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DESCRIPTION
OF
HAND GRENADES

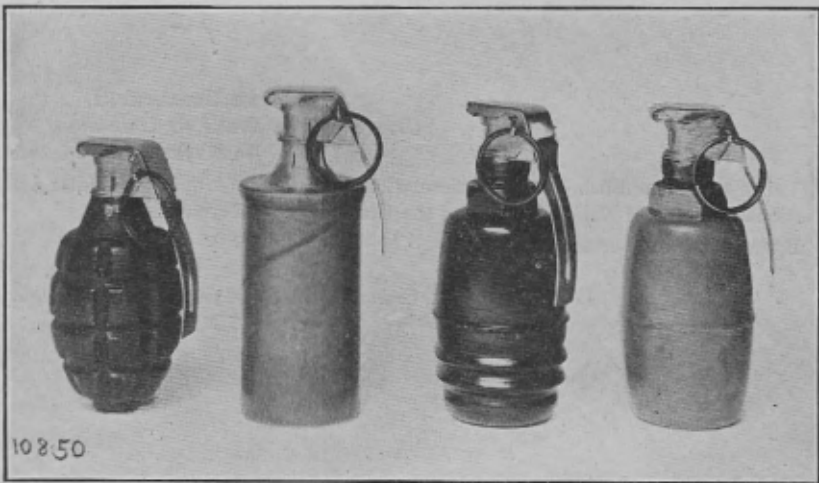
WITH INSTRUCTIONS AS TO
SAFETY IN HANDLING

(NINE PLATES)

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1918



Defensive hand
grenade, Mark II.

Offensive hand
grenade, Mark III.

Gas hand
grenade, Mark II.

Phosphorus hand
grenade, Mark II.

FOUR TYPES OF HAND GRENADES.

DESCRIPTION OF HAND GRENADES WITH INSTRUCTIONS AS TO SAFETY IN HANDLING.

CAUTION.

READ CAREFULLY.

Remember that the hand grenade is always loaded and cocked. It is always pointed at you. It is a safe weapon when properly handled, but a very dangerous one when handled otherwise.

If you accidentally allow the striker to function, do not drop the grenade and run, but throw the grenade as far as you can and then throw yourself flat on the ground.

If you drop the grenade, pick it up and throw it. There is plenty of time if you do not hesitate.

Remember that the bodies of all hand grenades will be painted battleship gray when loaded (live).

The bodies of the defensive hand grenades which are used for practice (not loaded) will be painted bright red.

A live grenade should never be thrown unless cover is at hand, behind which the operator and spectators may secure shelter. A fragment may fly over 200 yards.

Do not arm the grenade by drawing the safety split-pin. Unless the grenade is to be thrown at once, the split pin must *never be removed.* If the grip is accidentally released after the pin is pulled, the striker will be operated immediately and the grenade will explode.

Do not assume that you can guess when five seconds have elapsed, and try to function the grenade a moment or so before throwing. You will surely get caught some time if you do so.

Unless you remember these warnings and act accordingly you and your comrades will become the victims of your carelessness.

The detonator or firing device is dangerous in itself. Its size is no indication of its power, for it is powerful enough to blow one's hand to pieces.

The detonator contains a small charge of fulminate mixture. This explosive is very unstable, and the slightest jar or a sudden change in temperature may be sufficient to cause explosion. Consequently the only safe thing to do is to treat all detonators with proper respect.

Do not attempt to pull a detonator off the safety fuze once it is crimped on; the only safe way is to *cut the fuze above the crimping* if the detonator has to be removed.

A live grenade that has misfired should be recovered only by some one who understands the mechanism thoroughly. Ten minutes should elapse after throwing before going near or touching the grenade.

Do not disassemble a grenade that has failed to go off. Let an expert do it.

DETAILED DESCRIPTION OF BOUCHON ASSEMBLY, MARK II.

The *Bouchon assembly*, shown on Plates II and III, is standard for all types of hand grenades described herein.

Nomenclature.

Key to plate.	Name of part.	Material.
A.....	Bouchon.....	Lead—antimony die-casting.
B.....	Lever.....	Sheet steel.
C.....	Bouchon sealer.....	Do.
D.....	Striker.....	Do.
E.....	Spring.....	No. 15 piano wire.
F.....	Hinge pin.....	C. D. steel.
G.....	Split pin.....	Annealed cottor-pin.
H.....	Split-pin ring.....	Steel wire.
I.....	Moisture cap.....	Tinfoil.
K.....	Primer.....	
L.....	Bouchon plug.....	Rubber.

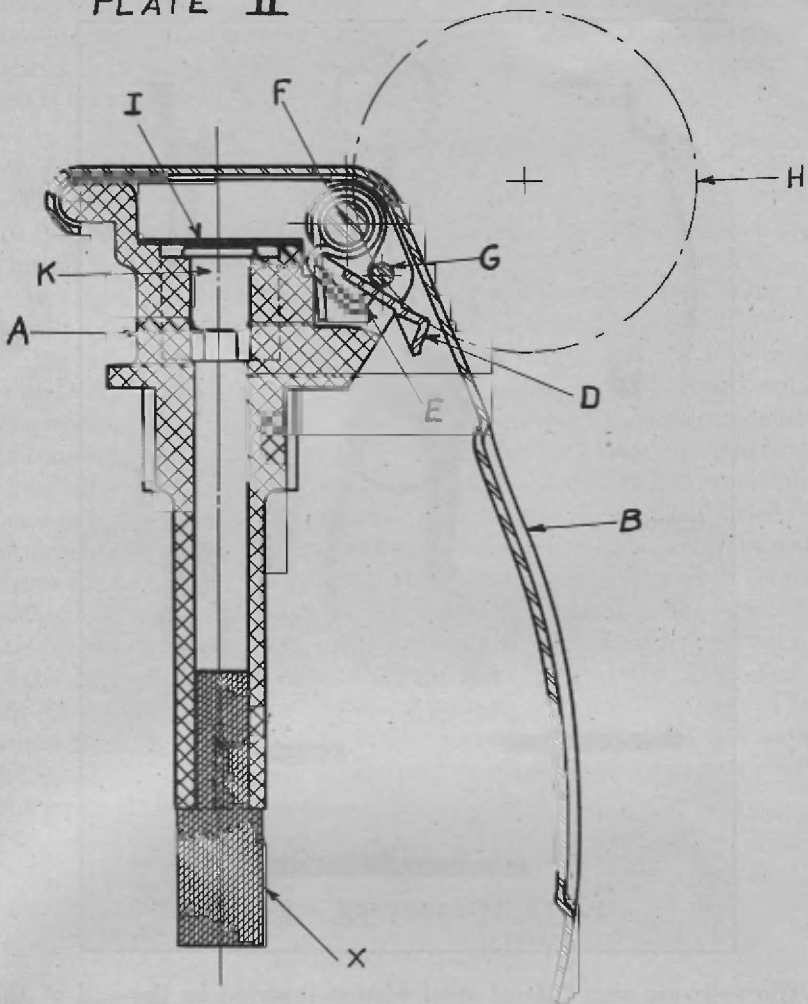
The bouchon (A) is a die-casting of lead and antimony which carries the entire firing mechanism. It is attached to the body of the grenade by means of the threaded portion of the bouchon stem or thimble.

The lever (B) is pressed from sheet metal and shaped to fit over the top of the bouchon (A) as a cover. On one side a lug is bent over to hook under the protruding lip of the bouchon (A). The opposite side of the lever extends downward and is slightly rounded to follow the lines of the grenade body. A hole traverses the two ears of the cover portion to permit the insertion of the split pin (G).

The bouchon sealer (C) is punched out of sheet metal, to fit over the threaded portion of the bouchon stem. Two projecting lugs are so bent as to fit between the lever and the wings of the bouchon (A). The sealer serves to prevent the entrance of mud or sand into the bouchon recess, and thus insures the proper functioning of the striker (D).

The striker (D) is also pressed from sheet steel and is designed to fit into the recess in the top of the bouchon (A). Two wings, one on each side, are so bent and punched as to provide the bearings for the hinge-pin (F). The opposite end of the striker is bent slightly upward and carries a pointed lug, which is intended to strike the primer (K).

PLATE II

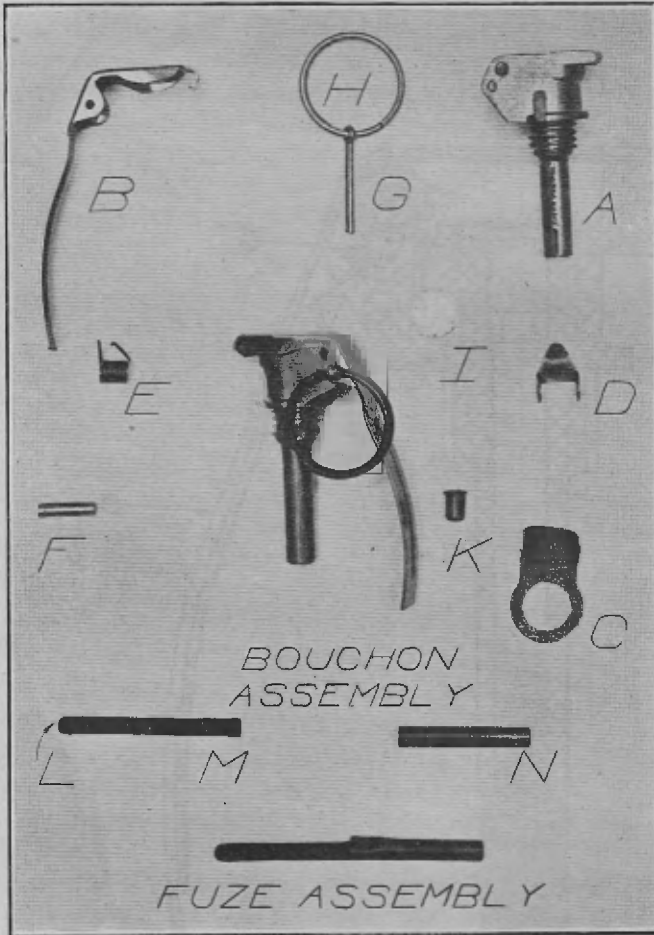


BOUCHON ASSEMBLY

The spring (E), which actuates the striker, is placed on the hinge-pin between the two suspending wings of the striker. It is of the rat-trap type of No. 15 piano wire; one end rests on the striker (D) and the other on a flat projecting boss in the recess in the bouchon (A).

The hinge pin (F), of steel rod, supports the striker (D) and spring (E) and is inserted in the two holes in the wings of the bouchon.

The split pin (G) is an annealed steel cotter pin, which is inserted through the holes in the lever (B) and the bouchon (A), and serves to hold the lever (B) in place against the action of the striker (D) and spring (E).



The split-pin ring (H) of steel wire is inserted in the end of the split-pin (G) to facilitate its removal.

The moisture cap (I) is a weatherproofing tinfoil disc placed on the shoulder of the bouchon recess above the primer (K), and is cemented in position with silicate of soda or gum lacquer.

The primer (K) is of the standard center-fire type. It is pressed into place on the lands in the bouchon (A) over the fuze hole.

The Fuze Assembly.

The fuze assembly is shown on Plate III.

The priming powder (L) is a special igniting mixture of celluloid, acetone, and powder which is placed on the upper end of the fuze (M) to insure proper ignition.

The fuse (M) is a 2-inch length of Bickford fuse, timed to burn five seconds, with an allowable variation of plus or minus six-tenths of a second. It is inserted in the bouchon stem under the primer (K) and is crimped in place.

The Detonator.

The detonator (N) is a standard No. 6 fulminate of mercury detonator for Defensive Hand Grenades, and a No. 8 for Offensive, Gas, and Phosphorus Hand Grenades.

As a matter of general information, the method of assembling the bouchon parts, fuse, and detonator is described as follows:

The primer is pressed into the bouchon recess and the tinfoil disc is properly secured in position with silicate of soda or gum lacquer. The lower end of the fuse is inserted in the top of the detonator for a distance of five-eighths of an inch and the detonator container is firmly crimped over it in such a manner that the diameter of the crimped portion is the same as that of the fuse. In this operation a small fold of metal is left on one side of the detonator. This is inserted in a slot cut in the bottom of the bouchon tube, when the fuse is placed therein, with the priming composition just below the primer. The bottom of the bouchon stem is then securely crimped over the crimped portion of the detonator; at the same time the stem is tightly compressed over the fuze at a point five-eighths of an inch from the bottom. These joints must be very tight to prevent any possibility of a premature explosion due to the flash of the primer reaching the detonator without going through the fuze.

DESCRIPTION OF THE GRENADE BODIES.

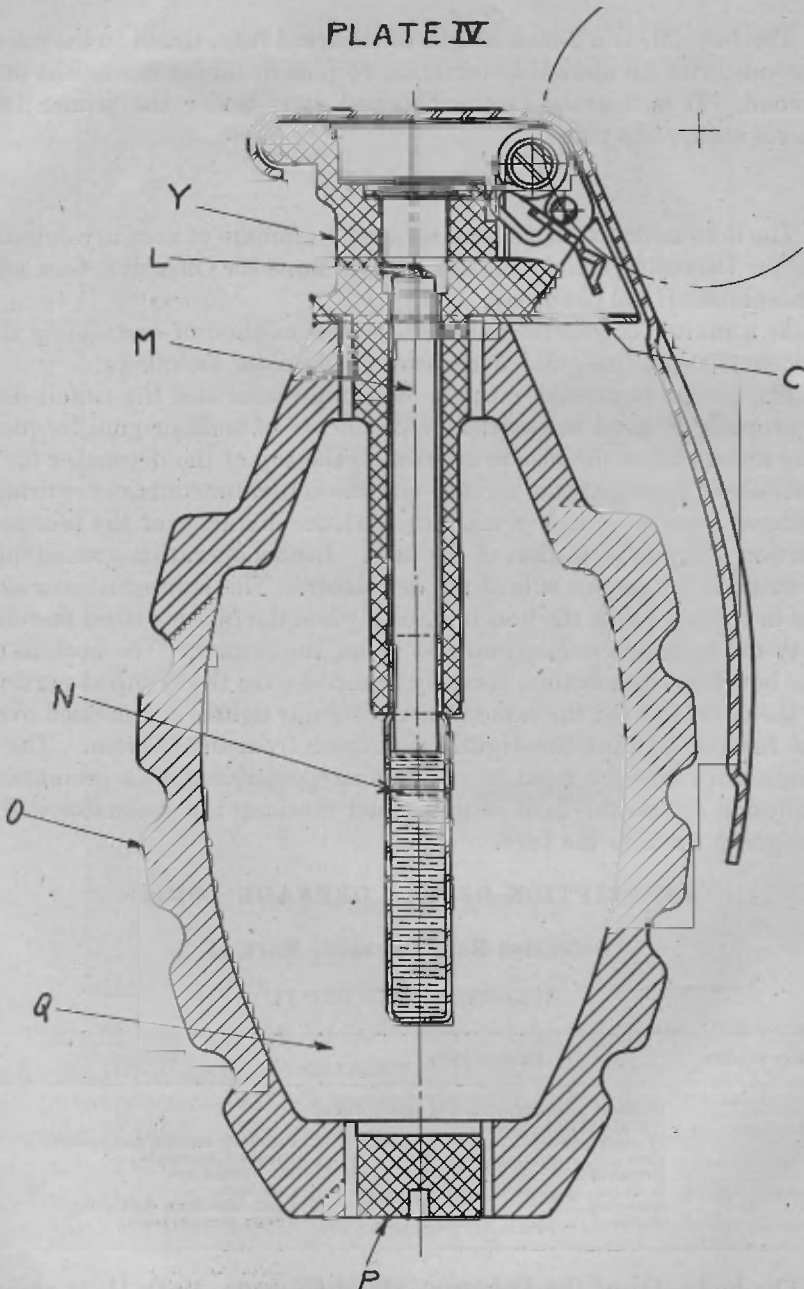
Defensive Hand Grenade, Mark II.

Nomenclature. (See Plate IV.)

Key to plate.	Name of part.	Material.
Y.....	Bouchon assembly, shown in detail, Plates II and III.	
L.....	Priming powder.....	Celluloid, acetone, and powder.
M.....	Fuse.....	Bickford, 5 seconds.
N.....	Detonator.....	No. 6 fulminate.
O.....	Body.....	Cast iron.
P.....	Base-plug.....	Lead-antimony die-casting.
Q.....	Charge.....	Trojan grenade powder.

The body (O) of the Defensive Hand Grenade, Mark II, is about the size of a large lemon, designed to fit comfortably in the hand. It is made of cast iron, with a deeply serrated outer surface to insure proper fragmentation. The surface is weatherproofed by means of paint.

PLATE IV

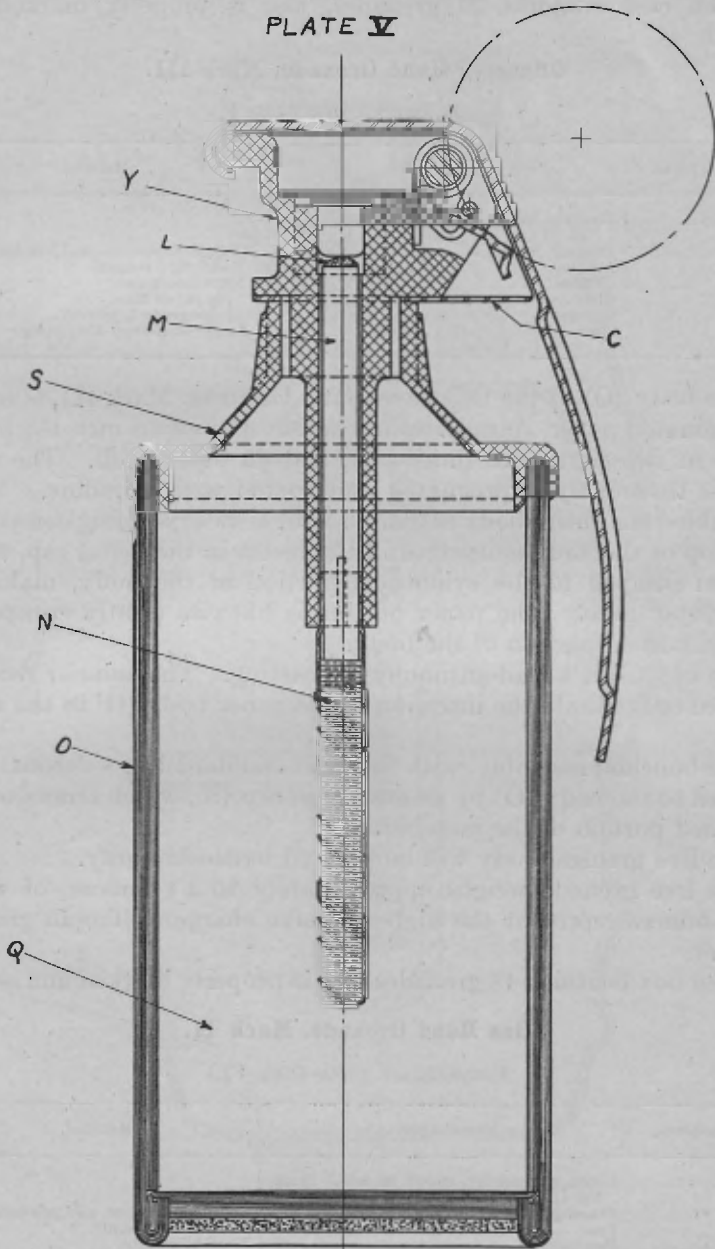


**DEFENSIVE HAND GRENADE
MARK II**

The bouchon assembly, with fuze and standard No. 6 detonator, screws into the head of the body (O) through the bouchon seal. The threads are covered with asphaltum paint, to make a tight, water-proof joint.

The base plug (P) is a headless die-cast screw which fits in the bottom of the body (O), the threads being covered with asphaltum paint. The plug is slotted to provide a grip for a screw driver.

PLATE V



OFFENSIVE HAND GRENADE
MARK III

The live (loaded) grenade body will be painted battleship gray.

The live grenade weighs approximately 22 ounces, of which two ounces represent the high-explosive charge.

Each case contains 24 grenades, and is properly marked and sealed.

Offensive Hand Grenade, Mark III.

Nomenclature. (See Plate V.)

Key to plate.	Name of part.	Material.
Y.....	Bouchon assembly, shown in detail, plates Nos. II and III.	
L.....	Priming powder.....	Celluloid, acetone, and powder.
M.....	Fuse.....	Bickford, 5 seconds.
N.....	Detonator.....	No. 8 fulminate.
O.....	Body.....	7-ply paper tube.
Q.....	Charge.....	Trojan grenade powder.
S.....	Cap.....	Lead-antimony die-casting.

The body (O) of the Offensive Hand Grenade, Mark III, is a tube of laminated paper, spirally wound, about 3/32 of an inch thick, and made in two parts: An inner shell and an outer shell. The inner shell is thoroughly impregnated and coated with paraffine. When assembled the entire body is treated with a waterproofing compound. The top of the body is inserted in the recess in the metal cap, which is then crimped to the cylindrical portion of the body, making a waterproof joint. The paper bottom is likewise tightly crimped to the cylindrical portion of the body.

The cap (S) is a lead-antimony die-casting. The annular recess is tapered to facilitate the insertion of the paper body (O) in the metal cap.

The bouchon assembly, with fuse and standard No. 8 detonator, is secured to the body (O) by means of the cap (S), which screws on the threaded portion of the bouchon.

The live grenade body will be painted battleship gray.

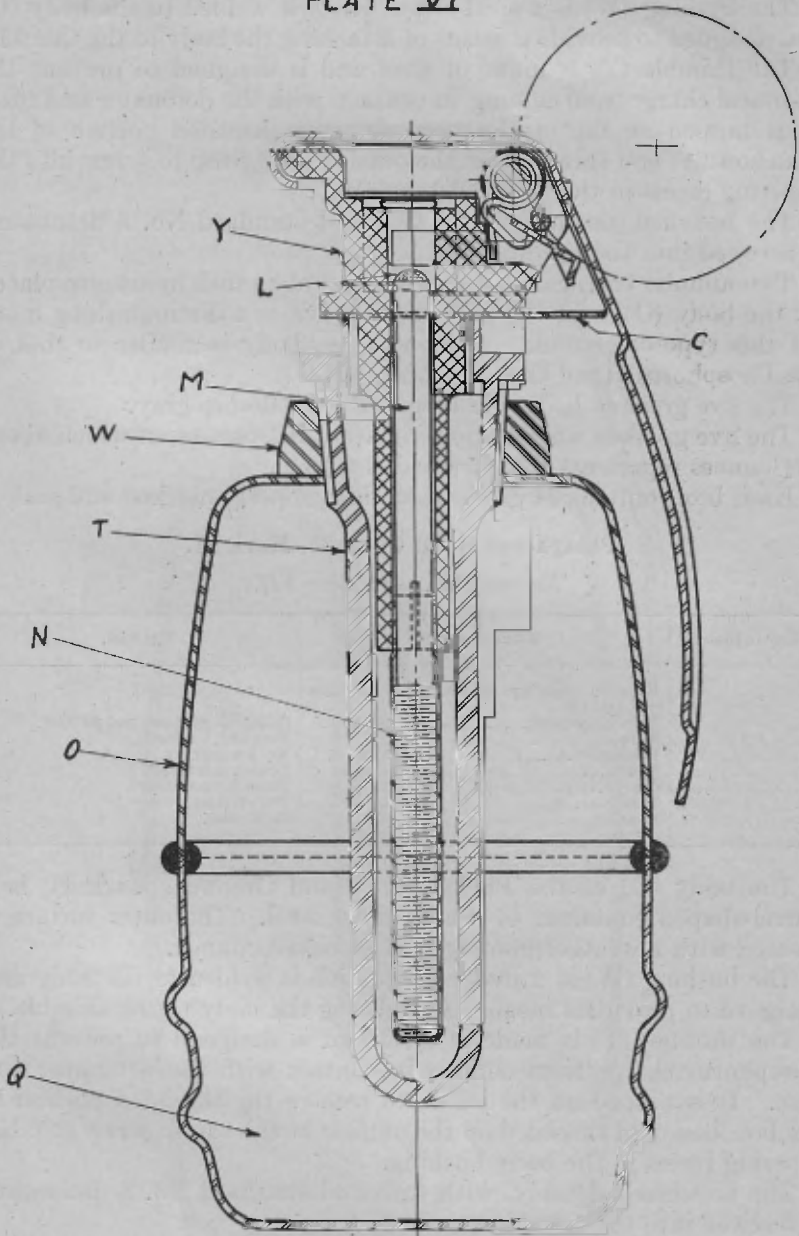
The live grenade weighs approximately 10 3/4 ounces, of which 4 1/4 ounces represent the high-explosive charge of Trojan grenade powder.

Each box contains 48 grenades and is properly marked and sealed.

Gas Hand Grenade, Mark II.

Nomenclature. (See Plate VI.)

Key to plate.	Name of part.	Material.
Y.....	Bouchon assembly, shown in detail Plates No. II and III.	
L.....	Priming powder.....	Celluloid, acetone, and powder.
M.....	Fuse.....	Bickford, 5 seconds.
N.....	Detonator.....	No. 8 fulminate.
Q.....	Charge.....	Special chemical mixture.
T.....	Thimble.....	Drawn steel.
W.....	Bushing.....	C. R. steel.



**GAS HAND GRENADE
MARK II**

The body (O) of the Gas Hand Grenade, Mark II, is a barrel-shaped container of drawn sheet steel. The outer surface is treated with a weatherproofing coat of baking enamel.

The bushing (W) is a steel collar which is welded to the body (O) and designed to provide a means of attaching the body to the thimble.

The thimble (T) is made of steel and is designed to prevent the chemical charge from coming in contact with the detonator and fuse. It is tapped on the inside to receive the threaded portion of the bouchon (A) and threaded on the outside at the top to screw into the tapering recess in the body bushing (W).

The bouchon assembly, with fuse and standard No. 8 detonator, is screwed into the thimble.

Two annular corrugations, about a half of an inch apart, are placed on the body (O), near the bottom, to serve as a distinguishing mark for this type of grenade. Otherwise the body is similar to that of the Phosphorus Hand Grenade, Mark II.

The live grenade body will be painted battleship gray.

The live grenade weighs approximately 20½ ounces, of which about 12½ ounces represents the chemical charge.

Each box contains 24 grenades and is properly marked and sealed.

Phosphorus Hand Grenade, Mark II.

Nomenclature. (See Plate VII.)

Key to plate.	Name of part.	Material.
Y.....	Bouchon assembly, shown in detail Plates II and III.	
L.....	Priming powder.....	Celluloid, acetone, and powder.
M.....	Fuse.....	Bickford, 5 seconds.
N.....	Detonator.....	No. 8 fulminate.
O.....	Body.....	Drawn sheet steel.
Q.....	Charge.....	Phosphorus mixture.
T.....	Thimble.....	Drawn steel.
W.....	Bushing.....	C. R. steel.

The body (O) of the Phosphorus Hand Grenade, Mark II, is a barrel-shaped container of drawn sheet steel. The outer surface is treated with a weatherproofing coat of baked enamel.

The bushing (W) is a steel collar which is welded to the body and designed to provide a means of attaching the body to the thimble.

The thimble (T) is made of steel and is designed to prevent the phosphorus charge from coming in contact with the detonator and fuse. It is tapped on the inside to receive the threaded portion of the bouchon, and threaded on the outside at the top to screw into the tapering recess in the body bushing.

The bouchon assembly, with fuse and standard No. 8 detonator, is screwed into the thimble.

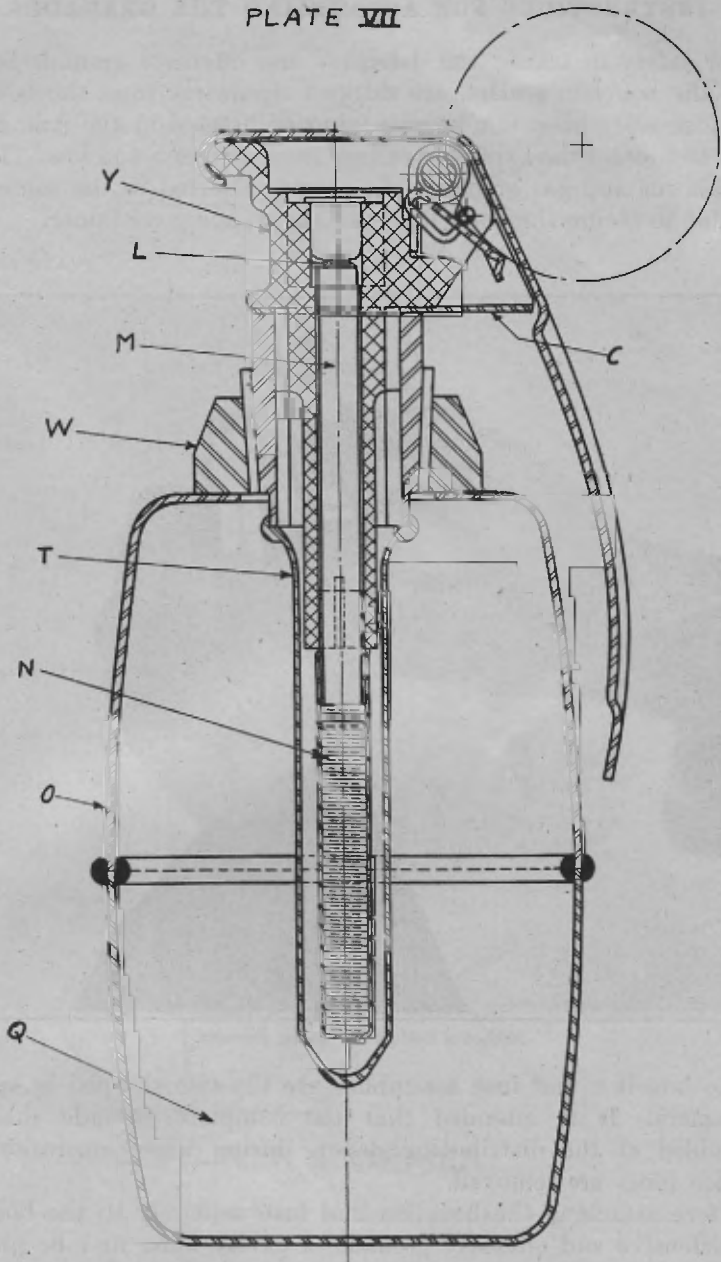
In order to distinguish this grenade from the Gas Hand Grenade, Mark II, the body (O), has no annular corrugations.

The live grenade will be painted battleship gray.

The live grenade weighs approximately 18½ ounces, of which about 10 ounces represent the phosphorus charge.

Each case contains 24 grenades, and is properly marked and sealed.

PLATE VII

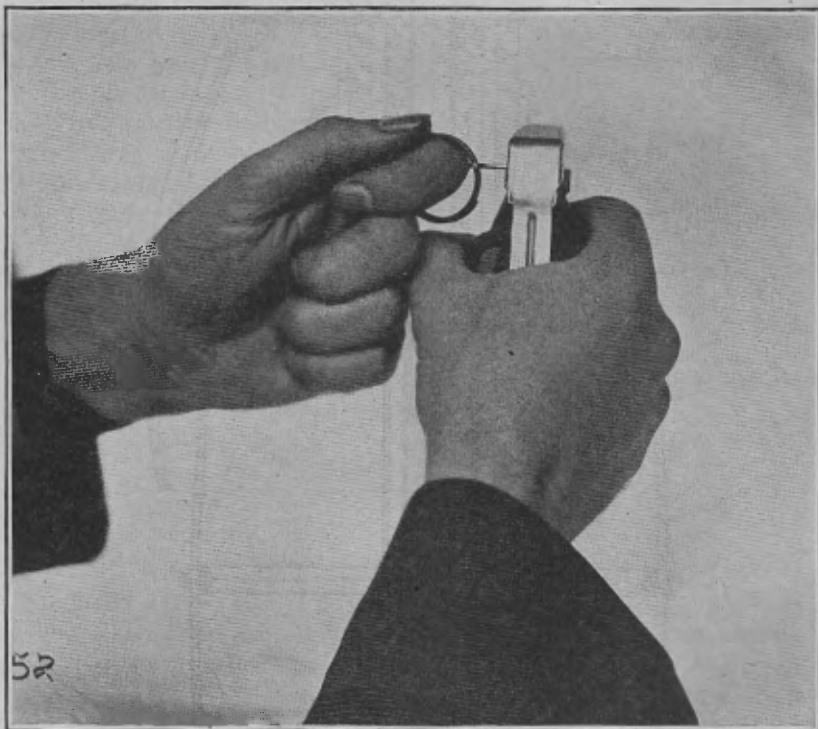


PHOSPHORUS HAND GRENADE
MARK II

INSTRUCTIONS FOR ASSEMBLING THE GRENADES.

For safety in transit the defensive and offensive grenade bodies, with the bouchon sealers, are shipped separately from the bouchon and fuze assemblies. A wooden plug is inserted in the hole in the body to protect the explosive charge from moisture and loss. In the phosphorus and gas grenades the plug is inserted in the top of the thimble to secure the body firmly in the shipping container.

PLATE VIII

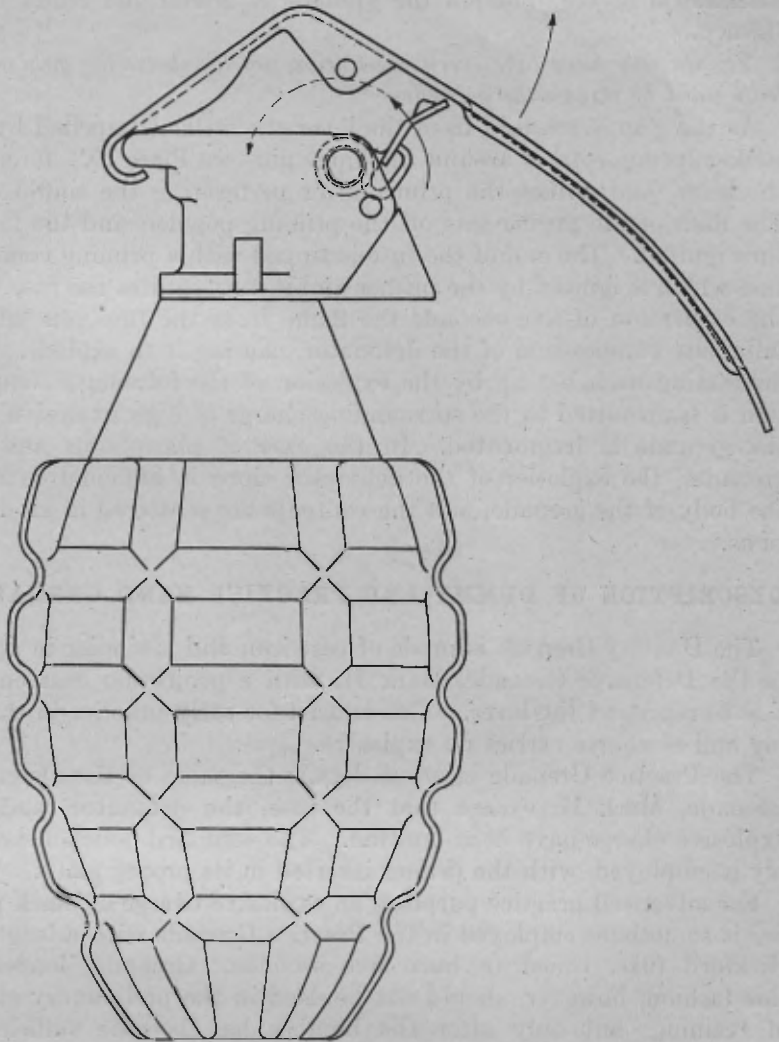


Method of holding and arming grenades.

The bouchon and fuse assemblies are likewise shipped in special containers. It is intended that the complete grenade shall be assembled at the distributing depot, during which operation the wooden plugs are removed.

Before attaching the bouchon and fuse assembly to the body of the defensive and offensive grenade, a cavity must first be pressed into the explosive charge to facilitate the insertion of the bouchon stem and detonator. A properly shaped wooden forming plug should be used for this purpose.

PLATE IX

**OPERATION OF LEVER & STRIKER****Operation of the Grenade.**

All American grenades, as standardized, are of the type which, after the safety-pin has been removed, will arm the instant the lever is released.

To arm the grenade the bomber grasps the grenade and lever firmly in his throwing hand in such a manner as to secure the lever tightly against the body of the grenade, as shown in Plate VIII. The first finger of the free hand is inserted in the split-pin ring and

the ring is gripped tightly between the second and third joints. Upon withdrawal of the split-pin the grenade is armed and ready to be thrown.

The thrower must take every precaution not to release the grip on the lever until he throws the grenade.

As the grip is released from the lever the striker, impelled by the striker spring, rotates around the hinge pin (see Plate IX), forces up the lever, and strikes the primer after perforating the tinfoil disk. The flash of the primer sets off the priming powder, and the fuse is thus ignited. The end of the fuse is tipped with a priming composition which is ignited by the primer and in turn ignites the fuse. At the expiration of five seconds the flame from the fuse sets off the fulminate composition of the detonator, causing it to explode. The detonating wave set up by the explosion of the fulminate composition is transmitted to the surrounding charge of high explosive, and the grenade is fragmented. In the case of phosphorus and gas grenades, the explosion of the detonator alone is sufficient to burst the body of the grenade, and the contents are scattered in all directions.

DESCRIPTION OF DUMMY AND PRACTICE HAND GRENADES.

The Dummy Grenade is made of cast iron and is similar in design to the Defensive Grenade, Mark II, with a projection cast on the side to represent the lever. This is used for early practice in throwing and of course carries no explosive.

The Practice Grenade is in all details the same as the Defensive Grenade, Mark II, except that the fuse, the detonator, and the explosive charge have been omitted. The standard bouchon assembly is employed, with the primer inserted in its proper place.

For advanced practice purposes an explosive charge of black powder is sometimes employed in the Practice Grenade with a length of Bickford fuze, timed to burn five seconds. Grenades loaded in this fashion, however, should not be used in the preliminary stages of training, but only after the bomber has become sufficiently familiar with the use of the grenade in an unloaded condition.

A rubber plug is inserted in the bottom of the bouchon stem of all practice bouchon assemblies to weatherproof the primer. This plug should be removed when the grenade is to be used.

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WAR DEPARTMENT,

OFFICE OF THE CHIEF OF ORDNANCE,

Washington, D. C., June 26, 1918.