

WEAPONS

(Marine Infantry Battalion)

T.O. Approved 1 July, 1942

H. F. ECKERT



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WEAPONS
(MARINE INFANTRY BATTALION)

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WEAPONS
(MARINE INFANTRY BATTALION)

T.O. APPROVED 1 JULY, 1942

INTRODUCTION

Strategy and tactics of warfare have been considerably affected by the rapid strides made in the development of modern weapons, especially the airplane, the tank, and other armored vehicles. The high mobility and tremendous striking power of these weapons have caused attention to be focused on them to such a degree that many laymen believe the importance of the infantry arm in modern warfare is negligible.

In spite of all new developments, the importance and task of the infantry remains essentially unchanged. Infantry may be transported to the theater of operations by vehicle or by air; they may even be landed by plane or parachute at points within the enemy lines—but their job is still the same: they must close with the enemy in personal combat and take and hold the ground. The assistance of the supporting arms is aimed toward this phase in offensive combat. They can assist the infantry with the fires of their weapons up to a certain distance, whereupon the infantry must maintain such fire superiority that has been gained from the enemy by using the fire power of its own weapons, until such time as the enemy can be closed upon. In defensive combat the supporting arms assist the infantry in stopping enemy attack troops from reaching the supported infantry. The infantry uses all the means at its disposal for its defense and in case of a penetration, assumes a limited offensive in the form of counterattacks to drive out the hostile troops. To accomplish the above tasks, the infantry has been armed with the weapons described herein.

Material in this text is intended only for the purpose of acquainting students of these Schools with the general characteristics of weapons of the rifle battalion and their battlefield employment in brief. No attempt has been made to cover technical details involved in the firing, functioning, care and cleaning, or training.

Organizational data is taken from Tables of Organization, Infantry Regiment, Marine Division, Approved 1 July, 1942.

SECTION 1

U.S. RIFLE, CAL. .30, M1903*

1. **General.**—The rifle with its bayonet is the infantryman's main reliance. In spite of the addition of numerous auxiliary weapons to infantry units, the rifle is by far the most versatile weapon of the infantry soldier; it is primarily the weapon for frontal fire and for distributed fire. The individual soldier, with his own fire weapon, including his bayonet, remains the basic element of infantry combat.

2. **Essential Characteristics.**—a. **Description.**—The U.S. Rifle, cal. .30, M1903, is a manually operated clip loaded, magazine fed, air-cooled shoulder weapon of the bolt type. Provision has been made for attaching a bayonet. This rifle is commonly referred to as the Springfield Rifle. (See Fig. 1.)

b. **General data.**—**Weights:**

Rifle (without bayonet)	(pounds)	8.69
Bayonet	(pounds)	1
Length (without bayonet)	(inches)	43
Average effective rate of fire		
	(aimed shots per minute)	10
Sights graduated to	(yards)	2,850
Maximum range:		
M1 cartridge	(yards)	5,500
M2 cartridge	(yards)	3,450

c. **Loading.**—The magazine of the rifle holds five cartridges and one additional cartridge may be inserted in the chamber, making the maximum capacity of the rifle six shots for one loading. In order to facilitate loading, cartridges are issued in clips holding five cartridges each.

d. **Functioning.**—Extraction, ejection, and loading are accomplished by manual operation of the bolt. The rifle fires once for each squeeze of the trigger.

e. **Rear sight.**—The rear sight leaf is graduated from 100 to 2,850 yards, the proper range being set by moving the drift slide up or down the sight leaf. Windage adjustments are made by means of a knob on the right side of the rear sight.

3. **Organization of Personnel.**—a. **Assignment.**—The M1903 Rifle is a basic, individual weapon, and the rifleman himself is a complete fire unit.

*The U.S. Rifle, Cal. .30, M1903A1 is essentially the same as the M1903 Rifle except that it has a pistol grip stock.

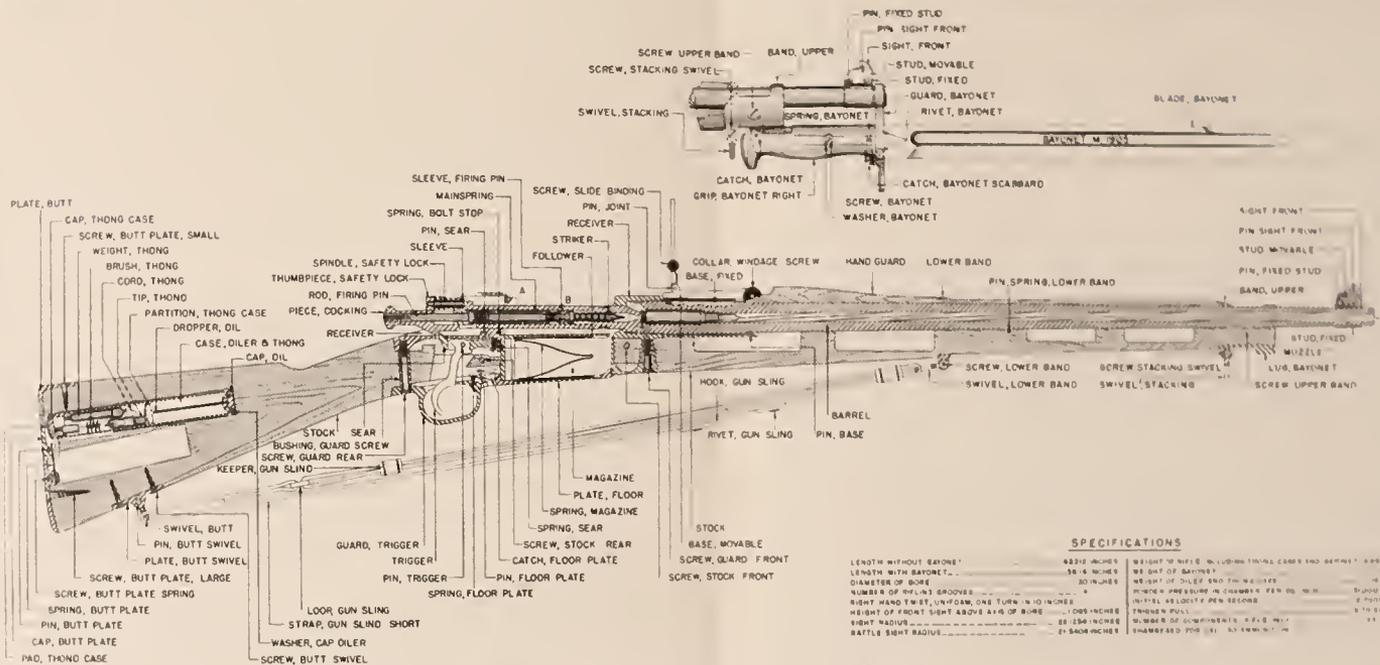


FIG. 1.—U.S. RIFLE, CAL. .30, M1903.

b. **Equipment.**—Each rifleman armed with the M1903 Rifle carries one cartridge belt containing 40 rounds, and a bayonet and scabbard.

4. **Ammunition Supply.**—a. **Allowance.**—The unit of fire* is 100 rounds per rifle in an infantry battalion, proportioned as follows: 80 per cent ball, 15 per cent armor piercing, and 5 per cent tracer.

b. **Distribution.**—Ammunition is distributed as follows: 40 rounds carried on the rifleman and extra ammunition issued prior to combat.

5. **Employment.**—a. Riflemen with their weapons are organized into squads for the purpose of supply, application and control of fire, and fire discipline. An attack is advanced by the fire and movement of individual squads and of the individual riflemen within the squads. In the defense, rifles are used to take under fire all suitable targets within effective range in their assigned sector. They cover areas which cannot be reached by the fire of automatic weapons, and thicken the fire in areas which are covered by other weapons. When mortars, antitank guns, or automatic weapons are located near a squad position, the riflemen protect them from hostile assault.

b. Being one of the most mobile of infantry weapons, the rifle is used to great advantage by individuals or small groups on special missions, such as scouting and patrolling.

c. Although the M1 cartridge has a maximum range of 5,500 yards, the actual effective range of the rifle varies with the nature of the target, terrain, and other conditions such as weather and light. The maximum effective range of the rifle is considered to be 600 yards, but generally it is desirable to withhold rifle fire until the enemy has come within 400 yards.

This rifle can be fitted with a temporary attachment for firing rifle and antitank grenades—(See Section 16).

*A unit of fire for a designated weapon is the quantity of ammunition, in rounds, which that weapon may be expected to expend on the average in 1 day of combat.

SECTION 2

U.S. RIFLE, CAL. .30, M1

1. **Essential Characteristics.**—**a. Description.**—The United States Rifle, cal. .30, M1, is a semi-automatic, self-loading, gas-operated, clip-fed, air-cooled, shoulder weapon. It has a pistol-grip stock and provision has been made for attaching a bayonet. This rifle is sometimes referred to as the Garand Rifle. (See Figure 2.)

b. General data.—

Weights:

Rifle (without bayonet)	(pounds)	8.94
Clip, loaded, 8 rounds	(pounds)	.50
Bandoleer, filled, 48 rounds	(pounds)	3.25
Bayonet	(pounds)	1
Length of rifle (without bayonet) ..	(inches)	43
Average effective rate of fire		
	(aimed shots per minute)	30
Sights graduated to	(yards)	1,100
Maximum range, M2 cartridge	(yards)	3,450
Maximum range, M1 cartridge	(yards)	5,500

c. Firing.—The rifle fires but once for each squeeze of the trigger. When the eighth shot has been fired, the empty clip is automatically ejected upward out of the receiver to the right and the bolt remains open, ready for the insertion of another clip. The eight cartridges are loaded in a reversible clip which can be inserted in the rifle either side up. Ammunition is usually loaded into clips at the factory, but may be loaded by hand.

d. Advantages.—The principal advantage of the weapon is its mechanical operation, resulting in fire power two or three times greater than that of the M1903 rifle. The sustained rate of fire is about 30 rounds per minute. The shock of recoil of the M1 rifle is some 30 per cent less than that of the M1903 rifle. This outstanding feature reduces fatigue and permits the rifleman to fire many rounds with no shoulder padding and still be fresh enough for all normal combat firing.

e. Sights.—The front sight of the M1 Rifle is of the blade type, protected by two guards, and is designed to prevent blurring.

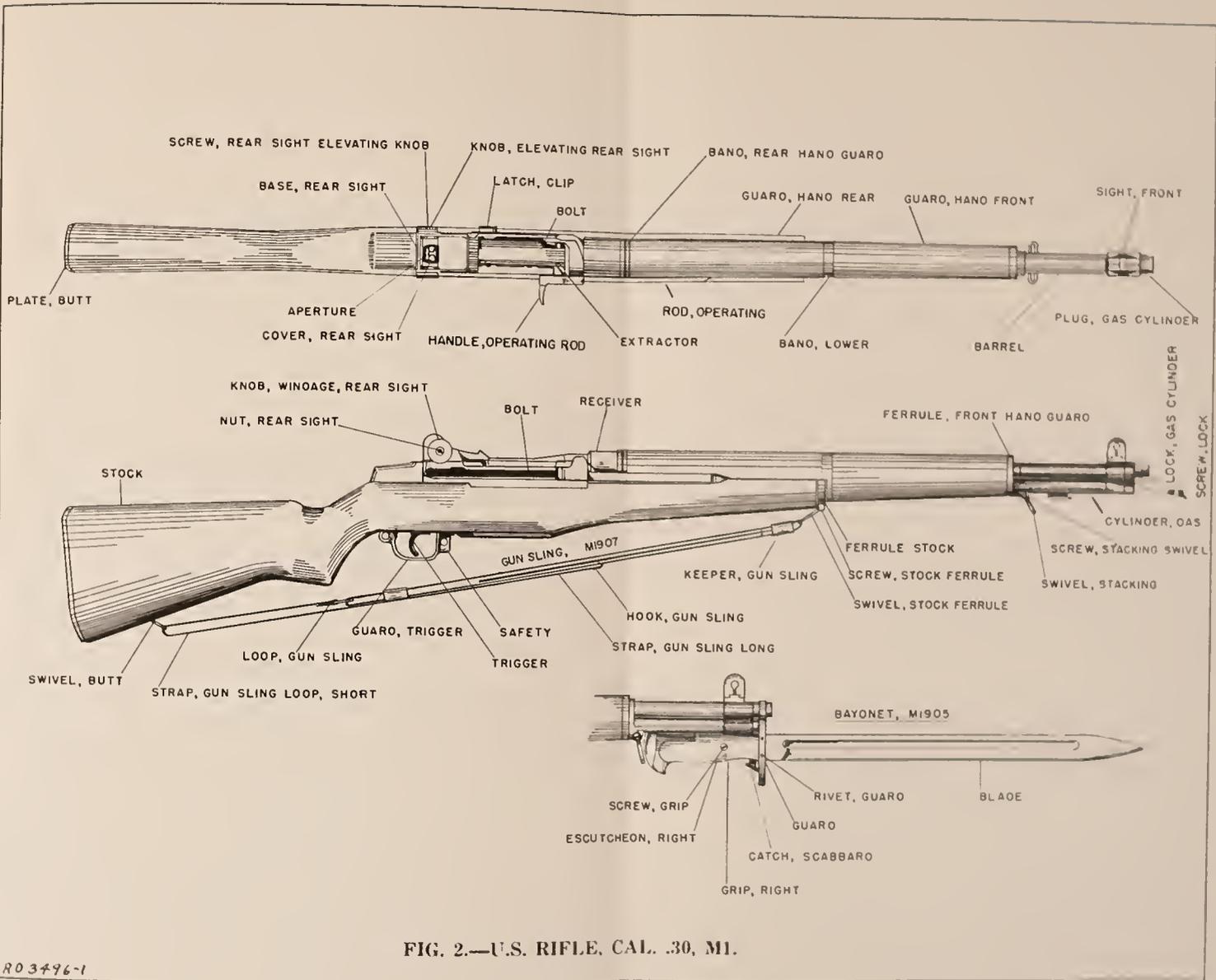


FIG. 2.—U.S. RIFLE, CAL. .30, M1.

The rear sight is of the aperture type. The elevation drum is constructed to correct for the zero, so that when firing at a particular range the reading on the sight may be adjusted to correspond to the actual range. Adjustments in elevation are made by means of a knob on the left side of the receiver. Windage adjustments are made by means of a knob on the right side of the receiver directly opposite the range knob. A key lock has been added to the windage knob to prevent the sights from being jarred out of adjustment during firing.

2. Organization of Personnel.—a. Assignment.—The M1 Rifle is a basic, individual weapon, and the rifleman himself is the complete fire unit.

b. Equipment.—Each rifleman armed with the M1 Rifle carries one cartridge belt containing 40 rounds of ammunition, and a bayonet and scabbard.

3. Ammunition Supply.—a. Allowance.—The unit of fire is 160 rounds per rifle in an infantry battalion, proportioned as follows: 80 per cent ball, 15 per cent armor piercing, and 5 per cent tracer.

b. Distribution.—Ammunition is distributed as follows: 40 rounds are carried on the rifleman and extra ammunition is issued prior to combat. Additional ammunition is secured from the battalion ammunition distributing point. The superior rate of fire of the M1 over the M1903 increases somewhat the burden of ammunition supply.

4. Employment.—The employment of the M1 rifle is practically identical with the M1903. It is obvious, of course, that the fire power of a squad armed with the M1 rifle is much greater than when equipped with the M1903 rifle. This advantage increases the efficiency of the squad and permits the fire mission to be accomplished with greater rapidity and ease.

The M1 rifle **cannot** be used with the attachment for firing rifle grenades or antitank grenades.

SECTION 3

BAYONET, M1905

1. **Description and Employment.**—a. The bayonet, M1905, is issued with the 1903 rifle and the M1 rifle. The weapon weighs about one pound and is provided with a scabbard. It attaches securely to the muzzle end of the rifle. (See Fig. 2.)

b. The bayonet is an essential addition to the rifle, since a well-disciplined enemy cannot generally be driven from his position by fire alone. By making full use of cover and concealment, the enemy will continue to hold ground until driven out by hand-to-hand combat. The rifle equipped with the bayonet, employed skilfully and aggressively, is a most effective weapon with which to take and hold a position.

c. The mere possession of a bayonet, unsupported by the ability and desire to use it, is of no great value. Men must be imbued with the "spirit of the bayonet"; they must be filled with the will and determination to advance aggressively and seek personal combat. The first personal encounter of a war usually indicates which opponent is better prepared for close-in fighting. In future actions the better prepared opponent will willingly seek hand-to-hand combat while the other will attempt to avoid it. The infantryman must therefore be thoroughly trained to have confidence in his bayonet and to have the desire to use it.

SECTION 4

AUTOMATIC PISTOL, CAL. .45, M1911 AND M1911A1

1. **Essential Characteristics.**—a. **Description.**—The Automatic Pistols, cal. .45, M1911 and M1911A1, are recoil-operated, magazine-fed, self loading hand weapons. The gas generated in a cartridge fired in the pistol is utilized to perform the functions of extracting and ejecting the empty cartridge case, cocking the hammer and forcing the slide to the rearmost position, thereby compressing the recoil spring. The action of the recoil spring forces the slide forward, feeding a live cartridge from the magazine into the chamber, leaving the weapon ready to fire again.

The M1911A1 pistol is a modification of the M1911 pistol. The operation of both models is exactly the same. (See Figs. 3 and 4.)

b. **General data.**—

Weights:

Weight of pistol with magazine (pounds)	2.43
Weight of empty magazine(pounds)	.15
Weight of loaded magazine, 7 rounds (approximate)(pounds)	.48
Length overall of pistol(inches)	8.59

c. The magazine of the pistol holds seven cartridges. One magazine is carried in the weapon, and two additional magazines are carried in the pistol belt.

d. This weapon is used for individual and emergency defense at close quarters (ranges up to 50 yards) for personnel not armed with the rifle or other weapon.

Weapons

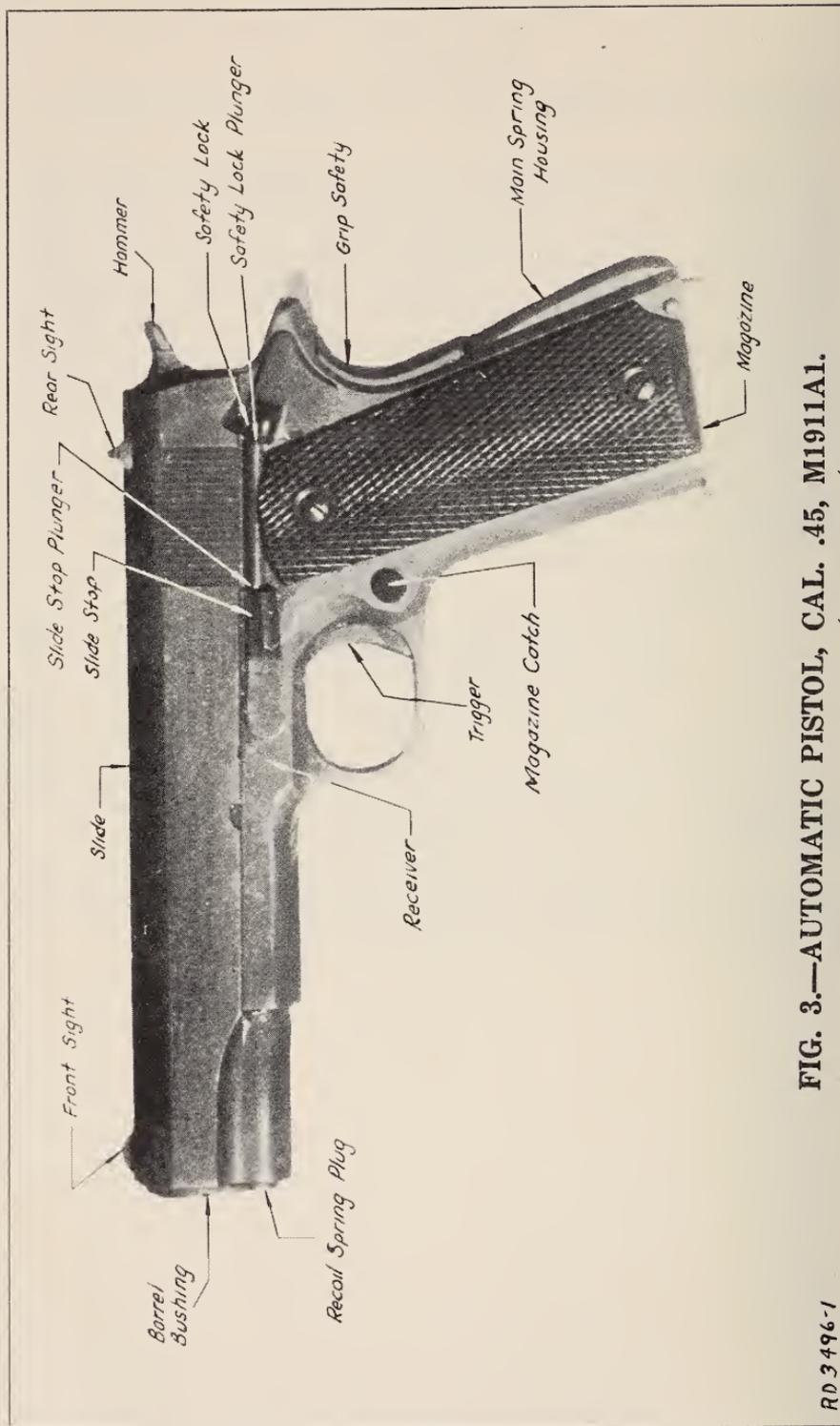


FIG. 3.—AUTOMATIC PISTOL, CAL. .45, M1911A1.

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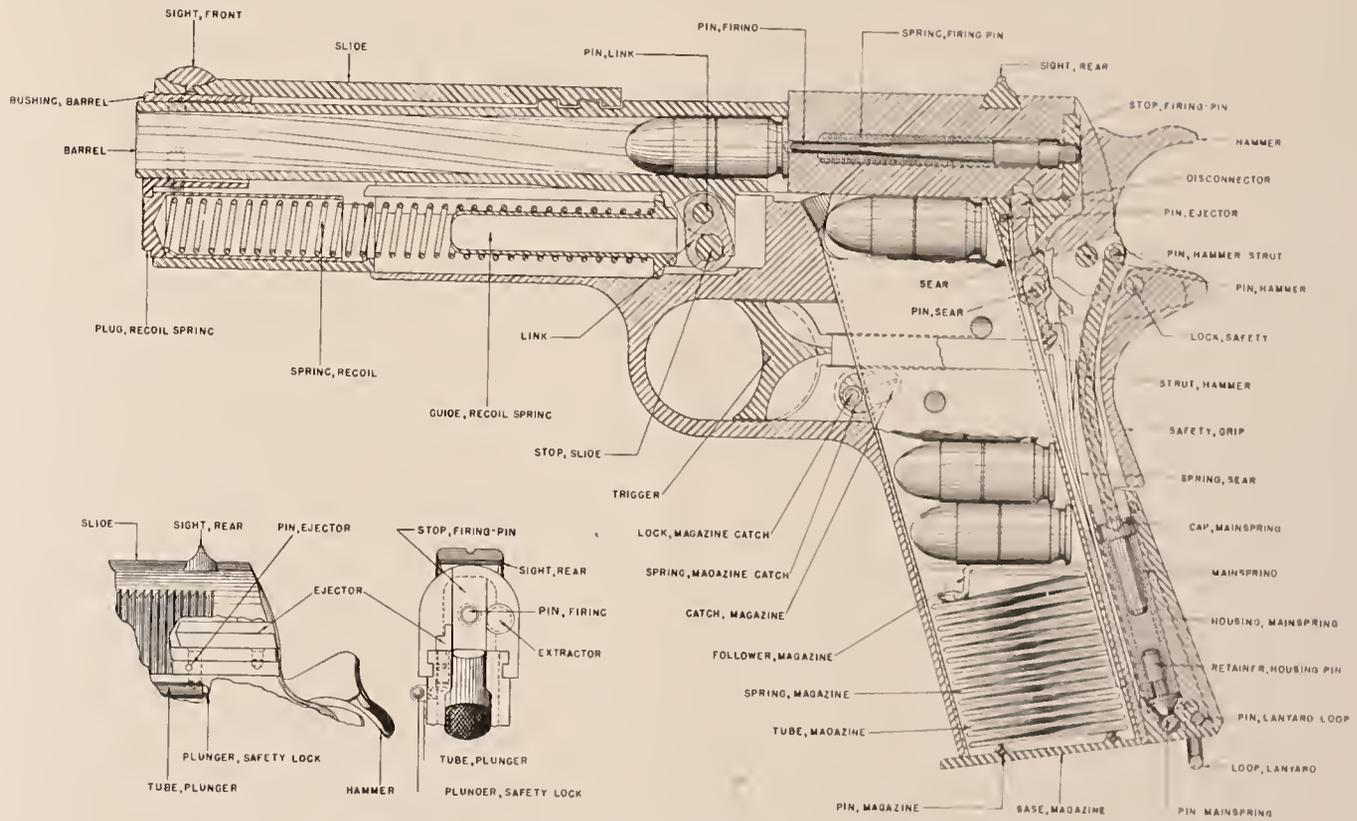


FIG. 4.—AUTOMATIC PISTOL, CAL. .45, M1911.

SECTION 5

U.S. CARBINE, CAL. .30, M1

1. **General.**—The Carbine fills the need for a light personal arm which may be carried and operated almost as easily as the pistol but which has an effective range of approximately 300 yards.

2. **Essential Characteristics.**—a. **Description.**—The U.S. Carbine, Cal. .30, M1, (See fig. 5), is a semi-automatic, magazine-fed, gas-operated, air-cooled shoulder weapon. It has a pistol-grip stock and is fed from a box type magazine having a capacity of 15 rounds. It is provided with a sling. Ammunition for the carbine is the Cartridge, carbine, Cal. .30, M1. (See fig. 6.)

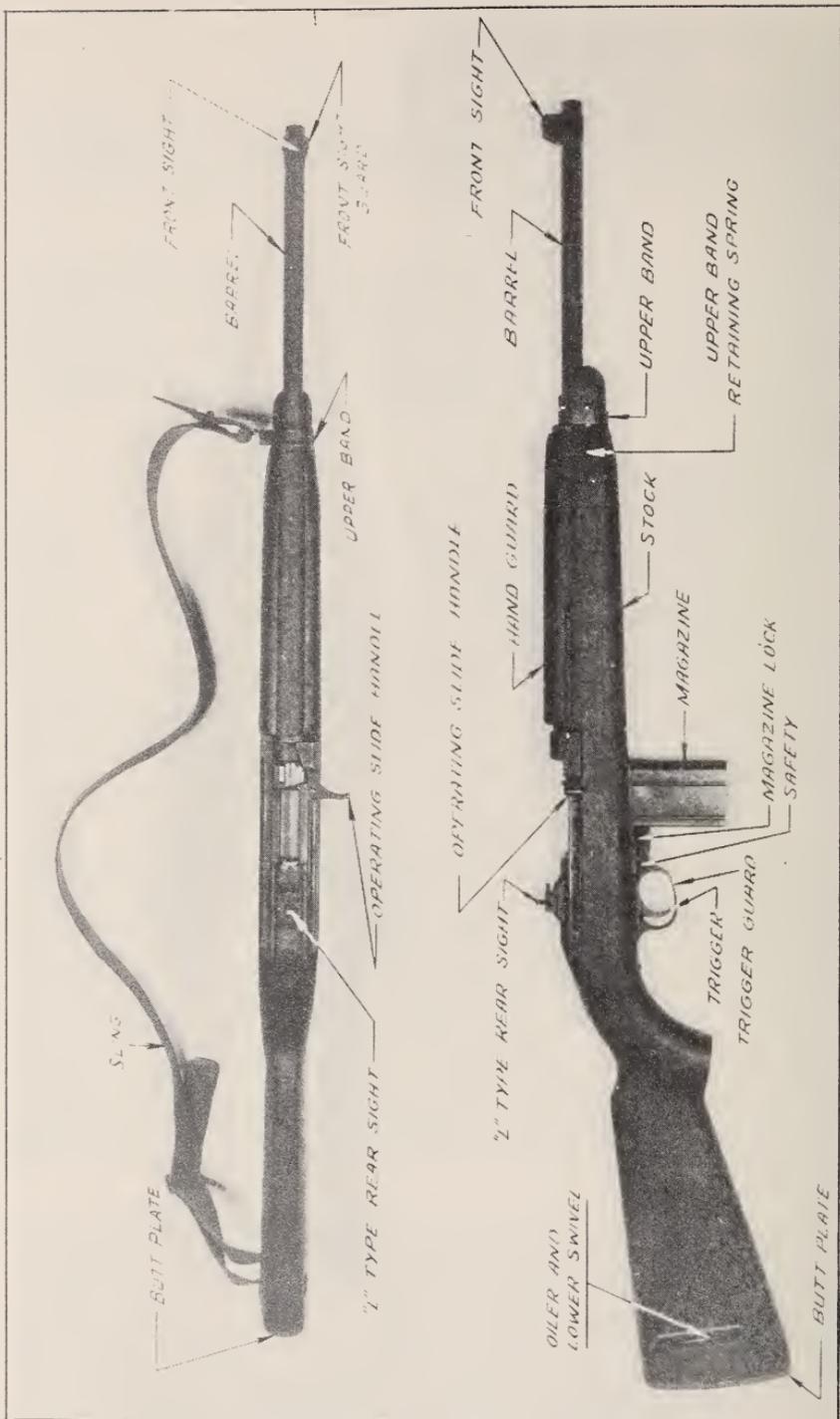
b. **General data.**—**Weights:**

Carbine without sling	(pounds) ..	5.12
Carbine with sling	do	5.23
Magazine, empty	do17
Magazine, loaded	do57
Total weight, w/sling and magazine do		5.80
Length of carbine	(inches) ..	35.50
Maximum range	(yards) ..	2,000
Muzzle velocity	(feet per sec) ..	1,900
Capacity of magazine	(rounds) ..	15

c. **Sights.**—The front sight is the post type, protected by wings. The rear sight on models initially issued is an L-type sight consisting of two arms at right angles, each pierced with an aperture and computed for ranges of 150 and 300 yards only. Either arm of the sight may be raised into position by turning with the fingers. In order to make intermediate changes in range and windage adjustments, it is necessary to change the point of aim accordingly. Later models of the carbine are equipped with adjustable sights and graduated from 100 to 300 yards in increments of 50 yards and providing for windage adjustment of 3 points right and 3 points left.

3. **Employment.**—The carbine is being issued to the majority of the personnel formerly armed with the pistol. Whereas the pistol is satisfactory only for close-in shock action, accurate results are obtained with the carbine up to 300 yards. This factor, linked with the light weight and relative ease of manipulation, gives the carbine a tremendous advantage over the pistol and renders it especially valuable in coping with infiltration tactics, snipers, and emergencies beyond the reach of the pistol.

Weapons



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FIG. 5.—U.S. CARBINE, CAL. .30, M1.

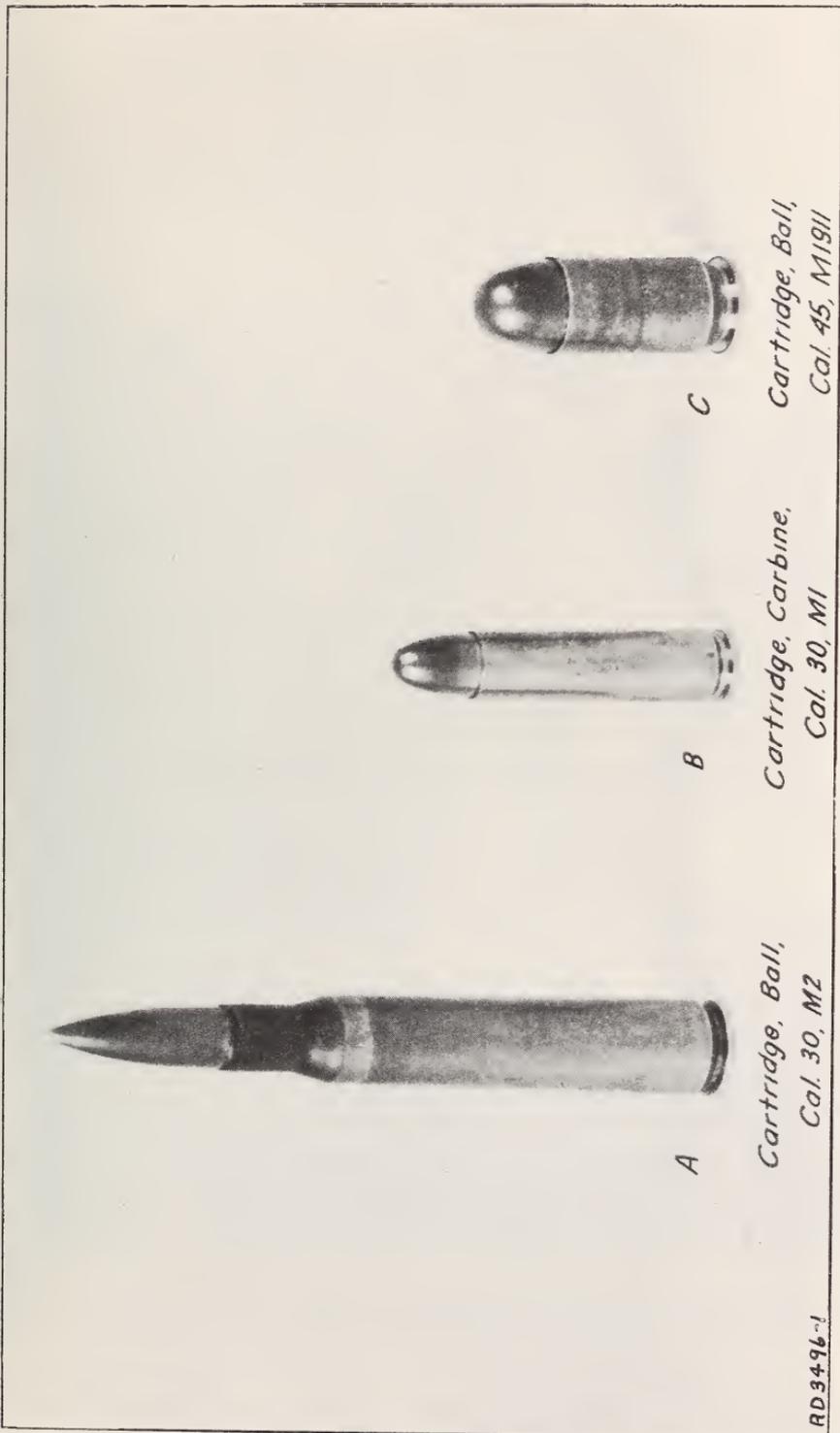
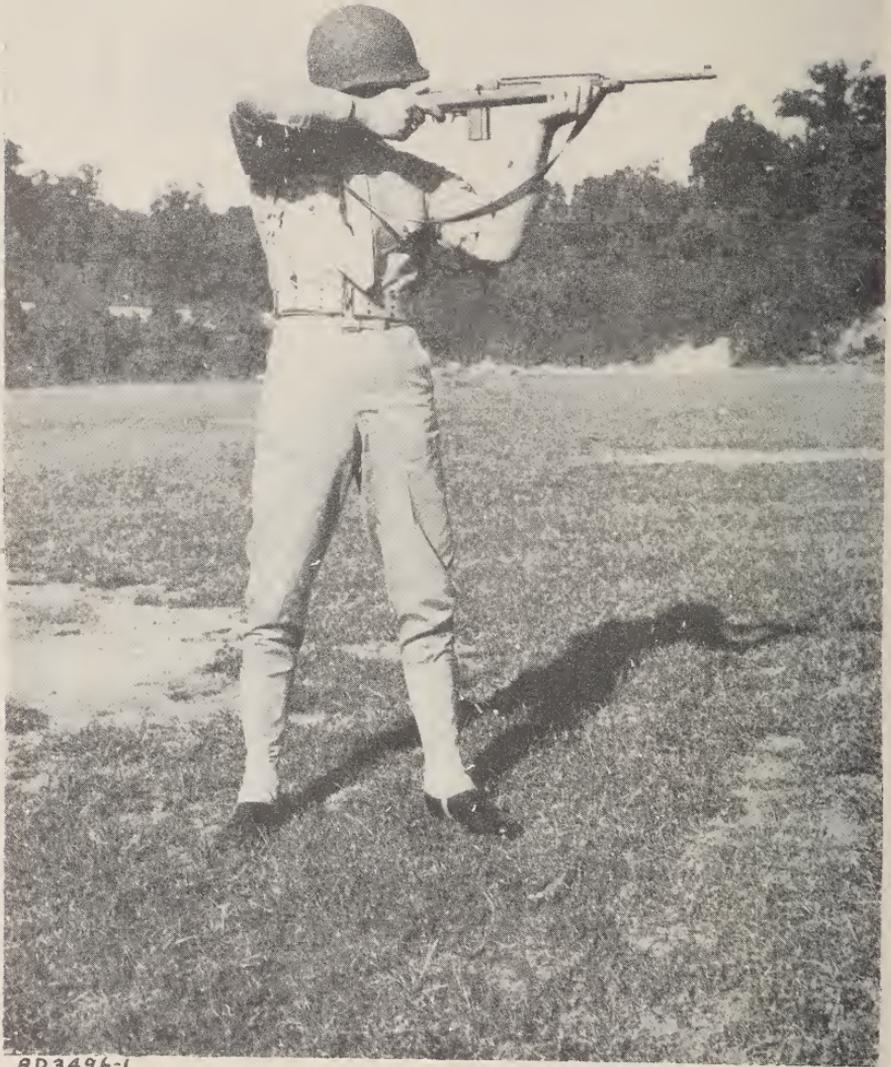


FIG. 6.—COMPARATIVE SIZES OF SMALL ARMS AMMUNITION.

Weapons



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FIG. 7.—STANDING POSITION, U.S. CARBINE.

SECTION 6

**BROWNING AUTOMATIC RIFLE, CAL. .30,
M1918A2, WITH BIPOD**

1. **General.**—The adoption of the automatic rifle, with bipod, has proved an invaluable asset to the small infantry unit commander. The rate of fire, which is more than 100 rounds per minute, is greater than the combined volume of several riflemen. Although the weapon weighs more than the rifle, it has approximately the same mobility. This combination of mobility and fire power facilitates the effective handling of unexpected situations at times when all riflemen are engaged in the fire fight.

2. **Essential Characteristics.**—a. **Description.**—The Browning Automatic Rifle, cal. .30, M1918A2, with bipod, is an air-cooled, gas operated, magazine-fed, shoulder weapon. There are two cyclic rates of full automatic fire, normal and slow, which may be selected by the firer. It is not capable of semi-automatic fire. (See Figure 8.)

b. **General data.**—

Weights:

Rifle without sling	(pounds) 21
Magazine, empty	(ounces) 7
Magazine, filled	(pounds and ounces) 1-7
Number of rounds in magazine	20

Cyclic rates of fire:

Slow (approximately) (rounds per minute)	350
Normal (approximately) (rounds per minute)	550
Effective rate of fire (rounds per minute)....	120-150
Maximum range, M1 cartridge	(yards) 5,500
Maximum range, M2 cartridge	(yards) 3,450

c. **Modifications.**—The M1918 Browning Automatic Rifle was modified by mounting a bipod assembly on the barrel and by replacing the rifle butt plate with a hinged butt plate.



FIG. 8.—BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2.

RD3496-1

Other modifications which have been made to adapt the weapon for use as a light machine gun, designated as the Browning Automatic Rifle, Cal. .30, M1918A2, are as follows:

(1) The bipod body fits over the rear half of the flash hider like a sleeve, and the flash hider is then screwed onto the threaded muzzle of the rifle. This allows the bipod to rotate about the rifle barrel so that regardless of the ground on which the bipod legs stand the rifle will not be canted. The bipod legs are locked in a vertical plane while firing. The feet of the bipod are set at a 90° angle to the legs and resemble skids. This facilitates moving the gun while firing from the prone position.

(2) The cyclic rate of fire can be changed at will from the normal rate of about 550 rounds per minute to a slow rate of about 350 rounds per minute. This slow rate of fire is accomplished by the combined action of a buffer and rate reducing mechanism.

(3) The forearm is cut away level with the bottom of the barrel to allow the chamber to cool more rapidly.

(4) By means of a stock rest the automatic rifle can be laid in the daytime on a final protective line. The elevating screw and clamp on the stock rest allow the gun to be laid and clamped for any desired range. Aiming stakes, or improvised stakes driven along the side of the barrel, can be used to control the direction of fire. Thus the gun can deliver automatic fire along a predetermined line under any conditions of visibility—regardless of fog, smoke, or darkness. The stock rest, however, is used only when the automatic rifle is used as a substitute for the light machine gun in the light machine-gun units.

(5) A magazine guide has been added to facilitate proper seating of the magazine.

d. **Sights.**—The rear sight is of the leaf type with slide and may be moved to the right or left for windage correction by means of a knob at the side. One click of the windage knob moves the strike of the bullet 3 inches on the target for each 100 yards of range. The elevation, or range adjustment, is set by turning the elevating knob. One click of the elevating knob moves the strike of the bullet 3 inches on the target for each 100 yards of range.

3. Organization of Personnel.—One automatic rifle is assigned to each rifle squad and two automatic rifles are assigned to the BAR squad of each rifle platoon, making a total of five automatic rifles per platoon. In defense an additional automatic rifle may be provided.

Weapons

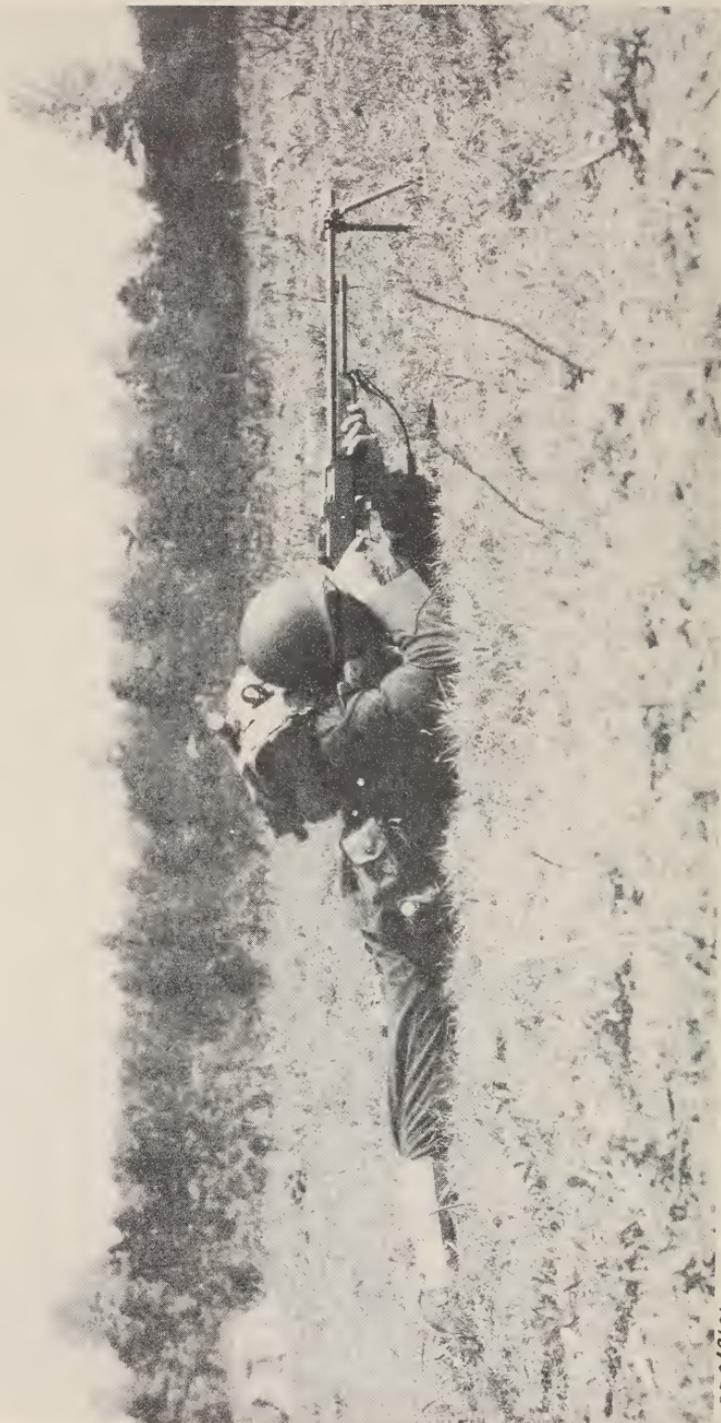


FIG. 9.—BROWNING AUTOMATIC RIFLE, PRONE POSITION.

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Browning Automatic Rifle, Cal. .30



**FIG. 10.—BROWNING AUTOMATIC RIFLE,
ANTIAIRCRAFT POSITION.**

4. **Ammunition Supply.**—The unit of fire for this weapon is 420 rounds per rifle and is proportioned as follows: 80 per cent ball, 15 per cent armor piercing, and 5 per cent tracer. When ammunition carried by the squads is expended, additional supply is secured from the battalion ammunition distributing point.

5. **Employment.**—a. The automatic rifles form the principal fire elements of the rifle platoon in the defense. Positions are generally so located as to cover the entire sector of fire of the platoon. Automatic rifles may be assigned flanking missions in certain situations, leaving frontal fields of fire to the riflemen. Wherever practicable, alternate emplacements are selected for each automatic rifle.

b. In offensive combat the dispositions and actions of the automatic riflemen are generally as prescribed for the riflemen. The automatic rifle is especially valuable and is put to full use when employed to establish a base of fire for the support of the movement of another squad. (See Figure 9.)

c. Automatic riflemen are frequently assigned anti-aircraft missions. When a unit is in bivouac or being moved by truck, these weapons are assigned to vantage points in the area or in the truck column and are kept in readiness to fire on attacking aircraft. (See Figure 10.)

SECTION 7

REISING SUBMACHINE GUN, CALIBER .45,
MODELS 50, 55, AND 60

1. **Essential Characteristics.**—a. **Description.**—The Reising submachine gun, caliber .45, model 50, 55, or 60, is an air-cooled, delayed blowback, magazine fed, hand or shoulder weapon which may be fired from any position and with one or both hands. The exterior surface of the rear part of the barrel is made with radial flanges or cooling fins, which radiate the heat during firing, thus cooling the barrel. The gun will generally be equipped with a sling.

Model 50 is distinguished by its conventional rifle stock and by the addition of a compensator. (See Figs. 11 and 12.)

Model 55 is distinguished by its folding steel stock which gives the weapon unusual compactness. (See Fig. 11.)

Model 60 is similar to model 50 but is fitted with an 18 inch barrel.

b. **General Data.**—

Weight of gun (approximate) (pounds)	6.5
Overall length:	
Model 50 ----- (inches)	35
Model 55 ----- (inches)	22
Model 60 ----- (inches)	42
Length of barrel:	
Model 50 ----- (inches)	11
Model 55 ----- (inches)	10.5
Model 60 ----- (inches)	18
Capacity of magazine ----- (rounds)	20
Cyclic rate of fire (rounds per minute)	450-500
Sustained rates of fire:	
Full automatic (rounds per minute)	100
Semi-automatic (rounds per minute)	40
Maximum effective range ----- (yards)	350

c. **Functioning.**—The weapon is fed from a box type magazine having a capacity of twenty rounds. When a round is fired, the blow-back, delayed by the friction of cammed surfaces and the resistance of the action bar spring, is utilized to force the action bar and bolt to the rear, unlocking the bolt, extracting and ejecting the fired cartridge case, recocking the hammer and compressing the action bar spring. On

termination of the rearward motion of the action bar and bolt, the action bar spring causes the action bar and bolt to move forward. During the forward motion, a cartridge is stripped from the magazine by the feed rib of the bolt and chambered. On termination of the forward motion the weapon is loaded, the bolt locked and the piece ready for firing. The same mechanism is used in models 50, 55, and 60, and all parts are interchangeable. The model numbers indicate differences in stock or barrel lengths.

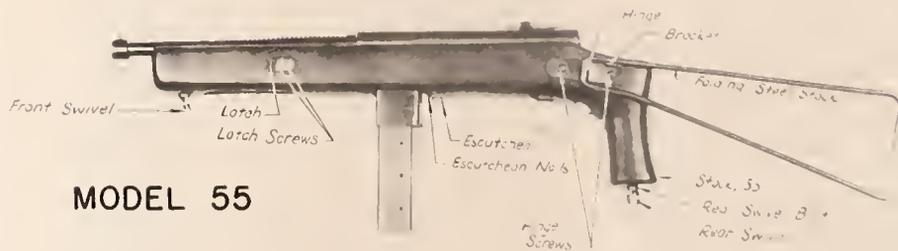
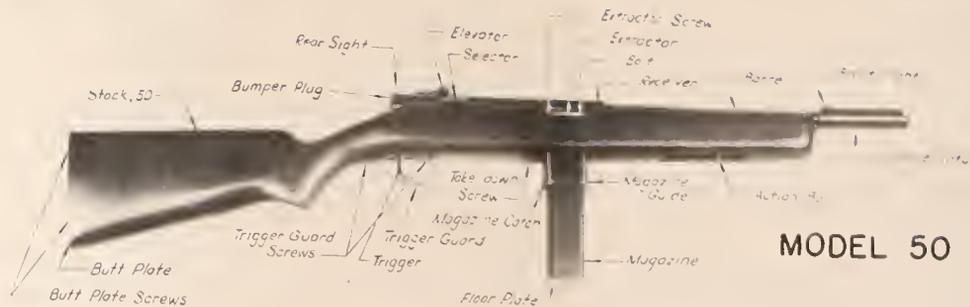
d. Sights.—The front sight is an adjustable blade, mounted on the barrel; the rear sight is an aperture sight adjustable for elevation. To adjust the sights for a desired range, raise the rear sight and slide the elevator along until the ears on the sight fall into the steps in the elevator. These steps for elevation are graduated for 50, 100, 200 and 300 yards.

2. **Ammunition Supply.**—The ammunition allowance for this weapon will be approximately that of the Thompson sub-machine gun.

3. **Employment.**—This weapon is employed for the same purposes as the Thompson gun—where a defensive or supporting arm of short range, great fire power and mobility is desired. As the weight of the Reising gun is only two-thirds that of the Thompson, it is even more mobile.

Models 50 and 60 with the conventional rifle stocks are suitable for use where compactness is of relatively little importance. Model 55 with the folding steel stock is particularly suitable for troops whose duties require that they be armed with a short and light yet effective and accurate weapon.

The Reising gun is rapidly replacing the Thompson sub-machine gun in the Marine Corps. Corporals of rifle squads, BAR squads, mortar and machine gun squads and AA and AT squads are among those equipped with the Reising sub-machine gun. It is also being issued to Navy Yards and small posts within the United States in place of the M1 rifle.



Thompson Submachine Gun, Cal. .45

SECTION 8

THOMPSON SUBMACHINE GUN, CAL. .45, M1928A1

1. **Essential Characteristics.**—a. **Description.**—The Thompson Submachine Gun, cal. .45, 1928A1, is a recoil operated, magazine fed, air cooled, shoulder weapon. It is capable of firing both full-automatic and semi-automatic fire. It is frequently referred to as the "TSMG" and the "Tommy Gun." (See Fig. 13.) The M1928 is essentially the same as the M1928A1 except for a different type of foregrip. (See Fig. 14.)

b. **General data.**—

Weight of gun.....	(pounds)	10.75
Length of gun.....	(inches)	33.69
Length of barrel.....	(inches)	10.50
Number of rounds in magazine:		
Box magazine	(rounds)	20
Drum magazine	(rounds)	50
Cyclic rates of fire:		
Full-automatic	(rounds per minute)	600
Semi-automatic	(rounds per minute)	100
Sustained rates of fire:		
Full-automatic	(rounds per minute)	100
Semi-automatic	(rounds per minute)	40
Maximum effective range	(yards)	350

c. **Functioning.**—After a cartridge has been fired, the recoil unlocks the bolt, drives it to the rear, extracts and ejects the empty cartridge, compresses the recoil spring, and locks the piece. When the trigger is squeezed, the expansion of the compressed recoil spring returns the bolt to its forward position, feeds the cartridge from the magazine into the chamber, locks the bolt in the firing position, and fires the cartridge.

d. **Sights.**—The front sight consists of a one-piece member secured to the front end of the barrel with a pin.

The rear sight mounts on a base riveted to the top of the receiver. The base has side walls to protect the sight. It has a central housing for the plunger and plunger spring, and at its rear end it carries the sight leaf pivotally mounted. The pivot end of the leaf is cylindrical and has "V" slots for engagement with the plunger under pressure of the plunger spring. These "V" slots are so located that the plunger engages therewith when the leaf is in the "up" or "down" position and serves as a catch to hold the leaf in these two positions.

On the leaf is mounted a slide, held in position by a small studded leaf spring secured on the left edge, the stud engaging with serrations on the left edge of the leaf. Projecting from the slide is a forward wall notched for a battle sight

Thompson Submachine Gun, Cal. .45

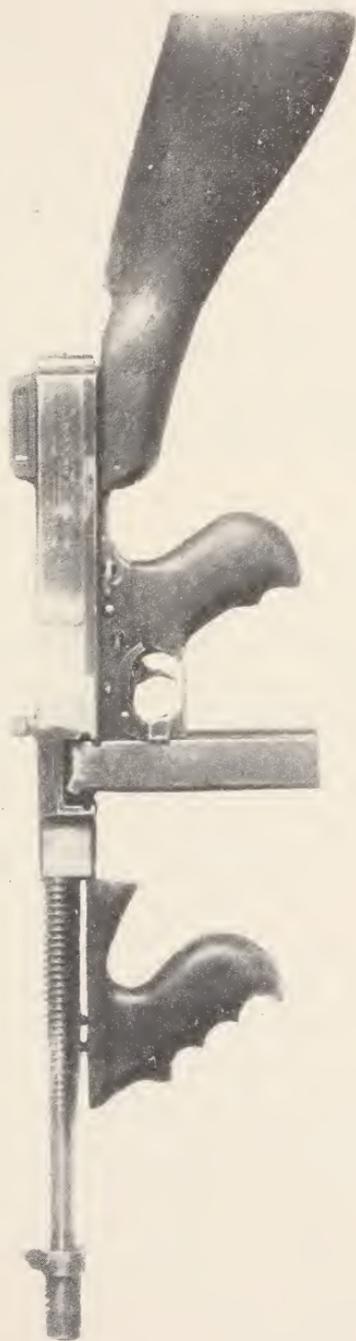


FIG. 14.—THOMPSON SUBMACHINE GUN, CAL. .45, M1928

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and two side lugs which support a windage screw. The windage screw carries the eyepiece which extends below the slide. The eyepiece has an opening for a field view and an aperture for sighting. The upper end of the eyepiece is provided with a suitable edge for carrying an index mark for windage adjustment. Immediately above this edge on the battle sight wall is the windage graduation.

2. Ammunition Supply.—The unit of fire is 260 rounds per gun in an infantry battalion, proportioned as follows: 77 per cent ball and 23 per cent tracer. The gunner can carry 180 rounds. (Two 50-round drums and four 20-round magazines.)

3. Employment.—The Thompson submachine gun has its own characteristics and its own place in battle. It is essentially a short range arm and is particularly valuable for close-in fighting when its ability to stop a man instantly and its ability to remain in action for a long period by use of the 50 round drum make it most effective.

SECTION 9

THE BROWNING LIGHT MACHINE GUN, CAL. .30, HB,
M1919A4, GROUND

1. **Essential Characteristics.**—a. **Description.**—The Browning Machine Gun, cal. .30, HB, M1919A4, is a flat-trajectory, air-cooled, belt-fed, recoil-operated weapon. It is mounted on a tripod and is capable of delivering rapid automatic fire fixed in direction and elevation. (See Figure 15.)

b. **General data.**—

Weights:

Gun, with pintle and elevating mechanism	(pounds)	34
Tripod, M2 (less pintle and elevating mechanism)	(pounds)	12
Chest of ammunition (one 250-round belt)	(pounds)	20.5

Rates of fire:

Slow	(rounds per minute)	40
Medium	(rounds per minute)	75
Rapid	(rounds per minute)	150

c. **Rate of fire.**—The increased mobility of the light machine gun as compared to the heavy was obtained at a sacrifice of cooling properties. This gun, which is cooled by movement of air through flanges about its barrel, is limited as to rate and length of fire by its tendency to overheat. At the slow rate of fire of approximately 40 rounds per minute, it can fire indefinitely; at the medium rate of fire of approximately 75 rounds per minute, it can fire for 25-30 minutes; at the rapid rate of 150 rounds per minute, it can fire for 10 minutes.

d. **Sights.**—The light machine gun is equipped with the conventional leaf and blade sights. Windage is controlled by a knob on the right of the rear sight, and elevation is adjusted by a knob on the top of the leaf. The left edge of the leaf is graduated in mils for range.

2. **Organization of Personnel.**—The Light Machine-Gun Squad consists of 1 corporal, who is the squad leader, and 5 privates who are assigned as gunner, assistant gunner, and ammunition carriers.

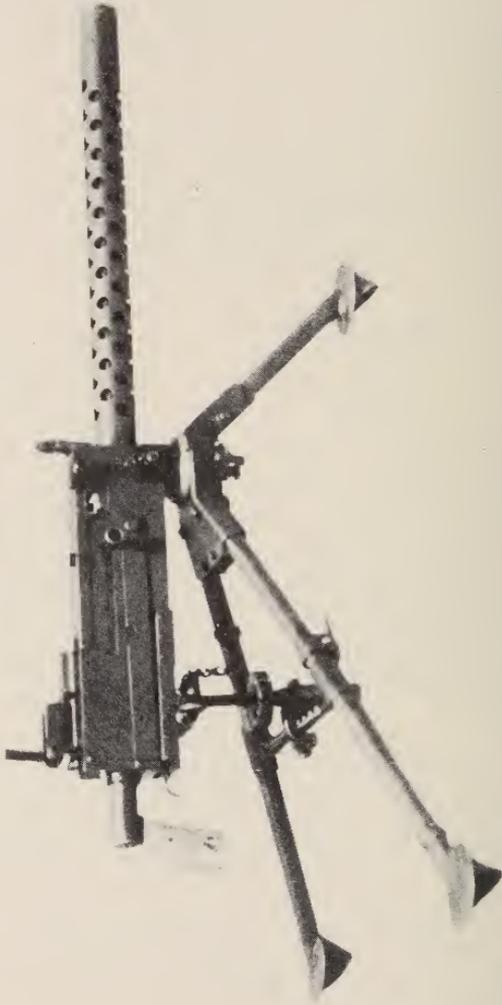


FIG. 15.—LIGHT MACHINE GUN, CAL. .30, M1919A4.

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When carried by hand, the gun, its equipment, and ammunition are distributed as follows:

Personnel	Equipment	Arms
Corporal	Field glasses, compass.	Submachine gun.
Gunner (No. 1)	Tripod, 1 chest of ammunition.	Carbine (pistol or submachine gun)
Assistant gunner (No. 2)	Gun, asbestos mittens, 1 chest of ammunition.	Carbine (pistol or submachine gun)
Ammunition carrier (No. 3)	Spare barrel & extension, chest of spare parts, 1 chest of ammunition.	Rifle.
Ammunition carriers (No. 4 & 5)	2 chests of ammunition, each.	Rifles.

3. Ammunition Supply.—a. Allowance.—The unit of fire for this weapon is 900 rounds per gun in the weapons platoon of the rifle company, and is proportioned as follows: 77 per cent ball, 12 per cent armor piercing, and 11 per cent tracer.

b. Additional ammunition is secured from the battalion ammunition distribution point.

4. Employment.—a. The light machine gun is designed as an offensive weapon and is most effective when employing direct fire against personnel and unarmored vehicles. When using armor-piercing ammunition, however, it is effective at close range* against lightly armored vehicles and aircraft. Up to midrange,* its accuracy is approximately equal to the heavy machine gun.

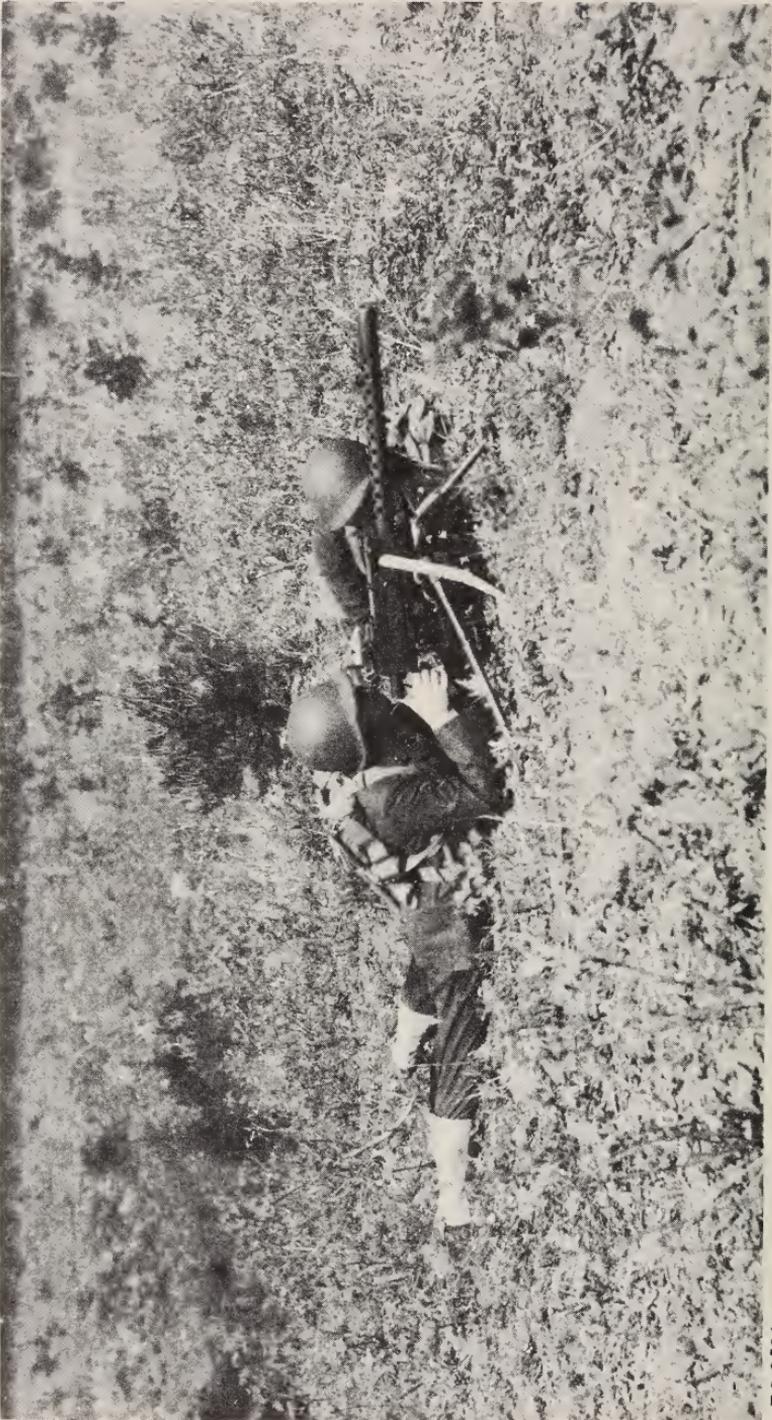
b. The relatively light weight, high mobility, and low relief of the gun enable it to closely follow the attacking echelons. It may go into position on the front line in order to assist in gaining fire superiority; or it may be used to support the advance of attacking units from commanding ground immediately in rear. Figure 16 shows the light machine gun in position.

c. Although designed primarily for the offense, it is used effectively in the forward elements of defensive positions. The company commander may use it to advantage to bring a large volume of fire on a threatened flank or to break up counterattacks. In general, the uses of the light machine gun in defense are exactly the same as the heavy machine gun.

*For general infantry purposes ranges are classified as follows:

- Short Point blank to 200 yards.
- Close 200-400 yards.
- Midranges 400-600 yards.
- Long 600-1,500 yards.
- Distant Beyond 1,500 yards.

Weapons



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FIG. 16.—LIGHT MACHINE GUN IN POSITION.

SECTION 10

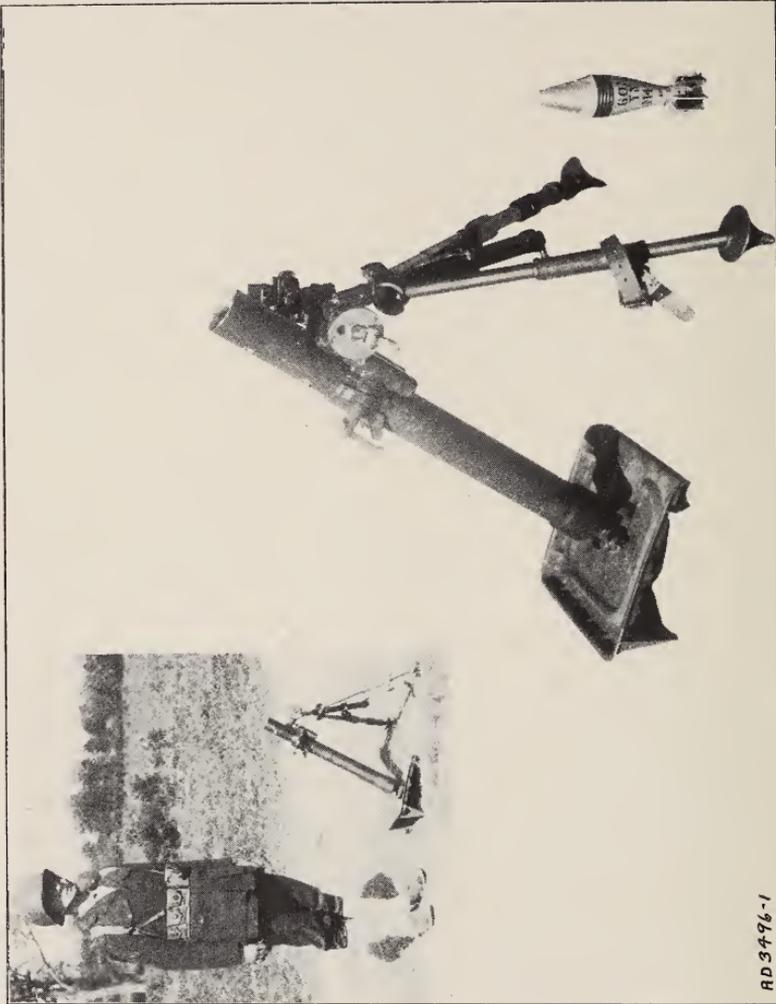
60mm MORTAR, M2

1. **Essential Characteristics.**—a. **Description.**—The 60mm Mortar, M2, is a smooth bore, muzzle-loading, high trajectory weapon. The mortar consists of a barrel (tube), a base cap, and a firing pin, all assembled in one unit. The mount consists of two units: the bipod, and the base plate. The mortar barrel is attached to the bipod by means of a mortar clamp and is easily dismountable. It is attached to the base plate by inserting the base cap into the base plate socket and then closing the locking lever. The bipod consists of the leg, elevating mechanism, and traversing mechanism assemblies. The right leg of the bipod contains no moving parts. The left leg is provided with an adjusting screw which will lengthen or shorten the leg as desired for the purpose of cross-leveling the mortar (i.e., placing the traversing screw in a horizontal position, removing the "cant" from the weapon). The base plate is made of pressed steel. (See Figure 17.)

b. **General data.**—**Weights:**

Mortar and mount	(pounds)	42
Mortar	(pounds)	12.8
Mount	(pounds)	29.2
Bipod	(pounds)	16.4
Baseplate	(pounds)	12.8
Accessories	(pounds)	12.2
One round	(pounds)	2.96
Length overall	(inches)	28.6
Limits of elevation	(degrees)	40-85
Traverse, right or left, approximate ..	(mils)	70
One turn of handwheel, approximate ..	(mils)	10
Maximum range	(yards)	1,935
Maximum effective range	(yards)	1,000
Effective radius of shell burst	(yards)	17
Normal rate of fire	(rounds per minute)	18

c. **Sights.**—The 60mm mortar is aimed by means of aiming stakes and the M4 sight. The aiming stakes are improvised as required. The M4 sight includes a collimator (an opaque sighting tube containing a vertical white line), elevating and lateral deflection mechanisms, and longitudinal and cross levels, all supported by a bracket with a dovetailed base which fits into a slot in the mortar yoke. (See Figure 18.)



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FIG. 17.—60mm MORTAR AND SHELL.

60mm Mortar, M2

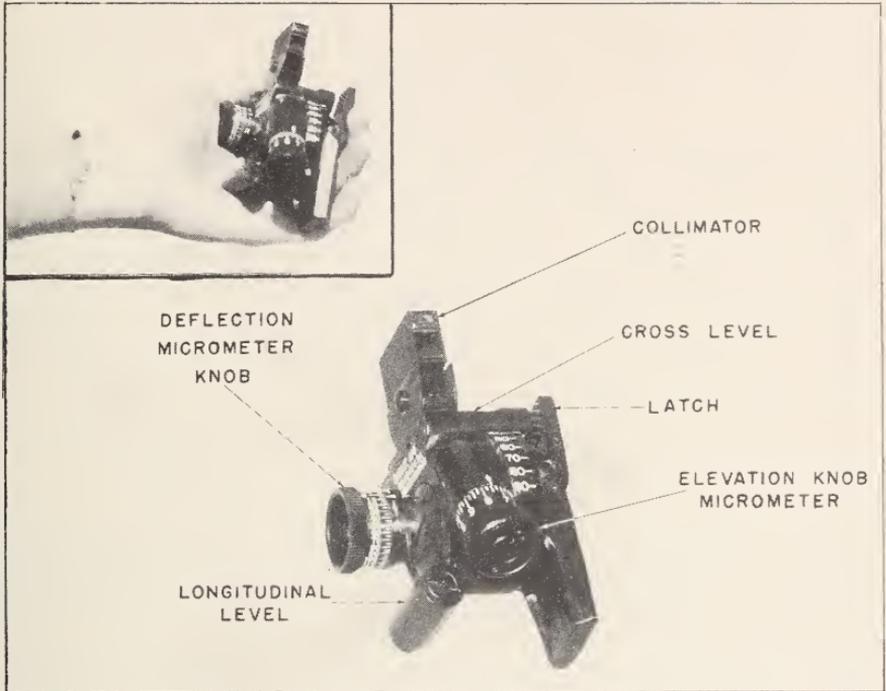


FIG. 18.—M4 MORTAR SIGHT.

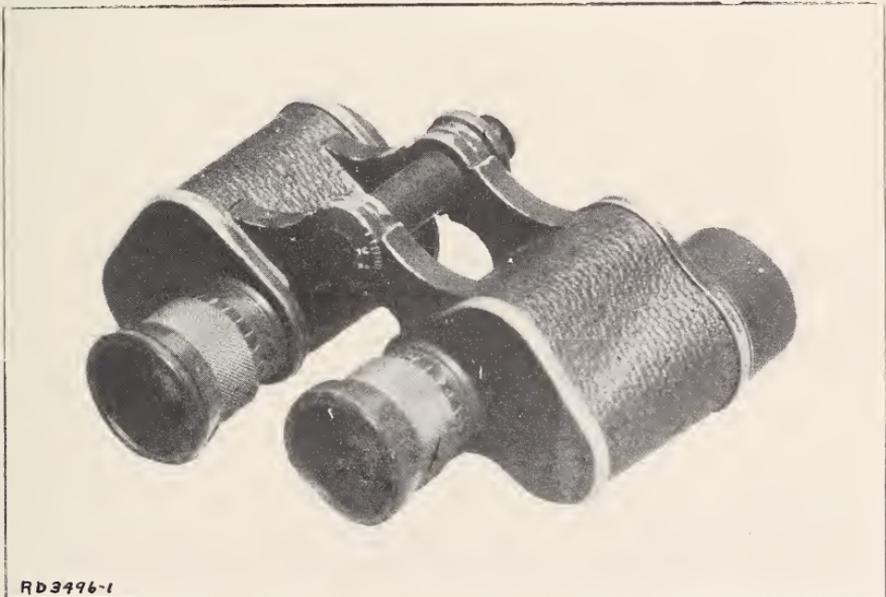


FIG. 19.—TYPE EE FIELD GLASS.

Weapons

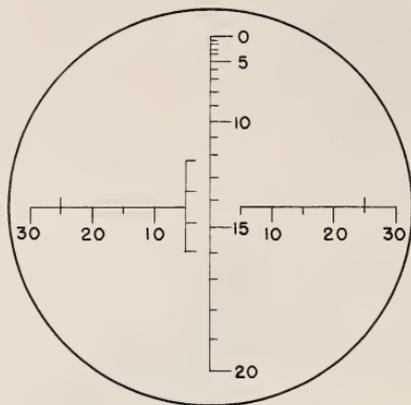


FIG. 20.—RETICLE ON FIELD GLASS OF OLDER MANUFACTURE SHOWING MIL SCALES AND INVERTED SIGHT LEAF.

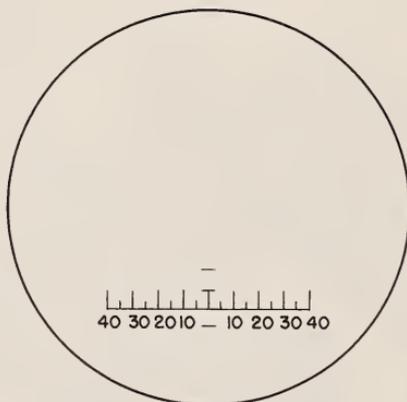


FIG. 21.—RETICLE ON FIELD GLASS OF RECENT MANUFACTURE SHOWING MIL SCALES.

d. **Instruments.**—(1) **Compasses.**—Two types of marching compasses are in general use with the mortar for the measurement of magnetic azimuths. They are the prismatic compass and the lensatic compass, modified prismatic type.

(2) **Field Glasses.**—The field glass, type EE, is an observation instrument of 6 power with an 8° field of view. The field glass proper consists of two compact prismatic telescopes pivoted about a common hinge. In the left scope is mounted a thin glass reticle, on which are engraved graduated mil scales for the measurement of small horizontal and vertical angles and an inverted sight leaf scale for the rapid computation of certain fire data. (See Figures 19 and 20.)

In field glasses of recent manufacture, known as Glasses, Field (6 x 30), W/mil Scale, the reticle shows only the horizontal and vertical mil scales, as shown in Figure 21.

e. **Ammunition.**—Two types of ammunition are authorized for the 60mm mortar; the high explosive, M49A1, mortar shell, and the practice, M50A1, mortar shell. (Note: later type ammunition is designated M49A2 and M50A2.) The shells are propelled by explosion of bundles of sheet powder attached to the base of the shell between the blades of the fin. The full charge consists of four equal propellant increments; to fire a lesser charge, increments not required are removed. The powder bundles are exploded by an ignition cartridge fitted into the base of the shell.

The shell is exploded upon ground impact by its detonating fuze. To prepare the shell for firing, it is only necessary to remove the cotter pin (safety wire) from the fuze.

The necessity for conserving the limited ammunition supply will normally not permit sustained rate of fire greater than 18 to 20 rounds per minute.

2. **Organization of Personnel.**—The 60mm mortar is a crew-operated weapon. The mortar squad consists of a corporal and 4 privates. The corporal is squad leader and the privates are gunner, assistant gunner, and ammunition carriers. Carried by hand the 60mm mortar, its ammunition, and equipment are distributed within the squad as follows:

Personnel	Equipment	Arms
Corporal (squad leader)	Base plate, sight, field glass, compass, cleaning brush, spare parts. (weight, 25 lbs.)	Submachine gun.
Gunner (No. 1)	Motor and bipod, (weight, 29.2 lbs.)	Carbine (pistol or submachine gun).
Assistant Gunner (No. 2)	12 rounds, in bag.	Carbine (pistol or submachine gun).
Ammunition carriers (Nos. 3 & 4)	12 rounds, each, in bag.	Rifles.

Weapons



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FIG. 22.—60mm MORTAR IN POSITION.

3. Ammunition Supply.—a. The unit of fire for the mortar is 60 rounds, all high explosive. The mortar squad carries 36 rounds.

b. Additional ammunition is secured from the battalion ammunition distributing point and must be transported to the gun position by hand. In the attack, maintenance of ammunition supply presents difficulties which force gun crews to carefully conserve ammunition for use against targets of vital importance that develop as the action progresses. In the defense, problems are somewhat simplified, since much ammunition can be stored at or near the mortar positions.

4. Employment.—a. The mortar is the most powerful weapon of the rifle company. It is assigned to the weapons platoon and is designed to carry out all high-angle-fire missions of the company. Its curved trajectory makes it particularly effective against targets which are defiladed. Its precision enables it to engage hostile machine guns and other supporting weapons that have been definitely located. Because of this curved trajectory, 60mm mortar fire is not restricted by the safety precautions imposed upon flat-trajectory weapons when they are fired over friendly troops. Figure 22 shows the mortar and crew in position.

b. The mortar can render close and effective support by firing over the heads of attacking platoons until riflemen are close enough to the hostile position to deliver the final assault. The limiting range to the target from the mortar firing position for accurate fire is 1,000 yards, and the distance to the front-line troops should not exceed 500 yards. Accuracy of fire falls off rapidly with increase in range.

c. In the defense the 60mm mortar is used against targets of opportunity and to cover dangerous routes of approach and critical areas which are not under the fire of other weapons.

SECTION 11

81mm MORTAR, M1

1. **Essential Characteristics.**—a. **Description.**—The 81mm Mortar, M1, is a smooth bore, muzzle-loading, high-trajectory weapon. The mortar consists of a barrel (tube), base cap, and firing pin. The mount consists of a bipod, with elevating and traversing mechanism assemblies, and a base plate. The mortar is attached to the bipod by means of a mortar clamp which should be securely fastened to the barrel $\frac{1}{3}$ of the way down from the muzzle. (See Fig. 23.) The mortar is seated on the base plate by inserting the spherical projection of the base cap into one of the three base plate socket seats and rotating the mortar 90°. The left leg of the bipod may be adjusted for the purpose of cross-leveling the mortar.

b. **General data.**—**Weights:**

Mortar and mount	(pounds)	136
Mortar	(pounds)	44.5
Mount	(pounds)	91.5
Bipod	(pounds)	46.5
Base plate	(pounds)	45.0
Overall length of mortar	(inches)	49.5
Limits of elevation	(degrees)	40-85
Traverse, right or left	(mils)	65
One turn of handwheel	(mils)	12
Normal rate of fire ... (rounds per minute)		18

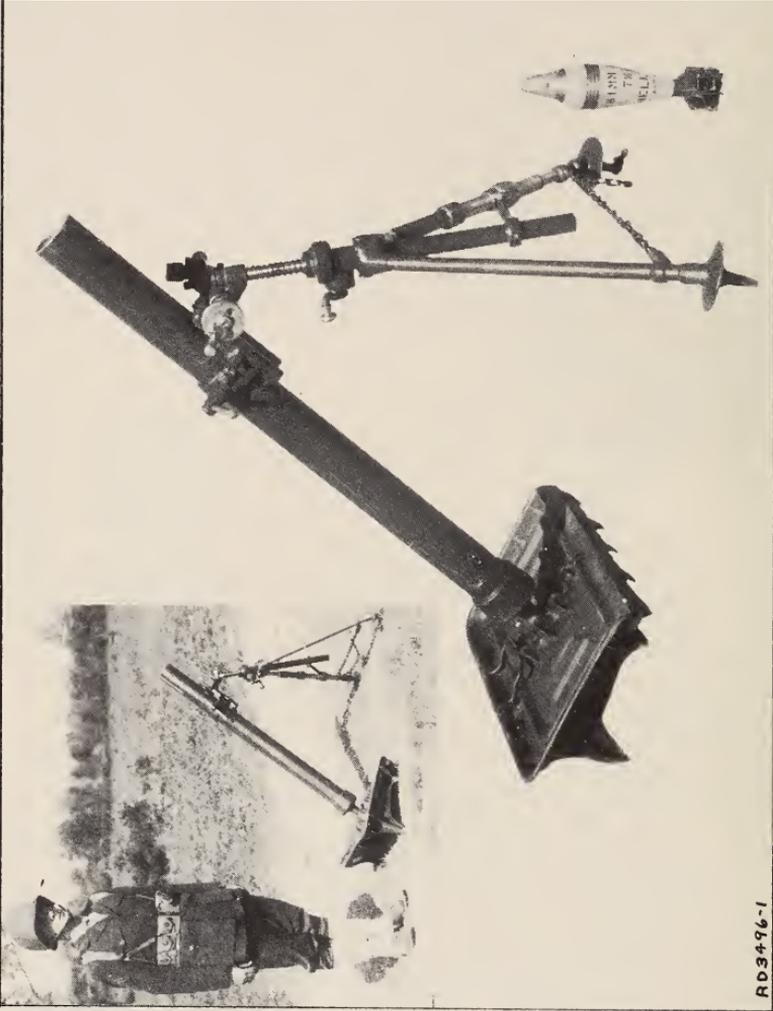
Ranges:

6.92-pound high explosive shell, M43, Light	(yards)	100-3,290
10.51-pound high explosive shell, M56, Heavy	(yards)	300-2,655
11.36-pound smoke shell, M57 (yards)		300-2,470
Effective bursting radius, light shell (yards)		25

c. The 81mm mortar is assigned to the weapons company of the infantry battalion. Its high trajectory permits it to occupy defiladed positions and fire on defiladed targets which cannot be reached by other weapons. The mortar combines mobility and power to a greater degree than any other supporting infantry weapon. The light shell has an explosive effect comparable to that of the 75mm projectile, and the heavy shell is comparable to the 105mm artillery projectile.

d. **Sights.**—The 81mm mortar is aimed by means of the M4 sight and aiming stakes (2 and 4 foot lengths). See Section 10, paragraph 1c, for description of M4 sight.

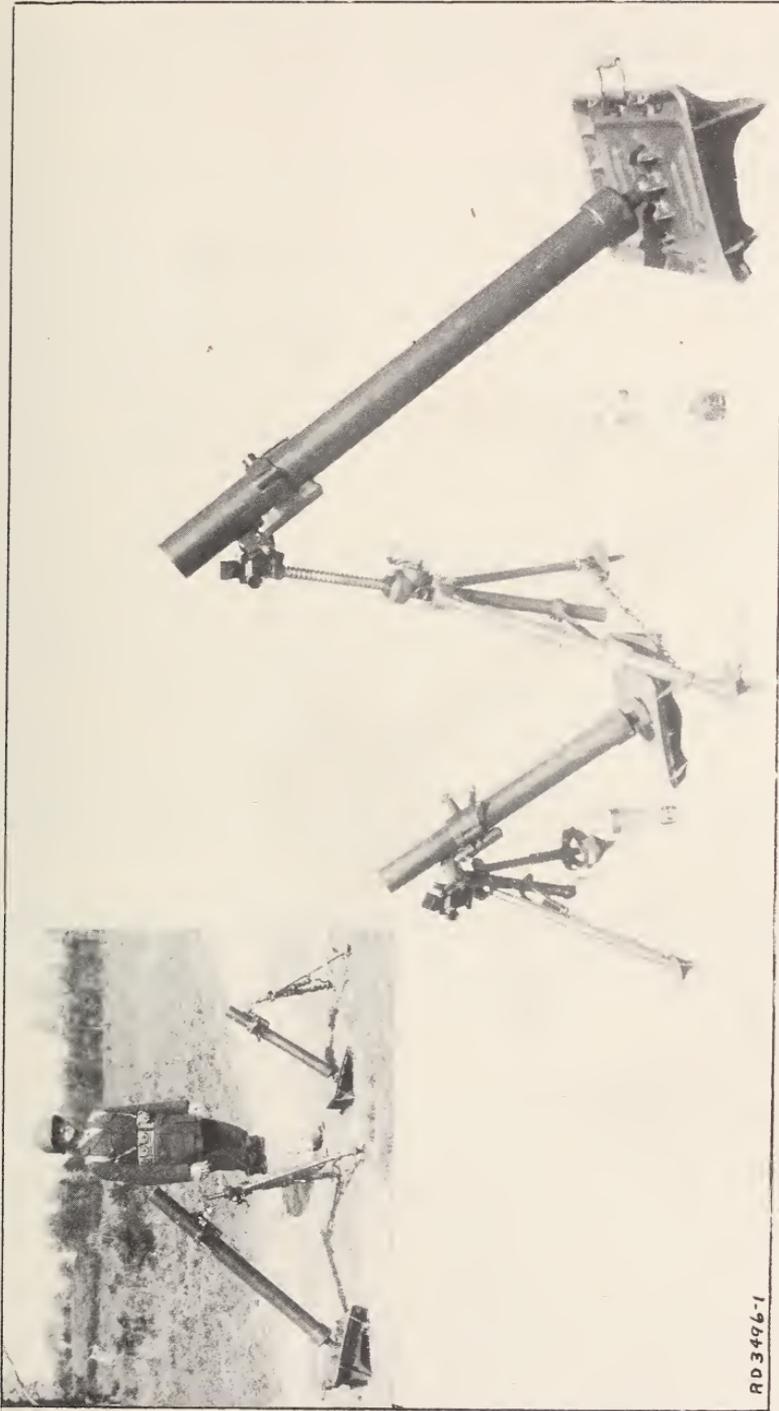
e. **Instruments.**—(See Section 10, paragraph 1d.)



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FIG. 23.—81mm MORTAR AND SHELL.

81mm MORTAR, M1



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FIG. 24.—81mm AND 60mm MORTARS, COMPARATIVE SIZES.

2. **Organization of Personnel and Equipment.**—The 81mm mortar squad consists of 1 corporal, who is squad leader, and 5 privates, who are gunner, assistant gunner, and ammunition carriers.

When carried by hand, the mortar, its equipment and ammunition, and personal arms are distributed as follows:

Personnel	Equipment	Arms
Corporal, (squad leader)	Sight, field glass, compass.	Submachine gun.
Gunner (No. 1)	Bipod.	Carbine (pistol or submachine gun).
Assistant gunner (No. 2)	Mortar, 1 aiming stake.	Carbine (pistol or submachine gun).
Ammunition carrier (No. 3)	Base plate, 1 aiming stake.	Carbine (pistol or submachine gun).
Ammunition carrier (No. 4)	Cleaning staff, 6 rounds HE shell, M43, or; 4 rounds HE shell, M56, or; 4 rounds smoke shell, M57.	Carbine (pistol or submachine gun).
Ammunition carrier (No. 5)	Same as No. 4 above (less cleaning staff.)	Carbine (pistol or submachine gun).

The 81mm mortar squad has available handcarts (M3) which are used to transport the mortar, equipment, and ammunition as far forward as the hostile fire will permit without undue casualties. Carts will hold 18 rounds of light shell or 36 rounds of heavy shell.

3. **Ammunition Supply.**—a. The unit of fire for each 81mm mortar is 126 rounds per mortar in the weapons company of the infantry battalion, and is proportioned as follows: 83 percent high-explosive and 17 percent white phosphorus. Five ammunition carts (M3) are allotted to the ammunition squad of each mortar section, and 1 ammunition cart to each mortar squad.

b. Additional ammunition is secured from the battalion ammunition distributing point. In view of the weight of the shells and the possible difficulty of transportation to the mortar position, careful consideration must be given to the location of the gun position with respect to ammunition supply.

In the attack, when supply lines have been lengthened by forward movements, it becomes necessary to consider whether or not a target is of sufficient importance to warrant the expenditure of ammunition.

4. **Employment.**—a. The initial position of the 81mm mortar in the attack should be in a concealed location close in rear of the assaulting units. Such a position will permit the mortars to support the leading echelons for a longer period of time without forward displacement, and will enable them to respond promptly to calls for fire from the attacking elements. The mortar is shown in position in Figure 25.

Most remunerative targets for the mortar in the attack are hostile machine guns, accompanying artillery, light mortars, antitank guns, and similar weapons which have either been definitely located or whose general location has been spotted. The mortars are used to break up enemy counter-attacks and to cover areas defiladed to other weapons.

b. Positions of the mortars in the defense differ somewhat from the attack. A location too near the main line of resistance may force a retrograde movement by the mortar units during a critical stage of the engagement when their support is most needed.

In the defense the mortars are used to cover gaps in the final protective line. This is the primary target. Secondary targets are numbered and assigned priority and are fired on command or signal. These targets may include defiladed areas and avenues of approach or enemy supporting weapons.

c. The importance of the 81mm mortars to the battalion commander cannot be underestimated. Their effectiveness is well illustrated by the fact that for a short period a single mortar can place as much fire upon a target as an entire battery of light artillery.

Weapons



FIG. 25.—81mm MORTAR IN POSITION.

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SECTION 12

BROWNING HEAVY MACHINE GUN, CAL. .30, M1917

1. **Essential Characteristics.**—a. **Description.**—The Browning Heavy Machine Gun, Cal. .30, M1917, is a flat trajectory, water-cooled, belt-fed, recoil-operated weapon. The gun is mounted on a tripod, usually the M1917A1. The barrel is surrounded by a water jacket which holds about 7 pints of water and prevents the barrel from overheating. (See Figure 26.)

b. **General data.**—**Weights:**

Gun and pintle, without water....(pounds)	33.50
Gun and pintle, with water.....(pounds)	40.75
Tripod, M1917A1.....(pounds)	51.00
Tripod, M1917.....(pounds)	52.35
Belt, filled, 250 rounds in chest..(pounds)	20.50
Belt, empty.....(ounces)	7.50
Length of barrel.....(inches)	24.00
Sight, M1 graduated to	(yards) 3,400
Sight, M2, graduated to	(yards) 2,600
Maximum rate of fire..(shots per minute)	400-525
Muzzle velocity (theoretical)	
	(feet per second) 2,700
Effective range	(yards) 3,500
Maximum range, cartridge M1.....(yards)	5,500

c. The heavy machine gun is assigned to the weapons company of the infantry battalion. In addition to delivering direct rapid automatic fire, the gun can be laid to deliver long range indirect fire.

d. **Sights.**—The front sight consists of the front sight blade and base. The rear sight is somewhat similar to the conventional leaf sight, and can be adjusted for windage and elevation.

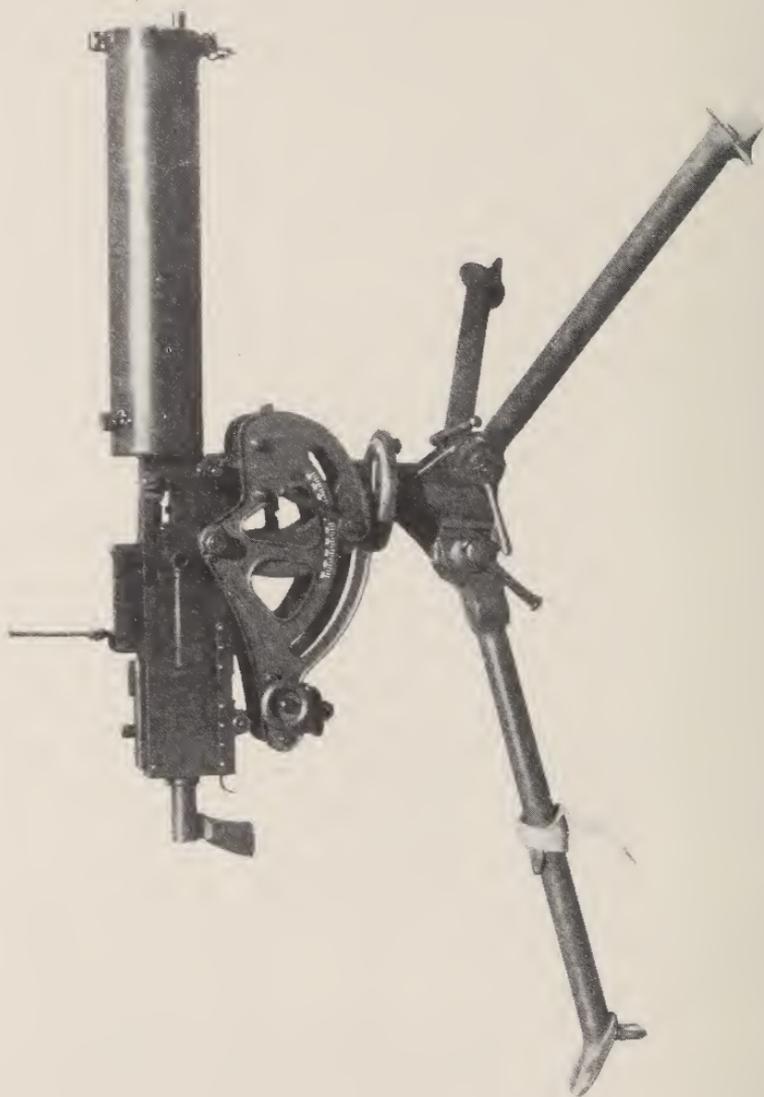
e. **Instruments.**—(1) **The Machine-Gun Clinometer, M1917.**—This instrument is used to lay the machine gun in elevation, or when the gun is laid, for measuring its angle of quadrant elevation.

(2) **Compasses.**—(See section 10, paragraph 1d.)

(3) **Field Glass, Type EE.**—(See section 10, paragraph 1d.) In machine-gun firing, the inverted sight leaf, when provided, is used to pick up auxiliary aiming points in direct laying.

(4) **The Aiming Circle, M1916.**—The aiming circle is a small compact surveying instrument used for measuring azimuths and horizontal and vertical angles (angles of site).

Weapons



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FIG. 26.—BROWNING HEAVY MACHINE GUN, CAL. .30, M1917.

(5) **Range Finders.**—This instrument is used to determine range by a method of triangulation. There are several models available for use.

2. Organization of Personnel.—The heavy machine gun is a crew-operated weapon and is handled by a squad consisting of: 1 corporal as squad leader; and 8 privates as gunner, assistant gunner, and supply and ammunition carriers.

When carried by hand, the gun, its equipment and ammunition are distributed as follows:

Personnel	Equipment	Arms
Corporal (squad leader)	Clinometer, spare barrel, cleaning rod.	Submachine gun.
Gunner (No. 1)	Tripod.	Carbine (pistol or submachine gun).
Assistant gunner (No. 2)	Gun (with water, flash hider, and steam condensing device).	Carbine (pistol or submachine gun).
Ammunition carrier (No. 3)	1 chest of ammunition, 1 chest of water, 1 carrying sling.	Carbine (pistol or submachine gun).
Ammunition carrier (No. 4)	1 chest of ammunition, 1 chest of spare parts, 1 carrying sling.	Carbine (pistol or submachine gun).
Ammunition carriers (all higher numbers)	Each, 2 chests of ammunition, 1 carrying sling.	Carbine (pistol or submachine gun).

Two hand carts M3 are assigned to the machine-gun squad to carry gun and equipment when practicable.

3. Ammunition Supply.—a. Allowance.—The unit of fire for this weapon is 6500 rounds per gun in the weapons company of the infantry battalion, and is proportioned as follows: 75 per cent ball, 13 per cent armor piercing, and 12 per cent tracer.

b. Additional ammunition is secured from the battalion ammunition distributing point. Whenever the situation permits, the carts should be used to replenish ammunition supply.

4. Employment.—a. **Offensive.**—(1) **General.**—For the infantry, machine guns are an important source of fire power. Due to possibility of their developing a tremendous amount of fire, and their mobility, the use of machine guns is one of the most effective means of supporting an attack. Moreover, the quality of the machine-gun support may be a highly important factor in the success or failure of the plan of action.

The plan of action of the commander should contemplate the full utilization of the fire power of all machine guns; both, of battalions in assault, and when practicable, of those in reserve. The weapons company of the infantry battalion is composed of 3 machine-gun platoons, an AA and AT platoon, and a mortar platoon. The weapons company is an integral part of the battalion, and when the battalion becomes an assault unit its weapons company always operates with it.

The commander of an assault battalion is responsible for the proper tactical use of his weapons company. All machine guns, when practicable, should be used to support the assault rifle units in the initial stages of the attack; thereafter, their forward movement should be so regulated as to furnish the maximum supporting fire to assault units, consistent with safety for the flanks of the battalion. In general, the machine guns should be so employed as to further the scheme of maneuver of the battalion.

(2) **Localities of employment.**—Elevated localities, as close in rear of the line of departure as safety will permit, are utilized for initial machine-gun positions. This avoids the necessity for forward displacement in the early stages of the attack, and facilitates overhead fire.

Effective machine-gun support after the attack is launched is dependent upon pushing part of the guns well forward, close in rear of the assault rifle elements. This prompt forward movement often affords the opportunity for flanking fire even though there be no available elevated positions. Machine-gun positions should not interfere with the maneuver of rifle units, but a careful coordination of the movements of rifle units is a prerequisite of effective machine-gun support.

(3) **Antiaircraft protection.**—In the attack it is not practicable for a machine-gun unit, as a whole, to be prepared to execute simultaneously a ground fire mission and an antiaircraft fire mission of equal importance. If the fire power of all the machine-gun units of assault battalions be considered essential to the successful advance of assault rifle companies then the machine-gun antiaircraft fire, when necessary, should be provided from units of reserve battalions.

(4) **Flanking fire.**—Localities captured from the enemy frequently afford positions from which machine guns will be able to engage from the flank other points which are still resisting, thus enfilading organized tactical localities that prevent the advance of our own adjacent assault units. In such situations, machine-gun fire is especially valuable, and a portion of the guns should be advanced promptly. Movement into localities permitting such fire should be effected as soon as the friendly rifle units have captured them and evidenced ability to hold them.

Browning Heavy Machine Gun, Cal. .30, M1917



FIG. 27.—HEAVY MACHINE GUN IN POSITION.

(5) **Consolidation of captured positions.**—When the objectives assigned to assault battalions have been gained, or reorganization has been ordered, a sufficient number of machine guns should at once be moved forward by the commander immediately concerned in order to cover effectively the front and flanks of the position to be organized for defense or to cover the reorganization.

b. **Defensive.**—(1) The number of machine guns assigned to a given sector of a defensive front will depend on the disposition of the rifle units occupying it. For defense of a battle position, sufficient machine guns should be available for the following:

(a) The development of continuous interlocking bands of flanking fire in front of the main line of resistance and such of the other lines of the position as may be necessary.

(b) The distribution of guns in depth sufficiently to cover the rear and flanks of, and the intervals between the organized tactical localities on the successive lines of the position.

(c) The delivering of defensive fires out in advance of the battle position, and the support of those elements of the defense located in front of the battle position.

(2) Machine guns employed in the defense of a battle position are assigned missions which may be one or a combination of the following:

(a) To cover a given sector of fire by employing direct laying on any suitable target which may appear in it.

(b) To protect by flanking fire a given tactical locality against assault.

(c) To support counterattacks.

(d) To deliver fire by indirect laying on designated areas.

(e) To deliver antiaircraft fire.

(3) In any defensive arrangement, lines are decided upon beforehand, along which, in order to stop assaults, it is desired to place one or more flanking bands of fire. These are known as the "final protective lines." Individual machine guns are sited so that on call, and if the assault is imminent, they (the guns) are switched from targets farther away and fire along this final protective line. In front of a line of resistance, the fire of such machine guns is linked up with that of other weapons to form a continuous belt of flanking fire. Dead spaces in this belt are covered by automatic rifle, mortars, artillery, and rifle grenades. (See Figure 28.)

(4) Machine guns which, because of intervening objects, are unable to fire by direct laying at the beginning of an attack, are given missions of delivering fire on call by laying on approaches or important areas. This mission is first in order of occurrence but second in order of importance to that of delivering fire by direct laying. If rear area guns are given indirect laying missions on enemy approaches, such tasks usually will be executed from alternate positions, in order not to disclose prematurely the positions for direct laying missions. The area covered by a single gun using indirect laying varies with the range. The average may be taken as 25 yards wide by 100 yards deep.

(5) The most effective use for machine guns is for flanking or enfilade fire. Flanking fire, combined with surprise action, enables a machine gun to cause tremendous losses in a very short time.

c. **Alternate positions.**—It should be remembered that once having opened fire from a position, the enemy will be on the alert to pick up the location and direct counter fires from supporting weapons against it. Gun crews should therefore change positions as often as the situation permits.

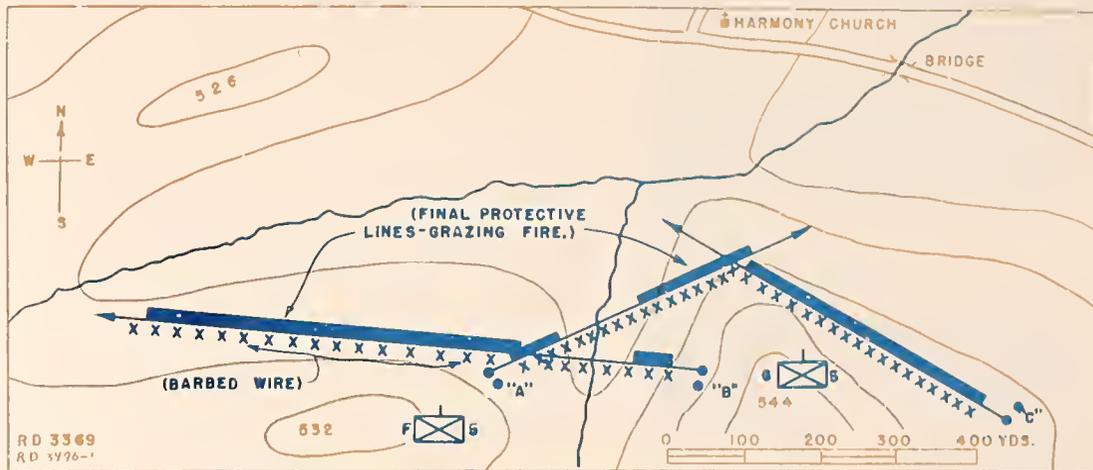


FIGURE 28.—TO ILLUSTRATE THE SITING OF MACHINE GUNS TO OBTAIN GRAZING FIRE ALONG FINAL PROTECTIVE LINES (ABBREVIATED FPL).

Final Protective Lines are close-in defensive fires of machine guns placed across the front of a defensive position for grazing fire, and fixed in elevation and direction. They can be fired day or night or under any condition of visibility.

All Machine Guns (both light and heavy) on the main line of resistance are laid and clamped on a final protective line when not otherwise engaged. Fires are placed on these lines on call from defending rifle units and last for a specified number of minutes.

Maximum Length of FPL's on flat ground is 700 yards, as bullets do not rise above the height of a man in this distance.

Adjacent Machine Guns coordinate their fires with each other and with close-in fires of other weapons.

Flat Ground in front of the main line of resistance is usually covered by FPL's of machine guns.

Low Spaces and Gaps in the FPL are filled in with the fire of artillery, mortars, and other weapons.

Lines of Barbed Wire (called tactical obstacles) are constructed along FPL's to detain the enemy

or hold him under fire. FPL's (with barbed wire obstacles) should not be closer than 40 yards nor farther than 100 yards from the position being defended.

If Less Than 40 Yards, the enemy could approach within hand grenade range.

If More Than 100 Yards, it is more difficult to hold the enemy under effective fire and observation, especially in fog or at night when visibility is reduced.

ILLUSTRATIVE SITUATION

Blue is organizing a defensive position against an expected Red attack from the north. One rifle company is assigned to defend Hill 532 and one to defend Hill 544.

Machine guns sited on west side of Hill 544 (at "B") can place grazing fire (FPL's shown by the heavy portion of the arrow) across the entire front of Hill 532 because ground is approximately flat along that part of the line of fire.

Machine guns located on east side of Hill 532 (at "A") cannot cover entire front of Hill 544 with fire because the nose extending north from Hill 544 prevents grazing fire beyond that point. To cover the entire front of Hill 544,

additional guns must be placed at "C."

The fires from guns at "A" and "B" would not be grazing fire where it crosses the low ground along the stream; therefore no FPL's are indicated in that area. That area would be assigned to a 60mm or 81mm mortar and their fires would be placed there when it became necessary to fire on the FPL.

The FPL's from guns at "A" and "C" would not be grazing fire beyond the nose of Hill 544, as the ground drops off too sharply; therefore the FPL's for these guns have not been made 700 yards long, but only long enough to indicate where grazing fire occurs.

Tactical wire obstacles along the FPL's is indicated thus: XXXX.

Note especially that FPL's run generally parallel to the front being defended, and not out toward the expected enemy approach. Machine guns would fire to the front (from alternate or supplementary positions) when the enemy was in the vicinity of the bridge, Harmony Church, and Hill 526. As the attacking elements came closer the machine guns would move or shift their fires to form the interlocking bands of grazing fire (final protective lines) across the fronts of adjacent units along the previously selected lines as indicated.

SECTION 13

THE BROWNING MACHINE GUN, CAL. .50, M2
(ANTITANK)

1. **Essential Characteristics.**—a. **Description.**—The Browning Machine Gun, Cal. .50, M2, Antitank, is a flat-trajectory, air-cooled, belt-fed, recoil operated weapon. It is mounted on a machine-gun tripod mount, cal. .50, M3. The gun has high mobility and low relief relative to other anti-tank weapons. It can be manhandled for considerable distances and can be easily concealed in small areas. (See Figure 29.)

b. **General data.**—**Weights:**

Gun (flexible) without barrel(pounds)	54.38
Tripod mount, M3	(pounds) 40.50
Pintle and elevating gear (carried attached to receiver)	(pounds) 4.00
Ammunition chest, empty	(pounds) 4.73
Belt of ammunition, 100 rounds ..	(pounds) 30.80
Barrel (45 inch)	(pounds) 29.50
Capacity of ammunition chest, 1 belt	(rounds) 100
Muzzle velocity	(feet per second) 2,660
Rate of fire, cyclic	(rounds per minute) 400-500

c. The caliber .50 machine gun is capable of firing from 400 to 500 rounds per minute, but since it is an air-cooled weapon such a high rate of automatic fire cannot be maintained continuously. Normally, the gun is fired in short bursts, but may be fired by rapid single shots and either type of fire may be continued for an appreciable length of time. With a cool gun a single burst of 100 to 150 rounds can be fired without overheating the barrel. The heavy barrel retards overheating; added cooling is secured by the circulation of air around the breech, through slots in the barrel supports. Normally, the .50 caliber ground gun is fed from the left.

The weapon has a high initial velocity, with adequate armor penetration at close and midranges. At an angle of impact of less than 20° from normal, armor-piercing ammunition will penetrate armor of $\frac{5}{8}$ inch thickness at a maximum range of 500 yards.

Weapons

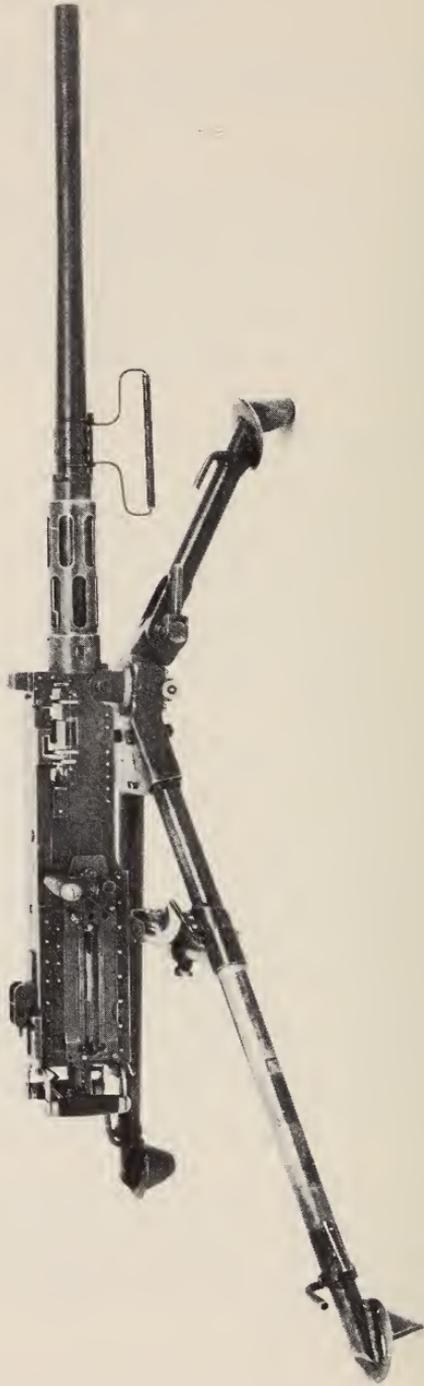


FIG. 29.—BROWNING MACHINE GUN, CAL. .50, M2.

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d. **Sights.**—The gun is provided with a conventional front and rear sight, and a mount for a telescopic sight. The leaf of the rear sight is graduated to 2600 yards. The range dial of the telescopic sight is graduated in yards from 100 to 3000 yards; and in mils from 0 to 64.

The rear sight base is provided with an adjustable dovetailed groove in which the telescopic sight, T-3, is mounted. This sight has a magnification of 3.25 power. The telescopic sight gives much greater accuracy and should be used whenever possible; that is, in the delivery of fire of precision on stationary ground targets and in fire on moving targets.

2. **Ammunition Supply.**—The unit of fire for this weapon is 2500 rounds, proportioned as follows: 72 percent armor-piercing and 28 percent tracer. Whenever the situation permits, handcarts are used to transport additional ammunition from the battalion ammunition distributing point to the gun positions.

3. **Employment.**—a. This weapon is a part of the AA and AT platoon of the weapons company of the infantry battalion. During the development of the battalion for the attack, the platoon is usually detached for the execution of antitank missions, and is distributed so as to afford protection to the rifle echelon which will constitute the principle combat element of the battalion. If the situation indicates danger of mechanized attack from a flank, the antitank units march on the menaced flank.

b. In the battalion assembly area and in a defensive position, the antitank weapons are ordinarily assigned the mission of frontal antitank security. (Regimental antitank units are the principle agencies of flank antitank protection.) Depending on the terrain and general situation, it may be necessary to separate emplacements widely. In such cases, opening of fire is released to section or squad leaders.

In selecting positions, due consideration should be given the fact that armor-piercing abilities are limited to close and midranges. The gun is shown in position in Figure 30.

c. The speed of a hostile motorized or mechanized attack makes it necessary for these guns to be in firing positions ready to fire at all times. After the hostile attack has developed, little or no time is available for movement into positions.

Once having fired, the guns should be moved to another position at the first opportunity; for, if the location has been observed by the enemy, heavy and immediate artillery fire may be expected.

Weapons



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**FIG. 30.—BROWNING MACHINE GUN, CAL. .50,
IN POSITION.**

SECTION 14

37mm GUN, ANTITANK, M3

1. **Essential Characteristics.**—a. **Description.**—The 37mm Antitank Gun, M3, is a flat trajectory weapon of the field gun type. It is a single shot weapon with a drop type breech-block. The gun is mounted on a carriage of the split trail type with pneumatic tires. The carriage is designed for one-man control of aiming, elevating, traversing, and firing. The gun is designed for towing behind its prime mover on roads and across country. (See Figure 31.)

b. **General data.**—

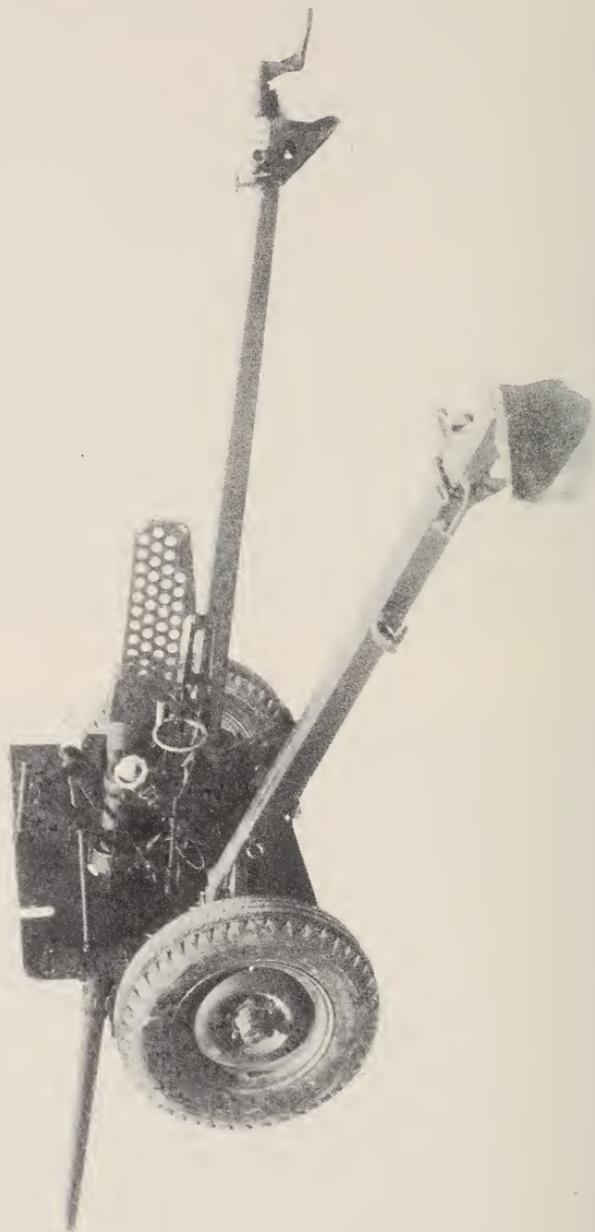
Weights, ammunition:

Complete round, armor-piercing (pounds)	3.41
Projectile, armor-piercing (pounds)	1.92
Complete round, high-explosive (pounds)	2.72
Projectile, high-explosive (pounds)	1.23
Breech operation	Manual
Muzzle velocity, armor-piercing (f/s)	2,600
Muzzle velocity, high-explosive (f/s)	2,750
Maximum limits of elevation on carriage (from level) (degrees)	From plus 15 to minus 10
Maximum traverse, right (degrees)	30
Maximum traverse, left (degrees)	30
Weight, gun and carriage, firing position (pounds)	912
Normal recoil (inches)	20
Rate of fire (aimed shots per minute)	15 to 20 rounds

c. The gun's armor-piercing ammunition is primarily for use against armored vehicles. Figures 32 and 33 illustrate the armor piercing capabilities of the projectile against various types of armor plate. Note that at 600 yards with an angle of incidence of zero it penetrates $2\frac{1}{2}$ inches of rolled armor plate. In attack, this ammunition can be also used with effect against concrete emplacements. High-explosive ammunition is used against unarmored vehicles, personnel, and machine guns. Practice ammunition identical with the armor-piercing, except for the quality of steel in the projectile, is provided for training.

d. The gun is provided with wheel segments which swing on the axle and serve to raise the tires off the ground to increase the stability of the carriage for firing. They are locked in both the firing and traveling positions by a spring-actuated plunger.

Weapons



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FIG. 31.—37mm ANTITANK GUN, M3, MOUNTED ON CARRIAGE, M4.

37mm Gun, Antitank, M3

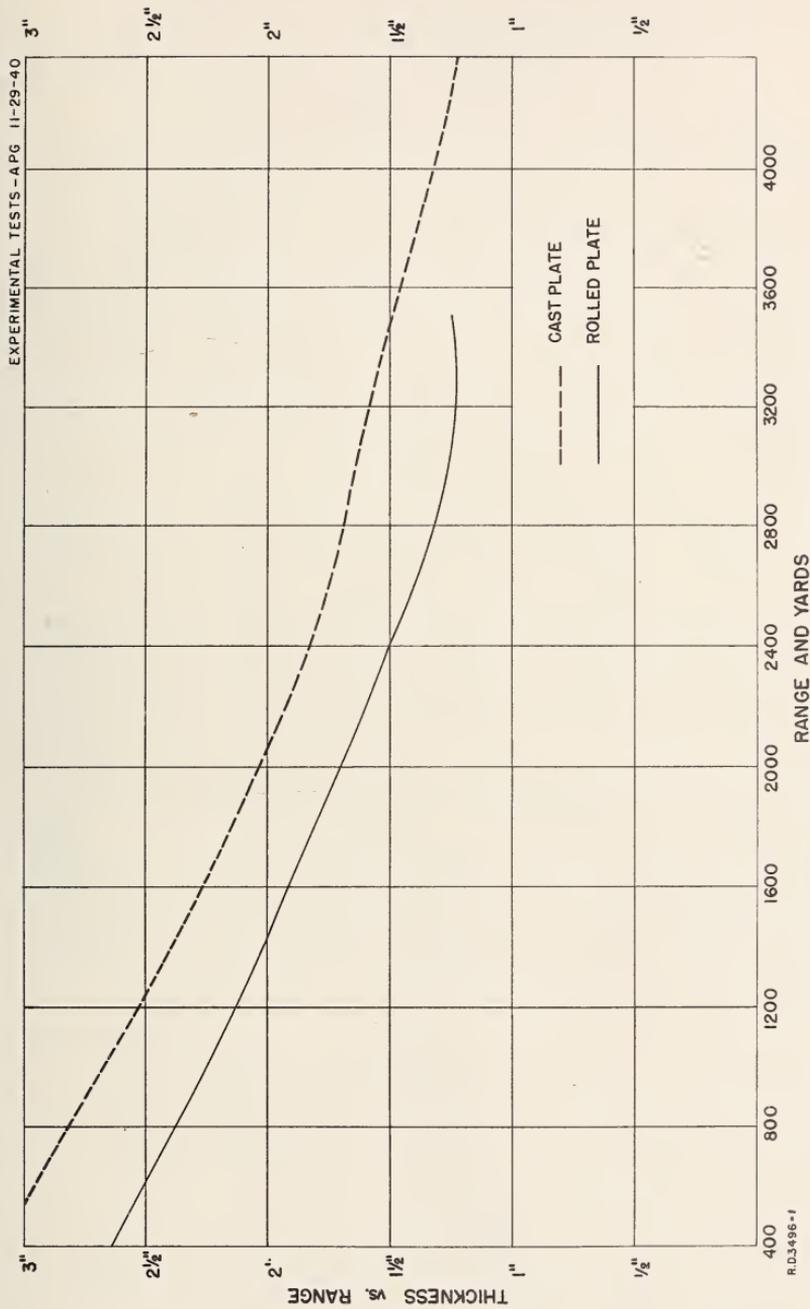


FIG. 32.—PENETRATION OF ARMOR PLATE BY 37mm AP SHOT, M51.

Weapons

RANGE vs. DEGREE OF OBLIQUITY
RANGE-YARDS

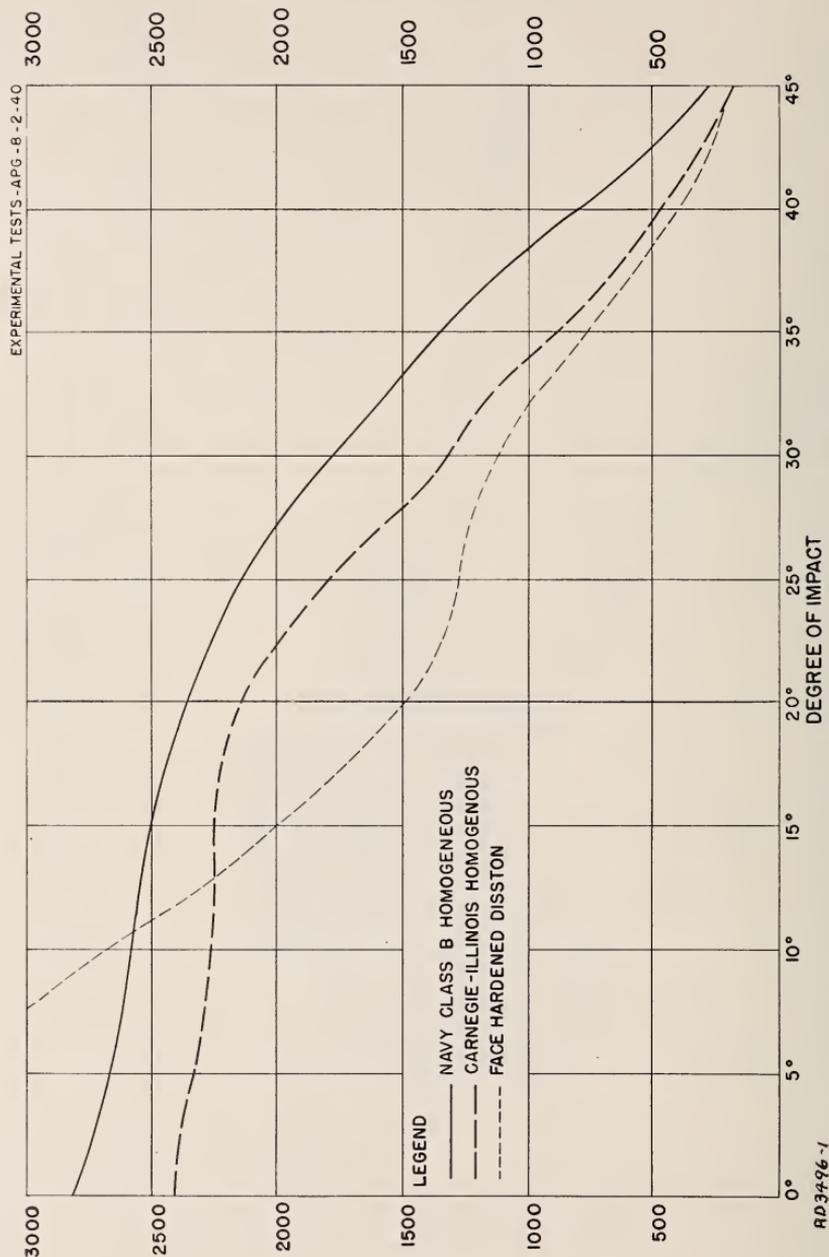


FIG. 33.—PENETRATION OF 1 1/2" ARMOR PLATE BY 37mm AP SHOT, M51.

e. **Sights.**—The sight, telescope, M6, is a non-adjustable telescope with no magnification and is used for all firing with the 37mm gun. It has an illuminated reticle which is graduated for various ranges and leads.

2. **Ammunition Supply.**—The unit of fire per gun is 240 rounds, proportioned as follows: 15 per cent cannister, 25 per cent high explosive, and 60 per cent armor-piercing.

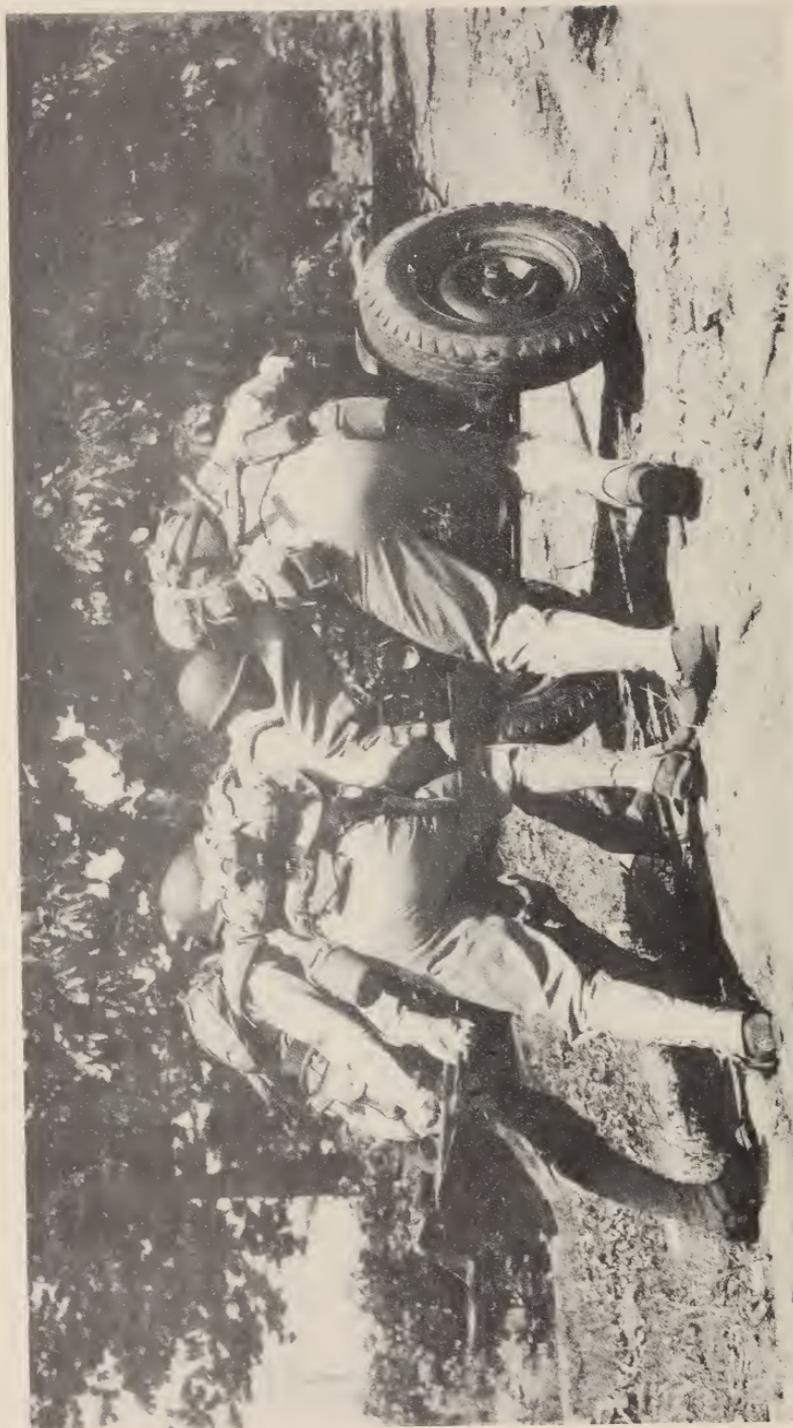
3. **Employment.**—a. **Firing positions.**—The firing position is selected primarily for its field of fire and observation. The gun is usually fired from the crest of a hill or other open position, taking advantage of partial defilade. There should be cover in the immediate rear of the firing position for occupancy by the weapon and crew prior to opening fire. The gun's low silhouette facilitates concealment in high grass, bushes and brush and artificial camouflage. However, the distinctive noise, muzzle blast and flash tend to disclose the position. A hit on the enemy target must be secured on the second or, at most, the third round, and the gun position should be changed as soon as the situation permits.

The extent to which a firing position is prepared depends on the amount of time available and the contemplated action. Steps to camouflage the gun should be taken immediately and foxholes should be dug alongside so that the crew can drop into them for protection and then quickly resume their positions at the gun.

b. Guns of battalion antitank units are generally assigned missions of frontal antitank security. In the defense they occupy positions in the vicinity of the main line of resistance. In the attack they occupy positions on vantage points as close as possible to the attacking echelons, and during the advance they maintain as close proximity to the attacking echelon as the terrain and the situation permit.

Fire is generally withheld until tanks come within 500-700 yards.

Figure 34 illustrates the gun going into position.



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FIG. 34.—37mm ANTITANK GUN GOING INTO POSITION.
(NOTE: Gun can be readily moved by 4 men.)

SECTION 15

ANTITANK MINES

1. **General.**—The illustration below shows the current type of antitank mine. These mines are used in mass in mine fields to create tank obstacles.

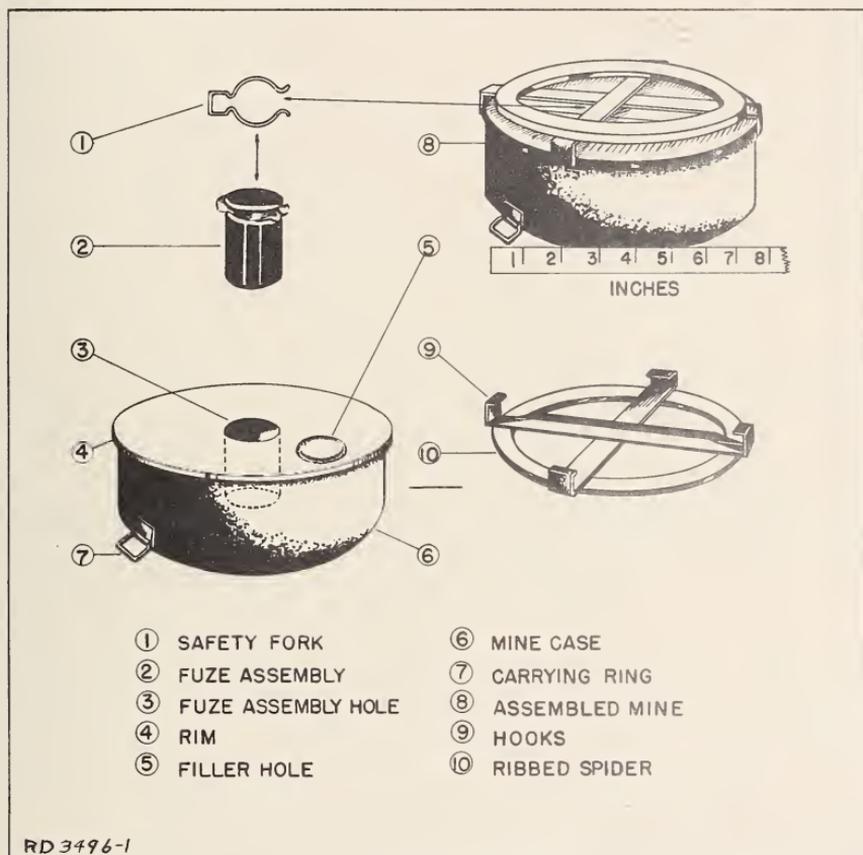


FIG. 35.—ANTITANK MINE.

NOTE: For shipment, the ribbed spider fits on the bottom of the mine case, and fuzes are carried separately. When ready for use, the fuze assembly is inserted and the ribbed spider placed on top so that the hooks are clipped under the rim of the mine case. Until removed, the safety clip prevents the fuze plunger being forced down to fire the mine. This clip can be replaced. A ring handle is attached to the side of the case for carrying purposes.

SECTION 16

GRENADES

PART I.—HAND GRENADES

1. **Fragmentation Hand Grenade, Mk. II.**—a. The fragmentation hand grenade is made of cast iron, weighs about 20 ounces, and is about the size of a large lemon. (See Figure 36.) The bursting charge is composed of E.C. blank fire powder. The outside surface of the grenade is deeply serrated horizontally and vertically to assist its breaking up into uniform fragments when the grenade explodes. Within five yards, an exploding grenade is almost 100 percent effective, and a considerable percentage of casualties may be expected up to thirty yards. Scattered fragments may inflict injuries up to 200 yards, and the thrower should therefore take cover immediately upon releasing the grenade.

To fire the grenade, the safety pin is pulled out and the missile is thrown. The safety lever is automatically released as the weapon leaves the hand, and the grenade explodes in five to seven seconds afterward.

Hand grenades are effective against personnel only. On the defensive they are best employed when thrown at an approaching enemy from the cover of foxholes; on the offensive they are valuable for mopping up dugouts and shell holes and for close fighting in woods and at night.

2. **Chemical Hand Grenades.**—a. Smoke and gas grenades have a cylindrical body made of tin plate. The body contains perforations or vents which are covered with squares of adhesive tape. When the grenade functions, the patches are blown or burnt off and the smoke or gas escapes. These grenades weigh about 17 ounces. (See Figure 38.)

b. Smoke and gas grenades are filled with HC (white smoke), CN (tear gas), or a CN-DM mixture and a small amount of blank fire powder. Two seconds after the primer is fired the grenade begins to generate and reaches full volume one second later. Functioning continues for 25 to 35 seconds.

c. Smoke and gas grenades are thrown and fired in the same manner as the fragmentation grenade.

3. **Practice Hand Grenades.**—a. The hand grenade, Mk. 1A1 is the current standard for practice and training. It consists of a one-piece cast iron body, in the shape of the fuzed fragmentation grenade, and a removable safety pin and ring. It is inert.

b. The practice hand grenade, Mk. II, is a limited standard practice grenade equipped with igniting fuze and

Weapons

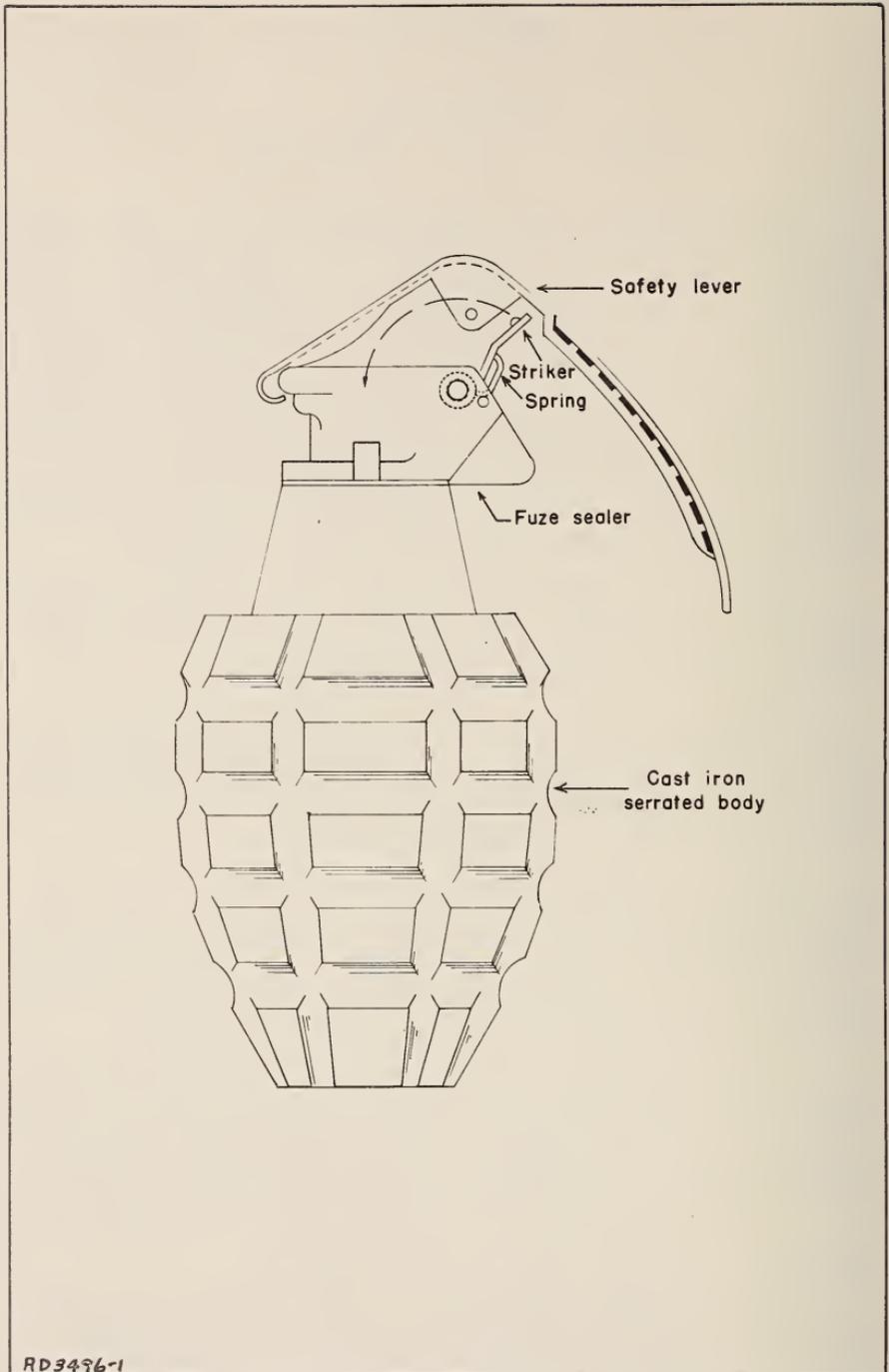


FIG. 36.—FRAGMENTATION HAND GRENADE, MK. II.

loaded with a charge of black powder contained in a paper tube. When the grenade is fired the charge explodes but does not rupture the grenade body.

4. **Other Types.**—a. An offensive grenade, consisting of a high explosive contained in a paper or plastic body is used for demolition and concussion effects. The grenade may be thrown without consideration of cover for the thrower.

b. Various types of incendiary grenades are in use, some consisting of chemicals contained in glass bottles.

PART II.—RIFLE GRENADES*, V.B. AND CHEMICAL

1. **Rifle Grenade, V.B., Mk-I.**—The V.B. rifle grenade, Mk-1, weighs about 17 ounces. It is made of malleable iron, and is about two and one-half inches long by two inches in diameter. It is cylindrical in shape, with a rounded top and flat base. It is serrated inside; this helps the high explosive with which the grenade is filled to burst the body into a great number of pieces when the grenade explodes. The grenade is also pierced longitudinally with a bullet tube through which the bullet from the rifle cartridge passes when the rifle is fired. The rifle grenade is fired from the V. B. rifle grenade discharger, which is a device that can be attached to any service rifle. To use the grenade, the soldier places the discharger on his rifle, inserts the grenade, and fires the rifle. The bullet passes through the grenade, the grenade is then expelled from the discharger by the force of the gases which follow the bullet and impinge on the flat base of the grenade. The mechanism of the grenade is such that it explodes, bursting into about 25 to 40 pieces, about five to seven seconds after being discharged. It may be employed by firing directly at the target, or more frequently, by elevating the muzzle of the gun and employing high angle of fire against the hostile dispositions. In this class of fire, the rifle being elevated from 40° to 80°, the V. B. grenade can be fired at targets ranging from 180 to 120 yards respectively.

2. **Chemical Rifle Grenades.**—a. The smoke rifle grenade, Mk-I, weighs about 16 ounces and is made of smooth sheet steel. The complete round consists of four units; the M-9 fuze, body, rifle rod, and chemical rifle grenade blank cartridge. The grenade is assembled by screwing into the body the fuze and rod. The grenade is fired by inserting the rod into the bore of the rifle, then pulling safety pin, loading rifle with special blank cartridge, elevating the muzzle and firing.

b. The lachrymatory rifle grenade Mk. II weighs 9.8 ounces and is made of smooth sheet steel with two annular corrugations. The grenade is packed, fuzed, and fired in the same manner as the smoke grenade. It is to be remembered that special blank cartridges must be used in firing these grenades. Chemical grenades are fuzed for 8.3 seconds.

The smoke and lachrymatory grenades are fired at angles of from 15° to 45° giving range of from 185 yards to 265 yards.

*The V.B. and Chemical Rifle Grenades are no longer classified as standard and will be issued only until the present supply is exhausted. These grenades can be used only with the M1903 Rifle.

Grenades

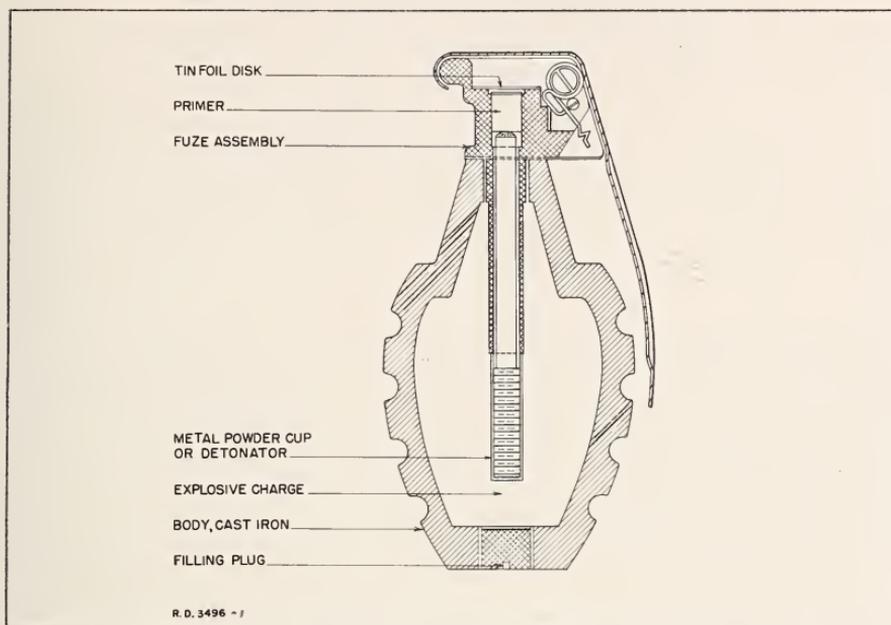


FIG. 37.—FRAGMENTATION HAND GRENADE, CROSS SECTION.

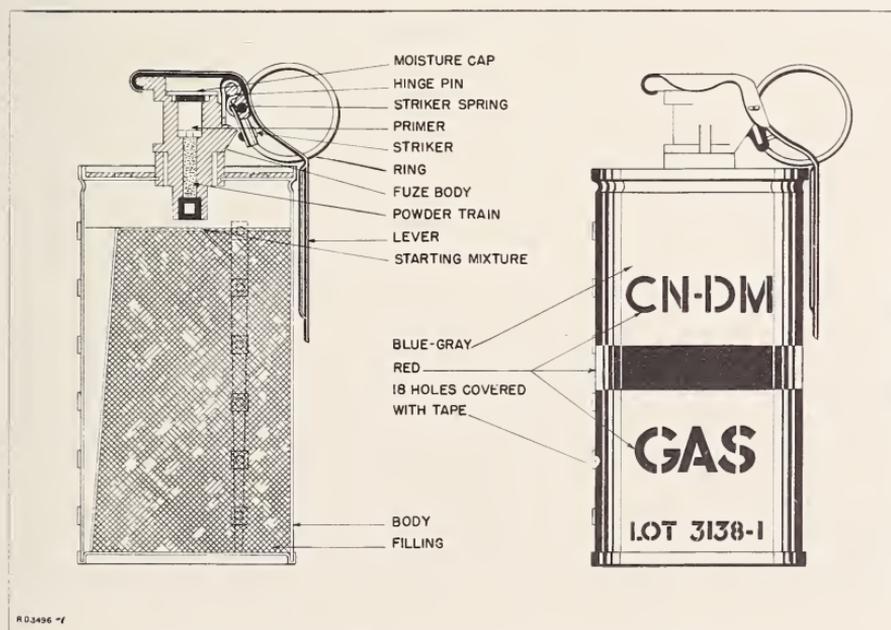


FIG. 38.—IRRITANT GAS HAND GRENADE.

PART III.—ANTITANK GRENADES

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Cartridge, AT Grenade, Cal. .30, M3	3	89
Launcher, Grenade	4	89
Sighting and Aiming	5	89
Firing Positions	6	90
Firing	7	90
Employment	8	91

1. **General.**—a. Antitank grenades are designed to pierce the armor of tanks and other armored vehicles and to destroy the personnel within or disable the machine. Casualties within a vehicle are caused by the blast of the explosion and by fragments torn from the armor plate when a penetration is made. The maximum range is about 150 yards when fired at an angle of 20 degrees. The maximum effective range is considered to be 75 yards. A special cartridge, issued with the grenade, must be used.

b. The U. S. Rifle, caliber .30, M1903, with the aid of a launcher, is used to fire the grenade. The M1903A1 Rifle and the M1917 Rifle may also be used. In case the M1917 Rifle is employed, a launcher designed to fit that rifle is issued.

2. **Description.**—a. Grenade, AT, M9.—The grenade, AT, M9, is constructed of sheet metal, weighs 1.5 pounds and is 9 inches in length. It has a head containing the filler and fuze, and a fin assembly which insures a stable line of flight. (See Figure 39.) There is a safety pin in the head which must be removed to arm the grenade. The pin is held in place by tape. The grenade will detonate only on impact with some hard object and must strike on its nose or within 20 degrees of normal to nose. It is painted yellow with black identification markings, giving the model and lot numbers.

b. Grenade, AT, M9A1.—The grenade, AT, M9A1, has a sheet metal body and weighs 1.31 pounds. It is similar to the M9 grenade in appearance except that the nose is more rounded and the safety pin is replaced by a safety wire in the tubular portion just below the head. (See Figure 40.) It is more sensitive than the M9 and will detonate upon contact with soft earth. It will also penetrate heavier armor plate.

c. Grenades, AT, practice, M11 and M11A1.—The grenades, AT, practice, M11 and M11A1 are inert (dummy) grenades, similar in shape and weight to the grenade, AT, M9

Weapons



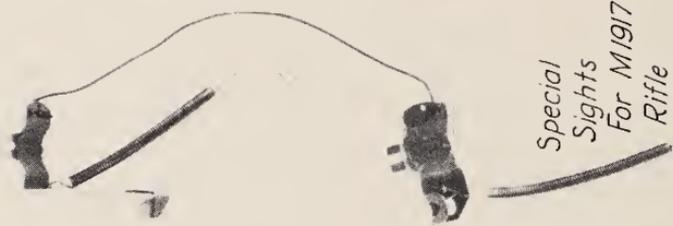
*AT Grenade
M9*



*Special
Cartridge
Cal. 30 M3*



*Grenade
Launcher M1*



*Special
Sights
For M1917
Rifle*



*Rubber Recoil Pad
For Rifle Butt*

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Fig. 39
Grenade, AT, M9, and Equipment.

and M9A1 respectively. They are painted black with white identification markings. They are used for training purposes and launched in the usual manner but contain no explosive charge.

3. **Cartridge, AT Grenade, Caliber .30, M3.**—The cartridge, AT grenade, caliber .30, M3, is a special type of blank cartridge used to discharge antitank grenades. (See Figure 39.) It is packed for shipping purposes in a cellophane envelope in the grenade fin assembly. Care must be exercised against losing the cartridge after removal from the grenade.

WARNING: Only this cartridge will be used for firing the grenade. Neither ordinary blank ammunition nor ball ammunition can be used.

4. **Launcher, Grenade.**—a. The launcher, grenade, is in effect an extension to the barrel of the rifle over which the grenade is placed for firing. (See Figures 39 and 41.) It is attached securely to the muzzle by means of a clamp and wing nut. When the launcher is attached, the rifle may be employed for firing ball ammunition, but the bayonet cannot be fixed.

b. The launcher, grenade, M1 is adapted for use with the M1903 and M1903A1 rifles. The launcher, grenade, M2 is to be used with the M1917 rifle.

5. **Sighting and Aiming.**—a. When firing the grenade with the M1903 or M1903A1 Rifle, the regular rifle sights are used. When firing with the M1917 Rifle, a special sight, grenade launcher, M2, is used. (See Figure 39.)

b. Sight setting, M1903 and M1903A1 Rifle. (See Figure 44.)—(1) For M9 or M11 grenades, the peep sight is set at 2,000 yards. (2) for the M9A1 and M11A1 grenades, the peep sight is set at 1,750 yards.

c. Method of aiming, M1903 and M1903A1 Rifle. (See Figure 45.)—(1) With the sights set as described in Paragraph 5-b above, use the top of the grenade as the front sight and for a range of:

25 yards—Sight through the triangular aperture just above the peep sight.

37.5 yards—Sight through the notch at the top of the drift slide.

50 yards—Sight over the top of the sight leaf.

(2) For a range of 75 yards, align the base of the front sight and the top of the sight leaf. Both eyes must be kept open and focused on the target.



Fig. 40

Grenade, AT, M9A1.

6. **Firing Positions.**—The Antitank grenade may be fired from any position used for firing the rifle. When firing from the shoulder, the butt of the rifle should be firmly seated and the body well braced since the recoil is somewhat greater than from regular ammunition. The recoil pad should be used whenever time permits. It is entirely safe, however, to fire from the shoulder without the pad, and many rounds can be fired without undue fatigue or shock to the grenadier. Due to the height of the sight, it is necessary to hold the head well up and away from the stock.

Figure 46 illustrates the standing position.

Every opportunity should be taken to rest the butt of the rifle against the wall of a foxhole, a stump or some solid object. (See Figures 48 and 49.) When the butt rest is employed the recoil pad should be used.

7. **Firing.**—a. To prepare for firing, place the rubber recoil pad on the butt of the rifle (See Figure 43); set sights properly, or if the M1917 Rifle is used, attach the special sights (See Figure 39); place the launcher over the muzzle of the rifle and fasten it securely as far down on the barrel as possible (See Figure 41); remove the blank cartridge from the grenade fin assembly and remove the cellophane envelope.

b. To fire the grenade (See Figure 50): 1. Open bolt of rifle; 2. Insert special cartridge in magazine; 3. Place grenade on launcher as far down as it will go; 4. Remove tape and withdraw safety pin or wire; keep muzzle of rifle elevated; 5. Close bolt, align sights on target and fire.



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Fig. 41
Launcher, Grenade,
M1 attached to
M1903 Rifle.



Fig. 42
Grenade, AT, M9, in
place on M1903
Rifle.



Fig. 43
Recoil Pad attached to
Rifle butt.

8. **Employment.**—The antitank grenade places in the hands of small units the power to effectively disable and destroy tanks and armored vehicles. Antitank grenadiers should be placed in position to cover all possible tank approaches. Full advantage must be taken of the ability of the AT Grenadier to protect crew-served weapons, command posts and other installations which may be vulnerable to attack by armored units. The grenade should never be fired until the tank has come within close range. The value of foxholes in this connection cannot be overemphasized. Due to the restricted visibility of tanks, it is possible for the AT Grenadier to remain under cover without being observed until the tank comes close enough to be reasonably certain of destroying it. Whenever possible the grenadier should wait until the side or rear of the tank is exposed, since the armor is generally lighter there than on the front or turret.

Weapons

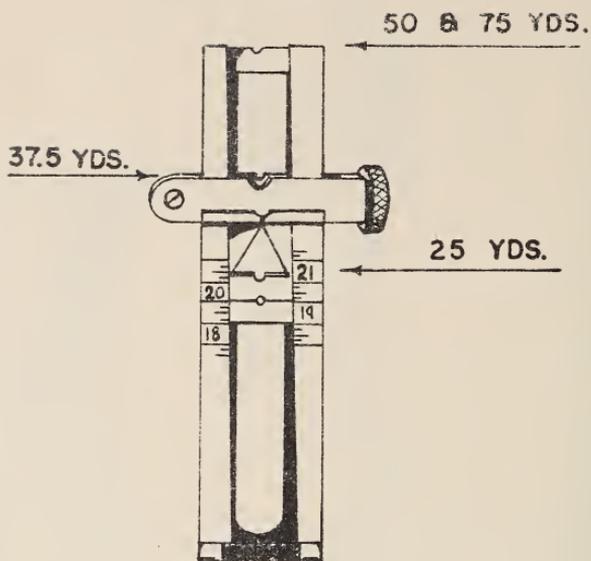
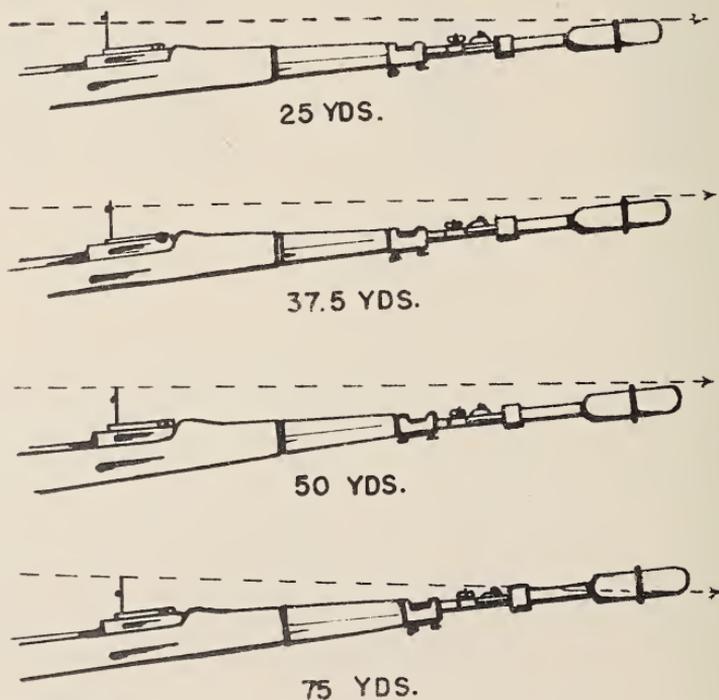


Fig. 44

Rear sight leaf M1903 Rifle set for use with Grenade AT, M9 or M11.



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Fig. 45

Method of aiming at various ranges.

Antitank Grenades



Fig. 46

Standing Position.

Note that the feet are spread well apart and the head is held away from stock.



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Fig. 47

Grenadier in foxhole firing from shoulder.

Weapons



Fig. 48

Method of resting butt against wall of foxhole.
Note firing position in insert.



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Fig. 49

Method of resting butt against stump for prone position.
Note firing position in insert.

Antitank Grenades



1. Open Bolt



2. Insert Cartridge in Magazine



3. Place Grenade on Launcher



4. Withdraw Safety Pin



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5. Close Bolt

Fig. 50
Steps to firing AT grenade.

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