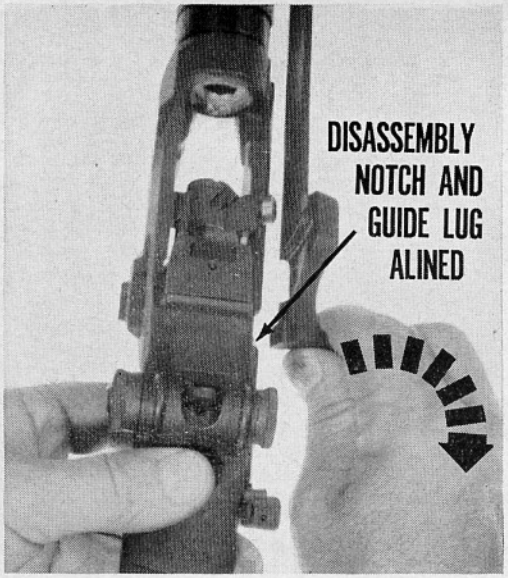
4. Grasp the bolt by the roller mounted on its



35.6(1) Removing operating rod spring and operating rod spring guide.



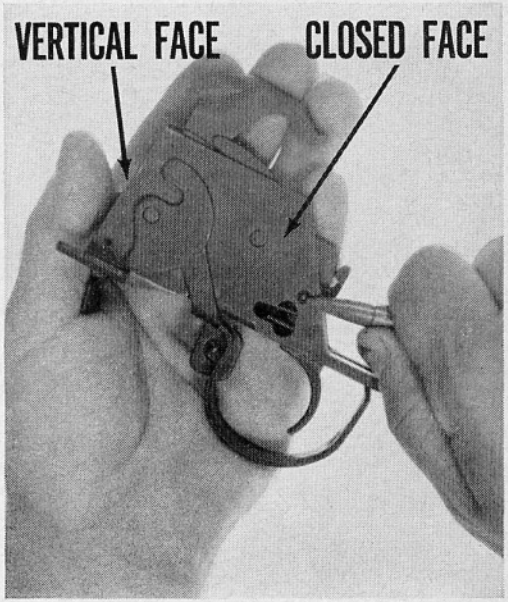
35.6(2) Continued.



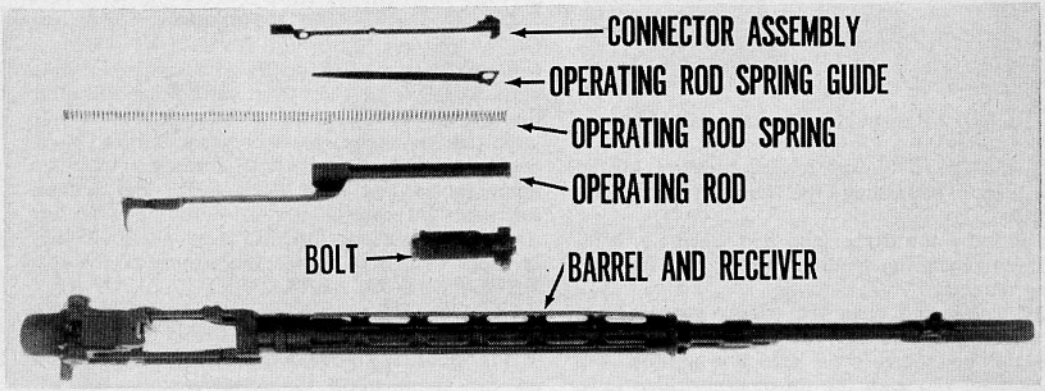
35.7 Removing operating rod.

right side and slide it forward. At the same time, lift it up and out to the right front with a slight rotating motion. Now study Fig. **35.8.** These are the parts of the barrel and receiver group in the order of their disassembly.

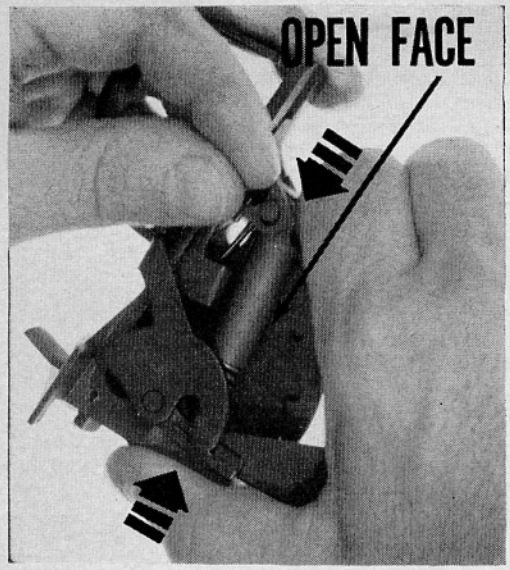
B. The Firing Mechanism Assembly. **1.** Close and latch the trigger guard. Push the safety in the off position (away from the trigger). Ease the hammer forward while squeezing the trigger. Now hold the assembly in your left hand, vertical face to your left and open face against the palm as shown in Fig. **35.9(1).** Using the tip of a cartridge, push on the trigger pin until its head is unseated. Grasp the assembly with the right hand, open face up, trigger guard to the left, forefinger over the sear, thumb on the vertical face. Next, apply a pinching action with the thumb and forefinger of the left hand and remove the trigger pin



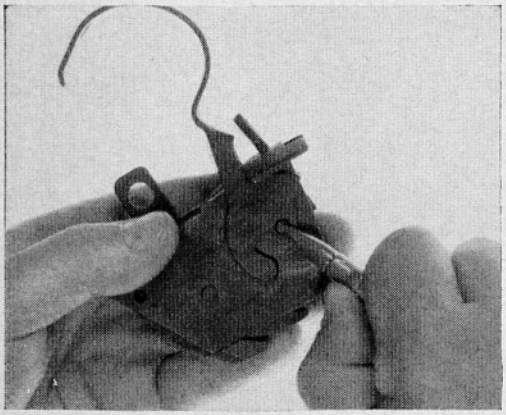
35.9(1) Unseating the trigger pin.



35.8 Parts of barrel and receiver group in the order of disassembly.



35.9(2) Removing the trigger pin.

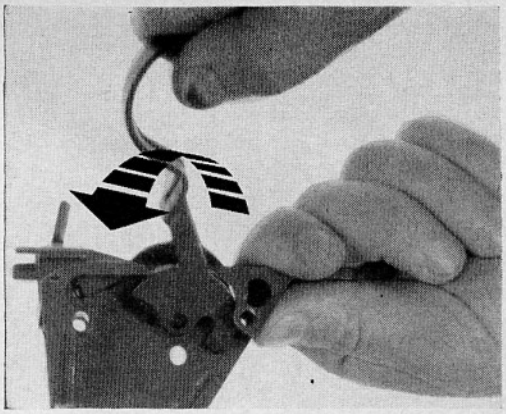


35.9(3) Removing the hammer pin.

(Fig. **35.9(2)**). Slowly release pressure of the right hand, permitting the hammer spring to expand.

2. Remove the trigger and sear assembly, hammer spring housing, hammer spring, and hammer spring plunger.

3. Unlatch and open the trigger guard. Hold the assembly in the left hand, vertical face away from the body and open face down. Push out the hammer pin with the tip of a cartridge (Fig. **35.9(3)**), and remove it. Turn the assembly over,



35.10 Removing the trigger guard.

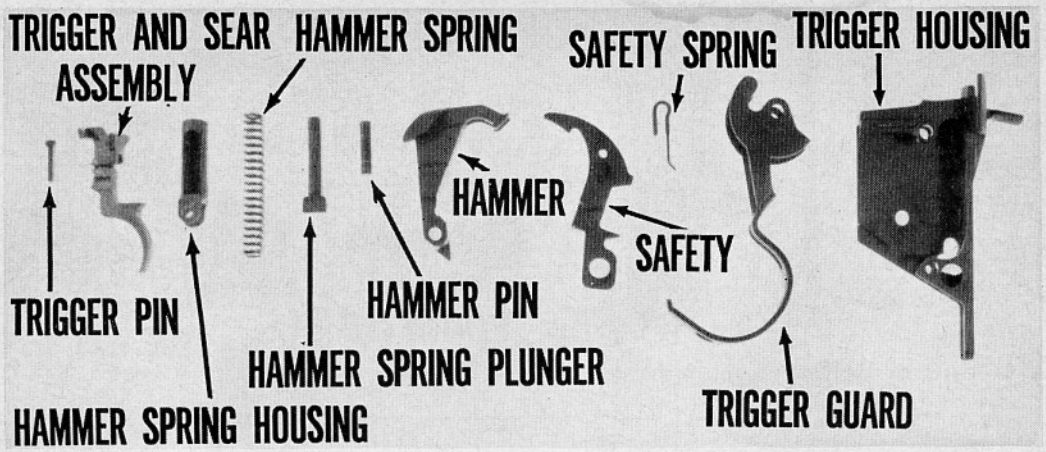
move the hammer to the rear slightly and lift it out.

4. Leave the trigger guard unlatched. Turn the trigger housing over so that the face is down. Push the stud of the safety from its hole with the tip of a cartridge. Lift the safety and safety spring from the trigger housing.

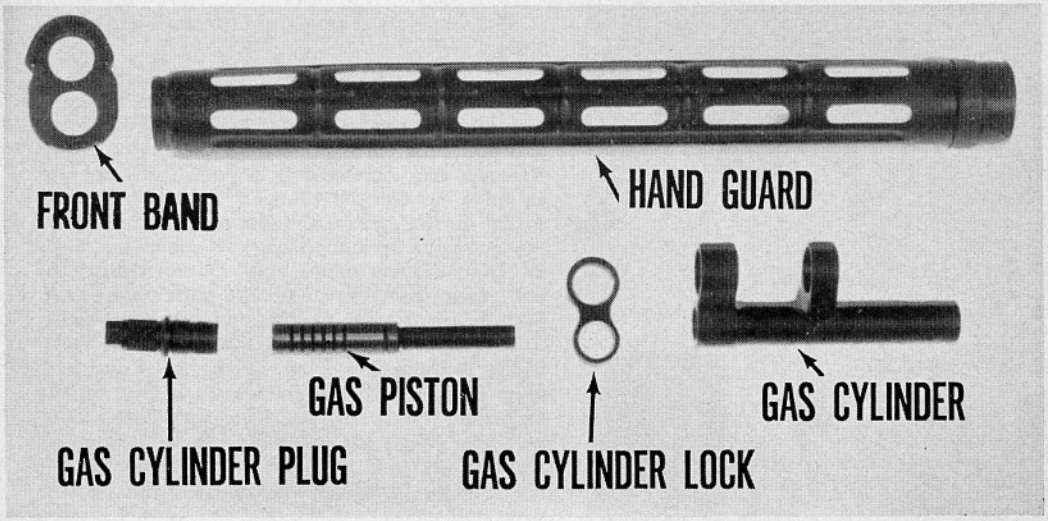
5. Hold the rear of the trigger housing in the left hand as shown in Fig. **35.10.** Grasp the trigger guard with the right hand and slide it to the rear until the hammer pin holes on the trigger guard are just forward of the safety stud hole. Rotate the trigger guard to the right, then push it forward and up, thus removing it from the trigger housing.

6. Leave the magazine latch in the trigger housing. Now study Fig. **35.11.** The parts of the firing mechanism assembly are shown in the order of their disassembly, from left to right.

C. Gas System and Handguard. Since the gas system and handguard are partially sealed, it will not always be necessary to disassemble these parts for cleaning. However, after firing and after the rifle has been exposed to water, it is extremely important that these parts be separated and thoroughly cleaned. The parts of the gas system are finely tooled and have sharp edges and smooth surfaces. Be careful not to burr the edges or roughen the surfaces because they must fit tightly in order to permit proper functioning of the gas. NEVER USE AN ABRASIVE TO CLEAN ANY PART OF THE GAS SYSTEM. The parts of the gas system and handguard are shown disassembled in Fig. **35.12.** To remove them, use the wrench on the combination tool and unscrew the gas cylinder plug. Tilt the muzzle down and carefully



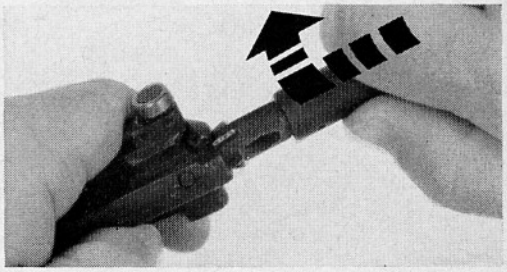
35.11 Parts of firing mechanism assembly in the order of disassembly.



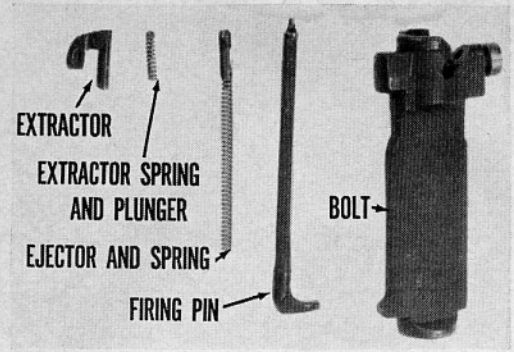
35.12 Parts of the gas system; handguard and front band.

remove the gas piston from the gas cylinder. Unscrew the gas cylinder lock and slide the lock and cylinder forward. Slip the front band forward toward the front sight. Push the handguard forward and lift it from the barrel.

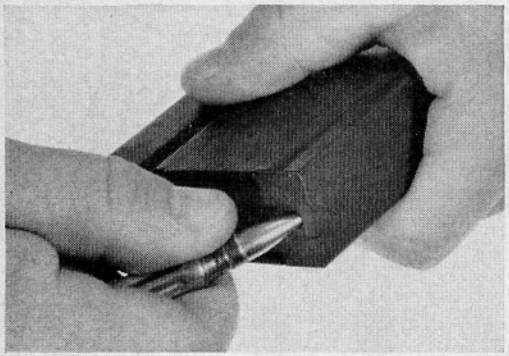
D. The Bolt. Hold the combination tool as shown in Fig. **35.13.** Push it into the face of the bolt with the screwdriver blade beneath the extractor. Turn the tool clockwise, maintaining pressure against the ejector and spring. Lift the extractor from the bolt slowly. As the extractor clears the



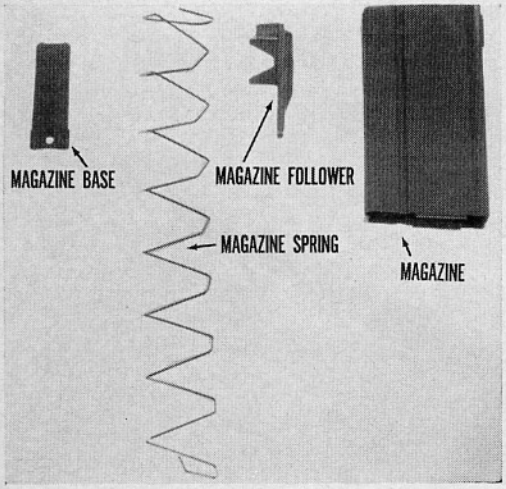
35.13 Unseating extractor.



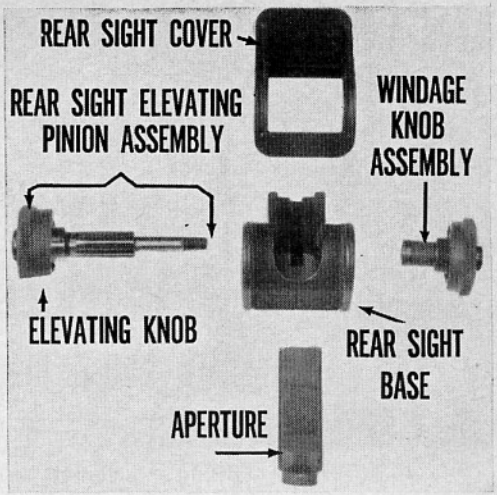
35.14 Parts of the bolt in the order of disassembly.



35.15 Removing the base of the magazine.



35.16 Parts of the magazine.



35.17 Parts of rear sight (exploded view).

ejector, allow the ejector to slowly push the combination tool away from the face of the bolt until it is no longer under pressure of the ejector spring. Remove the ejector and spring. Lift out the extractor spring and plunger. Leave the ejector spring on the ejector and the extractor spring on the extractor spring plunger. Remove the firing pin from the rear of the bolt. Do not remove the bolt roller from the stud. The parts of the bolt, in order of disassembly, are shown in Fig. **35.14.**

E. The Magazine. **1.** Use the point of a cartridge to raise the front of the magazine base (Fig. **35.15**) until the indentation is clear of the magazine. Grasp the magazine with either hand, with one finger of that hand covering the base. Remove the base with the other hand while the finger of the grasping hand controls the expanding magazine spring.

2. Remove the magazine spring and the magazine follower. Figure **35.16** shows the parts of the disassembled magazine.

F. The Rear Sight. The rear sight is disassembled only when supervised by a noncommissioned officer. NEVER DISASSEMBLE YOUR REAR SIGHT DURING A PERIOD OF RANGE FIRING. When it becomes necessary to disassemble the rear sight, follow these steps carefully and the zero of your rifle will not be changed. **1.** Place the barrel and receiver group on the flat surface with the sights up and muzzle pointing away from you. Turn the elevating knob forward, lowering the aperture as far as it will go.

CHECK THE READING ON THE ELEVATING KNOB AND WRITE IT DOWN FOR LATER USE IN ASSEMBLY.

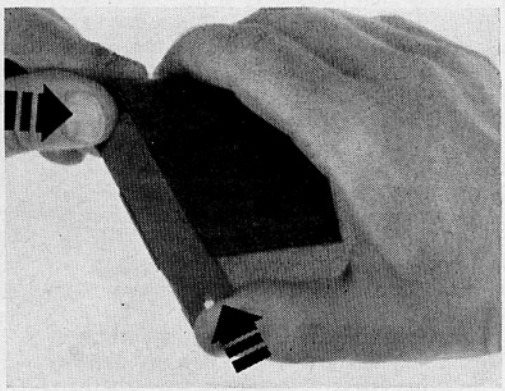
2. Unscrew the nut in the center of the windage knob with the screwdriver blade of the combination tool. The nut will loosen but it cannot be removed. Push forward on the right side of the rear sight base lightly. Remove the rear sight elevating pinion assembly by withdrawing it to the left. Pull the aperture up about one-half inch and place your right thumb underneath it, then push forward and up, thus removing the aperture, rear sight cover, and rear sight base. The parts of the rear sight are shown in Fig. **35.17.**

Assembly

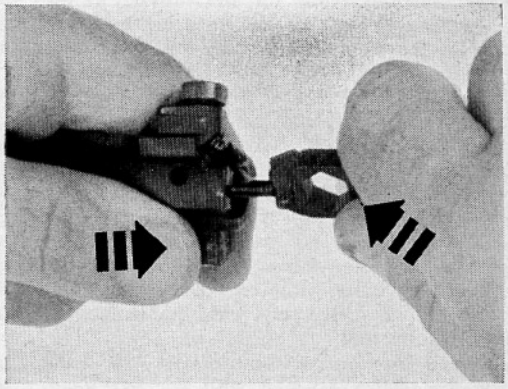
A. The Rear Sight. **1.** Assemble the rear sight cover and base. Seat the front lip of the sight cover in the slot at the front of the sight housing. Raise the base slightly then push forward and downward against the rear part of the sight cover until it is seated in its slot in the rear of the rear sight housing. Replace the windage knob assembly, screwing it in until it draws the base to the center position on the windage gauge. Push forward, lightly, on the right rear of the base while inserting the elevating pinion assembly from the left. Mesh the pinion with the teeth on the aperture until the threaded end of the pinion contacts the windage knob. Be sure the D-shaped nut in the windage knob and the elevating pinion are aligned. Tighten the nut in the center of the windage knob until you feel it resist, then back off one complete turn. This should give the correct tension to insure the rifle holds settings of elevation. When proper tension exists, you will hear sharp, distinct clicks as you adjust the elevating knob. MAKE SURE THAT THE READING WHICH WAS ON THE ELEVATING KNOB BEFORE DISASSEMBLY IS OPPOSITE THE INDEX MARK ON THE RECEIVER WHEN THE APERTURE IS AT ITS LOWEST POSITION. If not, adjust the elevating pinion assembly in its position with the aperture. When the reading is correct, tighten the elevating knob screw.

B. The Magazine. Reposition the spring inside the follower with the rectangular shaped end of the spring against the rear of the follower. Replace the follower and spring inside the magazine. Fully seat the follower. Place the top of the magazine on a flat surface and compress the spring. Hold the spring compressed with one hand and replace the magazine base by sliding it over the compressed spring as shown in Fig. **35.18.**

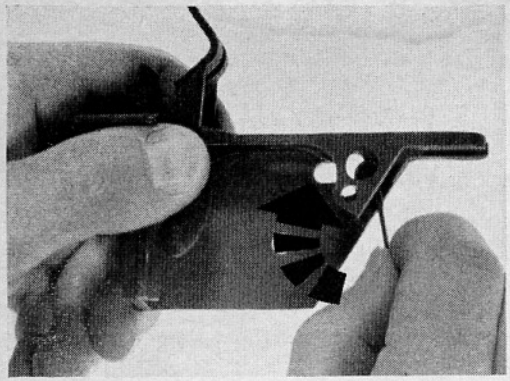
C. The Bolt. Insert the firing pin with the tang seated in its recess on the rear of the bolt. Hold the bolt in the left hand with the roller in the up position and to the right. Replace the ejector and ejector spring so that the cut on the ejector is toward the bolt roller. Replace the extractor spring and plunger. Engage the ejector with the combination tool as shown in Fig. **35.19,** being careful to push the ejector into position with the tool. When the ejector is fully seated, push the extractor into position and allow the tool to be pushed away as the extractor pushes on the screwdriver blade.



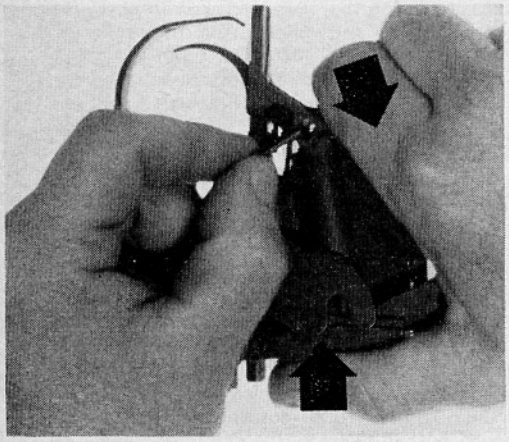
35.18 Replacing the magazine base.



35.19 Replacing extractor and ejector.



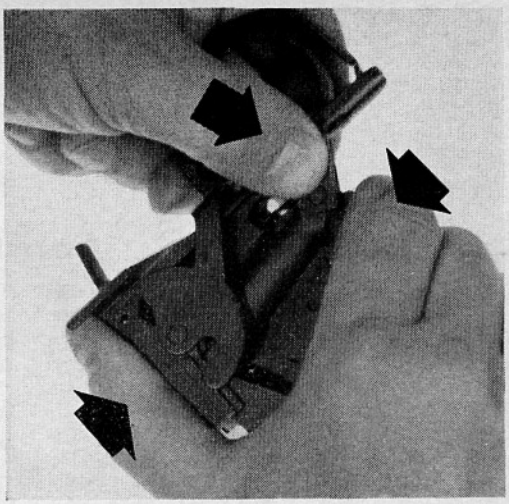
35.20 Replacing the safety spring.



35.21 Replacing the trigger pin.

D. Gas System and Handguard. Place the rifle on a flat surface, sights up and muzzle to the right. Engage the ends of the band on the handguard with the slots that are on the barrel and slide the handguard to the rear. DO NOT SNAP THE HANDGUARD INTO POSITION. Replace the front band. Slide the gas cylinder rearward through the front band. Screw the gas cylinder lock all the way down, then back it off until the loop is alined with the gas cylinder. Carefully replace the gas piston with the flat part toward the barrel and the open end toward the muzzle. Be certain that the piston moves freely and protrudes through the cylinder. Replace the gas cylinder plug and tighten it securely with the wrench of the combination tool.

E. Firing Mechanism Assembly. **1.** Hold the rear of the trigger housing with the left hand, vertical face away from you, open face to the right. Place the hammer stop (mounted on the trigger guard) over the edge of the floor of the trigger housing and just forward of the safety slot. Rotate the trigger guard down and to the left, replacing the trigger guard on the trigger housing.



35.22 Seating the trigger pin.

2. Hold the trigger housing with your left hand, vertical face to the left, open face up. Place the loop of the safety spring on its stud in the trigger housing and rotate it clockwise into position as shown in Fig. **35.20.**

3. Place the right forefinger over the safety spring stud to hold the safety spring in place. Insert the finger piece of the safety through the slot in the base of the trigger housing and turn the trigger housing over so that the open face is down. Seat the safety stud in its hole in the trigger housing with the left hand by pressing the safety down against the pressure of the safety spring.

4. Hold the trigger housing in the left hand, vertical face away from you and the open face up. Place the safety in the off position. Replace the hammer, holding it midway between the cocked and the fired positions. Be sure that the hammer toe is in front of the hammer stop on the right wing of the trigger guard. Aline the hammer pin hole in the hammer with the holes in the trigger housing and the trigger guard. The trigger guard should not be latched. Replace the hammer pin from the top and seat it firmly.

5. Assemble the hammer spring plunger, hammer spring and hammer spring housing into one unit. Hold the trigger housing in your left hand with the vertical face toward you and the open

face up. Place the plunger in its seat on the hammer. Make sure that the cut-away portion of the hammer spring housing is toward the safety. Hold these parts in place with your left thumb and insert the trigger into the trigger slot so that the notch at the curved rear surface of the finger piece bears against the rear of the slot in the trigger housing. Place the wings of the hammer spring housing astride the sear pin. With your right forefinger hooked over the sear, and your right thumb on the vertical face of the assembly, apply pressure to compress the hammer spring and aline the holes for the trigger pin. Insert the trigger pin as far as its head. See Fig. **35.21.**

6. Apply pressure with your right hand in the directions shown in Fig. **35.22** and seat the trigger pin firmly by pressing on the head with the left thumb.

F. The Barrel and Receiver Group. **1.** Lay the barrel and receiver on a flat surface, sights up, muzzle pointing away from you. Hold the roller and locking lug of the bolt with the right hand. Insert the bolt in the receiver with the rear end passing over the bridge of the receiver and the firing pin tang pointed down. Turn the bolt counterclockwise as far as necessary to cause the firing pin to clear the bridge. Guide the left locking lug of the bolt into its groove on the left side of the receiver. Lower the right locking lug on its bearing surface and slide the bolt halfway to the rear.

2. Hold the operating rod at the handle, place the front end into the operating rod guide. Position the rod so that the recess in the hump fits over the bolt roller. Turn the operating rod to the left until the guide lug will fit in the disassembly notch on the receiver. Move the operating rod forward until the bolt is closed.

3. Turn the barrel over, sights down and muzzle to the left. Place the operating rod spring guide into the operating rod spring, hump end up, and place the spring and guide inside the operating rod. Grasp the spring and guide with the left hand and compress the spring until the hole in the guide can be alined with the connector lock. Lower the guide and push the connector lock in with the right thumb.

4. Turn the barrel and receiver on its side with the operating rod handle up. Place the hole in the rear end of the connector assembly on the elongated stud of the sear release. Then place the right thumb on the rear of the connector assembly, index finger on the sear release bracket and the middle finger in the rear of the receiver. Push toward the muzzle with the right thumb and at the same time, turn the front of the assembly counterclockwise until it is lowered into the connector lock.

Operation

A. Loading. **1.** Place the safety in the safe position. **2.** Insert a loaded magazine into the magazine well, top front first. **3.** Pull backward and upward on the magazine until the magazine latch snaps into position. **4.** Pull back the operating handle and release it. The bolt will strip a round from the magazine and load it into the chamber. **5.** To load with a magazine in the weapon from the top of the receiver: insert the magazine charger in the charger guide; push the cartridges down into the magazine with either thumb; discard the charger.

B. Unloading. **1.** Place the safety in safe position. **2.** Remove the magazine. **3.** Pull the operating handle to the rear, thus extracting and ejecting the chambered round. **4.** Press in the bolt lock. When the weapon has unloaded itself through firing, the magazine follower will push up on the bolt lock, causing the bolt to be held to the rear.

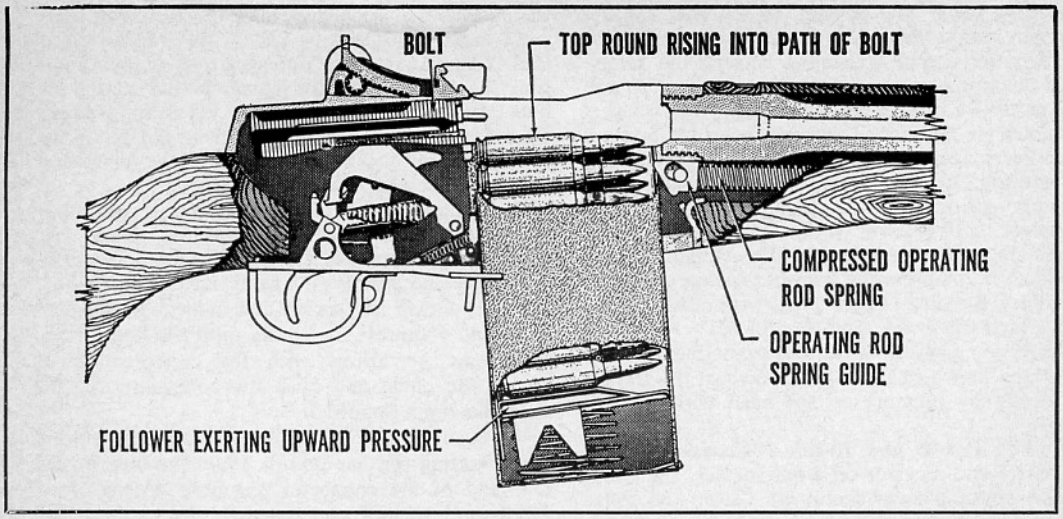
Functioning

When you press the trigger, a round is fired, the empty case is ejected, the hammer is cocked, a new round is fed into the chamber, and the rifle is ready to fire again. This action all takes place in about 1/800th of a minute. All the parts *function* in a given order known as the *cycle of operation.*

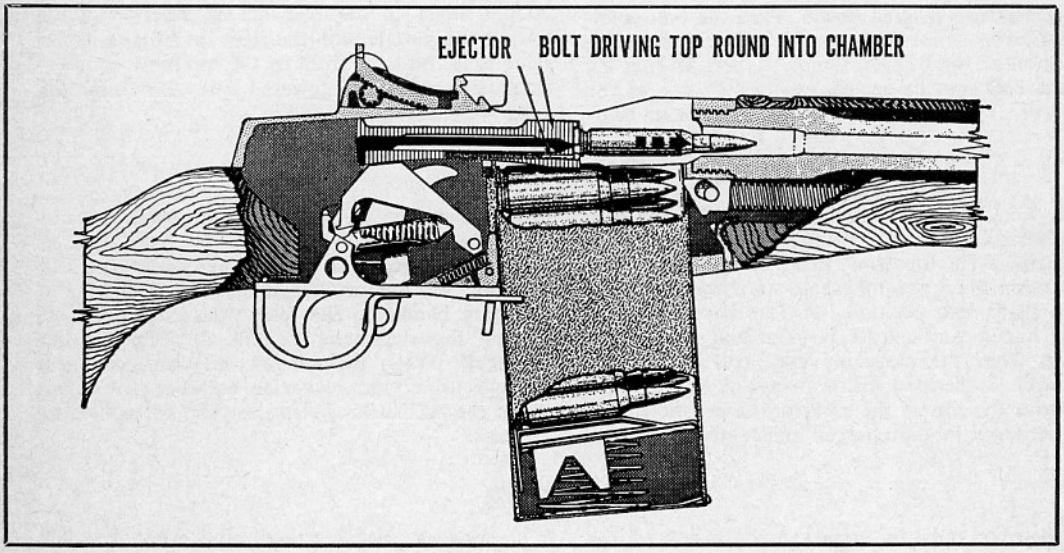
Knowledge of how each part functions in this cycle of operation will enable you to understand the cause of stoppages and to reduce them. There are eight steps in the cycle.

1. *Feeding.* Feeding takes place when a round is forced into the path of the bolt. The top round in the magazine is forced into the path of the bolt by the magazine follower rising under pressure of the magazine spring. See Fig. **35.23.**

2. *Chambering.* Chambering occurs when a round is moved into the chamber. This takes place as the bolt goes forward under pressure of the expanding operating rod spring. The bolt picks up the top round in the magazine and drives it forward into the chamber. Chambering is com-



35.23 Feeding.



35.24 Chambering.

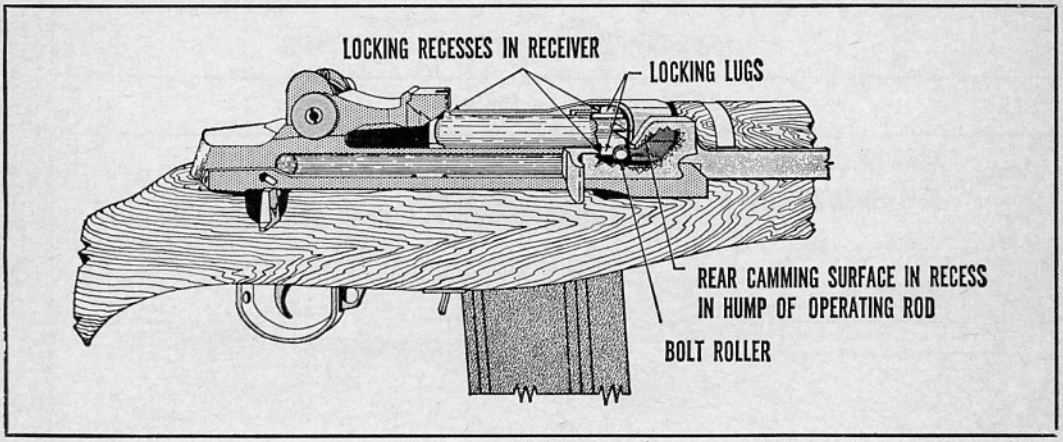
plete when the extractor snaps into the extracting groove on the cartridge and the ejector is forced into the face of the bolt. See Fig. **35.24.**

3. ***Locking.*** Locking occurs when the bolt is fully closed. This prevents loss of gas pressure until the bullet has left the muzzle. The bolt is locked by the rear camming surface in the hump of the operating rod forcing the bolt roller down. This engages the locking lugs on the bolt with the locking recesses in the receiver. Fig. **35.25.**

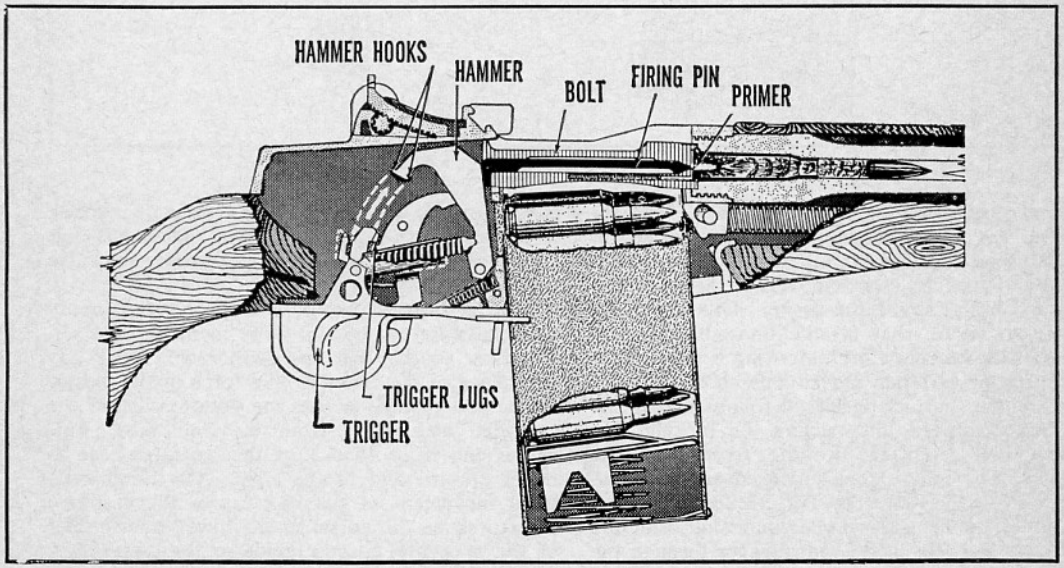
4. ***Firing.*** Firing occurs when the firing pin strikes the primer. When the trigger is pressed, the trigger lugs are disengaged from the hammer hooks and the hammer is released. The hammer

moves forward under pressure of the hammer spring and strikes the tang of the firing pin, driving the firing pin against the primer of the cartridge, activating it and firing the round. Fig. **35.26.**

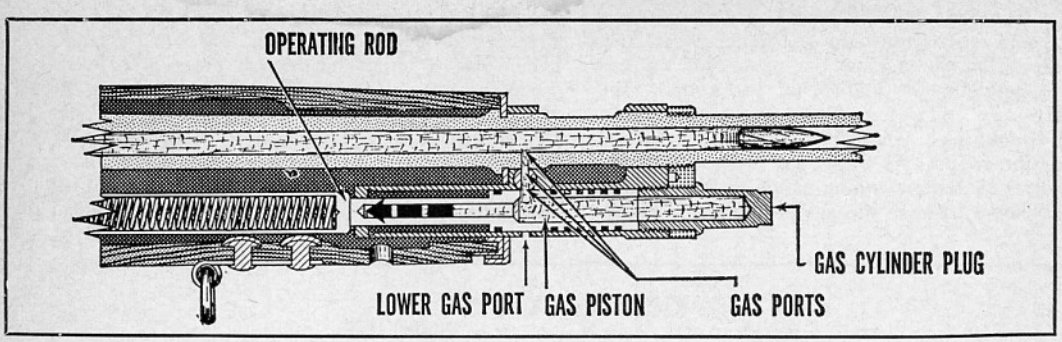
5. ***Unlocking.*** Unlocking occurs after the firing of the round. As the bullet is forced through the barrel by the expanding gases, a small amount of gas enters through the gas port into the hollow gas piston and the inside of the gas cylinder plug. The gas inside of the piston and plug expands and, when it builds up enough pressure to overcome the tension of the operating rod spring, the piston starts its rearward movement. As the piston is driven to the rear, it in turn drives the operating rod and bolt with it. When the piston has traveled slightly less than 5/32 of an inch, the gas ports are no longer alined and no more gas



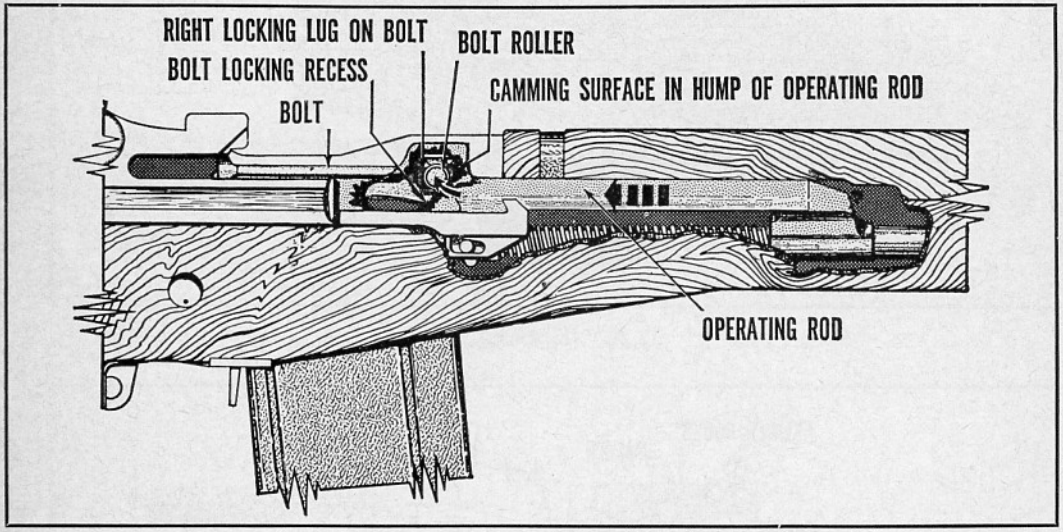
35.25 Locking.



35.26 Firing.



35.27 Action of the gas.



35.28 Unlocking.

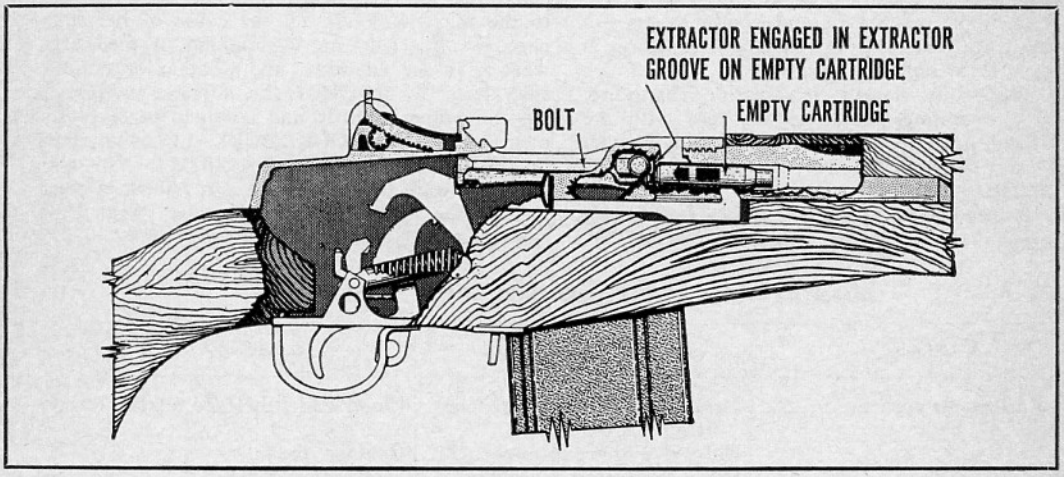
can enter the piston. (See Fig. **35.27**). The remaining gas in the barrel follows the bullet out of the barrel through the muzzle. There is about 3/8 of an inch rearward movement of the operating rod before unlocking begins. This is a safety feature to insure that all the unneeded gas has gone out the barrel before unlocking begins. After the operating rod has moved this short distance, the camming surface inside its hump forces the bolt roller upward, disengaging the locking lugs on the bolt from the locking recesses in the receiver. The bolt is thus unlocked and ready to be moved to the rear (See Fig. **35.28**). Any gas that is left in the gas cylinder or piston after the bolt is all the way to the rear escapes through the lower gas port of the cylinder.

6. ***Extracting.*** Extracting is pulling the empty cartridge from the chamber. As the bolt unlocks, slow initial extraction takes place. When the bolt is moved to the rear, it pulls the empty cartridge with it. (Fig. **35.29**).

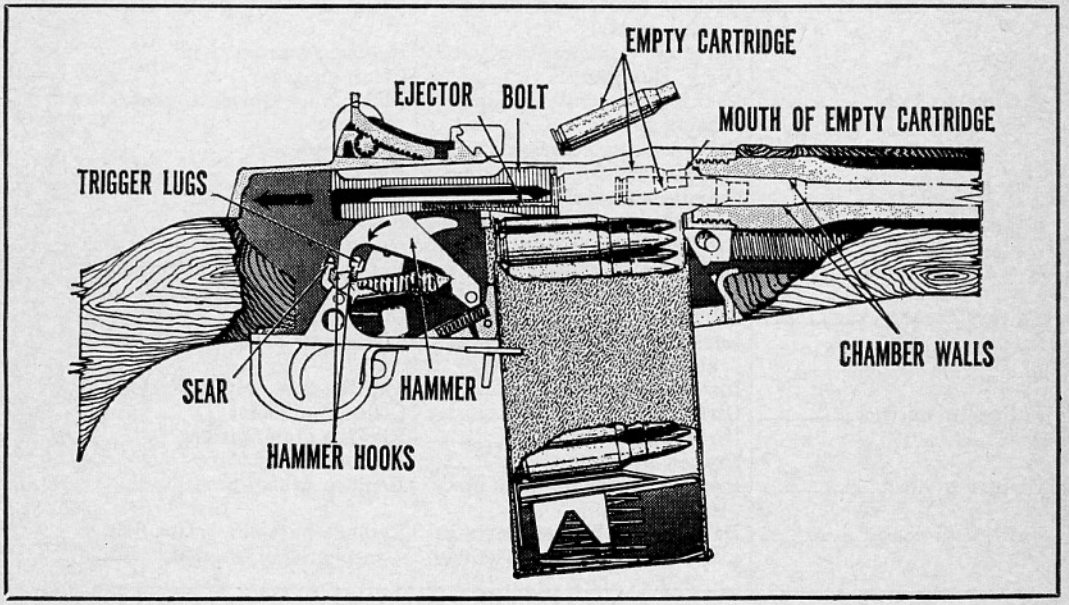
7. ***Ejecting.*** Ejecting is throwing the empty cartridge case out of and away from the receiver. As soon as the bolt has withdrawn the empty case clear of the chamber, the force of the ejector spring and plunger pushes the bottom edge of the cartridge base away from the bolt face. This causes the front (neck) of the cartridge case to move upward and to the right. The rapid rearward movement of the bolt causes the cartridge case to strike the angle on the lower right corner of the magazine charger guide as the cartridge is turned sideways. The rapid forward movement of the operating rod handle causes the leading edge

of the "camming hump" to strike the cartridge case with the angle on the outer edge of this "hump" continuing the movement of the empty case to the right front. When the last round has been fired and the bolt is held in the rearward position by the bolt lock, the ejector propels the last empty case away and out from the receiver. See Fig. **35.30.**

8. ***Cocking.*** Cocking occurs when the hammer is forced into the proper position for firing the next round. This happens as the bolt continues to the rear. The rear end of the bolt forces the hammer back and rides over it. The hammer is caught by the sear if the trigger is still held to the rear, but by the trigger lugs if the trigger pressure has been released. Fig **35.30.**



35.29 Extracting.



35.30 Ejecting and cocking.

Stoppages and Immediate Action

A. Stoppages. **1.** A stoppage is any unintentional interruption in the cycle of operation. Common causes are faulty ammunition or a faulty magazine. A stoppage may result from malfunctioning of one of the operating parts.

2. Proper care of the rifle will prevent most stoppages. When one does occur, the Marine rifleman promptly reduces it, and continues his fire mission. The first step in reducing a stoppage is to apply IMMEDIATE ACTION.

B. Immediate Action. If your rifle fails to fire, pull the operating handle to the rear with the right hand, palm up. Release the operating handle. Aim, and attempt to fire. Remember: PULL, RELEASE, AIM, FIRE.

C. Reduction of Stoppages When Immediate Action Fails. Now that you have learned the eight steps in the cycle of operation, you will be able to identify the malfunction which causes the stoppage. Further, you will be able to remedy the cause and continue with your fire mission. Here are the steps which you execute. **1.** TAKE the rifle from your shoulder. **2.** LOOK in the receiver. **3.** PULL the operating rod handle *slowly* to the rear. **4.** LOCATE the cause of the stoppage by observing the functioning of the parts, what is in the chamber, and whether or not the rifle ejects. **5.** REDUCE the stoppage by executing the proper remedy and continue to fire. Remember: TAKE, LOOK, PULL, LOCATE, REDUCE. Study the chart (Fig. **35.31**). You will note that each stoppage listed is a failure to complete a step in the cycle of operation. Also listed are the causes, and the remedy for each.

Stoppages; Their Causes and Remedies

Stoppages	Cause	Remedy
Failure to feed	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Defective or worn parts	Replace parts.
	Dirty or dented magazine	Replace magazine.
	Loose gas cylinder plug	Tighten plug.
Failure to chamber	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Defective ammunition	Replace ammunition.
	Dirty chamber	Clean chamber.
Failure to lock	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Dirty locking recesses	Clean recesses.
	Weak operating rod spring	Replace spring.
	Spindle valve closed	Open valve.
Failure to fire	Defective ammunition	Replace ammunition.
	Broken firing pin	Replace firing pin.
	Defective or broken parts in firing mechanism assembly.	Replace parts or entire firing mechanism assembly.
Failure to unlock	Dirty chamber	Clean chamber.
	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Insufficient gas	Tighten gas cylinder plugs.
Failure to extract	Dirty chamber	Clean chamber.
	Dirty ammunition	Replace ammunition.
	Broken extractor	Replace extractor.
Failure to eject	Broken ejector or weak ejector spring.	Replace faulty part.
Failure to cock	Defective or broken parts in firing mechanism assembly.	Replace parts or entire firing mechanism assembly.

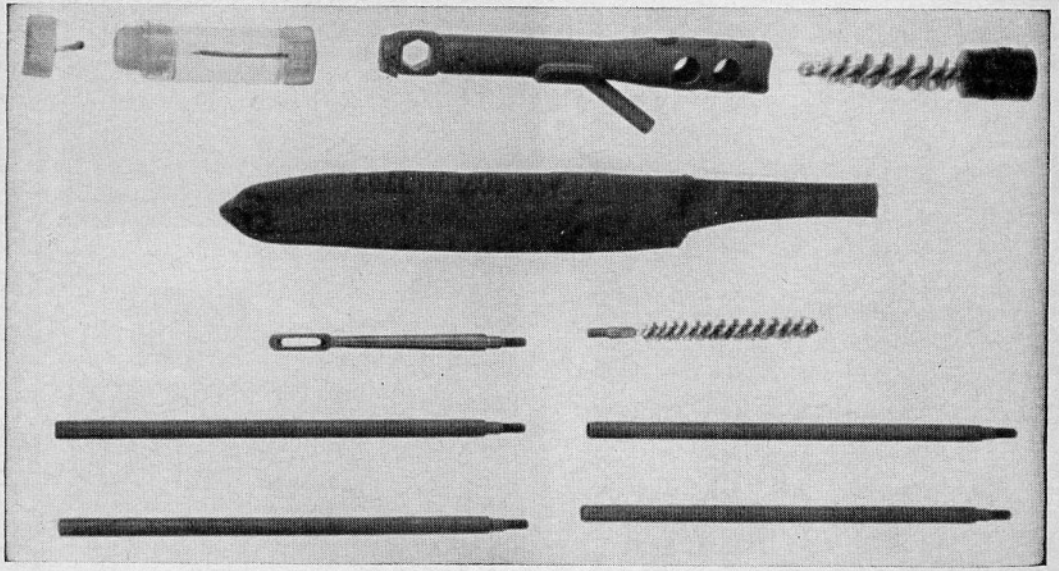
35.31 Stoppages: their causes and remedies.

Care and Cleaning

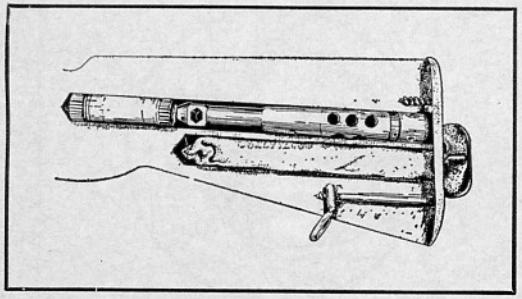
Chapter 23 provides general information concerning the care and cleaning of small arms. The following information applies specifically to the M14 Rifle.

A. Materials. **1.** Bore cleaner is used for cleaning the bore, chamber, and gas cylinder. It also provides temporary protection from rust. Hot, soapy water is an excellent substitute for bore cleaner. **2.** Patches are used to pass bore cleaner through the bore, to wipe dirt and excess oil and grease from surfaces, and to apply light coats of oil to smooth surfaces. **3.** Tooth brushes and small paint brushes make excellent cleaning tools for getting into small grooves, screw heads, and crevices. **4.** The rifle bore brush is used ONLY for cleaning the bore. It is always passed completely through the bore, NEVER moved back and forth while in the bore. **5.** *Never* dip the bolt in any cleaning agent as this could remove the lubricant from inside the bolt roller. **6.** *Never* oil gas piston or gas cylinder or use abrasives on gas cylinder assembly.

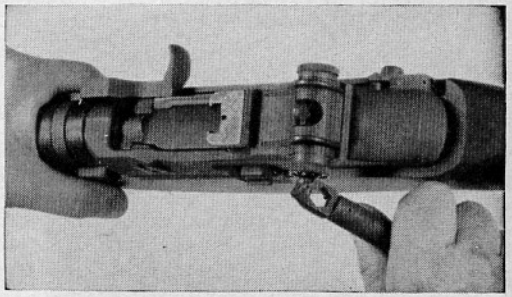
B. Equipment. Figs. **35.32** and **35.33** show the equipment issued with the rifle. All of them can be stowed in the butt stock.



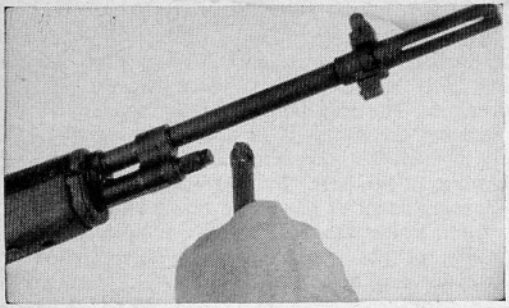
35.32 Cleaning equipment.



35.33 Stowage of cleaning equipment in butt stock.



35.34 Combination tool used as offset screwdriver.



35.35 Combination tool used as wrench.

C. Combination Tool. The combination tool can be used as an offset screwdriver (Fig. **35.34**), as a gas plug wrench (Fig. **35.35**), or as the handle for the cleaning rod.

D. Lubrication. Keep a light coat of oil on the metal parts of the rifle at all times, unless you are operating in a very dry, sandy climate. When preparing to fire the rifle, apply light quantities of lubriplate as shown in Fig. **35.36.**



35.36 Points to apply lubriplate.

Firing Positions

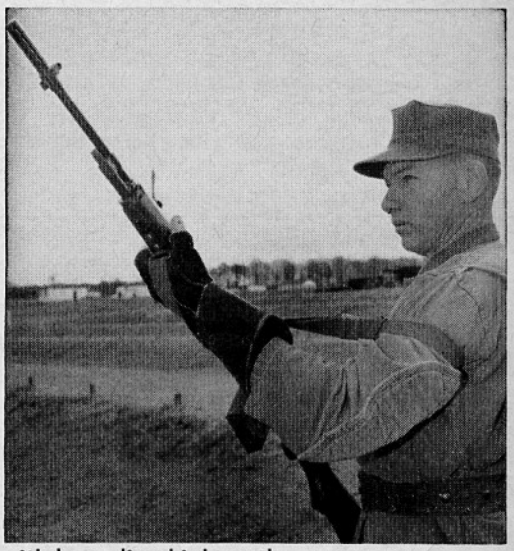
Correct positions for firing your M14 rifle are shown on the following pages. Study these pictures carefully.

THE PRONE POSITION

STEP ONE



Stand at the ready . . .



with loop sling high on the arm.

STEP TWO



Drop to the knees, holding the rifle securely.

STEP THREE



Keep right hand on stock near the heel and break fall with rifle butt.

STEP FOUR



Hit the ground with the left elbow thrown as far right and forward as possible, so that it will be under the piece when the position is completed.

STEP FIVE



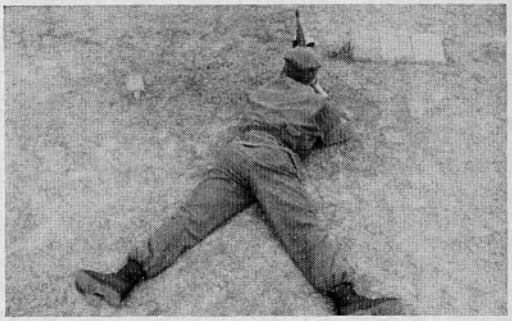
Place butt of rifle in shoulder and press cheek against stock.

STEP SIX



Grasp the small of the stock with right hand, elbow on ground.

STEP SEVEN



Feet well apart, shoulders level with the ground.

STEP EIGHT



Position of finger on trigger.



While reloading, keep left elbow and body in same position while removing magazine; brace rifle butt against deck.



Right arm rests on stock while replacing magazine.



Bolt should be released before resuming the position.

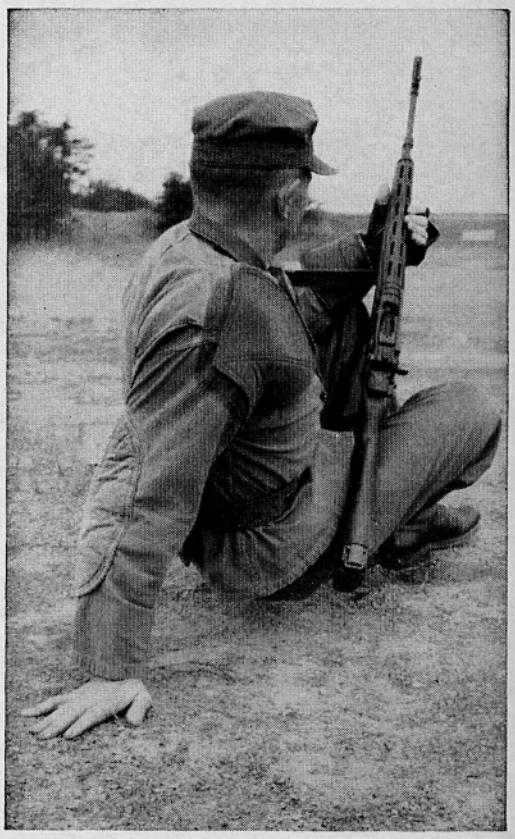
THE SITTING POSITION

STEP ONE



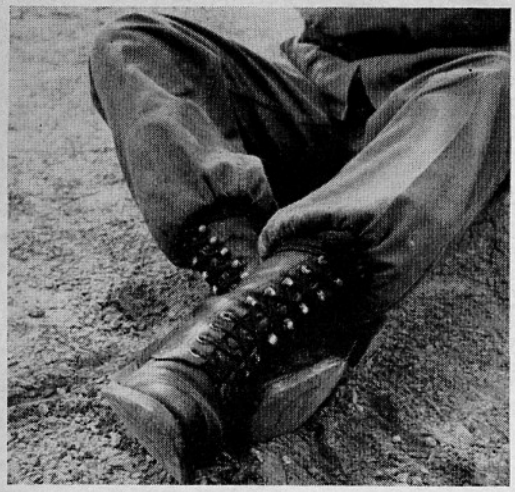
Stand at ready, loop sling high on arm, feet crossed.

STEP TWO



Drop to ground, break fall with right hand, feet in place.

STEP THREE



Feet are either crossed . . .



or placed slightly apart.

STEP FOUR



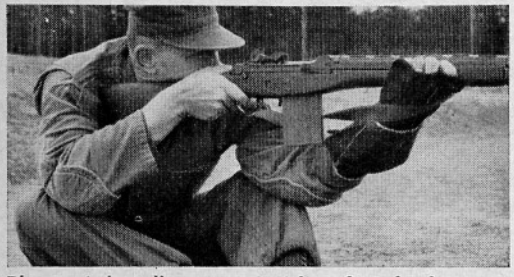
Place left elbow far down on inside of left leg.

STEP FIVE



Place butt of rifle in shoulder and press cheek against stock.

STEP SIX



Place right elbow on inside of right leg, hand gripping small of stock, ball of finger on trigger.

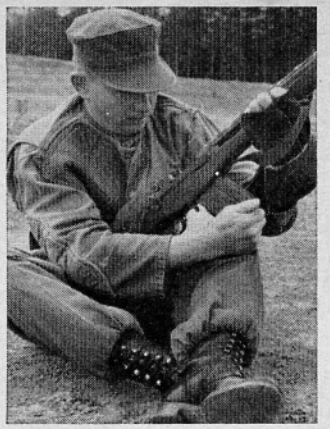


The back should be bent well forward. The closer your elbows are to the ground, the steadier you will be.

RELOADING RIFLE IN SITTING POSITION



To reload, brace the rifle butt against inside of thigh.



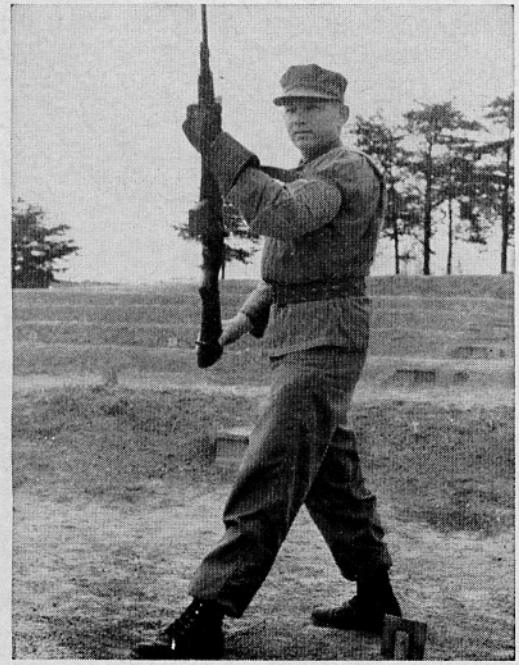
Stock is under leg when replacing magazine.



Release bolt before resuming the position.

THE KNEELING POSITION

STEP ONE



Stand at ready.

STEP TWO



Drop to right knee, right leg parallel to target; left foot at right angles to right leg, midway between foot and knee.

STEP THREE



Sit back on heel. Hold foot upright.

STEP FOUR



Place flat of elbow on flat of knee, so it will be under the piece when position is completed.

STEP SIX



Grip small of stock, elbow on line with shoulders, ball of finger on trigger.

This is a good position if properly used. Sit well forward and maintain balance. Do not use if inclined to rock backwards.

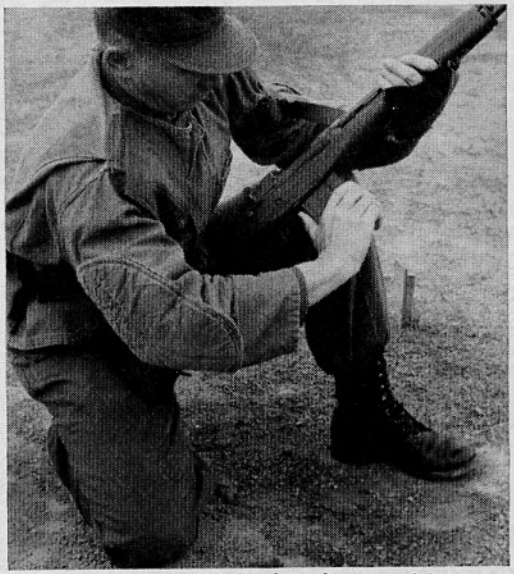


STEP FIVE



Place rifle in shoulder and press cheek against stock.

RELOADING RIFLE IN KNEELING POSITION



When reloading in the kneeling position, brace rifle butt against upper thigh to remove magazine.



While replacing magazine . . .



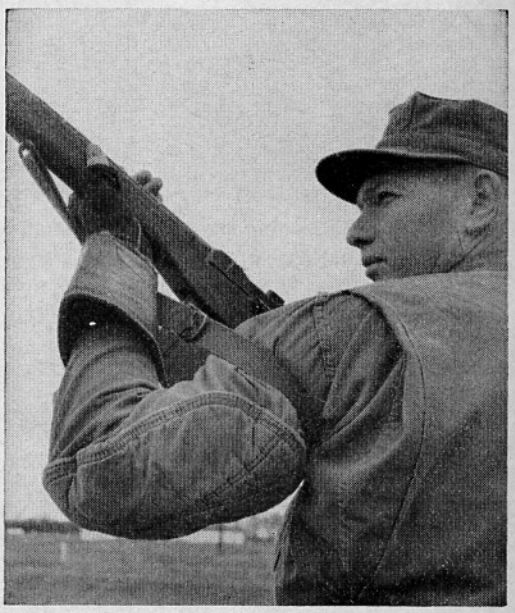
be sure to release bolt before resuming the position.

THE STANDING POSITION

STEP ONE

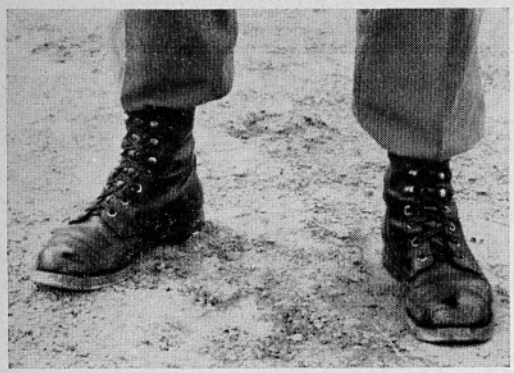


Stand at the ready . . .



with hasty sling high on the arm . . .

feet a comfortable distance apart, ensuring perfect balance. Equal weight on both feet.



STEP TWO



Place rifle in shoulder, holding left arm under the rifle in the most comfortable and balanced position.

STEP TWO (cont.)



Left hand should be forward of the balance of the piece.

STEP THREE



Grip small of stock, holding right elbow in line with, or above, shoulder.



Body erect.

Sight Setting

The rear sight is adjusted for range by turning the elevating knob. This knob has numbered graduations for 200, 400, 600, 800, 1000, and 1200 meters of range and index lines between these graduations for 100, 300, 500, 700, 900 and 1100 meters. Adjustment for windage is made by turning the windage knob. Each windage graduation on the receiver represents an angular adjustment of 4 minutes. Elevating and windage knobs are graduated in "clicks" which represent 1 minute of angle or approximately 1 inch on the target for each 100 meters of range. Arrows on the knobs indicate the direction in which to turn them to obtain corresponding changes in the point of impact.

Conversion to Automatic Fire

Your M14 rifle can be converted to fire automatically, although some are issued in the converted stage. When converted, the M14 will fire automatically or semiautomatically by the proper positioning of the selector. When the "A" on the selector faces you, with your rifle in firing position, your rifle will deliver automatic fire so long as the trigger is kept pulled and the ammunition lasts. In darkness, you can determine the position of the selector by touch since, when the lug end of the selector is up, the rifle is set to deliver automatic fire.

1. The M14 Rifle is modified to fire selectively (automatically or semiautomatically) by removal of the selector lock and the replacement of this part with a selector and selector spring. This operation should be performed only by a qualified armorer who has the proper tools. However, every Marine should know how the conversion is accomplished and understand the functioning of the rifle whenever automatic fire is delivered. The following paragraphs provide this information.

a. Converting to fire selectively.

(1) The rifle is separated into the three main groups and the connector assembly is removed. The barrel and receiver group is laid down, sights up, and the muzzle pointed away from the person making the changes. A drift pin is used to drive out the selector shaft pin. See Fig. **35.37.**

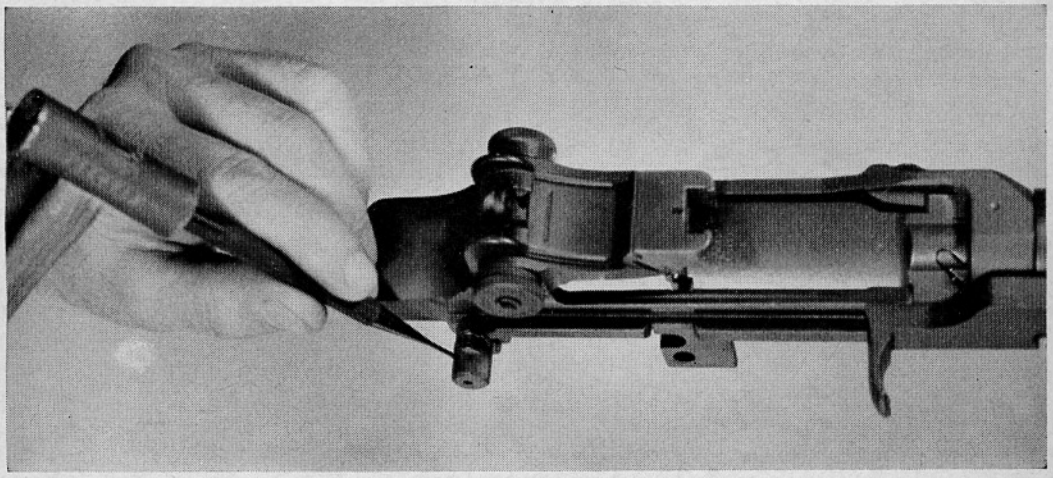
The selector shaft lock is then removed. THE SELECTOR SHAFT IS HELD IN POSITION. The rifle is then turned over with the sights down. The selector spring and selector are placed on the selector shaft and the spring is compressed while the selector is rotated until the point of the selector shaft engages in the recess of the selector. The holes of the selector and shaft will then be in alignment. The selector shaft pin is replaced and the connector assembly is then replaced on the barrel and receiver group. The rifle is then reassembled.

(2) To convert back to semiautomatic fire only, the aforementioned process is simply reversed.

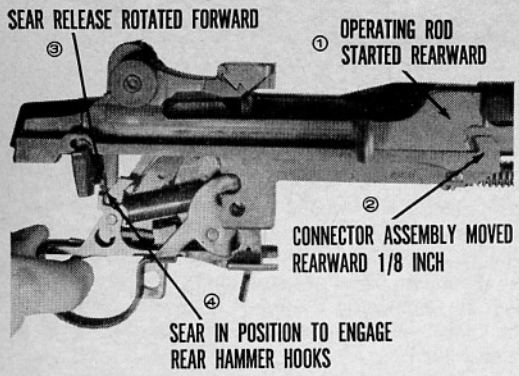
b. Functioning of the M14 when firing automatically.

(1) The selector is set for automatic fire. (Remember to have the "A" facing you when you are in firing position). Turning the selector to the "A" (automatic) position rotates the sear release until it is in a position to make contact with the sear.

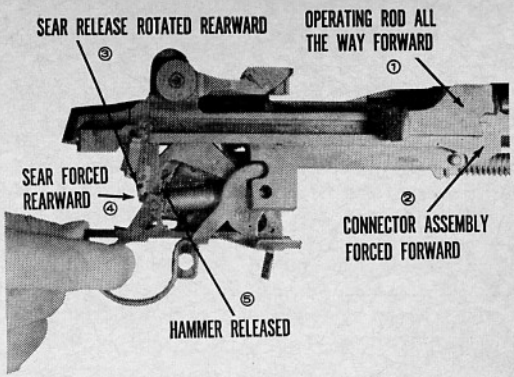
(2) The first round is fired and the trigger is held to the rear. The operating rod starts its rearward movement under pressure of the expanding gases. As the operating rod comes to the rear, the connector assembly moves rearward one-eighth of an inch under pressure of the connector assembly spring. This movement rotates



35.37 Removing the selector shaft pin.



35.38 Effects of rearward movement of connector assembly.



35.39 Effects of forward movement of connector assembly.

the sear release on the selector shaft so that the flange on the sear release allows the sear to move forward in position to engage the rear hammer hooks. (See Fig. **35.38**). Then, when the bolt drives the hammer to the rear, the sear engages the rear hammer hooks and the hammer is held in the cocked position.

(3) The bolt then moves forward and locks, and the shoulder on the operating rod engages the hook of the connector assembly, forcing it forward one-eighth of an inch. This rotates the sear release on the selector shaft, thus causing the flange on the sear release to push the sear to the rear. As the sear is forced to the rear, it disengages from the rear hammer hooks (Fig. **35.39**). The hammer then goes forward under action of the hammer spring, IF THE TRIGGER IS HELD TO THE REAR. Should the trigger be released at any time prior to the firing of the last round in the magazine, the hammer will be held in the cocked position by the trigger lugs, and automatic actuation of the sear release by the connector assembly will not take place.

RIFLE BIPOD M2

When your rifle is one which has been modified to fire automatically, it will be equipped with a bipod. The bipod and hinged butt plate provide the stability necessary to deliver well aimed automatic fire.

The Rifle Bipod, M2, is designed especially for



35.40 The M14 Rifle, showing Rifle Bipod M2, mounted in firing position.

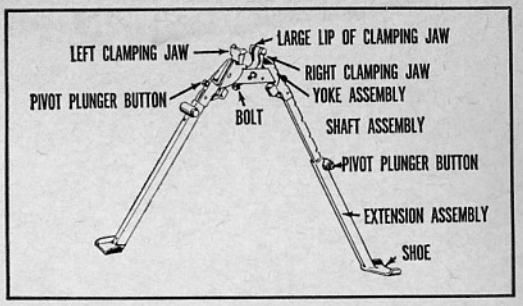
the M14 Rifle. (Fig. **35.40**) It is a light, folding, portable mount consisting of three major assemblies. These are: the yoke assembly; the right leg assembly; and the left leg assembly. The yoke assembly holds two clamping jaws, which clamp to the gas cylinder and gas cylinder lock. The jaws are locked in position by a bolt located on the lower portion of the right hand clamping jaw. The right and left leg assemblies are composed of the left and right shafts and the left and right extension assemblies. Each shaft slides within its corresponding extension assembly. Each leg assembly can be set at any of five positions by pushing in on the pivot plunger button and sliding the leg assembly up or down the shaft. Release of the pivot plunger button locks the leg assembly in the desired position.

Two other pivot plunger buttons, mounted on each leg assembly up near the yoke, control the rotating of the legs for firing or folded positions. (See Fig. **35.41** for location of the parts just named.)

The legs of the bipod should be folded flush against the forearm when the rifle is being carried or stored, as shown in Fig. **35.43.** The pivot plunger buttons mounted near the yoke will hold the leg assemblies in this position.

To remove the bipod from the rifle, use the hexagon wrench end of the combination tool as shown in Fig. **35.42.** The bolt which secures the jaws has a nylon pellet imbedded in the bolt body. Therefore it turns tightly in the hole, whether or not the clamping jaws are tight. When loosening the bolt, do not attempt to remove it completely from the clamping jaw since the end of the bolt has been bradded to prevent its being separated from the clamping jaw.

When the bolt has been loosened, the clamping jaws will expand from around the gas cylinder and gas cylinder lock. The bipod can then be removed by sliding it toward the muzzle of the rifle.



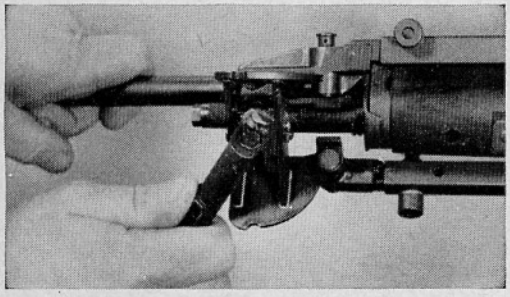
35.41 Rifle Bipod M2, as viewed from the rear.

When replacing the bipod, make certain that the large lips of the clamping jaws point toward the muzzle of the rifle. (Fig. **35.40**)

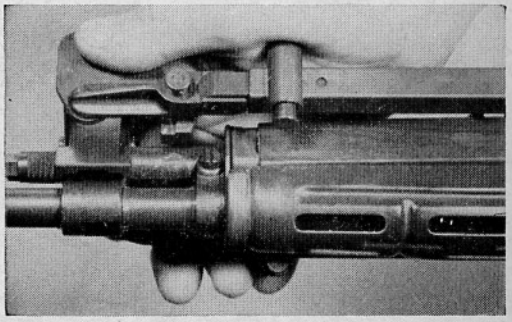
The bipod will rotate freely for 15 degrees in either direction from center. This avoids canting of the rifle when the bipod is resting on gently sloping ground. For steep slopes, one leg is adjusted up or down until the rifle is level.

When firing the rifle with the bipod in use, the hinged butt plate is raised and placed on top of the shoulder.

To work properly, the sliding shafts and other working surfaces of the bipod should be kept clean and have a light coat of oil placed on them. The bipod is made of aluminum and requires nominal care to prevent corrosion. However, the hinged butt plate is of steel and must be kept clean and lightly oiled at all times.



35.42 Loosening the hexagon-shaped nut with the combination tool in preparation for removing the bipod from the rifle.



35.43 Legs in folded position for carrying or storing the rifle.



The M60 Machine Gun

MARINES know machine guns well and use them extensively in combat. The guns are light and can be carried in the *attack*. Quite often they are advanced with the riflemen until the moment of the *assault*. At other times they are employed in groups, firing from a dominating *terrain* feature, and delivering large volumes of sustained, well-aimed fire on the objective. Either way, machine guns provide an effective *base of fire*. They gain and maintain *fire superiority* over the enemy, enabling the riflemen to close upon and seize the objective.

Machine guns form the backbone of a Marine unit in the *defense*. They are emplaced to cover avenues of approach and to deliver interlocking bands of *grazing fire* across the entire front of the Marine position. The guns fire on targets of opportunity which appear in their *sector of fire*. When the enemy launches an assault on the Marine position, the guns shift their fires to *final protective lines*. Each gun's fire crosses with one or more other guns. Thus, several interlocking bands of grazing fire are delivered across the front, forming a barrier of steel through which the enemy must pass. Barbed wire and mines form *obstacles* which channel the enemy troops into areas where the cross fire is heaviest. In this way the enemy assault is broken. (The terms shown in italics are defined in Chapter 3.)

Successful employment of the machine gun depends upon the knowledge and skill of the machine gunner. He must know it thoroughly and be able to keep it in operation by proper care and the prompt reduction of stoppages. This chapter describes the gun and all its parts; tells how to disassemble and assemble the gun; shows how the gun functions; explains common causes of stoppages and how to reduce them; and gives proper instructions for care and cleaning of the gun. Learn these items well and keep your gun firing in support of the riflemen.

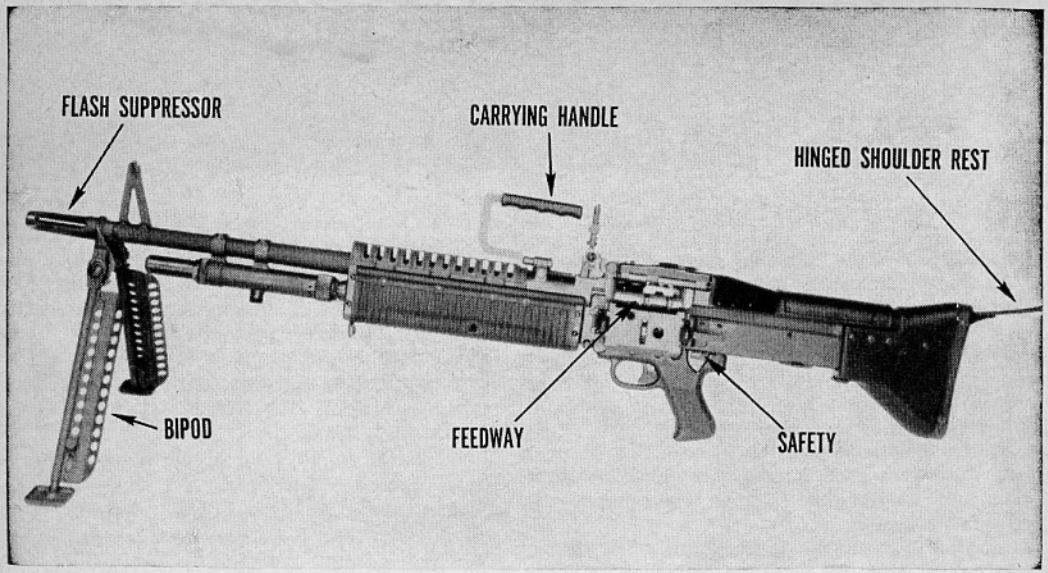
General Description and Characteristics

The Machine Gun, 7.62-mm., M60, is a *belt-fed, gas-operated, air-cooled, automatic weapon*. Cartridges are identical to those used in the M14 Rifle. They are fed into the gun by means of a metallic link belt, the individual links of which separate as the cartridges are stripped from the belt. The gun fires from the open bolt position and has a quick change barrel with fixed headspace. Expanding gases from the fired rounds drive the bullets through the barrel and also provide the energy to operate the gun. When the safety (located on the trigger housing) is set on the SAFE position, the bolt cannot be pulled to the rear or allowed to go forward. The flash suppressor on the front of the barrel dissipates muzzle flash and smoke and reduces the dust kicked up during firing.

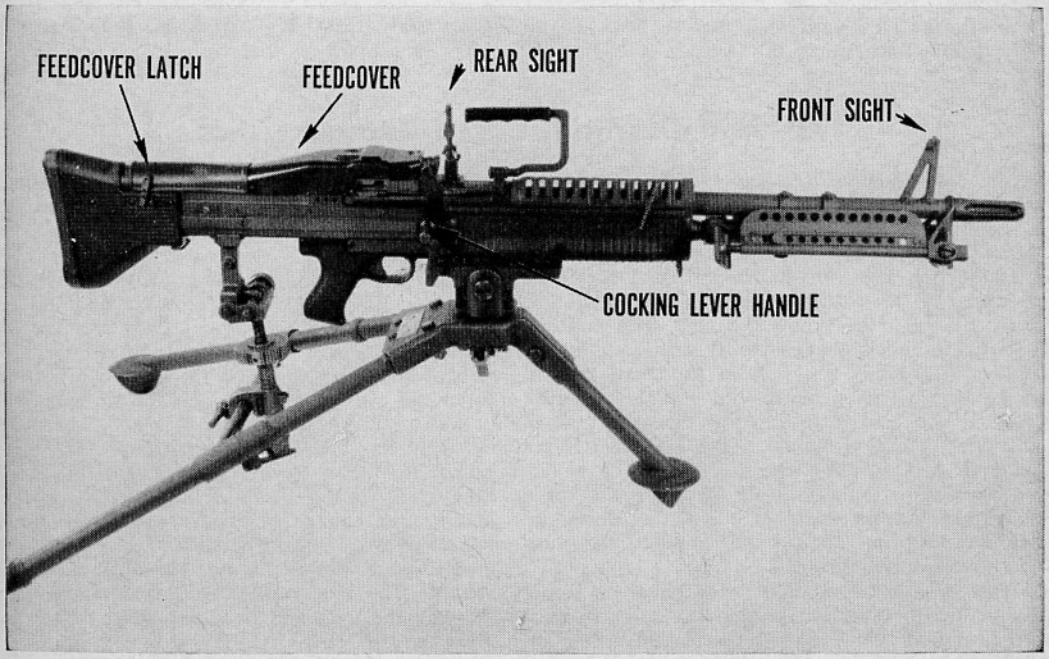
The M60 can be fired from either a bipod mount which is affixed to the barrel, or from a tripod mount, which is carried separately while on the march. The hinged shoulder rest provides support for the rear of the gun when the bipod is used. The tripod permits delivery of a high degree of accurate and controlled fire. Both mounts are pictured with the gun in Fig. **36.1(1)** and **36.1(2)**.

The front sight of the gun is fixed to the barrel. The rear sight (Fig. **36.2**) can be adjusted for both windage and elevation. One click of the traverse (windage) knob equals one mil of deflection change. The slide on the rear sight is used for major changes in range. It can be moved up or down, thereby increasing or decreasing range, by depressing the slide release. Minor changes in range are made by use of the elevating knob. Four clicks of the elevating knob equal one mil of elevation change. The rear sight is graduated for range in increments of 100 meters. The lowest graduation is 300 meters and the highest is 1,100 meters. The rear sight is folded forward when carrying the gun, and is raised when laying and firing the gun.

The cocking lever handle, mounted on the right side of the gun, is used to pull the bolt to



36.1(1) Machine Gun, 7.62-mm., M60, Bipod mounted.



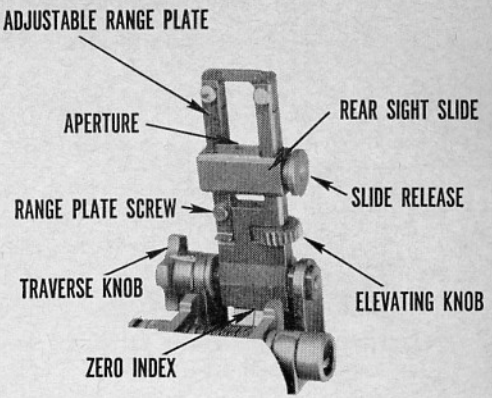
36.1(2) Machine Gun, 7.62-mm., M60, Tripod mounted.

the rear. IT MUST BE RETURNED TO ITS FORWARD POSITION EACH TIME THE BOLT IS MANUALLY PULLED TO THE REAR. Failure to do this will result in the cocking lever handle traveling forward rapidly when the trigger is pulled. This may cause injury.

Other important characteristics of the M60 are as follows:

OVERALL LENGTH	43½ inches
WEIGHT OF GUN	23.16 pounds
WEIGHT OF TRIPOD MOUNT, M122	19.5 pounds
RANGES:	
MAXIMUM	3,750 meters
MAXIMUM EFFECTIVE	1,100 meters
RATES OF FIRE:	
CYCLIC	550 rounds per minute (approx.)
SUSTAINED	100 rounds per minute for 10 min.
RAPID	200 rounds per minute for 2 min.

The M60 is easily taken apart and put together. No force is required. A cartridge and the combination wrench are the only tools required. Disassembly can be *general* or *detailed.*

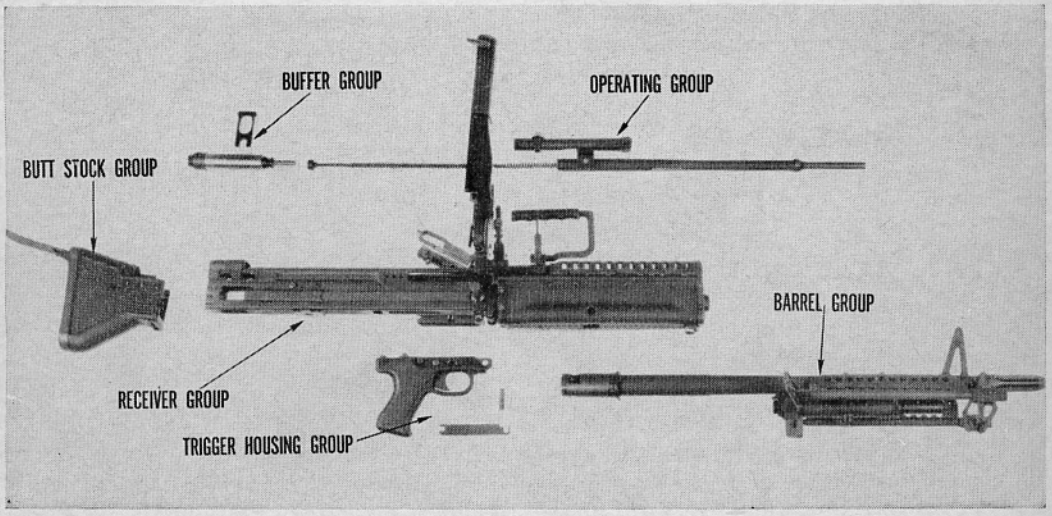


36.2 Rear Sight.

General Disassembly and Assembly

General disassembly involves removal of the *six major groups,* which are: *the butt stock group; buffer group; operating group; trigger housing group; barrel group; and receiver group.* As you remove these groups from the gun, lay them in order on a poncho or newspaper spread on a flat surface. This will enable you to learn the names of the parts, see their relationship with one another, and assemble them in proper sequence. Figure **36.3** shows the gun disassembled into the six major groups.

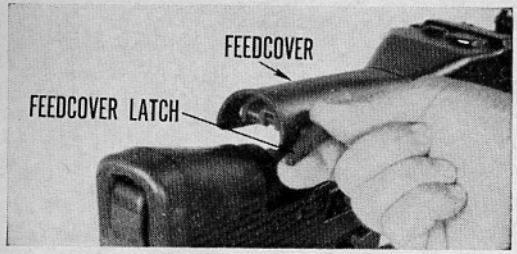
A. Disassembly. This begins with the bolt for-



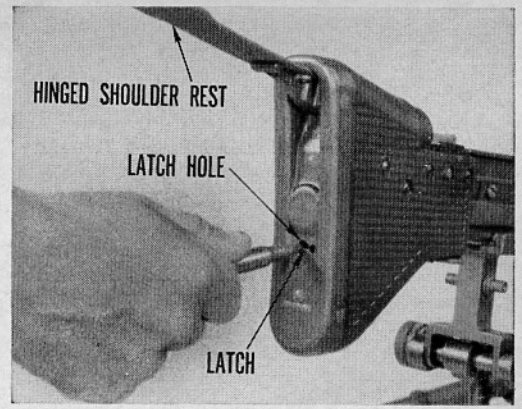
36.3 Six major groups disassembled.

ward, the feedcover closed, and the safety set on the FIRE position. Then follow the steps shown in Figures **36.4(a)** through **36.9.**

1. Removing the Butt Stock Group.

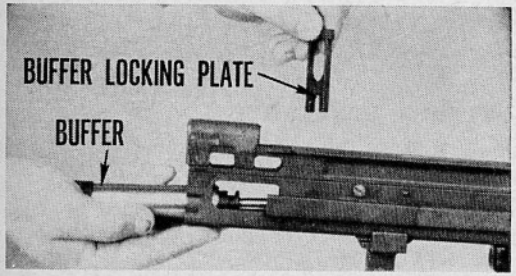


36.4(a) Turn the feedcover latch clockwise and raise the feedcover.

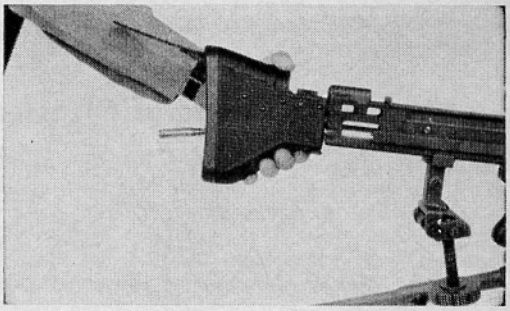


36.4(b) Raise the hinged shoulder rest and insert the nose of a cartridge into the latch hole, thereby depressing the latch.

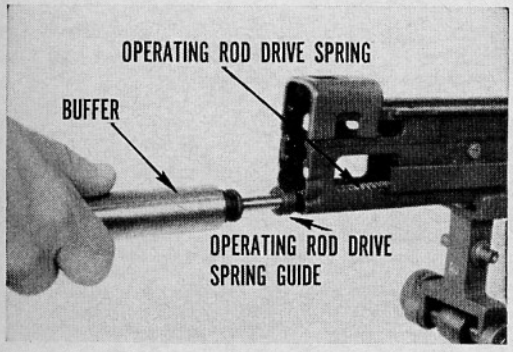
2. Removing the Buffer Group.



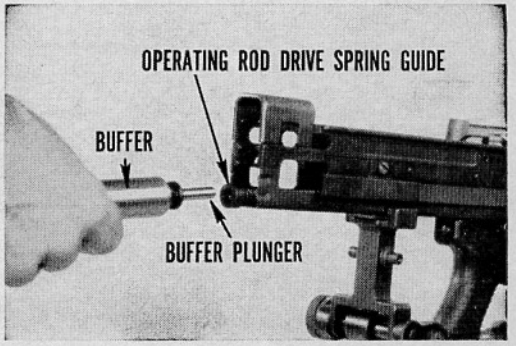
36.5(a) Press in with the palm against the exposed buffer group and remove the buffer locking plate from the top of the receiver.



36.4(c) Leaving the cartridge depressing the latch, remove the butt stock group by pulling to the rear.

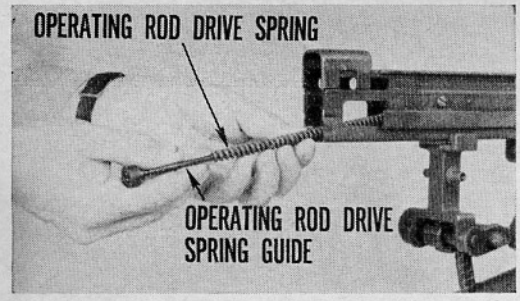


36.5(b) Withdraw the buffer slowly, allowing the operating rod drive spring to expand until the end of the operating rod drive spring guide is exposed at rear of receiver.



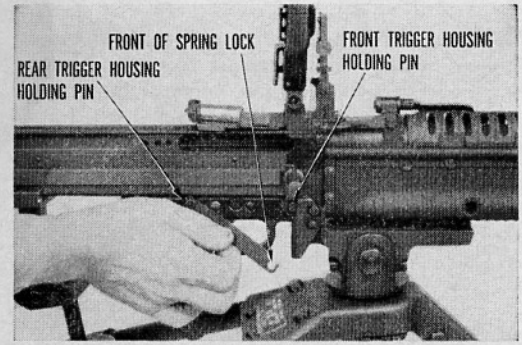
36.5(c) Remove the buffer by pulling the buffer plunger from the operating rod drive spring guide.

3. Removing the Operating Group.

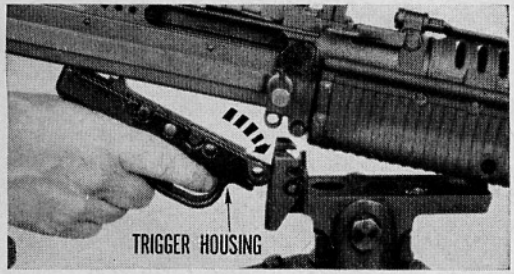


36.6(a) Pull the operating rod drive spring and guide from the receiver. Separate them.

4. Removing the Trigger Housing Group.



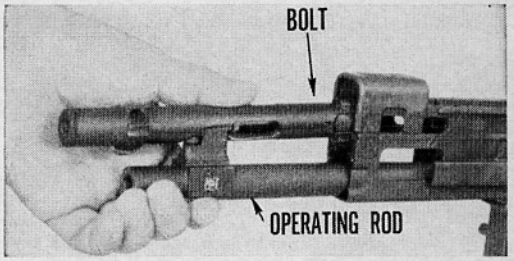
36.7(a) Press in on the front of the spring lock and rotate the front end down, clearing the front trigger housing holding pin. Then disengage the rear of the spring lock from the rear trigger housing holding pin.



36.7(c) Slide the trigger housing forward slightly, then rotate the front downward and remove the trigger housing group.



36.6(b) Pull the cocking lever handle to the rear until the bolt and operating rod are separated from the barrel socket and are halfway to the rear. Continue pulling the operating rod and bolt to the rear by pushing rearward on the actuating cam roller.

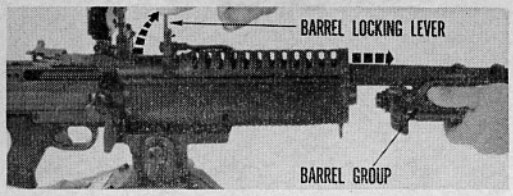


36.6(c) When about four inches of the bolt is exposed, grasp the bolt and operating rod securely to prevent rotation of the bolt. Remove them from the receiver, relax your grip slightly, allowing the bolt to rotate slowly. Leave bolt and operating rod together.



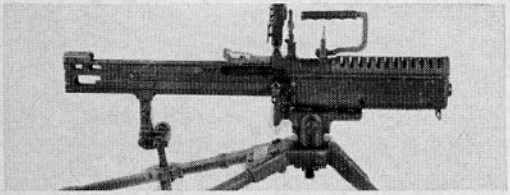
36.7(b) If the gun is tripod mounted, release the traversing bar slide from the traversing bar. Depress the rear mounting lug and raise the rear of the gun slightly. Remove the front trigger housing holding pin to the left.

5. Removing the Barrel Group.



36.8 Raise the barrel locking lever to the vertical position. Remove the barrel group (consisting of the flash suppressor, front sight, bipod assembly, gas cylinder and barrel) to the front.

6. The Receiver Group.

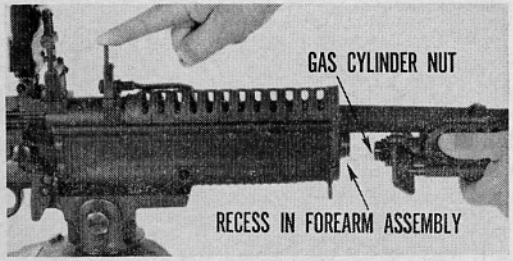


36.9 The receiver group remains after removal of the other five groups.

This completes general disassembly of the gun. Before you assemble the six major groups, study them and compare them with Fig. **36.3**. Learn the names of the groups and their component parts that you have studied thus far. Notice the relationship of the groups to each other. When you assemble the other five groups into the receiver group, follow the steps in the next section.

B. Assembly.

1. Replacing the Barrel Group.



36.10(a) Insure that the barrel locking lever is in the vertical position. Insert the rear of the barrel under the barrel cover and aline the gas cylinder nut with its recess in the forearm assembly. Push the barrel home and lower the barrel locking lever.

2. Replacing the Trigger Housing Group.

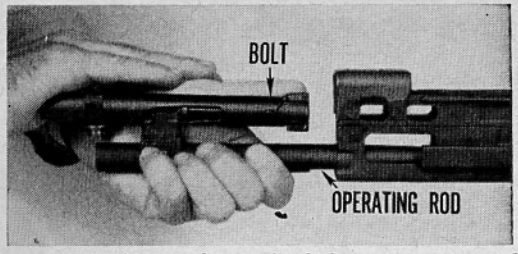


36.11(a) Depress the rear mounting lug and raise the rear of the gun (if gun is on tripod). Engage the notched detent of the trigger housing in the recess on the bottom of the receiver. Rotate the front of the trigger housing upward and aline the holes of the trigger housing with the mounting bracket on the receiver. Insert the front trigger housing holding pin from the left.

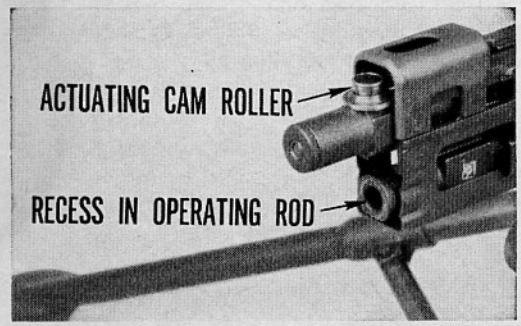


36.11(b) Replace the traversing bar slide on the traversing bar (if gun is on tripod). Engage the rear of the spring lock with the rear trigger housing holding pin. Insure that the spring lock is positioned so that the front must be pushed against the receiver to be positioned on the front trigger housing holding pin. Rotate the front of the spring lock up and engage it with the front trigger housing holding pin.

3. Replacing the Operating Group.

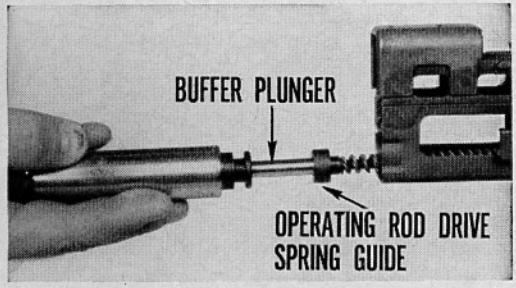


36.12(a) Insert the end of the operating rod into the receiver, holding the operating rod firmly, push forward on the rear of the bolt, causing it to rotate.

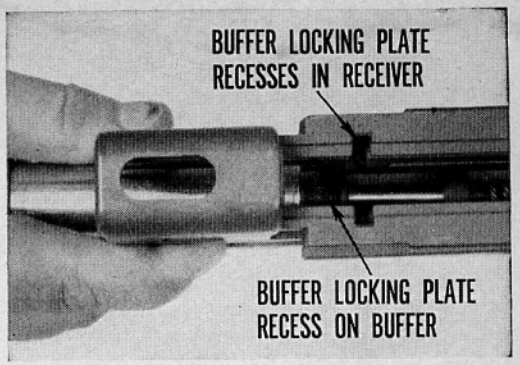


36.12(b) Push the operating rod and bolt into the receiver, with the actuating cam roller up, until the end of the operating rod is even with the rear of the receiver. Insert the operating rod drive spring guide into the operating rod drive spring and insert them into the recess in the end of the operating rod.

4. Replacing the Buffer Group.



36.13(a) Insert the buffer plunger into the operating rod drive spring guide. Pull the trigger and push forward on the buffer until the operating rod and bolt go fully forward.



36.13(b) Push in on the buffer until the buffer locking plate recesses on both the buffer and receiver are aligned. Replace the buffer locking plate.

5. Replacing the Butt Stock Group.



36.14(a) Aline the guide rails of the butt stock group with the guide rails on the receiver. A distinct click will be noted when the latch engages.

6. Checking For Correct Assembly Of Parts In The Receiver. When all parts are replaced in the receiver, pull the cocking lever handle to the rear and push it forward. Close the feedcover and pull the trigger. The operating rod drive spring will cause the parts to go forward.

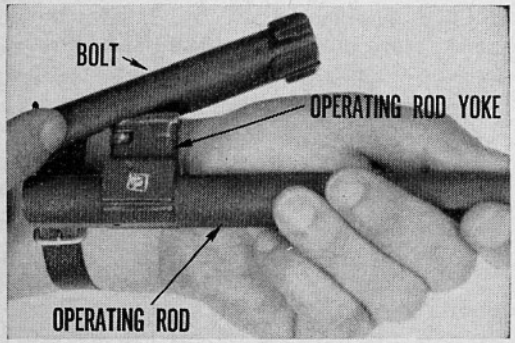
Detailed Disassembly and Assembly

Detailed disassembly involves the separation of the component parts of each of the six major groups except the butt stock and buffer group. As you disassemble these groups, keep the parts of each group close together and study their names.

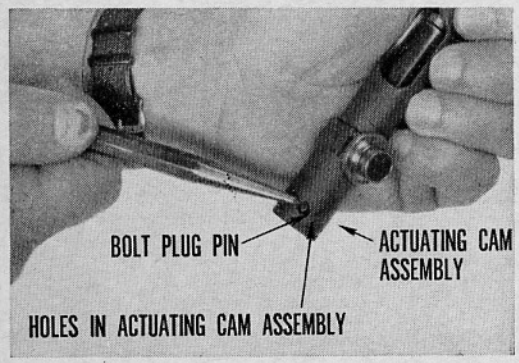
Learning the names of these parts is a necessary step in understanding the functioning of the machine gun.

A. Operating Group.

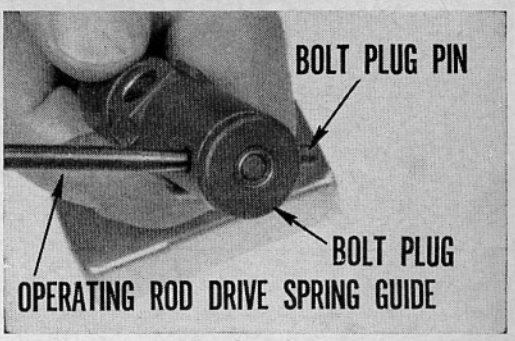
1. Disassembly.



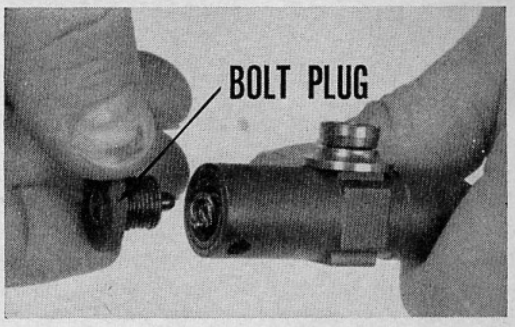
36.15(a) Grasp the operating rod securely in one hand with the bolt in the other. Push forward on the bolt; pivot the front of the bolt up and disengage it from the operating rod yoke.



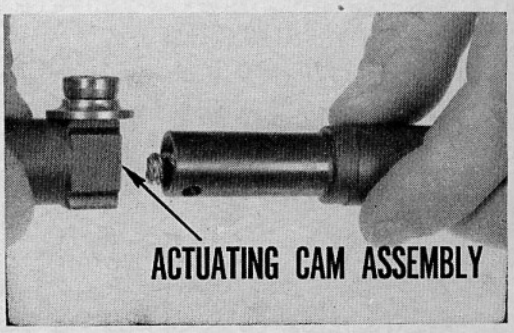
36.15(b) Rotate the actuating cam assembly until the holes are aligned with the bolt plug pin.



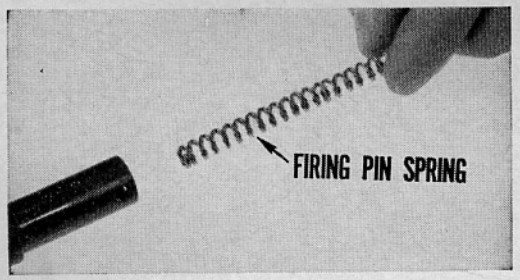
36.15(c) Use the end of the operating rod drive spring guide as a drift to remove the bolt plug pin.



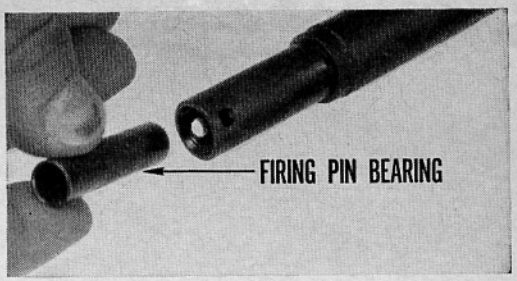
36.15(d) Unscrew and remove the bolt plug.



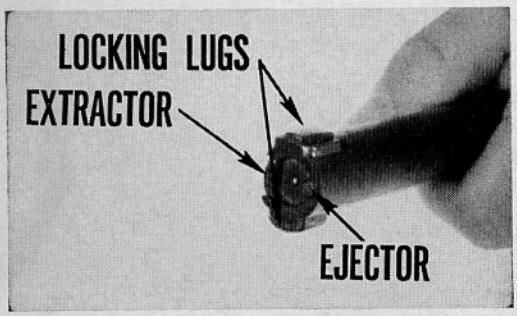
36.15(e) Remove the actuating cam assembly by pulling it from the rear of the bolt.



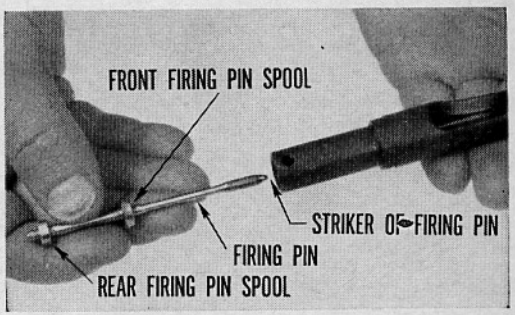
36.15(f) Remove the firing pin spring from the bolt body.



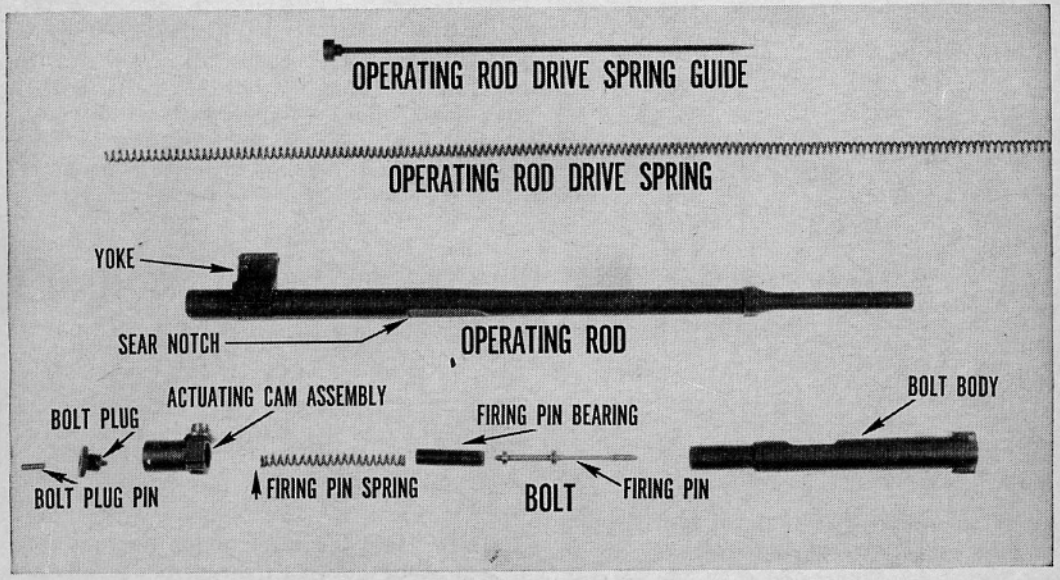
36.15(g) Remove the firing pin bearing from the bolt body.



36.15(h) Leave the extractor and ejector assembled in the bolt body.

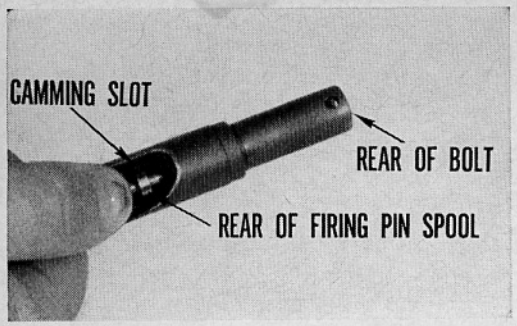


36.15(i) Remove the firing pin from the bolt body.

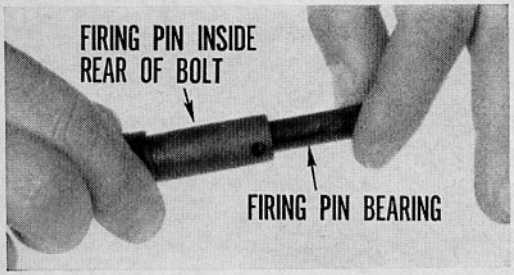


36.15(j) Operating group disassembled in detail.

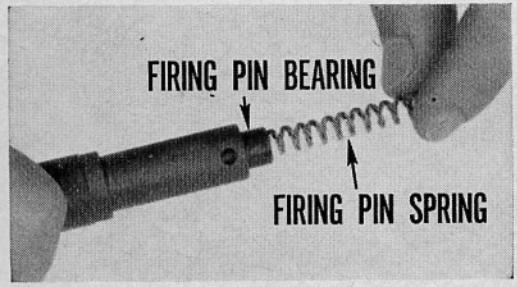
2. Assembly.



36.16(a) Hold the front of the bolt in the palm of your hand. Place your thumb in the camming slot of the bolt and insert the firing pin into the rear of the bolt body until the rear firing pin spool rests against the thumb.



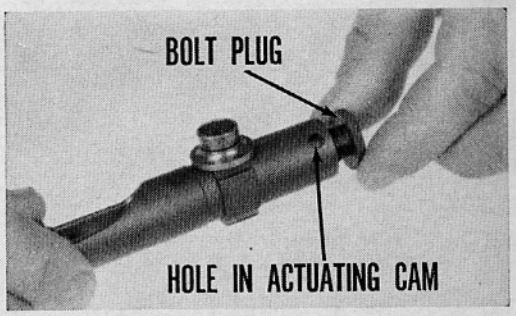
36.16(b) Position the firing pin bearing over the end of the firing pin.



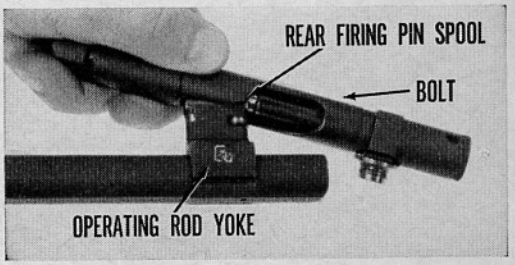
36.16(c) Position the firing pin spring within the firing pin bearing. Remove your thumb from the camming slot and allow the parts to slide down into the bolt body.



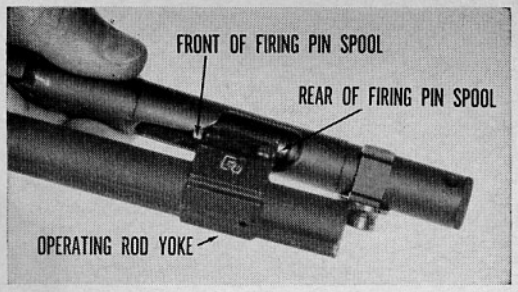
36.16(d) Place the actuating cam assembly over the rear of the bolt with the actuating cam roller toward the front of the bolt.



36.16(e) Screw the bolt plug finger-tight into the bolt body. Unscrew the bolt plug until the hole in it and the hole in the actuating cam assembly are alined. Insert the bolt plug pin and fully seat it in the actuating cam assembly so that the actuating cam assembly rotates freely around the bolt.



36.16(f) Hold the front of the bolt securely in one hand. Position the rear of the operating rod yoke against the rear firing pin spool.

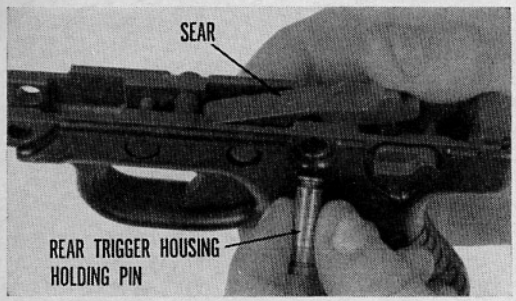


36.16(g) Push on the operating rod, thereby compressing the firing pin spring, and position the operating rod yoke between the spools on the firing pin.

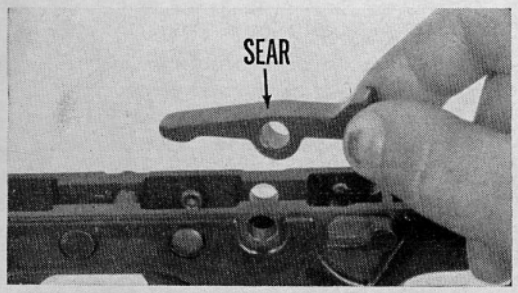
This completes the detailed disassembly and assembly of the operating group.

B. Trigger Housing Group.

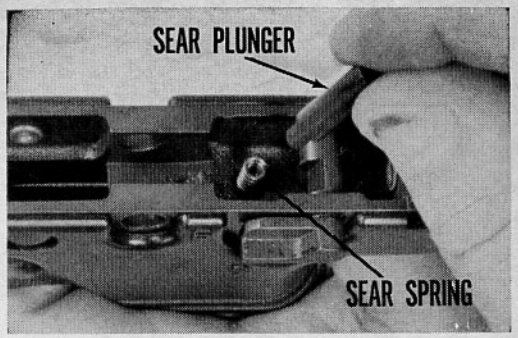
1. Disassembly.



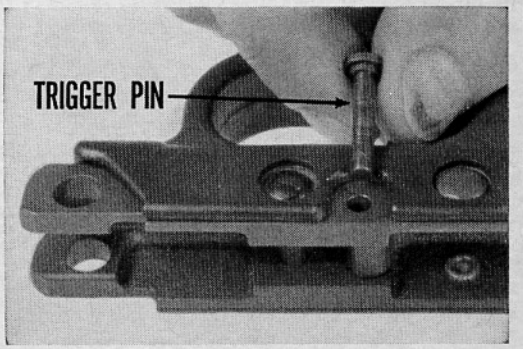
36.17(a) Depress the sear and remove the rear trigger housing holding pin to the left.



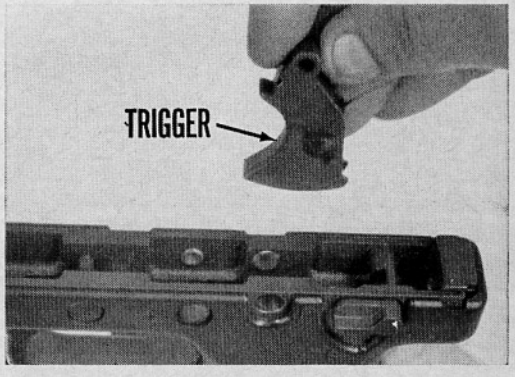
36.17(b) Remove the sear from the top of the trigger housing.



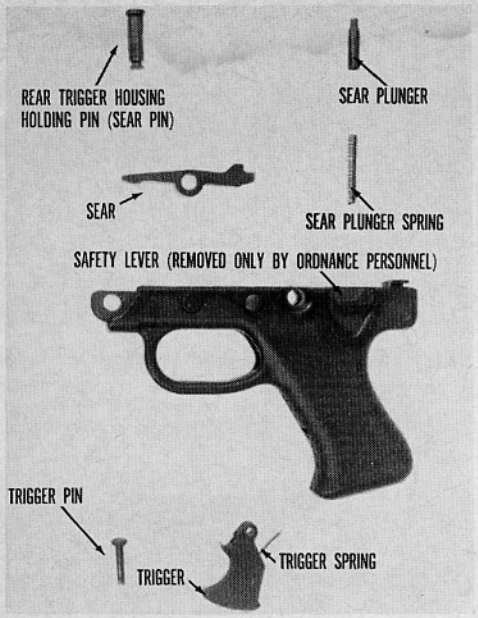
36.17(c) Remove the sear plunger and the sear spring from the top of the trigger housing.



36.17(d) Remove the trigger pin to the right.

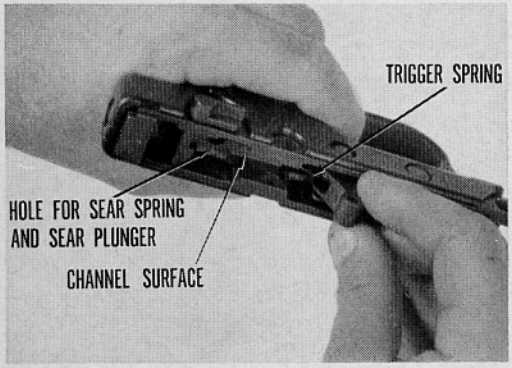


36.17(e) Remove the trigger from the top of the trigger housing.

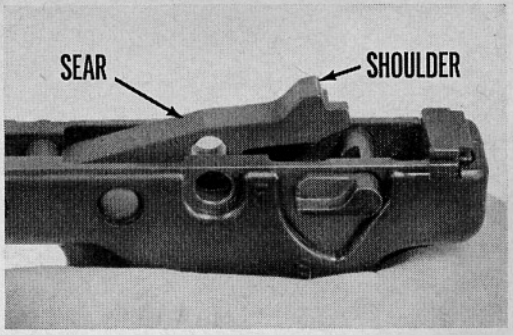


36.17(f) Trigger housing group disassembled in detail.

2. Assembly.



36.18(a) Position the trigger, with the trigger spring to the rear, through the top of the trigger housing so that the spring is under the channel surface. Align the holes in the trigger with the holes in the housing and replace the trigger pin from the right. Replace the sear spring and the sear plunger in the hole in the trigger housing.

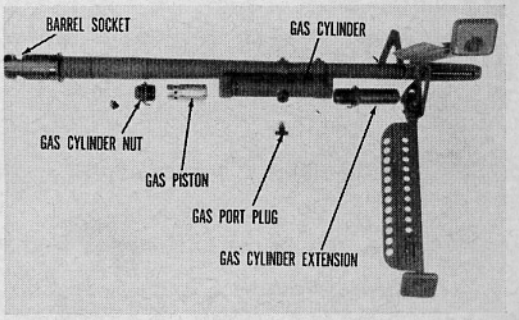


36.18(b) Position the sear with the shoulder up and to the rear. Press down on the sear and replace the trigger housing pin from the left.

This completes the steps in the detailed disassembly and assembly of the trigger housing.

C. Barrel Group.

1. Disassembly.

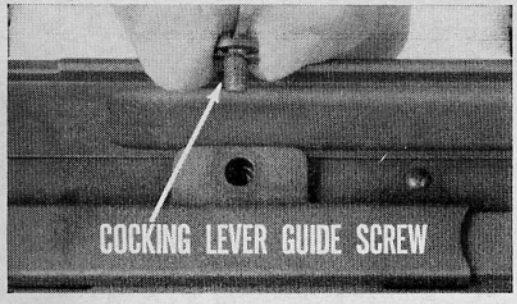


36.19(a) Place the bipod legs in the down position. Use the combination wrench to unscrew the gas cylinder nut. Remove the nut. Allow the gas piston to slide out of the rear of the cylinder. Unscrew and remove the gas port plug and the gas cylinder extension. The gas cylinder cannot be removed.

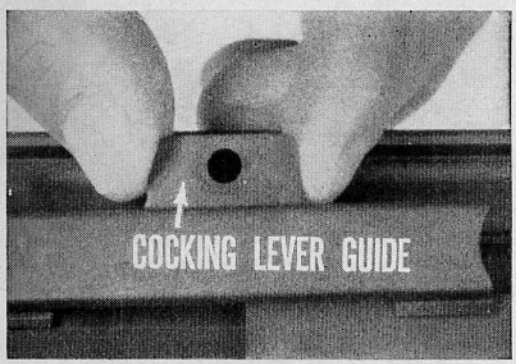
2. Assembly. Assemble the barrel in reverse order of the steps just described. Insert the gas piston carefully into the gas cylinder, with the escape holes and the closed end to the rear. Firmly tighten the gas port plug, gas cylinder nut, and gas cylinder extension, with the combination wrench.

D. Receiver Group.

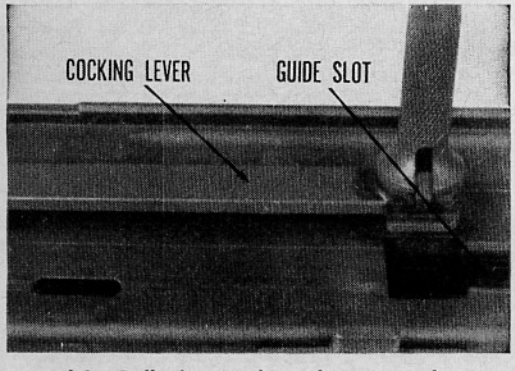
1. Disassembly.



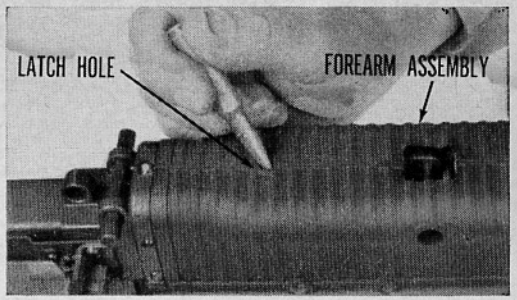
36.20(a) Unscrew and remove the cocking lever guide screw.



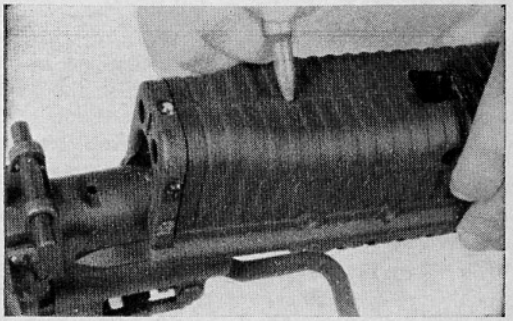
36.20(b) Remove the cocking lever guide by rotating it downward, away from the receiver.



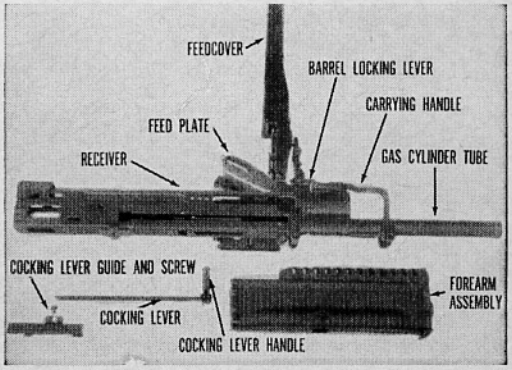
36.20(c) Pull the cocking lever to the rear and remove it from the guide slot.



36.20(d) Turn the receiver group so that the cover is down. Insert the nose of a cartridge in the latch hole at the bottom rear of the forearm assembly.

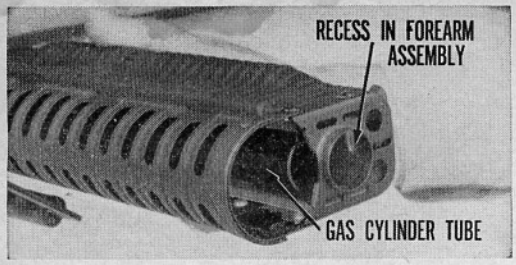


36.20(e) Press down on the cartridge, releasing the forearm latch. Raise the rear of the forearm slightly and remove it to the front.



36.20(f) Receiver group disassembled in detail.

2. Assembly.

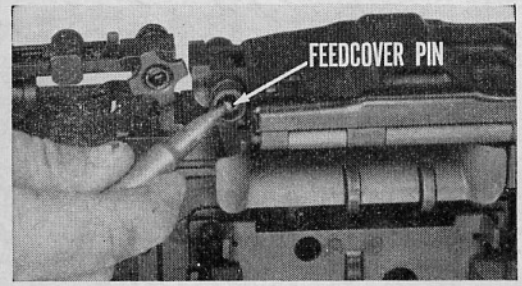


36.21(a) Position the forearm assembly over the gas cylinder tube. Aline the end of the gas cylinder tube with the recess in the forearm assembly. Insure that the gas cylinder tube is not binding with the baffles inside the assembly, then tap the rear of the forearm firmly to seat and lock it in position. Position the cocking lever in the large opening at the rear of the cocking lever slot. Push the cocking lever forward. Position the cocking lever guide over the cocking lever. Replace and tighten the cocking lever guide screw.

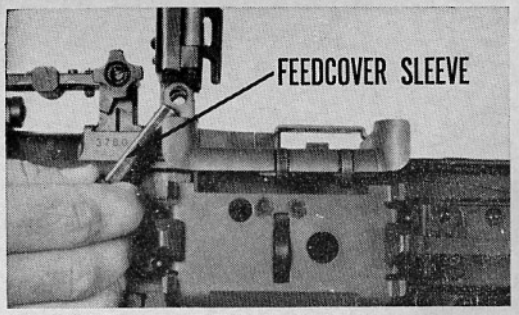
This completes the steps in the detailed disassembly and assembly of the receiver group.

E. The Feedcover. The feedcover is considered a component part of the receiver group but it is not normally detail stripped along with the rest of the receiver group. When a part in the feedcover is defective, the entire feedcover is replaced. For this reason it is necessary to know how to remove and replace the feedcover. Further, in order to understand the feeding action of the gun, it is necessary to know the many parts of the feedcover.

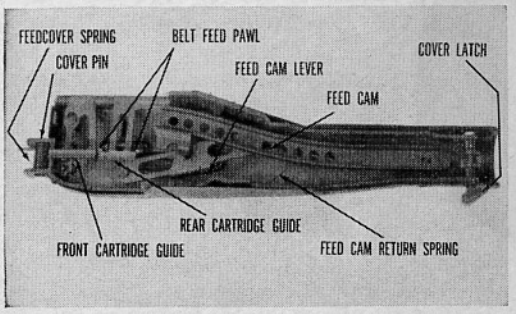
1. Removing the feedcover.



36.22(a) Push the feedcover pin out of its recess with a cartridge.

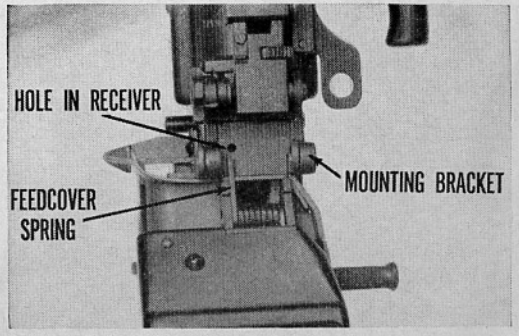


36.22(b) Remove the feedcover sleeve by pulling it from the recess. Remove the feedcover from the receiver.



36.22(c) Inside view of feedcover, showing names of working parts.

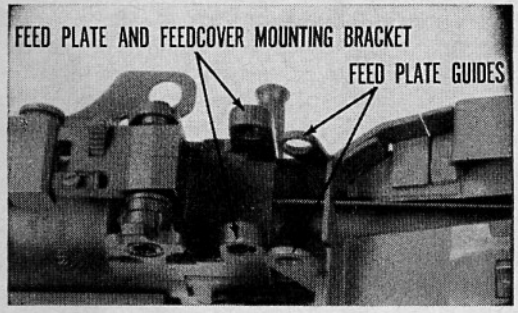
2. Replacing the feedcover.



36.23 Align the feedcover spring with the hole in the receiver and seat the feedcover in the mounting bracket. Insert the feedcover sleeve from one side and the feedcover pin from the other side.

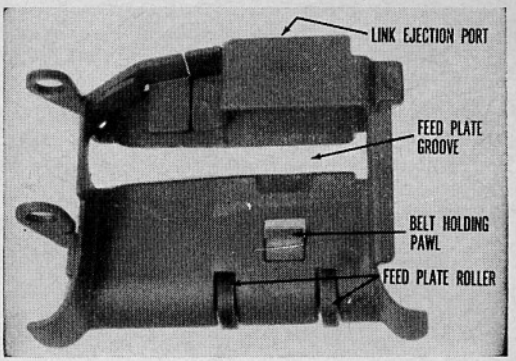
F. The Feedplate. Defective feedplates are replaced as a unit. Knowledge of how to replace a feedplate is essential to a machine gunner.

1. Removing the feedplate.



36.24 Raise the feedplate from the receiver and remove it.

2. Replacing the feedplate. Aline the feedplate guides to the left of the mounting brackets and replace the feedplate.



36.25 Important parts of the feedplate.

Operation

A. Loading with the Feedcover Raised, Bolt to the Rear.

1. Pull the cocking lever handle to the rear until the sear engages in the sear notch. PUSH THE COCKING LEVER HANDLE FORWARD.

2. Place the safety on SAFE.

3. Raise the feedcover and clear any links from previous belts.

4. Position the first round in the belt in the feedplate groove, lower and latch the cover.

B. Firing.

1. Make sure the safety is on the FIRE position.

2. Lay the gun on target.

3. Pull the trigger.

C. Unloading.

1. Raise the feedcover and clear the feedplate of ammunition and metallic links.

2. Inspect the chamber. Clear it if required.

3. Lower the feedcover, pull the trigger, place the safety in the SAFE position.

Functioning

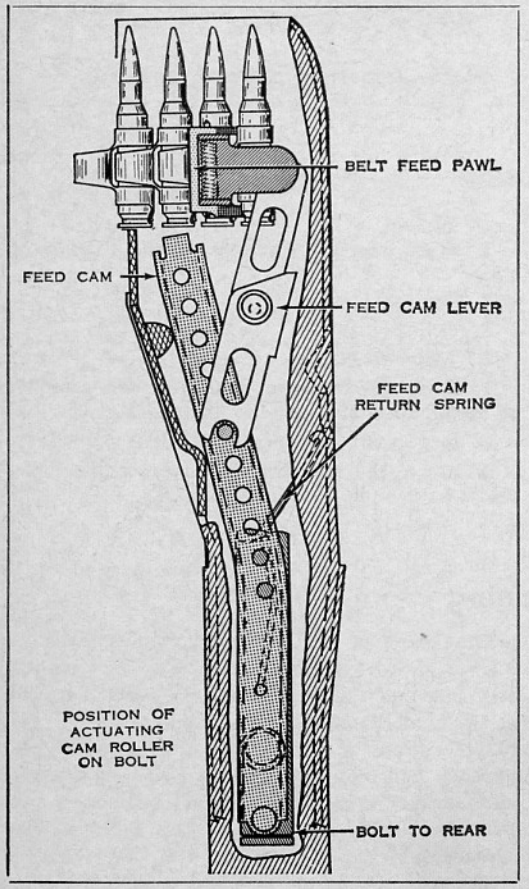
When you pull the trigger, the operating group goes forward, stripping a round from the belt and firing it. The gases from the exploding round propel the bullet through the barrel and provide the energy which drives the operating parts to the rear. As the operating group travels rearward, the empty case is pulled from the chamber and ejected from the gun, and the gun is cocked. If the trigger is kept pulled, this action is repeated automatically so long as ammunition is in the feedway. Each time a cartridge is fired, all the moving parts of the gun *function* in a given sequence known as the *cycle of operation*. There are eight steps in this cycle. They are the same as the eight steps in the functioning of your rifle, but the details of each step are a bit more complicated than those of the rifle. The cycle of operation begins with the first round positioned over the belt holding pawl and the bolt forward. The feedcover is closed and the belt feed pawl is positioned between the first and second rounds of the belt. The belt holding pawl is also positioned

between the first and second rounds in the belt. The eight steps in the cycle of operation are described as follows:

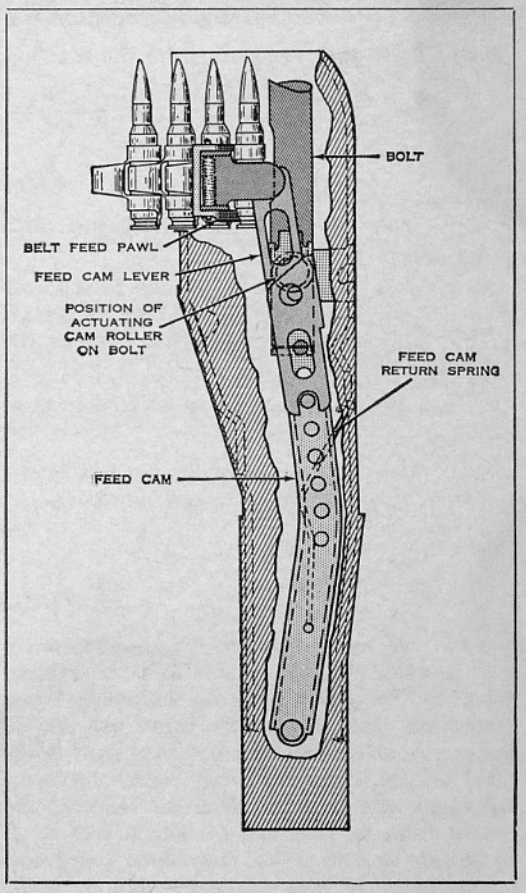
1. Feeding.

a. Feeding begins with the first round positioned over the belt holding pawl. As the cocking lever handle is pulled to the rear, the bolt moves to the rear, and the feed cam is moved to the left by the action of the actuating cam roller on the bolt and the feed cam return spring. This causes the feed cam lever and the feed pawl to move to the right. Since the feed pawl is positioned behind the first round, it pushes the round in the feedplate groove as it moves to the right. Fig. **36.26(a)** illustrates feeding with the bolt to the rear.

b. When the trigger is pulled and the bolt moves forward, the actuating cam roller causes the feed cam to move to the right (Fig. **36.26(b)**). This causes the feed pawl to move to the left. When the feed pawl moves to the left, it slides over the next round in the belt and positions behind the round. When the bolt moves to the rear (after firing), the feed pawl will again move to the right, pushing the next round in the feedplate groove. Feeding begins with the round positioned over the belt holding pawl and ends when the feed pawl is positioned behind the next round in the belt.



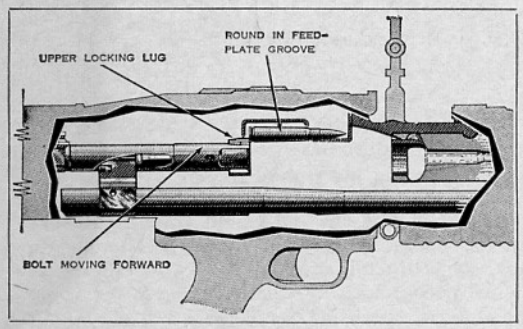
36.26(a) Feeding (bolt to the rear).



36.26(b) Feeding (bolt forward).

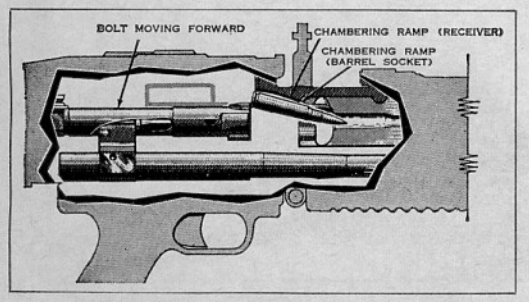
2. Chambering.

a. When the trigger is pulled, the sear is withdrawn from the notch in the operating rod. This permits the operating rod to move forward, driven by the expanding operating rod drive spring. Since the yoke cam on the bolt is engaged with the operating rod yoke, the bolt is carried forward. As the front of the bolt reaches the rear of the feedplate, the upper locking lug contacts the base of the cartridge which is exposed in the feedplate groove as shown in Fig. **36.27(a).** The rear cartridge guide holds the cartridge down into the feedplate groove.



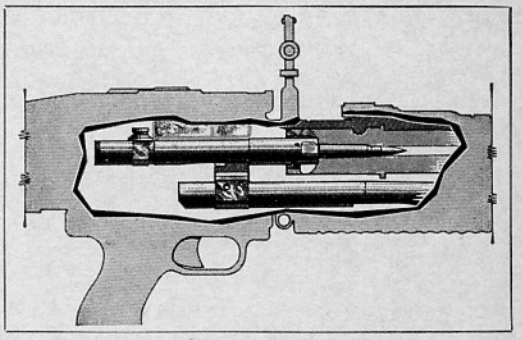
36.27(a) Chambering (upper locking lug of bolt stripping round from the belt).

b. As the bolt continues forward, the upper locking lug strips the round from the belt. The front cartridge guide prevents the link from being pushed forward and exerts pressure down on the cartridge. As the bolt continues forward, it causes the projectile portion of the cartridge to come in contact with the chambering ramp of the receiver. This causes the round to be deflected downward toward the barrel socket, and the chambering ramp of the barrel socket deflects the round down into the chamber. Fig. **36.27(b).**



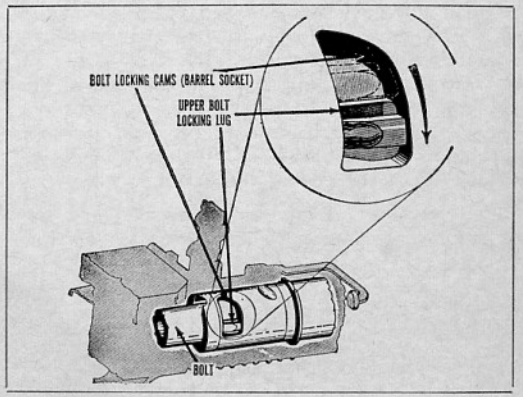
36.27(b) Chambering (cartridge being deflected into chamber).

c. When the round is fully seated in the chamber, the final forward movement of the bolt causes the extractor to snap over the extraction rim of the cartridge and the ejector is compressed. The bolt has not rotated and locked at this time. Chambering begins when the upper locking lug of the bolt contacts the rear of the cartridge. It ends when the round is fully seated in the chamber. See Fig. **36.27(c).**



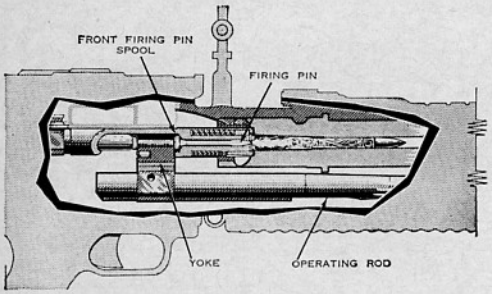
36.27(c) Chambering (cartridge fully seated in chamber).

3. Locking. As the round is chambered, the bolt locking lugs engage the bolt locking cams in the barrel socket. The locking cams cause the bolt to rotate in the barrel socket a quarter-turn clockwise. Locking begins when the locking lugs of the bolt contact the locking cams of the barrel socket. It ends when the bolt has rotated a quarter-turn clockwise. See Fig. **36.28.**



36.28 Locking (upper bolt locking lug rotating clockwise in bolt locking cams in barrel socket).

4. Firing. When locking is completed, the operating rod continues to move forward slightly, independent of the bolt. The firing pin is engaged by the yoke of the operating rod and is carried forward. The striker protrudes through the aperture in the face of the bolt, striking the primer of the cartridge and igniting it. The ignition of the primer causes a rapid burning of the powder within the cartridge. The resulting expanding gases rapidly drive the bullet through the bore. See Fig. **36.29.**



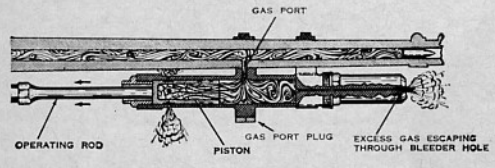
36.29 Firing.

5. Unlocking.

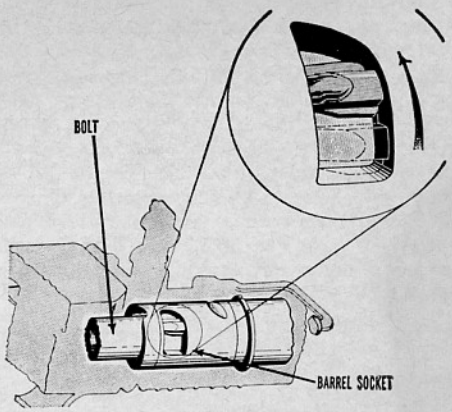
a. After the cartridge is ignited and the bullet passes the gas port, part of the expanding gases enter the gas cylinder through the port. The rapidly expanding gases enter the hollow gas piston and force it to the rear. The operating rod, being in contact with the piston, is pushed to the rear. See Fig. **36.30(a).**

b. As the operating rod continues to the rear, the yoke acts against the curved yoke cam in the bolt. This causes the bolt to turn a quarter-turn counterclockwise and unlocks the bolt from the barrel socket. Unlocking begins as the yoke of the operating rod contacts the curved portion of the yoke cam in the bolt, causing the bolt to begin its rotation (Fig. **36.30(b)**). Unlocking ends as the bolt clears the end of the barrel socket.

6. Extracting. While unlocking is going on, extraction is beginning. The rotation of the bolt



36.30(a) Unlocking (action of the gas).

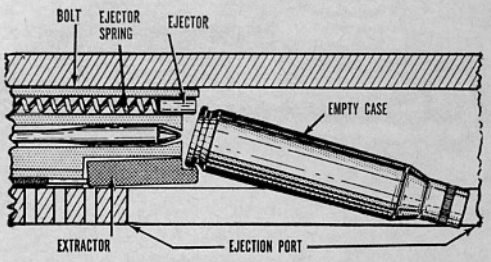


36.30(b) Unlocking (upper bolt locking lug rotating counterclockwise in bolt locking cams in the barrel socket).

in unlocking loosens the round in the chamber. As the operating rod and bolt continue to the rear, the extractor gripping the extraction rim of the cartridge pulls the cartridge case from the chamber as shown in Fig. **36.31.**

7. Ejecting. As the case is withdrawn from the chamber, the ejector presses on the base of the cartridge case, forcing the front of the spent case against the right side of the receiver. As the bolt continues to the rear, the action of the ejector pushing against the base of the cartridge and the extractor gripping the right side of the case cause the empty round to be spun from the gun as the case reaches the ejection port. (Fig. **36.31**). The empty link is forced out of the link ejection port of the feedplate and the next round is positioned in the feedplate groove.

8. Cocking. The operating rod continuing to the rear compresses the firing pin spring. When the pin is withdrawn and the spring is compressed, the gun is cocked.



36.31 Extraction and ejection.

Stoppages and Immediate Action

A stoppage is any interruption in the cycle of operation. Stoppages are caused by faulty action of the gun or by faulty ammunition. The skilled machine gunner promptly reduces any stoppage and continues with his fire mission. As soon as a stoppage occurs he applies *immediate action.* Immediate action is the procedure used for prompt reduction of a stoppage without investigating the cause. It reduces the majority of stoppages and permits you to resume firing quickly. The procedure for applying immediate action is as follows:

1. Pull the cocking lever handle to the rear and insure that the sear engages the sear notch on the operating rod.

2. Raise the feedcover.

3. Clear the feedplate of ammunition and links.

4. Inspect the chamber and receiver and remove any obstruction (such as a bent round, empty case, or foreign matter) from the receiver. IF A ROUND IS IN THE CHAMBER DO NOT ATTEMPT TO REMOVE IT. See the section on SAFETY PRECAUTIONS for dealing with hangfires and cook-offs.

5. Close the cover and press the trigger.

6. Reload, relay, and attempt to fire.

If immediate action fails to get the gun back in action, application of the appropriate remedy listed in the chart shown in Fig. **36.32** will reduce the stoppage. You will note that the chart lists stoppages in the same order as the cycle of operation. Probable causes and the proper remedy are also listed. Thorough knowledge of the functioning of the gun will enable you to determine the cause of stoppages and reduce them promptly.

STOPPAGE	*PROBABLE CAUSE*	*REMEDY*
Failure to feed	Defective feed mechanism parts	Replace cover.
	Links or brass in feedplate	Clear feedplate.
Failure to chamber	Defective cartridge guides	Replace cover.
	Obstruction in chamber	Remove obstruction.
	Weak operating rod drive spring	Replace.
	Dirty chamber	Clean and lubricate.
	Dirty or corroded ammunition	Replace.
Failure to lock	Dirty bolt locking lugs	Clean and lubricate.
	Dirty locking recesses in barrel socket	Clean and lubricate.
	Weak operating rod drive spring	Replace.
	Damaged bolt locking lugs	Replace bolt.
	Damaged barrel socket	Replace barrel.
Failure to fire	Defective ammunition	Replace ammunition.
	Broken firing pin	Replace firing pin.
	Broken front firing pin spool	Replace firing pin.
Failure to unlock	Dirty chamber	Clean and lubricate.
	Dirty bolt locking lugs	Clean and lubricate.
	Insufficient gas pressure	Tighten gas system. Clean gas port.
	Dirty locking recesses in barrel socket	Clean and lubricate.
Failure to extract	Dirty chamber	Clean and lubricate.
	Broken extractor	Replace bolt.
	Insufficient gas pressure	Tighten gas system. Clean gas port.
Failure to eject	Broken ejector or spring	Replace bolt.
	Insufficient gas pressure	Tighten gas system. Clean gas port.
Failure to cock	Insufficient gas pressure	Tighten gas system. Clean gas port.
	Broken rear firing pin spool	Replace firing pin.

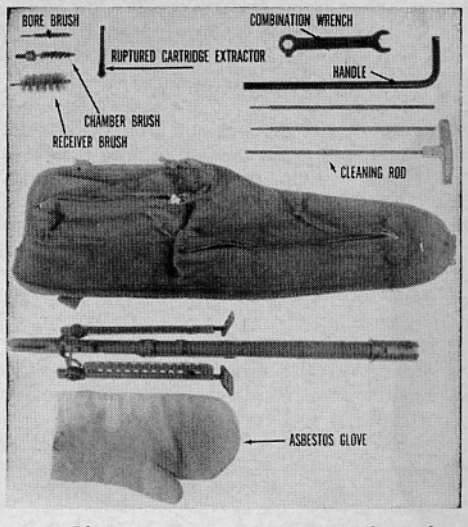
36.32 Stoppages, causes, and remedial action.

Care and Cleaning

Chapter 23 provides general information concerning the care and cleaning of small arms. The following instructions apply specifically to the M60 machine gun.

A. Materials. Bore cleaner is used to clean the bore, chamber, and gas system. Hot, soapy water may be used if bore cleaner is not available. Cleaning solvent is used for cleaning guns that have been stored in grease- or rust-preventing compounds. After using solvents, immediately dry the surfaces and oil lightly. DO NOT ALLOW SOLVENT TO COME IN CONTACT WITH RUBBER COVERINGS ON GUN PARTS. The bore brush is used only for cleaning the bore. It is always passed completely through the bore, never moved back and forth while inside the barrel.

B. Equipment. Fig. **36.33** shows the cleaning equipment issued with the gun. Items are carried in the pockets provided on the spare barrel case.



36.33 Cleaning equipment, spare barrel, and spare barrel case.

Safety Precautions

A. Clearing the Gun.

1. Always take positive action to insure clearance of the gun after firing.

2. Unload the gun by raising the feedcover, then clearing the feedplate of ammunition and links. Inspect the chamber.

3. Run a cleaning rod through the muzzle end of the gun until it is visible in the receiver. Remove it. Pull the trigger, allowing the bolt to go forward.

4. Leave the feedcover raised.

5. Place the safety on the SAFE position.

B. Hangfires, Misfires, and Cook-offs.

1. A hangfire is delay in the functioning of the explosive charge in the cartridge.

2. A misfire is a complete failure to fire. Misfires are usually caused by grit, sand, frost, or excessive lubrication.

3. MISFIRES AND HANGFIRES CANNOT INITIALLY BE DISTINGUISHED. THEREFORE TREAT ALL FAILURES TO FIRE AS HANGFIRES TO AVOID INJURY FROM COOK-OFFS.

4. A cook-off occurs when the heat of the barrel causes the round to fire even though the firing mechanism was not actuated. Therefore, LEAVE ANY HANGFIRE OR MISFIRE IN THE GUN FOR FIVE SECONDS TO BE SURE IT'S NOT A HANGFIRE. Attempting the removal of a hangfire or misfire from a hot gun may result in a cook-off with the receiver open. The possibility of injury is obvious. After five seconds, attempt to remove the round. If it cannot be removed in five additional seconds, lock the round in the chamber, leave the gun pointed toward the target and wait five minutes. Then remove the round.

5. DO NOT RETRACT THE BOLT WHEN A HANGFIRE OR COOK-OFF IS SUSPECTED.

C. Runaway Gun. A runaway gun may be caused by a worn sear, worn sear notch on the operating rod, short recoil, or oil in the buffer. The gun fires even though the trigger is released.

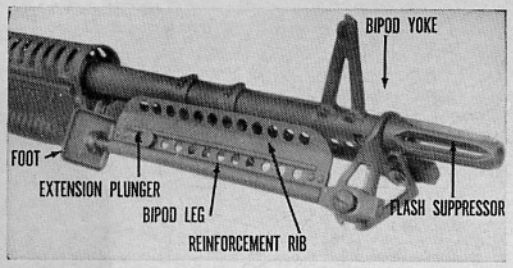
1. To stop a runaway gun:

a. Unlatch and raise the feedcover. *OR*

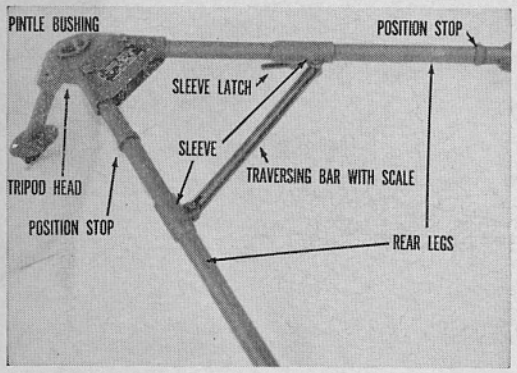
b. Twist the belt.

Mounts

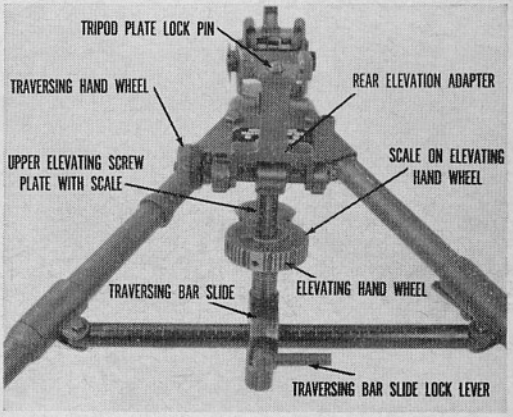
As mentioned in the first of this chapter, the M60 can be fired from either a bipod or tripod mount. Figures **36.34(a)**; **36.34(b)**; and **36.34(c)** show the names of the various parts on both type mounts.



36.34(a) Bipod mount.



36.34(b) M122 tripod mount without pintle, and without traversing and elevating mechanism.



36.34(c) Traversing and elevating mechanism mounted on the M122 tripod mount.





The 40-mm. Grenade Launcher M79

MARINE rifle squads are receiving their greatest boost in fire power in recent years with the adoption of the M79 grenade launcher. The new launcher is capable of destroying machine gun emplacements, light field fortifications and small troop concentrations. The M79 gives the rifle squad an area-fire weapon between the maximum range of the hand grenade and the minimum range of the 81-mm. mortar.

General Description

The 40-mm. Grenade Launcher M79 is a single-shot, break-open, breech-loaded, shoulder-fired type weapon that is capable of launching 40-mm. projectiles. The launcher is composed basically of five major subassemblies and groups. These subassemblies and groups are: the receiver group, the fore end assembly, the barrel group, the sight assembly and the stock assembly. The launcher has a rifled aluminum alloy barrel and steel receiver group, which consists of the firing mechanism, safety mechanism and barrel locking mechanism. The barrel, which pivots in the receiver on the fulcrum pin, is locked in the battery position by a latch. The stock is secured to the rear of the receiver by a screw and the rear sight is held to the barrel by a barrel band. Important characteristics of the M79 are:

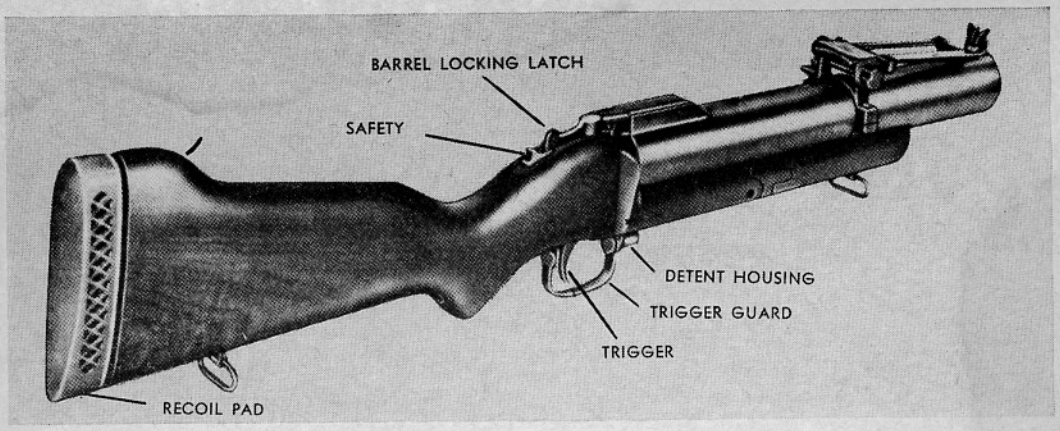
WEIGHT	
Loaded	6.45 lbs.
Unloaded	5.95 lbs.
LENGTH OF LAUNCHER	28.78 in.
LENGTH OF BARREL	14.00 in.
MAXIMUM RANGE	375 meters (410 yds.)
MINIMUM RANGE	50 meters (54-55 yds.)
MUZZLE VELOCITY	250 feet per second
TYPE OF OPERATION	Manually trigger-operated
TYPE OF FIRE	Single shot
TYPE OF FEED	Manually breech-loaded
RIFLING	6 lands, uniform right hand twist one turn in 48 in.
AMMUNITION	Cartridge, 40 mm. HE, M406 Cartridge, 40 mm. Practice, M407A1

Nomenclature and Stripping

A. Nomenclature. The nomenclature of the M79 is given in **Figures 37.1, 37.2** and **37.3.**

B. Stripping. The launcher is composed of five groups **(Fig. 37.3).** However, when field stripping the M79, only the fore end, stock assembly, and barrel and receiver group will be separated. The sights will not be removed from the barrel assembly and the receiver group will not be disassembled. To field strip the M79:

First, be sure the M79 is unloaded. Point the launcher in a safe direction and operate the barrel locking latch **(Fig. 37.4),** moving it to the right to its full limit of travel, and break open the breech. When the barrel locking latch is pivoted to its full limit of travel, the safety should move to the "safe" position and the latch remain in the open position. Inspect the weapon to make sure the breech is clear, then close the breech. Using the wrench assembly **(Fig. 37.5),** remove the machine screw which passes through the rear mounting hole of the front sling swivel. Pull the front end of the fore end away from the barrel

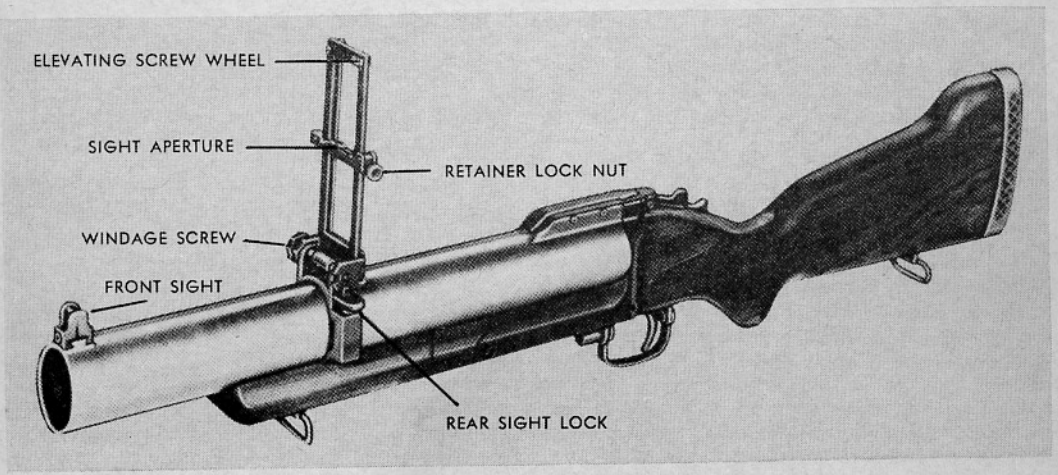


37.1 Grenade launcher M79, right rear view.

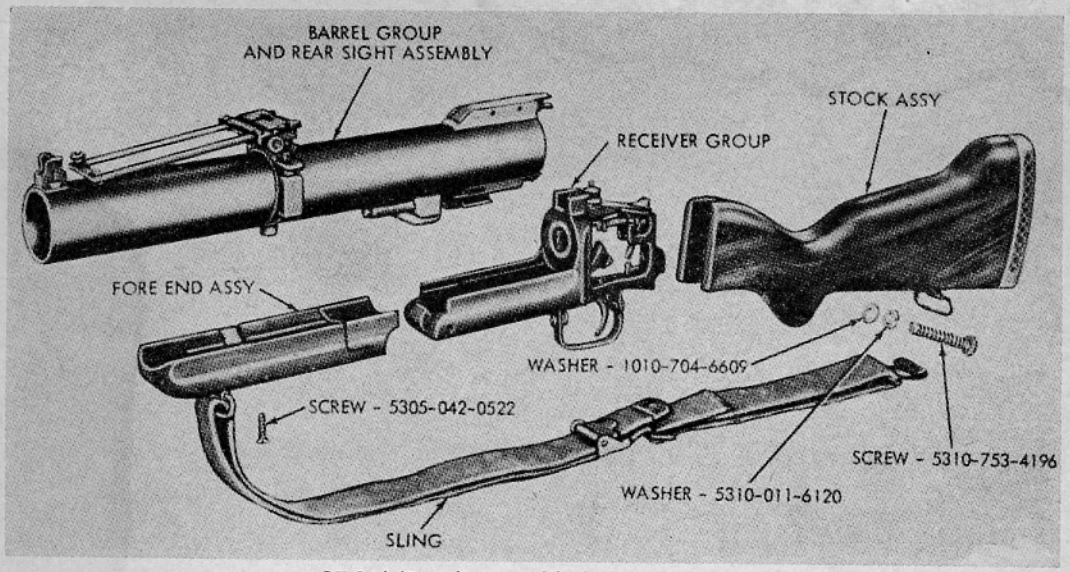
(Fig. 37.6) until the lug on the rear sight base is clear of the hole in the upper surface of the fore end bracket. While keeping the lug clear of the hole, pull forward on the fore end assembly until it is free of the receiver assembly. If the sling is attached to the sling swivel it can be removed either now or prior to disassembly. To remove the barrel assembly from the receiver assembly, operate the barrel locking latch and open the breech. Holding the receiver and stock assembly in the left hand and the barrel assembly in the right hand, move the barrel rearward in the receiver until it is disengaged from the fulcrum pin, then separate the barrel assembly from the receiver assembly (Fig. 37.7).

The stock assembly can be removed from the receiver assembly by using the wrench assembly and removing the pan-headed machine screw from the bottom of the stock near the front end. This completes disassembly by the individual and permits proper care and cleaning.

To reassemble the M79, the disassembly procedure is reversed.



37.2 Grenade launcher M79, left front view.



37.3 M79 disassembled into groups.

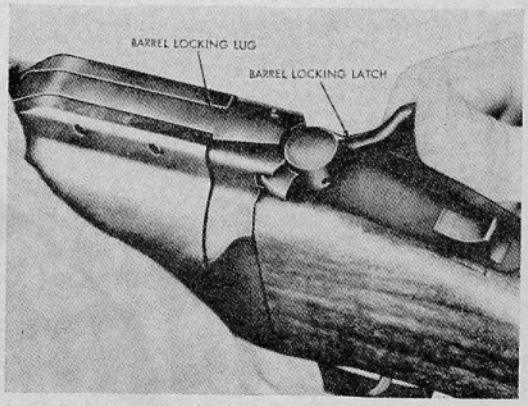
Operation and Functioning of the M79

A. Firing. Squeezing the trigger rearward causes the trigger to rotate about the trigger pin. The rear of the trigger lifts the rear of the sear, causing the nose of the sear to become disengaged from the sear notch in the hammer. This allows the hammer to go forward under energy supplied by the hammer spring. The hammer strikes the firing pin, driving it forward to strike the primer. Upon release of the trigger, the hammer settles back slightly, allowing the firing pin to withdraw from the face of the firing pin retainer in the face of the receiver. The rearward action of the firing pin spring supplies the energy to move the firing pin.

B. Unlocking. Press the barrel locking latch to the right; this action unlocks the barrel. The barrel locking latch is then held in the open position by the latch lock coming out of its recess in the top of the receiver. At the same time the barrel locking latch lever is moved to the right, the safety actuator, through the action of the barrel locking latch pivot, pushes the safety to the rear or "SAFE" position. The safety bar is positioned over the rear of the trigger.

C. Cocking. As the barrel pivots downward, the cocking arm, (located on the bottom of the barrel) lifts the front of the cocking lever, causing it to rotate about the hammer pin and contact the boss (or cocking lever shoulder) on the hammer. This rotates the hammer rearward about the hammer pin until the sear notch on the lower rear part of the hammer is engaged by the sear.

D. Extraction. The extractor, being engaged with the rim of the cartridge, withdraws the spent cartridge case from the chamber about one inch. This is due to the action of the extractor spring applying rearward pressure against the extractor each time the barrel is pivoted downward. The



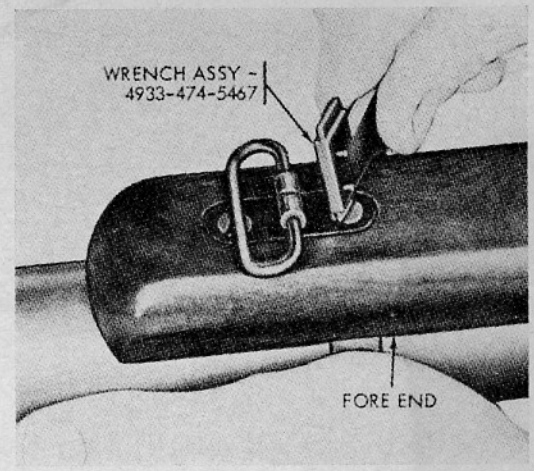
37.4 Unlocking the breech.

spent cartridge case is then removed from the chamber by hand.

E. Loading. When a round is inserted into the chamber, the round will go forward until the extractor groove (or rim) of the cartridge contacts the lip of the extractor.

F. Chambering. As the breech end of the barrel moves downward, the chambered end of the extractor comes into contact with the face of the receiver, causing the extractor to move forward toward the extractor housing, and carry the round with it. At the same time, the extractor spring is compressed in the extractor housing. When the barrel is fully locked, the round is chambered.

G. Locking. As the barrel closes, the rear of the barrel locking lug comes into contact with, and depresses, the latch lock. This frees the barrel locking latch. The barrel locking latch now pivots clockwise under energy supplied by the expanding safety actuator spring and actuator; the barrel locking latch comes to rest against the barrel locking latch stop, thus locking the barrel to the receiver.



37.5 Removing the fore end screw.

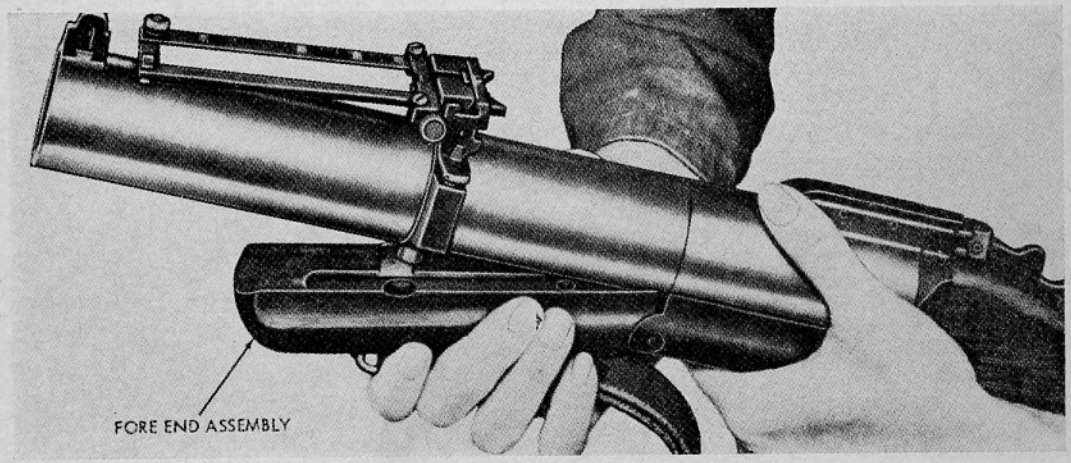
Care and Cleaning

Chapter 23 provides general information concerning the care and cleaning of small arms. The following information applies specifically to the M79 launcher. The bore and any powder-fouled parts will be cleaned with solvent cleaning compound (rifle-bore cleaner), then dried and lubricated. If the bore becomes badly fouled or corroded, the weapon will be repaired by third or fourth echelon maintenance.

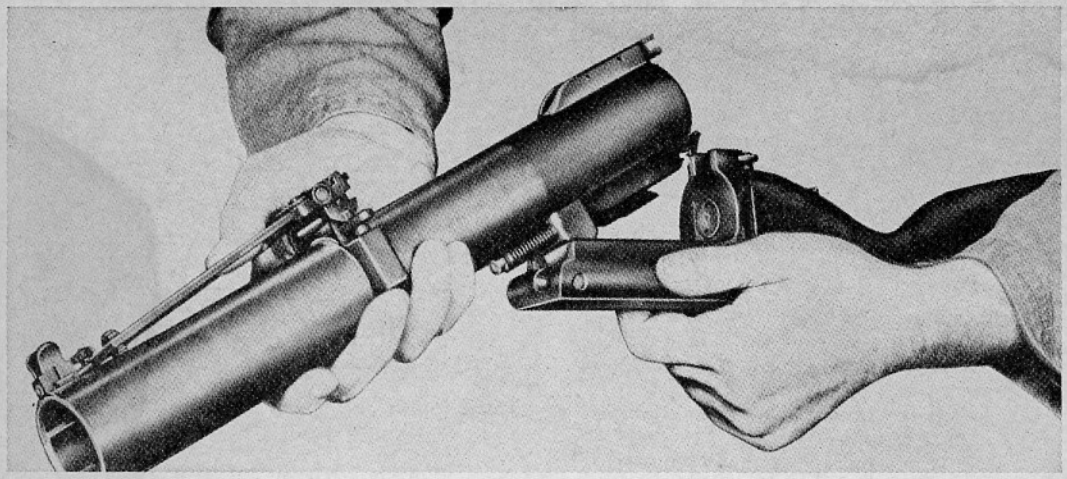
The M79 requires no painting; however, a light coat of raw linseed oil applied to the wood surfaces of the stock and fore end acts as a preservative and tends to resist moisture penetration.

Whenever operating in hot or cold climates, use cleaning methods and lubricants as described in Chapter 23.

DO NOT use diesel fuel oil, gasoline or benzine (benzoil), high pressure water, steam, or air for cleaning the weapon.



37.6 Removing or installing the fore end assembly.



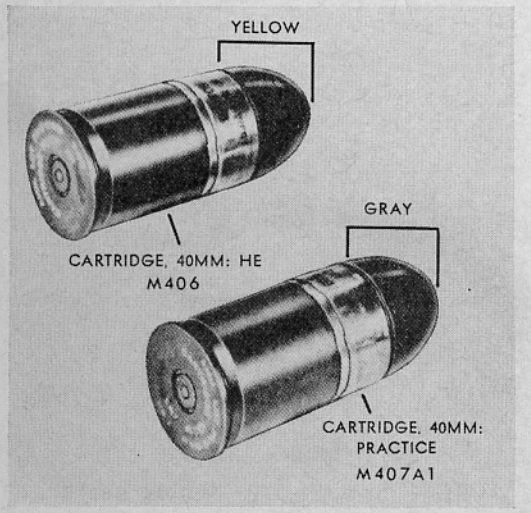
37.7 Removing or installing the barrel group.

Ammunition

The ammunition for the M79 grenade launcher is of the fixed ammunition type. The two major assemblies comprising the complete round are the cartridge case and the projectile (grenade). The over-all length of the round is 3.9 inches, and it weighs 8 ounces **(Fig. 37.8).**

Safety Precautions

A. The safety of personnel and equipment is the concern of all officers and enlisted men in any exercise in which live ammunition is fired. All applicable regulations for the firing of ammunition in training, practice and combat must be observed to minimize the possibility of accidents.



37.8 Cartridges used with the M79.

B. The following procedures will also be observed when firing the M79:

1. Keep the breech open when the launcher is not being fired.

2. Examine the ammunition to ensure that the practice (spotting) and high explosive ammunition are separate.

3. Load the M79 only when told to do so.

4. Keep the safety in the "S" position until the launcher is to be fired.

5. After loading, keep the muzzle pointed in the air and away from all personnel.

6. Misfires, hangfires, and cook-offs will be handled as stated in Chapter 36. However, wait *30 seconds* before clearing a failure to fire.

7. Surface winds are not an accurate guide to upper air (ballistic) winds. Care must be exercised in making a range estimate of this type if there is possible danger to friendly troops.

8. When firing HE grenades at targets within ranges of 50-80 meters, the operator must be in a protected position. Also, targets within an 80-meter radius of unprotected friendly troops should



37.9 Firing the grenade launcher M79—standing position.

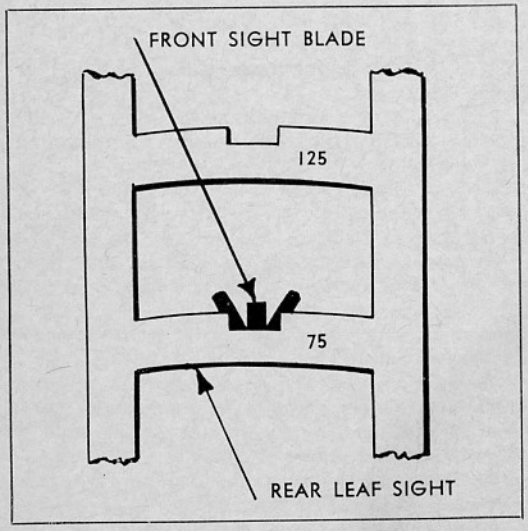


37.10 Firing the grenade launcher M79—prone position.

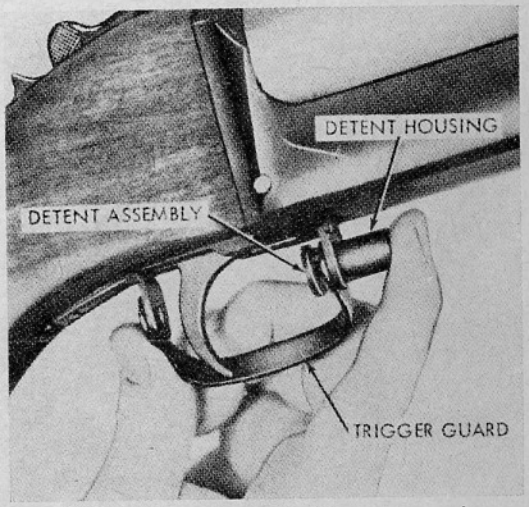
not be engaged. The danger radius of the practice grenade is 20 meters. In addition, observe precautions and warnings pertaining to the ammunition being used as stated previously.

Firing Positions

The M79 can be fired from any position that is used when firing the M1 or M14 rifle. However, the M79 will more than likely be fired from the standing or prone position (**Figs. 37.9** and **37.10**). To engage targets at ranges from 50-80 meters, the rear sight frame assembly is placed in the lowered (battle sight) position. With the frame in this position, the Marine can fire the launcher from his shoulder in either the standing or prone position. Longer ranges, from 80 to 375 meters, are fired with the rear sight frame placed in the upright position. An adjustment of



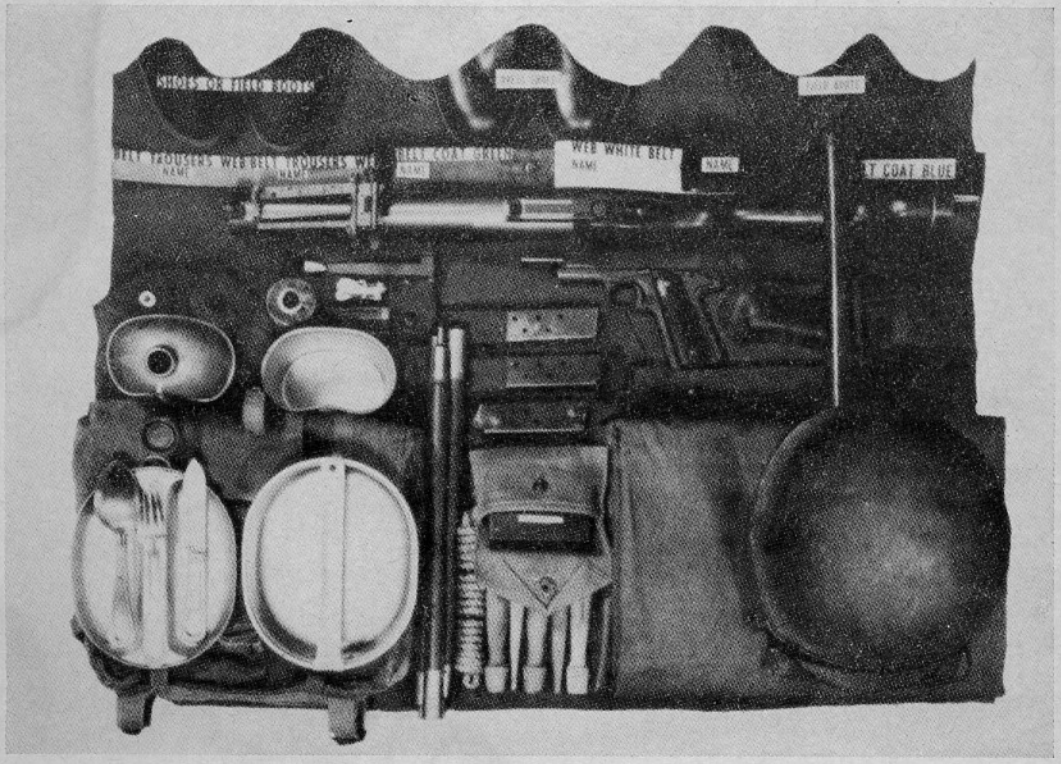
37.11 Correct sight alignment.



37.12 Operating the trigger guard detent assembly.

range setting is required when firing against the wind (head wind) or if firing with the wind (rear wind). The range setting is decreased for a rear wind and increased for a head wind. The correct sight picture for both positions (frame up or down) is to see the top of the notch in the frame of the rear sight centered and aligned with the top of the blade of the front sight and the target resting upon the top of the blade of the front sight **(Fig. 37.11)**.

When operating in cold weather while wearing gloves or mittens, operate the trigger guard detent assembly **(Fig. 37.12)** and raise the trigger guard to either of its upper positions before placing the safety in the firing position.



37.13 Equipment Display—Pistol/Grenade Launcher
(Clothing same as figure 7.10, page 72)



Marine Corps Leadership

Every private in the Marine Corps is a potential squad leader. Every squad leader can become a sergeant major. The truth in these simple statements is obvious. It has provided the Corps with the world's finest body of small unit leaders since 1775. As sure as a Marine's best friend is his rifle, the backbone of the Marine Corps is its noncommissioned officers. Every one of them *started* as a private.

All Marine noncommissioned officers are proud of their rank. They have a right to be. Some mighty good men have worn those same chevrons. Marines like Dan Daly, John Quick, Herman H. Hanneken, and John Basilone have left today's NCOs a strong tradition of outstanding leadership.

War has changed a lot since Hanneken led Marines against bandits in Haiti. It is much faster and far more complex than when John Basilone's men held the line at Bloody Ridge. But wars are still fought by men, and fighting men must have good leadership to win.

The Marine Corps' sergeants and corporals provide the most direct and personal leadership found anywhere. They do it in peacetime as well as in war. And like their forerunners of the "old Corps," none of them was a "born leader." They were all born, true. But they *became* leaders through *hard work, skill,* and a stern *sense of duty.*

This chapter deals with traits of character and the principles used to develop *skills* in leadership. When you develop them, you will have acquired that all-important *sense of duty.* The *hard work* part is up to you.

If you are now a private, the material here will tell you what is expected of NCO leaders in the Marine Corps. Study it and be ready to take on the responsibilities of higher rank when they come your way. If you are already a noncommissioned officer, a periodic review of this material and the uncompromising practice of what it preaches will make you a better one.



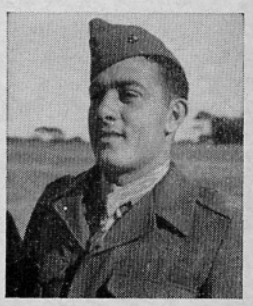
Daly



Quick



Hanneken



Basilone

Leadership Traits

You don't inherit the ability to lead Marines. Neither is it issued. You *acquire* that ability by taking an honest look at yourself. You see how you stack up against 14 well-known character

traits of a Marine NCO. These are:

1. Integrity
2. Knowledge
3. Courage
4. Decisiveness
5. Dependability
6. Initiative
7. Tact
8. Justice
9. Enthusiasm
10. Bearing
11. Endurance
12. Unselfishness
13. Loyalty
14. Judgment

Then you set out to acquire those traits which you might lack. You improve those you already have, and you make the most of those in which you are strong. Work at them. Balance them off, and you're well on the road to leading Marines in war or peace. Marines expect the best in leadership *and they rate it.* Give them the best and you'll find that you (1) accomplish your mission and (2) have the willing obedience, confidence, loyalty, and respect of your men. In fact, you will have lived up to the official definition of a military leader.

Now, let's take a closer look at each one of those 14 traits of character which a leader *must* have.

1. Integrity. The stakes of combat are too high to gamble leadership on a dishonest man. Would you accept a report from a patrol leader who had been known to lie? Of course you wouldn't. All your statements, official or unofficial, are considered by your men to be plain, unadorned *fact.* Make sure they are. When you give your word, *keep it.* There are people depending on you to come through with the goods.

2. Knowledge. Know your job, weapons, equipment, and the techniques to be used. Master this GUIDEBOOK and your other training material. Be able to pass that knowledge on to your men. You can't bluff them. Marines are expert at spotting a fake. If you don't know the answer to a question, admit it. Then find out. Most important, *know your men.* Learn what caliber of performance to expect from each of them. Put confidence in those whom you can. Give closer supervision to those who need it.

3. Courage. This comes in two kinds—physical and moral. If you are in a tight place and feel fear, recognize it. Then get control over it and make it work *for* you. Fear stimulates the body processes. You can actually fight harder, and for a longer time, when you are scared. So don't let a little fear make you panic inside. *Keep busy* when under fire. *Fix your mind on your mission and your men.* Courage grows with action. When things are really tough, take *some* action, even though it might be wrong. Positive action on a poor decision is better than a half-hearted attempt on the best possible one.

As for moral courage, know what's right and stand up for it. Marines are not plaster saints, by any means. But they serve God, Country, and Corps—in that order. The Ten Commandments are still a pretty good set of regulations, and they haven't had a change published for almost two thousand years. A Marine with the morals of an alley cat will never command the loyalty and respect of other Marines. A combat leader must also be a moral leader.

When you're wrong, say so. Don't try to weasel out of your mistake. Everybody makes a mistake now and then. The trick is not to make the same one twice. When a job is left undone, the true leader doesn't harp, "Sir, I told those people . . ." He fixes the breakdown, not the blame.

4. Decisiveness. Get the facts, all of them. Make your mind up when you've weighed them. Then issue your order in clear, confident terms. Don't haggle over minor points and don't confuse your men by debating with yourself out loud. *Say what you mean and mean what you say.* Make up your mind in time to prevent the problem from becoming bigger, but don't go off while still at the "half-cock" position. If the decision is beyond the scope of your authority, take the problem up the chain of command to the person who gets paid to *make* that decision. But if the decision *is* yours, make it. Don't pass the buck.

5. Dependability. If only one word could be used to describe Marine noncommissioned officers over the years, that one word would have to be "dependable." They get the job done, regardless of obstacles. At first they might not have agreed with the ideas and plans of their seniors. Being dependable, if they thought they had a better plan, they tactfully said so. But once the decision was made, the job was done to the best of their ability, whether or not it was their own plan which went into effect. Orders were followed to the letter, in spirit, and in fact. The mission came first, then the welfare of their men, then their own requirements.

A dependable noncommissioned officer is a solid citizen. He's always on time, never makes excuses, and stays hot on the job until it's done. He's aboard when needed and out of the way when he isn't needed. Duty demands that he often make personal sacrifices. He *senses* what has to be done, where his duty lies. His Country, his Corps, and his men need, *and get,* dependability.

6. Initiative. Think ahead. Stay mentally alert and physically awake. Look around. If you see a job that needs to be done, don't wait to be told. If the squad bay is full of newspapers and food wrappers on a Sunday morning, organize a

detail and get the place squared away. Don't wait for the Duty NCO to come around. If you spot an enemy OP, get some effective fire on it. By the time someone else finds that OP, it may have fire on you. Your situation and the lot of your men can always be improved. Do what you can. Use the means at hand. Think ahead, and you'll *stay* ahead.

7. Tact. The right thing at the right time, that's what we mean by tact. It embraces courtesy, but it goes much further. It's the Golden Rule; consideration for others, be they senior or subordinate. Courtesy is more than saluting and saying, "Sir." It doesn't mean you meekly "ask" your men to do a job, either. You can give orders in a courteous manner which, because it is courteous, leaves no doubt that *you expect to be obeyed.* The tactful leader is *fair, firm, and friendly.* You already respect another man's property. Learn to respect his feelings as well. If he needs "reading off," then do it—but do it in private. Don't make a spectacle of him and yourself by doing it in public. On the other hand, when he does a good job, let his friends hear about it. He'll be a bigger man in their eyes, and you in his.

There are times, particularly in combat, when a severe "dressing down" of one man or a group of men may be required. Even so, this is tactful, for it is the right thing at the right time.

In dealing with seniors, the Golden Rule again applies. Approach them in the manner you'd want to be approached *were you in their position with their responsibilities.*

Use tact with your juniors, but remember, a Marine NCO coddles nobody. Use tact with your seniors, but remember, nobody likes an "ear banger."

When you join a new outfit, just keep quiet and watch for a while. Don't noise it around that your old outfit was a better one just because it happened to do things differently. Make a few mental notes when you find something that *is* wrong. When you've got your feet on the ground, then make those changes *that you have the authority to make.* You might be surprised at how little really needs changing. Besides, you'll have learned another way of getting the job done.

8. Justice. Marines rate a square-shooting leader. Be one. Don't play favorites. Spread the liberty *and* the working parties around equally. Keep anger and emotion out of your decisions. Get rid of any narrow views which you may have about a particular race, creed, or section of the country. Judge a man by *what kind of a Marine* he is; nothing else. Don't let your men be overlooked when the PX ration is distributed in the field. If you get an extra carton of smokes, divide them equally. Give every one of your Marines a chance to prove himself. Help those that fall short of your standards, but keep your standards high.

9. Enthusiasm. It's a fact that the more you know about something, the greater your interest and enthusiasm. Show it. Others will follow your lead. Enthusiasm is more contagious than the measles. Set a goal for your unit, then put out all you've got in the achievement of that goal. This is particularly applicable in training. Marines are at their best when in the field. After all, they joined the Corps to learn how to fight. They'll learn, all right, but only when their instructor is enthused about what he's teaching. Show knowledge and enthusiasm about a subject and your troops will want that same knowledge. Show your dislikes and gripe about what's going on and you'll still be leading—but in the wrong direction. The choice is yours. Make the right one.

Don't get stale. "Take your pack off," can sometimes be good advice. Do it once in a while. Then come back strong with something new. When you find yourself forced to run problems over the same old terrain, run them from the other direction.

10. Bearing. Remember your DI? He was lean, leather-lunged, and tanned to a bone-deep brown. He had drilled shoulders and knife-edge creases that sliced down his shirt and trousers all the way to a pair of shoes that looked back at you. His brass glittered at every move and he didn't walk, he *marched!* And he taught you to do the same. He knew that when he inspected a platoon of 70 men just once, *he* had been inspected 70 times by 70 different pairs of eyes. Consequently, he had *bearing.* You learned from him that a uniform is more than a mere "suit of clothes." You wear a suit—but you *believe* in a uniform. Therefore, you *maintain* it—all the time. People often ask why Marines don't wear shoulder patches, cords, decals, loops, discs, brass crests, and so on. Marines don't need such trinkets. The globe, eagle, and anchor—set against an immaculate blue or a well-pressed forest green background—is enough identification. Besides, every stripe, every ribbon, every piece of metal, that you see on a Marine was *earned.* It wasn't handed out like an early chow pass. You earned your uniform and everything on it. Wear it with pride.

That's part of what is meant by bearing. The rest of it is how you conduct yourself, in or out of formation, ashore or on board, verbally and emotionally. Learn control of your voice and

gestures. A calm voice and a steady hand are confidence builders in combat. Don't ever show your concern over a dangerous situation, even if you feel it.

Speak plainly and simply. You're more interested in being understood than in showing off your vocabulary. If you ever rant and rave, losing control of your tongue and your emotions, you'll also lose control of your men. Swearing at subordinates is unfair. They can't swear back. It's also stupid, since you admit lack of ability to express displeasure in any other way. Don't lose your temper. Master yourself before you try to master others. There may be one exception to this rule. The time might come, in battle, when tough talk, a few oaths, and the right amount of anger is all that will pull your outfit together. Even Christ got mad when he drove the money changers from the temple. But save your display of temper until it is absolutely needed. Otherwise it won't pay off since you'll already have shot your bolt.

Sarcasm seldom gets results. Wisecrack to Marines—they've been around—they'll wisecrack back. Make a joke out of giving orders and they'll think you don't mean what you say. This doesn't mean to avoid joking at all times. A good joke, at the right time, is like good medicine, especially if the chips are down. As a matter of fact it is often the Marine Corps way of expressing sympathy and understanding without getting sticky about it. Many a wounded Marine has been sent to the rear with a smile and a remark about, "What some people won't do to get outta' work!"

Dignity, without being unapproachable—that's what bearing is. Work at it.

11. Endurance. A five-foot-four Marine sergeant once led his squad through 10 days of field training in Japan. He topped it off with a two-day hike, climbing *over* Mt. Fuji, on the 36 miles back to camp. When asked how a man his size developed such endurance, he said, "It was easy. I had 12 guys pushin' me all the way." What he meant, of course, was that 12 other Marines were depending on his *endurance* to pull them through. He couldn't *think* about quitting. Every leader must have endurance beyond that of his troops. The squad leader must check every man's position, then go build his own. On the march he will often carry part of another's load in addition to his own. He also has the burden of command upon him. An unfit body or an undisciplined mind could never make it.

Keep yourself fit, physically and mentally. Learn to stand punishment by undertaking hard physical tasks. Force yourself to study and think when tired. Get plenty of rest before a field problem. Don't stay on liberty 'til the last place is closed. The town will still be there when you get back. You'll enjoy it more then, anyhow.

A favorite saying of Marines is that you don't have to be trained to be miserable. That's true. But you do have to train to *endure* misery.

12. Unselfishness. Marine NCOs don't pull the best rations from the case and leave the rest to their men. They get the best they can for *all the men* in their unit, all the time. A leader gets his own comforts, pleasures, and recreation *after* his troops have been provided with theirs. Look at any chow line in the field. You'll see squad leaders at the end of their squads. You'll find staff noncommissioned officers at the end of the company. This is more than a tradition. It is leadership in action. It is unselfishness.

Share your men's hardships. Then the privileges that go with your rank will have been earned. Don't hesitate to accept them when the time is right, but until it is, let them be. When your men are wet, cold, and hungry—you'd better be, too. That's the price you pay for leadership. What it buys is well worth the cost. The dry clothes, warm bunk, and full belly can come later.

Give credit where credit is due. Don't grab the glory for yourself. Recognize the hard work and good ideas of your subordinates and be grateful you have such men. Your leaders will look after you in the same way. They know the score, too.

13. Loyalty. This is a two-way street. It goes all the way up and all the way down the chain of command. Marines *live* by it. They even quote Latin for it—*"Semper Fidelis."* As a leader of Marines, every word, every action, must reflect your loyalty—up and down. Back your men when they're right. Correct them when they're wrong. You're being loyal either way. Pass on orders as if they were your own idea, even when they are distasteful. To rely on the rank of the person who told *you* to do a job is to weaken your own position. Keep your personal problems and the private lives of your seniors to yourself. But help your men in their difficulties, when it is proper to do so. Never criticize your unit, your seniors, or your fellow NCOs in the presence of subordinates. Make sure they don't do it either. If a deserving man gets into trouble, go to bat for him. He'll work harder when it's all over.

When it comes to spreading corruption, the proverbial rotten apple couldn't hold a candle to the damage that can be done by a disloyal noncommissioned officer. The Marine Corps has

never had a problem in this area. Keep the record clean.

14. Judgment. This comes with experience. It is simply weighing all the facts in any situation, application of the other 13 traits you have just read about, then making the best move. But until you acquire *experience* you may not know the *best move.* What, then, do you use for *experienced judgment* in the meantime? Well, there are about two hundred years' worth of experienced judgment on tap in the Marine Corps. Some of it is available to you at the next link in the chain of command. *Ask* and you'll receive. *Seek* and you'll find.

Principles of Leadership

Now that you've had a look at the character traits required in a leader, let's see how these are fitted into what we call the *principles of leadership.* Eleven are set forth just for the sake of discussion. You may want to add or delete some. That's OK. We're not concerned as much about the words and phrases as we are about their *application.* They're all common sense items, anyway. When you get right down to it, a discussion of leadership is only *common sense with a vocabulary.* You've got the common sense. Let's put some of that vocabulary to work.

1. Take responsibility for your actions and the actions of your Marines. The leader, alone, is responsible for all that his unit does or fails to do. That sounds like a big order, but take a look at the authority that is given you to handle that responsibility. You are expected to *use* that authority. Use it with *judgment, tact,* and *initiative.* Have the *courage* to be *loyal* to your unit, your men and yourself. As long as you are being held responsible, be responsible for success, not failure. Be *dependable.*

2. Know yourself and seek self-improvement. Evaluate yourself from time to time. Do you measure up? If you don't, admit it *to yourself.* Then turn to. On the other hand, don't sell yourself short. If you think you're the best NCO in your platoon, admit *that,* also to yourself. Then set out to be the best NCO in the company. Learn how to speak effectively, how to instruct, and how to be an expert with all the equipment that your unit might be expected to use.

3. Set the example. As an NCO you are in an ideal spot to do this. Marines are already looking to you for a pattern and a standard to follow. No amount of instruction and no form of discipline can have the effect of your *personal* example. Make it a good one.

4. Develop your subordinates. Tell your people what you want done and by when. Then leave it at that. If you have junior leaders, leave the details up to them. In this way, kill two birds with one stone. You will have more time to devote to other jobs and you are training another leader. An NCO with confidence in himself will have confidence in his subordinates. Supervise, and check on the results. But leave the details to the man on the spot. After all, there's more than one way to skin a cat. And it's the whole fur you're after, not the individual hairs.

5. Insure that a job is understood, then supervise it and carry it through to completion. This goes back to being *dependable* and *decisive. Make up your mind what do do, who* is to do it, *where* it is to be done, *when* it is to be done, and tell your men *why,* when they need to be told why. Continue supervising the job until it has been done better than the man who wanted it done in the first place ever thought it could be.

6. Know your men and look after their welfare. A *loyal* NCO will never permit himself to rest until his men are bedded down. He always gets the best he can for them by honest means. With *judgment* he'll know which of his troops are capable of doing the best job in a particular assignment. Leaders share the problems of their men, but they don't pry when a man wants privacy.

7. Every man should be kept informed. Make sure your people get the word. Be known as the "man with the straight dope." Don't let one of your men be part of the so-called "10 per cent." Certain information is classified. Let your people have only that portion that they *need* to know, but make certain they have it. Squelch rumors. They can create disappointment when they're good, but untrue. They can sap morale when they exaggerate enemy capabilities. Have the *integrity,* the *knowledge,* and the *dependability* to keep your men correctly posted on what's going on in the world, the country, the Corps, and your outfit.

8. Set goals you can reach. Don't send two men on a working party that calls for five. Your Marines may be good, but don't ask the im-

possible. Know the limitations of your outfit and bite off what you can chew. In combat, a boy sent to do a man's job can lead to disaster. In peacetime, it leads to a feeling of futility. Conversely, men who have a reasonable goal and then achieve it, are a proud lot. They've done something and done it well. Next time, they'll be able to tackle a little more. Don't set your sights clear over the butts; keep them on the target.

9. Make sound and timely decisions. *Knowledge and judgment* are required to produce a sound decision. Include some *initiative* and the decision will be a timely one. Use your initiative and make your decisions in time to meet the problems that are coming. If you find you've made a bum decision, have the *courage* to change it before the damage is done. But don't change the word any more than you absolutely have to. Nothing confuses an outfit more than the eternal routine of "brown side out . . . green side out."

10. Know your job. This requires no elaboration. It does require hard work on your part. Stay abreast of changes. War moves fast nowadays. Look up the dope on the latest weapons and equipment. Read up on recent developments. Don't be the type who can only say, "Well, that ain't the way we did it in the old Fifth Marines."

11. Teamwork. Train your unit *as a unit.* Keep that *unit integrity* every chance you get. If a working party comes up for three men, take your whole fire team. The job will be easier with an extra hand, and your men will be working as a *team.* Get your outfit out on liberty together now and then. They work as a team; get 'em to play as one. Put your people in the jobs they do best, then rotate them from time to time. They'll learn to appreciate the other man's task as well. When one member of your team is missing, others can do his share. But don't ever permit several men to do another man's job when he's around. *Everybody* pulls his load in the Marine Corps.

When you and your unit have done something well, talk it up. This builds *esprit de corps.* Every Marine knows enough French to tell you what that means. You can't see it but you can *feel* it. An outfit with a lot of *esprit* holds itself in very high regard while sort of tolerating others. There's nothing wrong with that. Every Marine has a right to figure his outfit is the best in the entire Corps. After all, *he's in it!*

What You Can Expect

We've spent some time on what the Corps expects of you as a junior leader. It's not all one way. There are certain things which you have a right to expect in return. First of all, since you are the link in the chain of command that lies squarely between your senior and your subordinates, you can expect the same leadership from him that you've just read about.

Then there's the additional pay you'll be getting along with every promotion—and promotion comes to real leaders, regularly. Also with promotion comes additional authority. It's granted to you on a piece of paper known as a Certificate of Appointment, commonly called a warrant. Take a look at it.

You'll see more there than a piece of paper—much more. First, there's an expression of "special trust and confidence" in your "fidelity and abilities." That is recognition of the highest order. It's appreciation for your hard work thus far. But look further. You don't rest on your laurels in the Marine Corps. There's a charge to "carefully and diligently discharge the duties of the grade to which appointed by doing and performing all manner of things thereunto pertaining." That means additional responsibility, which, when you think about it, is also a reward.

Next, you'll find that additional authority we mentioned a while back. It's in the words, "And I do strictly charge and require all personnel of lesser grade to render obedience to appropriate orders." The commanding officer who signs that Certificate is delegating a part of his authority to you. He gets his authority from the President of the United States and he has chosen you to help him in the execution of *his* responsibility. Notice, however, that he hasn't delegated responsibility. That isn't done in the Corps, by him, by you, or by anybody.

When it comes to leadership, there's no truer statement than that one. Only the noncommissioned officer is in a position to give the close, constant, personal type of leadership that we've been discussing. When you, as a Marine NCO, have provided your men with that type of leadership, then you already will have reaped the greatest return. By definition you'll (1) have accomplished your mission and (2) command the willing obedience, confidence, loyalty, and respect of the United States Marines under you. *There is no more satisfactory reward, anywhere.*


A TYPICAL VC FORTIFIED VILLAGE
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The 60-mm. Mortar

Characteristics and General Data

A. ***Characteristics:***

1. The 60-mm. mortar, M19, is a smooth bore, muzzle loading, high angle of fire weapon.

2. The mortar (barrel) is assembled into a single unit while the mount consists of two units, the bipod and base plate.

3. The mortar is attached to the bipod by means of a mortar clamp and is easily dismountable. It is fastened to the base plate by inserting the spherical projection located on the end of the barrel into the socket and then closing the locking lever.

Because of these characteristics the 60-mm. mortar is capable of firing from defiladed positions into other defiladed positions. Because of its low muzzle velocity and corresponding lack of penetrating power, the 60-mm. mortar is not suitable for engaging emplacements with overhead cover.

B. ***General Data:***

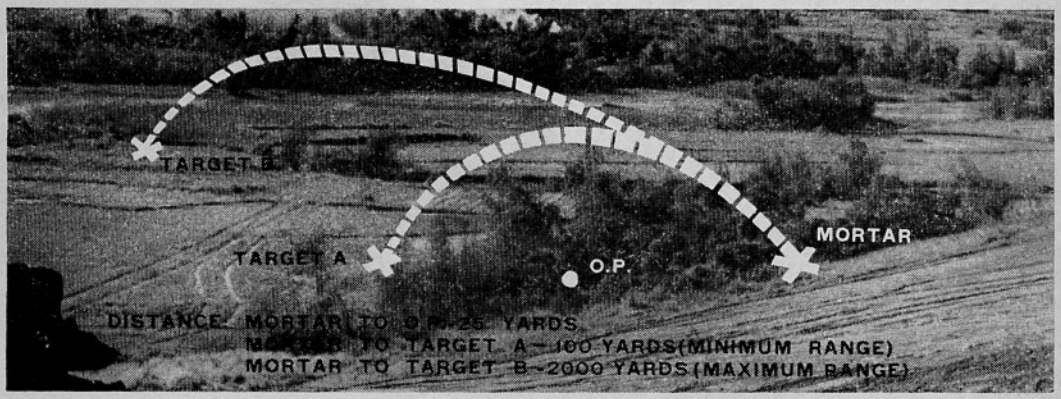
Length of mortar ..... 32.23 inches
Elevation (approximate) ... 40 to 85 degrees
Traverse right or left from center (approximate) ..... 125 mils
Number of mils in one turn of hand wheel (approximate) 15
Number of degrees in one turn of elevating crank ..... ½
Maximum rate of fire, rounds per minute 30-35
Normal rate of fire, rounds per minute ... 18

Weights:

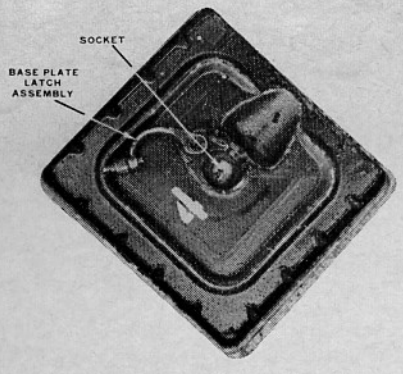
Mortar, M19, complete ..... 45.2 lbs.
Barrel, M19 ..... 16 lbs.
Bipod, M5 ..... 16.4 lbs.
Base plate, M5 ..... 12.8 lbs.

Ammunition:

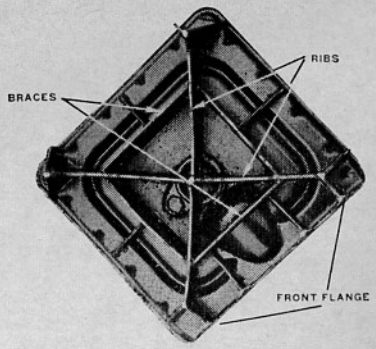
Range, HE, shell ..... 1985 yds. (approx.)
Range, WP, shell ..... 1650 yds. (approx.)
Range, illuminating shell ..... 1075 yds. (approx.)



39.1 Limits of the 60-mm. Mortar.



39.2 Top of base plate.



39.3 Bottom of base plate.

C. The 60-mm. mortar, M19, is mounted on the bipod, M5 and base plate. The mortar consists of the tube, a base cap extension and a base cap which houses a firing mechanism that can be set for either drop fire or lever fire. With the firing selector set for DROP FIRE, a shell placed in the tube drops down the tube until the primer of the propelling charge strikes the firing pin, firing the shell. When the firing selector is set at LEVER FIRE, the round is dropped down the tube and then fired by tripping the firing mechanism. This releases the striker to move forward and strike the firing pin, which strikes the primer of the propelling charge and ignites it.

The M4 Sight

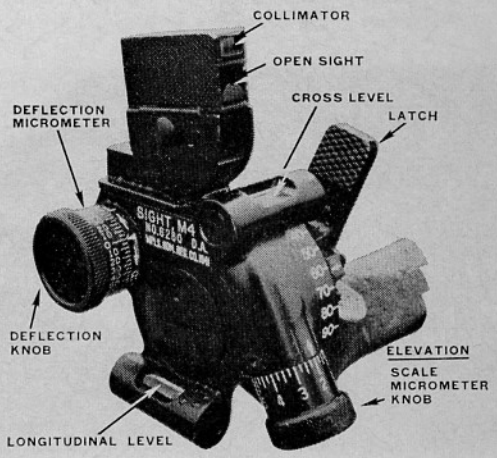
Your skill in placing mortar shells where you want them will depend a great deal on your knowledge and use of the M4 sight which is standard for use with the 60-mm. mortar. The M4 sight is pictured in Fig. **39.4**.

A. ***Attaching the Sight.*** You attach the M4 sight to the mortar by placing the dovetailed bracket in the mortar yoke. When you insert the bracket, press the latch well to the right and the sight goes easily into place. To remove the sight, press the latch to the right and lift the sight out of its recess.

B. ***Collimator and Open Sight.*** On the head of the M4 sight is the collimator and open sight.

1. The collimator is on top of the sight and part of it is enclosed in glass. The glass enclosed part is called the closed collimator sight. When you look into the closed collimator you see nothing but a vertical white line. This is the line you align with your aiming point.

2. The open sight is just below the collimator sight. On the front of this part is a vertical wire which is used as a front sight. In the rear of the open sight is a "V" type sight. This is used as a rear sight. The open sight is used only when the collimator is broken or when the light is such that you cannot see the white line in the collimator.



39.4 The M4 Sight.

Use of the M4 Sight

In sighting with the M4 you use the collimator in combination with the elevation arc and knob, the deflection knob, the longitudinal level, and the cross level.

A. ***Sighting.*** To sight with a collimator:

1. Place your eyes from three to 10 inches to the rear of the collimator.

2. Adjust your vision so that at the same time you look into the closed collimator sight, you look over the top of the collimator to see your aiming point. You will see the aiming point and the white line in the collimator at the same time. When the sight is properly aligned, the white line is along the left edge of your aiming point.

3. The collimator is pivoted. This is because your aiming point is usually on higher or lower ground than the mortar. By pivoting the collimator to the front or rear, you can bring the aiming point into your field of view.

B. ***Elevation.*** There is an elevation arc on the rear of the M4 sight. This arc is divided into a scale of 10 degrees. An index is on the right of the arc.

The elevation knob is to the left of and below the elevation scale. You turn this knob to make a change on the scale. A micrometer is on the elevation knob. This micrometer is graduated from one to 10 degrees, each degree graduated in ¼-degree steps. A complete turn of the elevation knob moves the elevation scale 10 degrees.

Zero of the M4 sight for elevation is 62 degrees. This is because 62 degrees is approximately halfway between 40 and 85 degrees. You will find that 85 degrees is the highest angle of elevation called for on any of the firing tables you will see.

C. ***Deflection.*** On the left of the sight is a deflection knob. This knob is graduated by mils in steps of five mils each. There are 150 mils to the right and 150 mils to the left.

On the body of the sight there is an index and two arrows. One arrow points toward the letter "R" and the other arrow points to the letter "L". These are to assist you in setting the proper deflection on the sight. They are used as follows:

1. To set for left deflection, simply turn the zero of the micrometer knob toward the letter "L" until the index which is on the body of the sight points toward the proper setting.

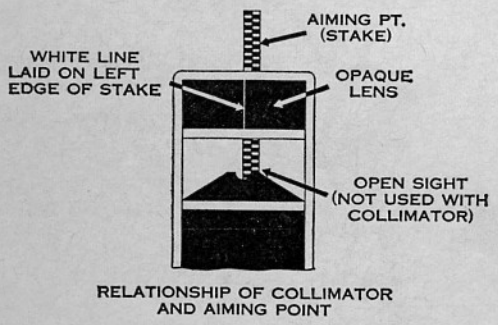
2. To set for right deflection, you simply reverse the procedure. Turn the zero of the micrometer knob toward the letter "R" until the index points toward the proper setting.

3. If your round hits left of the target, you set right deflection on your sight. If it hits to the right, you set left deflection on your sight.

D. ***Longitudinal Level.*** Beneath the deflection micrometer there is a level known as the longitudinal level. This level, when centered, indicates that the elevation of the mortar tube corresponds to the elevation on the sight.

The degree of elevation is set by means of the elevation micrometer knob. The longitudinal level is then centered by means of the elevating crank on the bipod.

E. ***Cross Level.*** Just behind the collimator is the cross level. When the cross level bubble is in the center, the mortar is cross leveled. You turn the adjusting nut on the bipod leg in order to center the cross level bubble. When this bubble is centered, it is a sign that the traversing screw is horizontal.



39.5 Collimator, correct sight alignment.

Mounting, Loading, and Dismounting

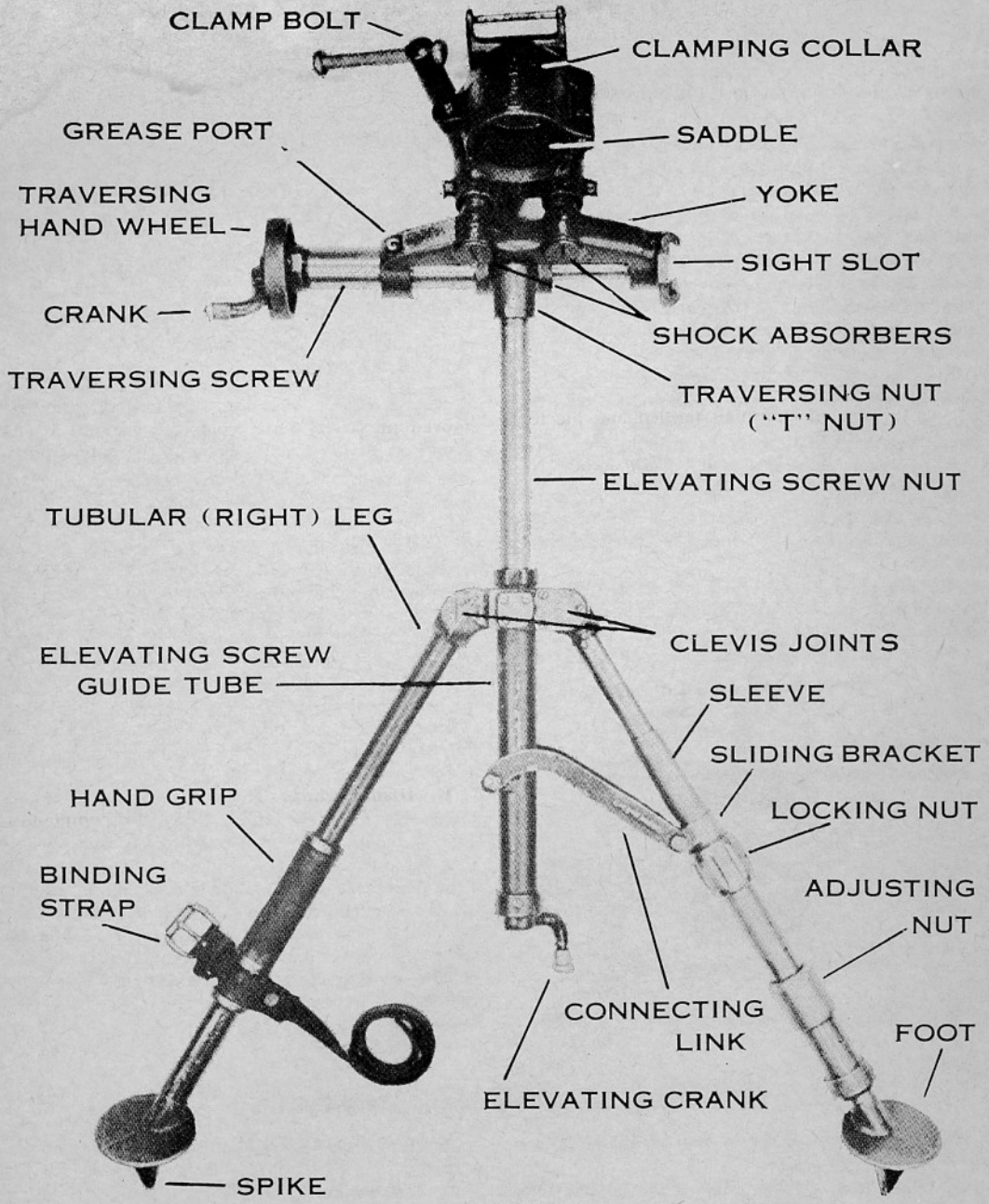
The gunner carries the mortar complete for action except for the sight.

A. ***Mounting.*** When the squad leader gives the command ACTION, if you are the gunner, you take the following steps to mount the mortar:

1. Get in a kneeling position on the left of the mortar.

2. Loosen the leg straps from around the mortar tube.

3. Grasp the mortar tube with your right hand



39.6 Mount, Bipod, M5.

and raise the tube so that the legs can swing free. Use your left hand to move the legs out about 18 inches in front of the front edge of the base plate. Then let the legs rest on the ground.

4. Reach over the mortar tube with your right hand and grasp the right leg of the bipod by the leather hand grip. With your left hand, grasp the left leg by the adjusting nut and the locking sleeve. Then spread the legs of the bipod. The muzzle of the mortar should fall to the right when this is done. If it falls to the left, the sliding bracket may slide off the top of the sleeve and cause trouble and delay in getting it back on. When spreading the bipod legs, lift them off the ground and pull them both apart at the same time as far as they will go.

5. After spreading the legs, run up the adjusting nut on the leg for about ¾ of an inch. This is to allow room for adjustment in leveling after the traversing mechanism is leveled and the locking sleeve tightened.

6. Now level the traversing screw as nearly as possible by eye, and lock the locking nut by turning it toward you.

7. By this time the No. 2 member of your squad has the aiming stake out. You pick up the mortar in the way most convenient to you and move it forward to the mortar position.

8. The squad leader already has laid the cleaning staff on the ground, pointing toward the target. Place the left edge of the base plate along this staff so that the front edge of the base plate is perpendicular to the line of sight.

9. Place the legs about 18 inches in front of the base plate and on a line parallel to its front edge.

10. Run the elevating screw nut halfway up by turning the elevating crank 15 turns.

11. Center the traversing screw.

12. You now are ready to put the sight on the mortar. When the sight is mounted, set it at 62 degrees elevation and zero deflection.

13. Next, sight through the collimator. Grasp the legs of the bipod and shift the bipod right or left until the sighting line of the collimator is aligned on the aiming point.

14. Move the feet of the bipod to the front or rear until the longitudinal level is approximately level.

15. When you are moving the bipod, don't worry about lining the sight accurately or leveling the longitudinal level accurately. Get a good position. Use the traversing handwheel and elevating crank to get the utmost accuracy in lining the sight and leveling.

16. You are now ready for the fire order. The No. 2 member of your squad has taken his position on the right side of the mortar. He lies on his right side with his feet to the rear and the weight of his body on his right elbow. His head is below and to the rear of the muzzle, but he is far enough forward to place the shell in the mortar barrel with his left hand. The squad leader has taken a position from which he can observe the target. The No. 3 member of your squad may take a position in rear of No. 2, to pass ammunition and assist in charging the shells. If the No. 3 member does not take this position, he remains under cover to the rear with the No. 4 and No. 5 members of the squad.

B. *Loading.* The loading acts are:

1. When the fire order has been given and the mortar laid, the gunner commands FIRE.

2. No. 2, having charged the shell and removed the safety wire, holds the shell in his left hand. With his thumb, he tests the safety pin to see if it is locked in position.

3. Then the No. 2 man inserts the shell into the barrel, fin assembly first, until the bourrelet is inside the muzzle.

4. At this point, the No. 2 man releases the shell and cuts his left hand down and back toward the base plate, making sure that he doesn't strike the mortar clamp bolt as he does so. The loader must be careful not to disturb the lay of the barrel when he inserts the shell.

5. The gunner watches the loading operation until the shell is dropped by No. 2, at which time both the gunner and No. 2 duck their heads to protect their faces from the muzzle blast.

C. *Dismounting.* The command for dismounting is, OUT OF ACTION. When this command is given, the mortar is dismounted in the following manner:

1. At the command, the No. 2 man goes forward and gets the aiming stake.

2. The gunner removes the sight, puts it in the case, and snaps the case shut.

3. The gunner puts the cover on the muzzle, centers the traversing screw, and runs the elevating screw nut all the way down.

4. He loosens the locking nut and pushes the mortar tube to the right.

5. The gunner is now ready to close the legs of the bipod. When you are doing this, follow carefully the steps given here. Failure to take proper precautions at this point may result in mashing your fingers or bruising your hand. To close the legs, you first grasp the mortar tube, not the right leg of the bipod, with your right hand.

6. Next, use your left hand to raise up on the left leg. Allow the right leg to remain on the ground.

7. Then push down on the left leg, forcing it over to the right leg.

8. With your left hand, bring the legs back to within a few inches of the base plate and allow them to rest on the ground.

9. Grasp the carrying strap with your right hand, the leg strap with your left hand, and push the mortar forward. At the same time, lift up on the carrying strap and let the base plate sandwich itself between the bipod and the tube.

10. Fasten the leg strap that binds the bipod to the tube. Check to see that the carrying strap is not fastened beneath the leg strap.

Misfires

When a round is inserted into the tube of a mortar, but the mortar fails to fire, it is called a misfire. The steps for handling misfires must be followed very strictly. They make up the only safe method for handling misfires. The steps are as follows:

1. When a misfire occurs, the round usually has struck the firing pin and failed to function. In rare cases, the round may hang in the tube without striking the firing pin. When there is any doubt whether or not the round has reached the base end of the chamber, the gunner kicks the tube with the heel of his shoe. If the round is not fired, set the firing selector on LEVER FIRE and trip the lever three times.

2. If the misfire has not been remedied by this method, the mortar crew should then wait one minute, provided they are firing in training exercises. If they are firing in battle, they should wait one minute if conditions permit. The waiting period is advisable to prevent an accident in case of delayed action in the ignition cartridge.

3. After the one-minute wait, the following steps should be taken to remove the round. The gunner first unlocks the mortar from the base plate. He braces the bipod by placing his left arm in front of the legs and grasping the hand grip of the right leg. He places his right hand around the base cap (using an ammunition bag for protection in case the tube is hot) and gradually raises the rear end of the tube until the round begins to slide out.

4. The No. 2 member of the squad kneels and places his right hand, palm up, under the tube. His left hand is placed, palm down, on the top of the barrel. The thumbs of both hands are placed along the forefingers and extreme care should be taken to see that no part of the hand is in front of the muzzle.

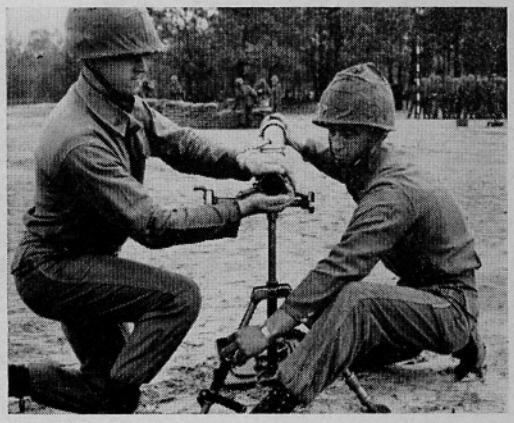
5. The base of the mortar must not be lowered again below the horizontal position until the round has been removed from the tube.

6. As soon as the round has started forward, and not before, the No. 2 man places the thumb of each hand over the muzzle and stops the round as the point of the fuze reaches the muzzle.

7. The No. 2 man now locates the safety pin.



39.7 Kicking barrel to dislodge misfire.



39.8 Hand position in handling misfire.

He places a finger over the head of the safety pin and removes the round from the muzzle. Then he inserts the safety wire and inspects the round to find out why the misfire occurred.

8. If the shell doesn't start sliding out when the tube is raised above the horizontal, the gunner shakes the tube to dislodge the shell.

9. After the shell has been removed, the gunner raises the base cap end of the tube higher and shakes it to dump out any matter that may have caused the misfire. This might be part of a tail fin, the remnant of an igniting cartridge, etc.

10. The gunner then lowers the mortar and locks the spherical projection in the socket. Firing is resumed. If another misfire occurs, the gunner inspects the firing pin to see that it is clean and tightly screwed into the base cap. He also sees that the tube is swabbed out thoroughly.

Ammunition

There are three kinds of shells used by the 60-mm. mortars in combat. These shells are High Explosive (H.E.) M49A2, Illuminating M83A3, and (W.P.) Smoke Shell, M302.

A. *H.E. M49A2.* The H.E. M49A2 shell is used against personnel and light material targets. Some of its characteristics are as follows:

1. It explodes instantaneously on impact.
2. It weighs approximately three pounds.
3. Its color is yellow and olive drab.
4. It is a fragmentation shell and breaks into more than 200 fragments when it explodes.
5. Its maximum range is approximately 2000 yards.
6. The propelling charge consists of one ignition cartridge and one to four increments.

B. *M83A3.* The M83A3 is an illuminating shell used to light up areas forward of our lines. Some of its characteristics are:

1. It has a fixed time fuze which goes off 15 seconds after the shell is fired.
2. It weighs 4.25 pounds.
3. Its color is white with black markings.
4. In the body of the shell there is a candle, a parachute and a small amount of black powder. When the powder train in the time fuze ignites the black powder in the body of the shell, part of the shell near the base is broken off. The candle is lighted and thrown out. It burns for a minimum of 31 seconds with a light of 330,000 candlepower and falls at a rate of about 10 feet per second.

C. *Shell (W.P.) Smoke M302.* This shell is similar in appearance to the H.E. shell. Some of its characteristics are as follows:

1. It explodes instantaneously upon impact.
2. It weighs approximately four pounds.
3. Its color is green with red markings.
4. Its filler is composed of white phosphorus, and it has a casualty producing incendiary effect.
5. The propelling charge consists of an ignition cartridge and one to four increments.
6. Its range is approximately 1650 yards.

Care and Cleaning



39.9 Hand position as shell slides forward.

The 60-mm. mortar, like all weapons, quickly becomes useless if it is not cared for. The proper procedure for taking care of your mortar is given here.

A. *During Training.* When the mortar is being used for training purposes it should be cleaned at the end of the day in the following manner:

1. Wipe all dirt from the mortar, base plate, bipod, and sights with dry rags. Then cover all unpainted surfaces with a light coat of oil, lubricating preservative special.

B. *Before Firing.* Before firing, the bore should be swabbed out dry with cotton waste or cleaning patches that have been attached to the cleaning staff.

C. *During Firing.* During firing, the bore should be swabbed out after every five rounds. During wet weather, the muzzle cover should be

placed over the muzzle when there is a lull in firing.

D. ***After Firing.*** After firing, the mortar should be cleaned not later than the evening of the day it is fired. Then it should be cleaned three successive days in the following manner:

1. Outside surfaces are cleaned as described previously.

2. To clean the bore, remove the firing pin from the spherical projection. Take a cleaning patch, or cotton waste, attach it to the cleaning staff and dip it in rifle bore cleaner. Swab the bore out thoroughly with this substance. Then use dry patches to dry the bore.

3. Take a clean patch, saturate it with oil, lubricating, preservative special. Then swab the bore with the patch.

4. When regular rifle bore cleaner is not available, the next best thing to use is about 1½ tablespoons of soda ash to one pint of boiling water. Cold water may be used if necessary. If soda ash is not available, use ¼ lb. of soap chips to one gallon of water.

5. If you use soda ash and water, or soap and water, to clean the bore, make sure the bore is dry before coating it with oil.

6. After the bore has been cleaned and oiled, clean the firing pin with the same substance. As your final step, coat the pin with oil and replace it in its recess.

Safety Precautions

A. ***Before Firing.*** Before firing, the gunner insures that:

1. The mortar is properly mounted.

2. The mortar is locked to the base plate in the proper manner.

3. The clamp bolt is secure.

4. The locking sleeve is secure.

5. The bore is clean.

B. ***During Firing.*** During firing, the gunner takes these precautions:

1. From time to time, he checks to be sure that the clamp bolt and locking sleeve are as tight as they should be.

2. Swabs the bore after every five rounds.

3. Checks frequently to see that the base plate and bipod positions are safe for firing the weapon.

4. If it is not clearly apparent that the shell will clear the mask, the gunner makes a thorough check for mask clearance.

5. During rainy weather, he keeps the muzzle cover over the muzzle except when a round is actually being fired.

C. ***Duties of No. 2.*** Before and during firing the assistant gunner (No. 2 man) insures that:

1. Each shell is clean, particularly the bourrelet.

2. The propelling charge is adjusted on each shell for the desired zone.

3. The fuze safety pin of each shell is in place properly.

4. The safety wire has been removed from the fuze.

5. He examines for the presence of a safety pin. Holding the round in a vertical position, with the fuze end up, he tests the tension of the safety pin spring by pressing and releasing the pin. Since a premature explosion will result from firing a round in which the safety pin becomes unseated, such rounds must not be fired. They are separated from the other ammunition and kept in a safe place until they are destroyed by ordnance personnel.