

GRENADES, HAND AND RIFLE

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Section

INTRODUCTION

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1. PURPOSE.

a. The purpose of this manual is to supply such information of technical nature concerning grenades as may be required for the care, handling, and use.

2. SCOPE.

a. This manual contains information concerning all current models of hand and rifle grenades, grenade fuzes, and accessories, which are procured and issued by the Ordnance Department. It also describes grenades issued by Chemical Warfare Service.

** Dissemination of restricted matter—The information contained in restricted documents and essential characteristics of restricted material may be given to any person known to be in service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except through authorized military public relations agencies. (See also paragraph 18 b, AR 380-5, 28 September 1942.)*

* Supersedes TC 10, 4 February 1943; TC 46, 12 April 1943; TC 80 (pars. 1 to 5), 7 July 1943; TC 82 (par. 5), 10 June 1943; and TC 93 (pars. 4 and 5), 5 July 1943.

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Section II

GENERAL

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3. DESCRIPTION.

a. A grenade is a small missile originally designed to be thrown by hand. It consists of a container filled with an explosive or chemical charge, together with a means of exploding or scattering the charge at the target. Similar missiles, designed to be projected by rifles, are called rifle grenades because of their similarity in construction and use. Hand grenades furnish the soldier with an auxiliary weapon similar to a shell or bomb to supplement his basic weapons. Rifle grenades are valuable not only for specialized use, such as against tanks, but also for covering the ranges between the maximum for hand grenades and the minimum for mortar shell.

4. CLASSIFICATION.

a. **General.** Grenades are classified according to method of projection as hand grenades or rifle grenades. They are further classified according to filler as explosive, chemical, or training.

b. Explosive Grenades.

(1) Hand grenades containing an explosive charge are of two types. One type has a light walled container and depends upon blast for its effect. The second or fragmentation type has a heavy metal body and its effect depends principally upon the shattering of the body and the scattering of the fragments at high velocity. The first type grenades can be thrown a greater distance than their effective radius, hence may be used without cover; the second or fragmentation type grenades have a danger radius greater than the distance they can be thrown; they must be used from cover.

(2) Explosive rifle grenades may be of special design for use against tanks or may be designed for fragmentation or blast effect against personnel or light material targets.

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c. **Chemical Grenades.** A chemical grenade is one whose filler produces a toxic or irritating physiological effect, a screening smoke, an incendiary action, or a combination of any or all of these. Those having more than one effect are classified according to the principal action.

d. **Training Grenades.** Grenades are provided for training and practice. They may be completely inert (training) or they may contain a reduced charge (practice).

5. IDENTIFICATION.

a. **General.** Ammunition is identified by the standard nomenclature of the item and the ammunition lot number. Both are marked on the original packing of the item and on the item itself, unless the item is too small.

b. **Standard Nomenclature.** Standard nomenclature is established in order that each item stored and issued by the Ordnance Department may be specifically identified by name. Such nomenclature is published in Standard Nomenclature Lists (SNL's). Except for certain cases described in subparagraph e, below, the use of standard nomenclature is mandatory for all purposes of record.

c. **Ammunition Lot Number.** When ammunition is manufactured, an ammunition lot number is assigned in accordance with pertinent specifications. It represents a lot or batch of items manufactured under uniform conditions which are expected to function uniformly. In general, it consists of a series of letters and figures representing the loader's initials, or symbol, and the loader's lot number. The use of the lot number is mandatory for all records pertaining to the particular ammunition including reports on condition, function, and accidents.

d. **Mark or Model.** When a particular model is adopted it is designated by a model number, which becomes part of the standard nomenclature of the item. This consists of the letter M followed by an arabic numeral. Formerly the model was designated by the word "Mark," abbreviated "Mk.," followed by a roman numeral. Modifications of the original model are indicated by adding the letter A and the appropriate arabic numeral to the original model designation. Thus, "Mk. IIIA2" indicates the second modification of the item whose original designation was Mk. III.

e. **Ammunition Identification Code.** Each complete round and each item of issue is assigned an ammunition identification code symbol in order to facilitate the making of requisitions and reports in the field. These symbols are published in SNL's and in Ordnance Field Service Bulletin No. 3-14.

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care should be exercised to insure that fuze cavities are clear of obstructions before attempting to assemble the fuze.

g. Disassembly of ammunition or components is not permitted except as specifically authorized herein, or by other competent authority.

h. Grenade fuzes and detonators are especially sensitive and should be protected from shock, heat, and friction. By shock is meant that which is caused by two fuzes knocking together when carried loose in the pocket. By heat is meant any abnormal heat such as that produced by prolonged exposure to the direct rays of the sun. By friction is meant any abnormal friction such as sliding across a table or being forced into a tight or obstructed fuze cavity.

i. The safety pin of a grenade fuze will be removed just before throwing or firing the grenade *and at no other time*. Care should be exercised to hold the safety lever firmly in place after the safety pin has been removed. The hook on the lever may occasionally be too short and may slip off the lip of the fuze. In such a case, the lever would tend to creep forward under the hand until the firing pin was released.

j. Rifle grenades prepared for firing by removal of the safety pin and not fired, will be rendered safe by replacing the pin securely before the grenade is removed from the launcher. The ring of the safety pin should not be used to lift or carry a grenade.

7. STORAGE AND PRESERVATION.

a. Explosives and ammunition should be stored in an area set aside for the purpose and at adequate distances from inhabited buildings, public highways and railways. Magazines or stacks should be separated from each other by sufficient distances to insure that the explosion of one pile will not cause the detonation of the next.

b. Ammunition should be piled by lot number in stable piles with enough dunnage to keep the pile clear of the floor or the ground, and also to insure free circulation of air throughout the pile.

c. No loose rounds or components will be permitted to remain in a magazine or with any other store of ammunition. Boxes which have been opened but not completely emptied will be closed and fastened in a manner as effective as the original packing.

d. Trash, empty boxes, scrap lumber, waste, rags, oils, paints and the like will not be permitted to remain in magazines containing explosives or ammunition nor in the neighborhood of any stock or pile of ammunition.

e. Smoking, carrying matches, and the use of lights other than those approved, in the vicinity of explosives or ammunition is forbidden.

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f. Grenades may be stored in one magazine with any type of fix or semifixed ammunition; however, this applies to grenade fuzes or when the fuze is issued assembled to the grenade. Fuzes packed separately may be stored with primers, detonator, boosters, or artillery or bomb fuzes. When the total amount of explosives is less than 10 pounds, grenades and fuzes may be stored together.

g. There should be at least two separate stocks of each kind ammunition on hand. Fuzes particularly, should be spread as much storage facilities permit.

8. DESTRUCTION OF UNSERVICEABLE MATERIEL.

a. Unserviceable materiel will be destroyed by authorized experienced personnel. Safety precautions, such as those laid down TM 9-1900 or the Ordnance Safety Manual, will be observed.

b. Grenades may be destroyed by burning in a pit: A fire is built and the grenades may be fed from behind a barricade down a baffle chute one at a time, waiting for the explosion of the previous grenade before feeding another.

c. Grenades may be destroyed by detonation: A number of grenades, not to exceed 20, are piled in a pit and three blocks of TNT primed and placed on top of the pile. The pit is covered and the TNT is detonated by means of safety fuze and a blasting cap or by electric blasting cap.

d. Grenade fuzes may be destroyed by placing on a layer of combustible material in a covered trench, lighting the material and taking cover.

e. Grenade duds may be gathered up and carried to a central point for destruction except when examination shows the occurrence of hung striker, that is, a grenade whose fuze striker has not rotated to strike the primer. In such a case, the dud will be destroyed in place with explosive. Care should be exercised not to disturb the dud when placing the charge.

f. Rifle grenade duds will be destroyed in place with explosive.

9. PACKING AND MARKING FOR SHIPMENT.

a. **Packing.** Grenades are packed in fiber containers which, in turn, are packed in wooden boxes. Current packings are shown in table I and figures 1, 2, and 3.

b. **Marking.** In addition to the nomenclature and lot number, packings offered for shipment are marked with the ICC name or classification of the article, names and address of consignor and consignee, the AIC symbol, and the weight and volume of the packing.

TABLE A
PACKING AND SHIPPING DATA

PAR. IN TEXT	NOMENCLATURE	MARKING REQUIRED BY I.C.C. REGULATIONS	INNER PACKING		OUTER PACKING								ESTIMATED PACKING PER				
			Method and Drawing No.	Method	Drawing Nos.	DIMENSIONS (FT.)			Area-Sq. Ft.	Vol.-Cu. Ft.	Wt.-Lbs.	No. Per Ton	SHIP TONS PER PKG.	TRUCK		R.R. CAR	
						L.	W.	H.						1 1/2 Ton	2 1/2 Ton	40 Ton	50 Ton
12	GRENADE, hand, fragmentation Mk. IIA1, w/hand grenade igniting fuse, M10A3	HAND GRENADES	1/cntr.M41 76-1-250 75-14-210	25/W.Bx	76-16-187 20-4-166	1.47	1.36	64	2.00	1.28	53	37	.032	56	94	1500	1875
14	GRENADE, hand, offensive, Mk. IIIA2, unfuzed	HAND GRENADES	none	50/W.Bx	76-16-341 20-4-318	2.14	1.12	57	2.40	1.36	52	38	.034	55	92	1480	1850
15	FUZE, detonating, hand grenade, M6A3	DETONATING FUZES Handle Carefully	25/ctn 76-16-190	200/W.Bx	76-16-189 20-4-170	2.13	1.41	86	3.00	2.58	72	27	.065	41	69	972 ^v	972 ^v
18	GRENADE, hand, training, Mk. IA1	(Not required)	none	24/W.Bx	76-16-248 20-4-256	2.06	.79	57	1.63	.93	48	41	.023	63	104	1696	2102
21	GRENADE, AT, M9A1	RIFLE GRENADES	1/cntr.M81 76-1-411 75-14-340	10 w/11 ctg./W.Bx	76-1-410 20-4-309	1.28	.55	1.22	.70	.86	30	66	.022	100	166	2650	2952 ^v
22	GRENADE, rifle, practice, M11A2	(Not required)	1/cntr. 76-1-433	50/W.Bx	76-1-432 20-4-319	2.23	1.19	1.24	2.66	3.30	100	20	.082	30	48	756 ^v	756 ^v
24	GRENADE, rifle, fragmentation, M17	RIFLE GRENADES	1/cntr.M112 75-14-407	10 w/11 ctg./W.Bx	76-1-527 20-4-379	1.55	.55	1.08	.85	.92	33	60	.023	90	151	2424	2625 ^v

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25	ADAPTER, grenade projection, M1	SMALL ARMS AMMUNITION	none	48 w/55 ctg./W.Bx	76-1-511 20-4-369	2						66	.038	69	116	1440 ^v	1440 ^v
29	GRENADE, smoke, red, AN-M3	Fireworks Handle Carefully Keep fire away	1/cntr.	25/W.Bx	B13-9-15 C.W.S.	1	7 1/2	7				32	.041	49	83	1311	1495 ^v
28	GRENADE, hand, irritant, CN-DM, M6	Fireworks Handle Carefully Keep fire away	1/cntr. E13-9-36	25/W.Bx	B13-9-15 C.W.S.	1	4 1/2	7 1/2				41	.026	62	104	2340 ^v	2340 ^v
29	GRENADE, smoke, white, HC, AN-M8	Fireworks Handle Carefully Keep fire away	1/cntr. E13-9-36	25/W.Bx	B13-9-15 C.W.S.	1	4 1/2	7 1/2				41	.026	62	104	2340 ^v	2340 ^v
29	GRENADE, hand, smoke, WP, M15	White Phosphorus with Detonating Fuses Handle Carefully	1/cntr.	25/W.Bx	B13-9-15 C.W.S.	1	11	11				41	.026	62	104	2340 ^v	2340 ^v
30	GRENADE, incendiary, AN-M14	Fireworks Handle Carefully Keep fire away	1/cntr. w/1 clamp	25/W.Bx	B13-9-15 C.W.S.	1	11	11				36	.026	54	90	2340 ^v	2340 ^v
29	GRENADE, smoke, colored, M16	Fireworks Handle Carefully Keep fire away	1/cntr.	25/W.Bx	B13-9-15 C.W.S.	1	11	11	.58			41	.026	62	104	2340 ^v	2340 ^v

GENERAL

v—Limited by volume.
cntr.—container
ctn.—carton
ctg.—cartridge
W.Bx.—wooden box

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0. FIELD REPORT OF ACCIDENTS.

a. When an accident involving the use of ammunition occurs during training practice, the procedure prescribed in AR 750-10, section VII, will be observed by the ordnance officer under whose supervision the ammunition is maintained or issued. Where practicable, reports covering malfunctions of ammunition in combat will be made to the Chief of Ordnance, giving the type of malfunction, type of ammunition, the total number of the complete rounds or separate loading components, and condition under which fired.

Section III

EXPLOSIVE HAND GRENADES

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1. GENERAL.

a. Explosive hand grenades are, in general, classified as defensive and offensive. Defensive hand grenades are designed for use from protective cover; their danger radius is greater than the distance they can ordinarily be thrown. Offensive hand grenades are designed for use by troops advancing in the open; their effective range is shorter than the distance they can be thrown. The defensive hand grenade is also called the fragmentation type because its effect is produced by the projection at high velocity of the fragments of its heavy metal body. Hand grenade fuzes are "time" and "automatic." They are classified as time fuzes because they explode the grenade charge a certain number of seconds after the grenade is thrown and as automatic because they start timing automatically as the grenade leaves the hand.

2. GRENADE, HAND, FRAGMENTATION, MK. IIA1, WITH HAND GRENADE IGNITING FUZE, M10A3.

a. Grenade. This grenade (figs. 4 and 5) is issued loaded and primed, ready for use. The body is a cast iron shell in the shape of a large lemon, and is grooved horizontally and vertically to assist in the

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formation of uniform fragments of effective size. It is 3.6 inches length and 2.25 inches in diameter. With fuze assembled, the grenade is 4.5 inches long. This grenade is fuzed with FUZE, igniting, hand grenade, M10A3 and is loaded with 0.74 ounce of E.C. blank 1 powder. The empty body weighs approximately one pound, load and fuzed, the grenade weighs 1.31 pounds.

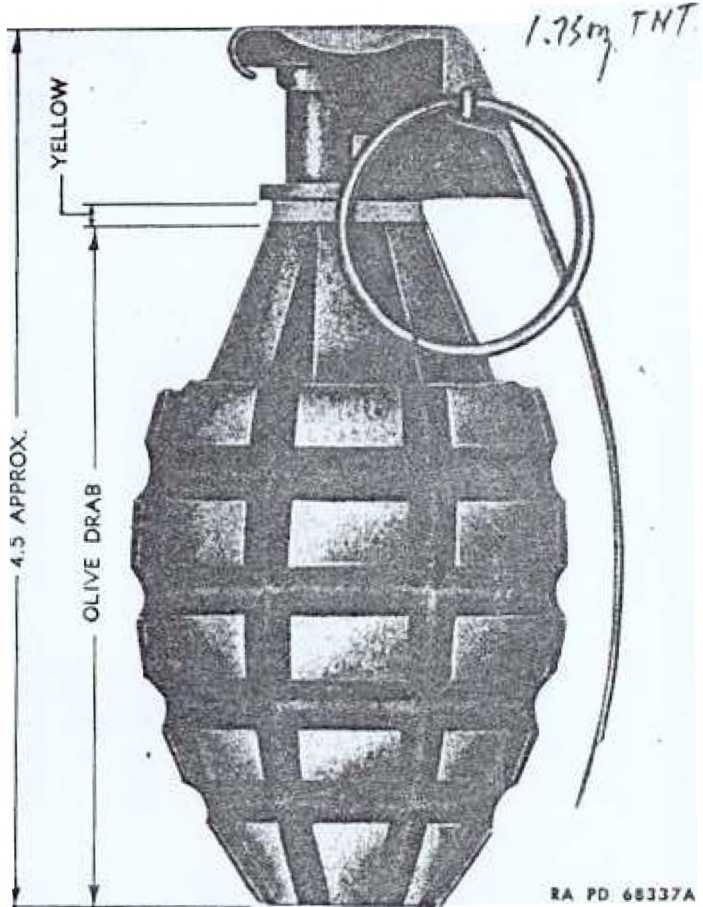


Figure 4 — GRENADE, Hand, Fragmentation, Mk. II A1, w/Hand Grenade Igniting Fuze, M10A3

b. **Fuze.** FUZE, igniting, hand grenade, M10A3 (fig. 5) is ordinarily issued assembled to the grenade because, using this type fuze the explosion of one grenade will not cause a mass detonation. The fuze consists of a body, striker, safety lever, and safety pin. The box

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f. **Packing.** Fragmentation grenades with igniting fuze assembled are packed one per fiber container M41, 25 such containers per wooden box. Detailed information will be found in paragraph 9, table I.

13. EARLIER MODELS.

a. Earlier models of the grenade body were designed with a filling hole in the bottom which was pipe-threaded and closed with a metal plug.

b. World War I fragmentation grenades were loaded with granular TNT and fired by a detonating fuze. This grenade was stored and issued unfuzed and was fuzed in the field as described for the offensive grenade (par. 14) below.

c. An earlier model of the fuze is the M10A2. This is identical with the M10A3 except for details of the delay element which give a delay of about 5 seconds (4.3 to 5.5 seconds).

14. GRENADE, HAND, OFFENSIVE, MK. IIIA2.

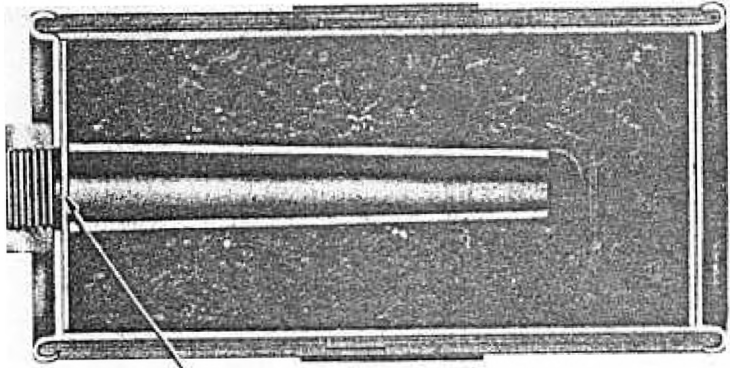
a. **Description.** This grenade (fig. 6) consists of a cylindrical pressed fiber body and a charge of pressed TNT. The body is about $4\frac{1}{2}$ inches in length and $2\frac{1}{8}$ inches in diameter. With fuze assembled, the over-all length is 5.35 inches. The head contains a threaded fuze hole which is sealed by a waterproof paper disk. This grenade is loaded with 0.427 pound of TNT pressed into the form of a cylinder with a paper-lined fuze well opening from one end. It is intended for use with FUZE, detonating, hand grenade, M6A3 (par. 15), but when used for demolition, may be used with any of the standard detonating firing devices or with primacord wedged into the fuze well. As issued, unfuzed, the loaded grenade body weighs 0.63 pound; fuzed, it weighs .84 pound.

b. **Operation.** This grenade is operated in the same manner as the fragmentation grenade described above (par. 12) and the same precautions should be observed. It may be thrown in the open, however, because there are no flying fragments produced by the grenade body and the blast is not effective against personnel except at very short ranges or in enclosed spaces. The principal use of this grenade is for demolition, and care should be exercised to have cover available against fragments of the structure demolished. If increased blast effect is necessary several grenades may be tied together. In this case only one grenade need be fuzed if the grenade bodies are in contact.

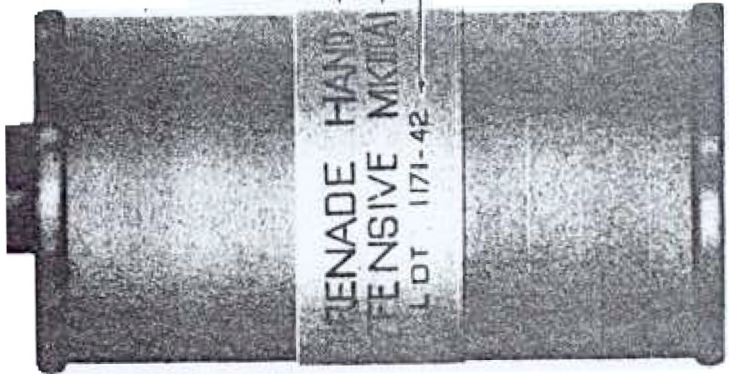
c. Fuzing.

(1) The unopened boxes are taken to a convenient place, which is 100 feet or more from any store of explosives or ammunition, and opened there. Boxes will not be opened nor grenades fuzed within 100 feet of a store of explosives or ammunition.

EXPLOSIVE HAND GRENADES



WATERPROOF PAPER SEAL



— LABEL - YELLOW (MARKING IN BLACK)

— MODEL OF GRENADE

— LOT NUMBER AND YEAR LOADED

BA PD 68339

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(2) Remove grenade and fuze from their packing and examine them to be sure that they are the right type and in a serviceable condition. Break the sealing paper closing the grenade fuze well and insure that the well is clear and free of obstructions or foreign matter.

(3) Hold the fuze, detonator up, in the left hand and screw *the body of the grenade on to the fuze*. In the case of the Mk. IIIA2 grenade, the fiber washer supplied with the fuze is not used because the top of the grenade is fiber. The washer should be used whenever the fuze is screwed into a metal adapter.

(4) Seat the fuze firmly with the fuze wrench packed with the fuzes.

(5) Unused grenades will be unfuzed and returned to storage by reversing the steps above.

d. Care and Precautions in Handling.

(1) Although unfuzed offensive grenades are comparatively safe to handle, fuzed grenades must be treated with caution because they not only are liable to detonation in mass, but also liable to cause the detonation of other ammunition nearby.

(2) Grenades will be fuzed in quantities sufficient for anticipated current needs only.

(3) When returning unused grenades to storage, the fuze hole in the grenade will be sealed with tape.

e. Earlier Models.

(1) GRENADE, hand, offensive, Mk. IIIA1 (fig. 7), differs from the Mk. IIIA2 in that the ends of the grenade body are of sheet metal and the grenade weighs 0.875 pound fuzed. The Mk. III had metal ends and contained only 0.27 pound TNT. It was shipped with a wooden plug in the fuze well.

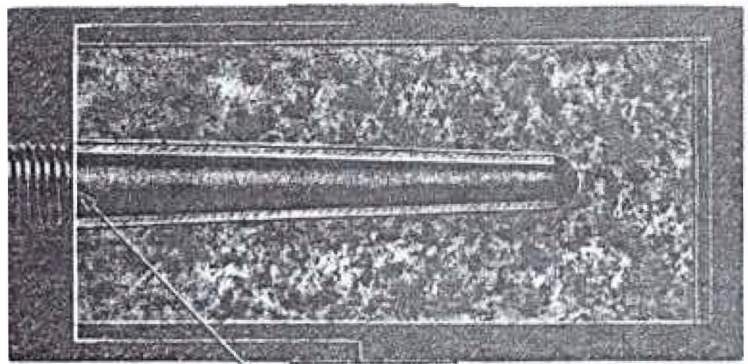
f. **Painting and Marking.** Offensive grenades are of black material or are painted black. Each grenade carries a yellow label marked in black with the type, model, lot, and year loaded.

g. **Packing.** Offensive hand grenades are packed 50 per box. Detailed information will be found in paragraph 9, table I.

5. FUZE, DETONATING, HAND GRENADE, M6A3.

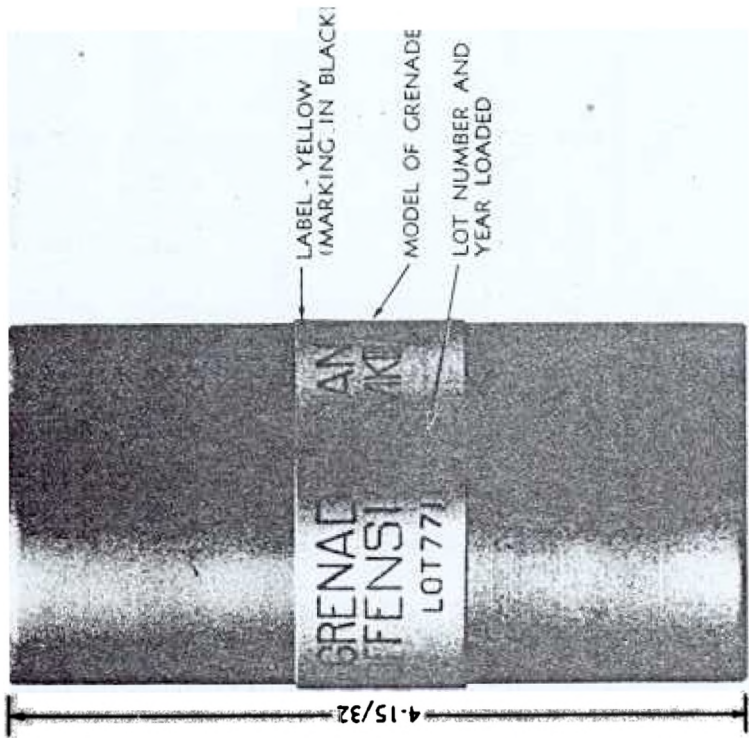
a. **Description.** This fuze (fig. 8) consists of a threaded metal body which contains the primer, delay element and detonator, and to which a spring-driven striker is attached. The striker is restrained by the safety lever which hooks over the lip on the body, passes across the head of the fuze and down the side of the grenade. The lever is held in place during shipping and handling by a safety cotter pin which is to be removed just before firing the grenade *and at no other time*. Since an occasional fuze may be found in which the safety lever can move forward when the safety cotter pin is removed, care should be

EXPLOSIVE HAND GRENADE



RA PD 68340

PAPER SEAL



LABEL - YELLOW
(MARKING IN BLACK)

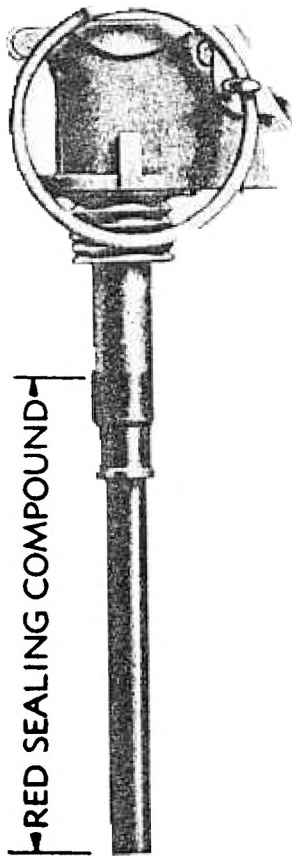
MODEL OF GRENADE

LOT NUMBER AND
YEAR LOADED

4-15/32

Figure 7 — GRENADE, Hand, Offensive, Mk. IIIA2, Unfuzed

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RA PD 53889

Figure 8 – FUZE, Detonating, Hand Grenade, M6A3

exercised to grasp the grenade in such a manner to prevent this occurrence. This fuze is distinguished from igniting fuzes by the red sealing compound used (instead of green) to seal the detonator into the fuze body. It differs from the M10A3, described (par. 12) above, in that the safety lever is straight while that of the M10A3 is curved; and differs from the M200A1, described (par. 27) below, in the length of the body being approximately 4 inches long as against 2 inches for the M200A1.

h. Operation. When the safety pin is removed and the safety lever released, the striker, driven by its spring, forces the lever off and, swinging around its pin, strikes the primer. The flame from the primer ignites a section of delay fuse which burns on the average for 4.5 seconds and then explodes the detonator which, in turn, detonates the

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charge of the grenade. The delay limits for this fuze are 4.0 to 4 seconds. The detonator consists of a 7-grain primer charge and a 13 grain tetryl charge.

c. **Earlier Models.** M6A2 and M6A1 models of this fuze may be encountered. These modifications have been declared unsafe for use and should be destroyed.

d. **Care and Precautions in Handling.** Detonating fuzes make a particularly sensitive type of ammunition. They should be protected against shock, heat, and friction. By shock is meant any shock produced by two fuzes knocking together when carried loose in the pocket or dropping from any height whatever, or by striking the box with a hammer. By heat is meant any source of abnormal temperature such as prolonged exposure to the direct rays of the sun. By friction is meant any friction such as sliding the fuze across the table or forcing it into a tight or obstructed well. Packages of fuzes opened but not completely used will be resealed as effectively as the original package before their return to storage.

e. **Painting and Marking.** The fuze is unpainted. It is however dipped in red sealing compound after the detonator is crimped in the body. This red color serves to distinguish readily detonating fuzes from igniting fuzes which are dipped in green compound. The safety lever of the fuze is stamped with the model, manufacturer's symbol, and lot number.

f. **Packing.** This fuze is packed 25 per carton, 8 cartons per box. More detailed information will be found in paragraph 9, table I.

16. IMPROVISED AND NONSTANDARD GRENADES.

a. **Fragmentation grenade bodies** may be used, with any type of firing device, for antipersonnel mines and booby traps. Fragmentation effect may be improvised by such methods as taping nails, cartridge cases or other metal, to the sides of a TNT or nitrostarch block and using a detonating fuze.

17. PRACTICE GRENADES.

a. **Grenade, Hand, Practice, Mk. II.** This grenade consists of a fragmentation body with a filling hole in the base, an igniting fuze M10A3, a small charge of black powder, and a cork plug. Extra fuze charges, and plugs are supplied separately so that the grenade body may be reused. When issued in bulk, fuze, charge, and plug are packed, each per box.

b. There are several improvised practice grenades which may be used:

(1) Fragmentation grenade bodies without fuze may be used for throwing practice.

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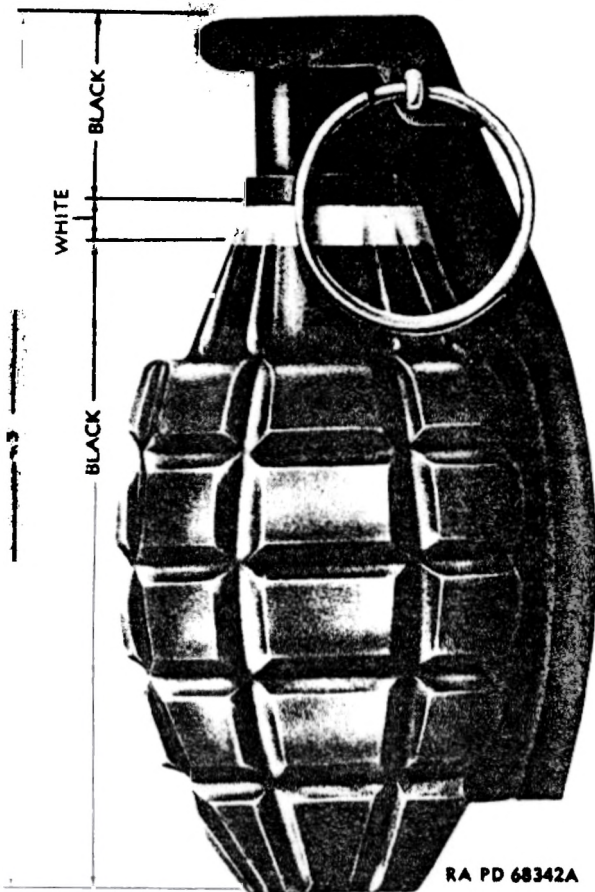


Figure 9 - GRENADE, Hand, Training, Mk. IAI

(2) Fragmentation grenade bodies of earlier manufacture, that is, with filling hole in the base, may be used with inert fuzes or with live fuzes and a cork replacing the metal plug in the base.

c. Practice grenades are painted blue and packed 10 per metal-lined box or 1 per fiber container, 24 per box.

18. GRENADE, HAND, TRAINING, MK. IAI.

a. This grenade (fig. 9) consists of a cast iron body with a removable pin and ring. It simulates the fuzed fragmentation grenade and is used for training and practice. It is painted black to indicate that it is completely inert and non-expendable. This grenade is packed 24 per box. Further details will be found in paragraph 9, table I.

Section IV

RIFLE GRENADES

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19. GENERAL.

a. Rifle grenades are used to cover that range between extreme range for hand grenades and minimum range for light mortar fire. Current rifle grenades have a hollow tail which fits over a grenade launcher attached to the muzzle of the rifle or carbine. The grenade is projected by the gases produced by firing a special blank cartridge in the weapon.

b. **Launchers.** The launcher currently used for rifle grenades consists of a short tube which is attached to the muzzle of the rifle or carbine. The hollow tail, or stabilizer assembly, of the grenade fits over the launcher, and projection is accomplished by the burning powder gases of a special blank cartridge. Launchers, cartridges, and weapon: authorized for firing are listed below:

Grenade Launcher	Rifle or Carbine	Cartridge
LAUNCHER, M1	RIFLE, U.S., cal. .30, M1903, M1903A1, and M1903A3	CARTRIDGE, rifle grenade, cal. .30, M3
LAUNCHER, M2	RIFLE, U.S., cal. .30, M1917	
LAUNCHER, M7	RIFLE, U.S., cal. .30, M1	
LAUNCHER, M8	CARBINE, cal. .30, M1, M1A1, M1A2	CARTRIDGE, grenade carbine, cal. .30, M6

(1) The following ammunition may be used with all the above launchers:

GRENADE, AT, M9A1

GRENADE, AT, M9

GRENADE, rifle, practice, M11, M11A1, and M11A2

ADAPTER, grenade-projection, M1, w/GRENADE, hand, fragmentation, Mk. II

GRENADES, HAND AND RIFLE

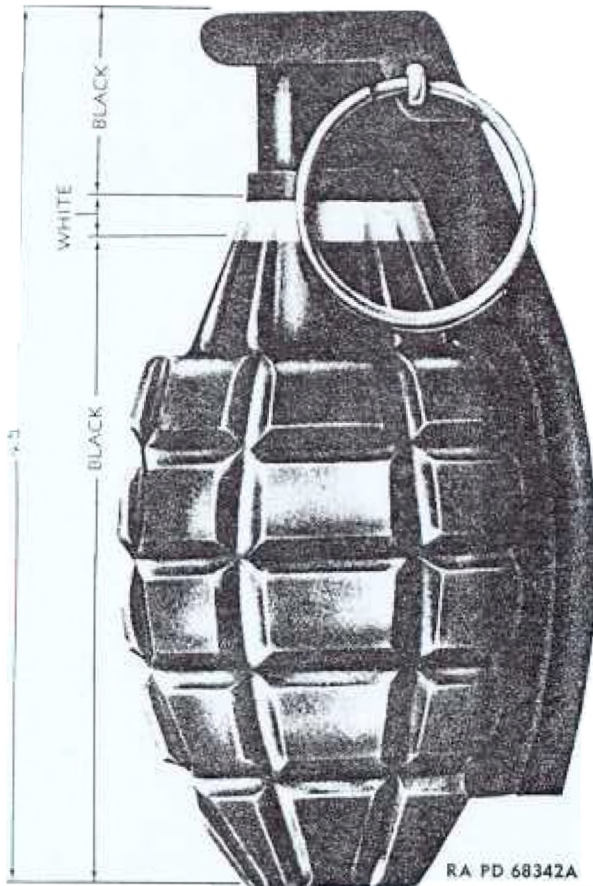


Figure 9 — GRENADE, Hand, Training, Mk. IA1

(2) Fragmentation grenade bodies of earlier manufacture, that is, with filling hole in the base, may be used with inert fuzes or with live fuzes and a cork replacing the metal plug in the base.

c. Practice grenades are painted blue and packed 10 per metal-lined box or 1 per fiber container, 24 per box.

8. GRENADE, HAND, TRAINING, MK. IA1.

a. This grenade (fig. 9) consists of a cast iron body with a removable pin and ring. It simulates the fuzed fragmentation grenade and is used for training and practice. It is painted black to indicate that it is completely inert and non-expendable. This grenade is packed 24 per box. Further details will be found in paragraph 9, table I.

Section IV

RIFLE GRENADES

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19. GENERAL.

a. Rifle grenades are used to cover that range between extreme range for hand grenades and minimum range for light mortar fire. Current rifle grenades have a hollow tail which fits over a grenade launcher attached to the muzzle of the rifle or carbine. The grenade is projected by the gases produced by firing a special blank cartridge in the weapon.

b. **Launchers.** The launcher currently used for rifle grenades consists of a short tube which is attached to the muzzle of the rifle or carbine. The hollow tail, or stabilizer assembly, of the grenade fits over the launcher, and projection is accomplished by the burning powder gases of a special blank cartridge. Launchers, cartridges, and weapons authorized for firing are listed below:

Grenade Launcher	Rifle or Carbine	Cartridge
LAUNCHER, M1	RIFLE, U.S., cal. .30, M1903, M1903A1, and M1903A3	CARTRIDGE, rifle grenade, cal. .30, M3
LAUNCHER, M2	RIFLE, U.S., cal. .30, M1917	
LAUNCHER, M7	RIFLE, U.S., cal. .30, M1	
LAUNCHER, M8	CARBINE, cal. .30, M1, M1A1, M1A2	CARTRIDGE, grenade carbine, cal. .30, M6

(1) The following ammunition may be used with all the above launchers:

GRENADE, AT, M9A1

GRENADE, AT, M9

GRENADE, rifle, practice, M11, M11A1, and M11A2

ADAPTER, grenade-projection, M1, w/GRENADE, hand, fragmentation, Mk. II

GRENADES, HAND AND RIFLE

RENADE, rifle, fragmentation, impact, M17
GNAL, ground, M17A1 to M22A1 inclusive

1. RANGE TABLES.

a. **AT Grenades.** Antitank Grenades M9 and M9A1, and the corresponding practice rounds, depend for range principally upon the elevation of the rifle at firing; the grenade is fully engaged on the launcher.

(1) When firing the M9 and M11, practice, set peep sight for 2000 rds.

Range of:	Use as Rear Sight:	Use as Front Sight:
yds.	Open sight just over peep sight	Top of grenade
5 yds.	Top of drift slide	Top of grenade
yds.	Top of sight leaf	Top of grenade
yds.	Top of sight leaf	Base of front sight

(2) When firing the M9A1 or M11A2 from M1903 or M1917 rifles:

Range of:	Use as Rear Sight:	Use as Front Sight:
yds.	Peep sight at 1875 yd.	Top of grenade
5 yds.	Peep sight at 2200 yd., use open sight	Top of grenade
yds.	Peep sight at 2200 yd., top of drift slide	Top of grenade
yds.	Top of sight leaf	Top of front sight

3) Range table for firing **GRENADE, AT, M9A1**, and practice, **1A2**, from M1 Rifles equipped with M7 Launchers:

Range (yards)	Angle of Elevation of Rifle (degrees)	Time of Flight (seconds)
55	5	1.0
106	10	1.9
151	15	2.8
190	20	3.7
220	25	4.5
242	30	5.3
256	35	6.1
261	40	6.8
260	45	7.5

RIFLE GRENADES

(4) Range table for firing GRENADE, AT, M9A1 and practice, M11A2, from carbines equipped with M8 Launchers:

Range (yards)	Angle of Elevation of Carbine (degrees)	Time of Flight (seconds)
36	5	0.8
70	10	1.5
100	15	2.3
127	20	3.0
149	25	3.7
166	30	4.3
178	35	5.0
184	40	5.5
184	45	6.1

b. **Fragmentation Grenades.** Impact fragmentation grenades and adapters depend for range principally upon the distance to which the grenade is placed on the launcher. The angle of elevation has very little to do with range but does control the time of flight. In order to provide for uniformity, launcher clips are provided. These clips are placed on the launcher so as to permit the tail of the grenade to slip over the launcher the desired amount. As a convenient means of describing the amount of engagement, the number of launcher rings left exposed by the grenade tail is taken as a measure.

(1) Range table for GRENADE, rifle, fragmentation, impact, M17, fired from M1903 and M1917 Rifles with Launchers M1 and M2, respectively:

Range (yards)	Rings on Launcher Exposed	Elevation of Rifle (degrees)
55	5	45
80	4	45
105	3	45
130	2	45
165	1	45
195	0	45
220	0	40

(2) Range table for firing ADAPTER, grenade-projection, M1, with GRENADE, hand, fragmentation, Mk. II, w/hand grenade igniting fuze, M10A3, fired from M1903, M1903A1, M1903A3, and M1917 Rifles with Launchers M1 and M2:

GRENADES, HAND AND RIFLE

Range (yards)	Rings on Launcher Exposed	Elevation of Rifle (degrees)
50	5	65
75	4	45
90	3	45
110	2	45
135	1	45
190	0	30

3) Range table for GRENADE, rifle, fragmentation, impact, M17, fired from M1 Rifles equipped with Launchers M7:

Range (yards)	Launcher Ring Showing (number)	Elevation (degrees)	Time of Flight (seconds)
56	6	45	3.3
79	5	45	3.9
104	4	45	4.5
130	3	45	5.0
157	2	45	5.5
186	1	45	6.0
200	0	45	6.3

4) Range table for GRENADE, rifle, fragmentation, impact, M17, fired from Carbines equipped with Launchers M8:

Range (yards)	Launcher Ring Showing (number)	Elevation (degrees)	Time of Flight (seconds)
36	6	45	2.6
58	5	45	3.3
76	4	45	3.8
92	3	45	4.2
109	2	45	4.6
126	1	45	5.0
136	none	45	5.2

5) Range table for ADAPTER, grenade-projection, M1, w/Mk. II fragmentation grenade, fired from M1 Rifles equipped with Launchers M7:

Range (yards)	Launcher Ring Showing (number)	Elevation (degrees)	Time of Flight (seconds)
58	6	45	3.4
81	5	45	4.0
104	4	45	4.6
128	3	45	5.1
151	2	45	5.6
170	1	30	4.5

55	5	65	5.0

RIFLE GRENADES

(6) Range table for ADAPTER, grenade-projection, M1, w/Mk. I fragmentation grenade, fired from Carbines equipped with Launchers M8:

Range (yards)	Launcher Ring Showing (number)	Elevation (degrees)	Time of Flight (seconds)
43	5	60	3.8
51	5	45	3.1
67	4	45	3.6
84	3	45	4.0
100	2	45	4.4
117	1	45	4.8
129	none	45	5.1
<hr/>			
115	none	30	3.6

21. GRENADE, AT, M9A1.

a. Description. This grenade (fig. 10), consists of a body, a stabilizer assembly, and a fin. The body is cylindrical with rounded ends 5.98 inches in length, 2 1/4 inches in diameter. The stabilizer is a hollow tube which screws into the base of the body and fits on the launcher. It also carries a wheel-shaped fin assembly which aids in stabilizing the flight of the grenade. The body is made of cast metal and weighs 0.76 pound including a charge of 4 ounces of high explosive. The stabilizer weighs 0.47 pound. The complete assembly weighs 1.23 pounds as fired. This grenade is designed primarily for use against tanks and other armored or resistant targets. It has an impact fuze assembled integral with it. The fuze is restrained from acting by a safety pin which projects through the stabilizer. When the pin is withdrawn, however, a drop of two feet, nose first, to a hard surface will cause the fuze to explode the grenade.

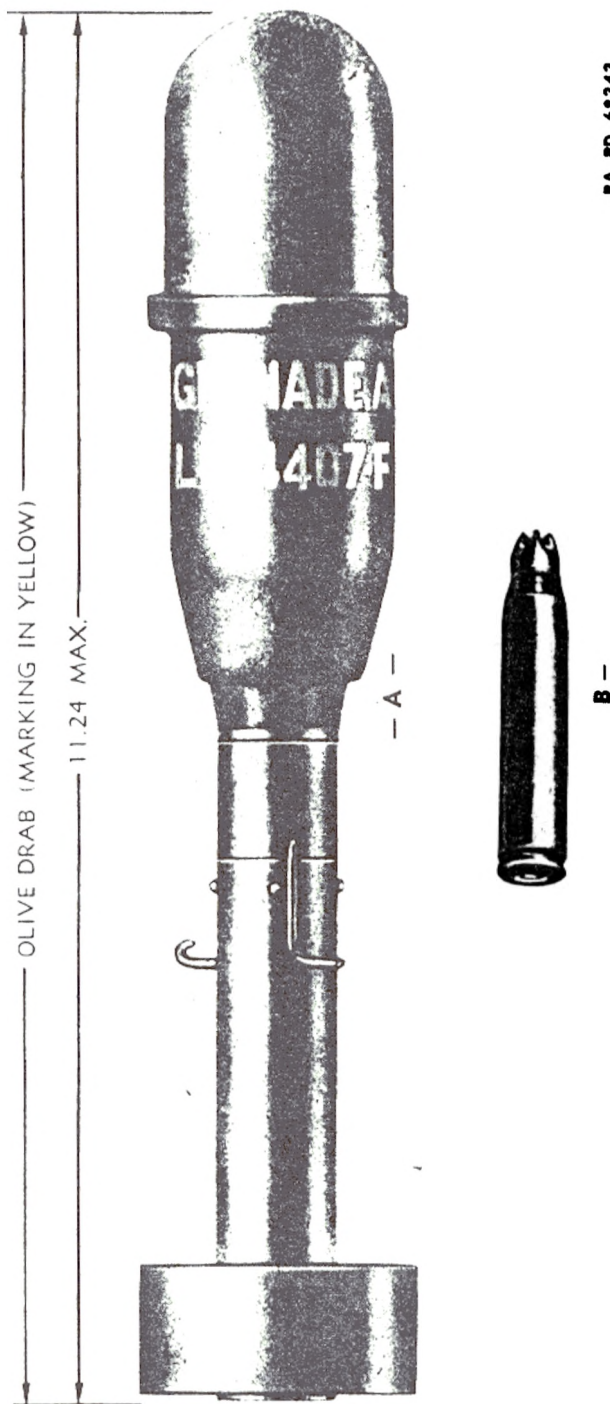
b. Sequence of Operations.

(1) In loading and firing U.S. Rifle M1 and Carbine M1, the following sequence will be observed:

- (a) Open bolt and clear the rifle.
- (b) Lock.
- (c) Insert grenade cartridge in chamber.
- (d) Close the bolt.
- (e) Place grenade on launcher in accordance with range table.
- (f) Withdraw safety pin.
- (g) Unlock.
- (h) Sight and fire.

(2) When using the M1903, M1903A1, and M1917 Rifles, the rifle will be locked after the bolt is closed.

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Figure 10 GRENADE, AT, M9A1, and CARTRIDGES, Rifle Grenade, Cal. .30, M3

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(3) When locking the M1903 or M1903A1 Rifles, raise the safety lock only to the vertical position. This facilitates unlocking the rifle quickly (g), should occasion demand.

(4) If the grenade is not fired, the following sequence will be observed:

(a) Lock.

(b) Replace safety pin in grenade and remove grenade from launcher.

(c) Replace grenade in container and reseal.

(d) Unload cartridge and repack.

c. Precautions.

(1) Once the grenade is on the launcher, care will be exercised not to lower muzzle, to such an extent that the grenade slides off.

(2) The grenade must strike within 20 degrees of normal to be sure to function. The velocity of the grenade itself is not a critical factor in its function. On striking, the grenade will pierce the armor of any known medium tank by the extremely high order detonation of its charge. The danger radius from fragments to the rear of the grenade is 50 yards.

d. Earlier Models. Grenade, AT, M9, has the same tail assembly as the M9A1. The head is acorn-shaped and is equipped with a point fuze. It is slightly less sensitive than the M9A1 and will not function on graze or on impact with soft earth or sand. The safety pin of the M9 is located in the base of the grenade body instead of in the stabilizer tube. Its pull ring is taped to the body with adhesive tape

e. Care and Precautions in Handling.

(1) Care must be exercised to use only the special grenade cartridge authorized for the weapon when firing rifle grenades. Any other blank cartridge may damage the rifle. The use of any cartridge that has a bullet assembled to project a rifle grenade will explode the grenade on the launcher.

(2) Handle the grenade with care to prevent damage to the tail assembly. Grenades with cracked, bent, or otherwise distorted stabilizer assemblies will not be used.

(3) Take care in firing through brush or trees; impact with branch will explode the grenade.

(4) Keep grenades and grenade cartridges together.

(5) Do not drop the grenade after the safety pin has been removed.

(6) Do not use the rifle grenade for a hand grenade by swinging it by the tail: a swing strong enough to throw the grenade an effective distance is liable to function the fuze.

GRENADES, HAND AND RIFLE

(7) Make sure that the tube of stabilizer is clean and that the grenade moves freely on the launcher.

f. **Painting and Marking.** The grenade is painted lusterless olive drab and marked in yellow with the type and model, lot, manufacturer's initial, and date of loading.

g. **Packing.** Rifle grenades are packed one per fiber container, 10 such containers and a carton of 11 cartridges per box. More detailed information will be found in paragraph 9, table I.

2. GRENADE, RIFLE, PRACTICE, M11A2.

a. This grenade (figs. 11 and 12) simulates the M9A1. It is the same size as the service grenade and is used for training in marksmanship. The grenade is so constructed that the fin and the ogive assemblies, which are most liable to damage in use, may be replaced and the grenade used repeatedly. The M11A1, an earlier model, has a replaceable tail only. The M11 was shaped like the M9 service grenade. The practice grenade is painted black and marked in white. It is packed one per fiber container, 50 such containers per box. Spare fins, ogives, and cartridges are furnished separately.

3. CARTRIDGES FOR GRENADE PROJECTION.

a. Two types of cartridges (fig. 13) are provided for projecting grenades.

(1) **CARTRIDGE, RIFLE GRENADE, CAL. .30, M3.** This cartridge is loaded in the standard cal. .30 case. The load consists of 5 grains of black powder and approximately 49 grains of a progressive burning smokeless powder; the exact amount is adjusted to give the M9A1 a velocity of 165 feet per second at 5 feet.

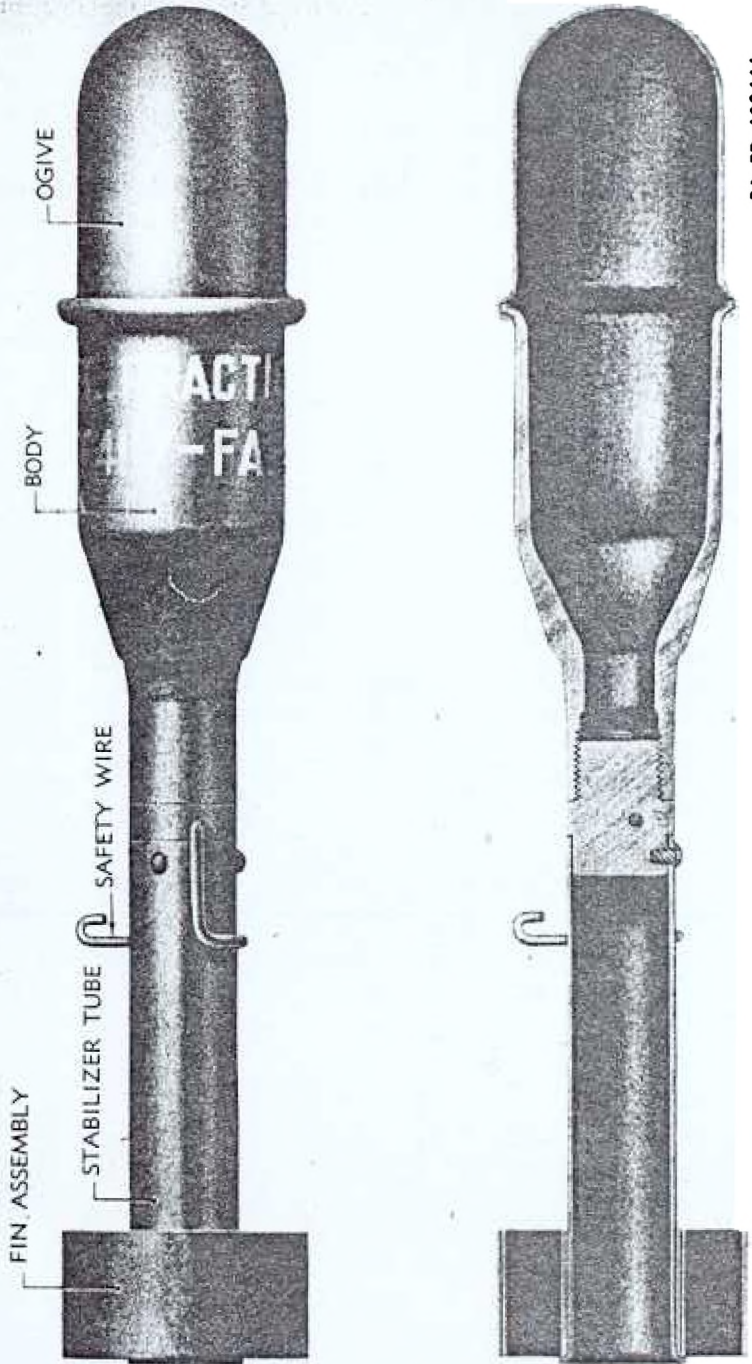
(2) **CARTRIDGE, GRENADE, CARBINE, CAL. .30, M6.** This cartridge is loaded in the standard carbine cartridge case with approximately 21 grains of special powder adjusted to give a velocity of 145 feet per second at 5 feet.

b. **Identification.** In addition to the markings on the packings, both cartridges may be distinguished from ordinary blank cartridges by the 5-point star crimp used to close the mouth of the case.

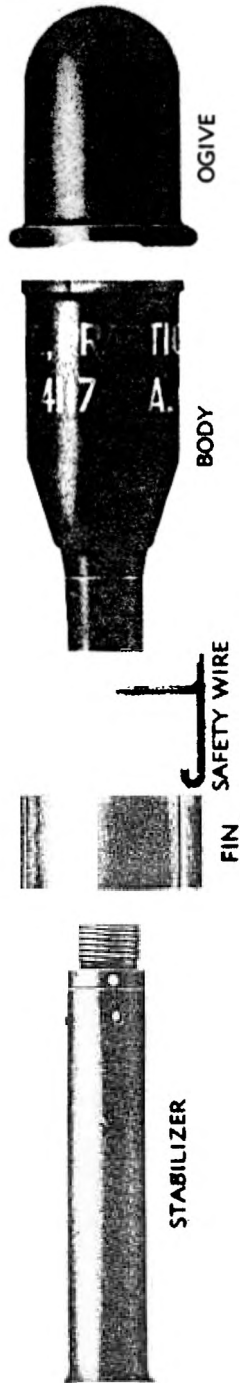
4. GRENADE, RIFLE, FRAGMENTATION, IMPACT, M17.

a. **Description.** This grenade (fig. 14) consists of a fragmentation type body similar to the Mk. IIA1 hand grenade (par. 12 above) assembled to a fuze and stabilizer assembly similar to that for the AT and practice rifle grenades (pars. 21 and 22). This grenade will explode on any impact sufficient to retard its flight sharply. It may not function on graze impact or on impact with water.

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Figure 12 — GRENADE, Rifle, Practice — Disassembled

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charge of the grenade. The delay limits for this fuze are 4.0 to 4.5 seconds. The detonator consists of a 7-grain primer charge and a 13.5 grain tetryl charge.

c. **Earlier Models.** M6A2 and M6A1 models of this fuze may be encountered. These modifications have been declared unsafe for use and should be destroyed.

d. **Care and Precautions in Handling.** Detonating fuzes make up a particularly sensitive type of ammunition. They should be protected against shock, heat, and friction. By shock is meant any shock produced by two fuzes knocking together when carried loose in the pocket, dropping from any height whatever, or by striking the box with a hammer. By heat is meant any source of abnormal temperature such as prolonged exposure to the direct rays of the sun. By friction is meant any friction such as sliding the fuze across the table or forcing it into a tight or obstructed well. Packages of fuzes opened but not completely used will be resealed as effectively as the original packing before their return to storage.

e. **Painting and Marking.** The fuze is unpainted. It is however dipped in red sealing compound after the detonator is crimped in the body. This red color serves to distinguish readily detonating fuzes from igniting fuzes which are dipped in green compound. The safe lever of the fuze is stamped with the model, manufacturer's symbol and lot number.

f. **Packing.** This fuze is packed 25 per carton, 8 cartons per box. More detailed information will be found in paragraph 9, table I.

16. IMPROVISED AND NONSTANDARD GRENADES.

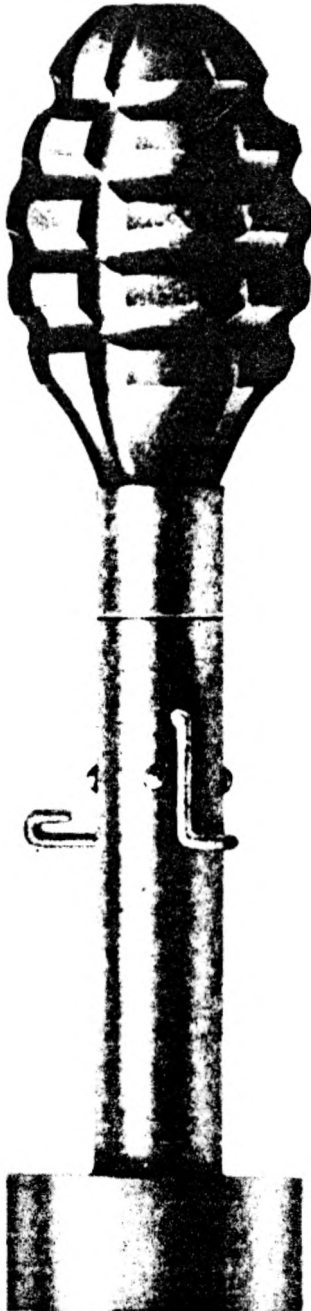
a. **Fragmentation grenade bodies** may be used, with any type firing device, for antipersonnel mines and booby traps. Fragmentation effect may be improvised by such methods as taping nails, cartridge cases or other metal, to the sides of a TNT or nitrostarch block and using a detonating fuze.

17. PRACTICE GRENADES.

a. **Grenade, Hand, Practice, Mk. II.** This grenade consists of a fragmentation body with a filling hole in the base, an igniting fuze M10A3, a small charge of black powder, and a cork plug. Extra fuze charges, and plugs are supplied separately so that the grenade body can be reused. When issued in bulk, fuze, charge, and plug are packed, each per box.

b. There are several improvised practice grenades which may be used:

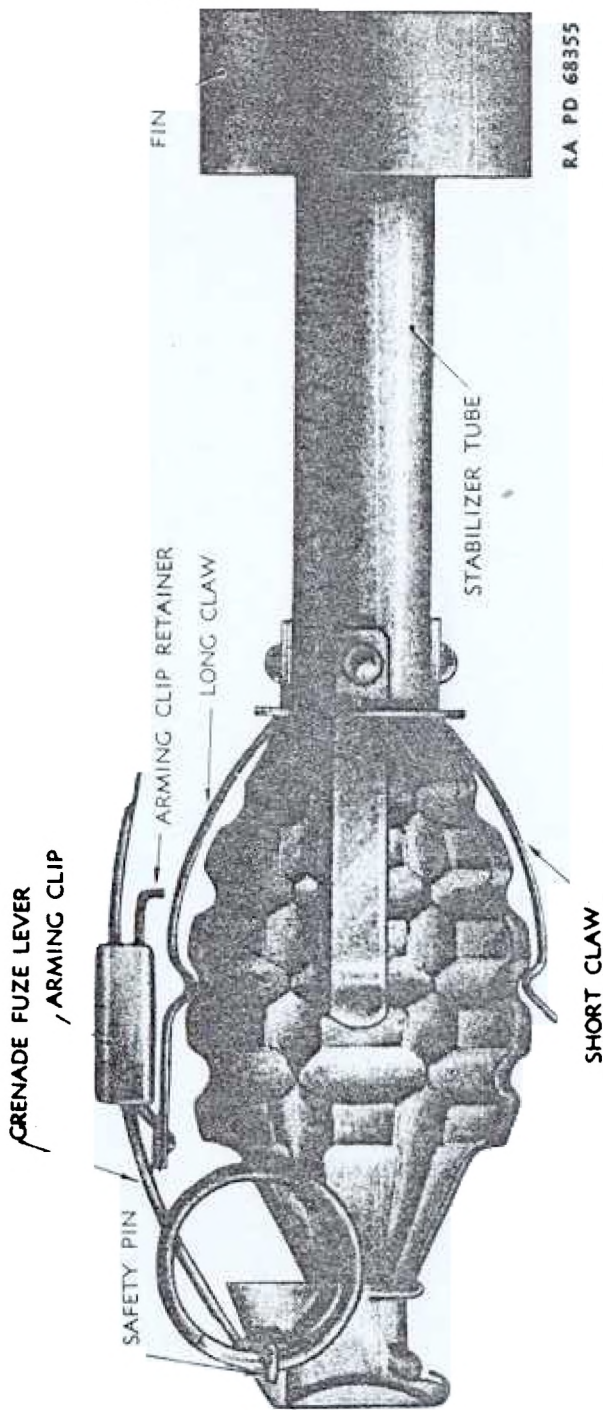
(1) Fragmentation grenade bodies without fuze may be used for throwing practice.



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Figure 14 -- GRENADE, Rifle, Fragmentation, Impact, M17

RIFLE GRENADES



RA PD 68355

Figure 15 - ADAPTER, Grenade Projection, M1, w/GRENADE, Hand, Fragmentation, Mk. II

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GRENADES, HAND AND RIFLE

the striker. If the lever is struck on its outer surface, near the striker, while in this condition, it is possible that the lever may spring loose from the fuze and release the striker, allowing the fuze to function. Care should be exercised, once the safety pin is removed, to prevent the lever being struck.

b. **Ground Signals.** Ground signals which have been adapted for firing from grenade launchers, are designated by A1 model numbers. The signals are packed with the stabilizer assembly closed by a cork plug and with the special blank cartridge attached to the cork by a metal clip. The signal is fired in the same manner as the rifle grenade except that it is fired almost vertically upward. The case rises to a height of approximately 600 feet where the signal assembly is ejected and burns according to type. Care should be exercised to fire the signal so that the case will not fall on friendly troops. Signals should be especially protected against moisture and should not be stored with other types of ammunition. Signals are packed one, with one cartridge, per fiber container, 25 such containers per box. See also paragraph 9, and table I.

(1) The types and models of ground signals supplied are as follows:

SIGNAL, ground, white star, parachute, M17A1
SIGNAL, ground, white star, cluster, M18A1
SIGNAL, ground, green star, parachute, M19A1
SIGNAL, ground, amber star, parachute, M21A1
SIGNAL, ground, amber star, cluster, M22A1
SIGNAL, ground, red star, parachute, M51A1
SIGNAL, ground, red star, cluster, M52A1

Section V

CHEMICAL GRENADES

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General	26
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Smoke grenades	29
Incendiary grenades	30
Frangible grenades	31

26. GENERAL

a. Chemical grenades (figs. 16 to 21) are those filled with a chemical agent which produces a toxic or irritating physiological effect, a screening or signalling smoke, an incendiary action or a combination of any or all of these effects. Chemical grenades are not stored or issued by Ordnance and are briefly described herein for completeness.

CHEMICAL GRENADES

b. **Fillers Used.** The following are the commonly used fillers for chemical grenades giving symbol, name and principal use:

Symbol	Name	Principal use
CN	Chloracetophenone, burning mixture	Tear gas
CN-DM	Chloracetophenone-Diphenylamine-chloroarsine, burning mixture	Tear gas—Vomit gas
HC	Hexachlorethane-zinc	White smoke producer
TH	Thermate, thermit and nitrates	Incendiary
WP	Phosphorus, spontaneously inflammable	Smoke

c. **Marking.** Chemical ammunition is painted blue gray. Colored bands and markings are used to indicate the type of filler as follows:

Color of Band	Marking	Type of Filler
Two green bands	(type, model and lot) in green	persistent gas, casualty agent
One green band	(type, model and lot) in green	nonpersistent gas, casualty agent
One red band	(type, model and lot) in red	irritant gas
One yellow band	(type, model and lot) in yellow	smoke (top of grenade painted color of the smoke)
One purple band	(type, model and lot) in purple	incendiary

d. **Precautions.** Chemical grenades do not ordinarily explode hence no cover is necessary to avoid fragments. However, the following precautions should be observed:

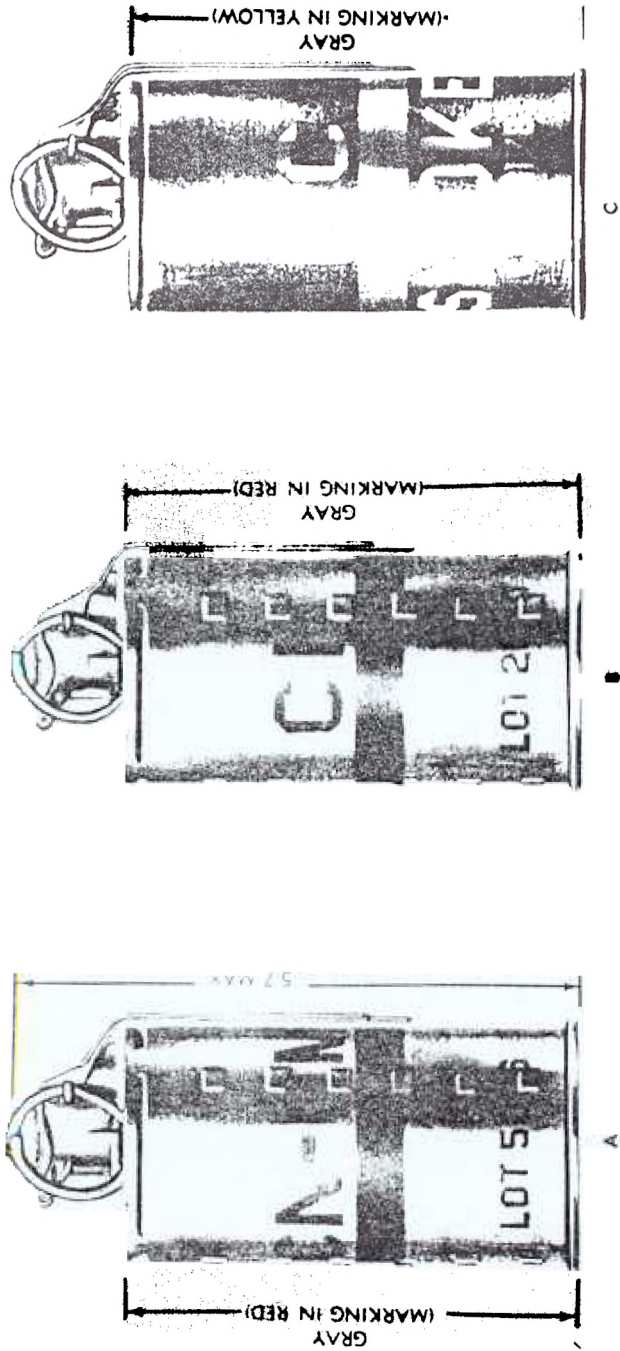
(1) In training and practice, chemical grenades should be thrown down wind. Gas masks should be available. Grenades should be thrown to function not less than 20 feet from personnel, due to the occurrence of an occasional flashing grenade.

(2) The incendiary effect of all burning grenades should be born in mind when using this type in the vicinity of dry vegetation.

(3) Chemical ammunition will be stored separately, and preferably down wind from other ammunition. Chemical munitions are classified as: Group A persistent vesicants; Group B nonpersistent, as gas and smoke; Group C spontaneously inflammable; and Group D incendiary or readily inflammable. Each of these types will be stored separately. FS and AC (par. 31) are group B chemicals, WP (par. 26) group C, all others listed in paragraphs 26 and 31 are group D.

(4) FS smoke, while not harmful to personnel, is corrosive toward metals and fabrics. Materiel exposed to FS should be washed as soon after exposure as practicable. FS liquid is a strong corrosive acid.

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Figure 16 Chemical Grenades

CHEMICAL GRENADES

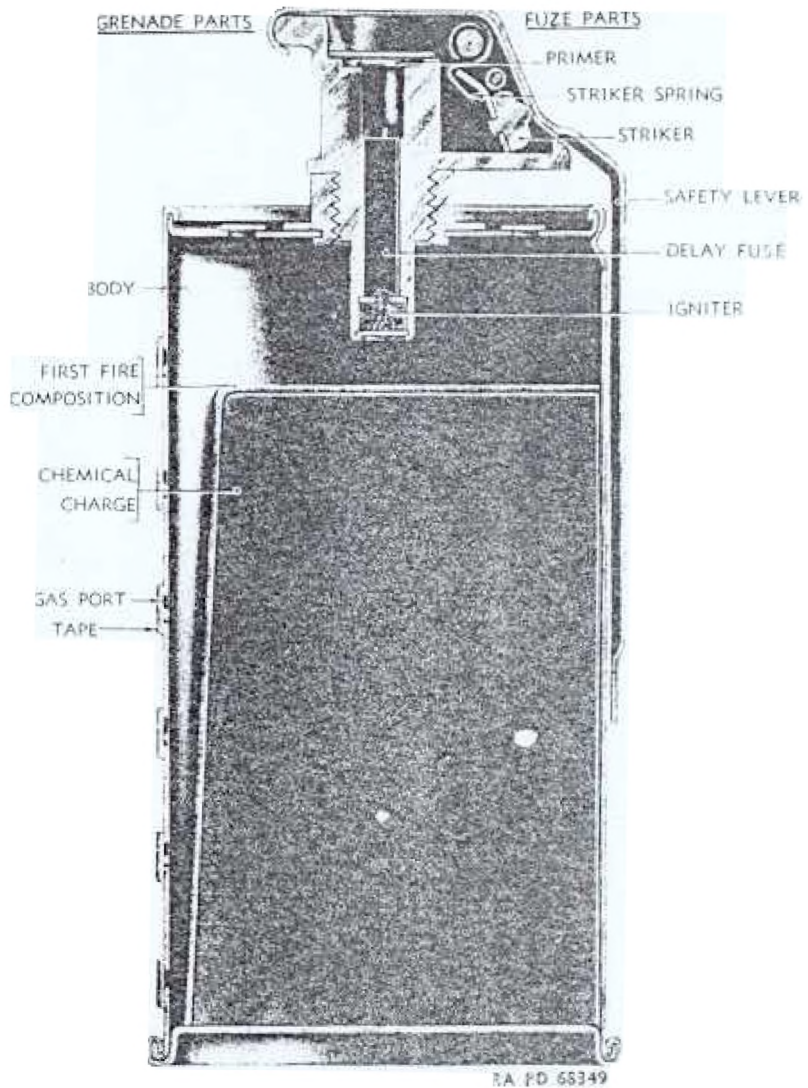


Figure 17 – Chemical Grenade w/Hand Grenade Igniting Fuze M200A1 – Section

GRENADES, HAND AND RIFLE

(5) Phosphorus is spontaneously inflammable on exposure to air. Phosphorus fires may be extinguished by water but will remain extinguished only as long as the phosphorus is covered with water. When phosphorus grenades burst, they may scatter the material over an area as large as 25 yards radius.

7. FUZE, IGNITING, HAND GRENADE, M200A1.

a. This is the fuze (fig. 17) generally used with chemical grenades. It is essentially the same as the M10A3 described in paragraph 12 except that the delay time averages 2 seconds. It is operated in the same manner. This fuze is always issued assembled to the grenade.

8. GAS GRENADES.

a. Gas grenades (fig. 17) are generally of the burning type, that is, they utilize the heat of burning of some such fuel as nitrocellulose, to vaporize the chemical ingredient. These grenades are in the shape of smooth sheet metal cylinders $2\frac{1}{2}$ inches in diameter and 5 inches long. There are three lines of six gas ports in the body and four ports in the head. These are covered by small squares of adhesive tape which are blown off when the grenade begins to function. The grenade begins to evolve gas in two seconds and reaches full volume in three seconds after throwing. The following grenades are issued:

- (1) GRENADE, hand, irritant, CN-DM, M6
- (2) GRENADE, hand, rear, irritant, CN, M7

9. SMOKE GRENADES.

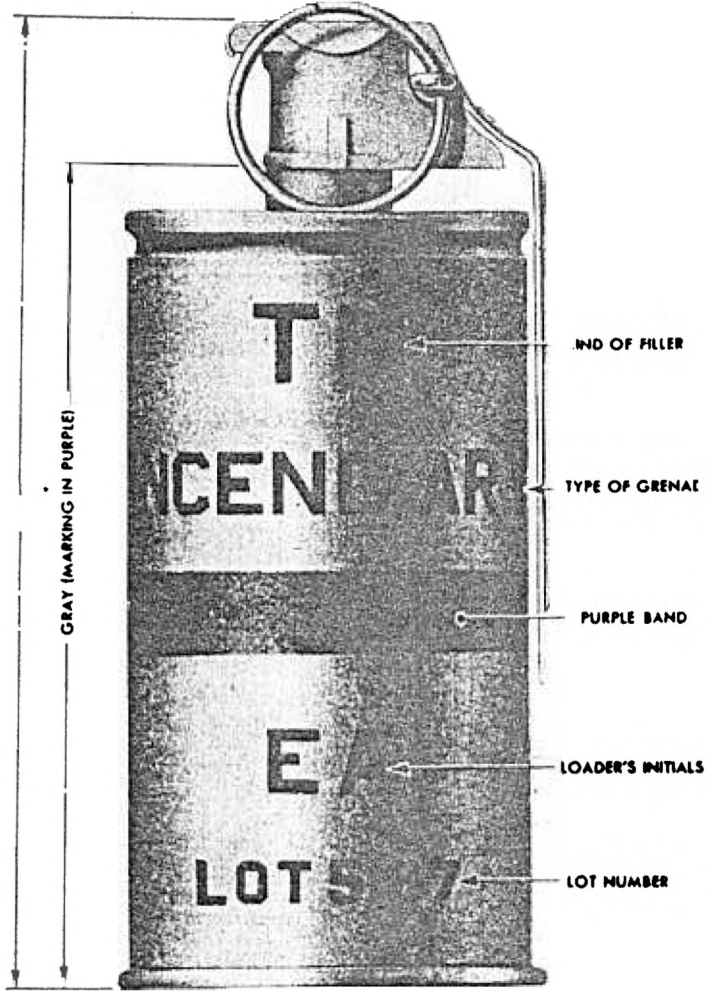
a. **Burning Type.** These grenades (figs. 16 to 20) resemble the gas grenades described above except that in the case of the white smoke grenade (AN-M8) and the black smoke (M16), there are no openings in the side of the grenade body; there are only the four ports in the head. The smoke mixture is ignited by the fuze and burns approximately $3\frac{1}{2}$ minutes. The volume of smoke generated by a grenade is generally too small for screening purposes, hence, these grenades are authorized for use as signals. The following grenades are issued:

- (1) GRENADE, smoke, white, HC, AN-M8
- (2) GRENADE, smoke, colored, M16*

CAUTION: The presence of moisture will cause this type of grenade to ignite spontaneously. If a fire should occur in such munitions, an attempt should be made to remove and segregate the burning items. Neither water nor the usual chemical extinguishers should be used in an attempt to extinguish such fires.

* This grenade is supplied with fillings which produce smoke of the following colors: Red, Green, yellow, blue, orange, violet, and black.

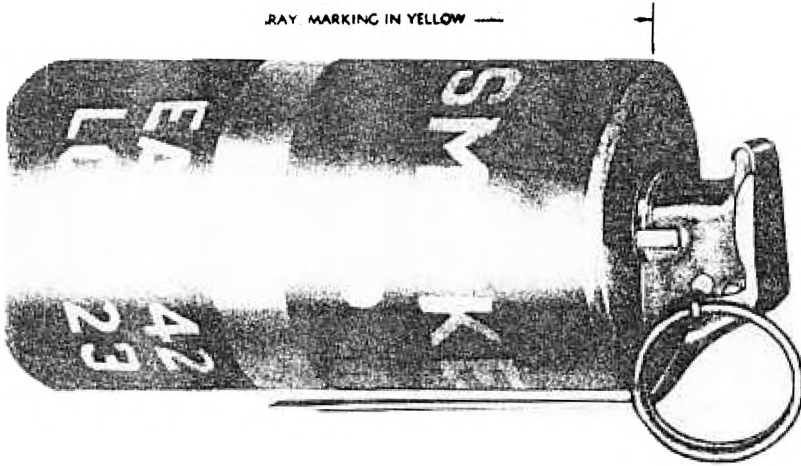
CHEMICAL GRENADES



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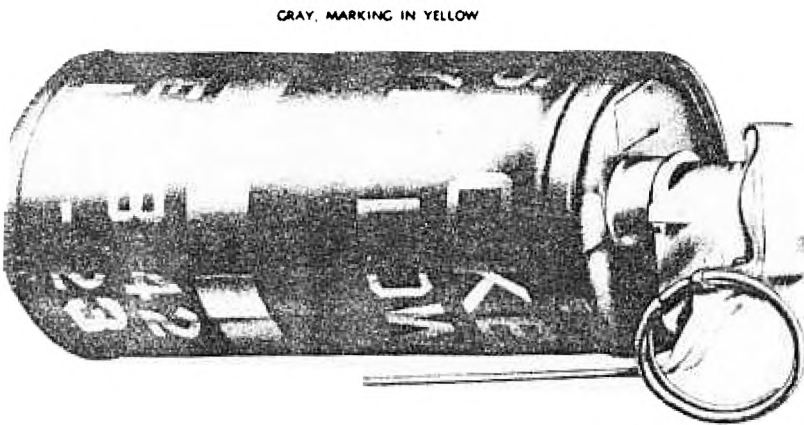
Figure 18 – GRENADE, Incendiary, AN-M14

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RA PD 69035

Figure 19 — GRENADE, Hand, Smoke, WP, M15



RA PD 69043

Figure 20 — GRENADE, Smoke, Colored (Yellow), M16

CHEMICAL GRENADES

b. **GRENADE, smoke, red, AN-M3.** This grenade differs from the other smoke grenades described above in that the fuze safety lever is shortened and the grenade body is assembled in a cylindrical outer container. This container has three flaps welded to the side which may be bent outward at right angles to furnish additional bearing for supporting the grenade in snow, mud, or other such soft surface. In using this grenade, care should be exercised to hold the short fuze lever firmly when removing the safety pin.

c. **Bursting Type.** This type grenade (fig. 19) contains phosphorus in a sealed container. It is fuzed with M6A3 detonating fuze described in paragraph 15. Upon functioning, the container bursts and the phosphorus is scattered. The phosphorus ignites spontaneously and burns, giving off a dense white smoke. A phosphorus fire can be extinguished by water, but will start again unless the water covers the phosphorus completely. A leaking or burning phosphorus grenade should be submerged in a container of water until it can be disposed of safely.

30. INCENDIARY GRENADES.

a. **GRENADE, incendiary, AN-M14.** The standard incendiary grenade is filled with thermate, a mixture of iron oxide, aluminum powder, and barium nitrate. Upon ignition with the FUZE, igniting hand grenade, M200A1 (par. 27) it burns with an intense heat, producing molten iron. When practicable, this grenade should be fastened in place as it tends to shift position on ignition. A clamp of flat steel strapping and a nail are packed in the container with each grenade. The clamp is used to hold the grenade on a slanting or perpendicular surface. NOTE: The grenade should always be placed in the clamp with bottom up.

b. **FLARE, trip, M49, w/FUZE, trip, M12.** This flare is a pyrotechnic item. It is described herein with its fuze because of the resemblance to grenades and grenade fuzes, and because it may in case of necessity be used as an incendiary against inflammable material or be thrown as an illuminating hand grenade. The flare resembles an offensive or chemical grenade in shape and size. The visible part of the fuze are identical with those of the M6 or M200 type grenade fuze. The flare does not explode. It burns for about 30 seconds with a light of 60,000 candlepower. The fuze operates in the same manner as grenade fuzes except that it contains no delay element: *Its action is instantaneous.* CAUTION: If it is necessary to use this item as a grenade, it should be operated from a distance by means of a wire cord; it should never be held or allowed to drop near friendly personnel after the safety lever is released. If this model fuze is encountered disassembled from the flare, it may be identified by the fact that there is no extension of the fuze body beyond the threaded part.

GRENADES, HAND AND RIFLE

HAND GRENADES.

The **M1** is used **made** by filling glass bottles, obtained locally with chemical agent. When necessary and needed the **on**

The **M1** consists of a **last cylinder containing chemical powder** **nades** of **line and alcohol**. **breaks against the target** the powder and **ignites spontaneously**.

M1 **per** **type**, filled with powder **bleed**. **This igniter** **ped** **and** **grenade** filled **solid** **type** **pulled**, **igniting the powder** **be** **the** **grenade** **thrown**.

M1 **of** **spring-loaded** **igniter** **cylinder** **and** **under** **against** **and** **nade**. **The** **clay** **has** **held** **the** **the** **tension** **round** **the** **hol** **the** **cylinder** **and** **restrains** **the** **firing** **pin**. **passes** **through** **the** **iso** **the** **when** **used**, **the** **afety** **pin** **removed** **and** **the** **smash** **against** **the** **target**. **When** **the** **bottle** **is** **struck** **and** **the** **firing** **pin**, **dri**

spr **ushes** **the** **primer** **of** **the** **T** **h** **the** **grenade** **fler**. **per** **ade** **the** **gasol** **and** **alcohol** **and** **the** **plain** **ne** **per** **described** **ign** **subpar** **bo** **he** **be** **led** **flowing** **agents** **par**

smoke, no **necessary** **produces** **white** **smoke**.

hydrocy **acid—casual** **no** **ign** **required**.

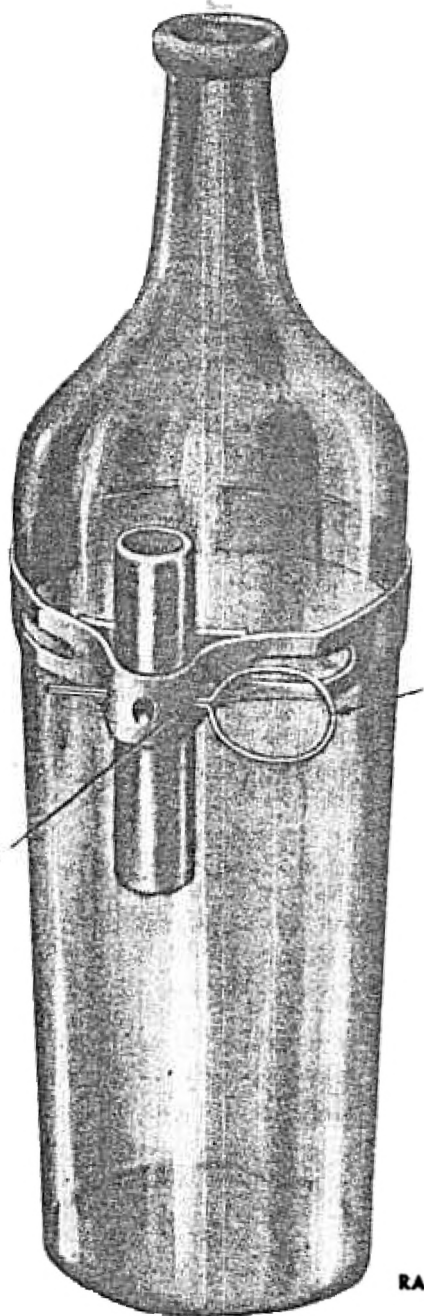
M1 **tension** **sol** **iter** **M1**.

of **gasoline** **and** **napalm—uses** **igniter** **M3**.

d. **tions.** **and** **enades** **will** **be** **filled** **by**, **under** **the** **per** **of** **Ch** **W:** **personnel** **who** **will** **indicate** **and** **once** **necessary** **cautions**.



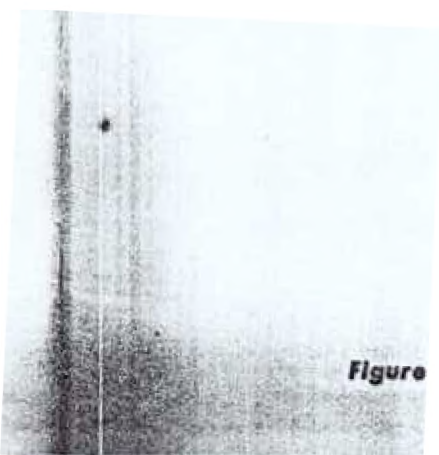
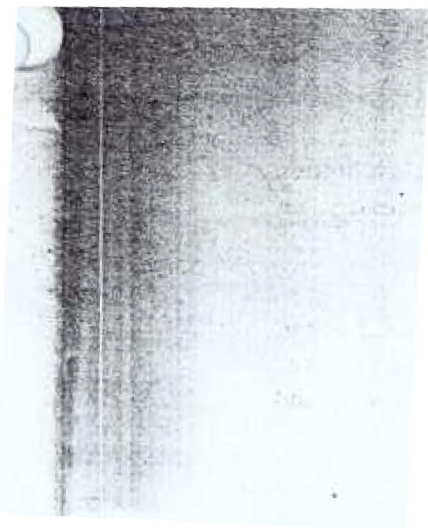
CHEMIC GRENADES



IGNI M3

RA

Frangible Grenade Igniter M3 (Empty)



Figure

GRENADES, HAND AND RIFLE

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List of publications for training.....	FM 21-6
Military chemistry and chemical agents.....	TM 3-215
Military pyrotechnics	TM 9-1981
Ordnance Safety Manual.....	O.O. Form No. 7224
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BY ORDER OF THE SECRETARY OF WAR:

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OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

Distribution: Bn and H 2-7, 11, 17, 18 and 44 (3); R 9(4); Bn
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(For explanation of symbols, see FM 21-6.)

