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AMMUNITION BULLETIN N° 30.

FOR INSPECTING ORDNANCE OFFICERS

AND

A.A. AMMUNITION OFFICERS.

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CHIEF INSPECTOR OF ARMAMENTS,

NOTICE.

It has come to notice that the system of issuing Ammunition Bulletins in bulk for sub distribution has resulted in duplication of issues and in the issue of Bulletins to establishments etc. where they are not required.

In order to prevent unnecessary distribution of these security publications and to economize in paper, departments etc. to which bulk issues of the Bulletin are made, should ascertain if their allotment can be reduced and inform C.I.A. accordingly.

AMMUNITION BULLETIN NO.30
FOR
INSPECTING ORDNANCE OFFICERS
AND
A. A. AMMUNITION OFFICERS.

ISSUED BY:-
CHIEF INSPECTOR OF ARMAMENTS.
WOOLWICH.

August 1942

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557. PROPELLANTS. CORDITE C.D.T.

A slightly modified cordite M.D.T. composition containing half per cent. carbamite in place of half per cent. mineral jelly and made from guncotton stabilized by a four-boil process has been developed. This new cordite has been named "Cordite C.D.T." and will in due course replace Cordite M.D.T.5-2 and 7-2.

Cordite C.D.T.5-2 is completely interchangeable with cordite M.D.T.5-2 in all respects.

Cordite C.D.T.7-2 is completely interchangeable with cordite M.D.T. 7-2 for .55-inch Boys A.T. ammunition.

558. PROPELLANTS. N.H. AND F.N.H. POWDERS. NOMENCLATURE.

Reference Bulletin No.22, Item 329.

It is the American practice to designate the propellant as "Flashless" according to the gun under consideration without regard to the composition. Therefore, with American ammunition, it is quite possible to have a propellant charge designated "F.N.H." with regard to a given gun when the composition of the propellant is that which has been designated "N.H. Powder" under British nomenclature. Propellant of the same composition and web size may produce a flash in another gun and would then be designated "N.H."

559. PROPELLANTS. HERCULES DOUBLE BASE F.N.H. POWDER. NOMENCLATURE.

The nomenclature, "Double Base F.N.H. Powder" has been approved for this propellant. The abbreviation "F.N.H./D.B." will be used.

The propellant is used in American 37 mm. ammunition and consists basically of 75.5 per cent. of nitrocellulose (Nitrogen content 13.2%) and 20 per cent. of nitroglycerine. Barium nitrate, potassium nitrate, dinitrotoluene and diphenylamine are included.

560. PROPELLANTS FOR ROCKETS U. NOMENCLATURE AND CODE LETTERS.

The nomenclature given in Bulletin No.26, Item 457 is cancelled and the following substituted :-

(a) Cordite.

	<u>Nomenclature</u>
Tubular cordite for 3-inch (undrilled)	S.U. 2.70-0.75
Tubular cordite for 3-inch (drilled)	S.U./D. 2.70-0.75
Slotted tubular cordite for 5-inch (Ungrooved)	S.U./S. 1.0-0.5
Slotted tubular cordite for 5-inch (grooved)	S.U./S.G. 1.0-0.5

(Grooved cordite was originally referred to as "Notched").

(b) Code Letters.

The code letter "S" enclosed in a rectangle will be used in markings to indicate cordite S.U.

Drilled propellant will be indicated by the addition of the letter "D" enclosed in a circle.

Groove propellant will be indicated by the addition of the letter "G" enclosed in a circle.

561. NOMENCLATURE. AMMUNITION MANUFACTURED IN CANADA.

Where manufacture of gun ammunition in Canada is to U.K. designs but incorporates local modifications the letter "C" will be included in the nomenclature (except in the case of fuzes) immediately before the Mark, e.g. "Shot, A.P., Q.F., 3.7-in. Gun, C. Mk.IIT."

BOMBS, M.L., 2-INCH MORTAR, H.E. DUPLICATION OF BATCHING.

Duplication of Batch markings, involving batches B.4601 to B.4609 inclusive has occurred. In the event of it being necessary to report on these rounds, the particulars entered on the batch label in the package should be quoted.

563. PROPELLANTS. SUSPENSION OF HEAT TESTING OF BALLISTITE AND N.C.(Y) CARTRIDGES

Reference R.A.O.S. Part 2, Pamphlet No.7, 1933, Appendix 111A and Appendix IV, Section 1 (as amended by Amendment No.29 of Feb.1937).

The suspension of heat testing of Ballistite and N.C.(Y) mortar cartridges for the period of hostilities has been approved. The testing of these propellant held in bulk will continue.

Consequent on this approval, the issue of propellant history sheets for these natures has been discontinued.

564. FUZE, PERCUSSION, BASE, MEDIUM NO.551 MK.II. DESCRIPTION.

Fig. 223.

Reference Bulletin No.29, Item 530 (Page 6).

The details of this detonating base fuze, as shown in the Figure, are generally similar to those of the No.501 described in Bulletin No.23, Item No.362

565. ROCKETS U 3-INCH. SEALING OF CLOSING DISCS OF TAILS PROPELLING.

Reference Bulletin No.25, Item 422 and Bulletin No.28, Item 494.

R.D.1202 is now being used to a certain extent by R.O.F.s for the sealing of paper closing discs in 3-inch tails. Discs sealed with this composition are white in colour but the variation from the normal dark red of R.D.Cement has no significance. R.D.Cement will continue to be used in the Service for the sealing of these discs.

When bakelite closing discs are supplied a special cement will be introduced for use with these discs.

566. SHELL, Q.F., 4.5-INCH, HOWITZER, SMOKE. MARKING OF PACKAGES.

Bursting smoke shell with fuze No.117 have been packed as complete rounds in boxes No.244 of the normal dark green colour. In order to facilitate identification, these boxes have been marked with 3-inch light green bands, completely round the box at right angles.

567. FUZE, PERCUSSION, DETONATING, 24/31. R.Y.G. USE OF R.D.1177.

Reference Bulletin No.23, Item No.358 and Bulletin No.28, Item 513.

Some of these fuzes have been supplied with the plain portion below the screwthreads treated with R.D.1177 instead of R.D. Cement. This treatment results in the lower portion of the fuze being blue in colour, but this variation from standard has no significance, and should not be confused with the system of marking used with American fuzes of similar appearance referred to in Bulletin No.27, Item No.477.

568. FUZE, TIME AND PERCUSSION NO.223 MARK I. DESCRIPTION.

Fig.224.

This igniferous time and percussion fuze has a combustion time arrangement based on the No.199 fuze and a direct action percussion arrangement similar in principle to that of the No.250 fuze. The tension cap is adjusted so that a turning effort of 250 inch-ounces is required to set the movable lower ring and the specified time of burning is 20.4 to 21.4 seconds. The fuze is fitted with a safety shutter with flash recess.

Action

The time action is the same as that of the No.199 fuze.

On acceleration the ferrule of the percussion mechanism sets back overcoming the support of the stirrup spring, and thus permits the arming spring to move the arming sleeve forward clear of the two steel balls which retain the striker. The balls are caused to move outwards by centrifugal force and thus leave the striker free, but kept in contact with the hammer by creep action. With the shell rotating at 4000 to 6000 r.p.m. the shutter is moved, against its spring, by centrifugal force to the armed position. On impact the hammer is driven in and forces the striker into the percussion detonator. The flash from the detonator passes through flash channel in the detonator plug and the fuze body to the perforated pellet of gunpowder at the base end of the channel. The flash from the powder pellet passes through the hole in the screwed plug to the powder in the magazine of the fuze.

The metal fuze cover No.5 is used to protect the fuze from moisture.

569. NOMENCLATURE. AMERICAN "MODEL" NUMBERS.

Reference Bulletin No.27, Item 467.

The "Model" number, (e.g.M2) included in the designation of ammunition stores is similar to the system of numbering in British nomenclature. Thus in the case of a fuze, say the M.48, the 48 may be regarded as the number of the fuze.

Where another type of the same model exists the alteration in type is distinguished by the addition of a letter and numeral as a suffix to the "Model" number. Thus in the instance of 37 mm. cartridge cases, the brass case is M.16 and the steel case is M.16B1.

570. FUZES TIME MECHANICAL. WATERPROOFING.

It has been established by immersion trials with fuzes No.207 and No.208 that the tensioning is considerably increased when the fuzes are not waterproofed with the composition R.D.1154. This is due to the expansion of the Presspahn washer by the absorption of water. Water was also found to have entered the clockwork mechanism.

The tensioning figures before and after immersion were found to be as follows :-

Fuze	Before Immersion inch. oz.	After Immersion inch. oz.
207	230	700
208	350	1000

571. CARTRIDGES. S.A., OBSERVING. .303-INCH. O. INSPECTION.

Reference R.A.O.S. Part II, Pamphlet No.6, Para.44.

"A 100% examination will be carried out by Inspecting Ordnance Officers when cartridges of the above nature, whether packed in boxes with open or soldered linings, reach the age of three years. Cartridges found to be exuding or otherwise defective will be dealt with as directed in paragraph 43 of these regulations. Cartridges in which no defects are found will be sentenced serviceable."
(W.S.9./615)

572. ROCKETS. U. 3-INCH. MARKING OF TAILS PROPELLING SUITABLE FOR THERMAL CONDUCTIVITY FUZES.

Tails suitable for use with thermal conductivity fuzes are stencilled "T.H." in the circle indicating the temperature limit.

3. FUZE, TIME AND PERCUSSION NO.221. MARKING TO INDICATE IMPROVED PERCUSSION ACTION.

Fuzes fitted with steel inertia pellets which are integral with the needle or with the original type of pellet with the needle further secured by punching are marked with a blue star one inch in diameter. Where covers are fitted, this marking is stencilled on the cover also.

574. FUZE NO.247 IN 3-INCH S.B. SHELL. DIFFICULTY IN REMOVING SAFETY CAPS.

Reference Bulletin No.28, Item 505.

Instances of difficulty in removing the safety cap of this fuze have been reported and have been found to be due to the presence of R.D. cement on the screwthreads. In these circumstances, the tape may be adhering to the cap and may result in the removal of the tape and safety pin with the cap, if efforts are made to remove a fixed cap. To avoid the risk involved in the removal of such caps, rounds found with fixed safety caps should be set aside and reported for rectification.

Such fuzes, removed from the shell, may be rectified under supervision.

575. CARTRIDGE, Q.F., 75 MM. WITH SHOT, A.P.C., M.61 (AMERICAN).

Reference Bulletin No.19, Item 250, Bulletin No.28, Item 517 and Bulletin No.29, Item 555.

The projectile with penetrative and ballistic caps previously designated "Shot A.P. M.61" has been re-designated "Shot A.P.C. M.61".

576. CARTRIDGE, Q.F., 75 MM. WITH SHOT, A.P., M.72 (AMERICAN).

Reference Bulletin No.25, Item 416, Bulletin No.28, Item 517 and Bulletin No.29, Item 555.

The projectile previously designated "Shot, Semi-A.P., M.72" has been re-designated "Shot, A.P., M.72".

577. MINE CONTACT ANTI TANK M.1. (AMERICAN).

Fig. 225.

The mine consists of short cylindrical body containing a bursting charge of T.N.T. or trimonite and provided with a fuze socket in its upper side. A spider is fitted above the fuze over the top of the mine body. Details of the fuze are given in Item 578.

The body is of steel and consists of a cup shaped lower portion closed at the top by a circular plate. The plate is welded to the lower portion and is fitted with a steel cylindrical fuze socket at its centre and a filling hole closed by a steel closing cap. A hinged lifting handle, shaped to fold down closely to the cylindrical body, is fitted near the base. The interior is coated with black acid-proof paint.

The bursting charge consists of approximately 5.83 lb. of cast T.N.T. or 6 lb. of cast trimonite, (picric acid and monitro-napthalene).

The spider consists of a ring of U section steel, of a diameter approximately the same as that of the top of the body, fitted on the underside with two diametrical arms at right angles. The arms are riveted to the ring and at the point of intersection. These are also of channel steel. The sides of the U channel are cut away towards the ends of the arms and the plain ends are shaped to fit down over the cylindrical wall of the body and engage under the periphery of the top plate. An alternative type of spider consists of a disc with portion cut away and hooked projections to engage the top plate.

The approximate dimensions of the mine with fuze and spider fitted are height 4.2 inches, maximum diameter 8.2 inches. The weight without fuze is 9.5 lb.

The base of the mine and the wall within .75 inches of the base are painted yellow. The remainder of the wall and the top plate are painted olive drab. The top plate is stencilled in black "ANTI-TANK MINE M1". The lot number is stencilled to the left of the filling hole and the fillers initials with date of filling are stencilled to the right of the filling hole. The spider is painted olive drab, (Spiders used with practice mines are painted blue).

Packing. (Fig.225)

The mines, with spiders fitted over the base, are packed 5 in a box. The box also contains 5 fuzes. The box is of wood and is fitted with a hinged lid secured by hasps and turnbuckles. The turnbuckles and hasps are sealed and a steel binding strip is fixed around the box and lid. The interior of the box is grooved at the sides to receive plywood partitions which separate the mines and a plywood holder to receive the fuzes is inserted at one end. The mines are packed on their sides with the lifting handle uppermost. When fuze and assembled ready for use in the field the partitions can be moved to extra grooves provided and thus increase the size of the compartments. The fuze lot and mine lot are stencilled on the ends, sides and lid of the box. The designation and quantity of mines and fuzes are stencilled on one side and the ends of the box. That end of the box which contains the fuzes will always be kept downwards. (See Item 578).

Stowage Dimensions.

The dimensions of the box are 26.2 x 9.8 x 10.6 inches. The estimated weights are as follows:- empty 15.5 lb., filled 63.6 lb.

578. FUZE, M.1., FOR MINE ANTI-TANK M.1 (AMERICAN). SPECIAL PRECAUTIONS IN HANDLING.

Fig.226.

Reference Item 577

1. Care in Handling.

It has been found that these fuzes may become armed by the severing of the shearing pins in transport. A fuze in this condition if dropped with the pressure plate downwards, or subjected to jolts producing a similar force, will detonate. These fuzes should be handled carefully with the pressure plate uppermost. The same precautions should be observed in handling boxes containing the fuzes.

To over-come this defect and as a temporary measure fuzes are being produced fitted with the detonator but without the magazine. The magazine filling in a metal container with a cavity to receive the detonator is inserted in the fuze socket of the mine as an exploder at the completion of the filling. Under these circumstances, accidental functioning of the fuze in handling or transport will be limited to the detonator. This fuze is designated M1A1.

A new fuze with a new design of firing mechanism is being developed.

2. Description.

The M.1 fuze consists of a steel cylindrical body carrying a firing mechanism supported by an aluminium cover in its upper part and a detonator set in a magazine filled C.E. in its lower part. A steel safety fork is fitted under the pressure plate of the firing mechanism to supplement the support of the aluminium cover until the mine is laid.

The steel body is recessed at the underside to form the magazine and at the upper side to receive the firing mechanism. The diaphragm separating the two recesses has a central hole for the passage of the firing pin and is fitted with a cup which houses the detonator at the underside. Two spring locking devices, consisting of a spring loaded ball, are contained in radial channels to secure the fuze in the socket in the mine. The aluminium cover closing the top of the body is secured by the body being turned over on the flange of the cover. The body is closed at the base by a torse plate disc.

The firing mechanism consists of a pressure piece secured to the aluminium cover at the head by a circular pressure plate and containing inside it a cylindrical sleeve, supported by two brass shearing pins, which in turn contains a spring loaded firing pin retained by steel balls located by the sleeve and the pressure piece. The pressure piece is recessed internally to accommodate the steel balls when the recess is pressed into alignment with the holes locating the balls in the sleeve.

3. Action.

The safety fork is removed when the mine has been laid.

When pressure is applied to the pressure piece or its plate the support provided by the aluminium cover is overcome and the firing mechanism as a whole is pushed down into the fuze body. When the protruding lower end of the sleeve meets the diaphragm the movement of the sleeve and firing pin is stopped whilst that of the pressure piece continues. This results in the severing of the brass shearing pins and an increase in the compression of the spring in the firing pin. The continued downward movement of the pressure piece brings its internal recess into alignment with the balls which are then forced into the recess by the inclined shoulders of the firing pin thus leaving the firing pin free to be driven into the detonator by its spring.

4. Arming and Action Liabile as the Result of Rough Usage.

In order to make the fuze sufficiently sensitive the shearing pins must be of light section. --The pressure required to operate the fuze is that necessary to shear these pins.

However, it can be seen from the Fig. that the initial compression on the spring is taken fully on the shear pins and it has been found that the stress thus set up combined with continued vibration in transit and handling may cause these pins to shear.

When this happens, the spring asserts itself and since the pressure piece cannot move upwards owing to the cover, the firing pin, the sleeve and the balls move downwards until the sleeve is in contact with the fuze body.

Since this will remove the balls further from the recess in the pressure piece, it would appear that the fuze must still remain adequately safe.

This is not so, since the sleeve, the balls and the firing pin are now free to float under pressure of the spring only and should the fuze be subjected to a heavy drop with the pressure plate downwards or other shock be applied to it in this direction, it is possible for the sleeve, the firing pin and balls to bounce and compress the spring towards the pressure plate end of the fuze when the balls will fly outwards into the recess provided and the spring will then carry the firing pin back again and fire the fuze.

This has been known to happen.

5. Packing.

The fuzes are packed 5 in a plywood holder in the box containing the mines (See Item 577) or may be packed separately in a box which holds 500.

The box is of wood with a hinged lid secured by hasps and turnbuckles. The hasps and turnbuckles are sealed and a steel binding strip is secured around the centre of the box and lid. Each of the fuzes is placed in a cylindrical spacer of chipboard and these are packed with strawboard packing pieces into the box in two layers with a plywood tray between the layers. The box is stencilled on the ends and on one side to indicate the designation and quantity of the fuzes. The lot number is stencilled on the ends, the sides and the lid.

Stowage Dimensions.

The dimensions of the package are :- 27.7 x 14.8 x 8.8 inches. The estimated weights are :- empty 27 lb., filled 162 lb.

The approximate weight of the fuze is .75 lb.

579. BOMB, H.E., ANTI-TANK, INFANTRY PROJECTOR, A./T. MK. I. DESCRIPTION.
Fig. 227.

The bomb has a bursting charge of the "Hollow" type and consists of a streamlined body with a nose fuze and a vaned tail unit which contains the propellant cartridge. Details of the fuze, No.425, are given in Item 580.

The tail unit consists of a tail tube in two parts, one partially enclosing the other, a strengthening sleeve and a vane assembly comprising four fins and a cylinder. A cup, to receive the body, is welded at the front end of the tail tube.

The body is of light construction and consists of a hind part which is welded to the cup of the tail unit and has a screwthread formed at its front end to receive the union ring by means of which the fore part is attached. The fore part of the body is approximately semi circular in shape with a conical projection forming the nose which is fitted with a holder to receive the fuze or plug. The base portion of the fore part is shaped to form a flange and to fit over the forward end of the steel cone which fits into the cavity of the hollow charge. The junction between the cone and the fore part is sealed by means of adhesive tape and a felt ring is inserted between the flange on the fore part and the union ring.

The cone has a central perforation fitted with a guide bush to receive the central detonator tube and has a cylindrical holder for the pellet container welded near its base. The holder contains a filling of cast T.N.T.

The pellet container is of tin or brass and is positioned by the holder in a central cavity in the bursting charge over a felt disc in the base of the body. Inside the container is a 1 oz. C.E. pellet with a central hole containing a felt plug to receive the central detonator tube. A felt washer with a paper washer above it is positioned between the C.E. pellet and the T.N.T. in the holder.

The bursting charge consists of approximately 12 oz. of Nobels Explosive No.808 (See Bulletin No.18, Item 223) and is sealed around the exterior of its cylindrical portion near the front end and a portion of the "Hollow" cavity by a cambric ring.

The central detonator tube is of aluminium, flanged at the open front end and has a central hole at its base end. The tube contains the detonator assembly consisting of a length of Cordtex (See Bulletin No.13, Item 133) to each end of which is crimped a No.66 detonator. The aluminium detonators have the concave base typical of the No.27 detonator and each contains a pressing of approximately 8 grains of P.E.T.N. The assembly, with the base of the forward detonator protruding, is secured in the tube by crimping.

Cartridge.

The cartridge consists of brass head fitted into the base of a brass body. The head contains a cap chamber with cap and anvil in a compressed paper wad of a similar type to those used in sporting cartridges. The wad is fitted with a brass cover cup. The body is in the form of a cup and is assembled over the head with its base to the front. The mouth of the cup is turned over the base of the head and shaped to form a rim. Three gaps are formed in the rim for the escape of air when the cartridge is pushed into the tail tube of the bomb. The body contains two cardboard discs in the front end and together with the head forms the container for the propellant charge which consists of approximately 41 grains of Nobels Rifle Neonite No.12.

The percussion cap is of brass and may be coated with copper. The initiator composition is of the type used in the caps of .303 cartridges. The 1.3 grain pressing is covered by a disc of paper foil.

Markings.

The bomb is painted service colour and bears the following markings :-

- (a) A ring of red bars and crosses arranged alternately around the fore part of the body to indicate a limited life in hot climates (See Bulletin No.21, Item 300). In this instance the limitation is due to the liability of the bursting charge to become insensitive as the result of prolonged storage in hot climates.
- (b) Two yellow bands with a black band midway between on the cylindrical part of the body and the figures 808 stencilled in white on the black band. The yellow bands indicate the H.E. filling whilst the black band and the figures indicate the nature of the bursting charge.
- (c) Letters in black indicating the filling station.
- (d) The lot number and date of filling, stencilled in black.

Dimensions.

The overall length of the bomb, fuzeed or plugged, is approximately 15.5 inches. The maximum diameter is 3.4 inches. The weight is approximately 2.5 lb.

Packing.

The bombs are packed with the cartridge in the tail tube and a plug secured in the fuze holder by the thimble. The fuze, in a mazak container, is clipped to the cylindrical portion of the vane assembly.

Three bombs are packed in a carrier consisting of three waxed rolled paper containers. The containers, strapped together by steel strips are fitted with metal end caps. A lifting handle and webbing sling are provided. The containers are marked to indicate the type of ammunition, the filler, date of filling, filled lot number, and cartridge lot. The X-X marking is also stencilled on the containers in red.

The stowage dimensions of the carrier are 16.1 x 13.5 x 4.2 inches. The approximate weights filled and empty are 14 lb. and 6.5 lb. respectively.

Three carriers are packed in a wooden crate which has the following dimensions :-

19.4 x 15.5 x 16.4 inches. The estimated filled weight is 55 lb.

580. FUZE, PERCUSSION NO.425 MK.I. DESCRIPTION. Fig. 228.

Reference Item 579.

The fuze has a graze action and is used in the H.E., A./T. bomb of the infantry projector.

The mechanism consists of an aluminium sleeve carrying an igniferous detonator which is held off the steel needle, fixed in the head of the fuze, by a creep spring. A 5 grain disruptive detonator is fitted near the base of the fuze and the opening at the base is reduced to a suitable diameter to receive the central tube detonator of the bomb by means of a cylindrical distance piece

A steel safety clip in the form of a ring is fitted in a groove near the head of the fuze to prevent its insertion base uppermost in the bomb.

The fuze is inserted in a holder fixed in the nose of the bomb and is retained by means of a thimble which fits over the fuze and is secured to the holder in the bomb by a bayonet joint arrangement. The thimble has a hole at its forward end to fit over the external head of the striker.

The fuze is issued in a mazak container clipped to the tail unit of the bomb. The container is provided with a spring clip which holds its two portions together and is the means of clipping it to the tail unit.

581. FUZES AND GAINES. SUBSTITUTES FOR R.D. CEMENT NO.1.

In the event of difficulty arising in the supply of R.D. Cement No.1, approval has been given for the use of the following compositions for the coating of the appropriate portions of fuzes and gaines :-

- (a) Composition R.D.1177.
- (b) Compositions L.R.X.330.
- (c) Bakelite Varnish 244/1.

These substitute compositions will be coloured to give a similar red to that of R.D. Cement No.1 in order to avoid the possibility of confusion with existing colour markings.

582. FUZE, INSTANTANEOUS, DETONATING, CORDTEX MK.IV.
MARKING OF PACKAGES TO INDICATE COVERING OF FUZE.

Reference Bulletin No.13, Item 133.

Packages containing Cordtex covered by rubberised tape instead of cellophane tape will be marked "R".

Packages containing Cordtex covered by plastic instead of bitumen will be marked "P".

583. SHELL, Q.F., H.E., 3-INCH 20-CWT., 3.7-INCH AND 4.5-INCH GUNS. OMISSION OF SMOKE BOXES CANCELLED.

Reference Bulletin No.25, Item 431.

The approval for omission of smoke boxes from the above-mentioned shell has been cancelled.

584. PLUG, FUZE-HOLE, 2-INCH NO.1, MK.IV. USE IN B.E. CHEMICAL SHELL.

The use of the abovementioned iron plug for all B.E. chemical shell has been approved. The plug has a flat under side and a screw slot for the key in the head. The plug has a short screwthreaded portion and enters the fuze hole to a depth of approximately .5 inches.

585. FUZES PERCUSSION, NO.231B MK.I^{REV} & III. MODIFICATIONS TO AVOID BLINDS.

Reference Bulletin No.21, Item 305, and Bulletin No.29, Item 549.

Fuzes of the abovementioned marks are fitted with inertia pellets which are not coned at the base to form a seal above the flash hole on acceleration. This cone seal which was intended as safety device, additional to the shutter, is liable to cause blinds when the fuze strikes a target just sufficient to crush in the nose.

586. PROJECTILES. VARNISHING OF DRIVING BANDS.

When shell are varnished instead of being painted, the driving band may also be varnished. The thickness of the sprayed-on varnish is only 0.001 inch and does not interfere with gauging or loading.

587. CARTRIDGES, Q.F. USE OF CELLOPHANE ADHESIVE TAPE FOR PROPELLANT CHARGES.

The use of cellophane adhesive tape to bind mechanically bundled cordite charges for Q.F. cartridges has been approved.

588. CARTRIDGES, M.L., 3-INCH MORTAR, AUGMENTING. 1260 GRAINS N.C.(Y) CHARGE.

Consequent on the introduction of a strengthened base plate for the M.L. 3 inch mortar, a long range charge consisting of 1260 grains of N.C.(Y) in six 210 grain cartridges has been approved.

589. CARTRIDGES, Q.F., 17 POUNDER GUN. DETAILS OF PIERCING AND PRACTICE ROUNDS.

Service Full Charge Rounds.

The fixed Q.F. full charge Service rounds for this tank and anti-tank equipment have a propellant charge consisting of 8 lb. 2 oz. N.H.055 with a prevention charge of tin foil, in the form of a loosely crumpled sheet, in the mouth of the case.

The primer in all cases is the No.9 percussion primer. The brass cartridge case is 23.07 inches in length, increases sharply in taper at 18.235 inches from the base and is necked. The diameter at the following points is :-

Base	5.31 inches
Stopped portion of flange	5.01 "
Body, in front of flange	4.77 "
Shoulder	4.243 "
Neck (1.02 inches from mouth)	3.078 "

The depth of the high and lower diameter portions of the flange is .25 and .305 inches respectively.

The following types of shot, all of which have two driving bands and an integral tracer, are used :-

Type and Mark	C.R.H.	Driving Bands Design	Tracer Design	Overall Length	Filled Weight.
A.P.C. I.T.	1.4	12304/8	13074	9.71	16. 02. 13.
A.P. II.T.	1.6	12304/8	13074	10.14	16. 15. 13.
A.P. III.T.	1.6	12304/7	14187	10.18	17. 0. 0.
A.P.C.IV.T.	1.4	12304/7	14187	9.73	17. 0. 0.

The penetrative caps are curved to a radius of 1.4 calibres but have a flat nose. They are attached to the shell by monalizing, by a soldering process.

Details of tracers filled to design 13074 are given in Bulletin No.25, (Item 430 and Fig.154).

Details of tracers filled to design 14187 are given in Fig.230. The trace is specified to commence within 200 yards and have a minimum duration of 5 seconds.

Practice, Full Charge Rounds.

The case and primer are the same as those used with the Service rounds. The propellant charge consists of 7 lb. 14 oz. of N.C.T.065 and a prevention charge of tin foil in the form of a loosely crumpled sheet is inserted in the mouth of the case.

The practice shot used all have a 1.6 C.R.H. head, are 10.09 inches in length, have two driving bands, and an integral tracer. The types are :-

Shot Prac. Mark.	Material	Driving Bands Design	Tracer design	Filled Weight
I.T.	Steel	12304/4	13314	16. 15. 7.
II.T.	Cast Iron	do.	13314	15. 11. 15.
III.T.	Steel	do.	13075	16. 15. 0.
IV.T.	Cast Iron	do.	13075	15. 11. 9.
V.T.	Cast Iron.	12304/7	14218	15. 11. 9.
VI.T.	Cast Iron.	12304/7	14218	16. 15. 7.

Details of tracers filled to design 14218 are shown in Fig. 230. Design 13314 differs from this in having a smaller celluloid closing cap.

Fig. 154 (Bulletin No. 25) is also typical of tracers filled to design 13075.

Practice Reduced Charge Rounds.

The case and primer are the same as those used with the Service rounds. The propellant charge is contained in a bag and consists of 3 lb. 9 oz. of N.H.033. The bag has a skirting at the base by means of which it is shellacked to the base of the case and is choked at the mouth with silk sewing. The filled bag extends throughout the length of the case and contains a prevention charge of tin foil at the top. The base is divided into five pockets arranged to fit over and surround the magazine of the primer.

The practice shot used are flatheaded and have two driving bands. All have an integral tracer and are 17 lb. in weight. The types are :-

Shot Flat Head Prac. Mark.	Material	Driving Bands Design	Tracer Design	Overall length
I.T.	Cast Iron	12304/4	13314	Max. 10 ins.
II.T.	Cast Iron	12304/4	13075	Max. 10 ins.
III.T.	Steel	12304/7	14218	Not Specified. Estimated 8.6 ins.
IV.T.	Cast Iron	12304/7	14218	Max. 10 ins.

Markings of Complete Rounds.

The propellant code letter and batch marking are stencilled in black (by the silver nitrate process) on the side of the case. The disc and year marking is used on cases filled N.C.T. (See Bulletin 15, Item 161).

The distinctive marking, indicating the nature of projectile, and the letter "T" under a semi circle, indicating the tracer are stencilled on the base of the case. The distinctive markings used are "A.P. Shot", "A.P.C. Shot" and "Prac.". The base of cases containing reduced charges are also marked "RED". All base marking are made by the silver nitrate process.

The shot are all painted black and stencilled in red.

A.P. shot are marked with a white tip with a white ring below. A red ring, indicating the explosive filling in the tracer cavity is marked between the white tip and ring.

A.P.C. shot have a one inch white tip on the cap and two white rings enclosing a red ring on the body immediately below the cap.

Practice shot have a white tip with a red ring below it and a yellow band round the body.

Practice flathead shot have a yellow band round the body and a red ring near the head.

All types are marked with the tracer symbol and the letter "T", the design number of the method of filling of the tracer and the serial number of the filled lot. This lot number is enclosed in a circle.

Cast iron projectiles are indicated by the letters "C.I." stamped or stencilled below the designation of the shot on the lower part of the body.

Driving Bands (Fig. 229)

In the earliest design in use, design 12304/4, the high diameter portion of the bands has a flat profile.

Bands to design 12304/7 are fitted in grooves spaced further apart and have front and rear slopes rising to a narrow point of high diameter, the profile resembling a hump.

Bands to design 12304/8 are similar in profile to the design 12304/7 and are used with shell designed to take the 12304/4 bands. The space between the working copper of the two bands is increased by the adjacent portions of the bands being reduced to a diameter corresponding to that of the shell.

Stowage Dimensions and Weight of Complete Rounds.

The maximum length of the complete rounds, including the safety clip No. 37, is 32.8 inches. The safety clip increases the length of the round by approximately .6 inches. The maximum weight is 35.5 lb.

Packing, Stowage Dimensions and Markings. (Fig. 23)

The rounds are packed in the wooden box C.274 which holds two. The stowage dimension of the box are 36.4 x 15 x 8.8 inches and estimated weights, filled and empty are 110 lb. and 38 lb. respectively.

The boxes are stained vandyke brown and those containing practice rounds are marked near one end with a 2 inch yellow band across the lid and down the sides. The reduced charge of the practice flat head round is indicated by a similar band in white near the other end of the box. The abbreviation "RED" is stencilled in black on the white band. The red disc and year marking is used on boxes containing N.C.T. charges.

In place of stencilling, labels (printed in black on a white background) are fixed to the package with shellac and afterwards coated over the exterior with shellac. The position of the labels, as required, is shown in Fig. 223.

Labels indicating the equipment and the nature of round are designed to correspond with the "Ammunition Code" and include the code number in the top right hand corner. Typical labels are shown in Figs. 231 to 236.

590. TRACERS, INTEGRAL TYPE FILLED TO DESIGN 14187.

Fig. 230.

Details of the filling of the tracer cavity formed in the base of the projectile are shown in the drawing.

Because of the presence of nitroglycerine and carbamite in the propellant charge, it is essential to protect the celluloid closing cup in the base of the shell in fixed Q.F. rounds. This is done by fixing a disc of bakelised paper to the base of the shell with R.D. cement. Without this protection the celluloid is liable to soften and become distorted. This may result in the cup falling out and the deterioration of the propellant by contact with the tracer filling.

Tracer cavities are filled to this design in the following shot :-

2-pr. A.P. Mk.VIII	25-pr. A.P. Mk.VII
6-pr. 7-cwt. A.P. Mk.VIII.	3.7-in. A.P. Mk.III
17-pr. A.P. Mk.III	3.7-in. S.A.P. Mk.III
17-pr. A.P.C. Mk.IV	40 mm. A.P. Mk.IV
3-in. 20-cwt. A.P. Mk.III	75 mm. A.P. Mk.II
3-in. 20-cwt. S.A.P. Mk.III	75 mm. S.A.P. Mk.VII
18-pr. A.P. Mk.VI	40 mm. S.A.P. Mk.IV
18-pr. S.A.P. Mk.III	

591. ROCKETS, U, 3-INCH. OHMMETER FOR TESTING RESISTANCE OF FUZE, ELECTRIC NO.F.53
ML.I IN TAILS PROPELLING.

Figs.238 and 239.

Reference Bulletin No.28, Item 494.

1. General Details.

(a) The Evershed Safety Ohmmeter (We Megger) will be supplied for testing the resistance of the fuze No.F.53 in tails propelling.

(b) The instrument consists of a hand driven D.C. generator and a direct reading ohmmeter mounted together in a case with a pair of terminals, each fitted with flexible leads three feet in length with contact spikes for making contact with the resistance under test.

(c) The dimensions of the instrument are $5\frac{3}{4} \times 4 \times 2\frac{3}{8}$ inches and the weight 3 lb. A wooden box with sockets for the contact spikes and a webbing handle is provided for the instrument. The dimensions of the box are $7\frac{1}{2} \times 4.5/16 \times 4.5/16$ inches.

(d) The instrument is designed to produce a maximum current of 12 milliamps (0.0012 ampere) and its ohmmeter has a range of 4 ohms with its scale sub-divided into tenths up to 3 ohms.

2. Method of Use.

(a) The operation of testing involves the winding of the generator handle, the reading of the ohmmeter scale and holding the spikes in contact with the nuts on the tail propelling. An assistant is therefore necessary.

(b) Whilst the contact spikes are held in contact with two of the contact nuts situated at right angles on the tail the handle of the generator is rotated at a uniform rate of approximately 160 r.p.m. and the resistance indicated on the ohmmeter scale is noted.

(c) If the resistance indicated is less than 1.1 ohms or greater than 2.1 ohms the tail is unserviceable. If within these limits, the tail will be turned through 90 degrees and the test repeated with the contact spikes held in contact with the other two contact nuts. The resistance in both positions must be within the limits for the tail to be regarded as serviceable.

(d) Tails rejected as unserviceable will be returned for repair at a R.O.F.

3. Electrical Details.

-15-

(a) The generator, which produces the testing current, is of the two pole permanent magnet type with rotating armature and commutator. The armature is wound with 25 turns of 0.003 Durka wire with a resistance of approximately 210 ohms. The design is such that the generator, even if its brushes were short circuited, cannot produce a testing current exceeding 12 milliamperes. A free wheel device allows the armature to come to rest slowly when the turning of the handle is stopped abruptly, thus relieving the transmission from strain and ensuring that the armature is rotated in the right direction. The voltage is 1.4 at 160 r.p.m.

(b) The ohmmeter is of the permanent magnet crossed-coils type. The moving element consists of a control coil and a deflecting coil mounted at a fixed angle to each other and pivoted so that the coils swing in the annular gap between a fixed core and the pole faces of the permanent magnet. The control coil consists of 100 turns of 0.006" S.S. wire with a resistance of approximately 4.5 ohms. The deflecting coil consists of 100 turns of 0.006" S.S. wire with a resistance of approximately 6 ohms. Connections to the moving coils are made through thin ligaments which exercise inappreciable controlling torque. The control coil is connected across a shunt of 4 ohms resistance which is connected between the generator and one of the terminals and is in series with the resistance under test. The deflecting coil is, in effect, connected across the terminals.

(c) The current from the generator flows in series through the fixed 4 ohm resistance and the resistance which is connected across the terminals by means of the contact spikes for testing. The control coil is influenced by the potential drop across the resistance under test. Thus the resultant movement of the coils and the position of the pointer over the calibrated scale is a measure of the ratio of the force exerted by the two coils. Since the resistance of the shunt is a fixed one, this ratio depends only on the value of the resistance under test so the scale is calibrated to read directly in ohms. Variations in the current flowing, due to variations in the rate at which the handle is turned, affect both coils in the same proportion and so do not vary the ratio.

592. CARTRIDGES, S.L. 20 MM. OERLIKOW. Fig. 240.

Reference Bulletin No.28, Item 516.

Details of the method of filling of the H.E./Incendiary/Tracer Marks IIT and VT shell are shown in the drawing.

ENEMY AMMUNITION

593. GERMAN, CARTRIDGE, Q.F., 7.62 CM. A.P. SHOT 40 (TUNGSTEN CARBIDE CORE). Figs. 241 and 242.

The armouring piercing shot with its ballistic cap is painted black and is fitted with a cartridge case and primer of Russian origin.

The percussion primer 42/44, as shown in the drawing, has a hollow sealing cone of copper and is screwthreaded for insertion in the case. The cap filling consists of mercury fulminate 21.9%, potassium chlorate 40.3% and antimony sulphide 37.8%. The whole of the primer, except the base, is coated with a black varnish.

The cartridge case is of brass, 15.1 inches in length and is not necked. The primer hole which is .99 inches in diameter is screwthreaded with 14 threads to the inch and the flash hole at its inner end is closed by a cloth disc. Details of the propellant charge are not available.

The shot with its ballistic cap is 9.5 inches in length and weighs approximately 9 lb. The steel body is screwthreaded to receive the aluminium alloy ballistic cap and is fitted with a driving band of soft iron covered by a band of copper. A cannellure for the attachment of the case is formed behind the driving band and a hole formed in the base is screwthreaded to receive the core holder. The cylindrical holder is of steel and is screwed into the base of the body from the front. Two recesses are formed in the holder, one at the front end to receive the armour piercing core and the other at the base which is screwthreaded to receive the tracer. The diaphragm between the two recesses is bored centrally to permit the escape of air when the core is inserted. Details of the tracer are not available.

The armour piercing core is 1-lb. 15 oz. 3 dr. in weight and consists of tungsten carbide plated with nickel. The base end of the core is chamfered to facilitate pressing into the holder. The marking "249E" has been found on the core in black.

The core and its holder are surrounded by a sleeve of moulded plastic which fills the space between the body and these components and has an ogival head within the ballistic cap. The plastic has a fairly high shock resistance and the design and construction of the projectile provides a rigid assembly of the components during flight without impeding free egress of the core on impact.

594. ITALIAN. SHELL, Q.F., 100/17, H.E., STREAMLINED WITH HOLLOW CHARGE AND INTERNAL BASE FUZE.

Fig. 243 and 244.

The shell is used in the Q.F. 100 mm., 17 calibre howitzer with a separate loading Q.F. cartridge and is designed with a "hollow" at the forward end of the bursting charge for the perforation of armour by blast.

The markings and dimensions of the shell, for identification, are shown in the drawing. The weight of the filled projectile is approximately 23 lb. 2 oz.

The streamlined body of the shell has a comparatively thin wall and is fitted with a copper driving band and a pressed in mild steel base plate. An external screwthread is formed at the head for attachment of the dome shaped impact cap of light alloy which brings about the functioning of the base, graze fuze and the detonation of the bursting charge at an effective distance from the target. Internally a screwthread recess is formed in the base of the cavity for the insertion of the fuze. The walls of the cavity are treated with paraffin wax. The weight of the empty shell, without fuze is 18 lb. 10 oz.

An exploder consisting of two pressed pellets of R.D.X./Wax, (one solid and the other perforated) wrapped together in a waxed or varnished paper wrapper, is fitted over the paper sleeve covering the magazine of the fuze. The solid pellet weighs 540 grains and contains a small quantity of pink dye. The perforated pellet weighs 332 grains. The paper wrapper is marked "Det. Seq. A.E.-T.M. 5% N 2 MOD 38".

The bursting charge is cast at a density of 1.63 and consists of 3 lb. 9 oz. of R.D.X./T.N.T. 60/40. The cavity or hollow formed in the head of the bursting charge is approximately parabolic in shape and is supported by a steel liner which is secured by the impact cap and has a maximum diameter of 2.85 inches and a thickness of approximately .047 inches.

Fuze. (Fig. 244)

The fuze is of the detonating type with a graze action and is screwed into a recess in the base of the shell cavity.

The cylindrical body contains a screwed aluminium pellet holder and is closed at the top by a screwed plug which fits over the fixed striker in the pellet holder and carries the magazine. The body is open at the base.

The pellet holder has a central recess which contains the graze or inertia pellet and is closed at the base by a screwed cap of aluminium. The recess is reduced in diameter near the top to engage the shearing wire fitted in the pellet. An adjacent recess is fitted with a detent and spring in an aluminium sleeve. The detent supports a brass locking pin which locks the centrifugal bolt, between the striker and detonator, in a transverse channel formed in the holder. The channel is closed at each end by an aluminium disc. The centrifugal bolt is a hollow cylinder of aluminium with an aperture to receive the locking pin. Two channels extending through the length of the holder are closed at the top by aluminium discs and at the base communicate with the recess containing the graze pellet. These, in conjunction with escape holes formed below the detonator in the pellet, are apparently intended to provide an escape for the pressure if the detonator is accidentally initiated. The steel striker with four flash holes formed round it is screwed into a projection on the top of the holder.

The brass graze pellet is held in position in the holder by the centrifugal bolt and is fitted with a protruding shearing wire which does not come into contact with the holder until the shell is in flight. The detonator in the head of the pellet is of the igniferous type and consists of a copper sleeve with an inner cup of tinfoil which contains .77 grains of a composition consisting of :- Mercury fulminate 11%, potassium chlorate 50.5%, antimony sulphide 38.5%. A recess below the detonator communicates with escape holes leading to the exterior of the pellet.

The cylindrical magazine of aluminium is screwed into the top closing plug against a lead washer and contains a felt disc and a detonator. The detonator consists of an aluminium sleeve with a concave closed end and containing a 13.6 grain filling of R.D.X. and an aluminium perforated cup containing a 5.6 grain filling of lead azide 58.1% and lead styphnate 41.9%. A silk disc and a cardboard washer are inserted at the perforated base of the cup and the detonator sleeve is closed by an aluminium inverted cup which also has a central perforation.

Action.

On acceleration the detent and locking pin set back thereby releasing the centrifugal bolt. During this period the bolt is held by the set back. During flight the bolt is moved clear of the graze pellet and the striker by centrifugal force and deceleration causes the graze pellet to creep forward until its shearing wire fouls the step at the forward end of the recess in the holder. The igniferous detonator in the pellet is then very near to the fixed striker and is only held clear by the shearing wire. On graze the shearing wire is overcome and the pellet carries the detonator on to the striker. The flash produced passes through the flash holes round the striker and initiates the lead azide and styphnate filling which brings about the detonation of the R.D.X. filling of the detonator.

595. JAPANESE SHELL, M.L., H.E. COMPLETE WITH PROPELLANT CHARGE FOR 50 MM. RIFLED MORTAR.

Fig. 245.

The shell of this muzzle loading round is fitted with a propellant container at its base which carries a copper driving band. Before firing, the driving band is flush with wall of the container and does not obstruct loading from the muzzle. On firing, the copper band is expanded by the propellant gases to engage the rifling. The propellant container also carries the means of ignition in the form of a percussion primer.

The round is fitted with a brass direct action fuze, marked with Japanese characters, and is painted black with a red tip, a yellow ring below the shoulder of the shell and a white band immediately above the junction of the shell and the propellant container. A round of this type has been found with the figures 3349 stamped in the driving band and inside the base plug. The length of the complete round is 5.75 inches, the diameter 2 inches and the filled weight 1 lb. 8 oz.

The shell body is of steel with a rounded head and a comparatively thin wall. The fuze-hole at the nose has a left hand thread. The shoulder is of higher diameter than the remainder of the round and apparently acts as a guide band in the bore. The base of the shell is closed by a steel screwed base plug which has a concave inner face and also provides the means of attachment for the propellant container. The bursting charge, consisting of approximately 5 oz. of T.N.T. is provided with a cavity to receive the magazine of the fuze. The cavity is lined with a flanged aluminium container.

The steel cup-shaped propellant container is screwthreaded internally at the mouth for assembly on the protruding base plug of the shell and is reduced in its external diameter for the greater part of its length to receive the flat copper hoop forming the driving band. A number of radial channels, lightly closed by tinfoil, are formed in the wall of the container near the base end of the portion carrying the driving band. These admit gas pressure for the expansion of the driving band. The base of the container has eight perforations for the escape of pressure arranged in a ring and a central perforation for the striker leading to a recess in the inner face which contains the primer. The perforations are lightly closed by a paper disc adhering to the base of the container. A copper container with a cover is carried inside the container to receive the ring shaped shellacked paper bag holding the propellant.

The propellant charge consists of approximately 46 grains of finely graphited nitrocellulose flake. The approximate dimensions of the rectangular flakes are .028 x .024 inches. The thickness varies from .003 downwards. The nitrocellulose which forms 95.7% of the propellant has a nitrogen content of 13%.

The cylindrical brass body of the primer has a cap chamber with anvil and two fire channels formed in its base and a magazine containing gunpowder. The forward end of the body is castellated. Details of the filling of the percussion cap are not available.

Fuze. (Fig. 246)

The brass fuze is of the direct action type and is marked in Japanese characters.

The body is screwthreaded with a left hand thread for insertion in the shell and has a magazine screwed in at the underside. The magazine is fitted with a detonator secured by a screwed plug at its upper end. Details of the filling of the magazine and detonator are not available.

The brass head of the fuze which is screwed into the body has a hole at the nose for the protruding head of the striker and is recessed internally for the striker assembly and the ferrule.

The striker assembly consists of a steel striker with a brass cup shaped head and sleeve attached at its out end. The head is flanged to engage the step formed in the head of the fuze. The sleeve which extends over the greater part of the striker has two slots extending from the open end to the striker head and contains the striker spring and arming spring. The brass support washer for the ferrule separates the two springs and the two arms formed on the washer protruding through the slots in the sleeve form a support for the ferrule. Prior to the loading of the round the ferrule is further supported by a two pronged safety pin inserted through the body. Four brass segments are positioned between the inner end of the striker sleeve and the diaphragm of the body. These segments are retained in this position by the cylindrical arming sleeve.

The ferrule is in the form of an inverted cup. A hole in the base of the cup fits round the striker sleeve and an internal groove near the mouth engages the arming sleeve when the fuze is armed.

The arming sleeve is of aluminium alloy and consists of a sleeve with three projecting arms to engage the ferrule when the fuze is armed.

Action.

The safety pin is removed before loading. On acceleration the ferrule sets back over the arming sleeve taking with it the support washer and compressing the arming spring. The projecting arms on the arming sleeve engage in the groove in the ferrule and thus locks these two components together. During flight the arming spring, acting on the support washer, moves the ferrule forward and taking with it the arming sleeve leaves the segments free to be thrown clear by centrifugal force. The striker is then held off the detonator by the springs only. On impact the striker is driven in and pierces the detonator.

596. AMENDMENTS.

Bulletin No.26. Item 457. Delete the item and substitute -
"See Bulletin No.30, Item 560"

Bulletin No.27. Item 467, line 12 in column headed "Explanation or British equivalent terms etc.":-
Delete "Mark II" and substitute "Model 2"

Item 476, page 9, line 5:-
After "filling" delete "." and add
"or practice shot."

Line 6:-
After "(inert)" delete "." and add
"or A.P. shot."

Bulletin No.29. Item 544, para.2 :-

Line 4. After "bands." add "The letters
"CAL.C" are stencilled in white on the
body."

FIG. N° 223 (ITEM N° 564.)

FUZE, PERCUSSION, BASE, MEDIUM, N°551. MARK II

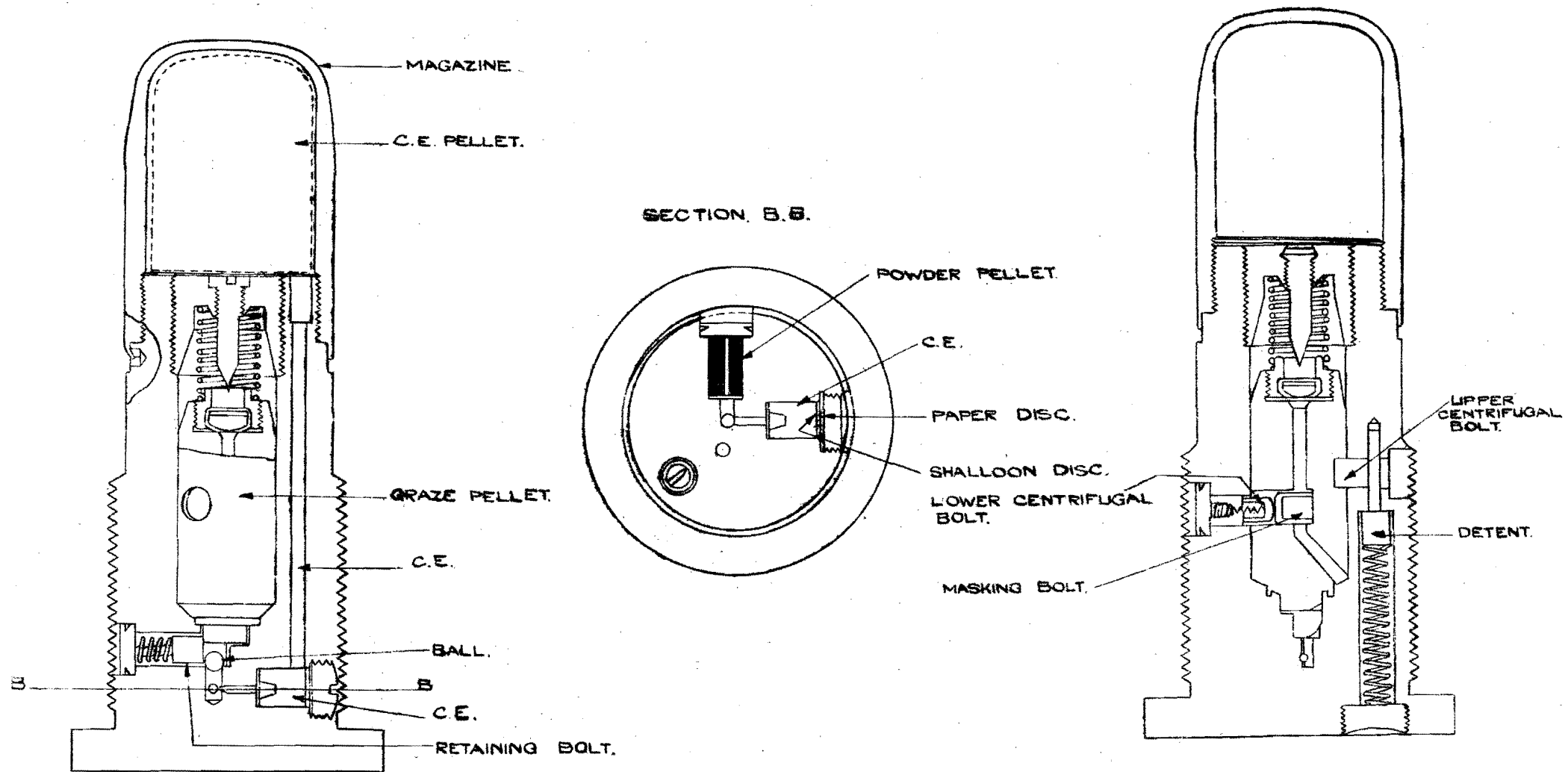


FIG.224 (ITEM.568)
FUZE, TIME & PERCUSSION, N°223 MARK.1.

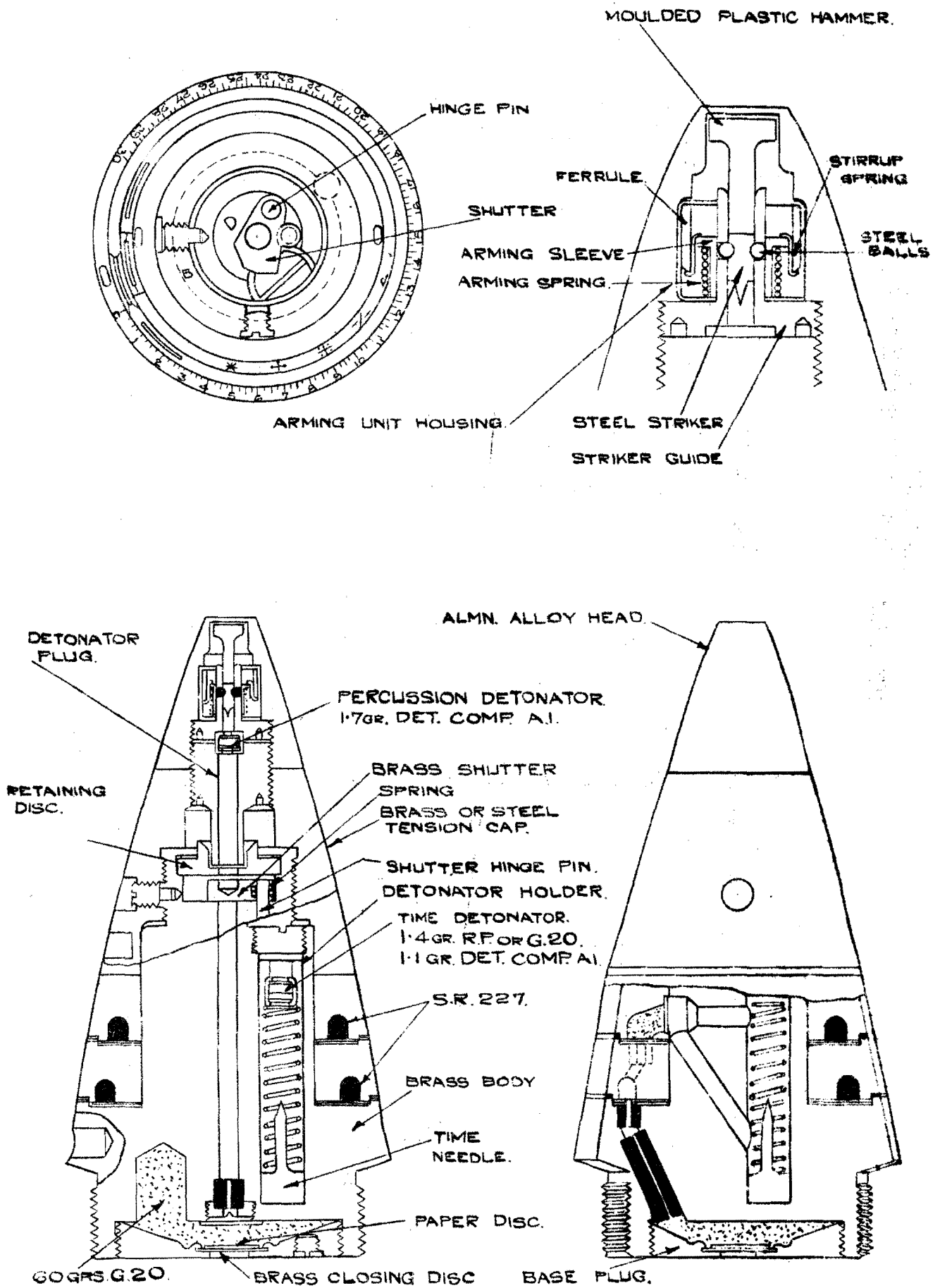


FIG. 225 (ITEM 577.)
MINE, ANTI-TANK, M.I. (AMERICAN.)

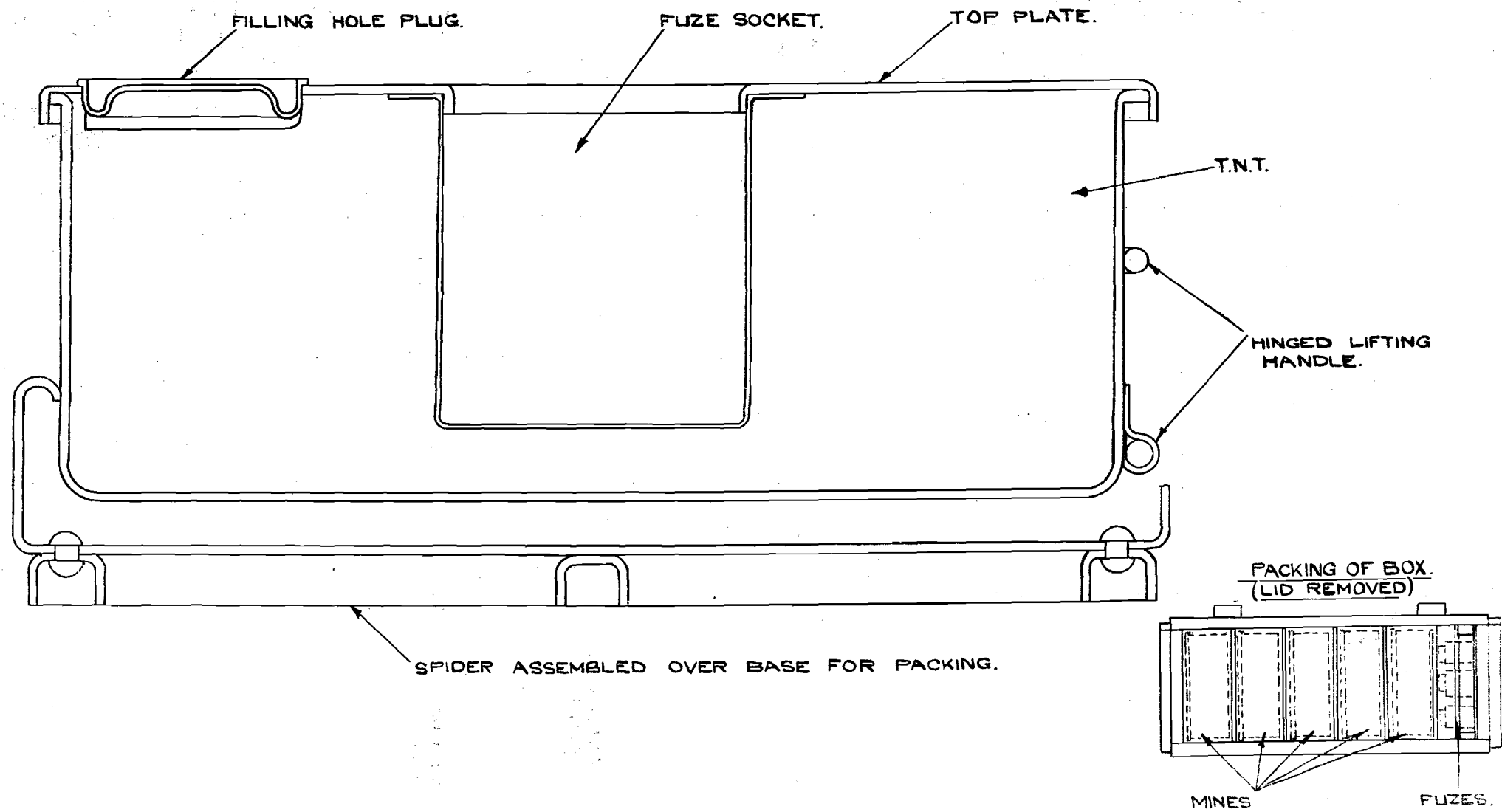


FIG. 226 (ITEM 578.)
FUZE, M.I. FOR MINE ANTI-TANK. M.I.
(AMERICAN)

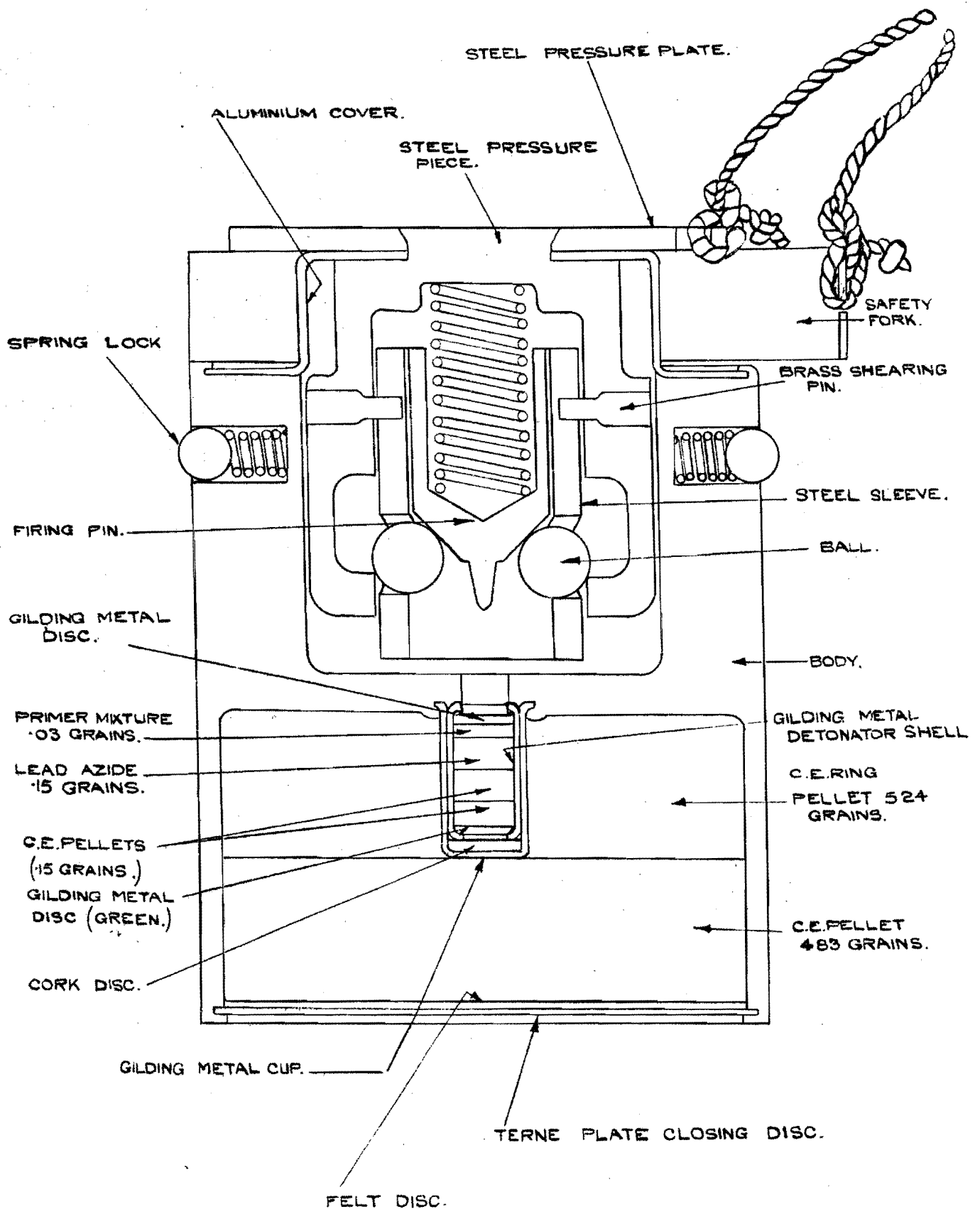


FIG. 227 (ITEM 579)
BOMB, H.E., ANTI-TANK, INFANTRY PROJECTOR, A/T. MK. I.

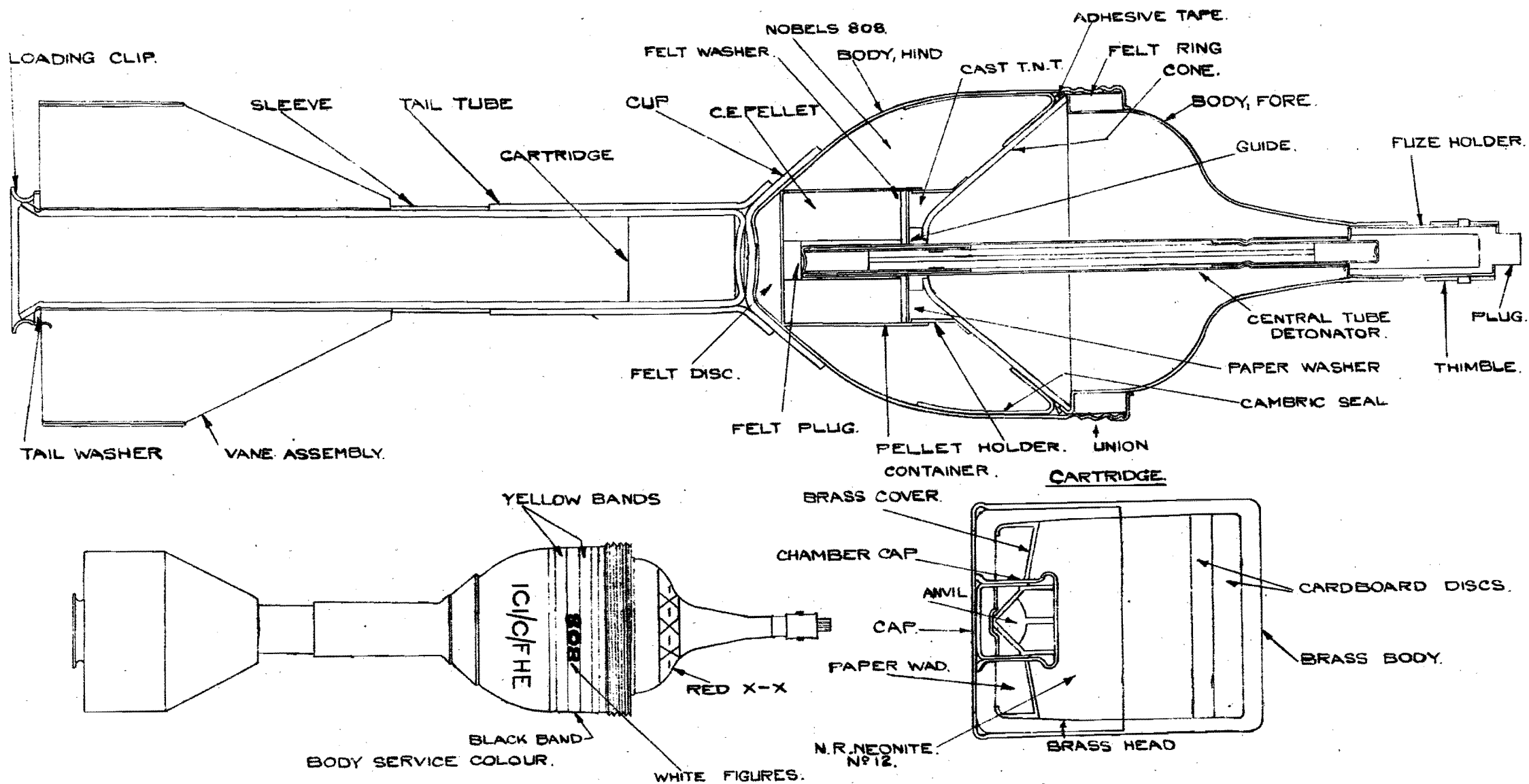


FIG 228. (ITEM 580.)
FUZE, PERCUSSION, № 425 MK. 1.

FUZE CARRIER.
(MAZAK)
SCALE $\frac{1}{1}$.

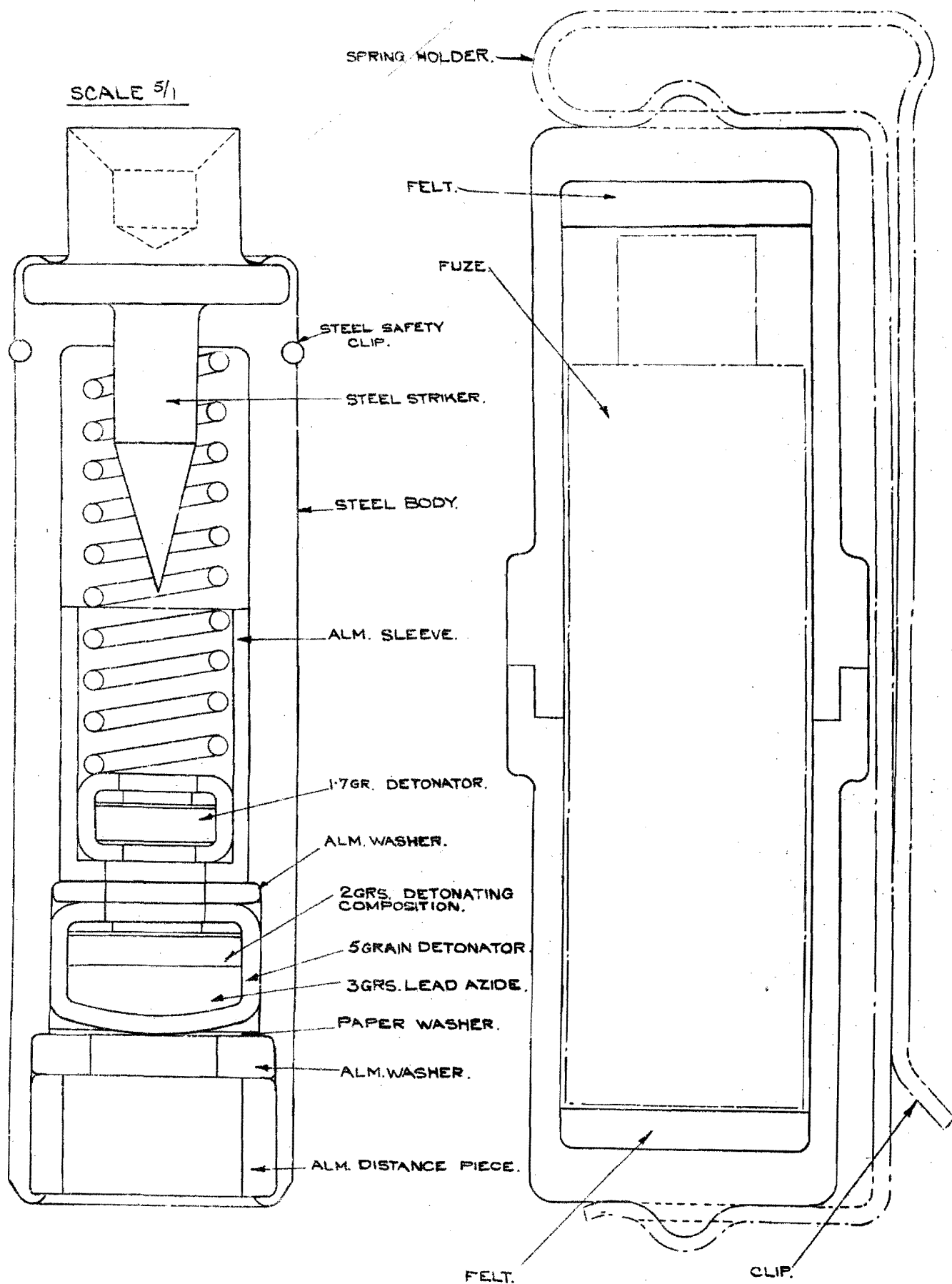


FIG.229 (ITEM 589)
SHOT Q.F.17 PR. DRIVING BANDS.

12304/4

12304/7

12304/8

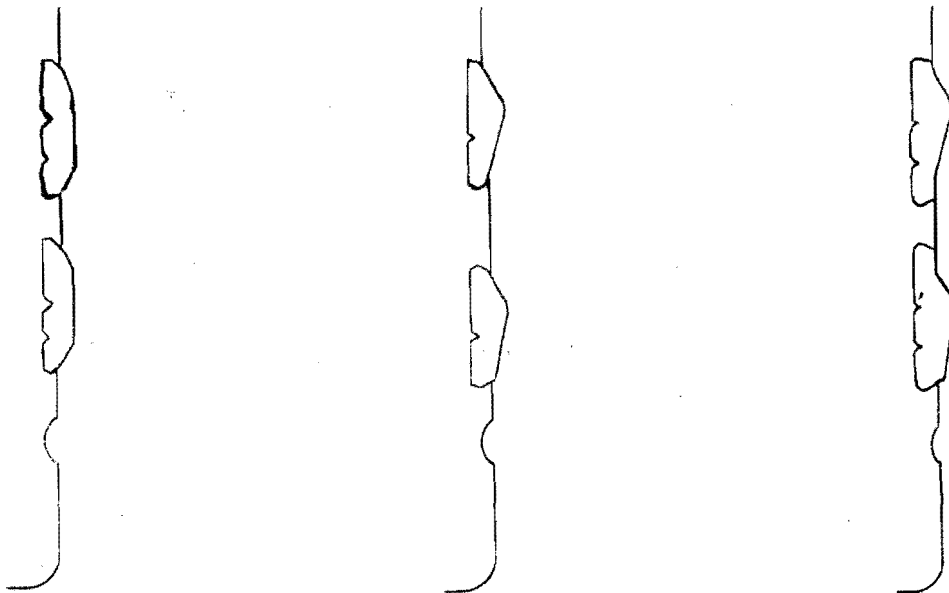


FIG.230 (ITEMS 590 & 599.)
METHOD OF FILLING TRACERS. DESIGN 14187 & 14218.

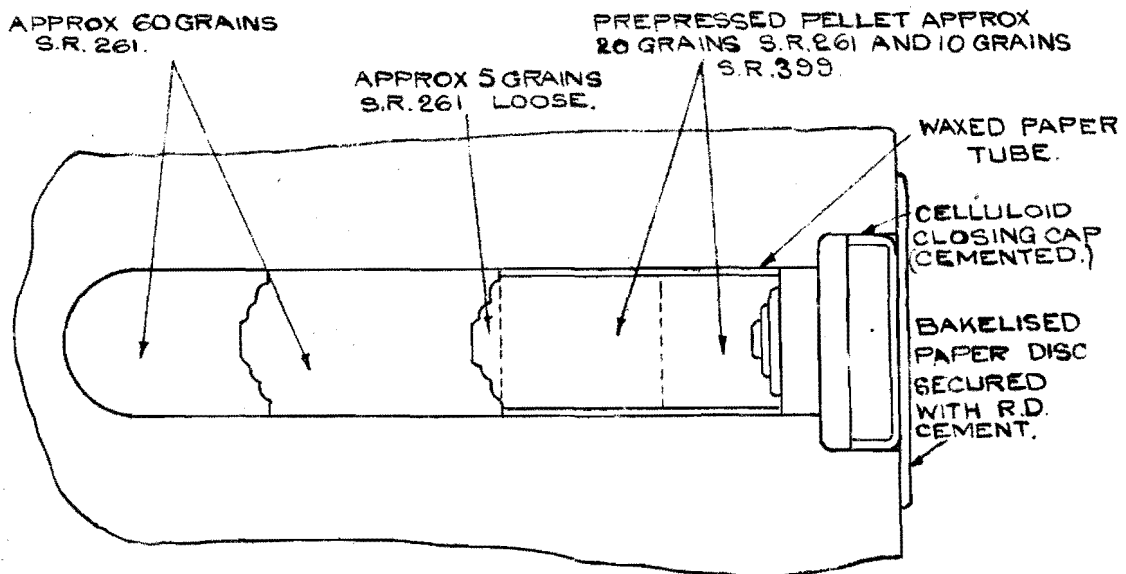


FIG.231 (ITEM 589.)
BATCH MARKINGS LABEL.

L.2000.

BATCH

FIG.232 (ITEM. 589.)
PROPELLANT CODE LABEL.
L.2001.

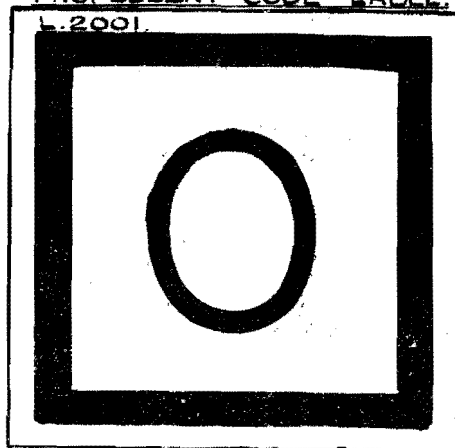


FIG.233 (ITEM.589.)

TRACER LABEL.

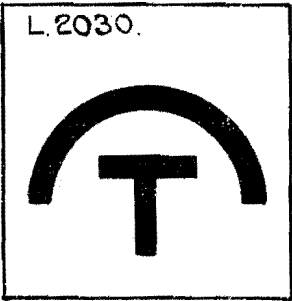


FIG.234 (ITEM.589.)

BATCH PARTICULARS LABEL.

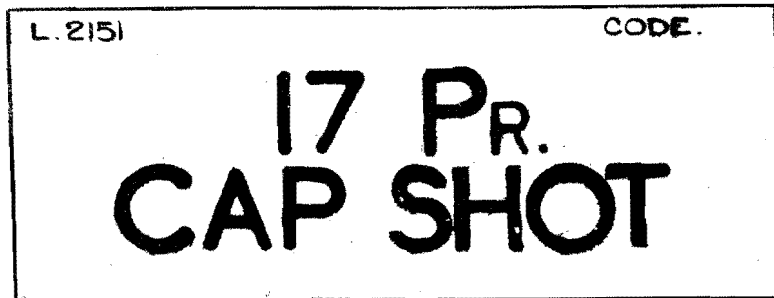
L.2144		CODE.3166.				
17 Pr SHOT		BATCH E				
MARK		PLUGGED SERIES				
PROPELLANT.	lb. oz. dr.					
SHELL	DES.		MK.			
FUZE GAINE PRIMER TRACER IGNITER	Nº	MARK.	LOT.	FILLER	DATE	ASSEMBLED
						CARTS.

FIG.235 (ITEM.589.)
A.P. SHOT LABEL.

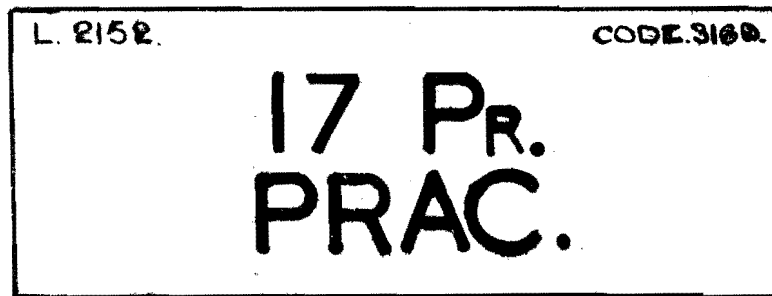
L.2150	CODE 3166.
17 Pr SHOT	

FIG. 236 (ITEM 589)
LABELS FOR Q.F. 17 PR. PACKAGES.

A.P.C. SHOT LABEL,



PRACTICE SHOT LABEL.



PRACTICE, FLAT-HEAD SHOT LABEL.

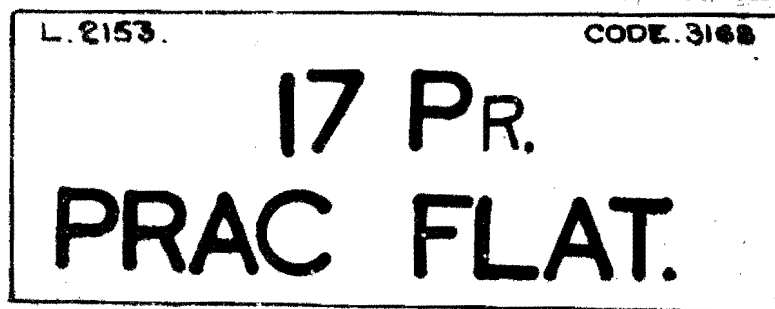


FIG. 237 (ITEM 589)
BOX, C, 274 WITH LABELS TYPICAL FOR CARTRIDGES Q.F., 17Pr.

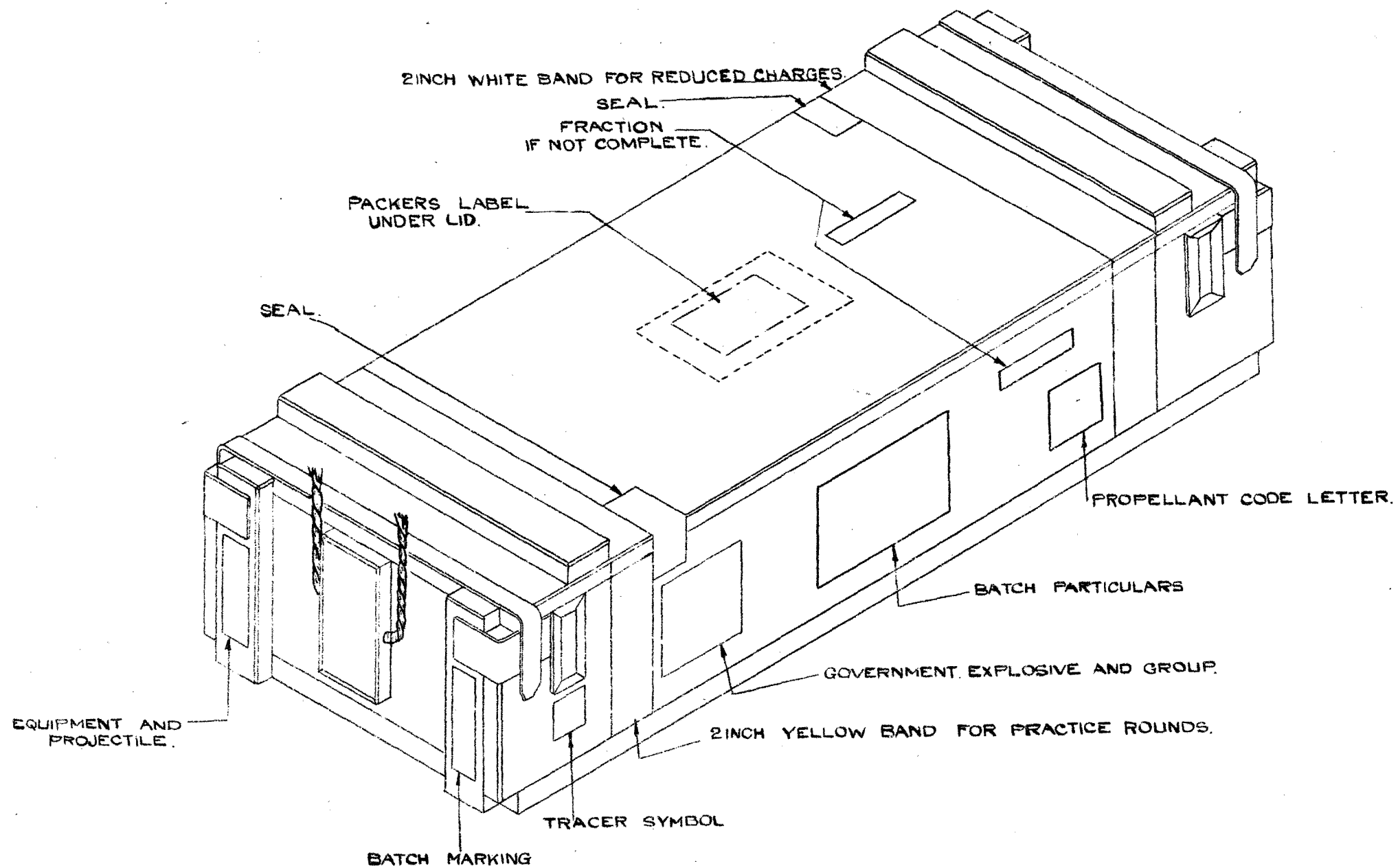


FIG.238 (ITEM 591.)
EVERSHED SAFETY OHMMETER.

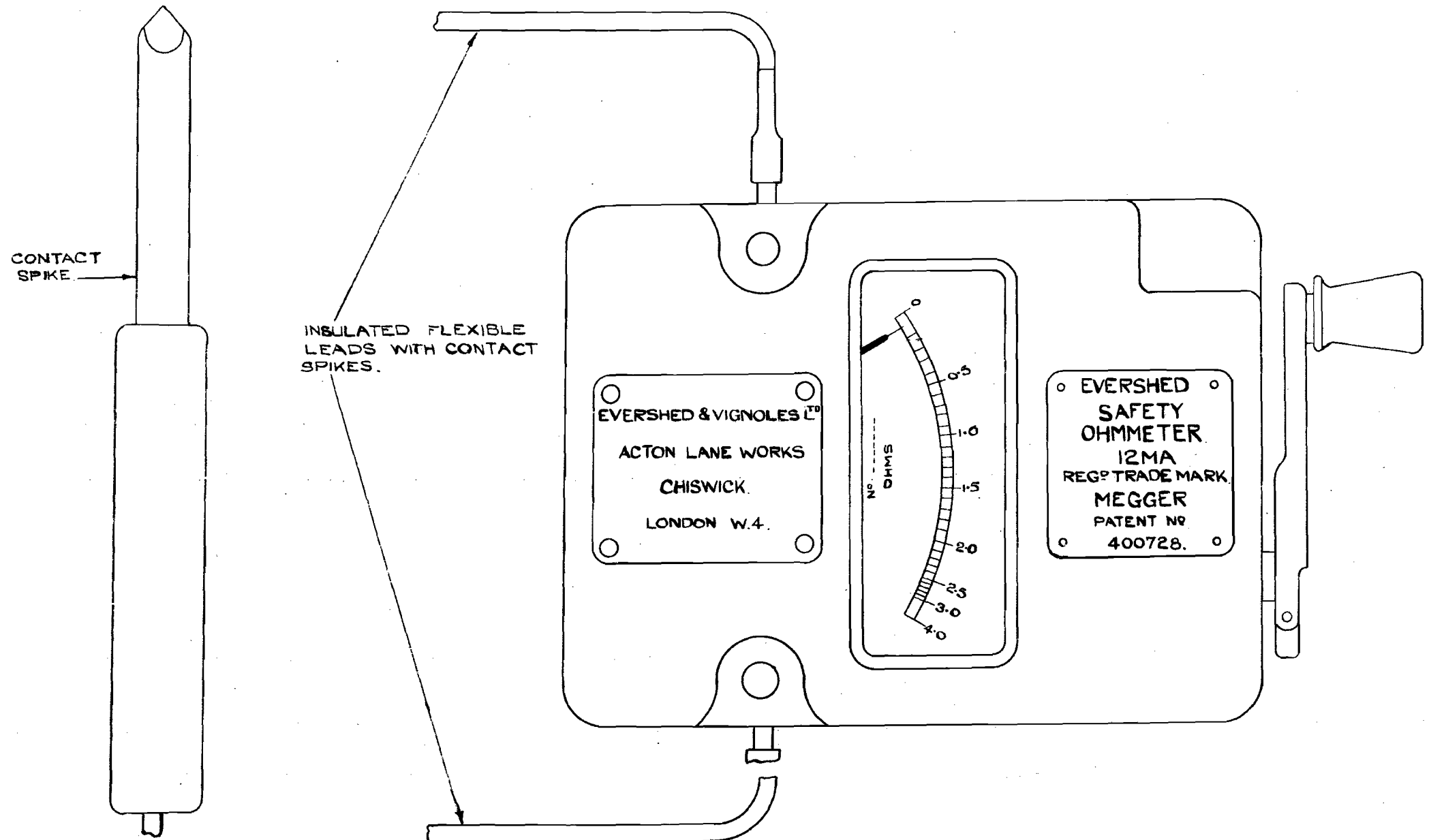


FIG. 239 (ITEM 591)
EVERSHED SAFETY OHMMETER DIAGRAM OF ELECTRICAL DETAILS.

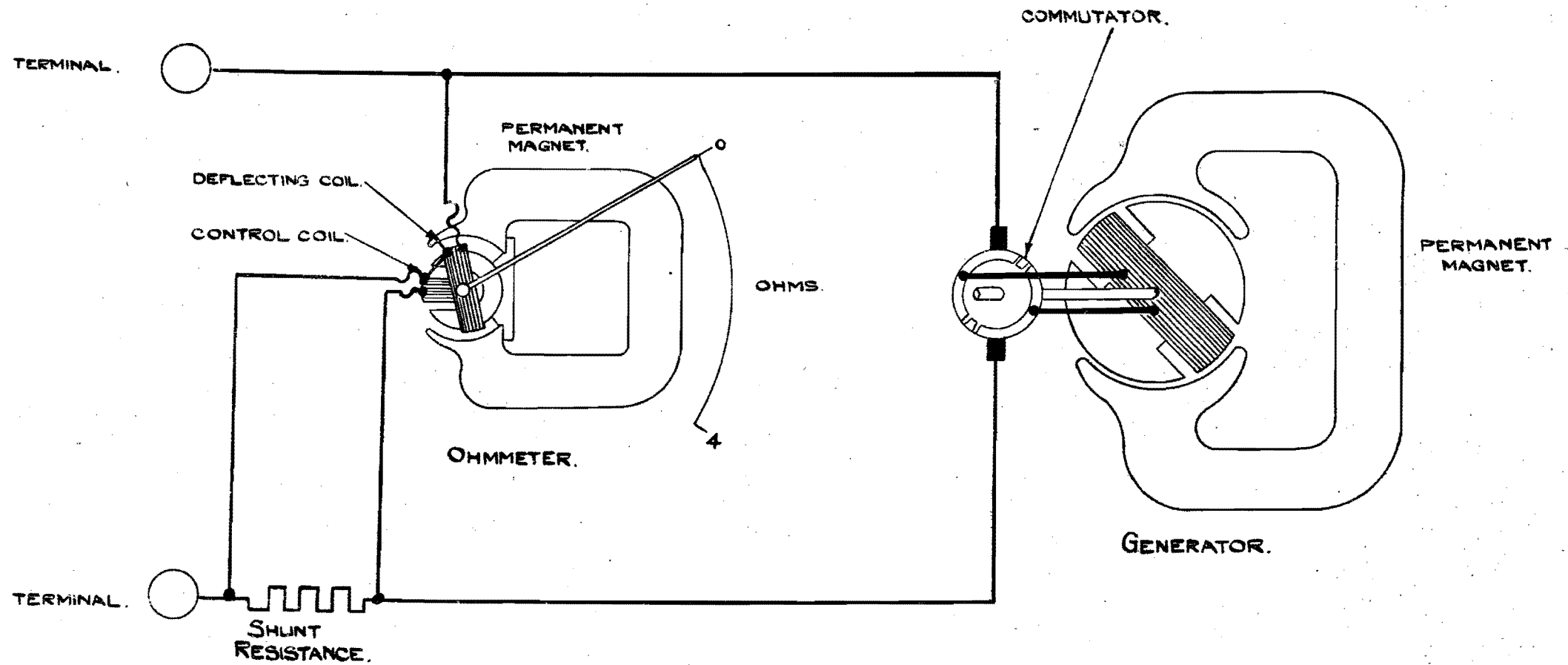


FIG. 240 (ITEM 592)

SHELL H.E./I/T 20 M.M. OERLIKON GUN MK. II T & V T

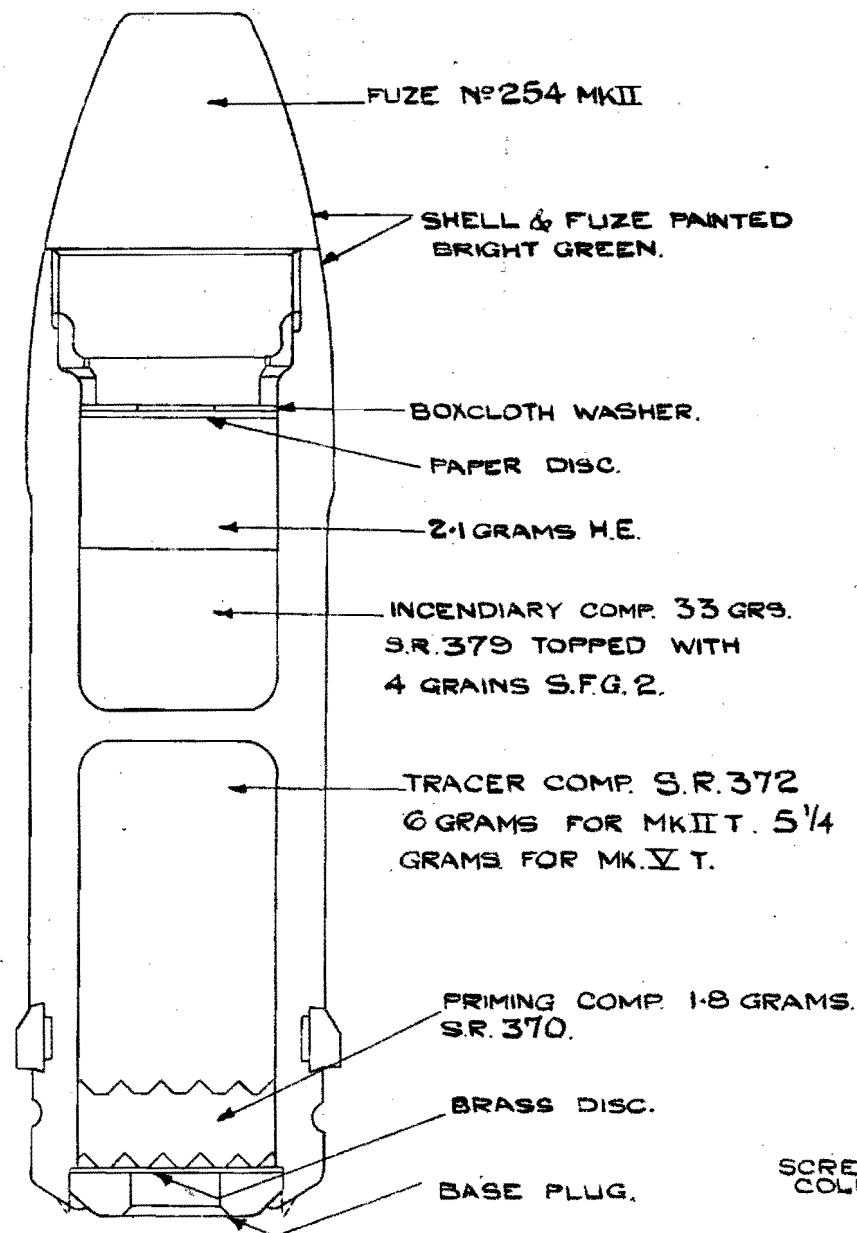


FIG. 241 (ITEM 593)

RUSSIAN PRIMER FROM GERMAN 7.62 CM ROUND.

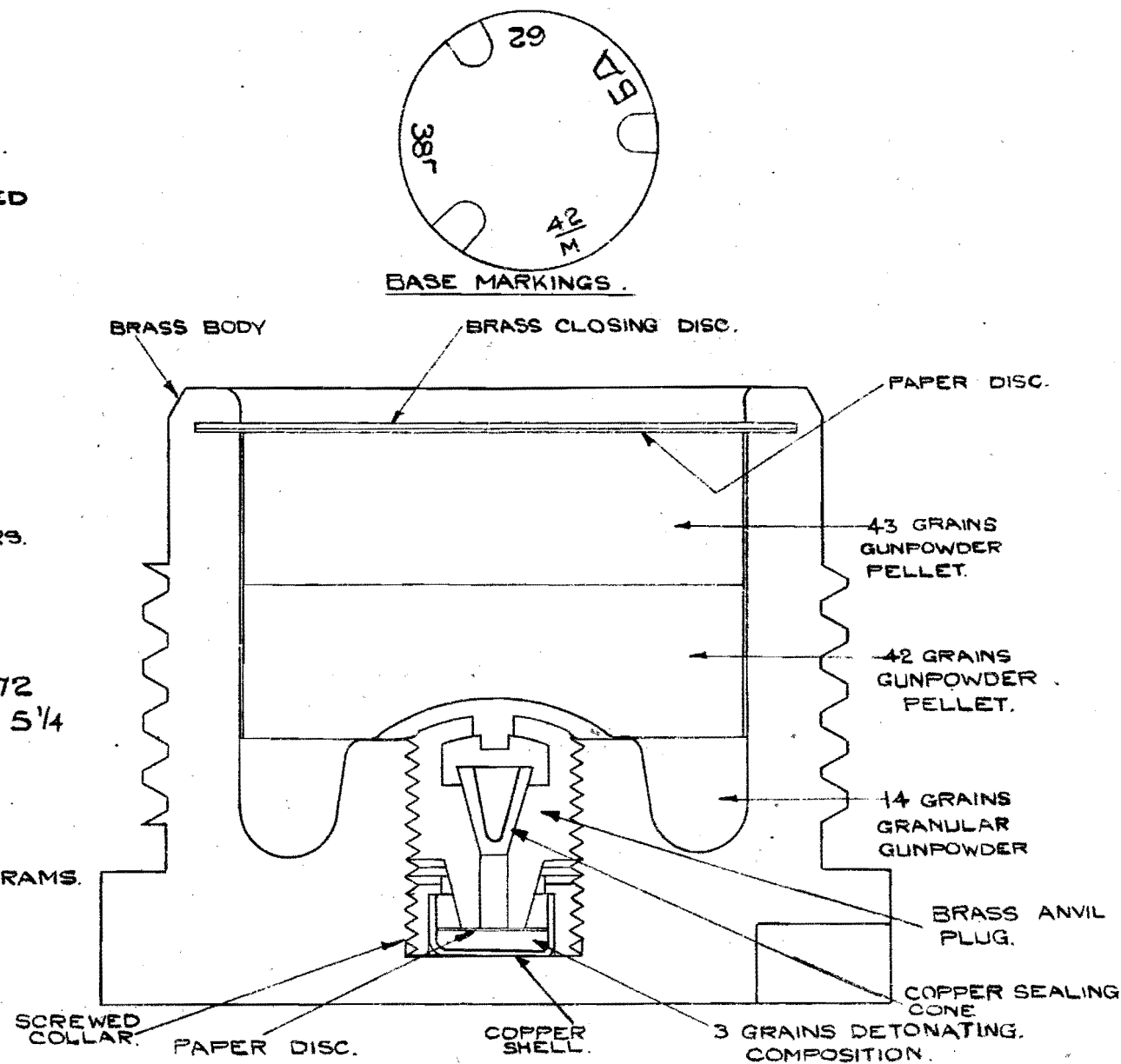


FIG. 242 (ITEM. 593)
GERMAN 7.62 cm. Q.F. SHOT A.P. 40 (TUNGSTEN CARBIDE CORE.)

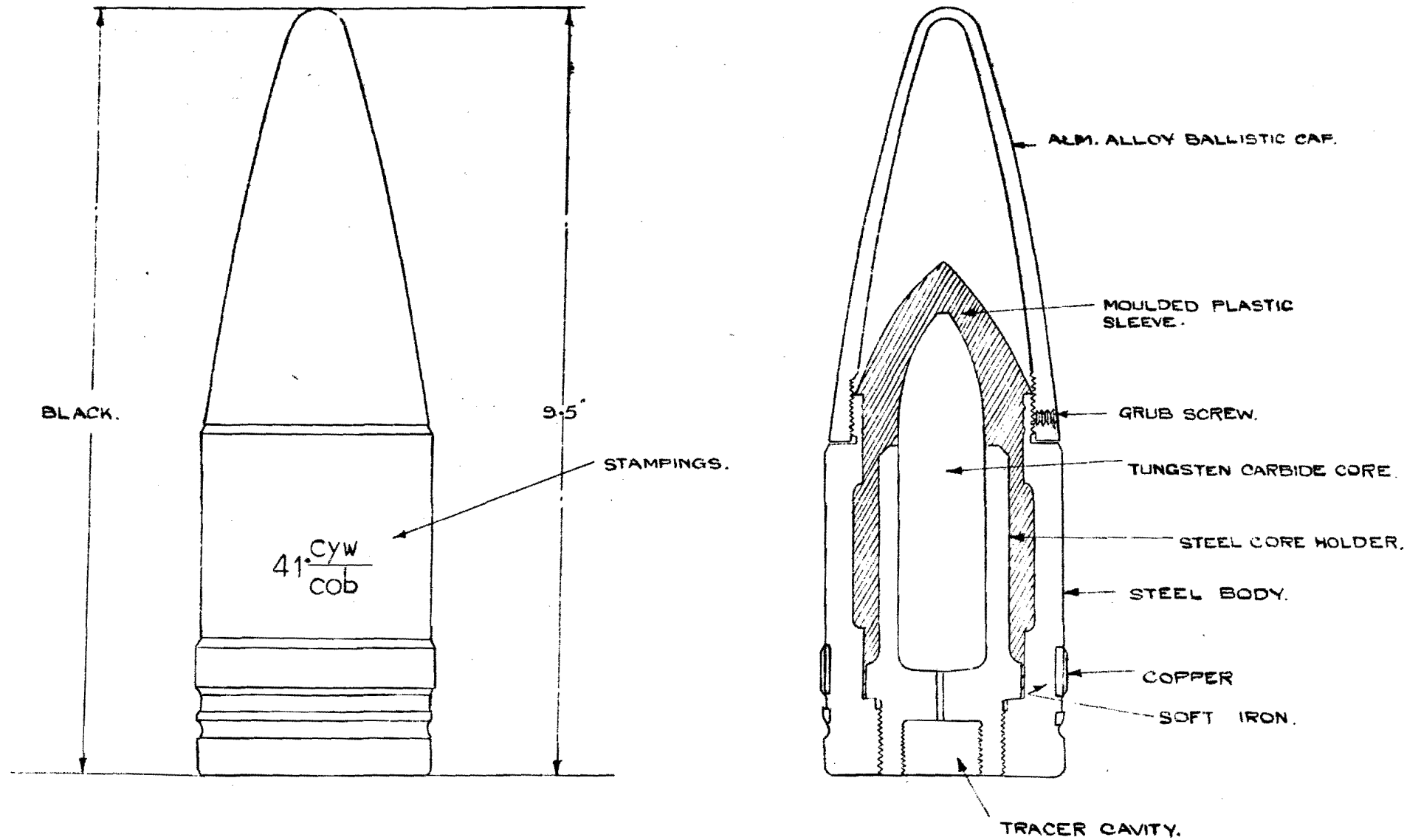


FIG. 243 (ITEM. 594)
 ITALIAN Q.F. 100/17 mm. H.E. SHELL WITH HOLLOW CHARGE.

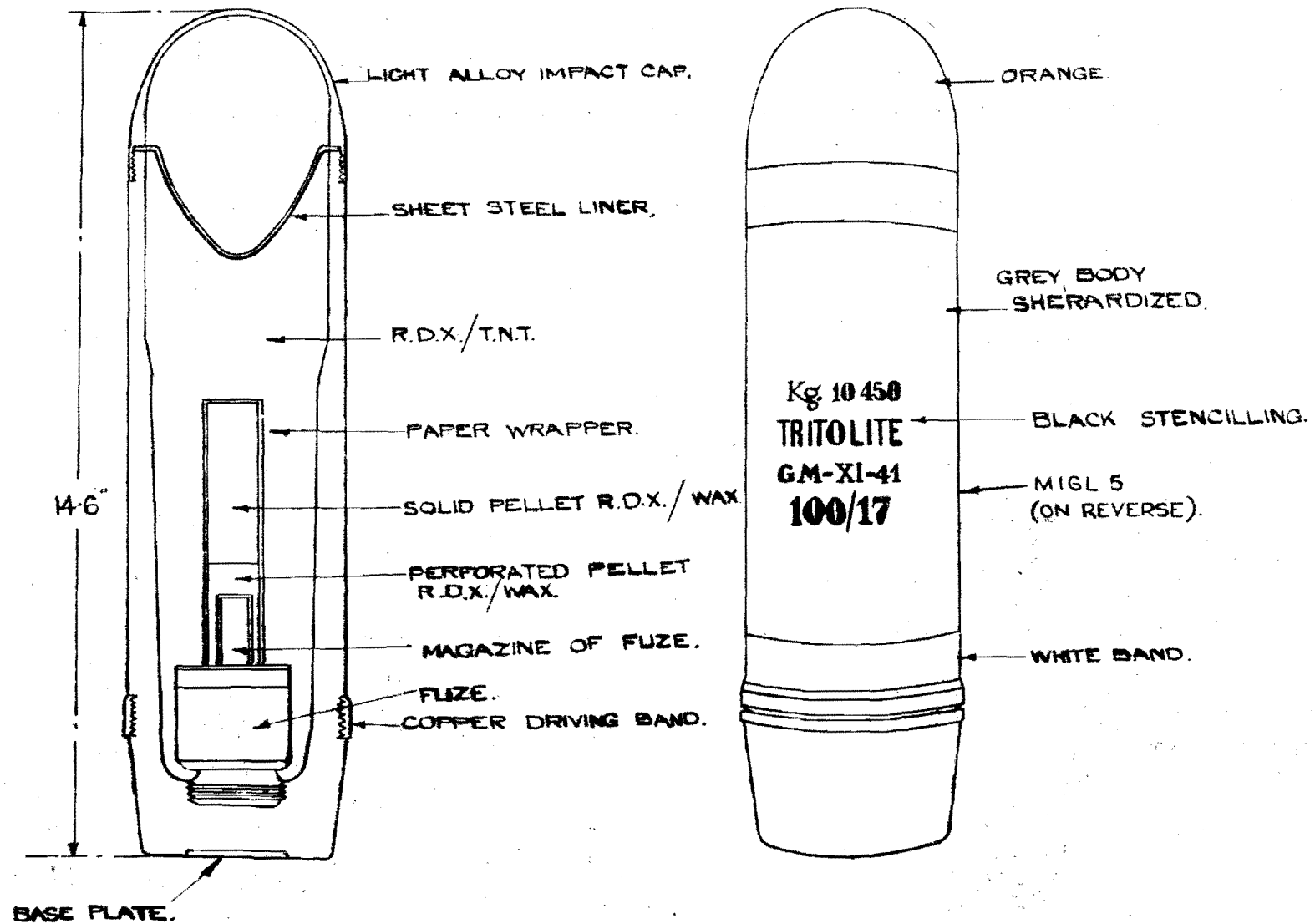


FIG. 244. (ITEM 594.)
ITALIAN FUZE, BASE, PERCUSSION FOR 100/17 MM. H.E. HOLLOW CHARGE STREAMLINED SHELL.

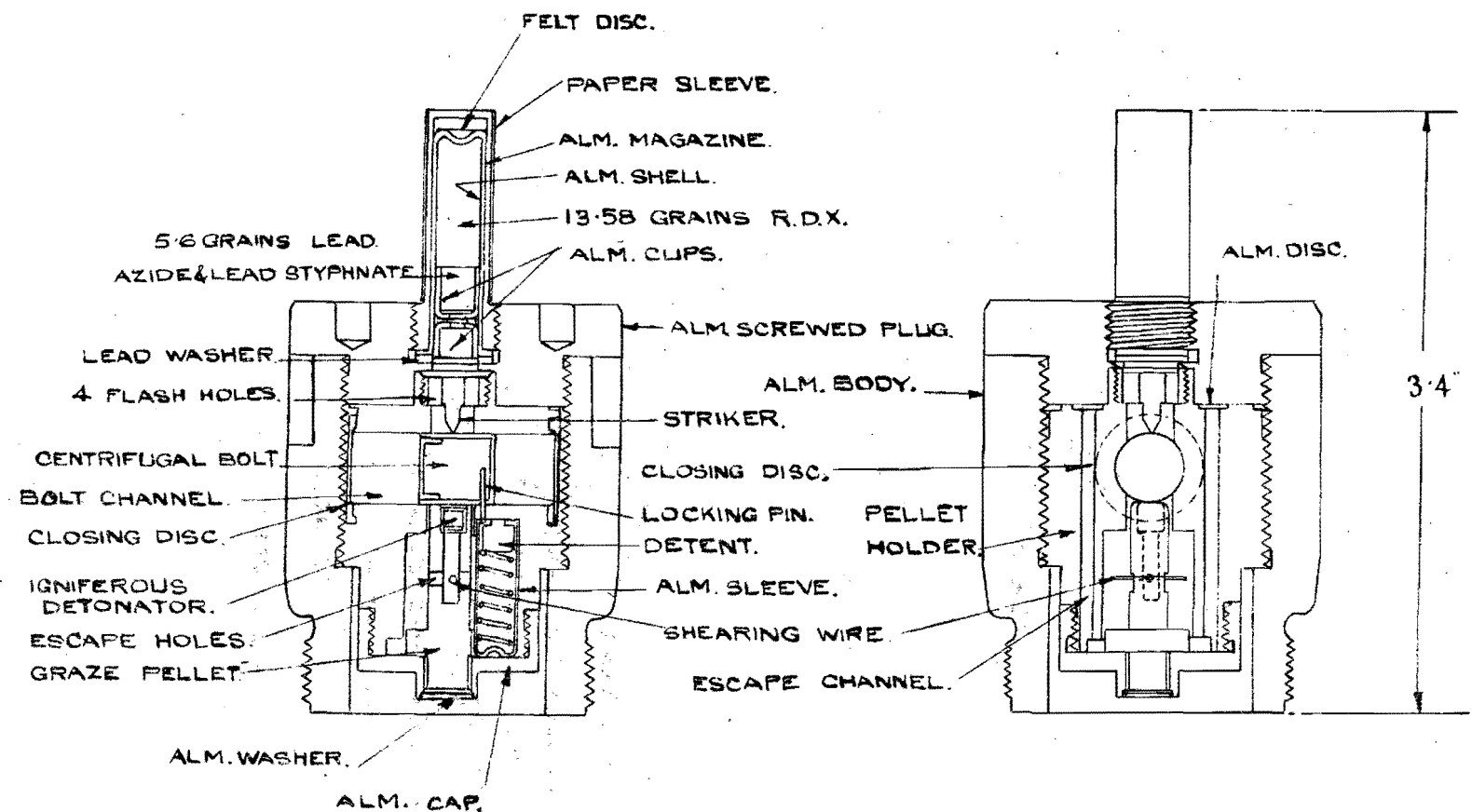


FIG 245 (ITEM.595.)
JAPANESE 50 MM. M.L. RIFLED MORTAR H.E. ROUND.

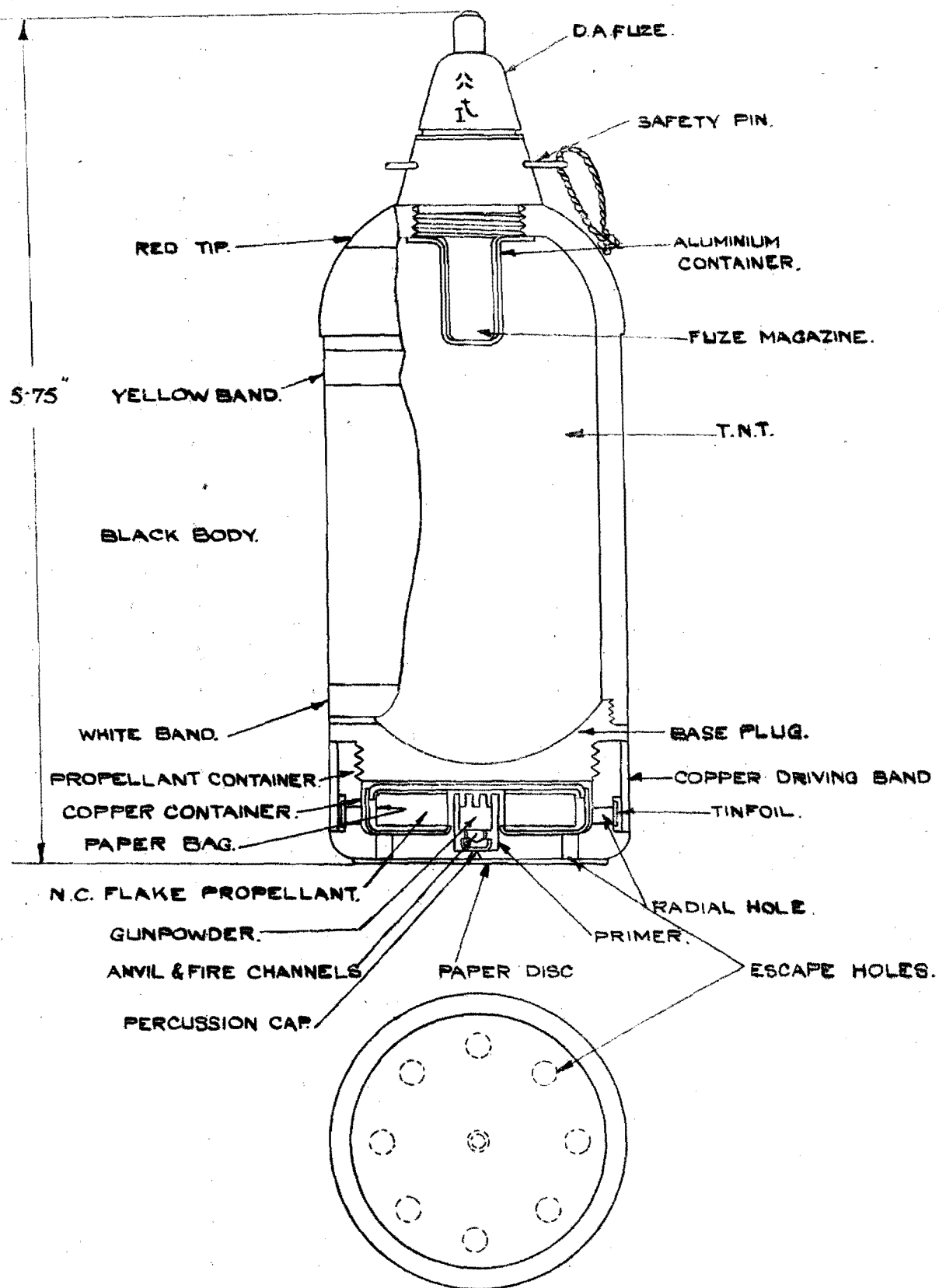


FIG. 24G. (ITEM 595.)
JAPANESE FUZE FOR 50 mm. H.E. MORTAR SHELL.

