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FM 23–30

WAR DEPARTMENT

BASIC FIELD MANUAL

GRENADES

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BASIC FIELD MANUAL

GRENADES

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(For explanation of symbols see FM 21–6.)

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BASIC FIELD MANUAL

GRENADES

(This manual supersedes FM 23–30, January 2, 1940.)

CHAPTER 1

HAND GRENADES

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SECTION I

GENERAL

■ 1. TYPES.—Hand grenades are divided into the following types:

a. Fragmentation grenades, containing an explosive charge in a body designed to fragment with the action of the bursting charge.

b. Offensive grenades, containing a high explosive charge in a paper body, designed for demolition effect.

c. Chemical grenades, containing a chemical agent which produces a toxic or irritant physiological effect, a screening smoke, an incendiary action, or any combination of these.

d. Practice grenades, containing a reduced charge, to simulate fragmentation grenades.

e. Training grenades, containing no explosive or chemical.

■ 2. FILLERS.—The filler is the substance contained in the body of a grenade. It may be a powerful explosive, as in the case of the fragmentation grenade, or a gas- or smoke-producing substance. Those used are—

a. EC (explosive company) blank fire smokeless powder.—This is a commercial type granulated nitrocellulose powder, generally pink or yellow in color. It is less powerful than

TNT and is exploded by ignition rather than detonation. Grenades loaded with this material can be issued fuzed and ready for use and are, in general, not susceptible to mass detonation.

b. Trinitrotoluene (TNT).—TNT is stable but, unlike blank fire powder, it explodes by detonation. Hand grenades filled with TNT are not stored or issued with the fuze assembled. TNT in block form is used for demolitions.

c. Chloracetophenone (CN).—This is a lachrymatory (tear) gas which produces a severe burning sensation in the eyes, causing intense weeping. In one type of irritant hand grenade, CN is combined with diphenylaminechlorarsine (*d* below).

d. Diphenylaminechlorarsine (DM).—DM is a gas which causes a burning sensation in the nose and throat and a heavy or tight feeling in the chest. There is also a nauseating effect, the degree of which depends on the concentration of the gas and the length of exposure. Grenades filled with chemicals, because of their small capacity, are not considered suitable for war use, but are very effective in riots, civil disorders, etc.

e. Hexachlorethane-zinc mixture (HC).—Upon ignition, HC mixture produces a dense white smoke which is harmless. HC smoke grenades are used by the Army Air Forces and the Armored Force for signals.

f. B chlorvinyldichlorarsine (M1).—M1 (lewisite) is a liquid which gradually changes to a gas. It is extremely vesicant and either gas or liquid will burn the skin or lungs severely. Casualties do not usually develop until a few hours after exposure. Grenades filled with M1 are suitable for contaminating vehicles and important installations.

g. Chloracetophenone solution (CNS).—CNS is a mixture of CN in chlorpicrin and chloroform. Chlorpicrin (PS) has lacrimatory properties similar to CN.

h. Sulphur trioxide-chlorsulfonic acid mixture (FS).—FS is a corrosive liquid which reacts with the atmosphere, producing an effective screening smoke.

i. Gasoline (liquid) (GA).—Liquid gasoline is an effective incendiary material with which to ignite combustible materials.

j. Gasoline (solidified) (GA).—The several forms of solidified gasoline burn more effectively than liquid gasoline.

k. AW filling.—The AW filling consists of phosphorus and a rubber-gasoline solution. The rubber-gasoline solution adheres to surfaces, and burns 6 to 8 minutes. The phosphorus prevents the rubber-gasoline solution from being extinguished with water.

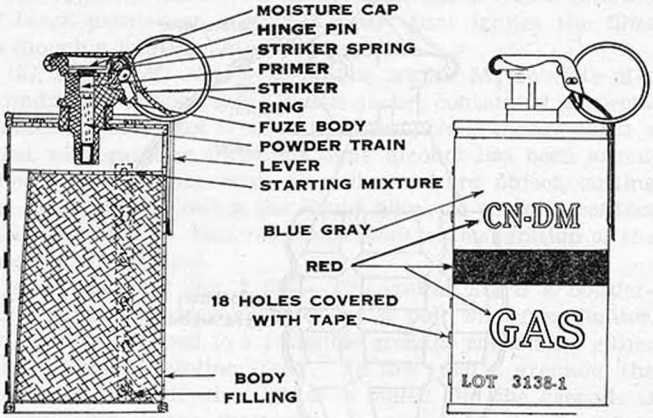
l. Thermate (TH).—TH is an incendiary filling which burns intensely. Grenades filled with TH are used against materials which are difficult to ignite.

■ 3. COMPONENTS.—*a. Time fuze.*—The time fuze, or safety fuze, is a cord containing a slow-burning powder train. The time fuze issued to the service is known commercially as Bickford fuze and burns at the approximate rate of 15 inches per minute. Time fuze should always be tested before using to determine its rate of burning. The time fuze in most of the grenade firing mechanisms is cut to burn for 5 seconds.

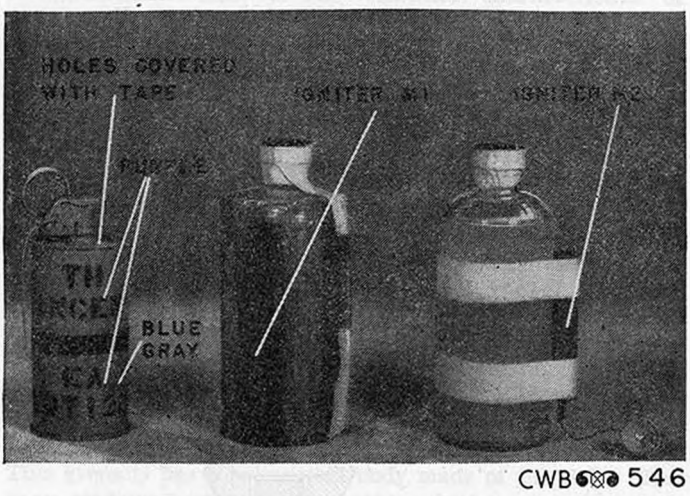
b. Detonators.—A detonator is a metal capsule filled with a detonating explosive such as fulminate of mercury. Commercial detonators come in 10 sizes, numbered 1 to 10. The higher numbered sizes are larger and contain increasing amounts of the detonating mixture. No. 6 and No. 8 are the ones used in grenades. Detonators are sensitive to heat, shock, and friction and should be handled carefully at all times.

c. Fuzes.—The fuze is the mechanism that fires the grenade. Fuzes are described in detail and their functioning explained in TM 9–1900. All grenade fuzes are time and automatic. Time means that the grenade is fired after a certain lapse of time and not on percussion. Automatic means that the fuze begins to function automatically as it leaves the hand, providing the safety cotter pin has been removed, thus providing a safety factor by eliminating the necessity of starting the action of the mechanism before the grenade is on its way. As to the final action, fuzes may be classified as detonating or igniting.

(1) *Detonating fuzes.*—Those that contain a detonator. The function of the detonator is either to set off the explosive charge or to burst the container and liberate the filler.



① Irritant gas hand grenade CN–DM M6.



② Incendiary grenade M14 and frangible grenades M1.

FIGURE 3.

chemical filler is composed of a mixture of CN–DM and a small amount of blank fire powder. Two seconds after the primer is fired the grenade begins to generate a gas having a pungent odor. One second later the gas reaches full volume and the grenade functions for 25 to 35 seconds.

(3) *Grenade, hand, gas, irritant, CN, M7.*—This grenade is similar to the M6 grenade but is filled with CN only instead of with the CN–DM mixture.

(4) *Grenade, hand practice, Mk. II.*—This grenade is a limited standard practice grenade and is equipped with the igniting fuze M10A1. The grenade is loaded with a charge of black powder contained in a paper tube. After the fuze is assembled in the grenade, this charge is inserted into the filling hole, which is closed with a cork.

(5) *Grenade, hand Mk. 1A1.*—This grenade is the current standard for practice and training. It consists of a one-piece cast iron body in the shape of the fuzed fragmentation grenade and a removable safety pin and ring. It is inert.

(6) *Grenade, hand, offensive, Mk. IIIA1.*—This grenade consists of a die-cast top, which is threaded to receive the fuze, detonating, hand grenade, M6A2, and a body of laminated cartridge paper which contains the high explosive 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. Grenade bodies and fuzes are shipped separately. Bodies are packed 25 per carton, with 8 cartons to a box.

(7) *Grenade, frangible, M1* (fig. 3 ②).—This grenade is a common glass pint bottle equipped with a screw cap and designed for the following chemical fillings: M1, CNS, AW, FS, and GA. No bursting charge is provided. Dispersal of contents is produced when the bottle is shattered by impact. Incendiary fillings are ignited by the M1 or M2 igniter immediately after impact. In the case of the AW grenade, the white phosphorus filling ignites spontaneously upon contact with air.

(8) *Grenade, incendiary, M14* (fig. 3 ②).—This thermate-filled grenade is similar in size and shape to the irritant gas hand grenade CN–DM M6.

b. Summary.—A summary of the various types of hand grenades is given in the following table:

HAND GRENADES

Type	Fuze	Weight as used (ounces)	Filler	Body	Range (yards)	Radius of burst	Painting and marking	Use	Delay time
Grenade,[1] hand, fragmentation, Mk. II.	Igniting, M10A1.	20	EC blank fire powder.	Cast iron, serrated.	50	30 yards	Yellow	Casualty	5 seconds.
Grenade, hand, fragmentation, HE, Mk. II.[2 3]	Detonating, M5.	20	TNT	Cast iron, serrated.	50	30 yards	Yellow	Casualty	5 seconds.
Grenade, hand, gas, irritant, CN–DM, M6.	Igniting, M200A1.	17	Chloracetophenone, diphenylaminechlorarsine.	Tinplate, smooth, cylindrical.	50	Burns; does not burst.	Gray.[4] "CN–DM GAS" and 1 band (all in red).	Harassing	Fumes start in 2 seconds; full volume, 3 seconds.
Grenade, hand, gas, irritant, CN, M7.	Igniting, M200A1.	17	Chloracetophenone.	Tinplate, smooth, cylindrical.	50	Burns; does not burst.	Gray.[4] "CN GAS" and 1 band (all in red).	Harassing	Fumes start in 2 seconds; full volume, 3 seconds.
Grenade, hand, smoke, HC, M8.	Igniting, M200A1.	17	HC smoke mixture.	Tinplate, smooth, cylindrical.	50	Burns; does not burst.	Gray. "HC SMOKE" and 1 band and lot (all in yellow).	Signal	Fumes start in 2 seconds; full volume, 3 seconds.
Grenade, hand, offensive, Mk. IIIA1.[6]	Detonating M6A2.	11	TNT	Paper	50		Yellow, type, model and lot in black.	Demolition.	5 seconds.
Grenade, hand, training, Mk. 1A1.	None	20	None	Cast iron, serrated.	50	None	Black	Training and throwing practice.	Inert.
Grenade, hand, practice, Mk. II.[5]	Igniting, M10A1.	20	Reduced charge black powder.	Cast iron, serrated.	50	Does not burst; blows out cork plug.	Blue	Practice	5 seconds.
Body, grenade, hand, fragmentation, Mk. II, with or without hand grenade fuze M5 (for dummy use).[5]	With or without, M5 fuze, without detonator.	20	None	Cast iron	50	None	Black	Training	None.

See footnotes at end of table.

HAND GRENADES—Continued

Type	Fuze	Weight as used (ounces)	Filler	Body	Range (yards)	Radius of burst	Painting and marking	Use	Delay time
Grenade, frangible, M1.	None	42	M1	Glass	25	5 yd.[6]	None	Casualty	Ignites on impact.
	None	35	CNS	Glass	25	5 yd.[6]	None	Harassing	Ignites on impact.
	None	40	AW	Glass	25	5 yd	None	Incendiary, casualty.	Ignites on impact.
	Igniting, M2	24	GA	Glass	25	5 yd	None	Incendiary.	Ignites on impact.
	Igniting, M1	25	Alcohol, gasoline.	Glass	25	5 yd	None	Incendiary.	Ignites on impact.
	None	42	FS	Glass	25	5 yd.[6]	None	Casualty, screening.	Ignites on impact.

Grenade, incendiary, M14.	Igniting, M200A1.	32	Thermate	Tinplate, smooth cylindrical.		Burns; does not burst.	Blue-gray. "TH INCENDIARY" and 1 band and lot (all in in purple).	Incendiary.	2 seconds.

[1] Issued fuzed ready for use.

[2] Limited standard. Superseded by grenade, hand, fragmentation, Mk. II, with hand grenade igniting fuze M10A1.

[3] Issued unfuzed but with grenade body loaded with the filler. The fuze is issued separately and must be assembled to the grenade prior to use.

[4] Old type has green marking on gray body.

[5] Substitute for training grenade Mk. 1A1.

[6] Vapor will travel a considerable distance downwind.

SECTION II

THROWING TECHNIQUE

5. GENERAL.—*a. Importance.*—Grenade throwing is the most important phase of hand grenade training. The thrower must always follow accurately the prescribed method of arming and throwing so that in the latter stages of training these operations will be performed mechanically. Perfection of form, accuracy, and range are the desired factors in grenade throwing. Accuracy and range are attained by practicing the prescribed throwing form. Due allowance may be made, however, for an individual's conformation.

b. Chemical hand grenades.—Chemical hand grenades are of such a highly specialized type that they cannot be employed in the same manner as other grenades.

(1) *Grenade, hand, gas, irritant, CN–DM, M6.*—The CN–DM grenade should be thrown slightly upwind of the target area so that the gas cloud will be carried to hostile personnel by the wind.

(2) *Grenade, incendiary, M14.*—This grenade must be thrown to fall on combustible materials.

(3) *Grenade, frangible, M1.*—These grenades are intended primarily for use against the personnel and contents of vehicles but may also be used against buildings. To be used effectively they should be thrown inside vehicles or buildings. Frangible grenades must be aimed accurately and thrown with sufficient force to assure breakage.

c. To hold grenade (fig. 4).—The grenade should be held in the right hand with the safety lever firmly pressed by the palm. The forefinger of the left hand is inserted through the safety-pin ring. (A left-handed man may hold the grenade in his left hand.) In this position the safety pin can be removed without altering the grip for throwing. The thrower must take every precaution after the safety pin has been withdrawn not to release his grip on the lever until the grenade is thrown. The thumb and forefinger of the right hand should be around the upper horizontal serration of the fragmentation hand grenade Mk. II. The grenade should not be gripped directly under the fuze head because this will result in inaccuracy, tumbling of the grenade in

flight, and reduction of the range. The fuze head has, on occasion, been caught by the fingers of the thrower, causing the grenade to drop immediately upon leaving the hand.

d. General rules for throwing.—The grenade is thrown by a combination of a shot put and baseball catcher's peg motion. The biceps muscle of the throwing arm should be contracted just before throwing. The grenade is released just before the arm is fully extended. It is given a spinning motion by being released over the tips of the fingers as it leaves the hand so that it will rotate around its longer axis, fuze to the rear, during its flight to the target. The



FIGURE 4.—Method of holding the grenade.

maximum range is obtained when the grenade leaves the hand traveling at an upward angle of 45°. The hand being at the shoulder, to execute the throw, carry the right hand forward and upward without twisting the wrist. The left arm always counterbalances the movement of the right arm. If the grenades are striking to the right or left of the target the entire body should be shifted to the left or right. For the first practice no attempt should be made to throw over 20 yards, as the throwing arm might be injured. Thirty-five yards is considered a good range after the first 100 grenades have been thrown at an average rate of 30 or 40 grenades a day for 3 or more days. A 50-yard range is above average.

■ 6. METHODS.—*a. To throw from standing position* (fig. 5).—The thrower facing the target, the commands and manner of execution are as follows:

(1) STAND.—Face to the right. Move the left foot 1½ to 2 feet toward the target, with the toe pointing in the general direction of the target. Assume a well-balanced and easy position. With the hands down and in front of the center of the body, grasp the grenade in the prescribed manner. When dummy grenades are used the left forefinger grasps the right thumb to simulate the grasping of the safety-pin ring.

(2) PULL PIN.—Pull out the safety pin with a twisting-pulling motion, holding the hands as nearly as practicable



1. STAND. 2. PREPARE TO THROW. 3. THROW.

FIGURE 5.—To throw from standing position.

in front of the center of the body. When dummy grenades are used simulate this movement.

(3) PREPARE TO THROW.—Quickly bring the right arm into position, the elbow at the height of and on line with the shoulders, palm of the hand up, and near or touching the shoulder. At the same time extend the left arm, palm of the hand down, in the direction of the target. The weight of the body is on the right foot. The body is bent to the right, right knee bent, eyes sighting over the left hand to insure direction and then fixed on the target. If throwing from a trench or throwing pit, the eyes should be fixed on the parapet or top of pit.

(4) THROW.—Quickly move the right arm upward and to the front without twisting the wrist and release the grenade just before the arm is fully extended, being sure to impart a spinning motion. At the completion of the throw the left foot and right toe are on the ground.

(5) RECOVER.—Resume the position of STAND.

b. To throw from kneeling position (fig. 6).—The thrower, facing the target, executes the commands in the following manner:

(1) KNEEL.—Face to the right, kneel on the right knee, right leg to the rear, left leg and foot pointing in the general direction of the target. The weight of the body is on the right knee.

(2) PULL PIN.—The execution is the same as for the standing position.

(3) PREPARE TO THROW.—The execution is the same as for the standing position except that the weight of the body is on the right knee.

(4) THROW.—The execution is the same as for the standing position except that the body is brought to rest by the chest coming in contact with the left knee and upper leg at the completion of the throw.

(5) RECOVER.—Resume the position of KNEEL.

c. To throw from prone position (fig. 7).—The thrower, facing the target, executes the commands in the following manner:

(1) LIE DOWN.—Assume a prone position, as shown in figure 7. The body is on a line approximately in prolongation of the target, so that when the position PREPARE TO THROW is taken it will be unnecessary to shift the feet or left knee. Either cheek is near or on the ground. Hold grenade as described in paragraph 5 and as shown in figure 4, but in front of the head, as shown in figure 7.

(2) PULL PIN.—Hold the grenade in front of the head and pull the pin in the same manner as described for the standing position.

(3) PREPARE TO THROW.—Draw back the hands and arms so that the hands are near the shoulders, left hand and forearm flat on the ground, right forearm and wrist *only* on the ground; shove the body upward, pivoting the weight of body



1. KNEEL



2. PREPARE TO THROW

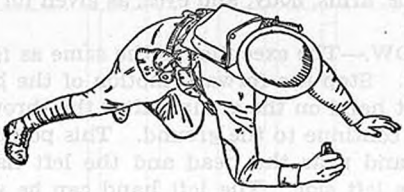


3. THROW

FIGURE 6.—To throw from kneeling position.



1



2



3



4

FIGURE 7.—To throw from prone position.

on the left knee; straighten the right leg and extend it straight to the rear. Hold the body upright. Do not push up with the hand holding the grenade. Keep this hand clear of the ground, as shown in figure 7. Continue until a kneeling position is assumed. Being now in a kneeling position, kneeling on the left knee, assume the same positions for the hands, arms, body, and eyes, as given for the standing position.

(4) THROW.—The execution is the same as for the standing position. Stop the forward motion of the body by placing the right hand on the ground after the throw, permitting the body to continue to the ground. This position will leave the right hand near the head and the left hand near the waist on the left side. The left hand can be used to carry another grenade to the right hand for the next throw.



FIGURE 8.—To throw from prone position (advancing).

(5) RECOVER.—Place the left hand next to the right in front of the head. Resume the position of LIE DOWN.

d. To throw from prone position (advancing) (fig. 8).— The body of the thrower can be advanced about 2 feet at each throw if this is desired. The commands and movements are the same as for the prone position except in PREPARE TO THROW. As the hands are brought back advance the left knee as far as possible. The distance that the left knee is advanced is the distance that the body will be advanced for each throw.

SECTION III

GRENADE COURTS AND SCORING

7. GENERAL PLAN.—The plan of grenade courts covers practically all the throwing conditions that will be encountered in actual service. A definitely laid out system of courts

is a necessity for training large classes where the time is limited and a fixed program must be followed. It eliminates indefinite procedure. With the exception of the trenches, or similarly constructed shelter, which must be had for live fragmentation grenade throwing, the court may be laid out in a short time and with very little material. The thrower

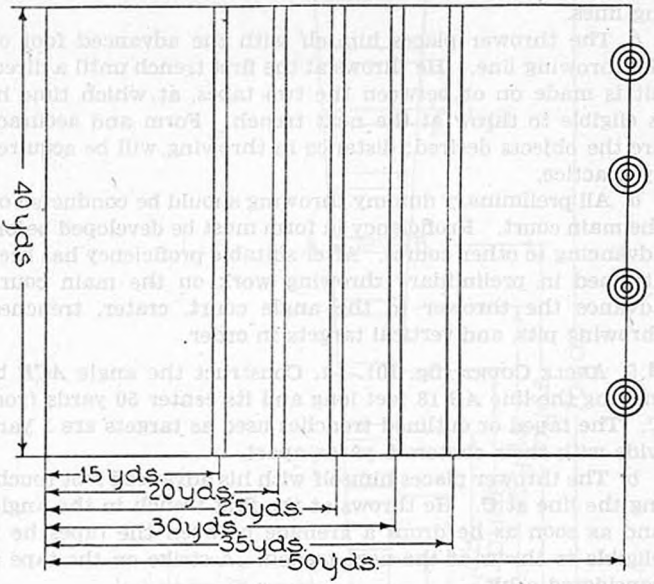


FIGURE 9.—Main court.

should be trained in all positions—standing, kneeling, and prone.

■ 8. MAIN COURT (fig. 9).—*a.* Place five rows of lines as indicated in figure 9, each row to consist of two lines of canvas or target cloth placed 1 yard apart, indicating a trench. The strips of cloth should be about 2 inches wide. Each court should be 40 yards wide and 50 yards long. At one end construct four spider webs of cloth strips, each composed of three concentric circles, 1, 2, and 3 yards in diameter, re-

spectively. Small stakes approximately 18 inches long, with pieces of cloth nailed on the top, are placed in the center of each web to give definite targets at which to aim.

b. This court will conveniently accommodate 64 men. Where a large class is to be instructed the spider webs should be eliminated, the court extended to approximately 75 yards in length, and both ends of the court used as throwing lines.

c. The thrower places himself with the advanced foot on the throwing line. He throws at the first trench until a direct hit is made on or between the two tapes, at which time he is eligible to throw at the next trench. Form and accuracy are the objects desired; distance in throwing will be acquired by practice.

d. All preliminary dummy throwing should be conducted on the main court. Proficiency in form must be developed before advancing to other courts. After suitable proficiency has been attained in preliminary throwing work on the main court, advance the thrower to the angle court, crater, trenches, throwing pits, and vertical targets in order.

■ 9. ANGLE COURT (fig. 10).—*a.* Construct the angle *ACB* by making the line *AB* 18 feet long and its center 50 yards from *C*. The taped or outlined trenches used as targets are 1 yard wide with their centers 5 yards apart.

b. The thrower places himself with his advanced foot touching the line at *C*. He throws at the first trench in the angle, and as soon as he drops a grenade between the tapes he is eligible to throw at the next trench. A strike on the tape is considered a hit.

■ 10. CRATER COURT (fig. 10).—*a.* Place a strip of canvas 4 feet long and 2 inches wide on the ground. At a distance of 25 yards to the front dig a circular pit 3 yards in diameter and not less than 18 inches deep. To increase the number of men who can use this court at one time, the throwing tapes can be placed in a circle around the crater, with the center of the crater as the center of the circle and a radius of 26½ yards.

b. The thrower places himself behind the throwing tape line. He throws at the pit from the standing, kneeling, and prone positions. A grenade which first strikes the ground outside and then goes into the pit is not considered a hit.

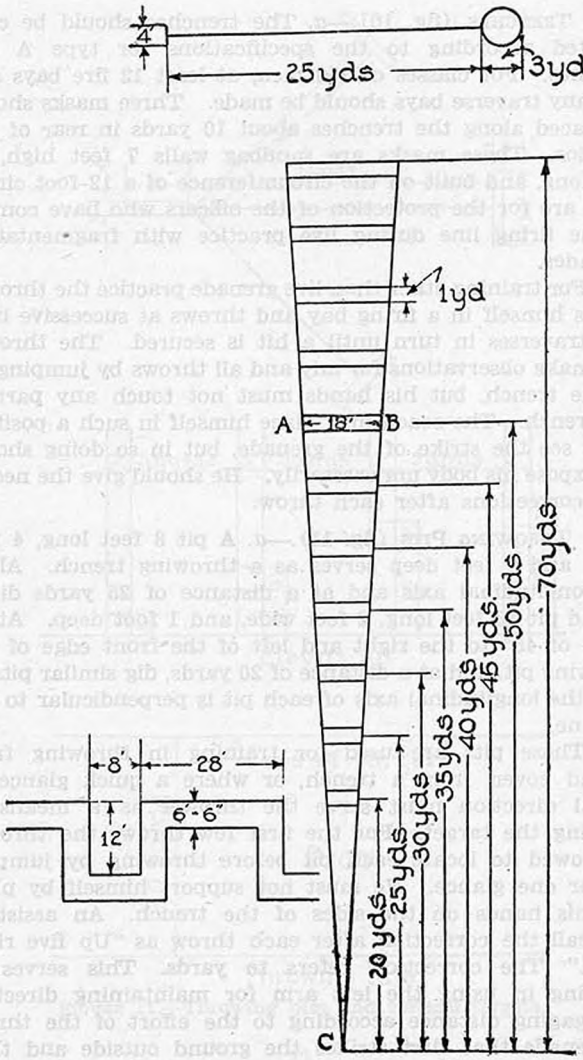


FIGURE 10.—Angle, crater, and trench courts.

■ 11. TRENCHES (fig. 10).—*a.* The trenches should be constructed according to the specifications for type A fire trenches. For classes of 150 men, at least 12 fire bays and as many traverse bays should be made. Three masks should be placed along the trenches about 10 yards in rear of the parados. These masks are sandbag walls 7 feet high, 12 feet long, and built on the circumference of a 12-foot circle. They are for the protection of the officers who have control of the firing line during live practice with fragmentation grenades.

b. For training other than live grenade practice the thrower places himself in a firing bay and throws at successive bays and traverses in turn until a hit is secured. The thrower can make observations for any and all throws by jumping up in the trench, but his hands must not touch any part of the trench. The coach may place himself in such a position as to see the strike of the grenade, but in so doing should not expose his body unnecessarily. He should give the necessary corrections after each throw.

■ 12. THROWING PITS (fig. 11).—*a.* A pit 8 feet long, 4 feet wide, and 7 feet deep serves as a throwing trench. Along the longitudinal axis and at a distance of 25 yards dig a second pit 18 feet long, 2 feet wide, and 1 foot deep. At an angle of 45° to the right and left of the front edge of the throwing pit, and at a distance of 20 yards, dig similar pits so that the longitudinal axis of each pit is perpendicular to the 45° line.

b. These pits are used for training in throwing from behind cover, from a trench, or where a quick glance or verbal direction must serve the thrower as a means of locating the target. For the first few throws the thrower is allowed to locate each pit before throwing by jumping up for one glance. He must not support himself by placing his hands on the sides of the trench. An assistant can call the correction after each throw as "Up five right eight." The correction refers to yards. This serves as training in using the left arm for maintaining direction and gaging distance according to the effort of the throw. A grenade that first strikes the ground outside and then goes into a pit is not considered a hit. The object is to

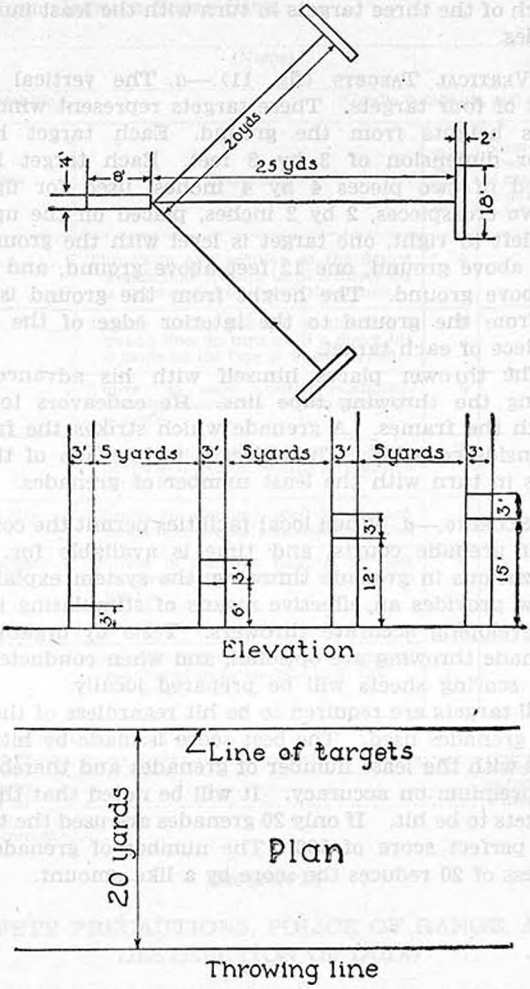


FIGURE 11.—Throwing pits and vertical targets.

other inflammable material; nor should they be fired closer than 30 feet from personnel. Thrower, or friendly troops, should not be directly downwind unless protected by gas masks.

c. Troops employing chemical grenades should wear their service gas masks except when using incendiary grenades. Gas masks or well-fitted goggles, however, will give considerable protection against average concentrations of CN in the open.

■ 20. To THROW PRACTICE GRENADES.—*a.* Pracitice hand grenades are practically free from hazard when properly used but they require the same degree of care in handling and operation as the standard live grenades.

b. The practice grenade described in paragraph 4*a*(4) may be thrown a safe distance by the average thrower, and personel need not take cover except for the purposes of training. The steel helmet should be worn. Although there is practically no danger involved, personnel should remain at a safe distance.

c. Practice grenades that fail to function after throwing (duds) will not be recovered until at least 10 minutes have elapsed, and should be handled by experienced personnel.

■ 21. To FUZE LIVE GRENADES.—*a. To fuze grenades.*—Grenades, hand, fragmentation, HE, Mk. II, unfuzed, and grenade, hand, offensive, Mk. IIIA1, are shipped, stored, and issued with the grenade body and fuze assembly separate. This is because they have detonating fuzes, and the detonation of one grenade will set off adjacent grenades. The grenade bodies have wooden shipping plugs screwed into the fuze seats. These grenades are fuzed as follows:

(1) Unscrew and remove the wooden shipping plug.

(2) Examine the cavity left in the explosive by the plug. If the cavity is not clear or of sufficient size to receive the fuze without friction, use a wooden stick about ¼ inch in diameter to enlarge the cavity.

(3) Insert the fuze into the grenade body.

(4) Hold the fuze in one hand and *screw the grenade body onto the fuze* with the other hand. In this operation the fuze should be the stationary part and the grenade body the moving part. A wrench is packed in each box of detonating

fuzes, and this should be used to seat the fuze firmly into the grenade.

b. Special precautions.—Unfuzed grenades will not be fuzed in ammunition dumps or their storage magazines, or within 100 yards of adjacent buildings, or in greater quantities than are needed for immediate use. Detonating fuzes, and grenades containing phosphorus, will be stored and transported separately from other explosives.

■ 22. POLICE OF RANGE.—*a. General.*—After throwing live grenades and before free access to the range is allowed to personnel, the range will be policed thoroughly and all duds will be destroyed by competent personnel as prescribed in paragraph 23.

b. Personnel employed.—The police of the range will be under the direct supervision of a commissioned officer who is thoroughly familiar with the prescribed methods of destroying grenades. The personnel engaged in this work should be given instruction as to the exact procedure to be followed and made thoroughly familiar with the danger of handling or disturbing the duds.

c. Inspection of range after policing is completed.—After the destruction of duds has been completed the officer in charge of the work will personally superintend a thorough police of the area in order to insure that no duds have been overlooked. This is essential both for the protection of troops using the range at a future time and to eliminate accidents to persons who might carry away duds as souvenirs.

d. Finding of duds.—All personnel, both military and civilian, who may find a dud should be warned of the dangers involved in handling them. They should be directed to report immediately the location of the dud to responsible military authority.

■ 23. METHOD OF DESTROYING GRENADE DUDS.—*a. Demolition with TNT blocks.*—(1) Individual fragmentation grenades can usually be destroyed in place with a ½-pound block of TNT or a stick of dynamite placed in intimate contact with the dud and covered with a few shovelfuls of earth. The firing may be accomplished by means of a time fuze and a blasting cap or by a magneto with suitable electric blasting cap.

(2) All fragmentation grenades are of the *time fuze* type—that is, they are designed to explode on the burning through of a piece of time fuze. This type of grenade dud can safely be picked up and destroyed at some central point, except that before a fragmentation hand grenade is picked up the striker should be looked at to make certain that it is all the way down against the primer. If the striker is not all the way down against the primer, but has rotated only part of the way, it is called a *hung striker*. Such a grenade dud should not be picked up but should be destroyed where it lies, using extreme care in placing the demolition charge to prevent jarring the grenade. Chemical-filled and practice grenade duds with hung strikers can be picked up with safety because they can be thrown out of danger range in case the striker happens to function.

(3) When it is considered safe to move them, not to exceed 30 or 40 grenades are stacked in a small hole dug in the ground about 1½ feet or more in depth, care being taken that the bodies of the grenades are in close contact. For example, 40 grenades may be arranged by placing 4 side by side and 4 more base to base with those for the bottom layer, and putting 4 similar layers directly on top of this. A number of ½-pound TNT blocks are then placed on top of the grenades. The number of TNT blocks to be used will depend on the number of grenades to be destroyed at one time. One block is sufficient for 6 grenades piled in 3 layers of 2 grenades each. At least 2 blocks should be used on 12 grenades piled in 3 layers of 4 grenades each. Five or six blocks should be used to explode 30 or 40 grenades.

(4) Where as many as 5 or 6 TNT blocks are used, it is preferable to arrange these by placing 4 of them side by side on top of the grenades, in close contact, the remainder being placed on top of this layer.

(5) The desired length of time fuze is cut (time fuze should be tested to determine rate of burning). One end of the fuze is placed carefully in the open end of a No. 8 detonator until it just touches the fulminate of mercury charge. Crimp the open end of the detonator tightly to the

fuze by means of a fuze crimper, care being taken not to press the fuze tightly against the fulminate of mercury charge. (A cap should never to crimped to a piece of fuze with the teeth, as this is extremely dangerous.) The detonator is inserted into one of the topmost blocks of TNT.

(6) The grenades and TNT blocks are then covered by a mound of earth at least a foot deep, and tamped lightly in order to obtain the maximum efficiency from the TNT.

(7) With the grenades underneath the TNT charge there is less scattering of fragments, and any grenades which happen to escape destruction will be left in the crater. These can then be destroyed by a second shot.

(8) The amount of earth covering used in the method described is entirely insufficient to prevent fragments of the grenades from being thrown to a considerable distance. It is not unusual for these grenade fragments to be thrown as far as 500 yards. All roads and other approaches to the range should be properly guarded or red flags and warning notices posted. A safe shelter or bombproof, built of logs or other suitable material, must be erected on the range so that the personnel carrying out the work can take shelter when the blasts are fired. No blast will be fired until every precaution is taken to insure that no one is within range of fragments or is likely to come within range before the charge explodes. This method is suitable for destroying high-explosive grenades only.

b. Destroying by means of fire.—Grenades are destroyed by means of fire either one at a time or in bulk, depending upon their explosive characteristics.

(1) *Destroying one at a time.*—(*a*) Individual destruction by fire is applicable to all fragmentation grenades but particularly to the grenade, hand, fragmentation, Mk. II, with M10 igniting fuze. Being loaded with EC blank fire powder and bearing the M10 igniting fuzes, these grenades are not susceptible to mass detonation. This same method of destruction is especially suitable for destroying practice or other types of grenades which contain no explosive except the detonator, and which therefore, are not readily disposed of by use of TNT blocks.

(*b*) A pit is dug in the ground about 2 feet square by 3 feet

deep, and a loosely fitting cover of iron plate or heavy boards provided. A fire of wood or coke is built in the bottom of the pit, and when a substantial bed of hot coals has been produced one of the grenades to be destroyed is dropped in, the cover is quickly dropped in place, and the operator takes shelter *until the grenade has exploded.* Grenades should be put in the fire one at a time, so that there will be absolutely no doubt as to whether or not there is an unexploded grenade in the pit. If there is unusual delay in exploding, no attempt should be made at that time to investigate. The time to investigate is after the fire has burned out and the pit is cold. This procedure may be modified by providing an inclined chute such as a piece of pipe placed so that one end is over the center of the pit and the other behind a suitable barricade. Precaution should be taken to baffle the open end of the chute so that the operator cannot look down the chute. The grenades should be fed into the fire through the chute, care being taken to avoid an accumulation of unexploded grenades or components in the pit.

(2) *Bulk destruction.*—(*a*) If destruction by fire is necessary the grenade, hand, fragmentation, HE, Mk. II, adapted for hand grenade detonating fuze M5, is best destroyed in bulk lots of from 30 to 40 grenades. However, they may be destroyed one at a time as prescribed above if it is so desired. These grenades, being loaded with TNT and containing the fulminate of mercury detonator, are subject to mass detonation if one of the detonators explodes.

(*b*) A pit similar to that used for destroying fragmentation grenades by detonation is necessary, and a heavy metal cover should be provided to stop flying fragments and unexploded grenades. A layer of inflammable material, such as wood or coke, should be placed under the pile of grenades, and as soon as the fire is started the cover should be placed over the pit and the personnel should take cover.

c. Destruction of irritant or other types of chemical grenades.—The destruction of irritant or other types of chemical grenades which fail to function should be accomplished under the supervision of the unit chemical officer.

SECTION V

ADVICE TO INSTRUCTORS

■ 24. GENERAL.—Training in hand grenades must not be restricted to hard and fast rules. Instructors must be constantly on the alert for new methods of training and operation, and nothing contained in this manual is to be construed as limiting in any way the initiative and originality of instructors, provided the necessary safety precautions are observed.

■ 25. SCOPE OF TRAINING.—*a. General.*—The schedule of instruction and scope of training will depend upon the length of time available, the combat duties of the personnel to be trained, and the importance of the grenade in the type of warfare to be conducted. Trench warfare necessitates extensive and detailed training in all types of trench fighting. Open warfare requires less extensive training. It should include such instruction as will form the basis for the effective use of the grenade in the combat training of the smaller rifle units.

b. Individual instruction.—(1) *Scope.*—The scope of individual instruction should include—

(*a*) Explosives in general and precautions to be observed in handling them, and grenades in particular.

(*b*) The general principles of detonating explosives.

(*c*) The characteristics, mechanism, and the care and use of service type grenades.

(*d*) The technique of throwing, including the throwing of dummy, practice, and live grenades.

(*e*) Precautions pertaining to the handling of duds.

(2) *Grenade throwing.*—Grenade throwing is the most important phase of individual grenade training and a very high standard of accuracy should be required, for besides the advantage it gives in combat it diminishes the risks of accidents and the consumption of grenades. Careful practice in the prescribed throwing technique is essential to successful throwing, and a considerable portion of the time available for training must be devoted to it.

c. Squad training.—After thorough training of the indi-

(7) Training in the technique of throwing or mechanical operation may best be conducted by arranging the squads under their assistant instructors on the throwing courts or in an area where they can hear the instructor. The instructor explains the several subjects covered. Concurrently with the instructor's explanation, assistant instructors demonstrate the operation. Following this each student performs the operation closely supervised by the assistant instructors.

■ 27. EQUIPMENT.—*a.* A special effort should be made to have on hand from the outset all grenades and other equipment that will be required during a course of training. Equipment should be carefully made and in excellent condition. Throwing courts, trenches, emplacements, etc., should be made according to required specification; if this equipment is old or has been in disuse, care should be taken to insure its proper repair prior to the time it will be needed for training purposes.

b. An accurate list of all of the material needed for each individual period of training should be prepared. Steps should then be taken to insure the availability of the material at the place and time and in the quantities required. Careful advance planning along this line will heighten the standard of training, avoid long delays between phases, and assist in obtaining the maximum amount of training in the period allotted.

CHAPTER 2

ANTITANK GRENADES

	Paragraphs
SECTION I. General	28–35
II. Marksmanship	36–47
III. Advice to instructors	48–50

SECTION I

GENERAL

■ 28. DESCRIPTION.—*a.* Antitank grenades are specially designed to be fired from the U. S. rifle, caliber .30, M1903, with the aid of a launcher which the soldier attaches to the muzzle of the rifle. A special cartridge, AT grenade, caliber .30, M3, which is issued with the grenade, must be used.

b. The U. S. rifle, caliber .30, M1903A1, and the U. S. rifle, caliber .30, M1917, may be issued in lieu of the M1903 for firing the antitank grenades. In such event a special sight will be issued at the same time to be attached to the rifle, and, in the case of the M1917 rifle, a launcher, especially designed to fit the rifle, will also be issued. Training with these two rifles should be given in addition to that prescribed herein for the M1903 rifle.

■ 29. TYPES.—The grenades are divided into two general classes:

High-explosive grenades, containing an explosive charge.

Practice grenades, designed for training or practice.

■ 30. CHARACTERISTICS.—*a. Grenade, AT, M9* (fig. 12).—The grenade, AT, M9, has a sheet metal body and weighs 1.5 pounds. It will detonate upon impact, providing the surface struck and the angle of impact are such as to exert pressure on the projection on the nose of the grenade.

b. Grenade, AT, M9A1 (fig. 13).—The grenade, AT, M9A1, has a sheet metal body and weighs 1.31 pounds. It is more sensitive than the M9 and may detonate upon impact with soft earth. However, for certainty of detonation, it should strike the target head-on or nearly so.

c. Grenades, AT, practice, M11 and M11A1.—These are inert (dummy) grenades, similar in shape and weight to the grenade, AT, M9 and M9A1, respectively. Each of these grenades consists of two parts—a head and a fin assembly. When damaged by repeated use, the fin assembly must be replaced.

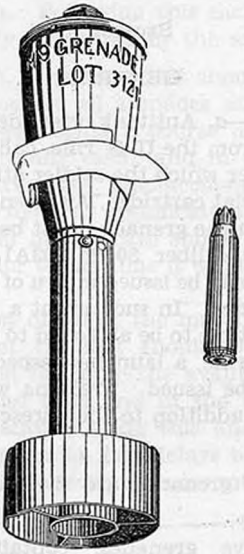


FIGURE 12.—Grenade, AT, M9, and cartridge, AT grenade, cal. .30, M3.

■ 31. IDENTIFICATION AND MARKINGS.—*a.* High explosive grenades (M9 and M9A1) are painted yellow with black identification markings, giving the model and lot numbers.

b. Practice grenades (M11 and M11A1) are painted black with white identification markings.

■ 32. CARTRIDGE, AT GRENADE, CALIBER .30, M3.—This cartridge, used in discharging antitank grenades, is a special type of blank cartridge. *Only* this cartridge will be used for this purpose. *Neither ordinary blank ammunition nor ball ammunition will be used.*

■ 33. LAUNCHER, GRENADE, M1 (fig. 14).—The launcher, on which the grenade is placed for firing, is an extension to the barrel of the rifle. A clamp with wing nut is provided for

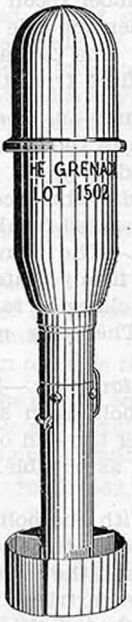


FIGURE 13.—Grenade, AT, M9A1.

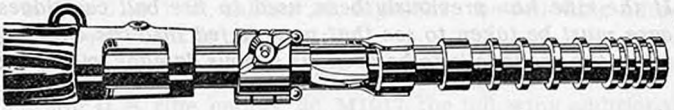


FIGURE 14.—Launcher, grenade, M1, attached to muzzle of rifle by clamp and wing nut.

attaching the launcher securely to the muzzle of the rifle. When the launcher is attached, the rifle may be employed for firing ball ammunition; however, the bayonet cannot be fixed. When firing the rifle with the launcher attached, care must

be taken to insure that the launcher is firmly attached to the rifle, otherwise the launcher may be damaged and inaccurate fire result.

■ 34. PAD, RECOIL.—A rubber recoil pad is provided for protecting the rifle stock when the rifle is fired with butt resting against a hard surface. The pad also lessens the shock of recoil when the rifle is fired from the shoulder.

■ 35. MECHANICAL TRAINING.—*a. Construction of grenades.*—No training will be given in the construction or principles of functioning of the grenade.

b. Attaching recoil pad.—The recoil pad is stretched over the butt of the rifle and seated firmly.

c. Attaching launcher.—The launcher is slipped over the muzzle of the rifle, and firmly seated as far down over the barrel as possible. The clamp is fastened securely by tightening the wing nut. The wing nut should be tightened frequently.

d. Placing grenade on launcher.—Elevate the muzzle of the rifle slightly, open the bolt, then slip the open end of the grenade fin assembly over the end of the launcher, and slide the grenade as far down as possible. Remove the safety pin (fig. 24 ②).

e. Firing grenade.—With the bolt open, insert the special cartridge in the magazine. After the grenade has been firmly seated on the launcher, and the safety pin removed, close the bolt, being sure that the cartridge is fed into the chamber. Take one of the prescribed positions, aim as described in paragraph 38, and squeeze the trigger until the rifle is fired. *If the rifle has previously been used to fire ball cartridges, care must be taken to see that none is fed into the chamber when the grenade is to be fired, as serious damage will result.*

SECTION II

MARKSMANSHIP

■ 36. GENERAL.—*a. Purpose.*—The purpose of this section is to provide a thorough and uniform method of training individuals to fire the antitank grenade at stationary and moving targets.

b. Place in training.—(1) Training in firing the antitank grenade should follow the course in rifle marksmanship. Without proper training in rifle marksmanship, the soldier instinctively gives the trigger a sudden pressure which results in flinching. The added weight of the launcher and the grenade exaggerates this tendency.

(2) The methods of instruction are similar to those used in teaching marksmanship with any other weapon. Training is divided into steps which must be taught in proper sequence.

c. Fundamentals.—To become proficient in firing the antitank grenade, a soldier must be trained in the following essentials:

(1) Correct sighting and aiming.
(2) Correct positions.
(3) Correct trigger squeeze.
(4) Correct sequence of operations in loading and firing.
(5) Correct range estimation.
(6) Correct application of leads for moving targets.

■ 37. EQUIPMENT.—*a.* The special equipment required for preparatory training is simple and readily improvised from materials at hand. The equipment required is as follows:

U. S. rifle, caliber .30, M1903.
Launcher, grenade, M1.
Pad, recoil.
Grenades, AT, practice, M11.
Rifle rest.
6- by 6-foot target frame.
20-inch sighting disk.

b. For U. S. rifle, caliber .30, M1903A1, the following additional equipment is required:

Sight, grenade launcher, M2.

c. For U. S. rifle, caliber .30, M1917, the following additional equipment is required:

Sight, grenade launcher, M2.
Launcher, grenade, M2.

■ 38. SIGHTING AND AIMING (figs. 15 and 16).—*a. Sight settings.*—(1) For M9 or M11 grenades, the peep sight is set at 2,000 yards.

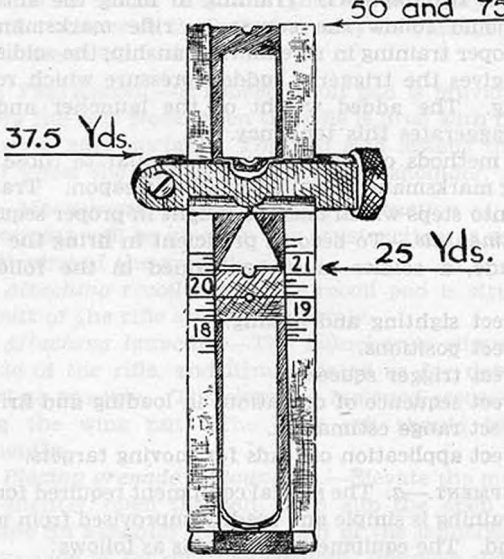


FIGURE 15.—Rear sight leaf, M1903 rifle, set for use with grenade, AT, M9 or M11.

(2) For M9A1 and M11A1 grenades, the peep sight is set at 1,750 yards.

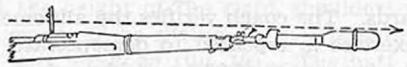
b. Method of aiming.—(1) Use the top of the grenade as a front sight and for a range of—

25 yards—use the open sight just over the peep sight.
37.5 yards—use the top of the drift slide.
50 yards—use the top of the sight leaf.

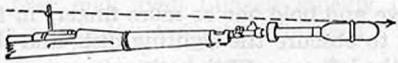
(2) For a range of 75 yards, use the base of the front sight and the top of the sight leaf. In order to employ this method both eyes must be kept open and focused on the target (see par. 39*b*).

■ 39. EXERCISES IN SIGHTING AND AIMING.—*a. Exercise No. 1.*—(1) *Purpose.*—To demonstrate the correct alinement of sights for ranges from 25 to 50 yards.

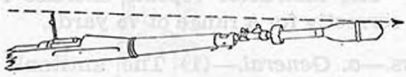
(2) *Method.*—(*a*) The instructor places the rifle with the



25 yards



37.5 yards



50 yards



75 yards

FIGURE 16.—Method of aiming at various ranges.

launcher attached in a rifle rest and alines the rest with a blank target. An antitank practice grenade M11 or M11A1 is placed on the launcher and the instructor then alines the sight disk by directions to the marker who controls the disk. When the disk is properly placed to demonstrate the correct sight alinement for a range of 25 yards, the instructor commands: HOLD. The instructor moves away from the rifle and directs each pupil in his group to look through the sights in order to observe the correct sight alinement for 25 yards.

(*b*) The marker then moves the disk out of alinement. Each pupil in turn takes position at the rifle and directs the marker to move the disk until the sight alinement is correct for a

range of 25 yards. The coach verifies the alinement for each pupil. The exercise is repeated to demonstrate the correct sight alinement for ranges of 37.5 and 50 yards.

b. Exercise No. 2.—(1) *Purpose.*—To demonstrate the method of sight alinement for a range of 75 yards.

(2) *Method.*—The instructor demonstrates the technique of alining the sights with both eyes open, by having each student close his left eye and hold one or more fingers in front of his right eye so as to obscure the sighting disk, and then having the pupil open the left eye. With both eyes open the disk again is visible.

c. Exercise No. 3.—(1) *Purpose.*—To demonstrate the correct sight alinement for a range of 75 yards.

(2) *Method.*—The instructor repeats exercise No. 1 with the disk alined correctly for a range of 75 yards.

■ 40. POSITIONS.—*a. General.*—(1) The antitank rifle grenade may be fired from any position used for firing a rifle.

(2) In the standing and kneeling positions, if time permits, the hasty sling should be used.

(3) When firing from the shoulder, care must be exercised to seat the butt of the rifle firmly. This precludes the possibility of injury due to the recoil.

(4) Owing to the height of the sight, the cheek cannot be pressed firmly against the stock. Consequently the head must be held well away from the rifle.

(5) In firing from the prone position it is desirable to employ a butt rest.

(6) The use of the recoil pad will be habitual when the rifle is fired from a butt rest. It may be used when the rifle is fired from the shoulder; however, when the grenade is fired from the shoulder without the recoil pad, the recoil is not excessive.

b. Standing (fig. 17).—The body should be faced at an angle from 60° to 70° from the line of fire with feet spread about 2 feet apart. Otherwise the position corresponds to that prescribed for firing the rifle.

c. Kneeling (fig. 18).—The firer kneels on the right knee, half-faced to the right, the left knee bent so that the left lower leg is vertical (as seen from the front); left arm well under the rifle and free from the left knee; right elbow

above or at the height of the right shoulder; the body well forward so as not to be sitting on the right heel.

d. Prone with sandbag (fig. 19).—The butt of the rifle is placed against the end of the sandbag with the right upper arm over the sandbag, and elbow resting on the ground.

e. Prone with casual butt rest (figs. 20 and 21).—In field firing, when firing from the prone position, any butt rest of which the firer may avail himself quickly (stump, vehicle rut, or other indentation) should be utilized. The right fore-



FIGURE 17.—Standing position.

arm is placed over the top of the butt of the rifle in order to hold it in firing position.

f. From individual prone shelter or foxhole (fig. 22).—In field firing the soldier should fire from an individual prone shelter (slit trench) or from a standing type one-man foxhole.

■ 41. SEQUENCE OF OPERATIONS (figs. 23 and 24).—*a.* In loading and firing, the following sequence will be observed:

(1) Open bolt.
(2) Insert cartridge in magazine.
(3) Place grenade on launcher.
(4) Withdraw safety pin.
(5) Close bolt.
(6) Aline sights.
(7) Squeeze trigger and fire.



FIGURE 18.—Kneeling position.



FIGURE 19.—Prone position; sandbag butt rest.



FIGURE 20.—Prone position; casual butt rest (stump).



FIGURE 21.—Prone position; casual butt rest (wheel rut).



① Reclining position; individual prone shelter, using rear wall as butt rest.



② Kneeling position; individual prone shelter.



③ Firing from standing type one-man foxhole.

FIGURE 22.



① Open bolt.



② Insert cartridge in magazine.

FIGURE 23.

b. Exercises in sequence of loading and firing.—(1) *Purpose.*—To practice the proper sequence of loading and firing so as to acquire speed and accuracy in operation.

(2) *Methods.*—The proper sequence is practiced in each position, the successive steps being performed initially "by the numbers." For practice in the standing and kneeling positions, the hasty sling is adjusted prior to starting the



① Place grenade on launcher.



② Withdraw safety pin.



③ Close bolt.

FIGURE 24.

sequence. For all training in positions and in the sequence of loading and firing, the launcher is attached to and considered an integral part of the rifle. This training is repeated in all positions until each soldier can perform the operation smoothly and accurately, and is able to engage a target approaching from any direction.

■ 42. RANGE ESTIMATION.—*a. General.*—(1) The firer must be well trained in hasty range estimation and its application to marksmanship. Because the weapon is normally employed quickly and at short ranges, the firer must estimate ranges by eye or by observation of fire.

(2) The usual method of range estimation is by eye. The firer is taught to estimate accurately and fix permanently in his mind two distances, 37.5 and 75 yards. Targets at other ranges are estimated in comparison with these units of measure.

(3) After one grenade has been fired, subsequent fire is adjusted by observation of successive strikes.

b. Exercises in range estimation.—The following exercises can be used as guides for instruction in range estimation. Ranges should be short, with none exceeding 125 yards. The exercises are especially suitable for class instruction.

(1) *Exercise No. 1.*—(*a*) *Purpose.*—To familiarize the student with the units of measure, 37.5 and 75 yards.

(*b*) *Method.*—The units of measure, 37.5 yards and 75 yards, are staked out on the ground. All students are required to become familiar with the appearance of these units from the prone, kneeling, and standing positions in the open and from the kneeling and standing positions in individual prone shelters and foxholes.

(2) *Exercise No. 2.*—(*a*) *Purpose.*—To give practice in range estimation.

(*b*) *Method.*—From a suitable assembly point, ranges are previously measured to a number of points varying in direction and range but all within 125 yards. Each soldier is required to estimate the ranges to the various points as they are indicated by the instructor and to record his estimations on a sheet of paper. At least one-half of the estimates are made from the prone position. Thirty seconds is allowed for

each estimate. When all the ranges have been estimated, each soldier's paper is checked by the instructor and the true ranges are announced.

■ 43. STATIONARY TARGET COURSE.—*a. General.*—See AR 775–10 for information as to who will fire the several courses and for ammunition allowances.

b. Course to be fired.

TABLE I

Range (yards)	Shots	Target	Position	Sling	Time
25	1	Rifle B	Prone, sandbag	None	No limit.
37½	1	Rifle B	Prone, sandbag	None	No limit.
50	1	Rifle B	Prone, sandbag	None	No limit.
75	1	Rifle B	Prone, sandbag	None	No limit.

TABLE II

Range (yards)	Shots	Target	Position	Sling	Time
25	1	Rifle B	Standing	Hasty	15 seconds.
37½	1	Rifle B	Kneeling	Hasty	15 seconds.
50	1	Rifle B	Kneeling in individual prone shelter.	Hasty	15 seconds.
75	1	Rifle B	Standing in one-man foxhole.	Hasty	20 seconds.

■ 44. MOVING TARGETS.—*a. Place in training.*—No individual should receive training in the technique of firing the antitank grenade at moving targets until after completion of the preliminary training prescribed in paragraphs 37 to 42, inclusive, and the stationary firing with the antitank grenade prescribed in paragraph 43.

b. Determination and application of leads.—(1) The lead necessary to hit a moving target is dependent upon its speed and its direction of movement with respect to the line of sight. Moving at a speed of 15 miles an hour, a vehicle will cover approximately 7 yards in 1 second—the average length of a medium tank. The antitank grenade moves 25 yards in approximately ½ second and 50 yards in 1¼ seconds. Therefore, to hit a vehicle moving across the front at 15 miles an hour, at ranges of 25 and 50 yards, the leads should

be about 3½ yards and 8 yards, respectively. At a speed of 25 miles an hour the leads should be about 6 and 15 yards, respectively.

(2) Leads are applied by using the length of the target as it appears to the firer as a unit of measure. This eliminates the necessity for corrections due to the angle at which the target crosses the line of sight because the more acute the angle the smaller the target appears and the less lateral speed it attains.

(3) The following table of leads is furnished as a guide:

Target moving at right angle to line of fire (mph)	Leads at ranges of—	
	25 yards	50 yards
15	½	1
25	1	2

c. Technique of fire.—The following technique is suggested for firing at moving targets:

(1) *Approaching targets.*—For a range of 25 yards, aim at the bottom of the target directly below the spot it is desired to hit. For a greater range, aim below the bottom of the target, the amount depending upon the range and speed of the target.

(2) *Receding targets.*—For a range of 25 yards, aim at the highest point of the target; for a greater range, aim above the target, the amount depending upon the range and speed of the target.

(3) *Crossing targets.*—Aline sights at the point it is desired to hit and, by rotating the body at the hips, swing the rifle across in the direction of the movement of the target to the desired lead. The rifle is kept swinging and the shot is squeezed off as the proper lead is reached.

d. Preparatory exercises.—In order to familiarize the individual with different target speeds, the instructor has the target towed at 15 and 25 miles per hour—

(1) Across the front, at 37.5 and 75 yards range.

(2) Toward the firer, from 100 to 25 yards.

(3) Away from the firer, from 25 to 100 yards.

Coaches, previously trained, illustrate the method of picking up the target, swinging through, and securing the correct lead for each range and speed. Throughout these exercises, the instructor reviews the technique described in *b* and *c* above.

■ 45. MOVING TARGET COURSE.

Course to be fired

Range (yards)	Number of rounds, M11 or M11A1	Position	Direction of movement of target	Speed (mph)
25	2	Kneeling in individual prone shelter.	Across front	15
50	2	Standing in foxhole	Across front	25
50 to 25	2	Reclining in individual prone shelter.	Approaching	15
75 to 50	2	Standing in foxhole	Approaching	25
25 to 75	2	Standing in foxhole	Receding	15

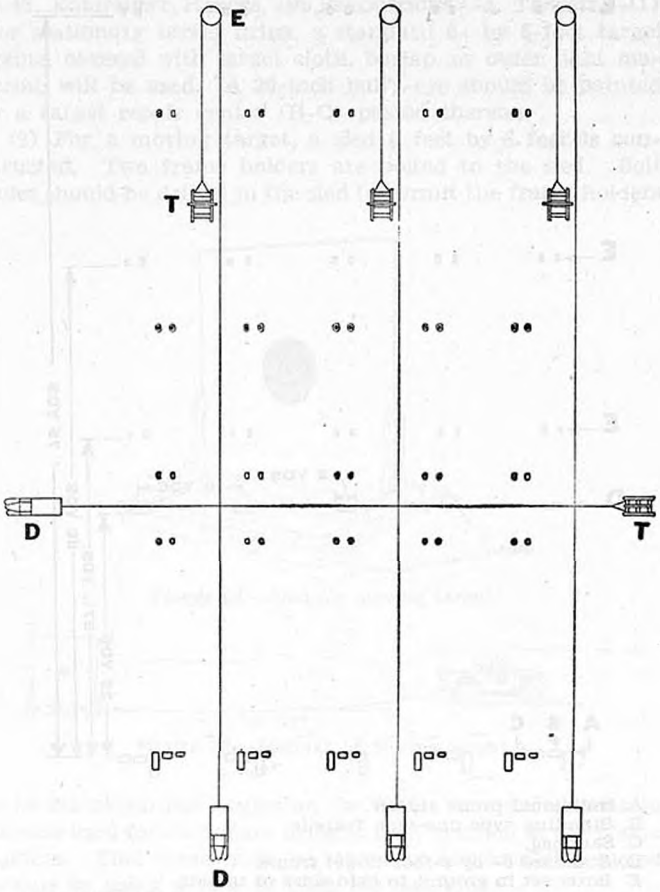
■ 46. FIRING AT FIELD TARGETS.—*a. Purpose.*—The purpose of this phase of training is to develop aptitude in the individual in the handling of his weapon under simulated battlefield conditions.

b. Extent.—The extent of this training is limited only by available time and ammunition allowances. Care in use of the practice grenades, and efficient maintenance of damaged grenades, will greatly extend their period of usability.

c. Prior training.—Before receiving training in firing at field targets, each individual will have completed the firing prescribed in paragraphs 43 *b* and 45.

d. Exercises.—(1) Individual prone shelters (slit trenches) and standing type one-man foxholes having been dug at suitable points on the 37-mm antitank moving target range, as suggested in paragraph 47, targets are operated at varying speeds and time intervals so as to provide surprise targets crossing, approaching, and receding at various angles. The firer is required to select the position to be used, and the proper time and method of engagement of the target.

(2) In addition to the firing exercises on the antitank range, advantage should be taken of every opportunity to combine training in antitank grenade firing with field exercises.



D.—Towing truck.
E.—Ground pulley.
T.—Target on sled.

For firing at crossing targets, one target may be towed along the front of the entire firing point, each individual firing at the target in succession and observing the strike of his own grenade. For firing at approaching and receding targets, a target will be necessary for each two firing points.

FIGURE 28.—Lay-out for moving-target firing.

(3) *Retrieving grenades.*—Since the firer can see the grenade in flight and striking the target, it is not necessary to cease firing and check targets after each shot. If one man is detailed to watch the flight of each grenade after it passes through the target and observe its final point of rest, much time will be saved in retrieving grenades.

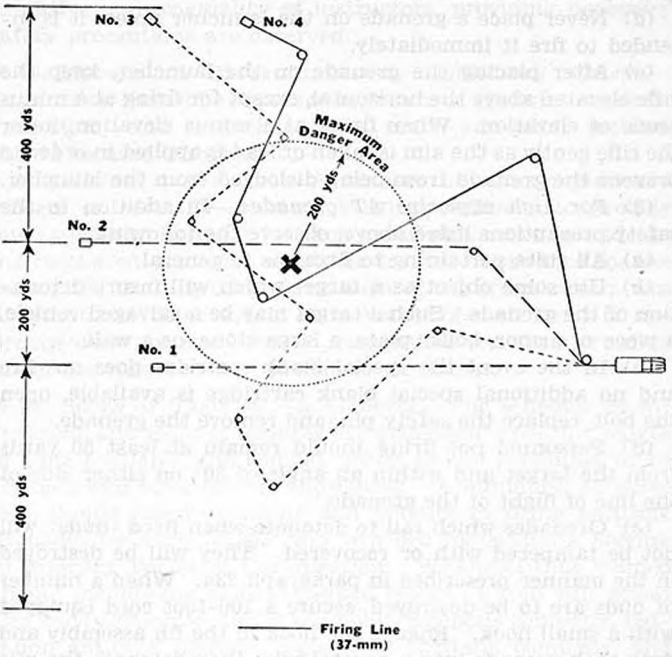


FIGURE 29.—Employment of 37-mm antitank range for antitank practice grenade field firing.

(4) *Field firing.*—The 37-mm antitank range may be utilized for field firing exercises with AT practice grenades by constructing several individual prone shelters or standing type one-man foxholes at a location such as that indicated by X in figure 29, where several moving targets pass within a range of 75 yards.

c. Safety precautions.—(1) *For AT practice grenades.*—(*a*) Keep the grenade clean and dry, particularly the inside of the tube of the fin assembly.

(*b*) See that there are no burs on the rings of the grenade launcher, and that the rings are free from grit.

(*c*) Inspect the wing nut on the clamp of the launcher frequently to insure that it is tight.

(*d*) Never place a grenade on the launcher unless it is intended to fire it immediately.

(*e*) After placing the grenade on the launcher, keep the rifle elevated above the horizontal, except for firing at a minus angle of elevation. When firing at a minus elevation, lower the rifle gently as the aim is taken or lead is applied in order to prevent the grenade from being dislodged from the launcher.

(2) *For high explosive AT grenades.*—In addition to the safety precautions listed above, observe the following:

(*a*) All rules pertaining to firearms in general.

(*b*) Use some object as a target which will insure detonation of the grenade. Such a target may be a salvaged vehicle, a piece of armor, boiler plate, a large stone, or a wall.

(*c*) In the event the special blank cartridge does not fire and no additional special blank cartridge is available, open the bolt, replace the safety pin, and remove the grenade.

(*d*) Personnel not firing should remain at least 50 yards from the target and within an angle of 30° on either side of the line of flight of the grenade.

(*e*) Grenades which fail to detonate when fired (duds) will not be tampered with or recovered. They will be destroyed in the manner prescribed in paragraph 23*a*. When a number of duds are to be destroyed, secure a 100-foot cord equipped with a small hook. Engage the hook in the fin assembly and drag each grenade into a central pile; then detonate the pile with TNT. This operation should be under the direction of an officer or a specially trained soldier.

SECTION III

ADVICE TO INSTRUCTORS

■ 48. GENERAL.—Training in the use of the antitank grenade must not be restricted to hard and fast rules. Nothing in this manual is to be construed as limiting in any way the initiative and originality of instructors, providing necessary safety precautions are observed.

■ 49. METHOD OF INSTRUCTION.—*a. Applicatory system.*—Instruction should be imparted by means of explanation, demonstration, and imitation. The coach-and-pupil method should be used throughout.

b. Assistant instructors.—A number of noncommissioned officers or specially selected privates, sufficient to provide one assistant instructor for each group of six men to undergo instruction at one time, should be trained in advance for use during the training of the remainder of the organization. An assistant instructor should be in charge of each group of approximately six men and be responsible for their training under the supervision of the officer in charge.

■ 50. SCOPE OF TRAINING.—*a. General.*—The schedule of instruction and scope of training are dependent upon the length of time available, the combat duties of the personnel to be trained, and ammunition allowances. A minimum of three men should receive training and practice in firing antitank grenades for each M1903 rifle provided for antitank defense in Infantry Tables of Organization. Personnel thus trained should include the assistant squad leader of each rifle squad and *each* section leader of the heavy weapons company, battalion antitank platoon, regimental antitank company, and cannon company.

b. Allotment of time.—(1) A total of 10 hours should be allotted for training, apportioned as follows:

Period	Hours	Instruction	Equipment
1	1	Conference, demonstration, and practical work in use of accessories and in sighting and aiming.	Rifles with launchers; grenades, AT, M11 or M11A1; rifle rest; target frame; 20-inch aiming disk.
2	1	Conference, demonstration, and practical work in positions and sequence of operations in loading and firing.	Rifles, with launchers, and recoil pads; target frame; grenades, AT, M11 or M11A1; sandbags; standing type one-man foxholes; individual prone shelters.
3	4	Firing stationary target course.	Same equipment as above; stationary targets; cartridges, AT grenade, caliber .30, M3.
4	4	Conference on range estimation and leads. Demonstration of method of firing at moving targets. Firing moving target course.	Same equipment as above. Trucks and sleds for moving targets.

(2) At the beginning of each period of instruction, the entire class should be assembled and the officer in charge should cover the work of the period with a brief conference and demonstration. Practical work should be conducted by assistant instructors in charge of each group.

c. After the moving target course has been fired, all individuals undergoing instruction should receive further training in firing at field targets.

APPENDIX

LIST OF REFERENCES

TM 9–1900.
SNL S–3.
AR 775–10.