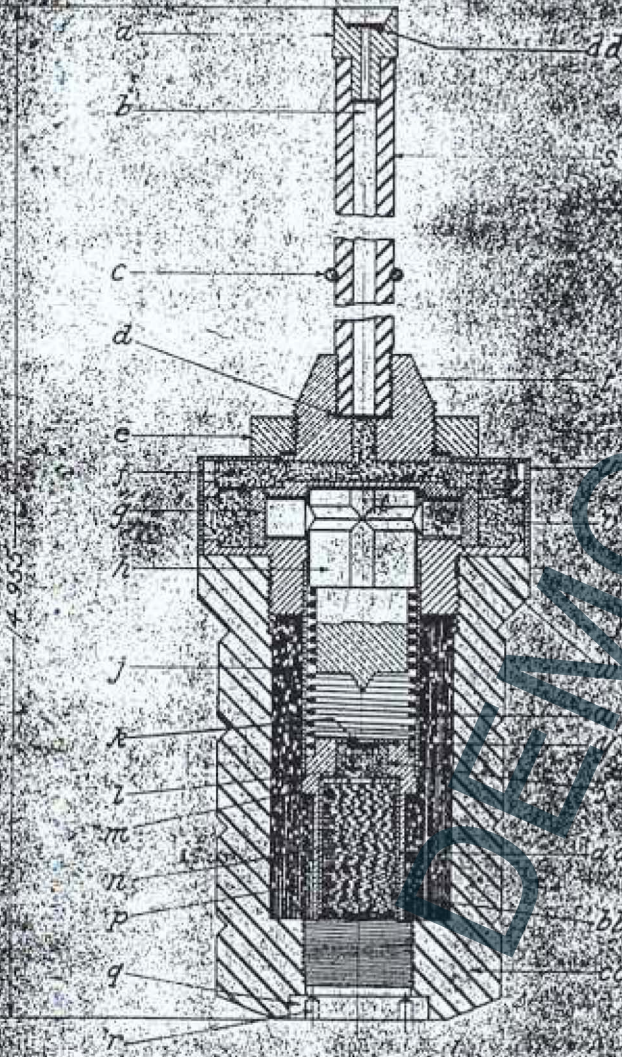


BABBITT RIFLE GRENADE



GRENADES.

The rifle grenade adopted by the Ordnance Department is the known as the Babbitt rifle grenade, and is illustrated in Plate I of this pamphlet. The rifle grenade is intended to be fired from service magazine rifle, model of 1903, by use of a specially loaded blank cartridge.

The hand grenade has been developed simultaneously with the rifle grenade and the type adopted by the department is illustrated in Plate II of this pamphlet. This grenade is thrown by hand in much the same manner as a stone is thrown from a sling. These grenades are high explosive missiles and should be used at short ranges from behind cover.

Rifle and hand grenades are packed in boxes containing 32 each.

THE ACTION OF THE RIFLE GRENADE.

The construction of the rifle grenade and the nomenclature of its component parts are indicated in Plate I.

(PLATE I.)

NOMENCLATURE.

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Sabot b. Bore of stem. c. Stem ring. d. Muslin disk. e. Locking nut. f. Safety-pin holder. g. Plunger. h. Casing. i. Percussion composition of 1894. j. Primer reinforcing charge. k. Primer holder. l. Detonating compound. m. Trinitrotoluol. | <ul style="list-style-type: none"> q. Plug. r. Pin-wrench holes. s. Stem. t. Closing screw. u. Powder train cover. v. Compressed, ^{unglazed} black rifle powder. w. Safety pin. x. Plunger restraining spring. y. Primer holder ^{disp.} z. Primer. aa. Detonator cup. bb. Felt disk. cc. Body. dd. Paper Disk. |
|--|---|

The grenade is designed to be fired at a constant angle of elevation, namely, 45°, except as noted below for ranges under 200 yards. The range attained being dependent upon the length of stem inserted in the bore of the rifle. Tests have shown that within considerable limits the range is but little affected by small changes in the angle

of elevation, near 45° , while a change in the length of inserted stem gives an appreciable change in the range.

The rifle grenade should be set for range as follows: The grenade having been removed from its tin packing container, grasp the stem with the thumb down and the thumb nail in the groove marking the range desired. Insert the stem in the muzzle of the service rifle and shove down until the range ring comes against the end of the thumb nail.

The special grenade cartridge is inserted in the chamber and the rifle fired ~~either from the shoulder, or better~~ by resting the butt on the ground, the firer kneeling to the left, fixing the direction and estimating the desired 45° elevation. The rifle should be held as firmly as possible.

When the special blank cartridge above referred to is fired in the gun, the flaming gases from its charge serve the double purpose of ejecting the grenade from the rifle and of arming the ~~plunger~~ of the grenade. The latter action is accomplished as follows: The flame passes up through the bore of the stem *s*, igniting the loose powder *f*, which in turn ignites the compressed rifle powder *v*. The compressed rifle powder pellets *v* serve, before being burned out, to hold the safety pins *w* in such a position that their conical points engage in the circumferential groove in the plunger *h*, and prevent this plunger from moving forward. It will thus be seen that the fuse can not be armed until after the exit of the grenade from the rifle. After the compressed rifle powder *v* has been consumed, and the safety pins *w* and the safety pin holders *g* released, the plunger *h* is still restrained from moving forward and striking the primer *z* by means of the plunger restraining spring. Upon impact with the ground, after having been fired from the rifle in the manner stated, the plunger *h* moves quickly forward, striking the primer *z*, igniting the percussion composition *k*, which in turn ignites the black powder reinforcing charge *l*, and this in turn detonates the fulminate composition *n*. The detonation of the fulminate composition causes the detonation of the trinitrotoluol filling *p*. The detonation of the grenade upon impact is violent and the grenade, body and components, are broken up into a number of effective fragments which have a considerable range, making it unsafe for the firers or observers to be in the open when the grenade detonates. At the proving ground the stems have been found over 300 yards ^{from behind, as far} in rear of the point of burst. Rifle grenades may also be fired point blank if desirable.

INSTRUCTIONS FOR THE USE OF THE RIFLE GRENADE.

Rifle grenades are shipped in bandoleers of olive-drab cloth, each of which contains four rifle grenades. The grenades are packed in the bandoleer in hermetically sealed tin containers, each carrying

one rifle grenade complete and one special blank cartridge for use in propelling the grenade. The bandoleer is opened by unfastening or tearing off the stripping tape. The tin containers are provided with a tearing-off strip which may be removed with the fingers. This should, however, not be done until the grenade is to be actually used. The bandoleer is carried over the shoulder, the end tapes being passed around the waist and tied in front or as may be most convenient. The weight of a complete bandoleer with four grenades, packing can and blank cartridge is 6 pounds ~~and~~ ounces; the weight of the packing can including the weight of the grenade and blank cartridge is 1 pound ~~and~~ ounces; the weight of the grenade proper is 1 pound ~~and~~ ounces, and the weight of the blank cartridge is 245 grains.

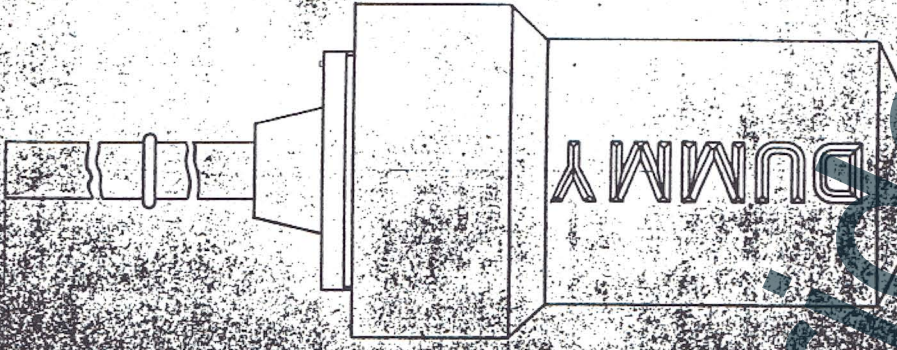
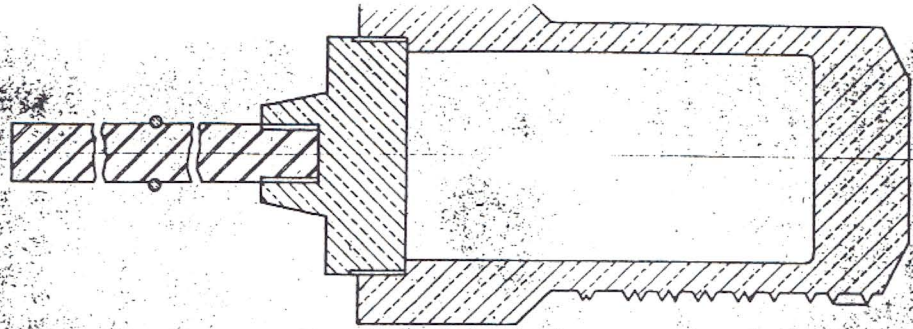
It will be noted that the stem *s* of the grenade is graduated with circular grooves corresponding to different lengths of insertion into the bore of the rifle, which in turn correspond to the various ranges. There is one set of graduations in yards of range based upon an angle of elevation of 45° . These graduations vary from ~~300~~ yards to ~~300~~ yards as a minimum. In order to cover the space between the minimum range as marked on the stem and the firing point, an angle of elevation of 80° may be used. With this angle of elevation, the ranges obtained will be approximately one ~~half~~ of the ranges marked on the stem. The angle of elevation of 80° may be closely approximated by resting the butt of the rifle upon a level piece of ground or upon a board, the surface of which is horizontal. In other words, the angle between the horizontal surface and the bore of the rifle with the rifle in the position of "order arms" is approximately 80° .

A range table giving more exact ranges for both the live and the dummy rifle grenades is given below:

Dummy grenades elevation 45°		Live grenades elevation 45°		Live and dummy grenades, elevation 80°		Dummy grenades elevation 80°	
Range.	Insert stem to graduation marked.	Range.	Insert stem to graduation marked.	Range.	Insert stem to graduation marked.	Range.	Insert stem to graduation marked.
Yards.	Yards.	Yards.	Yards.	Yards.	Yards.	Yards.	Yards.
60	60	60	60	22	60	23	60
80	80	75	75	25	75	29	80
100	100	95	95	32	95	36	100
120	120	115	115	40	115	40	120
140	140	135	135	47	135	44	140
160	160	160	160	55	160	49	160
		185	185	64	185		
		215	215	74	215		
		250	250	85	250		
		275	275	93	275		
		300	300	100	300		

The maximum pressure obtained from the special blank cartridge issued with the grenades is approximately 48,000 pounds per square inch, when the stem insertion is complete, i. e., when the stem ring stops against the closing screw of the grenade. This pressure corre-

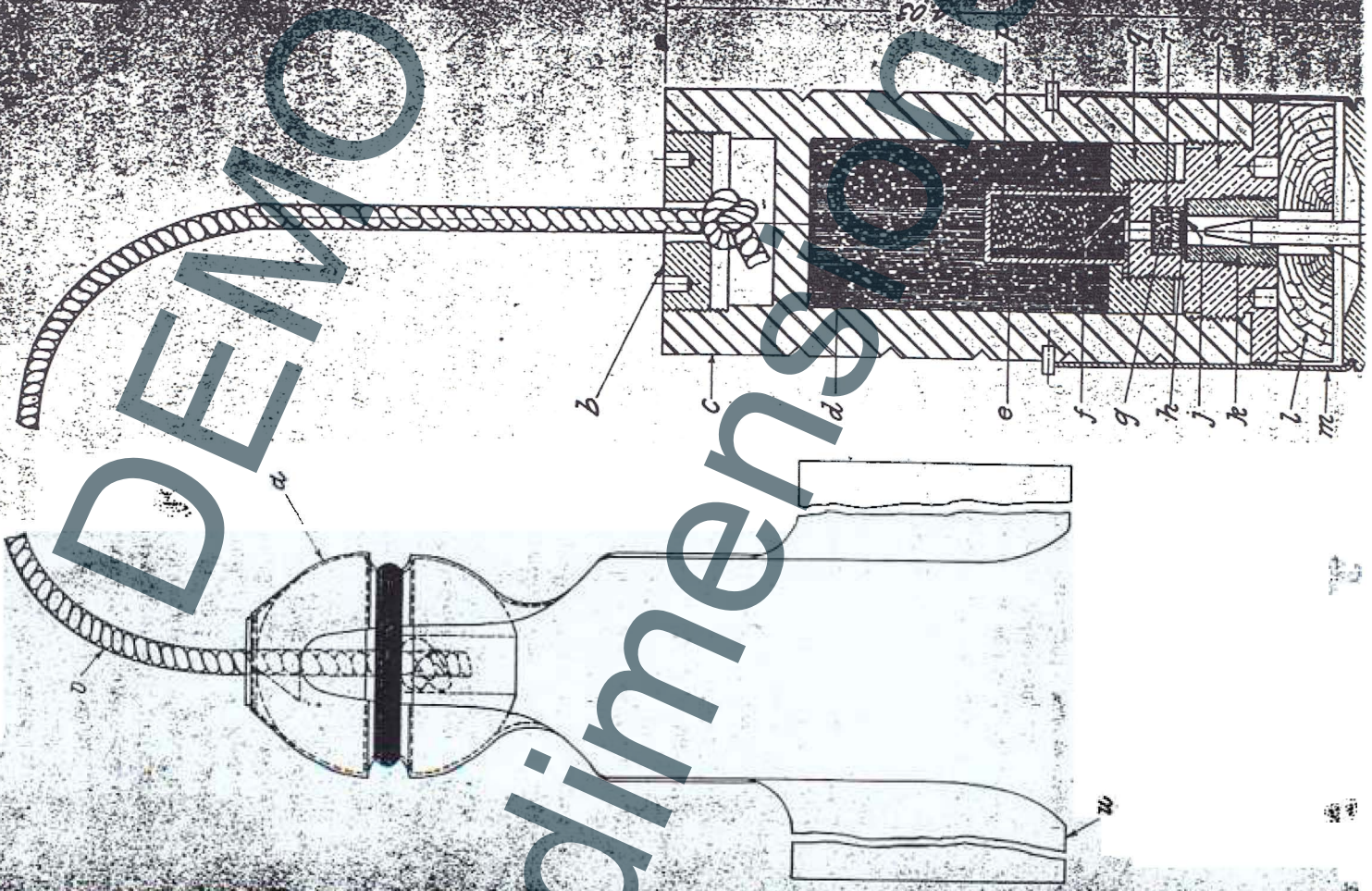
DUMMY RIFLE GRENADE



10.51

2 INCHES

HAND GRENADE



DEMO

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sponds, as may be seen from the range table, page 7, to a range of ~~200~~ yards.

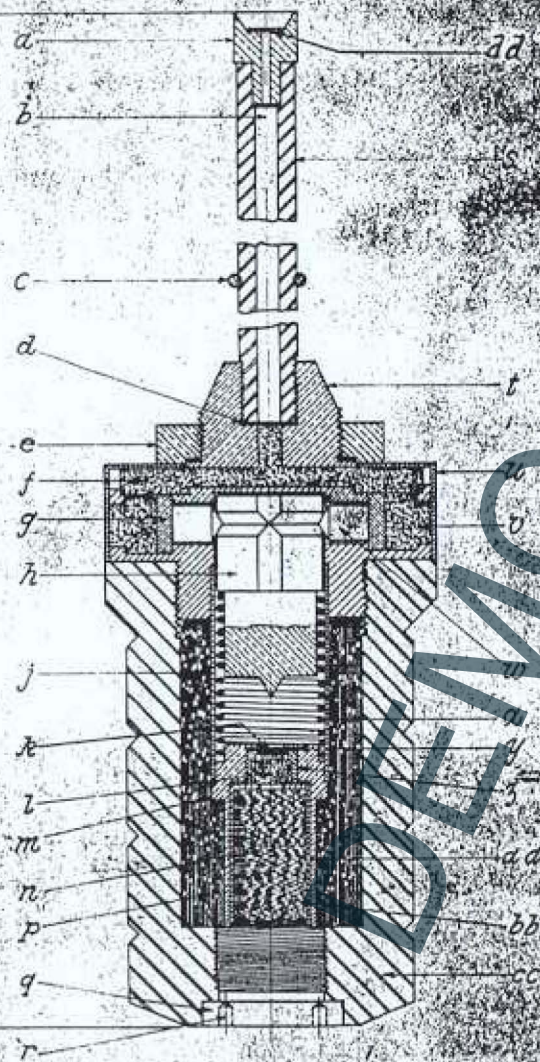
In firing the rifle grenade it has been found that the best results can be obtained by resting the butt of the rifle on the ground and estimating the angle which the barrel makes with the horizontal, which angle, as stated above, should be either 45° or 80° , these angles being those used for the determination of the graduation upon the stem. It has been found that the rifle grenade is not detonated by impact of the small-arms bullet unless it so happens that the bullet actually strikes the fulminate composition *n*. It will also be observed that *no blank cartridges other than those issued by the Ordnance Department should be used with the rifle grenade. Failure to observe this caution may result in injury to both the men and the matériel.* Should a rifle grenade fail to detonate on impact after having been fired from a rifle, it should be handled with extreme caution, in view of the fact that the safety feature as described above has now been removed. To handle such a grenade, it should be carried with the stem down and if practicable thrown into deep water, from which its recovery is improbable. If that be not practicable, the grenade should be buried in the ground where it will not likely be recovered. If it should be necessary to disassemble a grenade, either fired or unfired, the work should be done only in the presence of a responsible person. To do this, place the grenade, stem down, in a vise or clamp, so as to have the body above the powder train *f* project above the jaws of the vise. With a wrench unscrew the body and remove the plunger if free. If the plunger of a fired grenade can not be removed, the safety pellets have failed to burn out, and while the reassembled grenade would be safe, it would probably fail again. A grenade having once failed should not be again fired from the rifle.

DUMMY RIFLE GRENADES.

The dummy rifle grenade illustrated in Plate III is issued for instruction purposes, and is similar to the rifle grenade in Plate I of this pamphlet, except that the body is of bronze instead of ~~cast-iron~~ steel, and is not provided with grooves. It may from those features be distinguished readily from the live grenade. As a further precaution, this grenade is marked "DUMMY." The stem of this grenade is graduated in a manner ~~similar~~ similar to the method used for the stem of the live grenade. ^{But for shorter range} The weight of the dummy grenade is equal to that of the live grenade. The dummy grenade is for use in target practice. ~~The construction for the stem of the dummy grenade is the same as that of the live grenade, but owing to the fact that the stem of the live grenade is solid and has no hole along its length, the dummy~~



BABBITT RIFLE GRENADE



0 1 INCHES

~~is in the equal lengths of stem insertion. In other words, for the~~
~~and other purposes, the stems of the dummy and live grenades are~~
~~not interchangeable.~~ The range table for the grenade, both for 45°
 elevation and 80° elevation, is given on page 7. The manipulation of
 the dummy rifle grenade is entirely similar to that of the live grenade,
 so far as the stem insertion and firing from the rifle is concerned.
 The dummy grenade may be fired repeatedly. After the stem has
 become deformed, the dummy grenade can again be made serviceable
 by the addition of a new stem. Each dummy rifle grenade issued
 is accompanied by 5 extra stems and 50 blank cartridges. These
 grenades are not issued in tin packing boxes or with bandoleers.

ACTION OF THE HAND GRENADE.

The construction of the hand grenade and the nomenclature of its
 component parts are indicated in Plate II:

(PLATE II.

NOMENCLATURE.

- a. Streamer knob.
- b. Streamer holder.
- c. Body.
- d. Trinitrotoluol.
- e. Cup detonator.
- f. Filling washer.
- g. AR-enforcing charge.
- h. Percussion composition, of #94
- j. Primer ~~holder~~ ~~disc~~
- k. Primer holder.

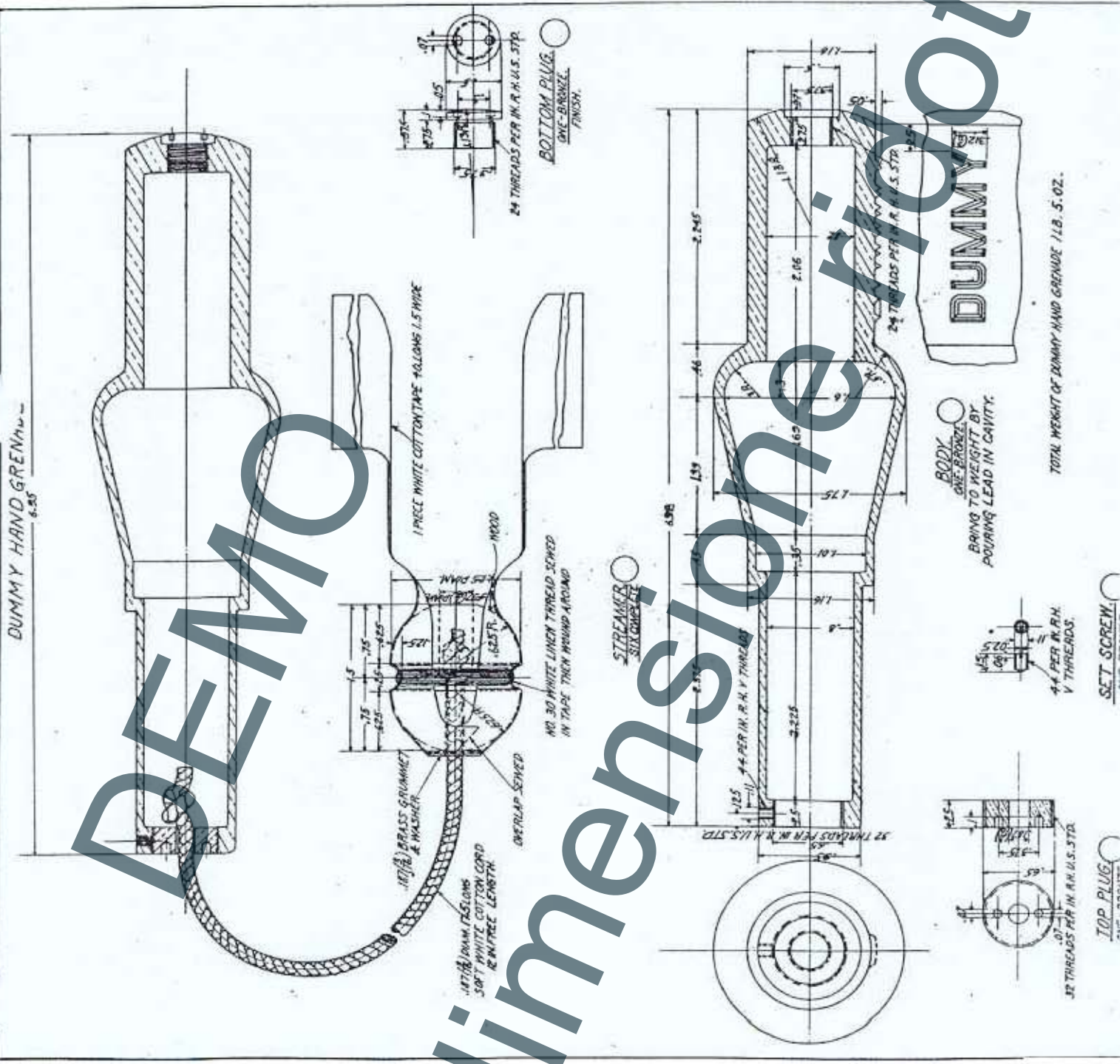
- l. Safety ~~disc~~.
- m. Hood.
- n. Firing pin.
- p. Fulminate composition.
- q. Cup-detonator sleeve.
- r. Primer.
- s. Closing screw.
- t. Firing-pin holder.
- u. Streamer.
- v. Cord.

The action of the hand grenade is as follows: The hood *m* is
 removed from the grenade by twisting this hood in such a manner
 as to release the bayonet joint. After the hood is removed, the
~~wooden safety disc~~ may be dropped or flung out by rapidly swinging
 the hood. After this ~~disc~~ is removed, the hood *m* is replaced by
 repeating the motion of disassembling in reverse order, care being
 exercised not to attempt to force the hood past the stop pins, as the safety
 feature has now been removed. When the hood is in the proper posi-
 tion to cause the fuse to be armed, the stud in the body which engages
 in the bayonet-joint groove in the hood should be opposite the longi-
 tudinal continuation of the bayonet-joint slot. The fuse is now
 armed, and when the grenade is thrown so as to fall upon the firing-pin
 end the weight of the grenade causes the thin sections of the hood *m*
 to be sheared by the small pins resting against the shearing sections,
 thus allowing the grenade to move downward into the hood, tele-
 scoping therewith, and strike the firing pin *n* against the percussion
 composition *h*. The impact of the firing pin ignites the percussion

DUMMY HAND GRENADE
6.25

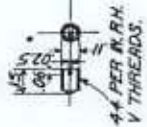
DEMO

dimensione ridotta



TOTAL WEIGHT OF DUMMY HAND GRENADE 1.85 OZ.

BODY ONE-PIECE BRASS BRING TO WEIGHT BY POURING LEAD IN CAVITY.



TOP PLUG
ONE-PIECE BRASS

STREAMER
SIX COMPLETE

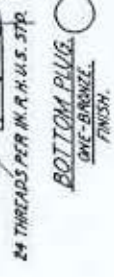
NO. 30 MINUTE LYNCH THREAD SCREW
IN TAPE THICK WOUND AROUND

1.25 IN. DIA. 1.50 LONG
SOFT WHITE COTTON CORD
RE IN-TREE LENGTH

.125 IN. DIA. BRASS GROMMET
& WASHER

1.25 IN. DIA.
1.625 IN. DIA.
1.75 IN. DIA.

1-PIECE WHITE COTTON TAPE 4.00 LONG 1.5 WIDE



SET SCREW
ONE-PIECE BRASS