

**WAR DEPARTMENT**

**INFANTRY FIELD MANUAL**

**§**

**WEAPON AND AMMUNITION TECHNICAL  
MANUAL, INFANTRY REGIMENT,  
PARACHUTE**

**June 1944**

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# **WEAPONS**

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# 60 MM MORTAR, M2, MOUNT, M2

The 60 mm Mortar, M2, is of French origin, developed by the Edgar Brandt Company, but manufactured in the United States under rights purchased from the Brandt organization. Its design has been altered and improved to conform to our standards. In addition to its normal function, it is now utilized as a projector for the illuminating shell, M83, employed to disclose aerial targets at night.

**MORTAR, M2**-The mortar consists of the barrel, base cap and firing pin. The base cap, ending in a spherical projection which fits into a socket in the base plate, is screwed to the breech end of the smooth-bored barrel. The firing pin fits in the base cap, which is bored and threaded axially to receive it.

**MOUNT, M2**-The bipod mount comprises the leg, elevating mechanism and traversing mechanism assemblies. The leg assembly consists of two tubular steel legs connected by a clevis joint attached to the elevating screw guide tube. Spread of the legs is limited by the clevis joint, which is provided with a spring latch to lock the legs in the open position. The legs terminate in spiked feet. The left leg has a cross-leveling mechanism consisting of a sliding bracket connected by a link to the elevating screw guide tube.

The elevating mechanism assembly consists mainly of an elevating screw nut which moves vertically on a screw within a guide tube, the elevating screw being actuated by a crank attached to its lower end.

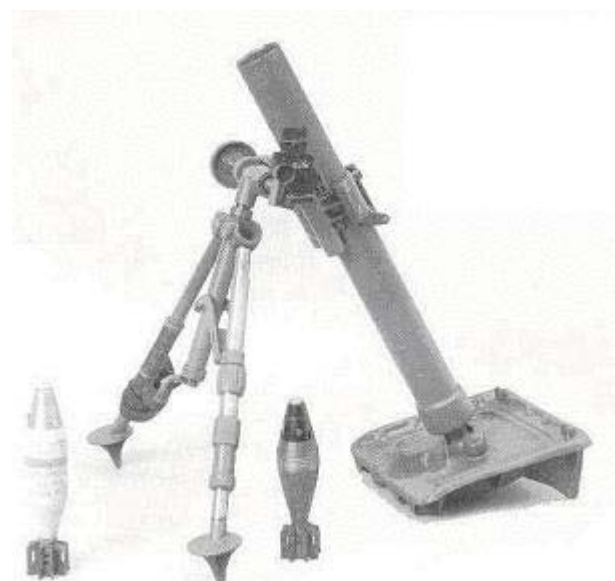
The traversing mechanism consists of a horizontal screw operating in a yoke and actuated by a traversing handwheel.

The sight bracket fits in a dovetail slot provided in the yoke. The barrel is clamped to the bipod by means of a clamping collar and saddle, shock absorbers being used to stabilize the mortar and mount during firing.

The base plate consists of a pressed steel body to which are welded a series of ribs and braces, a front flange and a socket. A locking lever fastens the spherical projection of the base cap in the socket.

## Sighting and Fire Control Equipment

Sight (Collimator), M4



## Ammunition

Projectile and propelling charge are in one unit constituting a complete round. The shell is furnished with stabilizing fins and a nose fuse. Propelling charges are divided into parts to provide for zone firing.

## CHARACTERISTICS

### MORTAR, M2

Weight of Mortar, M2, and Mount, MP....42.0 lb.  
Weight of mortar.....12.8 lb.  
Overall length of mortar.....28.6 ins.  
Diameter of bore.....2.36 ins.  
Rate of fire, maximum.....30 to 35 rds./min.  
Rate of fire, normal.....18 rds./min.

### MOUNT, M2

Weight of mount.....29.2 lb.  
Weight of bipod.....16.4 lb.  
Weight of base plate.....2.8 lb.  
Elevations, approximate.....40° to 85°  
Mortar clamp position A.....40° to 65°  
Mortar clamp position B.....45° to 70°  
Mortar clamp position C.....50° to 85°  
Maximum traverse, right.....70 mils  
Maximum traverse, left.....70 mils

## AMMUNITION

Shell	Range, Approximate
H.E., M49A2.....	100 to 1,985 yds.
Illumination, M83	
Training, M69	

# 81 MM MORTAR, M1, MOUNT, M1

During the first World War, the standard mortar adopted by the U. S. Army for infantry use as an indirect fire weapon was the British 3" Stokes trench mortar, Mk. I. Designs for a new mortar were started in 1920, but were abandoned in favor of attempts to improve bomb vanes in an effort to attain greater accuracy. While these tests were under way, the French firm of Edgar Brandt succeeded in developing a refined version of the Stokes mortar, together with suitable ammunition, which satisfied the requirements of the 17. S. War Department. After tests of the Stokes-Brandt mortar and mount were completed successfully by the Ordnance Department, and the using arms, manufacturing rights were purchased from the Brandt Company.

The 81 mm Mortar, M1, has a heavier barrel than the Stokes, Mk. 1, and a heavier base plate of new design. It also has a greater range and a higher rate of fire.

**MORTAR, M1**-The complete weapon consists of a barrel, bipod and base plate. The barrel is demountable from the bipod to form one load, while the bipod and base plate comprise two loads. Each load is light enough to be carried by one man. The smooth-bore muzzle-loading barrel is a seamless drawn-steel tube fitted at the breech end with a base cap within which is secured a firing pin protruding into the barrel.

**MOUNT, M1**-The mount consists of a base plate and a tubular steel bipod formed by two legs attached to a center trunnion by means of a compass joint. The left leg carries a cross-leveling mechanism which consists of a sliding bracket connected with the guide tube by a connecting rod. The mortar clamp, in two sections, clamps the barrel to the bipod and can be adjusted to three positions on the barrel.

The base plate is a rectangular pressed steel body to which are welded a series of ribs and braces, a front flange, three loops, two handle plates and a socket for the spherical end of the tube base cap.

## Sighting and Fire Control Equipment

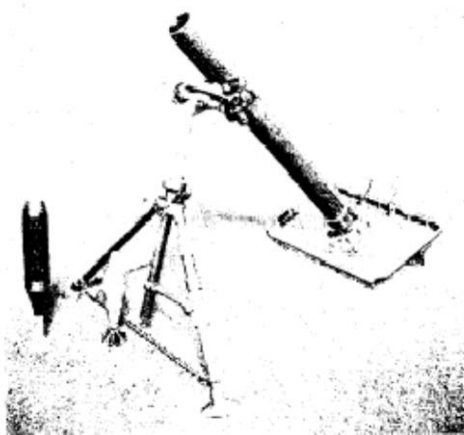
Each mortar is equipped with a sight which includes a collimator, elevating and lateral deflection mechanisms, and longitudinal and cross-levels. The sight mechanism, supported by a bracket fitted into the mortar yoke, provides accurate laying for elevation and deflection. Sight, M4, and Aiming Posts, M7, 118 and M9, are used with the 81 mm mortar.

## Transportation

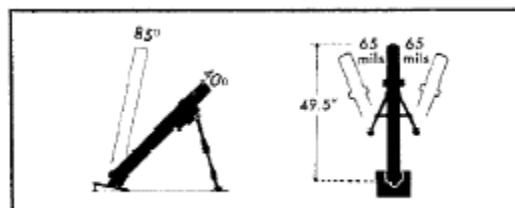
The 81 mm mortar can be carried by two men or can be transported on Hand Cart, M6A1. It is also part of the armament of the Half Track 81 mm Mortar Carrier, M4.

## Ammunition

Stabilization in flight is obtained by fins on the shell which cause the projectile to strike nose first. A point detonating impact type of fuse is fitted to the nose of the shell. The propelling charge attached to the base end of the projectile consists of an ignition cartridge and propellant increment. The increments of the charge arc removable to provide for zone firing.



81 mm MORTAR, M1, IN FIRING POSITION,  
WITH SHELLS, M43 AND M56



## CHARACTERISTICS

### MORTAR, M1

Weight of Mortar, M1, and Mount, M1...	136.0 lb.
Weight of mortar.....	44.5 lb.
Overall length of mortar.....	49.5 ins.
Diameter of bore.....	3.2 ins.
Rate of fire, maximum.....	30 to 35 rds./min.
Rate of fire, normal.....	18 rds./min.

### MOUNT, M1

Weight of mount.....	91.5 lb.
Weight of bipod.....	46.5 lb.
Weight of base plate.....	45.0 lb.
Elevations, approximate.....	40° to 85°
Mortar clamp position A.....	40° to 70°
Mortar clamp position B.....	50° to 80°
Mortar clamp position C.....	55° to 85°
Maximum traverse, right.....	65 mils.
Maximum traverse, left.....	65 mils.

## AMMUNITION

Weight	Ranges, Approximate
H.E. shell, M43A1, 6.87 lb....	100 to 3,290 yds.
M36, 10.62 lb....	300 to 2,558 yds.
Chemical shell, M57, 10.75 lb....	300 to 2,470 yds.



# AUTOMATIC PISTOL, CAL. .45, M1911A1



This is a recoil-operated, self-loading, semi-automatic weapon and is the standard sidearm of the U. S. Armed Forces.

The initial energy of the exploding cartridge holds the barrel and slide firmly locked together by two lugs on the barrel's upper surface which engage corresponding keyways in the slide. As pressure decreases the barrel drops, permitting the slide to recoil and compress the operating spring. As with other automatic and semi-automatic weapons the fired case is ejected on the recoil stroke and a new round picked up and chambered as the spring returns the slide to position.

The M1911A1 pistol incorporates the following modifications of the original M1911 design:

**GRIP SAFETY**—The tang of the grip safety has been extended better to protect the operator's hand.

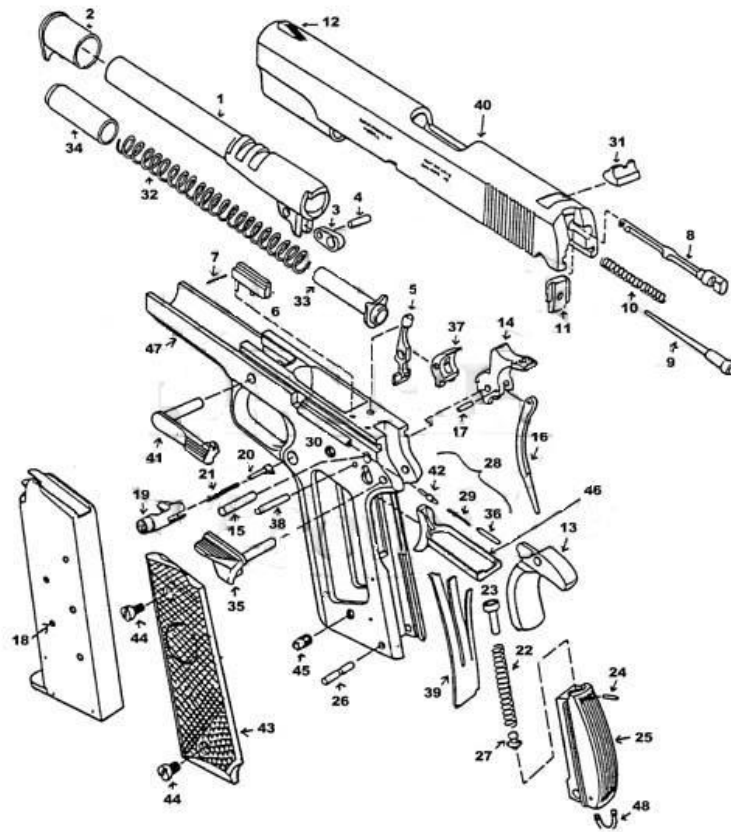
**RECEIVER**—A clearance cut has been made on either side of the receiver for the trigger finger.

**TRIGGER**—The face of the trigger has been cut to sharper radius and knurled.

**MAINSRING HOUSING**—The flat mainspring housing of the M1911 pistol has been replaced by a carved housing fitting the palm of the band.

## CHARACTERISTICS

Weight.....	2.44 lb.
Weight of recoiling parts.....	1.12 lb.
Weight, barrel.....	0.2 lb.
Length, overall.....	8.6 ins.
Length of barrel.....	5.03 ins.
Rifling, length.....	4.08 ins., 9.2 cal.
Number of grooves.....	6
Twist..Left-hand, 1 turn in 16 ins., 35.5 cal.	
Depth of grooves.....	0.0039 in.
Cross-sectional area of bore.....	0.1581 sq. in.
Type of mechanism..Short recoil, semi-automatic	
Feeding device.....	Magazine
Capacity of feeding device.....	7 rounds
Cooling.....	Air
Trigger pull.....	6.5 lb. max.; 4.5 lb. min.



PARTS DIAGRAM

1	Barrel	25	Mainspring Housing, Arched
2	Barrel Bushing	26	Mainspring Housing Pin
3	Barrel Link	27	Mainspring Housing Pin Retainer
4	Barrel Link Pin	28	Plunger Spring Assembly
5	Disconnecter	29	Plunger Spring
6	Ejector	30	Plunger Tube
7	Ejector Pin	31	Rear Sight, 1/16" Notch
8	Extractor	32	Recoil Spring
9	Firing Pin	32	Recoil Spring, General
10	Firing Pin Spring	33	Recoil Spring Guide
11	Firing Pin Stop	34	Recoil Spring Guide Plug
12	Front Sight, 1/16"	35	Safety Lock
13	Grip Safety	36	Safety Lock Plunger
14	Hammer	37	Sear
15	Hammer Pin	38	Sear/Disconnecter Pin
16	Hammer Strut	39	Sear Spring
17	Hammer Strut Pin	40	Slide
18	Magazine Assembly	41	Slide Stop
19	Magazine Catch	42	Slide Stop Plunger
20	Magazine Catch Lock	43	Grips
21	Magazine Catch Spring	44	Screw, Blued
22	Mainspring	45	Stock Screw Bushing
23	Mainspring Cap	46	Trigger
24	Mainspring Cap Pin	48	Lanyard Loop

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



The "Garand" rifle, designated as U. S. Rifle, cal. .30, M1, is a self-loading, semi-automatic shoulder weapon produced according to the design of Mr. John C. Garand, an employee at the Springfield Armory of the Ordnance Department. The rifle is gas-operated, clip-fed and air-cooled. It weighs 9½ pounds without the bayonet of approximately 1 pound weight.

Ammunition is loaded in clips of eight rounds carried in a bandoleer with six pockets holding a total of 48 rounds. Bandoleers weigh 3¼ pounds each.

The advantages of this rifle are inherent in the fact that it reloads itself after each shot. This prevents disturbance of aim or increase in fatigue due to manual operation of a bolt handle. It enables the soldier to deliver a volume of fire limited only by his proficiency as a marksman and his dexterity in inserting clips into the magazine. Troops equipped with this rifle possess greatly increased firepower with which to combat enemy ground forces, rapidly moving armored vehicles and low-flying planes.

The rifle consists of three main groups: a barrel and receiver group, a trigger-housing group, and the stock. The principal components of the barrel and receiver group are the barrel, gas cylinder lock, gas cylinder, operating rod, bolt assembly and hand guard. The trigger housing supports the hammer, safety, trigger and trigger guard.

When the rifle is loaded and the bolt closed the hammer is held in the cocked position. Pressure on the trigger releases the hammer to strike the firing pin which transmits the blow to the primer of the cartridge. As the bullet passes the gas port some of the gas enters the gas cylinder, where it drives the operating rod back, compresses the operating rod spring and carries the bolt to the rear. The empty cartridge case is extracted and ejected to the right front. The rearward movement of the bolt cocks the hammer and uncovers the magazine. The operating rod spring

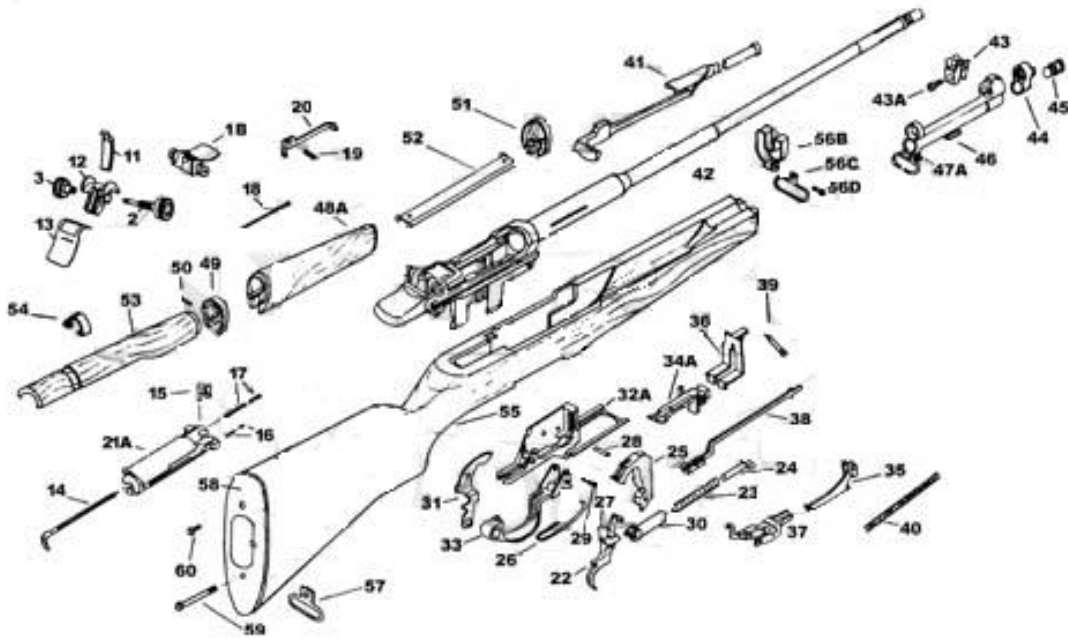
then forces the cartridges upward in the clip and the forward movement of the bolt slides the top cartridge into the chamber. The bolt is then locked by being rotated clockwise to engage the locking lugs in the receiver. The rifle is then ready to be fired again.

The entire clip is placed in the gun without removing the cartridges from the clip. It is necessary to squeeze the trigger to fire each cartridge. When the last round in the clip has been fired the clip is automatically ejected to the right from the top of the receiver and the bolt remains open. The rifle is now ready for the insertion of another clip.

A receiver sight is used for greater ease of aiming and to obtain a longer sight radius. It is adjustable for range and windage. The elevation knob on the left side has numbered graduations for ranges of 100, 300, 500, 700 and 1100 yards. The windage knob is on the right side and each windage graduation represents an angular adjustment of 4 minutes. Both elevation and windage knobs are provided with clicks which represent approximately one minute of windage or one inch elevation at the target for each 100 yards of range.

## CHARACTERISTICS

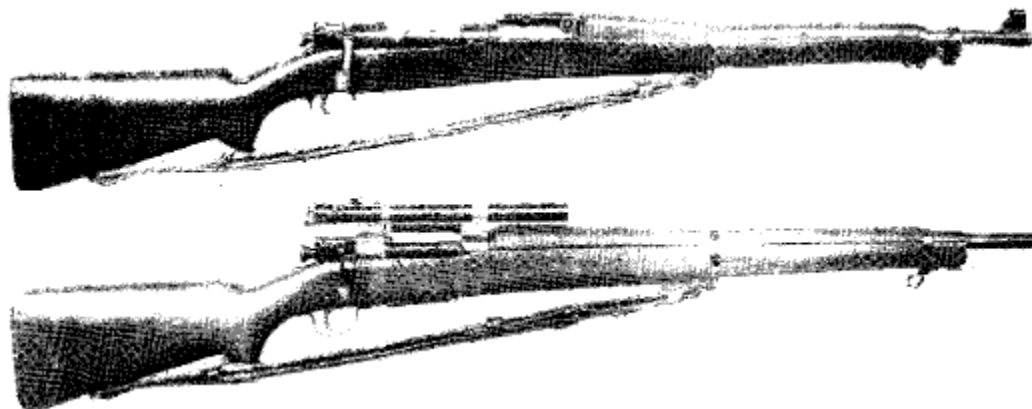
Weight.....	9.5 lb.
	with Bayonet, M1905: 10.5 lb.
Length (over-all).....	43.6 ins.
Length of barrel.....	24 ins.
Length of rifling.....	21.30 ins., 70.8 cal.
Number of grooves.....	2 or 4
Twist..Right-hand, 1 turn in 10 ins.,	33.3 cal.
Depth of grooves.....	0.0040 in.
Cross-sectional area of bore.....	0.0740 sq. in.
Type of mechanism..Gas-operated, semi-automatic	
Feed.....	8-rd. clip
Cooling.....	Air
Sight radius.....	27.9 ins.
Trigger pull.....	7.5 lb. max.; 4.5 lb. min.
Normal pressure.....	50,000 lb./sq. in.



#### PARTS DIAGRAM

1	Rear Sight, Complete	36	Bullet Guide
2	Elevator Pinion Assembly	37	Operating Rod Catch Assembly
3	Windage Knob	38	Follower Rod
11	Aperture	39	Follower Arm Pin
12	Sight Base	40	Operating Rod Spring
13	Sight Cover - Metal	41	Operating Rod
14	Firing Pin	42	Barrel
15	Extractor	43	Front Sight
16	Extractor Plunger And Spring	43A	Front Sight Lock Screw
17	Ejector And Ejector Spring	44	Gas Cylinder Lock
18	Clip Latch Pin	45	Gas Cylinder Lock Screw
19	Clip Latch Spring	46	Gas Cylinder
20	Clip Latch	47	Stacking Swivel
21A	Bolt	47A	Stacking Swivel Screw
22	Trigger-Sear Assembly	48A	Handguard W/ Metal, Front
23	Hammer Spring	49	Lower Band
24	Hammer Plunger	50	Lower Band Pin
25	Hammer	51	Handguard Ferrule, Front
26	Clip Ejector	52	Handguard Spacer, Front
27	Sear	53	Handguard W/ Retainer, Rear
28	Hammer Pin	54	Handguard Band Clip, Rear
29	Trigger Pin	55	Stock
30	Hammer Spring Housing	56B	Stock Ferrule
31	Safety	56C	Ferrule Swivel
32A	Trigger Housing, Stripped	56D	Ferrule Swivel Screw
33	Trigger Guard	58	Buttplate Assembly
34A	Follower And Slide Assembly	59	Butt Screw, Long
35	Follower Arm	60	Buttplate Screw, Short

U. S. RIFLE, CAL. .30, M1903A3 AND M1903A4  
(SNIPER'S)



This bolt-action, manually operated rifle replaced the Krag-Jorgenson as U. S. Army standard in 1903 and remains a standard item of issue and manufacture although largely supplanted for combat purposes by the gas-operated, semi-automatic rifle, M1.

The M1903 rifle, like virtually all military rifles in use today, represents adaptation of the original Mauser design, developed in Germany during the last decade of the 19th century. It is fed from a magazine well which is integral with the receiver. The magazine holds five cartridges which maybe loaded either singly & from the brass clip in which they are assembled at the arsenal. With an additional cartridge in the chamber, the weapon has a capacity of six rounds at one loading.

This rifle is rarely used at ranges greater than 600 yards but when necessity arises may be fired with a high degree of accuracy at 1,000 yards. All rifles of the series are equipped with swivels for the M1907 sling and carry integral with the front band a stud which permits mounting of either the M1 or M1905 bayonet.

**M1903A3**—The rear sight with which this model is equipped is similar to that developed for the caliber .30 carbine. It is a ramp type of sight, protected by parallel metal "ears". A knurled thumbscrew on the right side affords six points of windage adjustment, three right and three left. The peep slides upon the ramp which is graduated for adjustments in elevation covering ranges from 200 to 800 yards in 100-yard increments. The sight is mounted on the receiver bridge closer to the operator's eye than the rear sight of the M1903A1. This location increases the sight radius by approximately 6 inches.

**M1903A4 (SNIPER'S)**—As implied by the designation, this rifle is equipped for highly accurate fire against such targets as enemy snipers or individual occupants of observation posts. The iron sights, front and rear, are removed and a hunting type commercial telescope is mounted upon the receiver. The bolt handle of the rifle has been slightly modified to prevent interference with the telescope when the handle is raised and retracted. The telescopes now in use on the M1903A4 rifle include the Weaver 330-C with a magnification of 2½ diameters and the Lyman Alaskan telescope with a magnification of 2½ diameters. Both are supplied with crosshair reticles. The hairs used are of medium weight and subtend not more than one minute of angle. Both Weaver and Lyman telescopes have internal adjustments permitting exceedingly precise changes of elevation and windage.

## RIFLE, CAL. .30, M1903A3 CHARACTERISTICS

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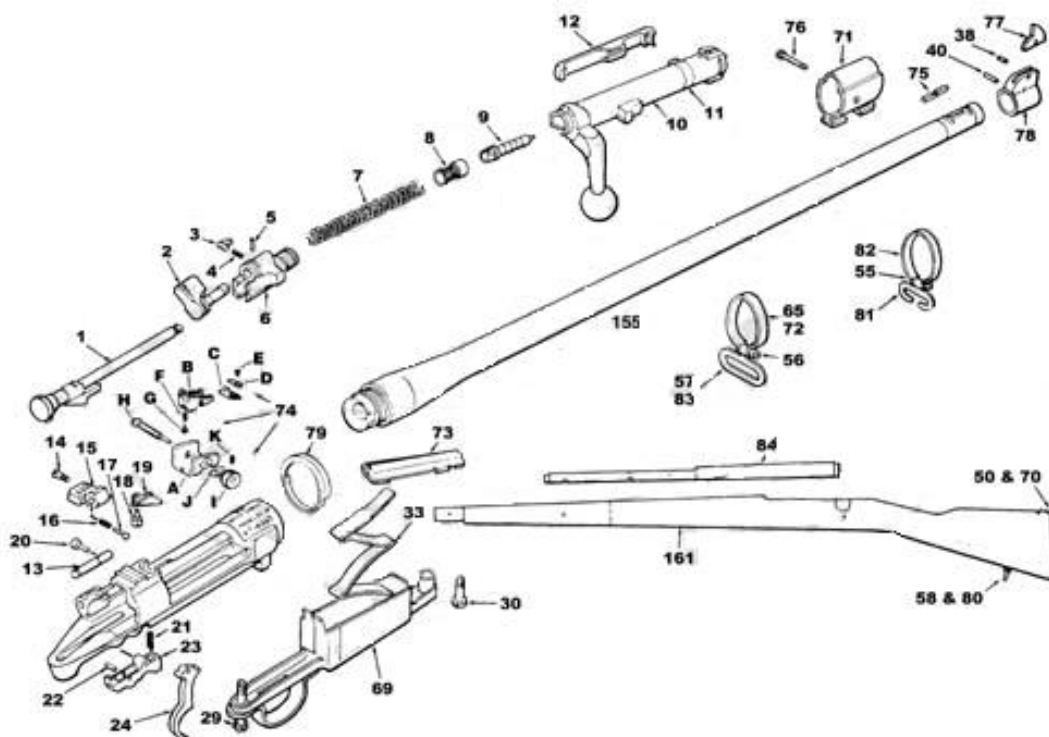
Weight, with sling.....9.0 lb.
                        with Bayonet, M1: 9.9 lb.
Length overall.....43.5 ins
                        with Bayonet, M1: 53.3 ins.
Length of barrel.....24 ins.
Rifling, length.....21.28 ins., 70.7 cal.
Number of grooves.....2 or 4
Twist.Right-hand, 1 turn in 10 ins., 33.3 cal.
Depth of grooves.....0.004 in.
Cross-sectional area of bore.....0.740 sq. in.
Type of mechanism.....Manual, bolt action
Feed.....5-rd. clip
Cooling.....Air
Trigger pull.....6 lb. max.; 4 lb. min.

```

## RIFLE, CAL. .30, M1903A4 CHARACTERISTICS

Weight of Characteristics of the M1903A4 Sniper's Rifle are identical with the above except that the weight of the telescope:

330-C telescope with Weaver sight.....9.7 lb.  
Lyman Alaskan telescope.....9.9 lb.



#### PARTS DIAGRAM

1	Firing Pin Rod	37	Front Sight Base Spline
2	Safety Lock Assembly	38	Front Sight Blade Pin
3	Bolt Sleeve Lock	40	Front Sight Base Pin
4	Bolt Sleeve Lock Spring	58	Butt Swivel
5	Bolt Sleeve Lock Pin	69	Trigger Guard, 1 Piece, Stamped
6	Bolt Sleeve, Stripped	70	Buttplate
7	Mainspring	71	Upper Band
8	Striker Sleeve	72	Lower Band
9	Striker	73	Follower
10	Bolt, Stripped	74	Rear Sight Assembly
11	Extractor Collar	75	Front Sight Key
12	Extractor	76	Upper Band Screw
13	Cut-Off Spindle	77	Front Sight Blade
14	Cut-Off Screw	78	Front Sight Base
15	Cut-Off	79	Handguard Ring
16	Cut-Off Plunger Spring	80	Butt Swivel
17	Cut-Off Plunger	81	Stacking Swivel
18	Ejector Pin	82	Stacking Swivel Band
19	Ejector	83	Sling Swivel, Stamped
20	Sear Pin	84	Handguard
21	Sear Spring	155	Barrel
22	Trigger Pin	A	Rear Sight Base
23	Sear	B	Windage Yoke, Stripped
24	Trigger	C	Slide Aperture
25	Follower	D	Slide Aperture Spring
26	Floorplate Catch	E	Slide Aperture Screw
27	Floorplate Catch Spring	F	Windage Yoke Spring
28	Floorplate Catch Pin	G	Windage Yoke Spring Plunger
29	Guard Screw, Rear	H	Windage Yoke Screw
30	Guard Screw, Front	I	Windage Index Knob
32	Floorplate	J	Windage Index Knob Click Spring
33	Magazine Spring	K	Windage Index Knob Screw
36	Front Sight Base Screw		

## U. S. CARBINE, CAL. .30, M1 AND M1A1



This compact, light-weight, semi-automatic weapon is now standard for those groups and units formerly equipped with the caliber .45 pistol, M1911A1. It is the regulation arm for all officers up to the rank of major.

The caliber .45 pistol is essentially a defensive weapon. The development of the caliber .30 carbine has placed in the hands of our troops not only a high-speed, accurate defensive arm but an offensive weapon as well. The carbine is capable of delivering effective fire at ranges as great as 300 yards—at least four times the effective range of the pistol which it has replaced.

The carbine is gas-operated, a portion of the gases of the explosion being admitted to a gas cylinder through a port in the barrel. Travel of the piston under pressure of the gases drives the bolt to the rear against the compression of the operating spring and extracts and ejects the fired case. The spring closes the bolt which picks up and chambers a new round on its forward travel. Operation, functioning, and general design of the carbine are similar in many respects to those characteristics of the caliber .30 Rifle, M1.

Like the Rifle, M1, the carbine is a semi-automatic arm and the trigger must be pulled for each shot. In case of failure of the gas-operated mechanism, the gun may be used as a hand-operated repeating arm, the slide being retracted and returned to position by hand.

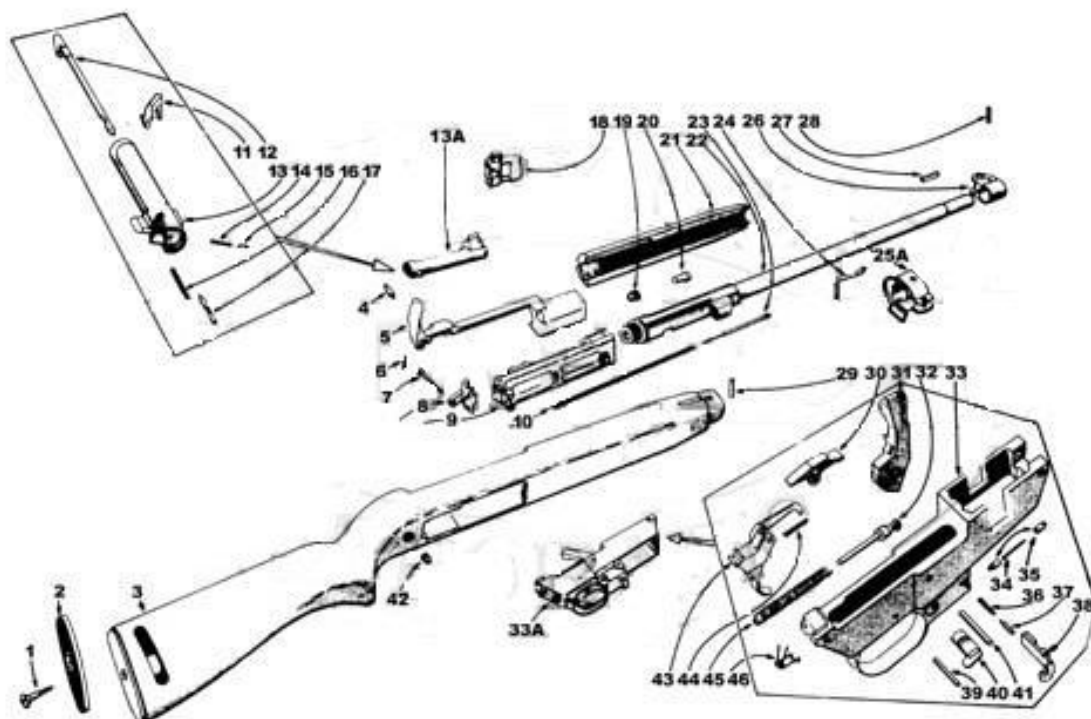
The weapon is fed from a box magazine with a capacity of fifteen rounds of ammunition

designated Cartridge, Carbine, Cal. .30, M1. The bullet weighs 110 grains and is propelled by a 14-grain charge of military smokeless powder.

**SIGHTS**—The original models of the carbine were equipped with an "L" type of rear sight with no adjustments for windage and with elevation adjustments of only 150 and 300 yards. This has been replaced by a ramp type of rear sight with click adjustments permitting three points of either right or left windage. The peep eyepiece slides upon the ramp which is graduated for elevation from 100 to 300 yards in 50-yard increments. The front sight is an "A" blade protected by wings.

### CHARACTERISTICS

Weight, total.....	5.45 lbs.
Length, overall, stock extended.....	35.6 ins.
Length, stock closed.....	25.5 ins.
Length of barrel.....	18 ins.
Rifling, length.....	16.77 ins., 55.7 cal.
No. of grooves.....	4
Twist..Right-hand, 1 turn in 20 ins.,	66.6 cal.
Depth of grooves.....	0.004 in.
Cross-sectional area bore.....	0.074 sq. in.
Type of mechanism..Gas-operated, semi-automatic	
Feed.....	15-rnd. magazine
Cooling.....	Air
Trigger pull.....	6 lb. max.; 4 lb. min.



# PARTS DIAGRAM

1	Buttplate Screw	24	Band Spring
2	Buttplate	25	Barrel Band
3	Stock	26	Front Sight
4	Slide Lock	27	Front Sight Key
5	Slide	28	Front Sight Pin
6	Slide Lock Spring	29	Trigger Guard Pin
7	Recoil Plate Screw	30	Sear
8	Recoil Plate	31	Hammer
9	Receiver	32	Hammer Spring Plunger
10	Operating Slide Spring	33	Trigger Housing
11	Extractor	34	Safety Spring And
12	Firing Pin	35	Safety Spring Plunger
13	Bolt	36	Magazine Catch Spring
14	Extractor Spring	37	Magazine Catch Plunger
15	Extractor Spring Plunger	38	Magazine Catch
16	Ejector Spring	39	Trigger Pin
17	Ejector	40	Safety, Wing Type
18	Rear Sight	41	Hammer Pin
19	Gas Piston Nut	42	Stock Escutcheon
20	Gas Piston	43	Trigger
21	Handguard	44	Sear Spring
22	Barrel	45	Hammer Spring
23	Recoil Spring Guide	46	Trigger Spring



# SUBMACHINE GUN, CAL. .45, M1 AND M1A1



This weapon is a redesign of John T. Thompson's model M1928A1. The M1 has a spring-loaded firing pin like the M1928A1. To simplify production several modifications were made.

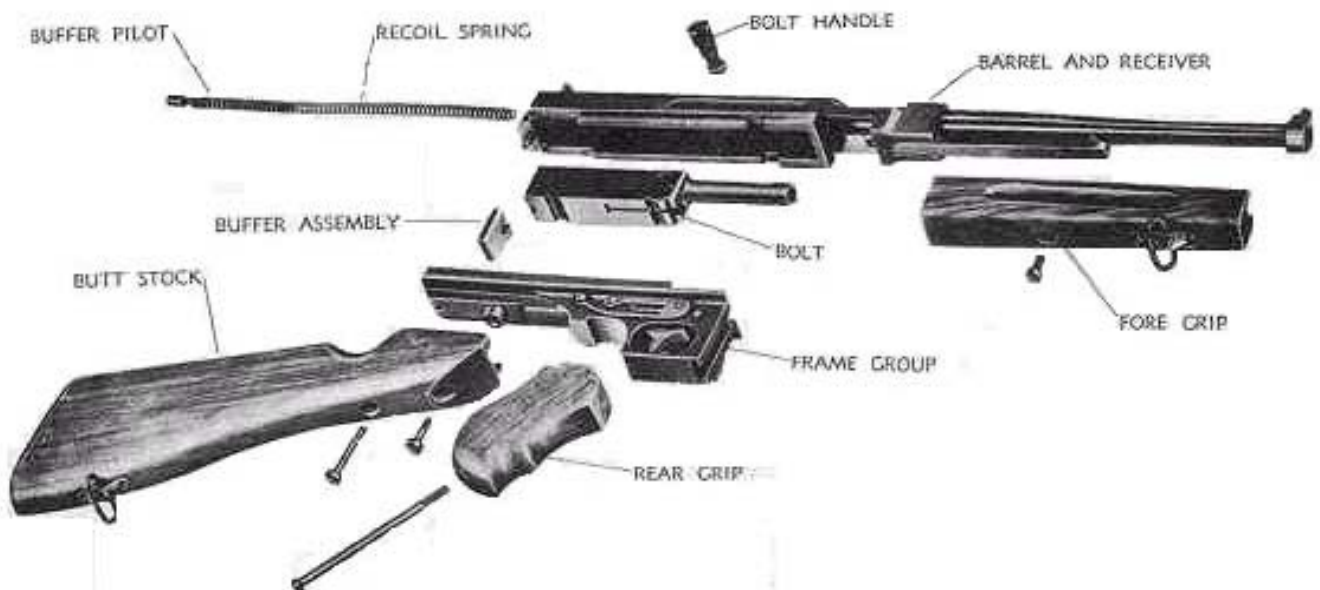
Unlike the M1928A1, the M1 has a permanently attached buttstock and a simple fixed aperture rear sight. Not present on the M1 is the Cutt's compensator and the ability to accept the M1928A1 50-round drum type magazine. The charging handle was also moved from the top, as on the M1928A1, to the right side of the receiver on the M1.

Submachine Gun, Cal. .45, M1 and Submachine Gun, Cal. .45, M1A1 Thompsons are straight blowback submachine guns. They are selective for semi-automatic or fully-automatic fire. It fires a cal. .45 cartridge from 20-round or 30-round box magazines. It has a rate of fire of 600 to 700 rounds per minute.

M1A1 differs from the M1 only in having the firing pin machined into the face of the bolt.

## CHARACTERISTICS

Weight.....	11.25 lb.
Weight, less magazine, oiler, and sling..	11 lb.
Weight of recoiling parts.....	1.62 lb.
Weight of barrel.....	0.95 lb.
Length.....	33.7 ins.
Length of barrel.....	10.52 ins.
Rifling, length.....	9.74 ins.
Number of grooves.....	6
Twist.....	Right-hand, 1 turn in 16 ins.
Depth of grooves.....	0.004 ins.
Cross-sectional area of bore.....	0.1581 ins.
Operation.....	straight blowback
Feed.....	20-rd and 30-rd magazines
Cooling.....	Air
Cyclic rate of fire.....	600-700 rds./min.
Sights.....	Fixed peep rear, A-blade front
Sight radius.....	21.2 ins.
Trigger pull.....	14 lb. max.; 10 lb. min
Pull to retract bolt.....	18-23 lb.

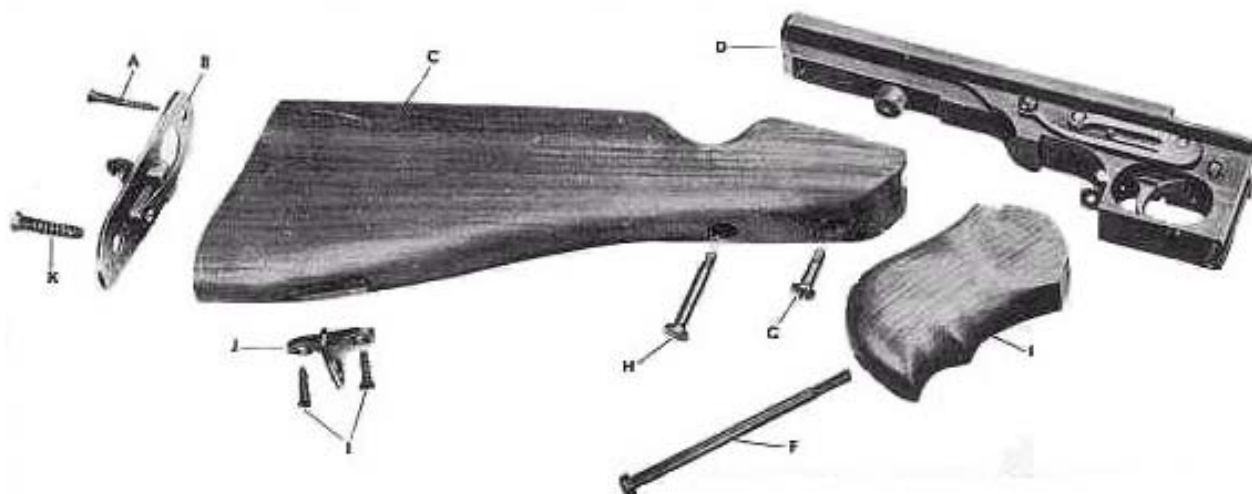


SUBMACHINE GUN, CAL. .45, M1



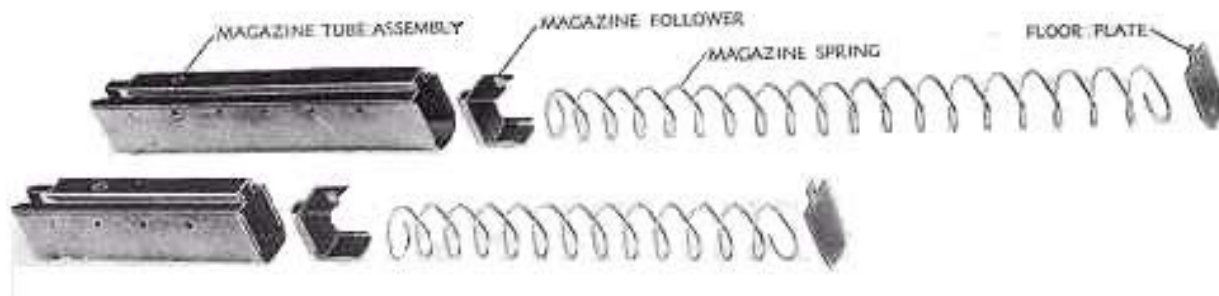
RECEIVER PARTS DIAGRAM

A	Rear Sight	G	Fore Grip Screw
B	Ejector Plate Stud	H	Horizontal Fore Grip
C	Ejector Assembly	I	Barrel and Receiver
D	Front Sight	J	Frame Latch
E	Sling Swivel Assembly	K	Frame Latch Spring
F	Sling Swivel Plate Screw		



FRAME PARTS DIAGRAM

A	Butt Plate Small Screw	G	Small Butt Stock Screw
B	Butt Plate Assembly	H	Large Butt Stock Screw
C	Butt Stock	I	Sling Swivel Plate Screw
D	Frame Group	J	Sling Swivel Assembly
E	Vertical Rear Grip	K	Butt Plate Large Screw
F	Rear Grip Screw		



20-ROUND AND 30-ROUND BOX MAGAZINE PARTS DIAGRAM

# SUBMACHINE GUN, CAL. .45, M3



This weapon has been designed and put in quantity production since the outbreak of World War II to fill the requirements for a light, portable arm with a high fire-potential.

Although the submachine gun (or 'machine pistol,' as it is known in Europe) has been a standard weapon of the U. S. Armed Forces for nearly 15 years, the cal, .45, M3, is an entirely new weapon, the result of study and experimentation and the testing of more than twenty foreign and domestic weapons of this type.

The Submachine Gun, M3, is now in use in all theaters of operation. It is the primary weapon for such shock units as commando raiders and paratroopers and is carried as an auxiliary arm in tanks and other vehicles.

It is a straight blowback operated weapon weighing 8.9 pounds complete with magazine, oiler, and sling. It is chambered for the cal. .45, M1911, cartridge but may be converted to 9 mm by substitution of a barrel of that caliber, a replacement bolt, a 9 mm magazine and a magazine adapter. Conversion to 9 mm permits use of the Parabellum cartridge, standard in the British Armed Forces, as well as use of certain types of captured enemy ammunition.

The overall length is 29.8 inches which is shortened to 22.8 inches when the extension stock, which may be used in emergency as a cleaning rod, is closed.

## Operation

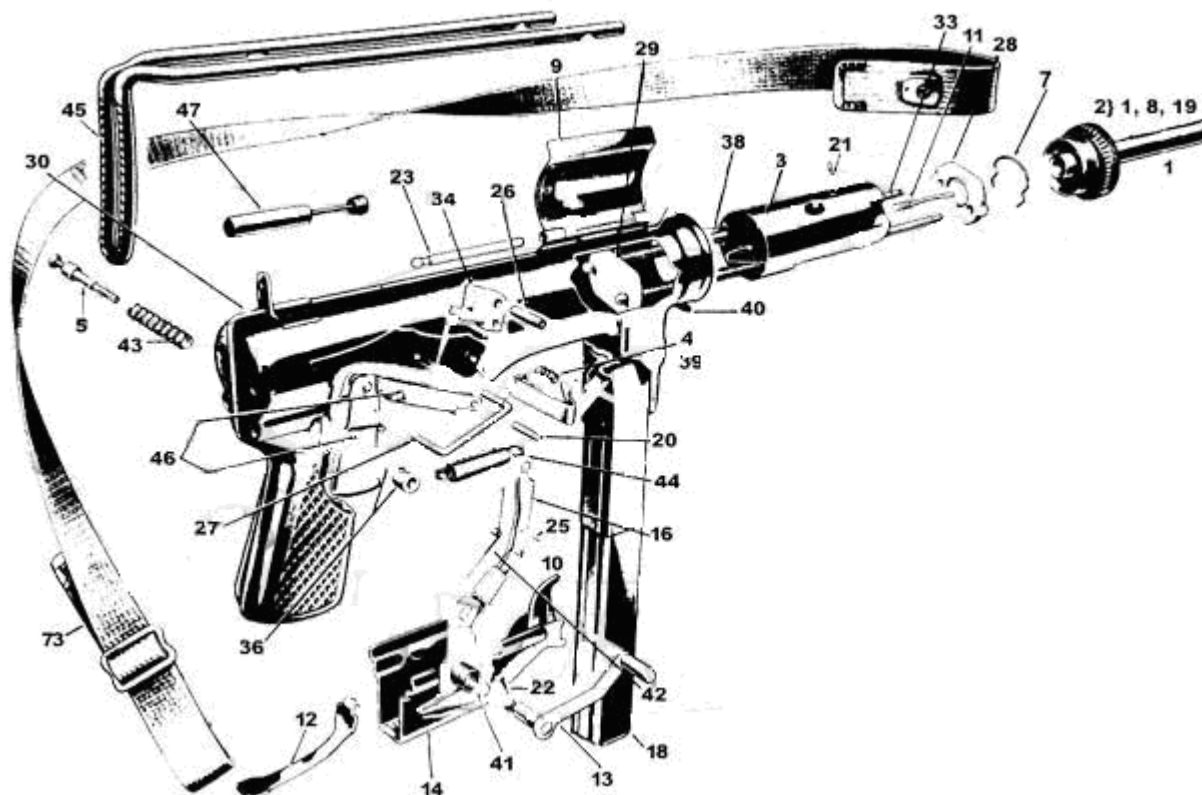
The fixed firing pin in the heavy bolt fires the cartridge at the completion of the forward stroke and the major portion of the energy of the explosion is absorbed by the inertia of the bolt. When this is over come the remaining energy is sufficient to drive the bolt to the rear against the compression of the operating springs. The fired case is ejected on the retracting stroke and the fully compressed dual spring returns the bolt to firing position, picking up and chambering another round on the forward movement.

Use of a heavy bolt holds the cyclic rate of fire to 350-450 rounds per minute. This low rate of fire and the design which places the stock in almost a straight line with the axis of the bore combine to reduce recoil, virtually to eliminate muzzle-climb, and to produce exceptional accuracy whether the weapon be used from the shoulder or as a "two-hand" pistol. Stampings are used wherever possible in the manufacture of the M3, only the barrel and bolt require machine operations, no critical metals are employed, and the gun may be produced at a minimum cost for one of this type.

The gun may be taken down without tools and folded into a space 12 5/8 inches long, 7 3/8 inches high, and 3 1/8 inches deep, or about 291 cubic inches. This permits convenient stowing in a soldier's pack for shipment or for packing in a standard container to be dropped by parachute.

## CHARACTERISTICS

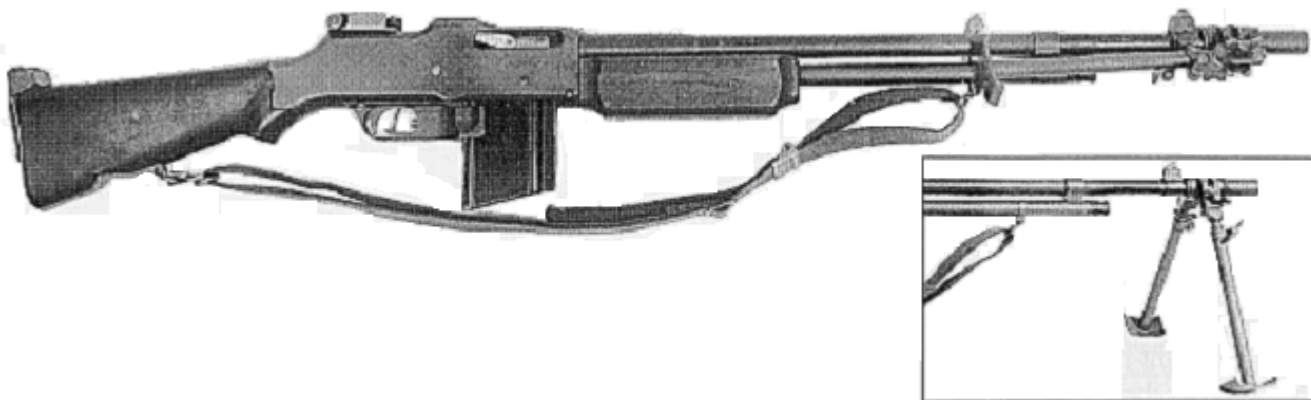
Weight, complete.....	8.9 lb.
Weight, less magazine, oiler, and sling.....	8.1 lb.
Weight of recoiling parts.....	2.0 lb.
Weight of barrel.....	0.62 lb.
Weight of barrel assembly.....	1.43 lb.
Length, overall, stock extended.....	29.8 ins.
Length, stock closed.....	22.8 ins.
Length of barrel.....	8.0 ins.
Rifling, length.....	7.2 ins.
Number of grooves.....	4
Twist..Right-hand, 1 turn in 16 ins., 35.5 cal.	
Alternate: 1 turn in 15 ins., 33.3 cal.	
Depth of grooves.....	0.0035 in.
Cross-sectional area of bore.....	0.1581 sq. in.
Operation.....	Straight blowback
Feed.....	30-rd magazine
Cooling.....	Air
Cyclic rate of fire.....	350-450 rds./min.
	full-automatic only
Sights.....	Fixed peep rear, A-blade front
Sight radius.....	10.8 ins.
Trigger pull.....	5 lb. max.; 7 lb. min.
Pull to retract bolt.....	18-23 lb.



PARTS DIAGRAM

- |                               |                                     |
|-------------------------------|-------------------------------------|
| 1 Barrel                      | 23 Cover Pin                        |
| 2 Barrel Assembly             | 25 Retracting Lever Pawl Spring Pin |
| 3 Bolt                        | 26 Sear Pin                         |
| 4 Magazine Catch              | 27 Trigger Pin                      |
| 5 Stock Catch                 | 28 Guide Rod Locating Plate         |
| 7 Cocking Lever               | 29 Guide Rod Retaining Plate        |
| 7 Guide Rod Retaining Clip    | 30 Receiver                         |
| 8 Barrel Collar               | 33 Guide Rod                        |
| 9 Ejection Port Cover         | 34 Sear                             |
| 10 Ejector                    | 36 Stock Catch Sleeve               |
| 11 Extractor                  | 38 Driving Spring                   |
| 12 Trigger Guard              | 39 Magazine Catch Spring            |
| 13 Retracting Handle          | 40 Ratchet Spring                   |
| 14 Housing                    | 41 Retracting Lever Spring          |
| 16 Retracting Lever With Pawl | 42 Retracting Lever Pawl Spring     |
| 18 Magazine                   | 43 Stock Catch Spring               |
| 19 Barrel Retaining Pin       | 44 Trigger Spring                   |
| 20 Connector Pin              | 46 Trigger With Connector           |
| 21 Extractor Pin              | 47 Oiler                            |
| 22 Cotter Pin                 |                                     |

# BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2



This gas-operated, air-cooled shoulder weapon represents successive modifications of the M1918A1 and the M1918, developed during World War I to meet infantry requirements for an easily transported weapon with a high fire-potential.

Commonly known in the service as the BAR, the M1918A2 is now in active use on all fighting fronts.

The differences between BAR, M1918A2, and its predecessor models are summarized below:

**BIPOD**—A bipod with spiked feet was clamped to the gas cylinder of the M1918A1. This has been replaced by a bipod with skid type shoes, mounted on a bearing integral with the flash hider. The legs may be folded to the rear or extended in the tubes in which they slide and locked in the extended position.

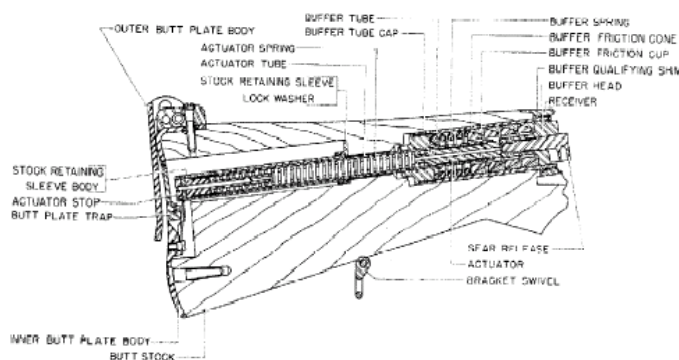
**RECOIL SPRING**—A metal shield has been set in the wooden forearm of the M1918A2 to protect the recoil spring from heat generated during sustained fire.

**CYCLIC RATE**—The M1918A2 differs from both prior models in that it is equipped with a selector mechanism, housed in the butt, which permits either a high-speed automatic fire of 500-600 rounds per minute or a retarded fire of 300-350 rounds per minute. The gun cannot be operated as a single-shot or a bearing integral with the flash hider. semi-automatic weapon.

**BUTT PLATE**—A hinge lug welded to the butt plate permits the mounting of an outer plate which may be swung parallel with the top line of the stock to serve as an additional support for the gun against the operator's shoulder. When not in use the outer plate folds against the inner and is retained by a spring-ball latch.

**GUIDE**—A right-and-left guide fastened to the trigger guard facilitates insertion of the magazine.

**SIGHT**—A new rear sight provides adjustments for both elevation and windage by large mounts equipped with click mechanism for minutes of angle.

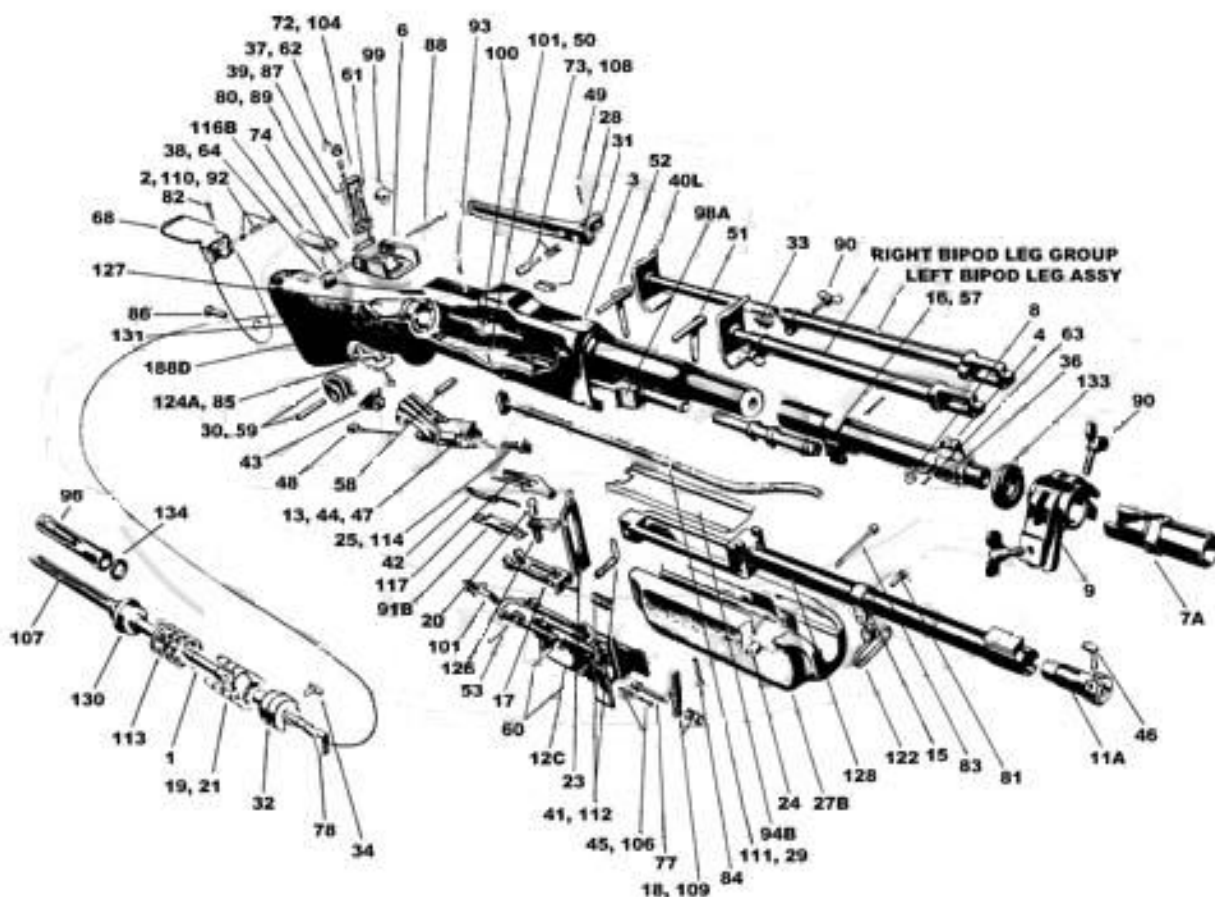


BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2 - BUTT STOCK GROUP - SECTIONAL VIEW - RIGHT SIDE

## CHARACTERISTICS

Weight, complete.....	19.4 lb.
Weight, less bipod.....	17 lb.
Weight of barrel.....	3.65 lb.
Length overall.....	47.8 ins.
Length of barrel.....	24.07 ins.
Rifling, length.....	21.41 ins., 71.1 cal.
No. of grooves.....	4
Twist..Right-hand, 1 turn in 10 ins, 71.1 cal.	
Depth of grooves.....	0.004 in.
Cross-sectional area of bore.....	0.074 sq. in.
Operation.....	Gas
Feed.....	20-rd magazine
Cooling.....	Air
Rate of fire.....	High-speed, 500-600 rds./min.
Retarded, 300-350 rds./min.	
Trigger pull.....	10 lb. max., 6 lb. min.

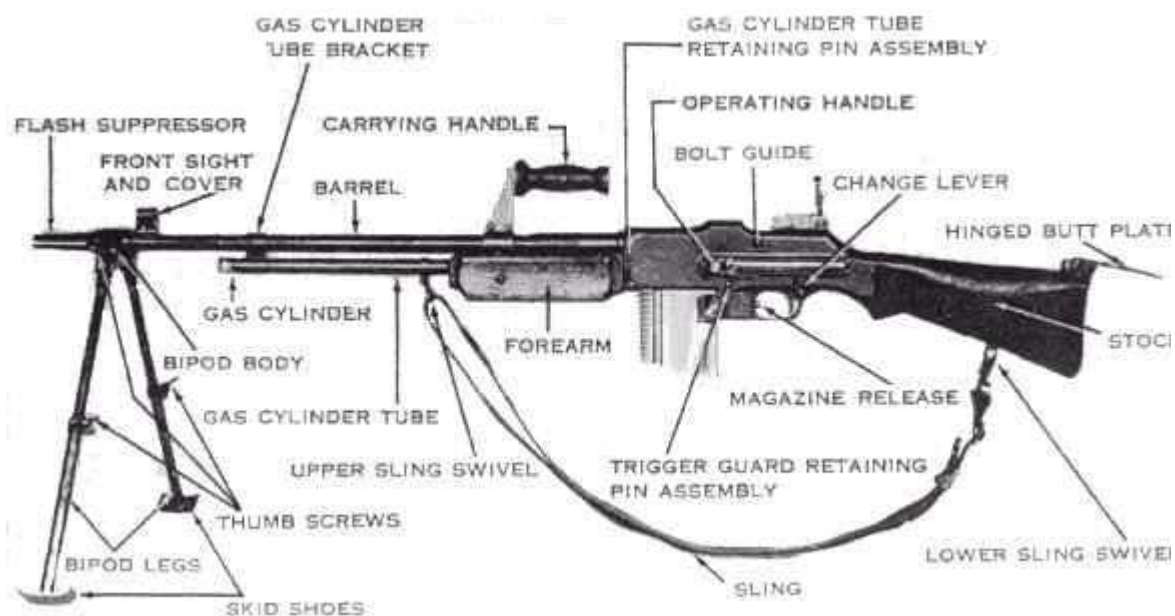




#### PARTS DIAGRAM

1	Actuator	41	Change Lever
2	Buttplate Bearing Ball	42	Sear Release Stop Lever
3	Barrel Assembly	43	Bolt Link
4	Front Sight Base	44	Bolt Lock
7A	Flashhider & Bipod Bearing	45	Ejector Lock
8	Front Sight Blade	46	Gas Cylinder Lock
9	Bipod Body	47	Bolt Lock Pin
11A	Gas Cylinder Body	48	Firing Pin
13	Bolt	49	Operating Handle Plunger Pin
15	Front Swivel Bracket	50	Change Lever Stop Spring Retaining Pin
16	Gas Cylinder Tube Bracket	51	Gas Cylinder Tube Retaining Pin Assembly
17	Sear Carrier	52	Trigger Guard Retaining Pin Assembly
18	Magazine Catch	53	Sear Pin
19	Buffer Cone	57	Gas Cylinder Tube Bracket Pin
20	Trigger Connector	58	Bolt Link Pin
21	Buffer Cup	59	Hammer Pin
23	Ejector	60	Trigger And Magazine Catch Pin
24	Forend Escutcheon	61	Rear Sight Elevator Screw Retaining Pin
25	Extractor	62	Rear Sight Elevation Knob Pin
27B	Forearm Assembly, Walnut	63	Front Sight Key Pin
28	Bolt Guide	64	Rear Sight Windage Knob Pin
29	Recoil Spring Guide	68	Buttplate Assembly
30	Hammer	72	Rear Sight Elevator Screw Knob Plunger
31	Operating Handle	73	Operating Handle Plunger
32	Buffer Head	74	Rear Sight Windage Click Plunger
33	Bipod Leg Key	77	Magazine Release
34	Buffer Key	78	Sear Release
36	Front Sight Key	80	Rear Sight Windage Scale
37	Rear Sight Elevation Knob	81	Swivel Bracket Screw
38	Rear Sight Windage Knob	82	Buttplate Screw, Long
39	Rear Sight Leaf, Stripped	83	Forend Screw, Long
40L	Sliding Bipod Leg, Left	84	Forend Screw, Short

85	Rear Swivel Screw	107	Actuator Spring
86	Buttplate Screw, Short	108	Operating Handle Plunger Spring
87	Rear Sight Elevation Screw	109	Magazine Catch Spring
88	Rear Sight Windage Screw	110	Buttplate Lock Spring
89	Rear Sight Windage Scale Screw	111	Recoil Spring
90	Bipod Thumb Screw	112	Counter Recoil Spring
91B	Sear	113	Buffer Spring
92	Buttplate Lock Spring Set Screw	114	Extractor Spring
93	Rear Sight Base Set Screw	116B	Rear Sight Leaf Spring
94B	Forend Shield	117	Sear Spring
96	Stock Retainer Sleeve	122	Front Bracket Swivel
98A	Gas Piston Slide Assembly, Old Style	124A	Butt Swivel Assembly
99	Rear Sight Elevator Slide	126	Trigger Assembly
100	Bolt Guide Spring	127	Buffer Tube
101	Change And Stop Lever Spring Assembly	128	Gas Cylinder Tube
102	Change Lever Stop Spring	130	Actuator Tube Assembly
103	Change Lever Stop Spring Assembly	131	Buffer Tube Washer
104	Rear Sight Elevation Click Spring	133	Bipod Friction Washer Assembly
106	Ejector Lock Spring	134	Stock Sleeve Lock Washer



**M1918A2 BROWNING AUTOMATIC RIFLE, LEFT SIDE**



**FILED STRIPPED M1918A2**

BROWNING MACHINE GUNS, CAL. .30, M1919A4 AND M1919A6



The Browning Machine Guns, Cal. .30, M1919A4, M1919A5, and M1919A6, represent modifications and improvements upon the older M1919A2 which evolved from the M1919, originally designed as armament for the M1917 and Mk. VIII tanks, now obsolete.

They are air-cooled, fabric-belt-fed weapons operating on the short-recoil principle common to all Browning machine guns. All have heavy barrels reciprocating within a steel sleeve, perforated to facilitate cooling. Mechanically they are identical with the Browning water-cooled machine gun, M1917, and working parts are interchangeable.

**M1919A4—STANDARD**—This gun is issued in two types, fixed and flexible. The fixed gun is used only for tank installation and is mounted as a unit with 37 mm or 75 mm guns. The two move together within the limited elevation and traverse of the tank mounts and the machine gun so installed cannot be aimed individually. It has a vertical buffer tube and is without pistol grip.

The flexible gun is for more general use. It is used as armament for combat vehicles, armored and unarmored, or may be fired as a ground weapon from the machine gun tripod mount, M2. It is equipped with a pistol grip and is fired from the back plate trigger.

As used by motorized and mechanized units the gun is installed on mounts of various types, depending upon the type of vehicle and the position of the gun thereon. It is customary to carry a tripod mount, M2, for each gun to adapt the weapon for ground use.

Barrels of the M1919, A4, A5, and A6 guns are 24 inches long, 5.37 inches longer than the barrel fitted to the M1919A2. The barrel sleeve has been correspondingly lengthened from 13.7 inches to 19.08 inches. Separate front barrel bearing plugs are provided to permit the use of either M1 or M2 ammunition. The M1919A2 gun was also modified by the addition of a belt feed lever group assembly which permits assembly and disassembly

of the lever from above. The trunnion block was equipped with a bunter plug to resist wear by the points of the bullets.

Further modifications have been made since the weapon was designated M1919A4. These include substitution of a buffer plug, buffer ring, and buffer disks for the older tapered form of plug with ring and filler. The change eliminates the "freezing" of ring and plug which retarded buffer spring action.

The bottom plate has been redesigned so that plate, stirrup, and elevating bracket are now a unit. The bottom plate is riveted to the receiver and a recess in the plate serves to locate the gun in the pack hanger.

**SIGHTS**—Sights are of the conventional machine gun type with the front sight mounted on the gun's trunnion block. The rear sight base is mounted on a bracket on the left side plate of the receiver. The folding leaf bears a mil elevation scale graduated for the sight radius of 13.94 inches. Each division on the elevation scale represents 100 yards and the scale is graduated up to 2,400 yards.

M1919A4 CHARACTERISTICS

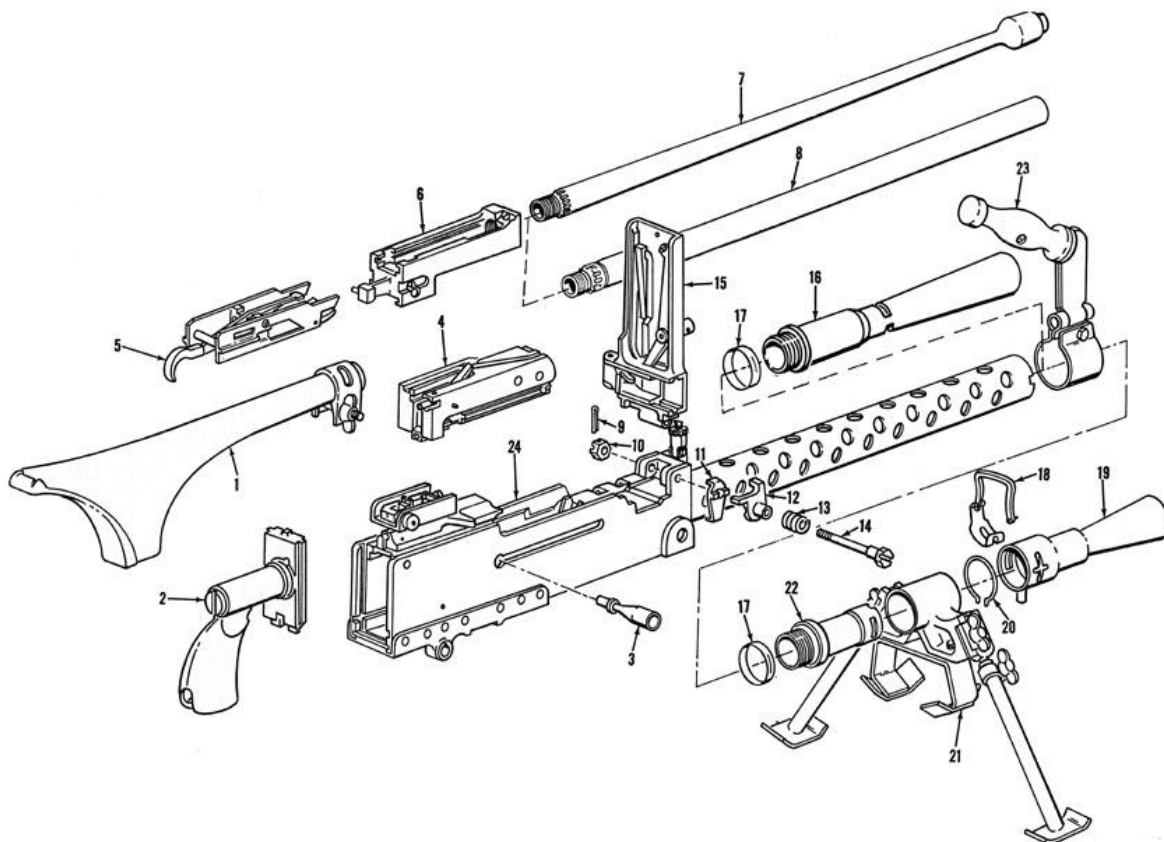
Weight, total.....	Flexible, 31 lb.
Weight of recoiling parts.....	11.7 lb.
Weight of barrel.....	7.35 lb.
Weight, overall.....	flexible, 41.1 lb.
Length of barrel.....	24 ins.
Rifling, length.....	38 ins., 71 cal.
No. of grooves.....	4
Twist, Right-hand, 1 turn in 10 ins.,	33.3 cal.
Depth of grooves.....	0.004 in.
Cross-sectional area of bore.....	0.074 sq. in.
Operation.....	Short-recoil
Feed.....	Fabric belt, 250 rds.
Cooling.....	Air
Rate of fire.....	400-550 rds./min.
Sear release.....	9 lb.
Trigger pull.....	7-12 lb.
Normal breech pressure.....	50,000 lb./sq. in.



**M1919A6- SUBSTITUTE STANDARD**—The designation of M1919A6 is given the Browning Machine Gun, Cal. .30, M1919A6 as modified for infantry use. The principal modifications, shown in the illustration herewith, include a shoulder stock, a carrying handle, and a bipod mount fixed to the barrel sleeve. A new front barrel bearing was provided and the cover latch changed to permit easier opening of the cover. Changes were made in the barrel plunger and driving spring to assure proper functioning without the muzzle plug.

## M1919A6 CHARACTERISTICS

Weight, total.....32.5 lb.  
 Weight of recoiling parts.....7.5 lb.  
 Weight of barrel.....4.65 lb.  
 Length, overall.....53 ins.  
 Length of barrel.....24 ins.  
 Rifling, length.....21.38 ins., 71 cal.  
 No. of grooves.....4  
 Twist.....1 turn in 10 ins., 33.3 cal.  
 Depth of grooves.....0.004 in.  
 Cross-sectional area of bore.....0.074 sq. in.  
 Operation.....Short-recoil  
 Feed.....Fabric belt, 250 rds.  
 Cooling.....Air  
 Rate of fire.....400-450 rds./min.  
 Trigger pull.....8.5 lb.  
 Normal breech pressure.....50,000 lb./sq. in.



**PARTS DIAGRAM**

- |    |                             |    |                                |
|----|-----------------------------|----|--------------------------------|
| 1  | Shoulder, Gun Stock Group   | 13 | Spring, Helical, Compression   |
| 2  | Plate Assembly, Back        | 14 | Screw, Shoulder                |
| 3  | Handle, Bolt                | 15 | Cover Group                    |
| 4  | Bolt Group                  | 16 | Flash Hider, Cal. .30, M6      |
| 5  | Lock Frame Group            | 17 | Lock, Barrel Bearing           |
| 6  | Barrel Extension Group      | 18 | Clip, Retaining Assembly       |
| 7  | Barrel Assembly, M1919A6    | 19 | Flash Hider, M7                |
| 8  | Barrel Assembly, M1919A4    | 20 | Ring, Retaining                |
| 9  | Pin, Cotter                 | 21 | Bipod Assembly                 |
| 10 | Nut, Castellated, Hexagonal | 22 | Bearing, Front Barrel          |
| 11 | Plate, Movable, Cover Catch | 23 | Handle Assembly, Carrying      |
| 12 | Plate, Fixed, Cover Catch   | 24 | Casing and Barrel Jacket Group |

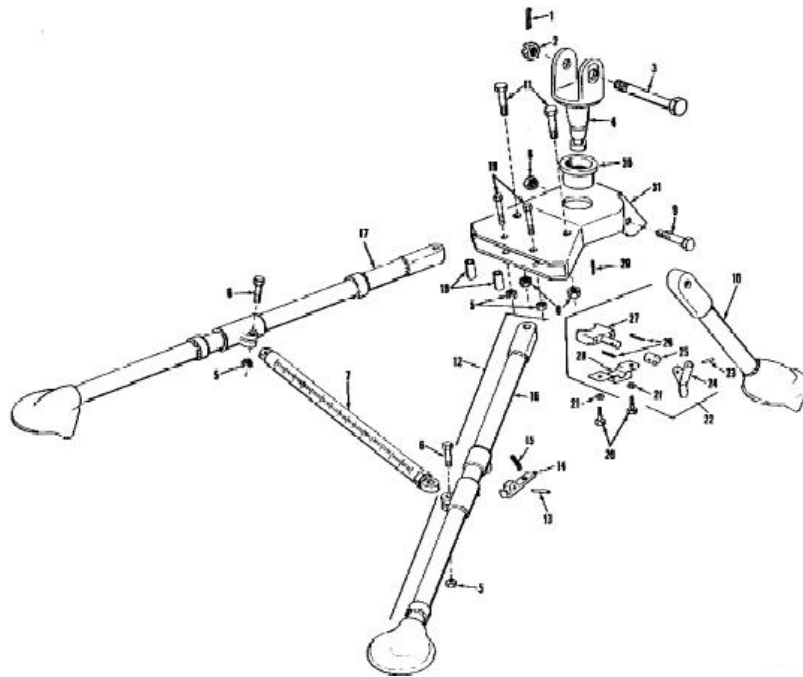
mechanism. Free elevation, with the gun supported only at the trunnion, is through an arc of  $21^{\circ}$ . Free depression may be obtained up to  $-45^{\circ}$ .

The tapered steel pintle on the receiver of the gun mates with a bronze bushing in the tripod head and is held securely by a latch which engages in an annular groove on the pintle.

The mount consists of three telescoping tubular steel legs in a tripod head. The two rear legs are joined by and obtain additional support from a graduated traversing bar which also carries the elevating mechanism and supports the rear of the gun.

Weight.....	14 lb.
Length, extended.....	32.5 ins.
Folded for transportation.....	27 ins.
Spread of rear legs.....	30 ins.
Command.....	11 ins.
Traversing range, free.....	6,400 mils (360°)
mechanical.....	50°
Traversing bar graduated.....	.800 mils
Elevating range, free.....	+21°, -45°
mechanical.....	+19°, -41°
least increment.....	.1 mil
Elevating handwheel graduated.....	every mil

Elevating handwheel graduated.....every mil

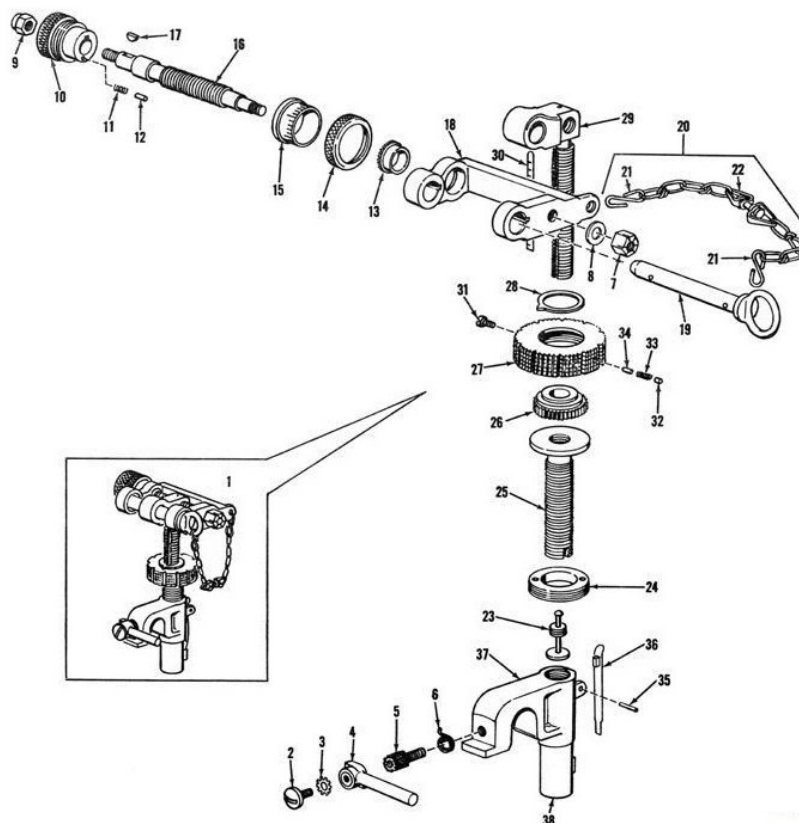


**M2 TRIPOD PARTS DIAGRAM**

- |                                  |                                 |
|----------------------------------|---------------------------------|
| 1 Pin, Cotter                    | 14 Latch Sleeve                 |
| 2 Nut, Slotter, Hexagonal        | 15 Spring, Helical, Compression |
| 3 Bolt, Machine, Hexagonal       | 16 Leg Group                    |
| 4 Pintle, Tripod Mount, Cal. .30 | 17 Leg, Rear Left               |
| 5 Nut, Plain, Hexagonal          | 18 Bolt, Machine, Hexagonal     |
| 6 Bolt, Machine, Hexagonal       | 19 Spacer, Sleeve               |
| 7 Bar, Assembly, Traversing      | 20 Screw, Machine, Hexagonal    |
| 8 Nut, Plain, Hexagonal          | 21 Washer, Lock                 |
| 9 Bolt, Machine, Hexagonal       | 22 Lock Assembly, Pintle        |
| 10 Leg, Front                    | 23 Pin, Straight, Headless      |
| 11 Bolt, Machine, Hexagonal      | 24 Cam, Pintle Lock Release     |
| 12 Leg Assembly, Rear Right      | 25 Collar, Shaft                |
| 13 Pin, Straight, Headless       |                                 |



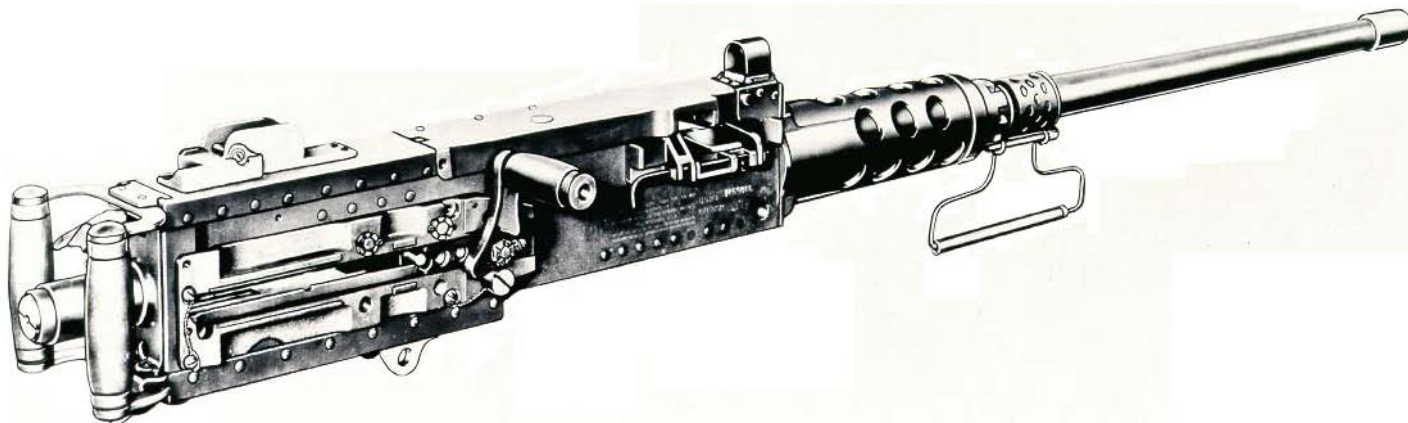
**MECHANISM, ASSEMBLY TRAVERSING AND ELEVATION**



TRAVERSING AND ELEVATION MECHANISM PARTS DIAGRAM

- |   |  |
|---|--|
| 1 Mechanism, Assembly Traversing and Elevation    | 20 Chain Assembly, Single Leg, Machine Gun Fastening Pin |
| 2 Screw, Machine, Buttonhead                      | 21 Hook, Chain   |
| 3 Washer, Lock                                    | 22 Chain and Swivel                                      |
| 4 Lever, Traversing Slide Lock                    | 23 Stop, Upper Elevating Screw                           |
| 5 Screw, Traversing Slide Lock                    | 24 Ring, Externally Threaded                             |
| 6 Spring, Helical, Torsion                        | 25 Screw, Elevating, Lower                               |
| 7 Nut, Self-locking, Hexagonal                    | 26 Ring, Click, Elev. Handwheel                          |
| 8 Washer, Thrust, Plain                           | 27 Handwheel, Elevating                                  |
| 9 Nut, Self-locking, Hexagonal                    | 28 Pointer, Dial   |
| 10 Handwheel, Traversing                          | 29 Screw, Elevating, Upper                               |
| 11 Spring, Helical, Compression                   | 30 Plate, Scale, Elevating Screw Upper                   |
| 12 Pin, Click, Elevating and Traversing Mechanism | 31 Setscrew, Lock, Elevating Handwheel                   |
| 13 Ring, Traversing Mechanism, Click              | 32 Pin, Straight, Headless                               |
| 14 Nut, Union, Locking, Traversing, Scale         | 33 Spring, Helical, Compression                          |
| 15 Dial, Scale, Traversing, Mechanism             | 34 Pin, Straight, Headless                               |
| 16 Screw, Traversing                              | 35 Pin, Spring, Tubular, Slotted                         |
| 17 Key, Woodruff                                  | 36 Stop, Elevating Screw, Lower, Assy.                   |
| 18 Yoke, Upper Elevating Screw                    | 37 Sleeve, Elevating, Mech.                              |
| 19 Pin, Quick Release                             | 38 Plug, Sleeve, Elevating                               |

# BROWNING MACHINE GUN, HEAVY BARREL, CAL. .50, M2 HB



Assembly of a heavy barrel (27 pounds) in the receiver of the caliber .50 Browning machine gun permits continued firing over a longer period, or firing of longer bursts, with less danger of damage to the weapon by overheating. The heavy barrel is quickly and easily dismounted to form a separate load for carriage by pack or for limited movement by hand. Any type of caliber .50 barrel, light or heavy, air- or water-cooled, may be fitted to any caliber .50 receiver. Changing the back plate assembly any air-cooled gun may be adapted for either fixed or flexible use.

**FEED**-All types of caliber .50 ammunition may be used. Feed is from a disintegrating metallic-link belt loaded in increments of 110 rounds. The gun is normally assembled for left-hand feed, which may be changed to right-hand feed by reversal of certain parts.

**FIXED TYPE**-The fixed type of caliber .50, heavy barrel, machine gun is used only in Heavy Tanks, M6 and M6A1. Two of these guns are rigidly mounted in Twin Mount, T52, in the bow of the tank below the 3 inch and 37 mm guns which are the principal weapons. While the guns are fixed, the mount may be moved by hand in limited traverse and elevation. Fixed guns are identical with those of flexible type except that the spade grip assembly has been removed from the horizontal buffer back plate and filler plates added.

**FLEXIBLE TYPE**-The Browning machine gun, heavy barrel, caliber .50, M2, in flexible and turret types, is the most widely used of any U. S. machine gun. It is used by infantry and special weapon units from the Tripod Mount, M3, as an anti-tank weapon. The limited elevation of the mount restricts its use in antiaircraft fire. It is installed in both medium and heavy tanks both as a turret gun and in ring mounts and is standard M7, in the 75 mm, 76 mm, 3 inch, and 105 mm gun motor carriages; in the Multiple Gun Motor Carriages, M13, M15, and M16; in the Armored Utility Car, M20; in halftrack cars, scout cars, medium and heavy tractors, and tracked landing vehicles.

In many of these the gun is installed in ring mounts permitting maximum elevation

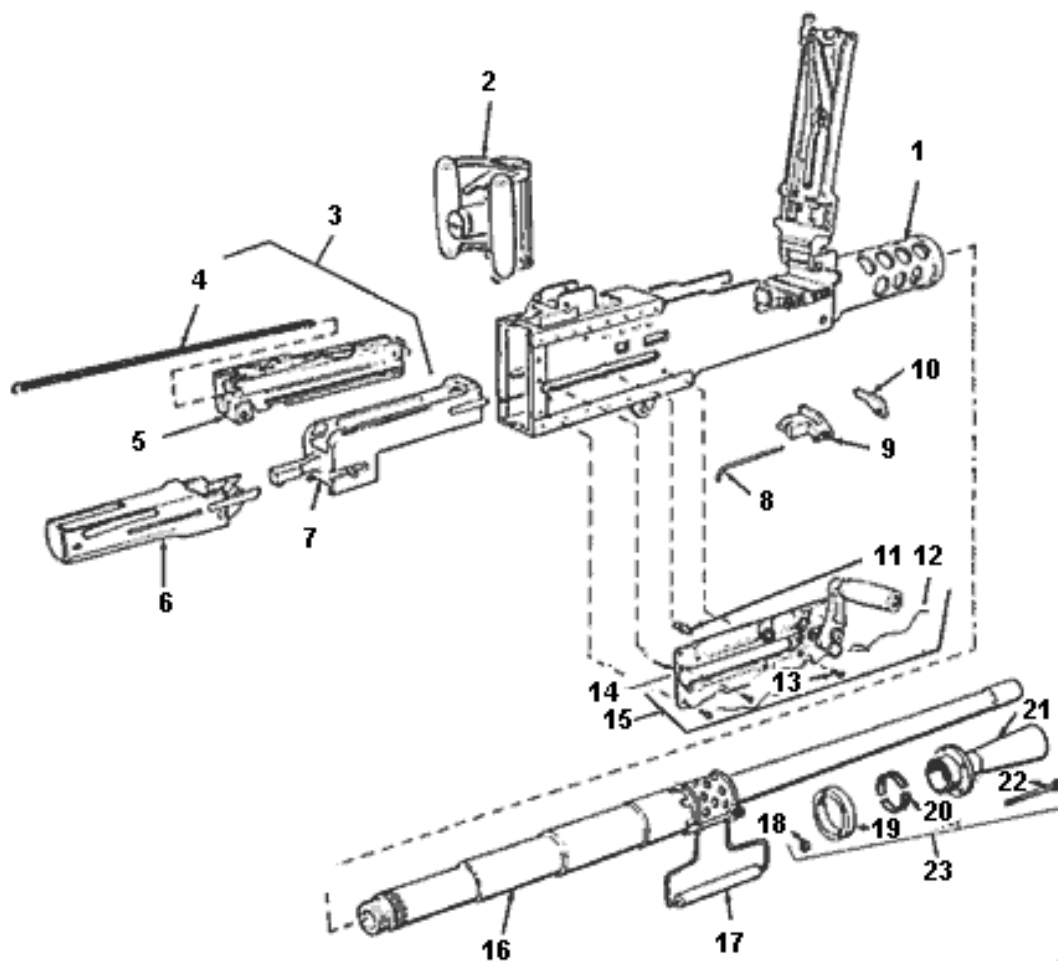
**TURRET TYPE**-The standard caliber .50, heavy barrel, machine gun is slightly modified for installation in tank turrets. The conventional blade and folding-leaf sights are replaced by antiaircraft sights and an Edgewater ring spring adapter is placed on the barrel. The distinguishing designation "Turret Type" is used for manufacturing, supply, and administration identification.

**SIGHTS**-Usual sight equipment is the conventional blade and folding-leaf A sights. A mount is provided for either the T3, M1, or M1918A2 telescopic sights.

**RATE OF FIRE**-The timed cyclic rate of the caliber .50, heavy barrel, gun is from 450 to 575 rounds per minute. Normal fire is in short bursts or single shots in swift succession. A single burst of from 100 to 150 rounds may be fired from a cool gun. At the rate of 40 rounds per minute, 500 rounds may be fired without overheating.

## CHARACTERISTICS

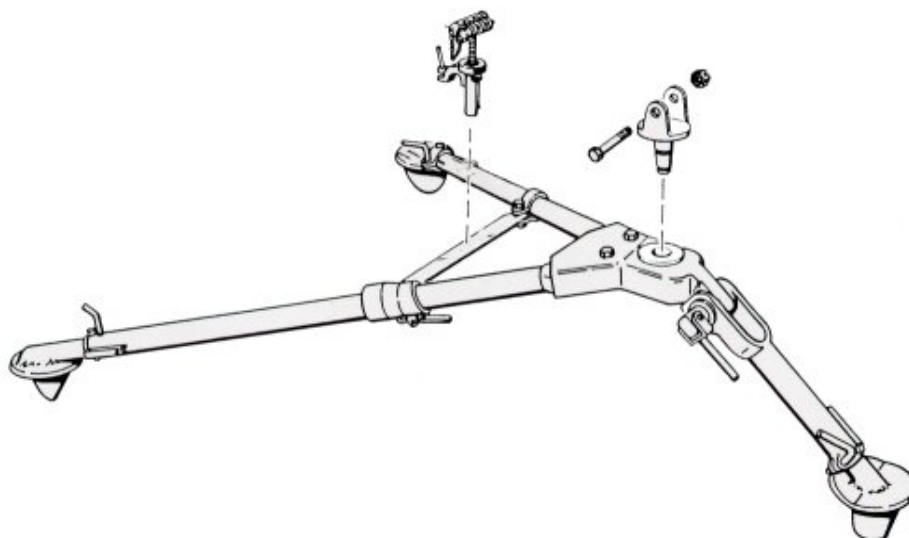
Weight, total .....	fixed, 82 lb.
	flexible, 84 lb.
	turret, 81 lb.
Weight of recoiling parts.....	38.8 lb.
Weight of barrel.....	27 lb.
Length, overall.....	65 ins.
Length of barrel.....	45 ins.
Rifling, length.....	40.91 ins., 81 cal.
No. of grooves.....	8
Twist.....	1 turn in 15 ins., 30 cal.
Depth of grooves.....	0.005 in.
Cross-sectional area of bore.....	2021 sq. in.
Operation .....	Short-recoil
Feed.....	Metallic-link belt, 100 rds. ea.
Cooling.....	Air
Rate of fire.....	450-575 rds./min.
Firing pin release	
Pressure at sear.....	10-20 lb.
Pressure at sear bar.....	30-35 lb.
Normal breech pressure.....	48,000 lb./sq. in.



**BROWNING MACHINE GUN, HEAVY BARREL, CAL. .50, M2 HB PARTS DIAGRAM**

- |                                      |                              |
|--------------------------------------|------------------------------|
| 1 Cover and Receiver Groups          | 13 Screw                     |
| 2 Back Plate Assembly                | 14 Slide                     |
| 3 Bolt and Rod Assembly              | 15 Retracting Slide Assembly |
| 4 Driving Spring Rod Assembly        | 16 Barrel Assembly           |
| 5 Bolt Group                         | 17 Barrel Carrier Assembly   |
| 6 Barrel Buffer Group                | 18 Nut                       |
| 7 Barrel Extension Group             | 19 Ring                      |
| 8 Belt Holding Pin                   | 20 Segment                   |
| 9 Cartridge Stop Assembly            | 21 Cone                      |
| 10 Front Cartridge Stop              | 22 Screw                     |
| 11 Headless Shoulder Pin (Bolt Stud) | 23 Flash Hider               |
| 12 Wire                              |                              |

## MOUNT, TRIPOD, MACHINE GUN, CAL. .50, M3



This mount is similar in all essentials to the .30 caliber tripod mount, M2, but is of more rugged construction throughout to accommodate the heavier caliber .50 weapon. It is designed for ground fire with the caliber .50, heavy barrel, flexible Browning gun.

Each leg consists of two telescoping sections of seamless steel tubing. A shoe with spade extension is welded to the end of each lower section. Normal mounting of the tripod is with the front leg at an angle of 60° and with all extensions closed. In this position the gun trunnion is 10 inches above the ground. Minor adjustments in command height may be obtained by changing the angle of the front leg or by extending the telescoping sections of all three legs. A clamping ring on each sleeve section of each leg permits locking the extension at any desired length.

A bronze bushing on the tripod head mates with the pintle of the gun which is locked in position by a pintle latch. A free traverse of 360° is possible. As with the caliber .30 gun a traversing bar joins the two rear legs, supports the rear of the gun, and carries the elevating and traversing mechanism. The traversing scale is graduated into 5-mil

subdivisions to 400 mils left and right of zero. The traversing dial formerly furnished with this caliber .50 mount has been eliminated.

The lower end of the elevating mechanism attached to the traversing bar through the traversing slide; the upper end is attached to the gun with a pin. The mechanism is a double screw assembly and affords an elevating range from +100 mils to -250 mils in increments of 50 mils or in 5 mil subdivisions.

### CHARACTERISTICS

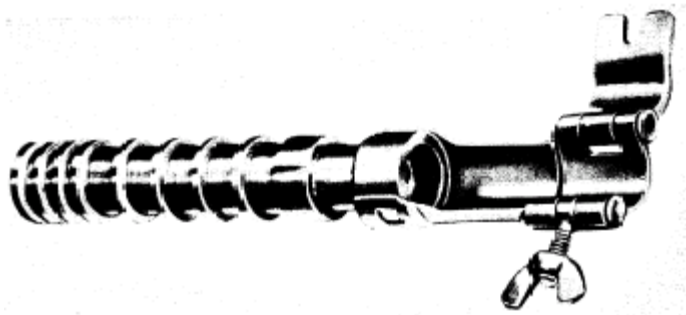
Weight.....	44 lb.
Length, extended.....	71 ins.
Folded for transportation.....	41 ins.
Height of trunnion, legs retracted.....	10 ins.
Legs extended.....	13 ins.
Spread of rear legs.....	30 ins.
Command.....	11 ins.
Range of traverse.....	6,400 mils (360°)
Traversing bar graduated.....	800 mils
Range of elevation.....	+100° to -250°
Elevating handwheel graduated.....	every mil



## LAUNCHERS, GRENADE, M1, M7, AND M8



Grenade launchers are tubular devices attached to the muzzles of U. S. rifles and carbines to permit launching or firing of the various standard rifle grenades, explosive or practice, the parachute and cluster Ground Signals, M17A1 and M22A1 inclusive. The MK II fragmentation hand grenade may be converted to a rifle grenade by means of a Grenade Projection Adapter, M1, and may be fired from the standard grenade launchers.



GRENADE LAUNCHER, M1

**LAUNCHER, GRENADE, M1**-The M1 launcher is for use with caliber .30 rifles of the 1903 series. The gas-operated, semi-automatic M1 rifle and M1 carbine employ the M7 and M8 grenade launchers respectively.

All launchers are of the same outside diameter. The tubular body of the launcher fits snugly within the stabilizer tube and the depth to which the launcher is inserted in the tube determines the range attained by the fired grenade. The range of the fired grenade increases as the number of visible rings decreases.

The exterior surface of the launcher is marked in a series of rings. These rings are marked consecutively from the rear to the muzzle. The rings are raised so that they may be counted and the range determined during night firing.

In all cases the actual launching is accomplished by means of a special blank cartridge, caliber 30, fired in the usual way in the rifle or carbine. The grenade cartridge may be distinguished from the ordinary blank cartridge by a rose crimp in the mouth of the case.

These cartridges are illustrated and described in the small arms ammunition section.

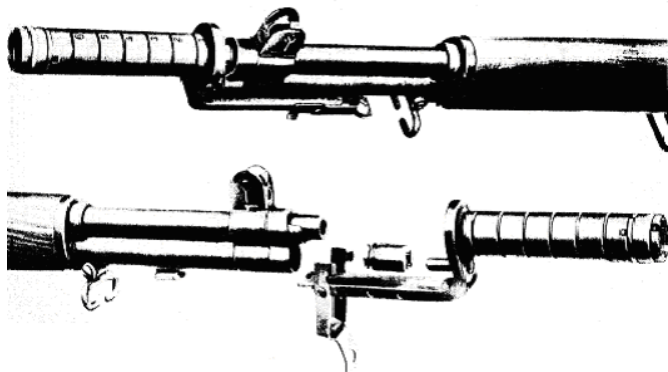
Modern warfare has emphasized the need for grenades to be fired at longer ranges and at higher velocities than were possible with the standard blank grenade cartridges. This has been accomplished by the so-called "vitamin pill," recommended for standardization on 15 January 1944 as Cartridge, Grenade, Auxiliary, Cal. 30, M7.

The designation as caliber .30 is somewhat misleading but refers to the rifle with which the auxiliary cartridge is used. The cartridge itself is a tube of drawn brass 0.45 inch in diameter and open at both ends. The open ends are scaled with paper wads after the tube is loaded with 20 grains of powder.

One end of the auxiliary cartridge is finished with a beveled rim which serves to keep it in place when it is inserted into the muzzle end of the launcher. The body of the launcher is then inserted in the stabilizer tube of the grenade as in normal firing. The effect is that of a booster, the flame of the grenade cartridge igniting the charge of the auxiliary cartridge and the power of the two combining to project the grenade from the launcher. Tests have determined that from 100 to 150 yard or greater range is obtained when the auxiliary cartridge is used.

The auxiliary cartridge case is ejected from the launcher simultaneously with the launching of the grenade. Since a maximum range is desired, the grenade is set as far back as possible on the launcher when the auxiliary is used. The auxiliary also increases the grenade's velocity, however, so that it may be used at shorter ranges where a reduced time of flight is desired.

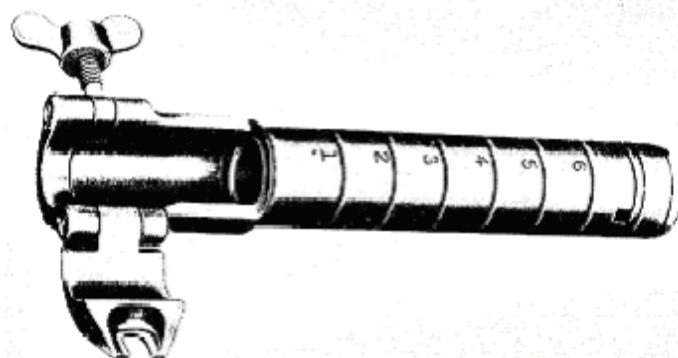




**LAUNCHER, GRENADE, M7**—This launcher represents an improvement, without change in designation, upon the original model designed for use with the U. S. Rifle, M1. A launcher of simple clamp-on design could not be used with this gas-operated weapon because of the creation of excess pressures which caused premature opening of the breech and drove operating rod and bolt back with sufficient force to break the receiver.

The problem was solved by the development of a valve screw to be inserted in the gas cylinder of the rifle in place of the regular gas-cylinder lock screw. The valve within the screw opens to permit the escape of excessive pressures. Service ammunition may be fired from the M1 rifle with the grenade launcher in place. Since the valve is fully open, operating pressures are not developed within the cylinder and the rifle can be used only as a single-shot weapon.

The M7 launcher as first designed fastened to the muzzle of the M1 rifle by means of a two-armed, hinged clamp. Service tests demonstrated that three distinct motions were necessary to attach or remove the device. Technicians at Springfield Armory developed a superior fastening in the form of a simple clip which locked behind the bayonet stud on the gas cylinder. Manufacturing was facilitated by using larger parts and reducing the total number of parts of the launcher from ten to five.



**LAUNCHER, GRENADE, M8**—Development of a grenade launcher for the Carbine, M1, was deferred until after a satisfactory launcher had been developed for the M1 rifle. Both weapons are gas-operated, semi-automatic arms and it was felt that the many difficulties encountered in designing a launcher for the rifle would be greatly augmented with the lighter gun.

The problem proved much simpler than had been expected. It was found that immobilization of the semi-automatic feature of the carbine was not necessary and that a simple clamp-on launcher similar to the M1 and M2 could be used. The carbine may be operated semi-automatically with the launcher attached and there is little loss of accuracy.

**SIGHT**—By action of the Ordnance Committee 10 February 1944 (OCM 22547) a new and more accurate sight, adaptable to all U. S. rifles and carbines, was standard as Sight, Rifle Grenade Launcher, M15. It consists of a five-inch sighting bar which may be quickly attached to or removed from a plate permanently mounted on the left side of the rifle stock. The bar carries a leveling bubble, a front sight, and an aperture rear sight with click adjustments for elevation.

# LAUNCHER, ROCKET, ANTITANK, 2.36 INCH, M9 AND M9A1



The rocket launcher, popularly known and widely publicized as the "Bazooka," represents the adaptation of the modern warfare of one of the oldest forms of military pyrotechnics, the rocket. It represents, too, the first practical development of a rocket launcher as a shoulder weapon for infantry use against tanks and other armored targets.

**M9-LIMITED STANDARD**—The launcher is an open tube approximately 54 inches long and 2.365 inches in internal diameter equipped with a shoulder stock, a pistol grip, electrical firing mechanism, and sights. The Rocket, M6A3, is 19.4 inches long and weighs 3.38 pounds. It carries a shaped charge of TNT capable of penetrating heavy armor at angles of impact up to 30°. The optimum range is approximately 200 yards, although the rocket may be employed at ranges as great as 600 yards. The Rocket, 2.36 inch, M6A3, is illustrated and described in the ammunition section.

In its original form the rocket launcher was supplied with a wooden shoulder stock midway of its length and was not reinforced. A two-cell dry battery supplied the spark for ignition of the rocket's propelling charge, pressure on the trigger completed this circuit.



The first models of the launchers were equipped with a hinged rear sight and fixed front sights. These were followed by a peep rear sight and a front sight in the form of a

rectangular frame at the muzzle of the launcher. The vertical sides of the frame carried graduation for ranges of 100, 200, and 300 yards.

The rocket launcher was introduced as a combat weapon during the North African campaign of 1942-43. Use in battle indicated the need for various improvements and for a model which could be broken down into two approximately equal loads for use by parachute troops. The present launcher, M9, represents the development of those tactical requirements.

Since a higher safety factor was required, the tube of the launcher is now wrapped with wire around all that portion adjacent to the operator's face. The skeleton stock is of metal and is shaped so as to permit two shoulder positions for ease of sighting at high and low elevations and for prone shooting. Midway of the tube is a flange with bayonet joints which breaks the launcher into sections which may be carried by paratroopers or packed into containers for aerial delivery. Reassembly can be effected in a few seconds without tools and the joint locked rigidly.

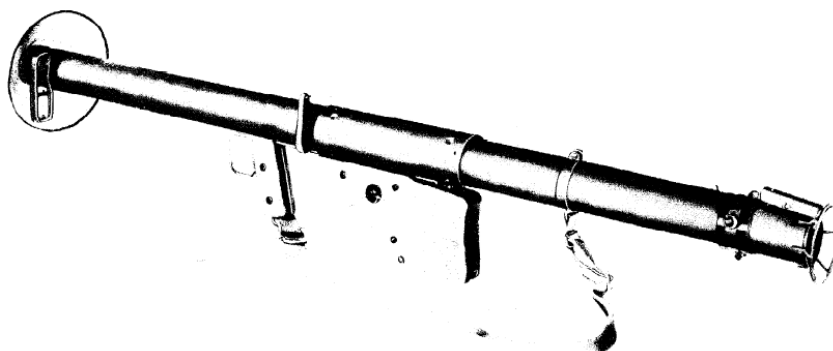
The dry cells which supplied the ignition spark in the earlier models have been replaced by a self-contained magneto operated by pressure on the "squeezer" type trigger. A one-way safety switch incorporated in the trigger mechanism cuts out the magneto and prevents generation of an electrical impulse as the trigger returns to position.

The sight is an optical ring hinged to fold against the tube when not in use and protected by a cover. An adjustable range scale provides graduations from 50 to 700 yards in 50 yard increments.

Assembled and ready for firing, the rocket launcher measures 55 inches overall and weighs approximately 14½ pounds.

**M9A1-LIMITED STANDARD**—The 2.36 inch Rocket Launcher, M9A1, is the same as the M9 launcher except for a modified tube coupling better fitted to withstand rough usage.

# LAUNCHER, ROCKET, ANTITANK, 2.36 INCH, M1A1



The 2.36 inch Rocket Launcher, M1A1 known as the "Bazooka," is an electrically operated shoulder weapon. It is employed against tanks, armored vehicles, pillboxes, and emplacements.

The rocket launcher has a wooden shoulder stock midway of its length and was not reinforced. A two-cell dry battery supplied the spark for ignition of the rocket's propelling charge, pressure on the trigger completed this circuit.

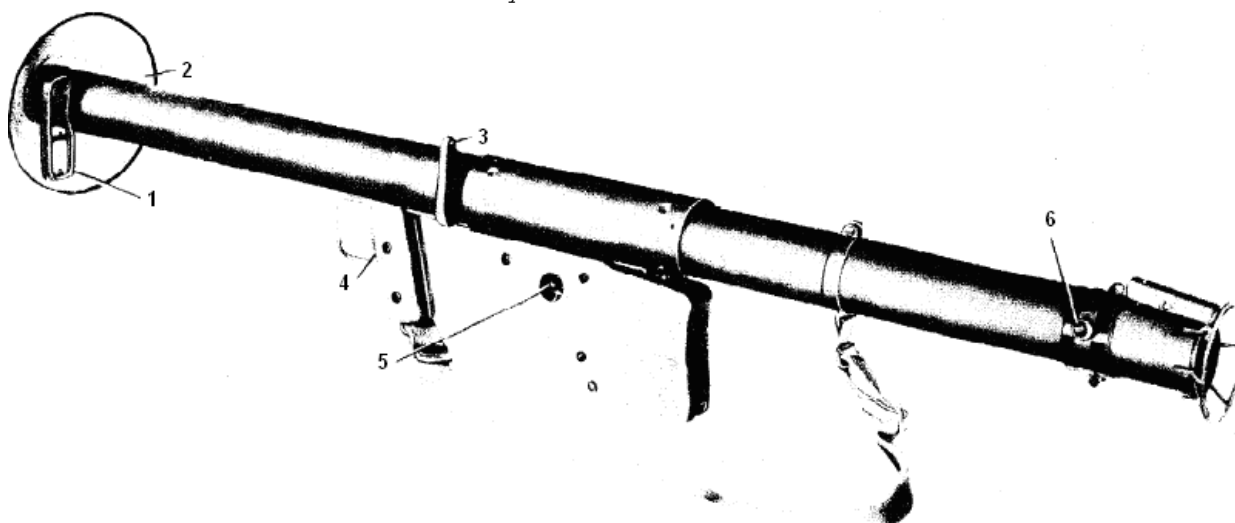
The rocket launcher is equipped with a peep rear sight and a front sight in the form of a rectangular frame at the muzzle of the launcher. The vertical sides of the frame carried graduation for ranges of 100, 200, and 300 yards.

The launcher is operated normally by two men although it can be handled by one man in an emergency. This launcher has a flash deflector to protect the operator from unburned powder as the rocket leaves the tube. One dry cell

firing battery and one spare battery are kept in the wooden stock.

## CHARACTERISTICS

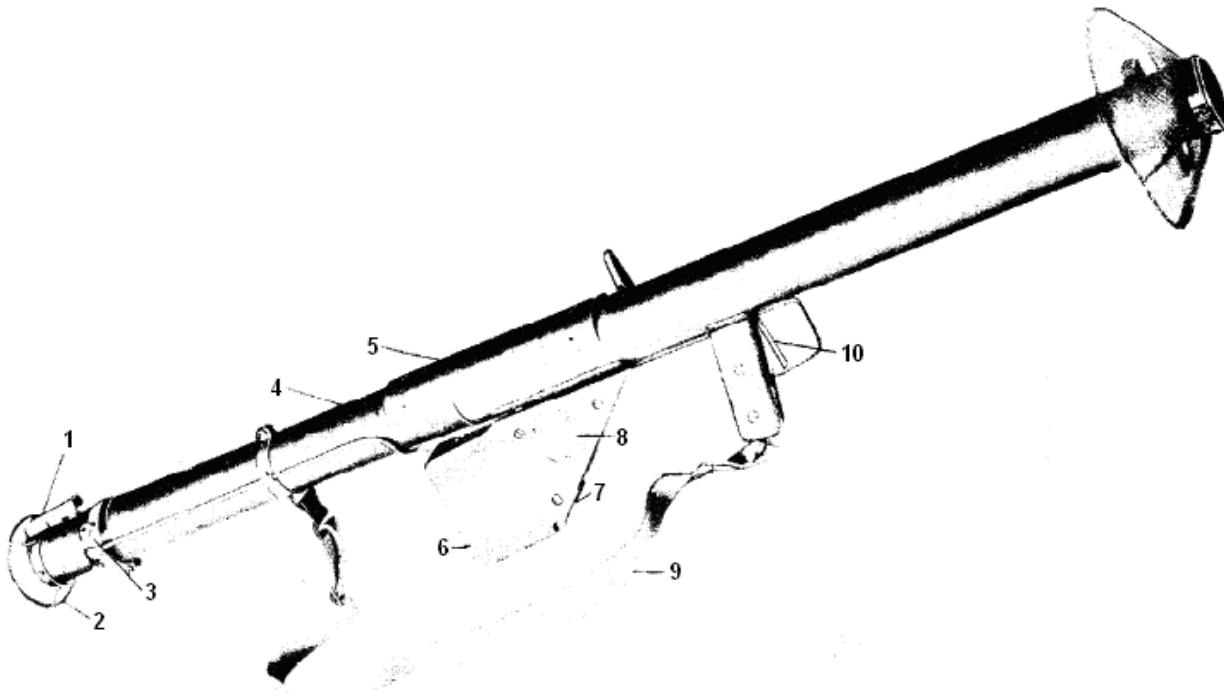
Weight, total.....13.3 lb.  
 Rails or tubes:  
 Length.....54.5 in.  
 Number and arrangement.....Single tube with stock and trigger  
 Composition.....Smooth bore steel tube  
 Mounting.....Fired from shoulder in standing, kneeling, or prone position  
 Elevation.....By operator  
 Traverse.....By operator  
 Rate of fire.....Not specified. Weapon must be sighted before firing each round  
 Firing mechanism.....Electric trigger switch  
 Fire control equipment.....Front stud sights provide for ranges of 100, 200, and 300 yds. Intermediate or greater range must be estimated. Rear sight is a peep sight.



2.36 INCH ROCKET LAUNCHER, M1A1-LEFT SIDE

- 1 Front Sight
- 2 Flash Defelctor
- 3 Rear Sight

- 4 Trigger
- 5 Light Bulb
- 6 Contact Spring



2.36 INCH ROCKET LAUNCHER, M1A1-RIGHT SIDE

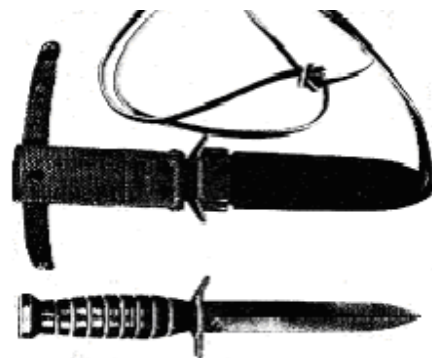
- |   |                         |    |                         |
|---|-------------------------|----|-------------------------|
| 1 | Tail Latch              | 6  | Stock                   |
| 2 | Breech Guard            | 7  | Hasp                    |
| 3 | Contact Spring          | 8  | Circuit Indicator Cover |
| 4 | Barrel Reinforcing Wire | 9  | Sling                   |
| 5 | Face Guard              | 10 | Trigger Guard           |

## KNIFE, TRENCH, M3 AND SCABBARD, TRENCH KNIFE, M6 AND M8

**KNIFE, TRENCH, M3**—The Trench Knife, M3, has been developed to fill the need in modern warfare for an efficient weapon for hand-to-hand fighting. While designated for issue to soldiers not armed with the bayonet, it was especially designed for such shock units as parachute troops and rangers.

The shaped and corrugated handle is of leather washers under compression. One cutting edge runs the full length of the blade; the other edge of the blade is ground to a cutting edge for 2 inches from the point, then tapers to a thicker section for rigidity and strength. The knife weighs 9 ounces and measures 11.7 inches overall. The blade is 6.7 inches long.

**SCABBARD, TRENCH KNIFE, M6**—The scabbard is made of leather with a steel plate fitted to the lower portion to secure the blade. Additionally, steel staples on the throat of the scabbard, prevent the blade from protruding through the bottom of the scabbard.

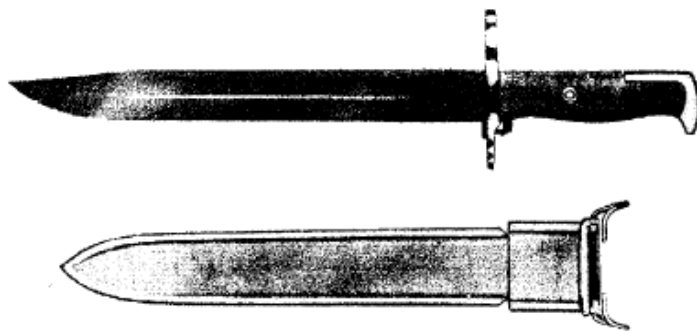


**SCABBARD, TRENCH KNIFE, M8**—The scabbard is made of plastic and replaces the leather scabbard, M6, formerly issued as a sheath for this weapon. The plastic is reinforced with metal about the tip of the blade to protect the wearer from injury in event of a fall or other accident. The scabbard weighs approximately 4 ounces and is 14 inches long overall.

## BAYONET, M1 AND SCABBARD, BAYONET, M7

**BAYONET, M1**—This offensive and defensive weapon has replaced the M1905 bayonet on all U.S. Army rifles and incorporates various improvements which experience with the older model had shown to be desirable. The new bayonet is shorter, better balanced, and may be used if necessary as a trench knife in hand-to-hand combat. It measures 14.4 inches long overall, has a ten-inch blade, and weighs 13.5 ounces. M4 bayonet is now being developed for the Carbine, M1.

**SCABBARD, BAYONET, M7**—Scabbard, Bayonet, M7 has replaced the M3 scabbard issued with the M1905 bayonet. It is made of plastic, is 11.2 inches long, and weighs 5 ounces.



# **AMMUNITION**

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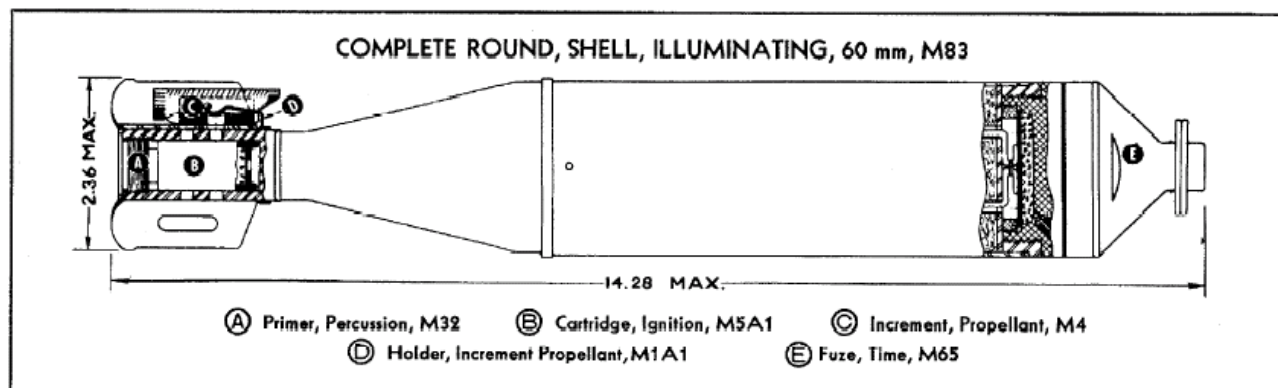
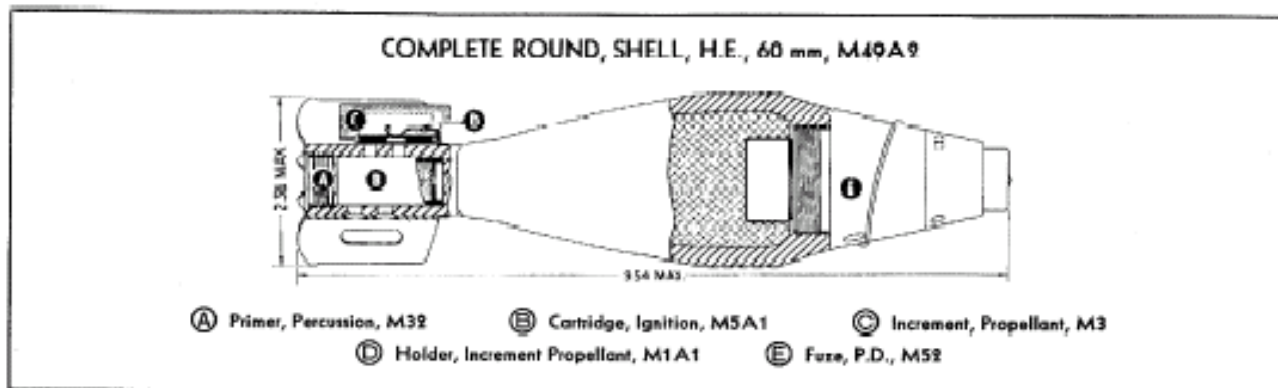
## 60 MM MORTAR SHELLS

SHELL, HIGH-EXPLOSIVE, 60 MM, M49A2

SHELL, ILLUMINATING, 60 MM, M83

SHELL, PRACTICE, 60 MM, M50A2

PROJECTILE, DRILL, 60 MM, M69



The Mortar, M2, fires projectiles weighing approximately three to four pounds and is accurate up to 1,985 yards at 45° elevation.

A round consists of projectile, fuze, propellant charge for zone ranging, primer, and a cartridge loaded with a ballistite explosive.

The primer strikes a firing pin (or anvil) at the base of the mortar tube. This action ignites the charge in the ignition cartridge and firing the propellant charges attached to the fin assembly

**SHELL, H.E., 60 mm, M49A2-STANDARD**—The complete round, weighing 2.94 pounds, consists of the fuzed and finned shell, H.E., M49A2, the M32 percussion primer, the M5A1 ignition cartridge, and the M3 propellant increment.

The shell body is manufactured from either a steel casting or forging. A bursting charge of 0.34 pounds of flake TNT is loaded into the shell body in two 0.17 pound increments. The first increment is consolidated at 2,000 p.s.i. pressure and the second at 5,000 p.s.i. pressure.

The propelling charge consists of a Hercules NG formula powder in sheet form having a single perforation. Several sheets are sewn together and assembled in a cellophane bag. The purpose of the cellophane being to keep the

powder dry and to facilitate attaching the increments to the shell. The number of increments depends on the range desired. Four of the M3 increments weight 0.024 pound. Each M3 increments weights 35 grains.

The increment propellant holder, M1, is used to attach the increments between the fins. The holder is a ring fitted with metal clips each of which has a loop on the end. The loop is pushed through the hole in the increment, thereby holding it in place between the fins.

**SHELL, ILLUMINATING, 60 mm, M83-STANDARD**—This shell has been designed for use in illuminating a target. Upon functioning of a time fuze, M65, an expelling charge is ignited which starts the flare burning, shears a number of pins holding the tail of the shell to the body and then expels the flare and parachute assembly from the shell body. The expelling charge is 0.06 pounds of black powder.

The M83 shell is 4.74 inches longer than the high-explosive, M49A2, and the complete round weighs 3.72 pounds. The propelling charge is a Hercules NG formula with several perforated sheets sewn together. The charge is assembled in a cellophane bag which is attached between the fins by the increment propellant



holder, M1A1. The maximum pressure is obtained with 130 grains of this powder.

The range at the maximum setting (14 seconds) of the time fuze, M65, is 1,040 yards at 50° elevation.

**SHELL, PRACTICE, M50A2-STANDARD**—Loaded and fuzed, the projectile weighs 2.90 pounds, of which 0.34 pound is the weight of the charge which includes 0.29 pound of inert loading and 0.05 pound of black powder pellet. Practice shells are filled with sand to make their weight approximately the same as high explosive

shells in order to obtain identical ballistic properties. The propelling charge for this shell is a Hercules NG formula, in sheet form, perforated and with several sheets Sewn together. There is one hole in the middle of each sheet. The increments are attached to the shell by the M1A1 increment propellant holder after being assembled in a cellophane bag. The maximum pressure is obtained with 168 grains of this powder.

**PROJECTILE, DRILL, 60 mm, M69-STANDARD**—See Table of Characteristics.

## CHARACTERISTICS

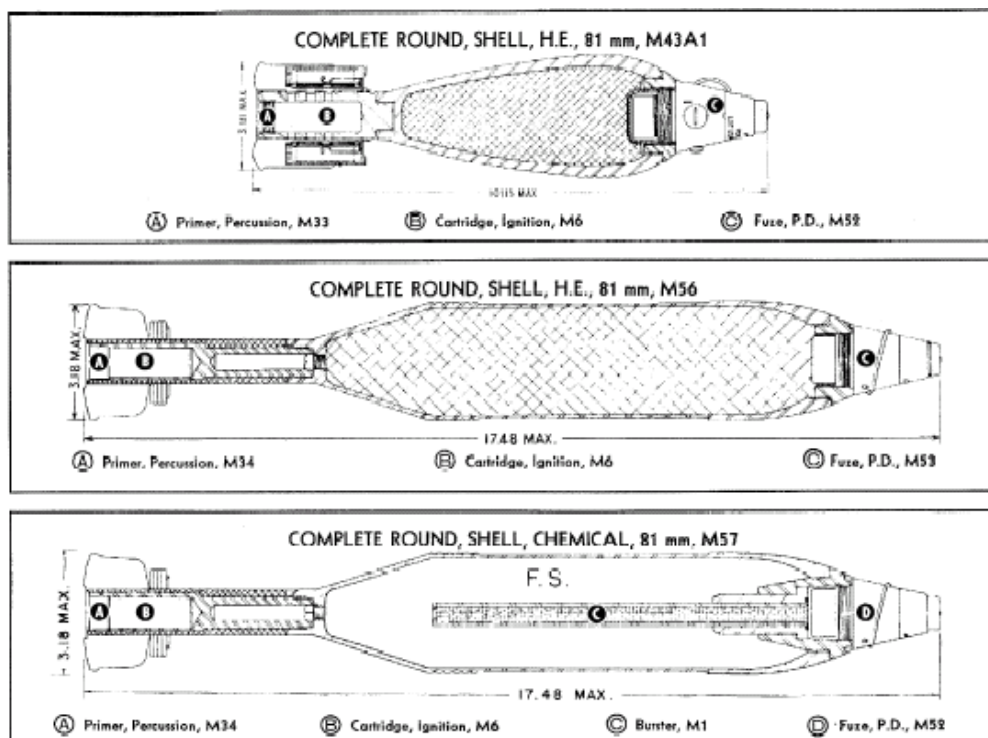
Drill,	Shell, H.E.,	Shell, Ill.,	Shell, Prac.,	Projectile,
	<b>M49A2</b>	<b>M83</b>	<b>M50A2</b>	<b>M69</b>
Caliber.....	60 mm	60 mm	60 mm	60 mm
Model of Mortar.....	M2	M2	M2	M2
Proj. Weight.....	2.90 lb.	3.70 lb.	2.90 lb.	2.90 lb.
Proj. Charge.....	TNT	Expelling Charge	Inert	---
Proj. Charge Weight.....	0.34 lb	0.06 lb., black powder	0.29 lb.	---
Fuze.....	P.D., M52	Time, M65	P.D., M52	---
Primer.....	M32	M32	M32	---
Cartridge.....	M5A1	M5A1	M5A1	---
Propelling Charge Weight..	0.024 lb.	0.018 lb.	0.024 lb.	---
Complete Round Weight....	2.94 lb.	3.72 lb.	2.94 lb.	2.94 lb.
Muzzle Velocity.....	518 ft./sec.	390 ft./sec.	518 ft./sec.	---
Maximum Range.....	45° 0'—1,985 yds.	---	45° 0'—1,985 yds.	---
	85° 30'—300 yds.		85° 30'—300 yds.	
Rated Maximum Pressure....	6,000 p.s.i.	6,000 p.s.i.	6,000 p.s.i.	---

# 81 MM MORTAR SHELLS

SHELL, HIGH-EXPLOSIVE, 81 MM, M43A1

SHELL, HIGH-EXPLOSIVE, 81 MM, M56

SHELL, CHEMICAL, 81 MM, M57



Since the last war, vast, changes in design have been made in the old "Stokes" mortar projectiles to improve their ballistics and functioning.

All the existing 3 inch and 81 mm mortar shells have a fin assembly to give greater stability to the shell in flight. Due to the improved stability, the present standard projectiles use a point-detonating fuze, the M52 or M53, in place of the "always" fuze that was necessary in World War I shells.

The interior of the fin assembly is machined to take the ignition cartridge and is perforated by a number of holes to permit the flame from the ignition cartridge to flash through to the propelling increments which are clipped between the fins by the M2A1 propellant increment holder in the M43A1 high-explosive round. On the M56 and M57 rounds the increments are placed around the cartridge holder tube. The shells are loaded through the muzzle of the mortar and ignition occurs when the primer strikes the fixed firing pin in the base of the barrel.

Both the 81 mm and 3 inch mortars are smoothbored. The 81 mm mortar, M1, is the present standard for manufacture and issue, and it has superseded the 3 inch mortar, Mk. 1A2. The ammunition is the same for both although a larger propelling charge can be used in the 81 mm mortar.

**SHELL, HIGH-EXPLOSIVE, M43A1-STANDARD-**  
This high-explosive shell is intended primarily for use against enemy personnel. As fired, the

shell with fuze, P.D., 3152, weighs 6.92 pounds. Of this the TNT bursting charge weighs 1.22 pounds; an alternate charge consists of 0.98 pound of 50/50 Amatol and 0.19 pound Cast TXT booster surround. Another loading consists of 1.28 pounds of trimonite. The weight of six 3x1 increments of sheet powder propellant is 0.097 pound. The sheet powder used has a Hercules NG formula. Several of the sheets are sewn together, each sheet having five perforations, one in the middle and one in each corner, the web size being 0.008 inch. Each increment is contained in a Cellophane bag which protects the charge and insures dry powder. The complete round weighs 7.05 pounds.

An alternate method of manufacture is a one piece shell body which does away with the adapter needed with the M43A1 round. This is the M43A1B1 shell. The shell body is produced by any of the following methods: forging, cupping of specially rolled plates, welded longitudinally, or casting.

## Firing Data (45°) for Shell, H.E., M43A1

Charge	Muzzle Velocity	Maximum Range
Cartridge.....	235 ft./sec.	541 yds.
Cartridge+1 Incr....	332 ft./sec.	1,020 yds.
Cartridge+2 Incr....	419 ft./sec.	1,500 yds.
Cartridge+3 Incr....	499 ft./sec.	2,042 yds.
Cartridge+4 Incr....	572 ft./sec.	2,517 yds.
Cartridge+5 Incr....	638 ft./sec.	2,963 yds.
Cartridge+6 Incr....	700 ft./sec.	3,988 yds.

**SHELL, HIGH-EXPLOSIVE, M56-STANDARD**—The M56 projectile embodies a relatively large charge, 4.30 pounds of TNT, in relation to the total weight, 10.62 pounds, of the shell as fired with the fuze, P.D., M53. It is designed primarily for use against light emplacements. Alternate bursting charges are: 3.89 pounds of 50150 Amatol and 0.20 pound of Cast TNT booster surround, or 4.46 pounds of trimonite. The maximum range is less than the R143A1. Ranges are listed in Table B. The M2 increment powder used in this round comes in sheets and is a Hercules NG formula. Several sheets are sewn together and each sheet has one perforation and a web of 0.008 inch.

#### Firing Data (45°) for Shell, H.E., M56

Charge	Muzzle Velocity	Maximum Range
Cartridge+1 Incr....	306 ft./sec.	875 yds.
Cartridge+2 Incr....	412 ft./sec.	1,474 yds.
Cartridge+3 Incr....	502 ft./sec.	2,046 yds.
Cartridge+4 Incr....	583 ft./sec.	2,558 yds.

**SHELL, CHEMICAL, M57-STANDARD**—The chemical shell, M57, with WP or FS filler, is used to make a smoke screen. When the shell is detonated, the burster charge fragments the shell body, scattering the filler to form the smoke cloud. The round used the same increment powder as the M56, HE, Shell.

As fired, the shell weighs 11.86 pounds when FS filled, and 11.33 pounds when WP filled. The weights of the chemical charge are 4.59 pounds with FS, and 4.06 pounds with WP filler. The weight of the teteryl burster charge is 0.08 pound. Complete round weights are as follows: 12 pounds when FS filled, and 11.47 pounds when WP filled.

#### Firing Data (45°) for Shell, Chemical, M57 (FS)

Charge	Muzzle Velocity	Maximum Range
Cartridge+1 Incr....	291 ft./sec.	808 yds.
Cartridge+2 Incr....	390 ft./sec.	1,374 yds.
Cartridge+3 Incr....	472 ft./sec.	1,916 yds.
Cartridge+4 Incr....	544 ft./sec.	2,431 yds.

#### Firing Data (45°) for Shell, Chemical, M57 (WP)

Charge	Muzzle Velocity	Maximum Range
Cartridge+1 Incr....	297 ft./sec.	833 yds.
Cartridge+2 Incr....	399 ft./sec.	409 yds.
Cartridge+3 Incr....	484 ft./sec.	1,952 yds.
Cartridge+4 Incr....	560 ft./sec.	2,466 yds.

**SHELL, TARGET PRACTICE, M44-STANDARD**—Loaded and fuze, the cast-iron shell of this round weighs 6.92 pounds, the same as the high-explosive shell, M43A1. The charge used is 0.2 pound of black powder. Fuze, PD, M52, is used. A propelling charge consists of sheet power in 6 increments of approximately 172 grains each. Only four increments are used in the 3 inch trench mortar, due to the lower pressures allowed in this mortar.

The sheet powder used has a Hercules NG formula. Several of the sheets are sewn together, each sheet having five perforations, one in the center and one in each corner, the web size being 0.008 inch. The round is assembled with percussion primer, M33.

**SHELL, PRACTICE, M43A1-STANDARD**—The M43A1 practice shell uses a black powder charge of 0.16 pound in place of the 1.22 pounds of TNT charge used in the high-explosive round, M43A1. In all other respects the M43A1 practice shell is identical with the high-explosive shell, M43A1. The round is assembled with percussion primer, M33.

**PROJECTILE, DRILL, M68-STANDARD**—See Table of Characteristics.

#### CHARACTERISTICS

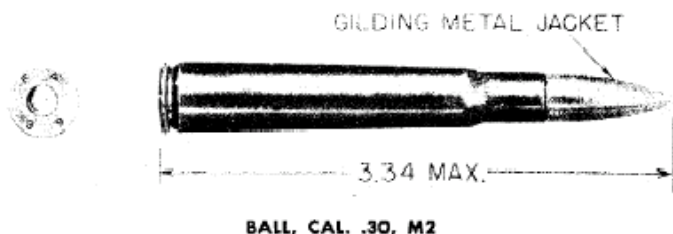
	Shell, H.E., M43A1	Shell, H.E., M56	Shell, Chem., M57	Shell, T.P., M44	Shell, Training,
<b>M68</b>					
Caliber.....	81 mm	81 mm	81 mm	81 mm	81 mm
Model of Mortar.....	M1	M1	M1	M1	M1
Proj. Weight.....	6.92 lb.	10.62 lb.	11.33 lb.	6.92 lb.	---
Proj. Charge.....	TNT	TNT	Chem. (FS) Chem. (WP)	BP	---
Proj. Charge Weight.....	1.22 lb.	4.30 lb.	4.59 lb. 4.06 lb.	0.2 lb.	---
Burster.....	---	---	M1	---	---
Fuze.....	P.D., M52	P.D., M53	P.D., M52	P.D., M52	---
Primer.....	M33	M34	M34	M33	M34
Cartridge.....	M6	M6	M3	M6	M6
Propelling Charge Weight.....	0.097 lb.	0.116 lb.	0.116 lb.	0.097 lb.	120 grs.
Complete Round Weight....	7.05 lb.	10.77 lb.	11.59 lb.	7.05 lb.	---
Muzzle Velocity.....	700 ft./sec.	583 ft./sec.	560 ft./sec.	700 ft./sec.	172 ft./sec.
Maximum Range.....	3,288 yds.	2,558 yds.	2,466 yds.	3,288 yds.	310 yds.
Rated Maximum Pressure...	6,000 p.s.i.	6,000 p.s.i.	6,000 p.s.i.	6,000 p.s.i.	---

# SMALL ARMS AMMUNITION

## CALIBER .30 CARTRIDGES

The caliber .30 cartridge, standard for all rifles and machineguns manufactured in that caliber, is issued in the following forms: Ball, M2; Tracer, M1; Incendiary, M1; Armor-Piercing, M2.

The caliber .30 cartridge is also issued in the following special-purpose forms: Rifle Grenade, M3; Dummy, M2; Blank, M.1909; Guard, M1; and High-Pressure Test, M13.

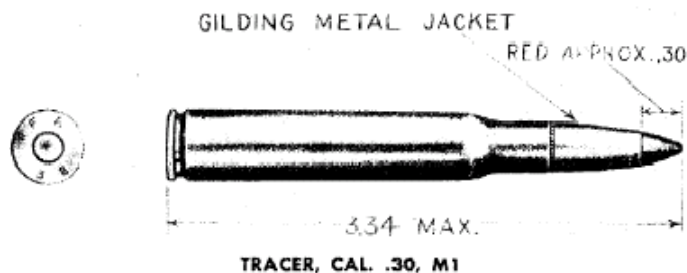


**BALL, CAL. .30, M2**—The cartridge so loaded is for use against enemy personnel and those material targets which do not require the employment of armor-piercing or other special-purpose rounds. The complete round includes primer, case, propelling charge of approximately 50 grains of IMR 4895 powder, and 150-grain bullet. The case is of drawn brass. Production of the steel case is being discontinued. The bullet consists of a gilding metal jacket on an alloy core of 90% lead, 10% antimony. As an alternate, a core of 97.5% lead, 2.5% antimony may be used. The bullet is not boattailed. The neck of the case is crimped into a cannellure in the bullet and yields to a minimum pull of 45 pounds.

Tested for accuracy, the M2 ball groups within a 13-inch circle at 500 yards and within a 15-inch circle at 600 yards. The following range table gives the external ballistics of the M2 150-grain service bullet. Those of the armor-piercing, incendiary, and tracer bullets vary slightly there from due to minor differences in bullet weights and velocities. Use of the IMR 4895 powder, which replaced the older IMR 4876, has shown a decrease in flight time of from one to two seconds at the ranges listed.

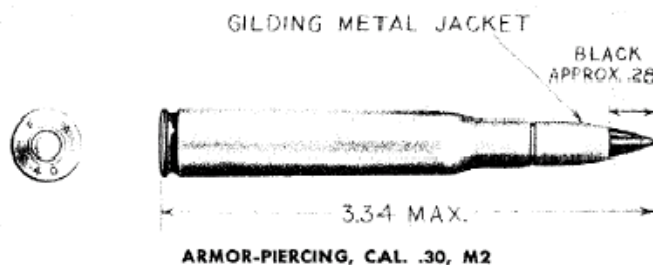
### RANGE TABLE

Range (Yards)	Angle of Fall (Mils)	Time of Flight (Seconds)	Maximum Elevation (Inches)	Angle of Ordnate (Mils)
100	0.7	0.12	0	1
200	1.5	0.25	3.6	2
300	2.4	0.38	7.2	3
400	3.4	0.53	14.	4
500	4.6	0.70	21.6	6
600	6.0	0.89	36.0	9
700	7.7	1.11	61.2	12
800	9.6	1.35	86.4	17
900	11.9	1.62	159.6	22
1,000	14.6	1.91	183.6	28



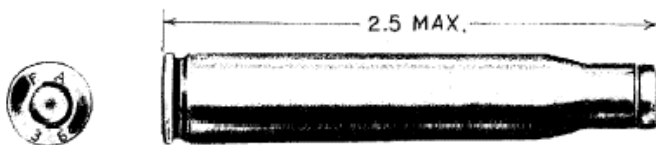
**TRACER, CAL. .30, M1**—This ammunition is used in machine guns and rifles to indicate the path of the bullet in flight as an aid in fire against moving targets. The round is identified by a red point, approximately .30 inch long, on the bullet. A 17-grain tracer compound is ignited by the propelling charge and burns with a brilliant red flame. The length of the trace is approximately 1,000 yards. Tracer bullets have an incendiary effect upon targets struck before the trace has burned out, but this action is not so pronounced nor so reliable as with rounds loaded for incendiary purposes.

The trajectory of the Tracer, M1, bullet crosses that of the Ball, M2, and Armor-Piercing, M2, at approximately 600 yards.



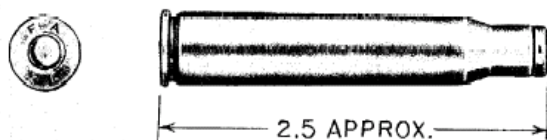
**ARMOR-PIERCING, CAL. .30, M2**—This ammunition is designed for fire against enemy aircraft, lightly armored vehicles, and similar targets. The round is identified by a black tip on the bullet. The core is of hardened steel instead of the lead alloy used in the ball cartridge.

**INCENDIARY, CAL. .30, M1**—This round, used for the purpose indicated by its designation, has not been manufactured since November, 1943. Existing stocks are issued for use in caliber .30 rifles and machine guns. The round is identified by the light-blue tip, approximately .30 inch in length, on the bullet. The bullet is not boattailed and contains a chemical incendiary compound which ignites upon contact.



RIFLE GRENADE, CAL. .30, M3

**RIFLE GRENADE, CAL. .30, M3**—This specialized cartridge is used in caliber .30 rifles of all types for firing rifle grenades from the Grenade Launchers, M1, M2, and M7. It is not used in machine guns. It may be identified by the five-petal rose crimp of the nose of the case. The case is base-loaded with 5 grains of FFFG black powder for rapid ignition, then with 45 grains of a progressive-burning IMR powder.



BLANK, CAL. .30, M1909

**BLANK, CAL. .30, M1909**—This round is a standard item of issue for use in all caliber .30 rifles during maneuvers, for signaling, and for firing salutes. By means of a blank-firing adapter it may be used for training purposes in machine guns and automatic rifles. The round may be identified by the absence of a bullet and a cannellure in the neck of the case against which the cardboard wad is seated and sealed with a drop of shellac. Blank rounds may be distinguished from rifle grenade cartridges by a roll crimp at the neck of the case. The rifle grenade cartridge case is closed with a rose crimp.

The complete assembly of the blank round weighs approximately 207 grains. Second-grade cases may be used in the assembly of blank ammunition.

**DUMMY, CAL. .30, M2**—This dummy cartridge was standardized by Ordnance Committee action 23 March 1944 (OCM 23258). It replaces the Cartridge, Dummy, Cal. .30, M1906, for use in training personnel in loading weapons and in simulated fire. The longitudinal corrugations which identified the M1906 cartridge prevented proper fit in belts and magazines and caused failures to feed. Manufacture of cases with longitudinal corrugations was discontinued and the new dummy round, Cal. .30, M2, is identified by two holes drilled through the case, which may be of either steel or brass. Cartridge, Dummy, Cal. .30, M1906, was reclassified as Limited Standard.



CARBINE BALL, CAL. .30, M1

**CARBINE BALL, CAL. .30, M1**—This is the standard cartridge for use in the U. S. Carbines, Cal. .30, M1 and M1A1. It can be fired in no other caliber .30 weapon and is immediately identified by its small size (1.68 inches overall) and the straight case. It is manufactured as Ball, M1; Tracer, M16; Grenade Cartridge, M6, for firing rifle grenades from Launcher, M8; as a Dummy, M13; and as a high-pressure test load developing a breech pressure of approximately 50,000 pounds. There is no blank cartridge for the Carbine, M1, nor are cartridges made with armor-piercing or incendiary bullets. The grenade cartridge is identified by the absence of a bullet and the rose crimp which closes the mouth of the case; dummy cartridges are identified by the usual holes in the case.

#### RANGE TABLE

Range (Yards)	Angle of Elevation (Mils)	Time of Flight (Seconds)	Angle of Fall (Mils)
100	1.5	0.17	1.7
200	3.5	0.38	4.8
300	6.2	0.64	9.4
400	9.7	0.94	15.6
500	14.0	1.28	23.5



GRENADE, AUXILIARY, M7

**GRENADE, AUXILIARY, M7**—This special-purpose round was developed as a booster to obtain increased ranges and higher velocities with rifle grenades and ground signals fired from grenade launchers mounted on U. S. rifles and carbines. The name "vitamin pill" was given the cartridge during its development and has clung to it since it has been made an item of standard issue.

Actually, the cartridge is a tube of drawn brass 0.45 inch in diameter and resembling in every way a caliber .45 blank cartridge, rimmed. There is no primer but a hole is drilled through the center of the base. Both that hole and the mouth of the case are sealed by paper wads against the escape of the 20 grains of powder with which the cartridge is loaded.

The cartridge is inserted in the muzzle of the grenade launcher and retained there by the rimmed base. The flame of the regular grenade cartridge fired in the chamber of the rifle burns through the paper wad scaling the

mouth of the case and ignites the auxiliary charge. The effect is that of a booster and the grenade is launched at greater speed and attains a range of from 100 to 150 yards above that to be expected when the grenade cartridge is used alone. The fired auxiliary cartridge is expelled from the launcher with the grenade.

CALIBER .45 CARTRIDGES

**BALL, CAL. .45, M1911**—This cartridge is standard for the Pistol, M1911A1, the Colt and Smith & Wesson Revolvers, M1917 (Limited Standard), and the Submachine Gun, Cal. .45, M3 (Substitute and Limited Standard) submachine guns are also chambered for this cartridge. When fired in the M1917 revolvers the cartridges must first be loaded in lunate clips holding three rounds.

**CARTRIDGE, BLANK, CAL. .45, M1**—Cartridge, Blank, Cal. .45, M1, is issued only for use in training cavalry horses and for saluting purposes in the M1917 revolvers. It is made with a rimmed case to permit its use without clips in the revolvers. There is no bullet and the mouth of the case is taper-crimped for 5/16 inch. The rim prevents the use of the caliber .45 blank cartridge in either pistols or submachine guns.

CHARACTERISTICS

	Weight, Round (Grs.)	Weight, Bullet (Grs.)	Weight, Powder (Grs.)	Length, Round (Ins.)	Length, Bullet (Ins.)	Muzzle Velocity (Ft./sec.)	Muzzle Energy (Ft. lb.)	Pressure (Lb.) (Copper)	Maximum Range (Yds.)
.30 Ball, M2....	396	152	50	3.34	1.125	2,805	2,429	50,000	3,500
.30 AP, M2.....	414	162	51	3.34	1.39	2,775	2,780	50,000	3,500
.30 Tracer, M1...	396	152.5	50	3.34	1.45	2,650	2,775	50,000	3,450
.30 Incend., M1..	386	140	54	3.32	1.41	3,050	2,700	52,000	5,500
.30 Carbine, M1..	193	110	14	1.68	0.69	1,975	775	41,000	2,000
.45 Ball, M1911..	327	234	6	1.28	0.68	825	383	14,000	1,700

**CARTRIDGE, BLANK, CAL. .45, M9**—A rimless caliber .45 blank cartridge which may be used in either pistols or submachine guns was standardized 11 November 1943. It is designated Cartridge, Blank, Cal. .45, M9 (Rimless).

**DUMMY, CAL. .45, M1921**—The round is made as a Dummy, M1921, for training personnel in loading pistols and submachine guns. The dummy cartridge uses a steel case and may be distinguished by the absence of a primer and by three 1/8-inch holes drilled equidistantly about the case.

RANGE TABLE

Range (Yard)	Time of Flight (Seconds)	Drop (Inches)
10	0.037	0.3
20	0.015	1.1
30	0.113	2.4
40	0.151	4.4
60	0.229	9.9
80	0.308	18.0
100	0.388	28.0



# RIFLE GRENADES

## GRENADE, ANTITANK, M9A1

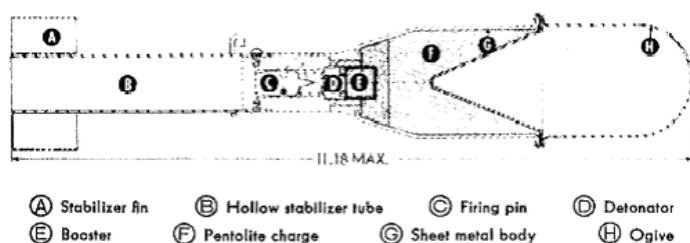
## GRENADE, ANTITANK, PRACTICE, M11A2

## GRENADE, RIFLE, FRAGMENTATION, IMPACT, M17

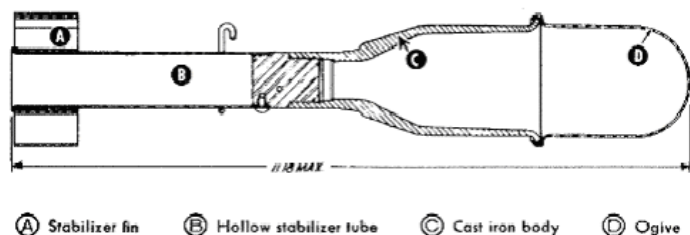
## ADAPTER, GRENADE-PROJECTION, M1

Rifle grenades are designed to be fired from the U. S. rifle and carbine by a launcher which the soldier attaches to the muzzle. A special blank cartridge, issued with the grenade, must be used.

Rifle grenades are divided into two general classes : (1) high-explosive grenades, containing an explosive charge, and (2) practice grenades, designed for training or practice.

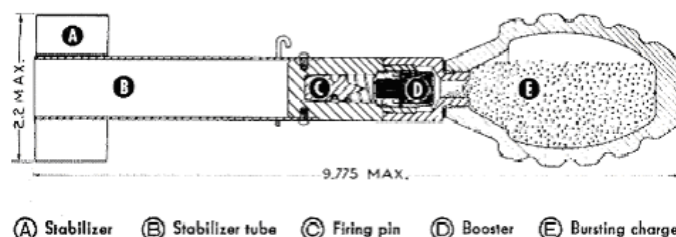


**GRENADE, ANTITANK, M9A1-STANDARD**—The antitank grenade, M9A1, has a sheet steel body and tail assembly and weighs 1.23 pounds. The body is filled with 4 ounces of Pentolite using the "hollow charge" principle. The tail contains the impact fuze and the stabilizing fin is spot welded on a stabilizer tube screwed to the head. The impact fuze consists of a firing pin held by a spring in flight. When shipped, the firing pin is retained by a safety pin. When the grenade strikes a target the pin moves forward to activate the detonator and explode the charge. The hollow shaped charge of this grenade has remarkable armor-penetrating qualities. The M9A1 anti-tank rifle grenade supersedes the grenade, A.T., M9.



**GRENADE, ANTITANK, PRACTICE, M11A2-STANDARD**—This is an inert loaded dummy grenade similar in shape and weight to the antitank

grenade, M9A1. This practice grenade superseded the M11 and M11A1 practice grenades. The M11A2 differs from the M9A1 in that the fin is replaceable. Extra fins are shipped with each grenade in the event the original one is bent or wears out.



**GRENADE, RIFLE, FRAGMENTATION, IMPACT, M17**—This grenade consists of a fin stabilizer assembly with impact type fuze similar to that used for Grenade, AT, M9A1. The head consists of a Mk. IIA1 hand grenade fuze body which is screwed in the fuze adapter on the stabilizer assembly. The M17 grenade is used in a manner identical with that of the Adapter, Grenade-Projection, M1, however, it offers a unit ready for firing without assembly in the field as is required for the M1 adapter.

**ADAPTER, GRENADE-PROJECTION, M1-STANDARD**—The grenade-projection adapter, M1, was designed to permit the projection of the Mk. IIA1 fragmentation grenade from the rifle. It has a fin assembly similar to that of the M9A1 grenade. The head of the fin assembly has four claws which clip around and hold the body of the Mk. IIA1 fragmentation grenade with the S-second time fuze. One of the claws has an arming clip which holds the safety lever of the Mk. IIA1 grenade. Upon setback the arming clip releases the safety lever of the Mk. IIA1 fragmentation grenade and the fuze explodes the grenade after 5 seconds. The adapter with Mk. IIA1 fragmentation grenade is fired from the same launcher used to launch the M9A1 and other rifle grenades.

## 2.36 INCH ROCKETS

ROCKET, H.E.A.T., 2.36 INCH, M6A1

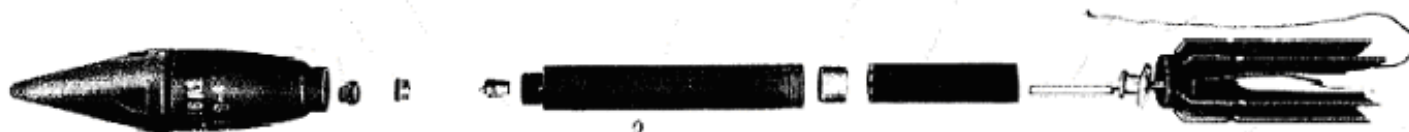
ROCKET, H.E.A.T., 2.36 INCH, M6A2

ROCKET, H.E.A.T., 2.36 INCH, M6A3

ROCKET, WP SMOKE, 2.36 INCH, M10



BOOSTER   DETONATOR   FIRING PIN SPRING   MOTOR   SPACER   PROPELLANT   IGNITER   TRAP



SHELL   ALUMINUM DISC   ALUMINUM CUP   FIRING PIN   SAFETY PIN   NOZZLE AND FIN ASSEMBLY

2.36 INCH H.E.A.T. ROCKET, M6A1

**ROCKET, H.E.A.T., 2.36 INCH, M6A1—STANDARD**—The 2.36 inch H.E.A.T. Rocket, M6A1, with shaped-charge loading is fired from a bazooka-type launcher at ground targets. The rocket is effective against the armor plate of tanks and armored vehicles. After penetration it has the effect of throwing white hot metal spray.

This round is a modification of the original M6 rocket, now obsolete. Changes were made as follows : improved ignition, involving removal of the contact ring from the ogive, reduced powder charge, and inserted obturator disc.

The practice round, inert loaded to conform to the live round, is the 2.36 inch Practice Rocket, M7A1.

### CHARACTERISTICS

Range.....600 yd.  
Dispersion.....8.5 mil.  
Velocity.....265 ft./sec.  
Service temperature limits.....0° to 120° F.

### Burning time:

At 0° F.....0.08 sec.  
At 120° F.....0.03 sec.  
Type of stabilization.....Fixed fins  
Length, overall.....21.6 in.  
Weight of round, loaded.....3.4 lb.  
Fuze.....BD—simple impact type

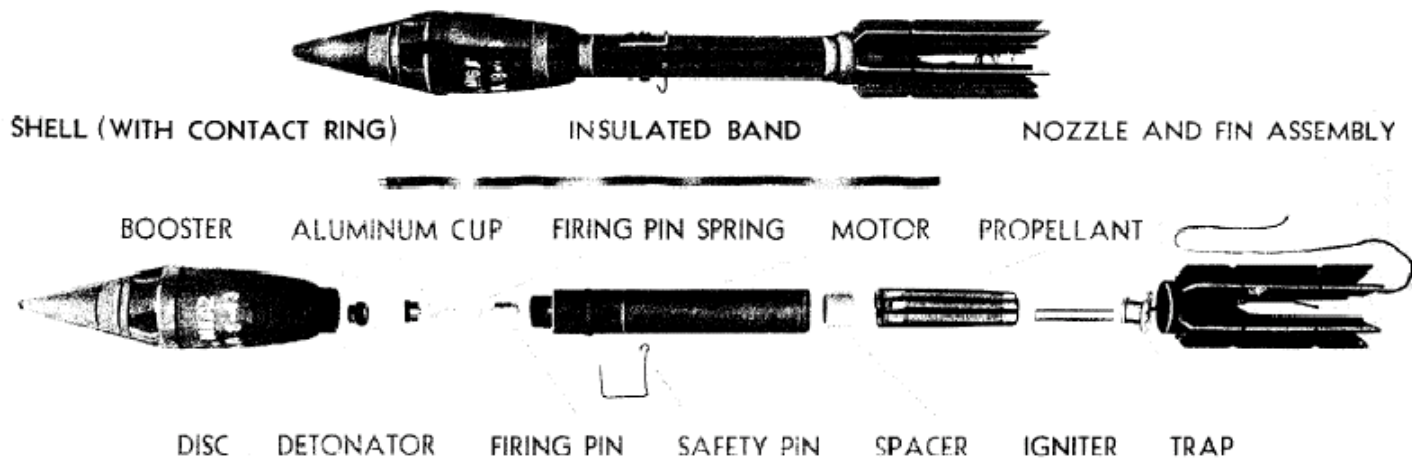
### Motor assembly:

Diameter, outside.....1.25 in.  
Length.....8.32 in.  
Weight(less propellant).....1.82 lb.  
Material.....WD 1025 or WD X1025 CD Steel  
Propellant.....0.136 lb. solvent extruded  
double base powder, 0.375  
in. O.D. by 0.08 in. I.D.  
by 4.15 in. long  
Type of loading....Five sticks held by pulpit  
trap and cardboard spacer

### Shell Assembly

Caliber.....2.36 in.  
Length.....8.8 in.  
Filler.....Pentolite  
Weight, filler.....0.5 lb.  
Weight, total.....1.57 lb.  
Type of ignition....Electric squib in aluminum  
case, centered in motor  
Launchers.....M1A1, M9, M9A1  
Packaging.....Packed fuzed, one per fiber  
container, 20 containers per  
wooden box





2.36 INCH H.E.A.T. ROCKET, M6A2

**ROCKET, H.E.A.T., 2.36 INCH, M6A2—STANDARD**—This round is a modification of the original M6 rocket, now obsolete. Except that the contact ring was not removed from the ogive, the changes are the same as for the M6A1. This modification was performed in a Theater of Operations, and the designation M6A2 was applied to distinguish it from the M6A1 modification performed at arsenals in the Zone of the Interior.

The practice round, inert loaded to conform to the live round, is the 2.36 inch Practice Rocket, M7A2.

#### CHARACTERISTICS

Range.....600 yd.  
Dispersion.....8.5 mils  
Velocity.....265 ft./sec.  
Service temperature limits.....0° to 120° F.  
Burning time:  
    At 0° F.....0.08 sec.  
    At 1200° F.....0.03 sec.  
Type of stabilization.....Fixed fins  
Length, overall.....21.6 in.  
Weight of round, loaded.....3.4 lb.  
Fuze.....BD—simple impact type

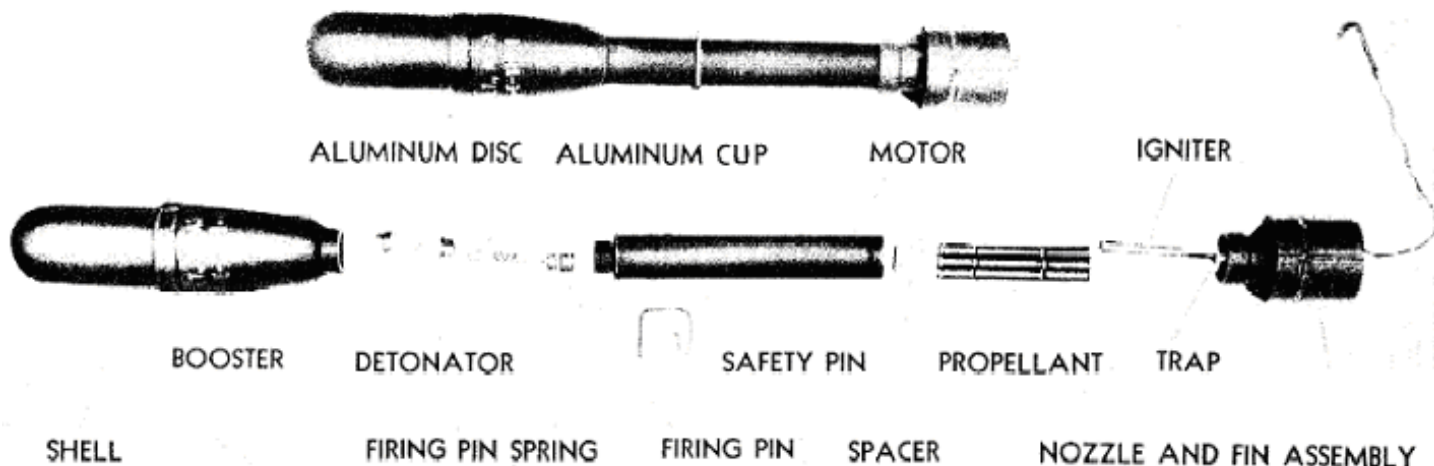
#### Motor assembly:

Diameter, outside.....1.25 in.  
Length.....8.32 in.  
Weight (less propellant).....1.82 lb.  
Material.....WDIOPS or WD X1025 C.D. steel  
Propellant.....0.136 lb. solvent extruded  
                                double base powder, 0.345  
                                in. O.D. by 0.08 in. I.D.  
                                by 4.15 in. long

Type of loading....Five sticks held by pulpit  
                                trap and cardboard spacer

#### Shell assembly:

Caliber.....2.36 in.  
Length.....8.8 in.  
Filler.....Pentolite  
Weight, filler.....0.5 lb.  
Weight, total.....1.57 lb.  
Type of ignition....Electric squib in aluminum  
                                case, centered in motor  
Launchers.....M1, M1A1, M9, M9A1  
Packaging.....Packed fuze, one per fiber  
                                container, 20 containers  
                                per wooden box



2.36 INCH H.E.A.T. ROCKET, M6A3

**ROCKET, H.E.A.T., 2.36 INCH, M6A3—STANDARD**—This round is the same as the M6A1 rocket except for a hemispherical ogive and cylindrical fins. The practice round, inert loaded to conform to the live round, is the 2.36 inch Practice Rocket, M7A3.

#### CHARACTERISTICS

Range.....600 yd.  
Dispersion.....6 mils  
Velocity.....265 ft./sec.  
Service temperature limits.....0° to 120° F.

#### Burning time:

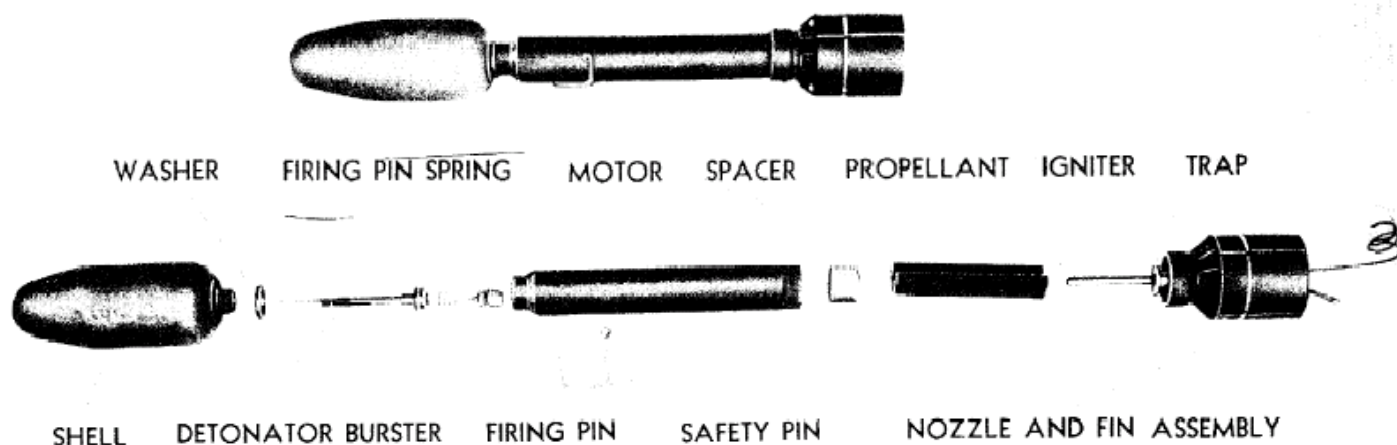
At 0° F.....0.08 sec.  
At 1200°F.....0.03 sec.  
Type of stabilization.....Fixed fins  
Length, overall.....19.4 in.  
Weight of round, loaded.....3.4 lb.  
Fuze.....BD—simple impact type

#### Motor assembly:

Diameter, outside.....1.25 in.  
Length.....8.32 in.  
Weight (less propellant).....1.82 lb.  
Material....WD 4130 or WD X8630 steel tubing  
Propellant.....0.136 lb. solvent extruded  
double base powder, 0.345  
in. O.D. by 0.08 in. I.D.  
by 4.15 in. long  
Type of loading...Five sticks held by pulpit  
trap and cardboard spacer

#### Shell assembly:

Caliber.....2.36 in.  
Length.....8.8 in.  
Filler.....Pentolite  
Weight, filler.....0.5 lb.  
Weight, total.....1.64 lb.  
Type of ignition....Electric squib in aluminum  
case, centered in motor  
Launchers.....M1A1, M9, M9A1  
Packaging.....Packed fuze, one per fiber  
container, 20 containers  
per wooden box or one fiber  
container, 10 containers  
per wooden box



#### 2.36-INCH WP SMOKE ROCKET M10

**ROCKET, WP SMOKE, 2.36 INCH, M10—STANDARD**—The 2.36-Inch WP Smoke Rocket M10 (formerly the T26E2) is a WP filled shell with the M6A3 rocket motor. It embodies a special burster assembly not present in the T26 and T26E1 rockets and supersedes and cancels these two former developmental rockets. The rocket is used for laying down smoke screens and as an effective casualty producing weapon against enemy personnel in foxholes, trenches, pillboxes, etc.

#### CHARACTERISTICS

Range.....600 yd.  
Dispersion.....6 mils  
Velocity.....265 ft./sec.  
Service temperature limits.....0° to 120° F.

#### Burning time:

At 0° F.....0.08 sec.  
At 1200°F.....0.03 sec.  
Type of stabilization.....Fixed fins  
Length, overall.....17.1 in.  
Weight of round, loaded.....3.4 lb.  
Fuze.....BD—simple impact type

#### Motor assembly:

Diameter, outside.....1.25 in.  
Length.....8.32 in.  
Weight (less propellant).....1.74 lb.  
Material...WD X4130 or WD X8630 steel tubing  
Propellant.....0.136 lb. solvent extruded  
double base powder, 0.345  
in. O.D. by 0.08 in. I.D.  
by 4.15 in. long  
Type of loading...Five sticks held by pulpit  
trap and cardboard spacer

#### Shell assembly:

Caliber.....2.36 in.  
Length.....5.9 in.  
Filler.....Pentolite  
Weight, filler.....0.9 lb.  
Weight, total.....1.64 lb.  
Type of ignition...Electric squib in aluminum  
case, centered in motor  
Launchers.....M1A1, M9, M9A1  
Packaging.....Packed fuze, one per fiber  
container, 12 containers  
per wooden box

# HAND GRENADES

**GRENADE, HAND, FRAGMENTATION, MK. IIA1**

**GRENADE, HAND, OFFENSIVE, MK. IIIA1**

**GRENADE, HAND, PRACTICE, MK. II**

**GRENADE, HAND, TRAINING, MK. IAI**

## TYPES

1. **FRAGMENTATION HAND GRENADES**—containing a high-explosive charge in a metallic body which is shattered by the explosion of the charge.
2. **OFFENSIVE HAND GRENADES**—containing a high-explosive charge in a paper body, designed for demolition or lethal shock effect.
3. **CHEMICAL HAND GRENADES**—containing a chemical agent which produces a toxic or irritant effect, a screening smoke, incendiary action or any combination of these actions.
4. **PRACTICE HAND GRENADES**—containing a reduced charge; simulate fragmentation grenades.
5. **TRAINING HAND GRENADES**—used in training troops; do not contain explosives or chemicals.

The filler in a grenade may be a powerful explosive, a gas, a smoke-producing or an incendiary agent. The filler in fragmentation grenades is either TNT (trinitrotoluene) or EC Blank Fire Smoke-less Powder. The latter is used in loading blank ammunition for small arms weapons.

**FILLERS**—EC powder is less powerful than TNT and usually is exploded by all igniting rather than a detonating agent. Grenades loaded with EC powder are issued fuzeed and ready for use. They are not susceptible to mass detonation.

The standard filler for offensive grenades is pressed TNT.

Fillers in chemical grenades consist of various chemical mixtures and solutions. The manufacturing, storage and issue of Chemical Grenades is a function of the Chemical Warfare Service.

Practice Grenades contain a small amount of black powder and are designed to give an indicating puff of smoke when the igniting type fuze functions.

**TIME AND AUTOMATIC FUZES**—The fuze is the device which causes the grenade to function. All standard hand grenade fuzes (including most of the chemical hand grenade fuzes) are Time and Automatic types. A "time" fuze fires the grenade after a lapse of time and not upon percussion or impact. Grenades which contain an "automatic" fuze function automatically as soon as the grenade leaves the hand, provided the safety pin has been removed and the safety lever held close to the body of the grenade prior to throwing. This lever provides a safety feature by eliminating the necessity of

manually starting the fuze action before the grenade is thrown toward the target.

**FUZE CLASSIFICATION**—Hand grenade fuzes are either detonating or igniting types.

A detonating fuze is used when shock is necessary to initiate the action of the explosive filler.

Igniting fuzes are used when the filler is one which requires heat initiation. This type of fuze will ignite the filler as though it had been lighted by a match.

All detonating and igniting hand grenade fuzes have the same general form and appearance. The fuze assembly consists primarily of a fuze body, having a threaded portion to permit insertion into the grenade body, a safety lever which restrains a striker, a safety pin to hold the lever in place, and a deep cup which is crimped to the lower portion of the fuze body and extends inside the grenade body when the fuze is assembled. The compound in the cup determines whether the final action of the fuze will be one of detonation or ignition.

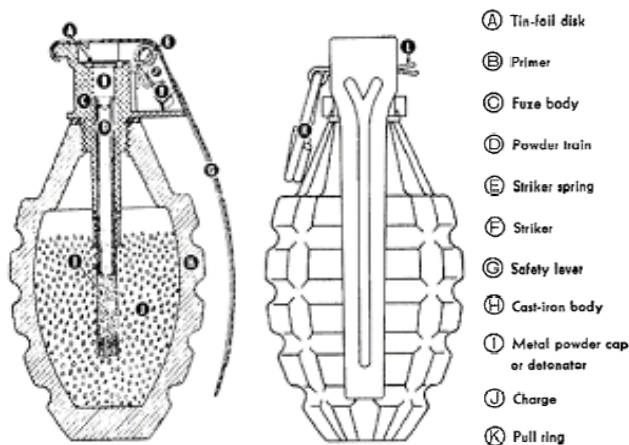
**OPERATION**—The safety device is a cotter pin with ring attached which enables it to be withdrawn easily. One end of the safety lever covers the top of the fuze body, sealing it against foreign bodies, and hooks over a lip in the fuze body. The other end of the safety lever extends downward and follows the contour of the grenade.

A grenade should be held with the safety lever pressed close to the grenade body by the palm of the hand. The thrower must take every precaution after withdrawing the safety pin, not to release his grip on the safety lever.

When the grenade is thrown, the safety lever is detached by the release of the striker spring and the impact of the striker. When no longer restrained by the lever, the striker rotates about a hinge pin and strikes a primer in the upper part of the fuze body.

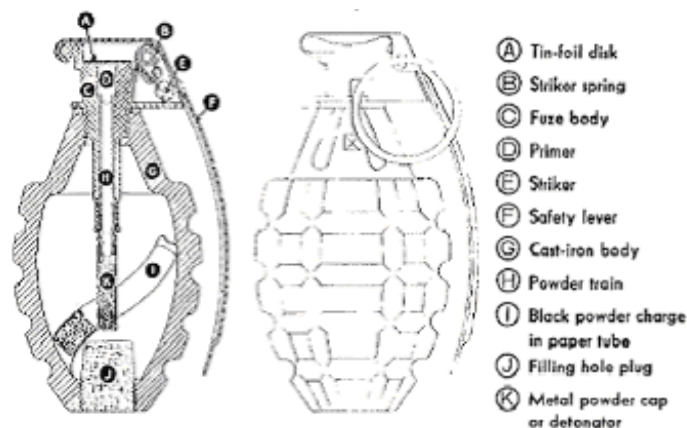
The primer is a center-fire type similar to a shotgun shell primer. The flame from the primer charge ignites a delay charge which in the M6A3 and M10A3 fuzes consists of a powder column compressed in a lead tube. The burning time varies from 4.0 to 5.0 seconds.

The delay charge ignites a black powder igniting charge in the M10A3 fuze and a tetaryl detonator in the M6A3 fuze. The igniter or detonator initiates the filler charge. The total burning time of the assembly is the same as the fuze, namely from 4.0 to 5.0 sec.

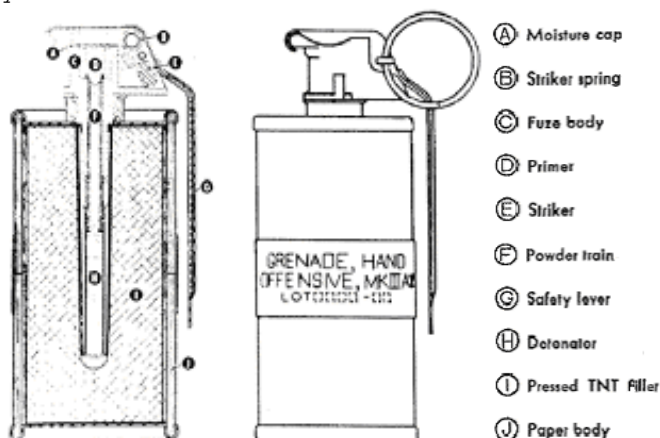


**GRENAD, HAND, FRAGMENTATION, MK. IIA1-STANDARD**—The body of this grenade is made of cast-iron and is about the size of a large lemon. The outside surface is deeply serrated horizontally and vertically to assist in producing uniform fragments when the grenade explodes. The bursting charge is 0.74 ounce of EC Black Fire Powder initiated by the M10A3 igniting fuze. The grenade loaded and fuzed weights 21 ounces. The bursting radius is 30 yards.

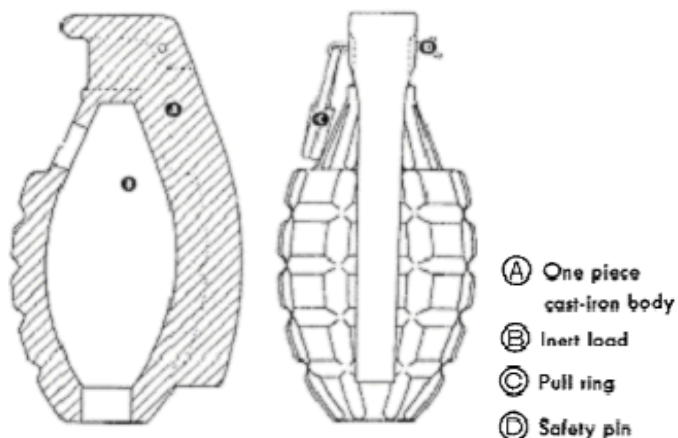
loaded and fuzed Mk. IIIAI grenade weighs 14 ounces, 6.83 ounces of which is the TNT charge.



**GRENAD, HAND, PRACTICE, MK. II-STANDARD**—This is a standard practice grenade and is equipped with the igniting fuze, M10A3. The grenade is loaded with a small charge of black powder in a cloth bag. The grenade when fuzed weighs 20.5 ounces.



**GRENAD, HAND, OFFENSIVE, MK. IIIAI-LIMITED STANDARD**—This grenade consists of a sheet-metal top, threaded to receive the detonating fuze, M6A3, and a body of laminated cartridge paper which contains the high-explosive TNT charge. This grenade is for demolition. It may be used in the open more safely than the fragmentation grenade because there is no marked fragmentation. The grenade bodies and fuzes are shipped separately. The



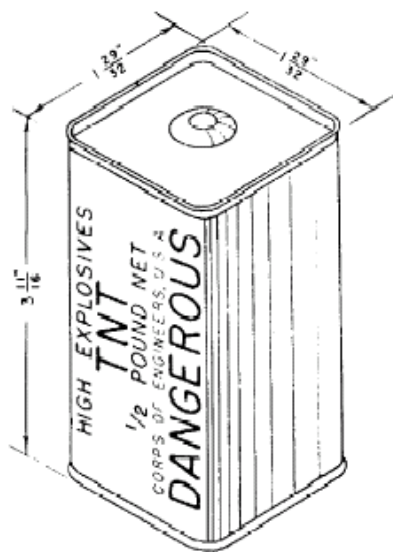
**GRENAD, HAND, TRAINING, MK. IAI-STANDARD**—This grenade is the current standard for practice and training. It consists of a one piece cast-iron body in the shape of a Mk. II fuzed fragmentation grenade and a removable safety pin and ring. It is inert. The grenade weighs 22 ounces, 1 ounce more than the Mk. II.

# DEMOLITION EXPLOSIVES

Standard Engineer Corps demolition material for issue includes the following items: Blocks, Explosive, TNT; Commercial size containers of Explosive, Ammonium Nitrate; Blocks, Demolition Chain, M1; Block, Demolition, M2; Cap, Blasting, Electric; Cap, Blasting, Non-Electric; and Fuze, Time or Safety.

The Engineer Corps has set the following requisites for military demolition explosives:

1. Not too sensitive to shock or friction
  2. High velocity of detonation
  3. High power per unit of weight
  4. High density (high weight per unit of volume)
  5. Stable
  6. Not too difficult to detonate
  7. Unaffected by changes of temperature or by moisture
  8. Convenient form for packing and loading
  9. Obtainable in large quantities commercially
- Triton or TNT (trinitrotoluene) possesses more of these characteristics than any other explosive.



**HALF-POUND BLOCK, TNT-STANDARD**—As issued, the TNT block has a density of 1.46, is rectangular in shape and 1.75 inches by 3.25 inches high. Each block is packed in a cardboard container closed at each end by lacquered tin. At one end is a cylindrical hole 2.125 inches deep in which the cap may be placed. The explosive is detonated by special issue tetryl caps and detonating cords.

In the event of a shortage of TNT, ammonium nitrate, sensitized by the addition of TNT, has been designated as substitute standard. It has similar properties to TNT except that it is highly hygroscopic and must be sealed in an airtight container.

Ammonium nitrate is packed in a cylindrical metal container 8.25 inches in diameter and 18.0 inches long. The weight is 40 pounds. Two tubes are attached to the container, parallel to the longitudinal axis, one to receive the detonating cord and the

other the special tetryl detonating cap which may be of non-electric or electric type.

Ammonium nitrate is especially suited for blowing road craters by the multiple charge method.

## BLOCKS, DEMOLITION, CHAIN, M1

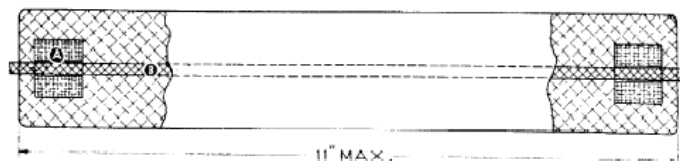


### BLOCKS, DEMOLITION, CHAIN, M1-STANDARD

The assembly consists of eight 2 x 2 x 11 inch blocks of cast tetrytol assembled on a detonating cord (primacord) which passes through the longitudinal axis of the blocks. Each block, which is enclosed in a paper-backed, asphalt-impregnated crinklecraft paper wrapping, consists of 2½ pounds of Tetrytol, a mixture of 75% tetryl and 25% TNT, with a cylindrical pellet of tetryl at each end. The blocks are placed with 8 inches of detonating cord between units and two feet of free detonating cord at each end of the chain.

The Blocks, Demolition, Chain, M1, may be used in various ways. They may be laid in a line, wrapped about an object, or detonated as packed in a lightweight haversack. It is necessary to set off the detonating cord by means of a blasting cap in order to fire the chain of blocks. These blocks are not affected by moisture and can stand submergence in water for 24 hours without appreciably altering their characteristics.

### ASSEMBLY OF PELLET AND PRIMACORD IN BLOCK



(A) Tetryl pellet

(B) Primacord

**BLOCK, DEMOLITION, M1-STANDARD**—The Block, Demolition, M2, is a tetrytol charge weighing approximately 2½ pounds and measuring 2 x 2 x 11 inches. At each end of the block is a cap-well containing a threaded bushing that will receive either an electric or non-electric blasting cap. The wells are lined with a thin waterproof paper tube, surrounded by 2 tetryl pellets. The block is wrapped in a paper-backed, asphalt impregnated, olive-drab crinklecraft paper. The wrapping is waterproof, mildew proof, and highly durable. At each end of the cartridge, a circular section of the wrapper is weakened to permit easy priming of the block. Eight blocks are packed in an inexpensive haversack.

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