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AMMUNITION BULLETIN No. 35

ITEMS 804-844

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THE CHIEF INSPECTOR OF ARMAMENTS.

MINISTRY OF SUPPLY
AMMUNITION BULLETIN NO.35. SECURITY

ISSUED BY:-
CHIEF INSPECTOR OF ARMAMENTS

ITEM NO.

823 Bomb, H.E.,A.T., Infantry Projector A.T., Mk.I.
834 Bombs, M.L.,4.2 in. Mortar, Duplication of Batches.
833 Box, P.60 Mk.II.
813 Box, Ammunition, C.286, Mk.II for 6 pr. 7 cwt.
814 " " C.298 Mk.I for 6 pr. 6 cwt.Mk.III Gun.
815 Boxes, Ammunition, Q.F. 2 pr. Mks. IX to XA Guns.
812 " " S.B.M.L. 4.2 in Mortar.
809 Box, Tail, Propelling, Rocket 'U' 3 in. H.97 Mk.I.
805 Cartridge cases, Stencilling.
811 Cartridge, Q.F. 6 pr. 6 cwt. Mk.III Gun FNH/P.038.
824 " " 17 pr. 6 lb. 4 oz. Cordite WMT.316-100.
822 " " " 7 lb. 2 oz. NH.050.
831 " " 3.7 in. Mks.I - III Guns. FNH/P 049.
832 " B.L.5.5 in. Mk.III Gun, Cordite N/S 164-048.
818 " " " Gun. Markings and Package.
810 " " 7.2 in. How. 24 lb. Cordite N/S 198-054,Charge 4.
830 Cartridges, Q.F. 75 mm. Service life of NCT.in rounds from America.
806 " " 3 in. 20 cwt., Cartridge clips.
829 Charges, $2\frac{1}{2}$ in. Projector, 10 drs. Mks.I & II.
819 Detonators for Fuzes and Gaines - Nomenclature.
836 Flare, Trip-wire, Mk.I (Fig. 329 & 330.)
807 Fuze, mine, contact, A.T. No.3 Mks.I,II & III -Waterproofing (Fig.322).
816 Fuze, percussion, D.A. No.244 - Implement Amm.
820 Grenade, hand, No.69, Removal of detonator.
821 " " No.75, A.T. Mk.I.
808 " " No.82, A.T. Mk.I. (Fig.323).
804 Projectiles - Marking of filled stores.
825 " Q.F. 95 mm. How.
817 Shell, Q.F. H.E. 40 mm. M. of F., Nomenclature "Pentolite 93/7".
826 " " " 95 mm. TK., S.P. & Inf. How.
827 " " Smoke Emission, 95 mm. TK.How.,Mk.I (Fig.324).
828 " " Smoke B.E.,95 mm. S.P. & Inf.How.,Mk.1A. (Fig.325)
837 Signal, 1 Star, Red, Green or White, Mk.I. (Fig.331)
835 Tubes. (Fig.326, 327 & 328.)

ENEMY AMMUNITION

GERMAN

838 Base fuze with optional and variable delay for 15 cm anti-concrete shell (Fig.332)
839 Base fuze with optional delay for 21 cm anti-concrete shell (Fig.333).

ITALIAN

840 Primer, percussion, Q.F. cartridge, model 908 (Fig.334)
841 Primer, percussion, Q.F. cartridge, model 930 (Fig.335)
842 Shell, Q.F., H.E. (Light case) 149/13 (Fig.336).
843 Time fuze graduated to 59 (Fig.337).

844 Amendments. (Enemy Ammunition)

AMENDMENTS

Bulletin No. 32. Item 658. Line 3. Delete "tin" and substitute "white metal".

" " 33. " 722. Line 3. Insert "." after "instances".
Delete "but only with the express sanction of D. of A."

" " 33. " 731. Page 17. Column 1, Line 27.
Delete VIIIz substitute VIII.

Page 19. List of Service S.A. Ammunition
Add:-

Cartridge S.A.Blank .303" L Mk.VII	.303"	Cordite	39.0	Mock Bullet.	
" " Incendiary .303" B Mk.IV	"	"	36.5	Incendiary	
" " " .303" B Mk.VII	"	"	36.0	"	
" " " B.Mk.VIIz	"	N.C.	35.5	"	
" " " .30" B Mk.IIz	.30"	"	50.0	"	
" " Drill .30" D Mk.I	"	-	-	-	
" " " " " " II	"	-	-	-	
" " " " " " III	"	-	-	-	
" " " " " " IV	"	-	-	-	

Page 25, Section B, Line 5.
Delete "Orange Yellow" Substitute "Grey"
Delete Line 10 and Substitute
"(iii) The Mark only is used with .303", .455", .5", .55", 1", 7.92 mm, 15 mm, and 20 mm, ammunition"
Line 11 from bottom of page after "Piercing" insert "Tracer"

Page 26, Line 18 and last line
Delete "1-inch" Substitute "1½-inch"

Page 27, Delete line 15 and Substitute:-
"Where used, carries the calibre, type, symbol, overprint and method of packing".

Page 28, Add to List of Current Distinctive Symbols:-

Anvil.	20 mm. H.S.Ball	-	Green.	White
Flat Iron	" " " A.P.	-	"	"
Lyre	" " " Tracer	-	"	"
Axe Head	" " " Incendiary	-	"	"
Aeroplane	" " " H.E.	-	"	"
Bursting Bomb	" " " H.E./A.P.	-	"	"
Violin	" " " H.E./Inc.I.	-	"	"
Desk Telephone	" " " " " II.	-	"	"
Tigers Head	" " " S.A.P./Inc.	-	"	"
Harp	12 Bore A.A. Training Dart.	-	"	"

Page 29, Columns 1 and 2.
After "H - Rifle Grenade" insert
"38" - ".30" Incendiary".
After "58 - .5" Incendiary insert
"50 - .50" Ball"
"50W - .50" Armour Piercing"
"50G - .50" Tracer"
"50B - .50" Incendiary"

Bulletin No.34, Item 789. Line 5. For "12 lb.8 oz." substitute "12 lb.9 oz."
" " 34, " 794. Page 20. Supercharge increment for use with 20 lb. Projectiles. Delete "W.M.061 5 oz.8 dr."

804. PROJECTILES - MARKING OF FILLED STORES

Reference Bulletin No.33, Item 713. In future the monogram of filling factory and date of filling will be stencilled on:-

(a) All separate loading shell.
(b) All fixed Q.F. shell filled by a different factory to that which assembles the complete round.
(c) All fixed Q.F. shell which are stored in the filling factory for more than one month before assembly into complete rounds.

This marking is not a requirement on fixed Q.F. shell which are assembled into complete rounds in the same factory within a month of filling.

805. CARTRIDGE CASES - STENCILLING.

The stencilling on brass-plated steel cartridge cases will be made with a 5 per cent solution of silver fluoride in water.

806. CARTRIDGES, Q.F. 3 in. 20 cwt. - CARTRIDGE CLIPS.

Reference Bulletin No.34, Item 755. The use of the No.27 cartridge clip with H.E. rounds fuzed No.119B, and for the packing of this clip in Box C.204 as an alternative to the No.5 clip, has been approved.

807. FUZE, MINE, CONTACT, A.T.NO.3 MKS.I,II &III. - WATERPROOFING. (Fig.322)

Approval has been given for waterproofing the abovementioned fuzes by means of a rubber ring to seal the joint between the top of the striker and the fuze body.

A round section rubber ring fits snugly round the striker and lies in a recess in the body of the fuze. Under the shear wire is a steel washer which, under the action of the striker spring, compresses the rubber ring and expands it against all surfaces, giving a waterproof joint. Fig.322 shows the Marks I, II and III fuze bodies modified accordingly.

Fuzes so modified will have the suffix letter "B" added to the Mark.

808. GRENADE, HAND, NO.82, A.T. MARK I.(FIG.323)

The body of this H.E. anti-tank grenade, formerly known as the Gammon Bomb, consists of a fabric bag, open at each end. The lower end of the bag is gathered in and an elastic band inserted round the edge, while the upper end fits under a steel cup, the edge being clamped between the cup and the flange of a tinned plate housing for the fuze, by 4 equally spaced rivets. A tinned plate cap, to the lower end of which is secured a aluminium primer tube, is screwed over the fuze housing.

The grenade is fuzed with the No.247 percussion fuze wound with $4\frac{1}{2}$ inches of tape instead of the usual 12 inches, and the primer tube contains a C.E. pellet over which is placed a felt washer. A central perforation in the pellet accommodates a No.63 detonator with a felt disc inserted between it and the bottom of the primer tube.

A strip of adhesive tape, about 2 inches long, is secured to the fuze cover and steel cup. The grenade is issued with the bag empty and the charge of plastic explosive is inserted through the bottom of the bag under local arrangements.

Markings are shown in Fig.323.

PACKING

The following components are packed in a steel box, G.70 fitted with Shields, packing No.2 Mk.I and No.3 Mk.I :-

40 empty grenade bodies, fuzed, in 4 tin boxes No.413 Mk.I, each containing 10.

40 filled primer tubes, in 4 tin boxes No.414 Mk.I, each containing 10.
40 detonators, in 4 tin boxes No.415 Mk.I, each containing 10.
Dimensions of Box G.70 are 19.15 x 8.34 x 7.85 inches.
The P.E. charges are packed separately.

809. BOX, TAIL, PROPELLING, ROCKET "U" 3 inch. M.97 Mk.I.

The empty and filled weights of the above mentioned box are :-

Weight, empty - 28½ lbs.
" filled - 94 lbs.

810. CARTRIDGE, B.L. 7.2 in. HOWITZER, 24 lb. CORDITE N/S. 198-054, CHARGE 4.

Reference Bulletin No.34, Item 793, Table of Cartridges, B.L.7.2 in. Howitzer.

The above cartridge is to M. of F. Design DD(L)16485. Dimensions are Length 21.5 inches, Diameter 6.8 inches. Packing is not yet clear.

811. CARTRIDGE, Q.F. 6 pr. 6 cwt. MK.III GUN - FNH/P.038.

A nominal charge of 3 lb. 2 oz. 4 dr. FNH/P.038 for use with the above gun has been approved.

812. BOXES, AMMUNITION, S.B., M.L., 4.2 in MORTAR.

The undermentioned steel boxes have been approved for S.B.,M.L.,4.2 in. Mortar ammunition:-

B.179 Mk.I. To pack 4 coloured smoke bombs in two carriers No.7.
Stowage dimensions are 27 x 11.35 x 11.875 inches.

B.181 Mk.I. To pack 4 H.E. or cylindrical bombs in two carriers No.6.
Stowage dimensions are 24.75 x 11.35 x 11.875 inches.

813. BOX, AMMUNITION, C.286, Mk.II FOR Q.F. 6 pr. 7 cwt.

The above steel box has been approved and is designed to hold 6 rounds A.P.C.B.C., each in a Container No.71.

Stowage dimensions are 29.75 x 13.75 x 9.5 inches.

814. BOX, AMMUNITION, C.298 MK.I, FOR Q.F. 6 pr. 6 cwt. MK.III GUN.

This steel box has been approved and is designed to hold 6 rounds H.E., each in a Container No.95.

Stowage dimensions are 32.875 x 13.75 x 9.5 inches.

815. BOXES, AMMUNITION, Q.F. 2 pr. MKS. IX TO XA GUNS.

The undermentioned wood boxes, for production in N. America, have been approved:-

G.304 Mk.I. To hold 12 rounds A.P., each in a Container No.9.
Stowage dimensions are 20.35 x 12.1 x 10.2 inches.

G.305 Mk.I. To hold 12 rounds A.P.C.B.C., each in a Container No.66.
Stowage dimensions are 22.6 x 12.1 x 10.2 inches.

816. FUZE, PERCUSSION, D.A., NO. 244 - IMPLEMENT, AMMUNITION.

Key, No.184 Mk.I, for inserting or removing the abovementioned fuze, has been approved.

817. SHELL, G.P., H.E. 40 m.m. - M. OF F., NOMENCLATURE "PENTOLITE 93/7".

M. of F. Design No.DD(L)14279 of the abovementioned shell has been amended to provide for the sealing of Pentolite filled shell by an unwaxed box cloth washer next to the filling and a waxed felt washer above this.

"Pentolite/D1" (abbreviated to "PEN/D1") has been adopted as the nomenclature for desensitised pentolite of existing composition hitherto referred to as 93/7 pentolite.

818. CARTRIDGE, B.L. 5.5 in GUN - MARKINGS AND PACKAGE.

B.L. 5.5 in. cartridges for use with 80 lb. shell will be specially marked with a black band round the cartridge bag and the addition of the words "FOR 80 lb. SHELL ONLY". The cartridge box will bear as much of a horizontal black band round it centrally as the other marking on the box will permit, with the same words.

Approval has been given for the temporary use of Box, Cartridge, C.1 for packing the abovementioned cartridges with flashless propellant. 6 cartridges, without containers, will be packed in this box.

819. DETONATORS FOR FUZES AND GAINES - NOMENCLATURES.

The following is a revised list of shortened nomenclatures for detonators for fuzes and gaines :-

Detonator		Revised Nomenclature	
6 grain	A/L.A./C.E.	6 gr.	AZY.
6 "	L.A./C.E.	6 "	ZY.
6 "	fulminate	6 "	F.
6 "	booster cap	6 "	F/Booster
5 "	L.A.C.	5 "	AZ.
5 "	A.S.A.	5 "	ASA.
4 "	L.A./C.E.	4 "	ZY.
4 "	fulminate	4 "	F.
3.25 "	composite	3.25 "	BP.
3 "	A composition	3 "	A.
2.5 "	composite	2.5 "	BP.
2 "	fulminate	2 "	F.
2 "	composite	2 "	BP.
1.7 "	A composition	1.7 "	A.
1.62 "	composite	1.62 "	BP.
1.35 "	"	1.35 "	BP.
0.64 "	"	0.64 "	B.P.

The following key letters are used to indicate the nature of the filling of the detonators concerned:-

A	Detonating composition, A mixtures.
B	" " B "
ASA	Lead azide - lead styphnate - aluminium mixture.
E	Bofors detonating composition.
F	Fulminate
P	Gunpowder
Y	Composition, exploding (C.E.)
Z	Lead azide

820. GRENADE, HAND, NO.69 - REMOVAL OF DETONATOR.

Grenades of this type which have been fitted with the detonator and which require to be de-detonatored before return to store should be dealt with as follows:-

In general this should be a simple and safe operation. The first point is to ensure that the safety pin, tape and cap are in position on the 247 fuze.

Then, holding the grenade horizontally, remove the base plug. Tilt the grenade gently, fuze uppermost, and allow the detonator to slide out into the hand, should this not take place, the grenade may be shaken gently, taking care to receive the detonator in the hand when it is dislodged.

If this operation fails to release the detonator, the grenade should not be tapped on any hard surface, but should be expended in action or practice as soon as possible. Otherwise it should be destroyed. Detonatored No.69 grenades must not be carried by sea or rail as this is a dangerous and prohibited practice. They must not be despatched by civilian road traffic. They may be conveyed in Service road vehicles only with Service drivers, but this should only be resorted to in emergency.

821. GRENADE, HAND, NO.75 A.T. MK.I.

Reference Bulletin No.23, Item 373. Nobels Explosive No.673 has been approved as an alternative to Nobels Victor Powder and Polar Dynamite 25% Nitro-Glycerine has been approved as an alternative to Nobels Explosive No.673.

822. CARTRIDGE, Q.F. 17 Pr. - 7 lb. 2 oz. NH.050.

The abovementioned cartridge, to M. of F. Design DD(L)13115, has been approved.

823. BOMB, H.E., A.T., INFANTRY PROJECTOR A.T. MK.I.

Reference Bulletin No.30, Item 579. The weight of the filled bomb, including cartridge and plug, but without fuze, fuze carrier and clip, is approx. 2 lbs. 10 oz.

824. CARTRIDGE, Q.F. 17 pr., 6 lb. 4 oz. CORDITE W.M.T.316-100.

The abovementioned cartridge, to M. of F. Design DD/L/16228, for provision for Australia if required, has been approved.

825. PROJECTILES, Q.F. 95 m.m. HOW.

The following is a list of shell for the 95 m.m. How., showing the equipment in which used:-

TYPE	M. of F. DESIGN NO.	EQUIPMENT IN WHICH USED		
H.E.	DD(L)11556	TK.	S.P.	Inf.
Smoke B.E.	DD(L)14663	-	S.P.	Inf.
Smoke Emission	DD(L)14881/A.	TK.	-	-
Hollow Charge	DD(L)15737	TK.	-	-

826. SHELL, Q.F., H.E., 95 m.m. TK.,S.P. & Inf. How. - M. of F.

M. of F. Design DD(L)11556 for 3.7 in. and 4.5 in. How. is applicable to the above shell. The design provides for a 9.2" to 9.3" two diameter cavity lined with a paper tube, a steel exploder container and a 1½ oz. or 1¼ oz. smoke box of red phosphorous. The smoke box is seated on a boxcloth disc in the bottom of the cavity and has a felt disc between it and the exploder container above. A C.E. or T.N.T. exploder "A" is inserted into the exploder container choke downwards.

The centre cavity has a T.N.T. surround and the bursting charge is Amatol 80/20 or 50/50 for Imperial service, or Amatol 60/40 for India. The filling is topped with T.N.T.

The shell, which may have a nose bush fitted, is closed by a 2 inch fuze-hole plug No.3 or Fuze No.119. The upper exploder "B" is issued with the fuze and is inserted choke downwards, being separated from the lower exploder by 2 tracing cloth or manila paper discs.

The exterior of the shell is painted buff colour and bears the usual stencilled markings. A ring of red crosses around the nose denotes that the shell is filled and is suitable for use in hot climates. A one inch green band denotes the Amatol filling. "60/40" is stencilled on the body when filled Amatol 60/40. Two green discs, diametrically opposite, indicate the presence of the smoke box, the letter "A" or "B" being stencilled on the discs to denote that the smoke box is of aluminium or bakelite, respectively.

827. SHELL, Q.F., SMOKE EMISSION, 95 m.m., TK. HOW. MK.I. - (Fig.324)

The shell body, of steel, has a thick walled base tapering to uniform thickness of wall towards the front. It is fitted with a copper driving band to design DD(L)14904/2 below which is a groove for the attachment of the cartridge case. The base is bored and threaded to receive the delay holder whilst the mouth is formed with a lip to accommodate the closing disc. M of F. is to DD(L)14881/A.

The delay holder, of mild steel, is formed with a flange and has external screwthreads to screw into the base of the shell. A central boring through the holder contains three pressings of delay composition as shown in the Figure , each being pressed in separately. The base of the holder is closed by a celluloid closing cup and a bakelised paper disc, each being secured with approved cement. When inserted into the shell the delay holder protrudes approx. 0.2 inches from the base of the shell.

The shell cavity is filled with about 5 lbs. 2 oz. smoke composition P.N. 83 (M) pressed in 4 or 5 increments. About 120 grains priming composition S.R.252 is pressed in with the first increment of smoke composition. The closing arrangement comprises millboard discs as required, a felt disc and a steel closing disc. The lip formed at the mouth of the shell is pressed over on to the closing disc and the joint sealed with approved cement.

Overall length of shell, with delay holder inserted, is 10.28 inches. Total filled weight 16 lb. 9 oz.

Particulars of painting and marking are shown in Fig.324.

828. SHELL, Q.F., SMOKE B.E., 95 m.m. S.P. AND INF.HOW.MK.IA (Fig.325)

This base emission smoke shell, for use with the 95 m.m. S.P. and Infantry howitzer, has a steel body and base and is fitted with a copper driving band to design DD(L)14885/1. It is filled to M. of F. design DD(L)14663.

The head of the shell, which may be fitted with a nose bush, is bored and screwthreaded to receive Fuze No.221 or Plug, fuze-hole, 2 inch No.1 Mk.II or III. Immediately below the fuze hole a diaphragm with a central hole is formed in the head, a tinned-plate disc being soldered over the hole.

A cavity below the diaphragm accommodates a 1½ oz. powder burster charge contained a shalloon bag. The smoke charge is contained in 4 containers, smoke, No. 4 Mk.II, a baffle plate being positioned between the burster charge and the upper smoke container. A hole through the centre of the baffle plate is covered by a paper disc secured with shellac and a paper washer is shellacked to the under surface of the plate.

The shell is closed by a lightly screwed in base over millboard discs. Length of shell fuzed, is 17.54 inches. Weight, fuzed, 25 lbs.

Details of painting and marking are shown in Fig.325.

829. CHARGES, 2½ inch PROJECTOR, 10 drs. MKS.I & II.

Reference Bulletin No.33, Item 702. Delete first three paragraphs and substitute:-

"The 10 dram charge has been designed to replace the 5 dram charge hitherto employed with the 2½ inch projector.

The Mark I charge consists of 10 drs. semi-smokeless black powder "B" enclosed in a celluloid (or cellulose acetate) container surrounded by a ring of approved insulating material. Attached to the outer diameter of this ring is a corrugated brown paper wrapper or sleeve forming the walls of the charge, the end furthest from the G.P. charge being closed by an air cushion built up of cardboard and secured with approved adhesive. The thicker of the two millboard discs (see fig.288) is attached to the ring with adhesive. The thinner disc is dropped in after insertion of the lightly tamped sawdust padding and before fixing the ring assembly to the sleeve. The end remote from the air cushion is covered by a cardboard washer of greater diameter than the ring, to prevent the charge from being pushed too far into the breech of the projector and causing a misfire.

The Mark II charge differs from the Mark I in that the space occupied by the ring, sawdust and air cushion is filled by one solid piece moulded from sawdust and paper waste."

830. CARTRIDGES, Q.F. 75 m.m. - SERVICE LIFE OF N.C.T. IN ROUNDS FROM AMERICA.

The Service life of N.C.T. in complete rounds of Q.F. 75 m.m. ammunition (now in service) received from America, has been fixed to expire in August 1944.

831. CARTRIDGES Q.F.3.7 in. MKS.I - III GUNS - FTH/P.049.

A nominal charge of 9 lb. 0 oz. 2 dr. FTH/P. 049 (for filling in Canada) has been approved for use with the abovementioned guns.

832. CARTRIDGES, B.L. 5.5 in. MK.III GUN - CORDITE H/S.164-048.

A nominal charge of 12 lb. 9 oz. cordite H/S 164-048, with a 2 oz. G.12 igniter at each end, has been approved for use with 80 lb. shell in the abovementioned gun. (See also Item 818 this Bulletin).

833. BOX P.60 MARK II.

This steel box, stowage dimensions of which are 19.125 x 12.3 x 5.2 inches, is designed to hold 4 Q.F.25 pr. A.P. Shot or Mk.I T practice, each in a No.8 Container; or 4 Q.F. 25 pr. Mk.IIT or IIIT practice, each in a No.46 Container; or 8 No.25 Smoke Generators with packing pieces. The box is fitted with a heavy cotton tape band 12 inches in length.

834. BOMBS, M.L. 4.2 inch MORTAR - DUPLICATION OF BATCHES.

Duplication of Batch markings, involving batches H.213 to H.278 inclusive, has occurred. In the event of any questions arising regarding this ammunition the particulars entered on the batch label in the package will be quoted.

835. TUBES. (FIG. 326, 327 and 328).

Tubes are used for firing B.L. guns and howitzers and, with adapters, in certain Q.F. guns used in Coast Artillery. They comprise the following:-

Tubes, percussion 'T'
Tubes, percussion, S.A.
Tubes, vent. (These may be Electric or Percussion, and are made in two sizes, .4 inch and .5 inch. The size is expressed with reference to the diameter of the mouth of the tube.)

Tube, vent, electric "S". (A special type for guns with strikerless locks)

Tubes, friction.

Tubes are issued in hermetically sealed tin plate boxes, usually 10 in a box. The tubes are described in the various handbooks and are brought together here for general information and in a convenient manner.

The complete list of tubes is as follows:-

TUBE (1)	MARK (2)	EMPTY DRAWING NO. (3)	FILLED DRAWING NO. (4)	PRESENT POSITION (5)	REMARKS (6)
Percn. "T"	II & IIR	DD(L)1096/1	DD/L/1096	Current	"R" denotes fired and repaired tubes.
" "T"	II	R.L.8210C			Friction or Percn. steel dummy drill. Exterior blackened all over.
Percn. S.A.	I	R.L.25843	R.L.25843	Obsolescent	"Necked" tube.
"	II	DD(L)5999/1	DD(L)5999	Current	-do-
"	IIIA	DD(L)1615B/1	DD(L)1615	-do-	"Un-necked" tube. "A" denotes modified gas seal.
"	IVA and V.	DD(L)10849/1	DD(L)10849	-do-	-do- -do-
"	I	R.L.28871			For drill purposes. Outer face blackened. and 3 indents painted red for identification.
Vent, Electric .4 inch	X	DD(L)1097/1	DD(L)1129A	Obsolescent	Mk.X tubes emptied and filled to Mk. XII, to have two stars added to Mark to identify filling.
.4 inch	XII & X**	DD(L)7616/1	DD(L)7616	Current	
Vent, Electric .5 inch	VIII	DD(L)1098/1	DD(L)1128/1	Obsolescent	
.5 inch	X	DD(L)5537/1	DD(L)5537	Current	
Vent, percn. .4 inch	VII	R.L.12724A (1)	-	Obsolescent	
.4 inch	XI	DD(L)624(1)/1.	DD(L)624(1)	Current	Mk.VIII re-designated to agree with Naval nomenclature.
.4 inch	II	R.L.13515		Current	Drill. Surface blackened all over for identification.
Vent, percn. .5 inch	IV	DD(L)603(1)/1	DD(L)603(1)	Obsolescent	
.5 inch	V	DD(L)603(1)/1.	DD(L)6012	Obsolescent	
.5 inch	VI	DD(L)9191/1	DD(L)9191	Current	
.5 inch	II	DD(L)11246			DRILL. Converted defective or fired tubes.
.5 inch	II & IIS	DD(L)11245			Mk.II Brass. Mk.II S Steel. "DRILL" marked on side and exterior blackened.

TUBE (1)	MARK (2)	EMPTY DRAWING NO (3)	FILLED DRAWING NO. (4)	PRESENT POSITION (5)	REMARKS (6)
Vent, Electric "S" .5 inch	VIII	DD(L)5538/L	DD(L)5538	Current	For Strikerless locks.
Friction	IV	DD(L)732	DD(L)732	Current	

All tubes, except the friction type, are used in the vents of guns or howitzers where it is essential to prevent gas escaping over or through the tube, as a rush of hot gas will put the vent and lock out of action. The tubes must therefore be vent sealing internally and externally. A loose copper ball or similar device accomplishes the former and the latter is attained by shaping the tube towards the mouth so that it expands radially and grips the vent tightly.

The following is a list of guns and howitzers showing the tubes used with each:-

NATURE.	TUBES USED.	REMARKS.
HEAVY AND SUPER HEAVY ARTILLERY.		
B.L. 6 inch Mk.XIX.Gun	P.S.A. .303 in.	
B.L.7.2 inch Mks.I to IV. How.	-do-	
B.L.8 inch Mk.VIII How.	P.S.A. .303 in.	
B.L.9.2 inch Mk.XIII, XIII* & XIIIA.	Vent, percn..4 inch	
B.L.9.2 inch Mks.II & IIA.How..	P.S.A. .303 in.	
B.L. 12 inch Mks.III-IV How.	-do-	
B.L. 18 inch Mks.I & II How.	Vent, elec. .5 inch Vent, percn. .5 inch	
MEDIUM ARTILLERY.		
B.L. 4.5 inch Mks.I & II Gun	P.S.A. .303 in, Mks. IIIA, IVA & V.	
B.L. 60 pdr. Mks.I - I** Gun.	P.S.A..303 in.	
B.L. 5.5 inch Mk.III Gun	P.S.A. .303 in. Mks.IIIA, IVA & V.	
B.L. 6 inch 26 cwt. Mk.I How.	P.S.A. .303 in.	
COAST ARTILLERY.		
B.L. 6 inch Mks.VII to VII**	Vent.Elec. .4 inch " Percn. .4 inch.	
Mks.XXI & XXIV.	Vent.Elec. .5 inch " Percn. .5 inch	
B.L. 9.2 inch Mks.X, XV & X**	Vent.Elec. .5 inch " Percn..5 inch	
Mk.XV.	Vent.Elec. .5 inch " Percn..5 inch	
B.L. 15 inch Mk.I.	Vent.Elec."S" .5 inch	
Q.F. 12 pdr.12 cwt. Mks.I to II***	Vent.Elec. . 4 inch " Percn.. 4 inch	In adaptor with metal igniter or with cordite cylinder and bag filled gunpowder.
Q.F. 4.7 inch Mks.III to IV*	-do-	-do-
Q.F. 6 inch Mk.II.	-do-	-do-

NATURE	TUBES USED	REMARKS.
NAVAL GUNS USED IN COAST ARTILLERY		
B.L. 4 inch Mks.VII, VII*, VII* and IX to IX*	Vent.percn. .5 inch	
B.L. 5.5 inch Mk.I.	Vent.percn. .5 inch	
B.L. 6 inch Mks.XI, XI* XII, XIIA and XIIB.	Vent.percn. .4 inch " " .5 inch	
B.L. 7.5 inch Mk.VI.	Vent.elec. .5 inch " percn. .5 inch	
Q.F. 4.7 inch Mk.V*	Vent.percn. .4 inch	In adaptor with metal igniter filled gunpowder.

The "T" tube is no longer used in Imperial Service as there are now no equipments fitted with "T" vents.

The Tube percussion S.A. Cartridge is the ordinary .303 cartridge case, containing a charge of gunpowder, closed by a cork or similar type of disc, the disc being varnished. The charge is usually in pellet form and the early Mark I contains no other fitting. The latter Marks incorporate a ball seal and a slightly different arrangement of the gunpowder. The Mark II has fine grain powder in a paper container towards the cap with pellets of powder in the remaining portion.

These S.A. tubes are used in B.L. equipments having suitable mechanisms usually of a low chamber pressure type. The ball seal prevents internal gas escape; where this is absent the cap fulfils this function, external gas escape is prevented by expansion of the body in the vent.

The Tube vent percussion is issued in two sizes .4 inch and .5 inch and is used in equipments usually of the high chamber pressure type.

The head accommodates a striker with enlarged head, retained by a shearing wire over a cap resting on an anvil plug with fireholes. The body of the tube is filled powder, either pellets alone or a combination of pellets and fine grain. The mouth is closed by a cork plug fitted with paper disc on each side and shellacked externally.

The exterior of the tube is blackened and the head is notched to facilitate ready identification by day and night, respectively, to avoid being confused with the electric tubes used with the equipment. Percussion tubes are an emergency device for use when electric firing fails.

Tubes vent, electric, are the normal firing means in high chamber pressure guns. They are issued in .4 inch and .5 inch sizes. They follow the same general lines in design i.e. an insulated contact is inset in the head of the tube from which an insulated wire leads through a cone plug to a special type of metallic bridge connected to the cone plug and so to the body. The bridge is surrounded by guncotton dust an easily ignited explosive, the remainder of the tube being filled with powder pellets and closed by the usual cork disc, paper discs and shellack.

The striker of the breech mechanism makes contact with the tube head and on a current being passed the bridge is heated, igniting the guncotton and gunpowder. Internal gas escape is prevented by the cone plug setting back and external by expansion of the mouth.

The tube vent electric "S" is issued in the .5 inch size only for strikerless locks and differs from the tube described previously by having the contact above the level of the head of the tube to suit the strikerless locks used by the equipments.

The tube friction is used for life saving rocket apparatus and sundry other devices. The body is of copper, filled with a fine grain gunpowder. A nib piece is let into the closed end in which is a friction bar and detonating composition. Withdrawing the bar ignites the composition and so the powder. Vent sealing is not required.

As all these tubes contain gunpowder they are liable to become unserviceable quickly unless kept dry. They should be kept in their hermetically sealed tins until actually required for use and no more than is absolutely necessary should be in ready use. Those that are should be coated with mineral jelly at the mouth and kept in a closed tube box and as dry as possible. Damp tubes may give hangfires or misfires. It is a useful plan to keep ready use tubes in their tin box but with adhesive tape in lieu of the steel tape band.

Each tube box carries a printed label giving full particulars of the contents. The colour and colour printing of the labels are as follows:-

	Paper	Printing
Tubes, percussion "T"	Orange	Black
Tubes, percussion S.A.	White	Black
Tubes, vent, percussion	White	Red
" " electric	White	Black
" " electric 'S'	"	"
Tubes, friction	"	"

Several tin boxes are packed in a larger wood box which bears the above pattern labels. Standard packages are :-

Box No.	Contents	Stowage dimensions (inches) L.	H.	W.
T.3.	100 Tubes, percn. 'T' or 200 Tubes, percn. S.A.	15.25	4.25	7.375
B.3.	360 Tubes, percn. S.A.	9.375	6.625	10.25
T.7	100 Tubes, vent, elec. or percn. .4 inch.	18.375	3.25	7.25
T.9	200 Tubes, vent, elec. or percn. .5 inch.	18.6	9.25	9.25
T.3	200 Tubes, vent, elec. 'S' .5 inch.	15.25	4.25	7.375
T.5	200 Tubes friction	14.75	4.0	7.5
T.6	100 " "	16.0	4.5	7.125

Tubes are in Storage Group VI, Category for safety distance "X" and Sea Stowage, O.A.S.

Drill tubes of the percussion vent type have a solid body or a wood plug in the body with 4 equi-spaced crimping slots down the side. The S.A. drill tube has a wood plug in the body. The friction drill tube has a steel spring in the T head to receive the lanyard hook, two spare springs and two spare securing screws being issued with each tube.

836. FLARE TRIP-WIRE Mk.I. (Fig. 329 and 330)

This flare is intended as an alarm device operated through a trip wire which ignites the flare.

The plastic body has a central pintle prepared internally to receive the striker and its spring and with an internal thread for the cap securing cartridge. The mouth is threaded externally to take the metal cover. The bottom is prepared to accommodate the release plate and safety pin whilst two ribs down each side fit over the forks of the picket.

The candle comprises a cardboard container with central tube and has the ends closed with millboard discs and washers. It is charged with S.R. composition 252 primed with S R 252 and gunpowder whilst a primed muslin washer closes the upper end. The candle is inserted in the body and retained there by the screwed cover with milled cage, R D 1158A being used on the threads.

The cartridge is a cut down 9 m/m case with cap and 1 grain of G 12 gunpowder. The annulus is lacquered dark purple.

The striker has the lower end prepared for the release plate.

The release plate is of steel, of a double L shape. One end fits over a stud on the body. A shaped opening about the centre fits over the end of the striker when central and retains the striker in the cocked position whilst a hole in the arm receives the safety pin. The outer arm is prepared for the clamping nut.

The clamp plates, upper and lower, are of steel and retain the wire.

The safety pin has a whipcord becket and tinned plate label with instructions for use.

The trip wire is of steel 26 SWG and 60 feet in length, and is wound on a moulded spool to which the inner end is secured by insertion between the cheeks of the spool whilst the outer end is attached to a hook and retained on the spool by an adhesive tape.

The steel picket is $\frac{3}{8}$ inch in diameter and 23 inches long: it has a short prong about the centre and a projecting fork at the top to form a support for the flare. An arm fits over the upper end and carries a tensioning spring at the outer end. The spring is locked by two links secured by a safety pin and carries a clamp on the loose end.

Action. Fig.330. The hook end of the wire is looped round a suitable obstacle or a picket, care being taken in the latter case that the prong is in the direction of pull. The flare picket is fixed in the ground also with its prong in the direction of pull, and the arm, with spring, placed in position. The wire is then passed between the loosened faces of the clamp attached to the spring and pulled taut until further movement of the spring is prevented by the links. This point must not be exceeded. The wire is then securely clamped by means of the butterfly nut and the split pin removed. Next, place the flare in the fork of the picket, slacken the wing nut on the release plate until the whipcord can be released and hung over the arm, care being taken to remove the safety pin. The clip wire is now placed between the two clamping plates of the flare and securely tightened.

The safety pin is now removed and the flare is ready for action.

When the trip wire is fouled it is drawn from the flare picket against the spring and the release lever moves with the wire bringing the enlarged portion of its slot over the head of the striker which moves upwards on to the cartridge by the action of its spring.

Time of burning of flare is approx. 60 seconds.

The flare body is painted buff colour and has the following Empty markings moulded in :- "FLARE TRIP WIRE MK.I"; Contractor's initials and Date of Manufacture: Filled markings, as follows, are stencilled on the body in black:- Monogram of Filling Station or Contractor's initials or trade mark; Date of filling (month and year); Lot Number.

Packing details are not yet clear.

The flares are in Storage Group IX.Category for safety distance "X".

837. SIGNAL, 1 STAR, RED, GREEN OR WHITE, MK.I (Fig.331)

The empty components of this signal star comprise a tubular tinned plate body closed at one end by a soldered on cup, it is fitted internally with a brown paper tube, a steel container with brown paper shellacked to its exterior surface, and a millboard disc positioned on the bottom of the body cavity.

The open end of the body is suitably prepared for the attachment of a tinned plate neck, the neck being prepared with a rolled thread to receive the screwed cap with washer and having a central hole into which is inserted the striker tube, the latter being secured by soldering. The bottom of the striker tube is enlarged and prepared with a rolled thread to receive a screwed on cup.

The star, suitably primed and wrapped in primed cotton cambric is inserted over about 20 grains Gunpowder G.20 in the bottom of the container. A cork plug, with a hole through the centre, and two short lengths of quickmatch are arranged over the star.

Igniting arrangements comprise a cut down standard 9 m.m. capped cartridge case secured in the bottom of the striker tube. The striker, with its spring under compression, is held over the igniter by a fork shaped release lever positioned on the top of the neck portion and engaging in a groove cut round the striker stem near the top. The release lever is fitted with a link and ring which are arranged to fold conveniently together over the lever to enable the closing cap to be screwed home.

A strip of lassolastic of the same colour as the star seals the joint between the neck and body while another strip of similar colour is secured over the longitudinal seam in the body. A printed paper label of appropriate colour (as indicated in Fig. 331) is affixed round the body and bears instructions for firing the signal together with designation and filling particulars.

To facilitate colour identification by night the base is embossed with a cross to denote Red signal, a triangle to denote Green signal, or a circle to denote White signal.

The star is designed to burn for not less than 4 seconds and to project to a minimum height of 100 feet.

Packing and Storage.

330 Signals, Star, of one colour, are packed in a B.166 Mk.II steel box. The box is painted service colour and is marked to show the Number and Nature of contents; Filled lot number; Contractor's initials or Trade Mark; Month and Year of filling. In addition the word "FILLED" is stencilled on the sides in Red.

Estimated weight of the filled package is 86 lbs. Stowage dimensions are 19.7 x 9 x 13.2 inches.

Category for storage is Group IX.

838. GERMAN BASE FUZE WITH OPTIONAL AND VARIABLE DELAY FOR 15 cm ANTI-CONCRETE SHELL
(Bd.Z.f.15 cm Gr 19 Be)
Fig.332

The fuze is of the igniferous type and is used with a gaine in the anti-concrete shell (Gr 19 Be) for the 15 cm medium howitzer (s.F.H.18). The shell is described in Bulletin No.33. The designation of the fuze, "Bd.Z.f.15 cm Gr.19 Be", is stamped in the base which carries a flat ring graduated to indicate the setting positions for non delay (OV), short delay (KV), and long delay (GV). The setting plug, in the centre of the ring, has a slot for the setting key and a setting index in the form of a line at right angles to the slot.

The graze mechanism is assembled in a cylindrical container, capable of rotation within the fuze body, and consists of a fixed needle and an inertia pellet carrying an igniferous detonator. The pellet is held away from the needle by five pivoted centrifugal segments mounted on a ring shaped holder and encircled by an expanding spring ring. There is no creep spring.

The cylindrical container of the mechanism is retained in the body by a screwed securing ring engaging a shoulder near the base and has a diametrical projection at the base to engage a corresponding slot in the front face of the setting plug. The top of the container is closed by the needle holder which is secured by four screws and has an inclined flash channel.

The setting plug, slotted to engage the container, is coned to correspond with a coned seating in the body and is secured by a screwed ring. A sealing washer of lead is held between circular grooves in the plug and the ring.

A diaphragm formed in the body of the fuze separates the large recess for the mechanism container from the small recess at the head for delay unit and the magazine. The diaphragm has three equally spaced flash holes, with any one of which, the inclined flash channel in the needle holder can be aligned by rotating the setting plug to the appropriate graduation on the setting ring. Felt discs and an aluminium disc with perforations corresponding with the flash holes are inserted between the needle holder and the underside of the diaphragm. A recess for the locating pin of the delay unit is formed in the top of the diaphragm which is covered by similar felt discs.

The delay unit is held fixed in its recess by a locating pin in its base and consists of a cylindrical aluminium pellet with three equally spaced longitudinal channels of about .1 inch diameter which coincide with the flash holes in the diaphragm. One of these channels contains no filling and provides a direct flash channel leading to the magazine when the inclined channel in the needle holder is aligned with it by rotating the setting plug to the "OV" graduation. The two other channels contain a pressed filling of delay composition with a central cavity of about .04 inch diameter formed from the top. The cavity assists in the ignition of the gunpowder in the magazine, the depth being designed to give the required effective thickness in the delay composition (i.e. about .2 inch in the long delay channel and about .15 inch in the short)

The magazine consists of a screwed plug recessed at the underside to contain the gunpowder filling. A flash hole formed in the centre is closed on the inside by a paper disc.

ACTION.

Before loading, the fuze is set for non delay, short delay or long delay by turning the setting plug so that the index line on the plug coincides with the "OV","KV", or "GV" graduations respectively. The turning movement of the plug is imparted to the mechanism container thus bringing the inclined channel in the needle holder into alignment with the appropriate hole in the diaphragm and channel in the delay unit.

During the travel of the shell up the bore, the pressure of the propellant gases presses the coned setting plug into its coned seating and compresses the lead washer between the plug and its securing ring. The gases are thus prevented from entering the fuze.

During flight, the coil of the expanding spring ring is enlarged and the segments swung clear of the path of the graze pellet by centrifugal force. Independent rotation of the mechanism container is prevented by the setting plug forced tightly into its seating.

On graze, the pellet moves forward and the detonator is pierced by the needle. The flash from the detonator passes through the inclined channel in the needle holder and enters the hole in the diaphragm with which this channel has been aligned by the setting. With the fuze set for non delay the inclined channel is aligned with the hole corresponding with the empty channel in the delay unit, so the flash passes direct to the powder in the magazine. When set for short or long delay, the inclined channel coincides with the hole in the diaphragm corresponding with the appropriate channel in the delay unit. The flash then ignites the delay composition in the channel which burns through to the magazine.

With the setting plug at any position other than those indicated on the graduated ring, the inclined channel in the needle holder is masked by the washers and the solid parts of the diaphragm. This would most probably prevent the ignition of the magazine and result in a "blind."

839. GERMAN BASE FUZE WITH OPTIONAL DELAY FOR 21 CM ANTI-CONCRETE SHELL
(Bd. Z.f. 21 cm Gr. 18 Be.)
Fig.333

The fuze is of the igniferous type and is used with a gaine in the anti-concrete shell (Gr.18 Be) for the 21 cm heavy howitzer (Mrs 18). The shell is described in Bulletin No.34. The designation of the fuze, "Bd. Z.f 21 cm Gr 18 Be", is stamped in the base of the fuze where there is also a setting device for optional delay. The setting index is in the form of an arrow head which is set to a graduation marked "MV" for delay or to a graduation marked "OV" for non delay.

The graze mechanism consists of a fixed needle and an inertia pellet carrying the detonator with a creep spring inserted between the needle holder and the pellet. The needle holder is in the form of a disc with flash channels, the needle being secured by a screwed plug.

A safety device consisting of five pivoted centrifugally operated segments is fitted at the top of the pellet recess. The segments are shaped to interlock and, instead of being retained in the safe position by the usual expanding spring ring, the releasing segment is held by a locking spindle. The spindle is contained in a longitudinal recess displaced from the centre of the fuze and has a head formed on its inner end to engage the segment. The spindle is retained in this position by a spiral spring. The base of the spindle is of larger diameter for operation by the pressure of gases from the propellant charge and is covered by a copper sealing disc to prevent the gases entering the fuze. The copper sealing disc is secured by a perforated screwed plug and the recess is closed at the base by a foil disc secured by a screwed ring.

The optional delay device consists of a centrifugally operated shutter which is prevented from moving clear of the open flash channel in the delay unit by the setting spindle when set for delay. The shutter is carried on a platform fitted above the needle holder and is of the sliding type. The platform is recessed on the underside to form a cavity with two flash channels; one leading to the open channel in the delay unit and the other, fitted with a sealing tube, to the delay channel. The setting spindle is contained in a second longitudinal recess, diametrically opposite to that containing the locking spindle, and has a portion of the head cut away to provide clearance for the sliding shutter when the spindle is set to the "OV" (non delay) graduation on the base of the fuze. The spindle is coned near the base to correspond with a coned seating in the body so as to provide a seal against gas pressure and has a slot in the base for the setting key. A screwed collar in the base of the fuze retains the spindle in its recess. A sealing washer of lead is held in circular grooves between the collar and the spindle.

The delay unit is shaped at the base to fit over the shutter and has two longitudinal channels. One channel is central, contains no filling, and leads direct to the magazine. The other channel is displaced from the centre and contains a pressed filling of delay composition. This channel leads to the outer edge of the magazine.

The magazine contains pressed gunpowder and is closed by a screwed plug with a central flash hole. The hole is closed on the inside by a paper disc.

ACTION.

Before loading, the fuze is set for delay or non delay by rotating the setting spindle so that the arrow head at its base is aligned with the "MV" or "OV" graduation respectively.

During the travel up the bore the propellant gases destroy the foil disc and, passing through the perforated plug, press the copper sealing disc and the locking spindle forward. The head of the locking spindle is thus moved clear of the segment which is free to move. The entry of the gases into the fuze is prevented by the copper sealing disc, the coned portion of the setting spindle and the lead washer being pressed into their seatings.

During flight, the tendency of the graze or inertia pellet to move forward as the result of deceleration is prevented by the creep spring. Also, the centrifugal segments are rotated, in succession, clear of the path of the pellet by centrifugal force. With the setting spindle set to "OV" (non delay) the shutter is also thrown outwards leaving the direct flash channel to the magazine open.

On graze, the momentum of the pellet overcomes the creep spring and the detonator is impinged on the needle. The flash passes through the channels in the needle holder and enters the magazine via the central channels in the platform and the delay unit.

With the setting spindle set to "MV" (with delay) the head of the spindle prevents the shutter from moving clear of the central direct flash channel. The flash can then reach the magazine only by the channel containing the delay composition.

840. ITALIAN PRIMER PERCUSSION Q.F. CARTRIDGE MODEL 908
Fig 334.

The base of the primer is stamped "MOD 908" and has a cap chamber in which the brass cap holder is visible. The brass body is flanged at the base and has a short screwthreaded portion for assembly in the cartridge case. The plain portion of the body has two rows of flash holes which are inclined at ten degrees towards the base and are closed by a sealing composition. The cap chamber at the base has an anvil formed in it and two flash channels leading into the magazine. The interior of the body is shaped to form a cylindrical magazine and is screwthreaded at the top to receive the brass closing plug. The plug has a central flash hole which is also closed with a sealing composition.

The magazine contains two pellets of gunpowder in a paper wrapper. The lower pellet has a central perforation, the upper being solid. The powder consists of potassium nitrate 74.4 per cent, charcoal 16.5 per cent and sulphur 9.1 per cent.

The copper cap is contained in a brass cap holder pushed into the cap chamber from the base and has a 1.8 grain initiator filling consisting of mercury fulminate 18.6 per cent, potassium chlorate 42.3 per cent and 39.1 per cent of antimony sulphide. The filling is pressed to form a cavity corresponding to the shape of the anvil and is covered by a disc of tinfoil without varnish.

841. ITALIAN PRIMER PERCUSSION Q.F. CARTRIDGE MODEL 930.

Fig. 335.

The primer is identified by the stamping "930" on the base and is of the type in which the percussion cap is not exposed. The brass body is flanged at the base and is screwthreaded over the lower part for insertion in the cartridge case. The interior is shaped to form a cap chamber and magazine and is partly screwthreaded to receive a screwed plug which supports the magazine filling and retains the anvil in position. The cap chamber has a base .045 inch thick and has a shoulder near the top to support the anvil.

The copper cap is large in diameter and contains a 1.5 initiator filling consisting of mercury fulminate 28.4 per cent, potassium chlorate 34.4 per cent, antimony sulphide 35.6 per cent and 1.6 per cent of glass. The filling is covered by a disc of tinfoil without varnish.

The brass anvil is a push fit in the mouth of the cap and has a hole through the centre which tapers towards the base. In addition there are two smaller flash holes which are enlarged at the base. The base of the anvil is of unusual shape.

The screwed plug also has a hole through the centre which tapers towards the base.

The magazine contains a pressed pellet of gunpowder with a tapering hole through the centre and is lightly closed by a brass disc. The top of the body is turned inwards to secure the disc and a waterproofing seal of varnish applied to cover the disc and the junction.

842. ITALIAN 149/13 LIGHT CASE H.E. SHELL.

Fig. 336.

The shell is fired from the 149 mm,13 calibre field howitzer with a separate loading Q.F. cartridge and, without the fuze, is 25.96 inches (approx 4.5 calibres) long. From the nose to the shoulder the shell is painted red or orange and from the shoulder to a 1.6 inch green band above the copper driving band the body is sherardised and is pale blue. Behind the driving band the shell is painted white and has two black strips painted at right angles across the base and continued up the wall to the driving band thus producing four black longitudinal strips behind the band. The weight marking "Kg 42" and the letters "M.B.T." enclosed in a rectangle, which indicate the bursting charge to be shellite, are stencilled on the ogive. The calibre in millimetres and the length of the howitzer in calibres are stencilled at about the centre of the body in the form "149/13". A small aluminium transit plug with knurling near the head protrudes from the Inneschi fuze in the fuze hole at the nose. The weight of the shell, filled and fuzed is approximately 93 lb 8 oz. The weight of the bursting charge is 16 lb 7½ oz.

SHELL

The shell, weighing 85.74 lb, consists of three main parts, the body, the diaphragm and the head.

The body is of forged steel with a comparatively thin wall and a correspondingly high capacity. A narrow driving band, wholly of copper, with a single cannelure is fitted at one and a half inches from the base. There is no base plate. The forward end of the body is shaped to correspond with the contour of the ogival head and is screwthreaded internally for its assembly. The cavity for the bursting charge is machined throughout and is screwthreaded at about the centre for the insertion of the diaphragm which thus strengthens the wall. The diameter of the cavity in front of the diaphragm is 4.88 inches. Behind the diaphragm the thickness of the wall is increased by the diameter being reduced to 4.46 inches at this part of the cavity. A chemical analysis of the steel shows the composition includes:- chromium .69 per cent, manganese 1.26 per cent, silicon .24 per cent, phosphorus .02 per cent, sulphur .052 per cent and nickel .26 per cent. The Vickers Diamond Hardness figures average 274.

The diaphragm is a circular plate of forged steel with an external screwthread for insertion in the cavity. Four equally spaced holes of .79"diameter are drilled about midway from the centre. The underside is recessed.

The head is ogival with a fuze hole at the nose and is of forged steel machin internally and externally. The lower portion is screwthreaded externally for assembly with the body.

Bursting Charge.

The 16lb. 7½ oz. bursting charge of shellite 60/40 (trinitrophenal 60, dinitrophenal 40) is contained in two cartons, inserted with paraffin wax one in each part of the cavity. The cartons are made of thick paper interleaved with aluminium foil and are fitted with aluminium end pieces. The carton in the lower part of the cavity is cylindrical and contains a 7 lb. 7½ oz. block of shellite. A cardboard disc is inserted in the base of the cavity below the carton and a felt disc is placed over the head. The recess in the underside of the diaphragm contains a cardboard disc with perforations corresponding with those in the diaphragm. A similar disc covered by a disc of thin cardboard covers the front face of the diaphragm. The carton in the upper part of the cavity is shaped to suit the ogival head of the shell and includes a paper tube closed at the base to line the exploder cavity and contain a steel exploder container. The exploder container is screwed to the gaine and has a felt disc at the base. The carton contains a 9 lb. block of shellite and has a felt washer placed over the head.

Exploder.

The exploder container, screwed to the gaine, contains 43.5 grams of graphited ballistite in the form of .022 inch cubes. The ballistite consists of nitrocellulose 50.47 per cent (Nitrogen content 12.25 per cent) nitroglycerine 48.96 per cent and .57 per cent of graphite.)

Fuze and Gaine

The fuze is of the Inneschi type described in Bulletin No.16 but has a larger body. The gaine contains a 5 gram filling of ballistite and differs from the 2.3 gram type shown in Bulletin No.32 (Fig 271C) in being longer. The lower portion of the body is reduced in diameter and screwthreaded for insertion in the top of the exploder container. The ballistite consists of 57.82 per cent of nitrocellulose (nitrogen content 12.12 per cent) and 42.18 per cent of nitroglycerine.)

P 7. ITALIAN TIME FUZE GRADUATED TO 59.

Fig. 337.

The fuze has been found in the following shell:-

75/27 C.K. & C.A. fragmentation shell.
75/27 Gun-How. shrapnel shell.
75/27 Gun-How. and 75/13 How. shrapnel shell
77/28 How. shrapnel shell.

Somewhat similar in appearance to British fuzes of the No.80 type, the fuze protrudes about 2 inches from the nose of the shell and is of the combustion type with two time rings and a tensioning cap. The upper ring is fixed and the lower setting ring is graduated to 59 and numbered to 58. The cap is of aluminium and is marked "T" in red. The rings and body are of aluminium alloy but in some instances the periphery of the platform, bearing the setting index, is of brass. A Brass fuze cover may be fitted and secured by a tear-off strip with a finger ring. The cover is also marked with the red "T" and an arrow with the word "TIRARE" indicating the direction in which the ring should be pulled for the removal of the cover. The screwthreaded portion of the fuze for insertion in the shell is 1.96 inches in diameter and has eight threads to the inch.

A fuze set to 58 gave a time of burning of 22.7 seconds at rest.

The body of the fuze has the normal type of platform formed around it with an inclined channel leading to the magazine. A felt washer on the platform is perforated to coincide with the channel which contains two perforated pellets of gunpowder. The magazine contains 44 grains of gunpowder and is closed at the base by a screwed plug with a lightly closed hole in its centre. Near its upper end the cylindrical part of the body has two semi-circular recesses for the locking pins of the upper time ring and is screwthreaded to receive the screwed retaining [illegible] and the tensioning cap. A cylindrical recess is formed in the upper part

of the body to accommodate the detonator assembly. The recess has a steel needle fitted in the centre of its base and a flash channel, leading to the upper time ring, in the wall. Two inclined surfaces to receive the arms of the stirrup spring are formed at the mouth of the recess. The lower part of the body, between the magazine and the recess, is solid.

The detonator assembly consists of a cylindrical brass pellet carrying an igniferous detonator in its base and supported by a brass stirrup spring. The upper end of the pellet is recessed to seat the larger end of a helical locating spring held between the pellet and a recess in the base of the cap.

The time rings are of normal design each having the usual lightly closed vent containing a perforated pellet of powder at the commencement of the train of fuze powder. The upper ring has two semi-circular recesses in its inner face to coincide with those in the body for the reception of the two locking pins. The flash channel leading into the fuze powder filling in the ring contains no powder. The lower ring is rotated relative to the index on the platform in setting and is graduated from 0 to 59 in a clockwise direction. The graduations are sub-divided to indicate half divisions and every alternate main graduation (even numbers) from zero to 58 is numbered. The safety setting is indicated by a cross. The assembled rings are secured by the retaining collar screwed to the body above the upper rings and secured by a locking pin. The tensioning of the setting ring is adjusted at assembly by the screwed cap which is then secured by a fixing screw. Coinciding lines scribed on the cap and the upper ring indicate the position to which the cap was turned to obtain the desired tensioning.

AMENDMENTS. (Enemy Ammunition)

844. Bulletin No.34 Item 796, Page 25. Delete "715" in the heading and Substitute "7.5"

" " " 801, Page 30. Line 6, Delete "500" and Substitute "approx. 575"

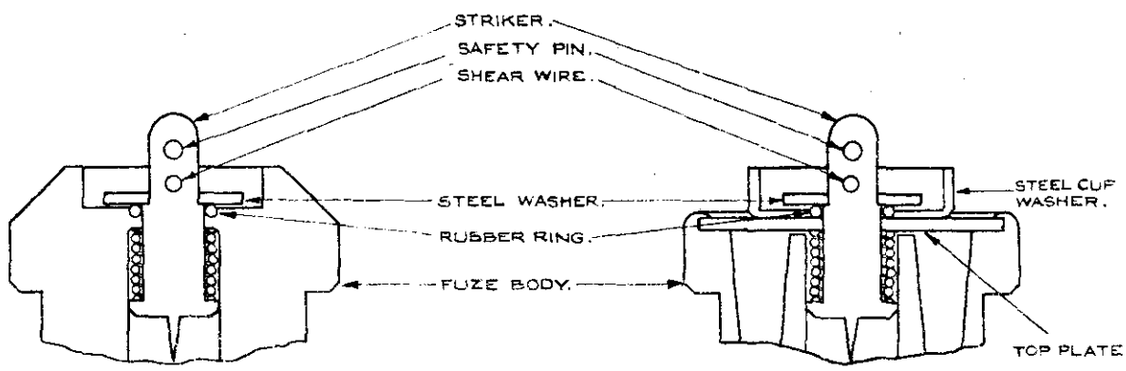
Line 10, Delete 300 lb. and Substitute "half."

Para. headed "COVER PLATE ASSEMBLY" line 7, Delete "edhe" and Substitute "edge".

FIG. 322 (ITEM 807)

FUZE, MINE, CONTACT, A.T. No.3.

WATERPROOFING ARRANGEMENT.



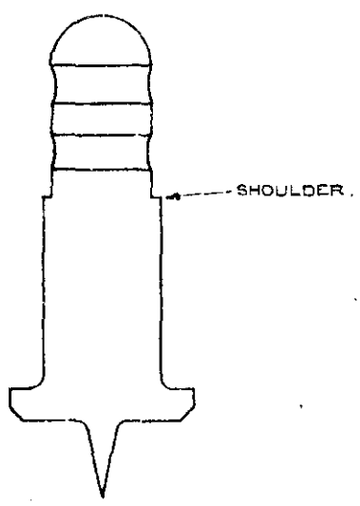
MKS. I AND II

MK. I. BODY. – ZINC BASE ALLOY.

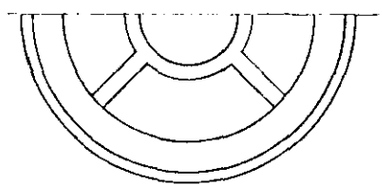
MK. II BODY. – CAST IRON.

MK. III

BODY. – BASE ALLOY.



MODIFIED STEEL STRIKER.
(MKS. I. II AND III)



MK. III. BODY CORED OUT.

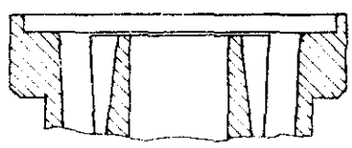
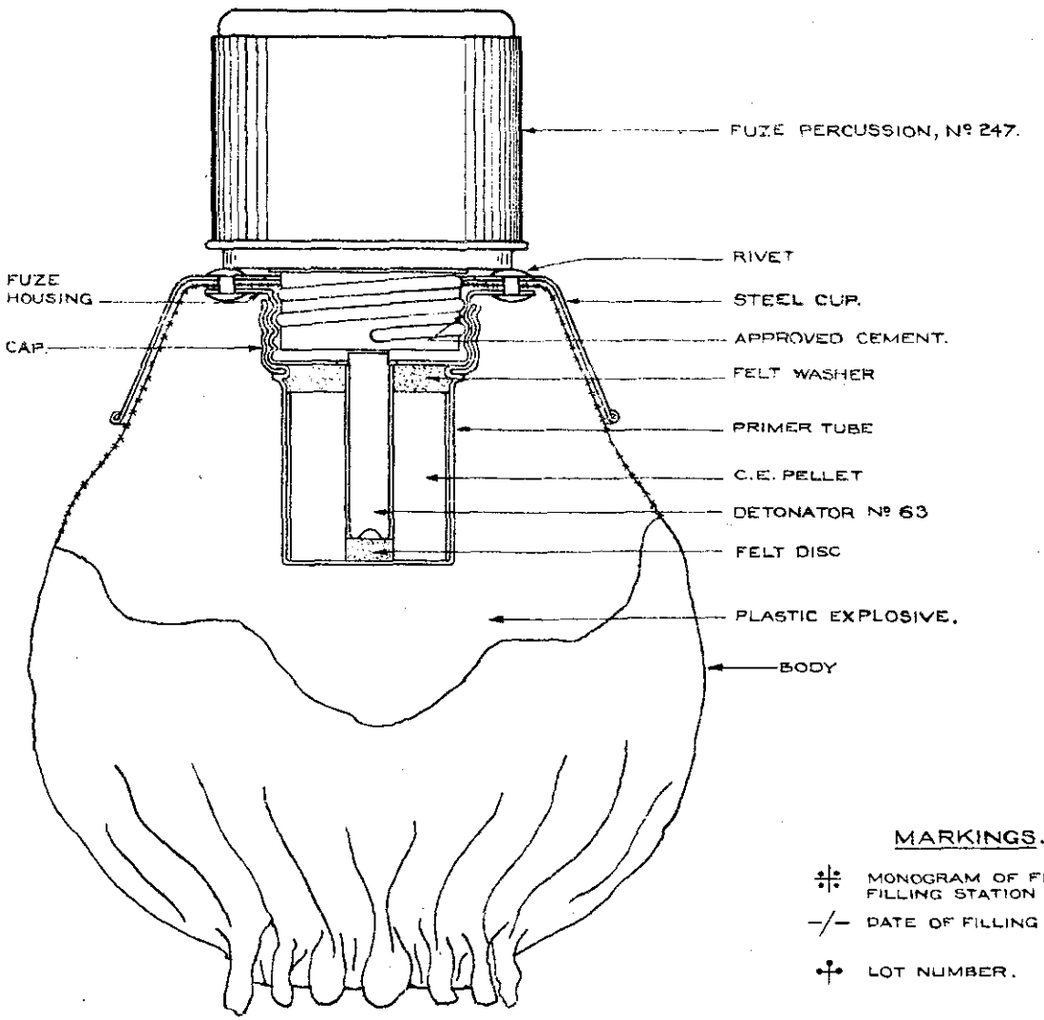
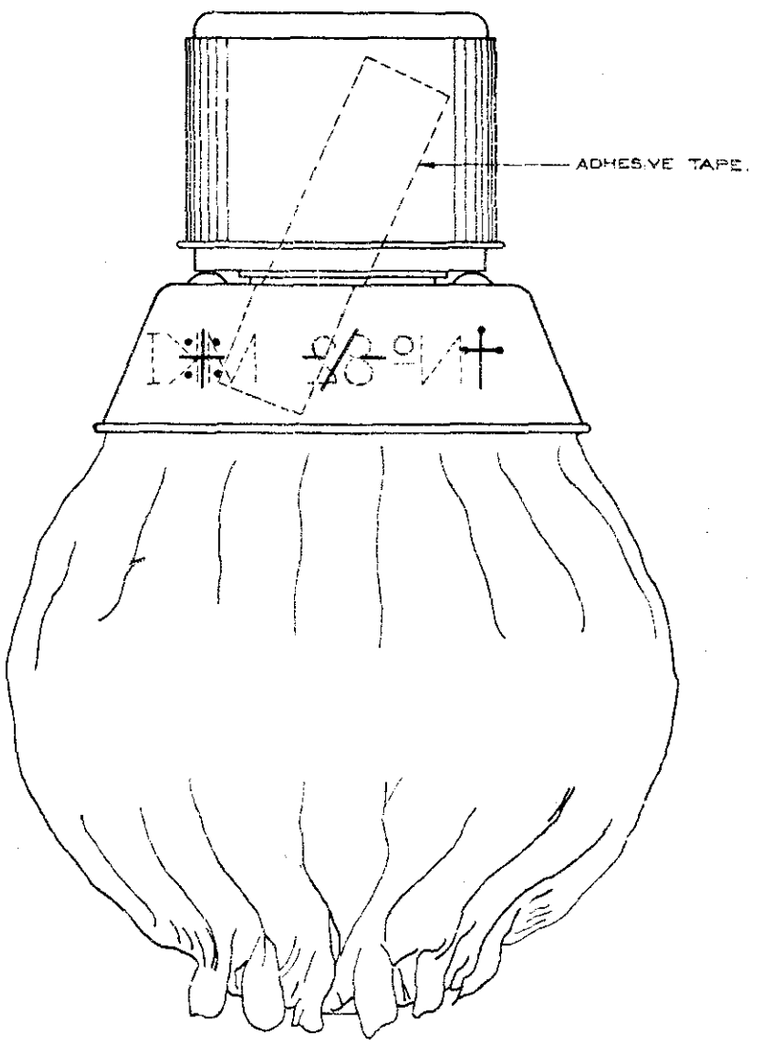


FIG.323 (ITEM.808.)

GRENADE, HAND, No 82, A.T.





MARKINGS.

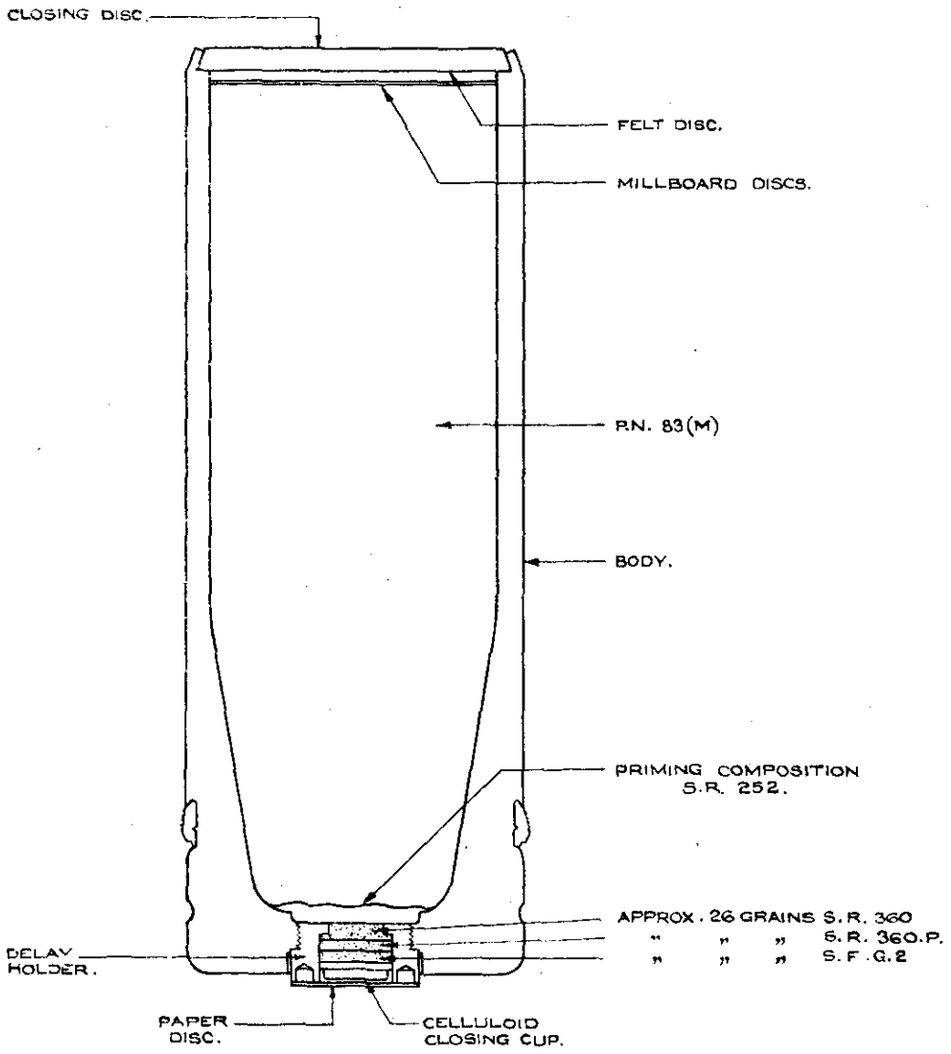
MONOGRAM OF FIRM OR FILLING STATION

—/— DATE OF FILLING (MONTH AND YEAR.)

LOT NUMBER.

FIG. 324. (ITEM. 827.)

SHELL, Q.F., SMOKE EMISSION, 95 m.m. TK. HOW. MK.I



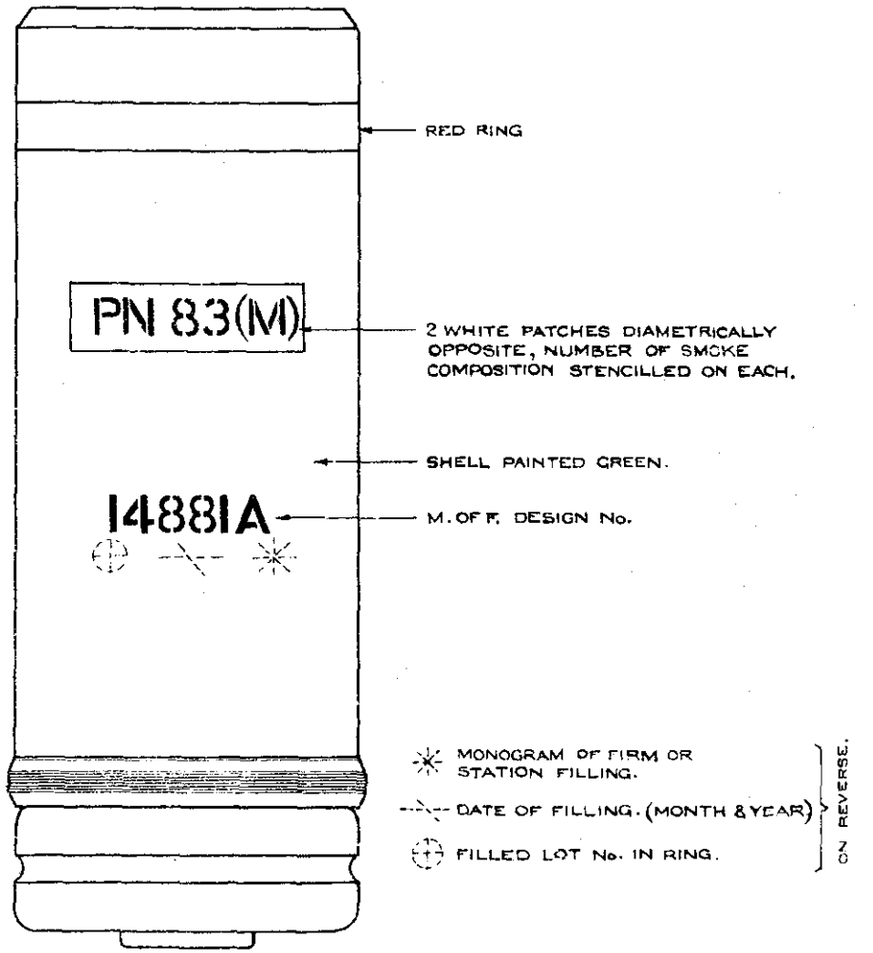


FIG. 325 (ITEM 828.)

SHELL, Q.F., SMOKE, B.E. 95 m.m. S.P. AND INF. HOW. MK. I.A.

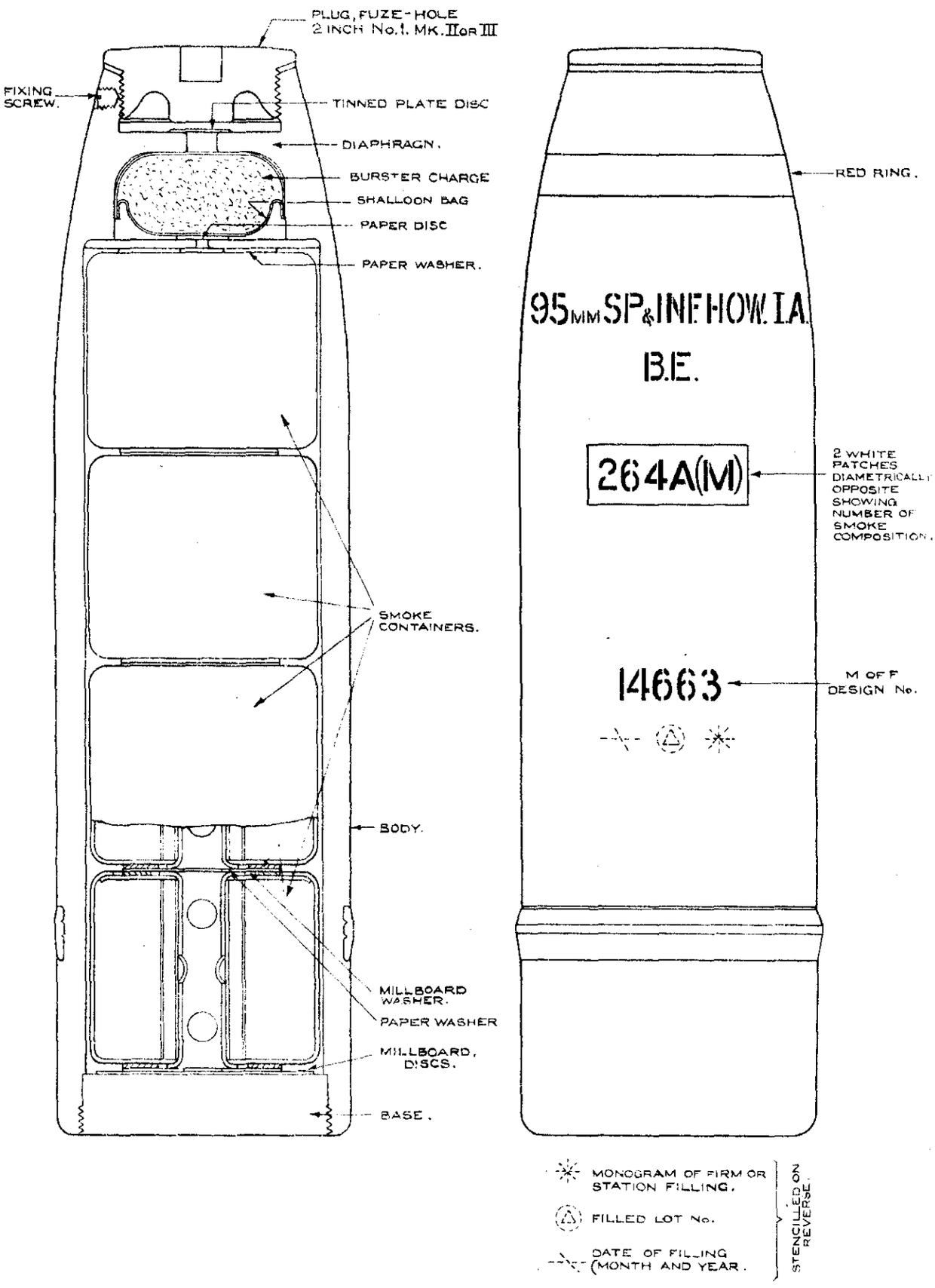
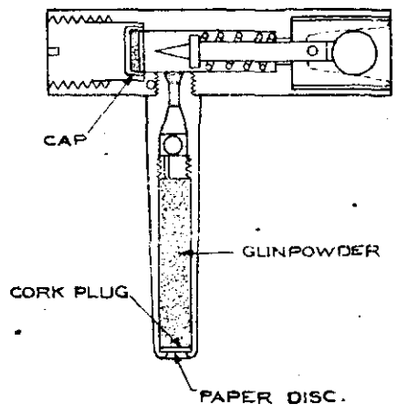


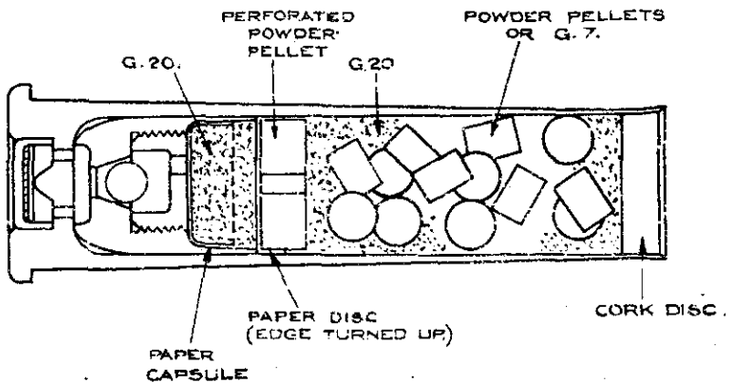
FIG. 326 (ITEM 835)

TUBE, PERCUSSION, T., MK. II.



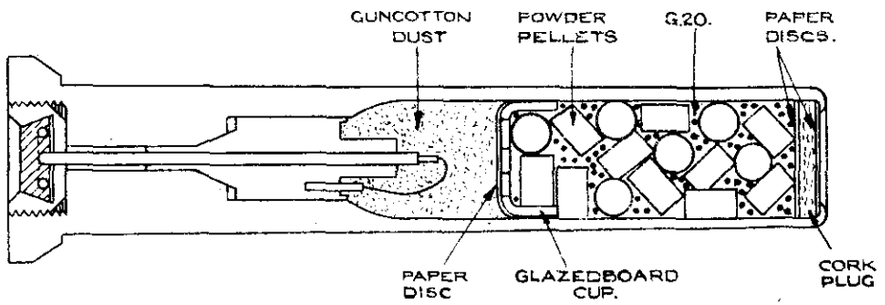
Scale 1/1

TUBE PERCUSSION, S.A., CARTRIDGE, MKS IV A AND V.



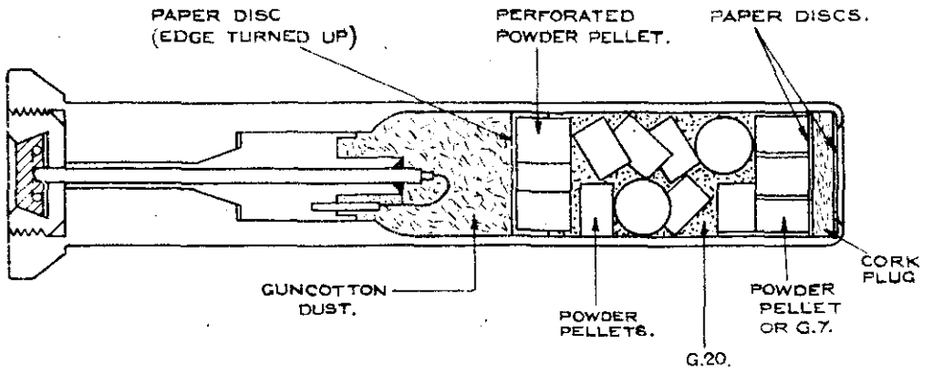
Scale 2/1

TUBE, VENT, ELECTRIC, ·4 INCH MK X



Scale 2/1

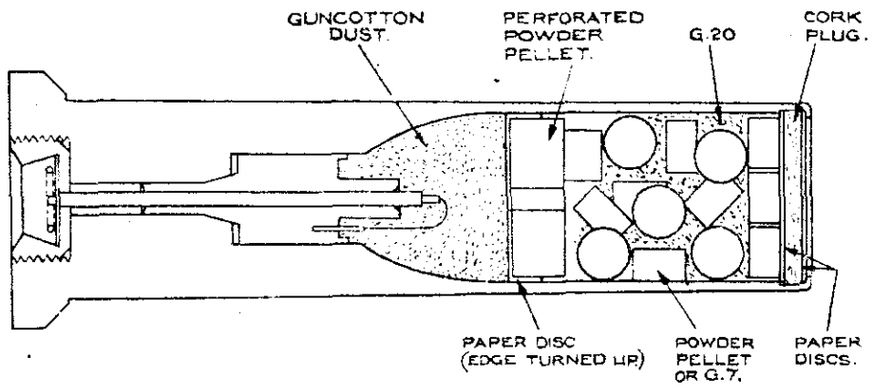
TUBE, VENT, ELECTRIC, ·4 INCH MKS X** AND XII.



Scale 2/1

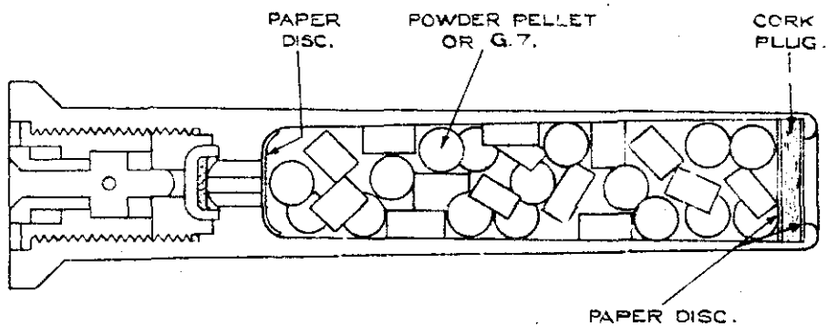
FIG. 327. (ITEM 835)

TUBE, VENT, ELECTRIC, ·5 INCH MK. X.



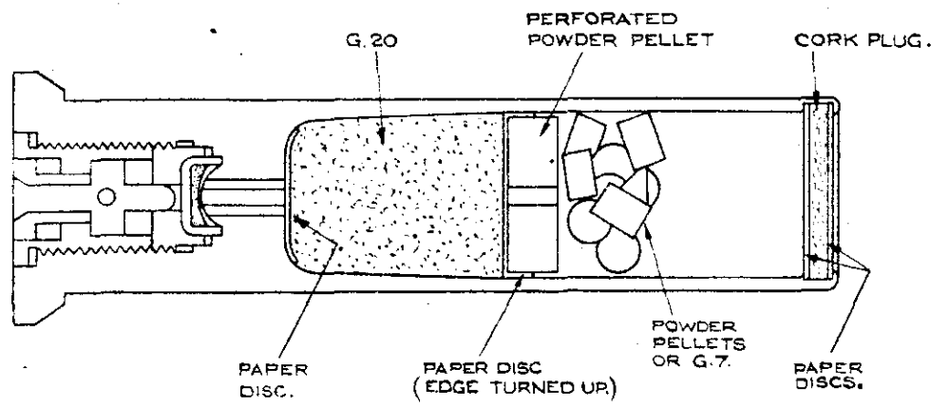
Scale 2/1

TUBE, VENT, PERCUSSION ·4 INCH MK XI.



Scale 2/1

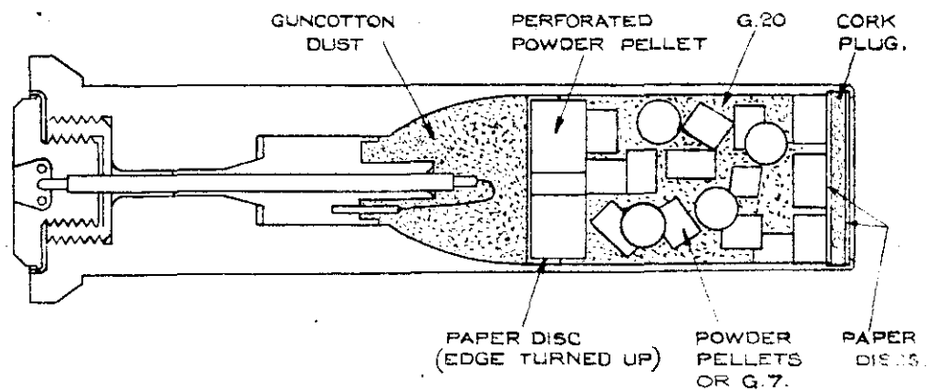
TUBE, VENT, PERCUSSION ·5 INCH MK VI



Scale 2/1

TUBE, VENT, ELECTRIC "S" ·5 INCH MK VIII.

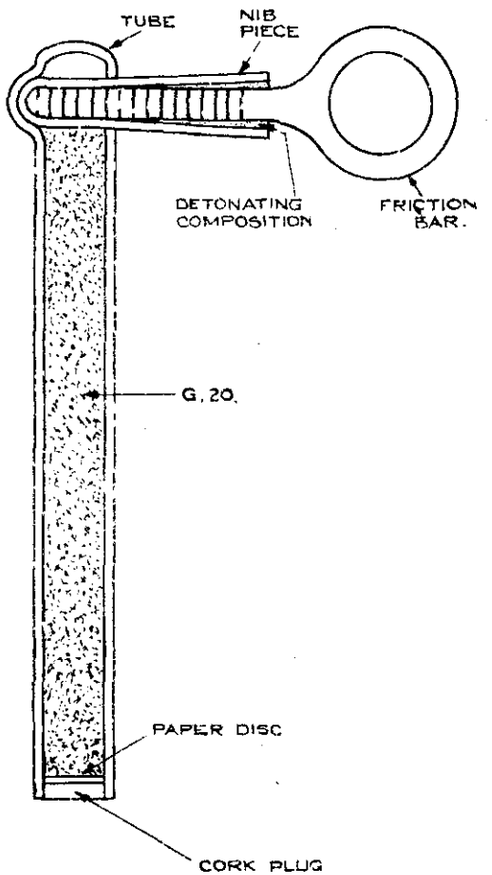
FOR STRIKERLESS LOCKS.



Scale 2/1

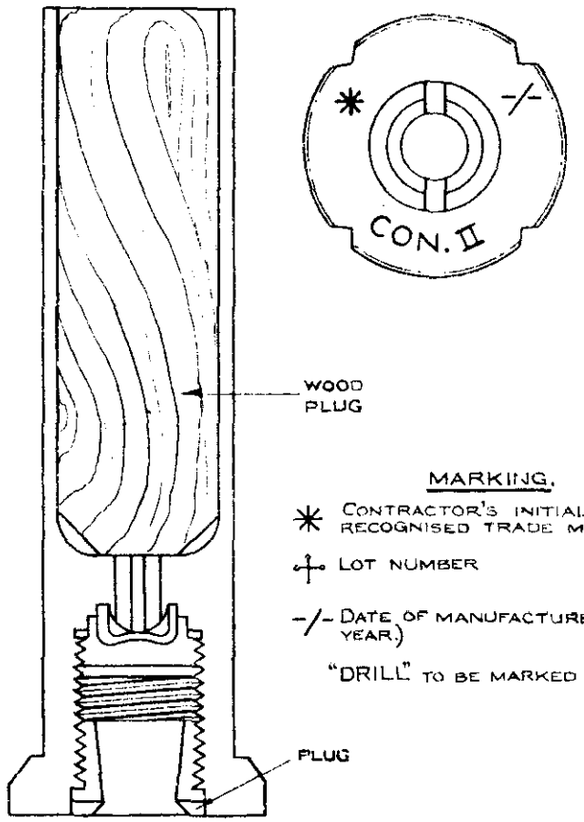
FIG. 328 (ITEM 835.)

TUBE, FRICTION, MK IV.



Scale ½ (approx)

TUBE, VENT, PERCUSSION, DRILL, ·5 INCH, CONVERTED MK II.

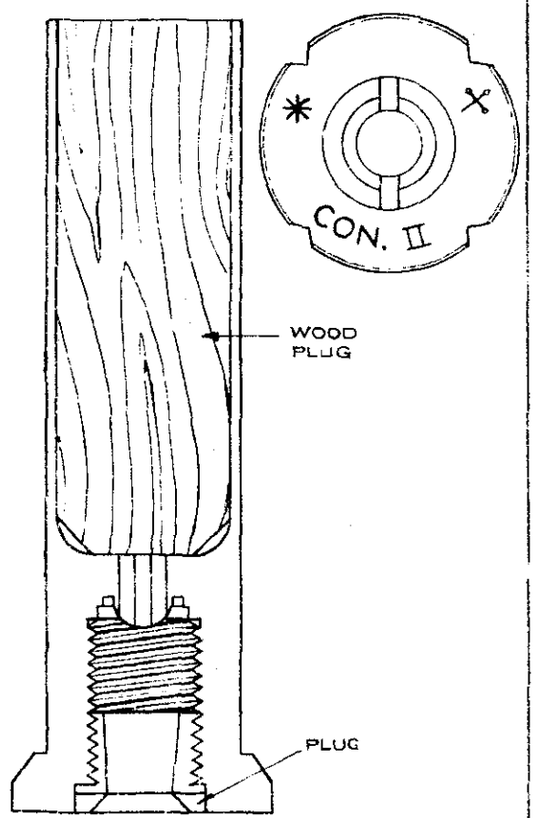


FIRED TUBE.

MARKING.

- ✱ CONTRACTOR'S INITIALS OR RECOGNISED TRADE MARK
- ✣ LOT NUMBER
- −/− DATE OF MANUFACTURE (MONTH & YEAR.)

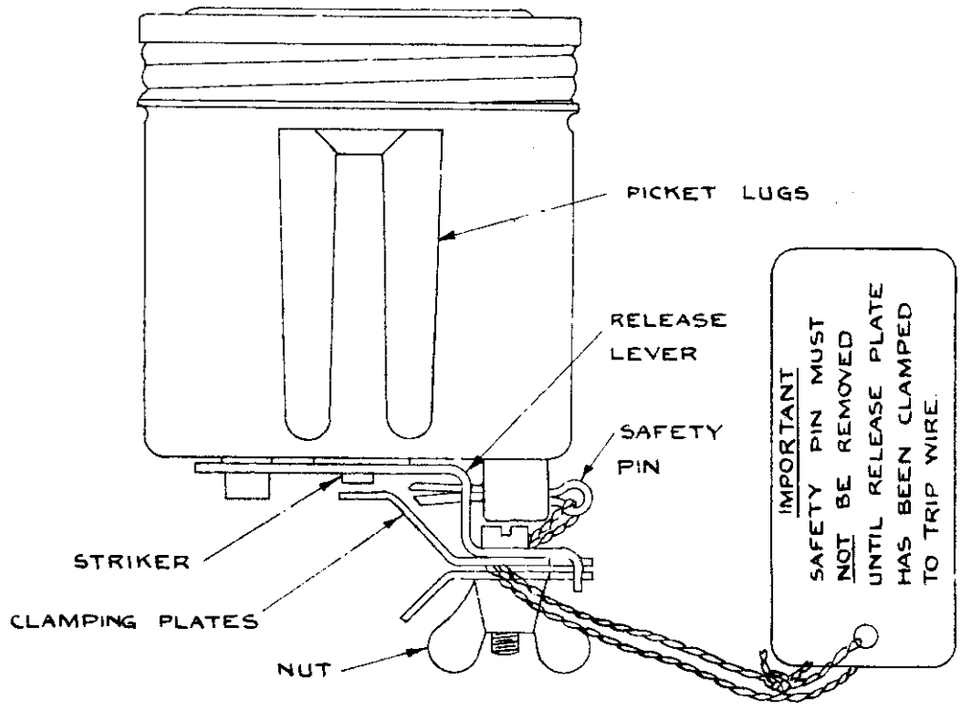
"DRILL" TO BE MARKED ON SIDE.

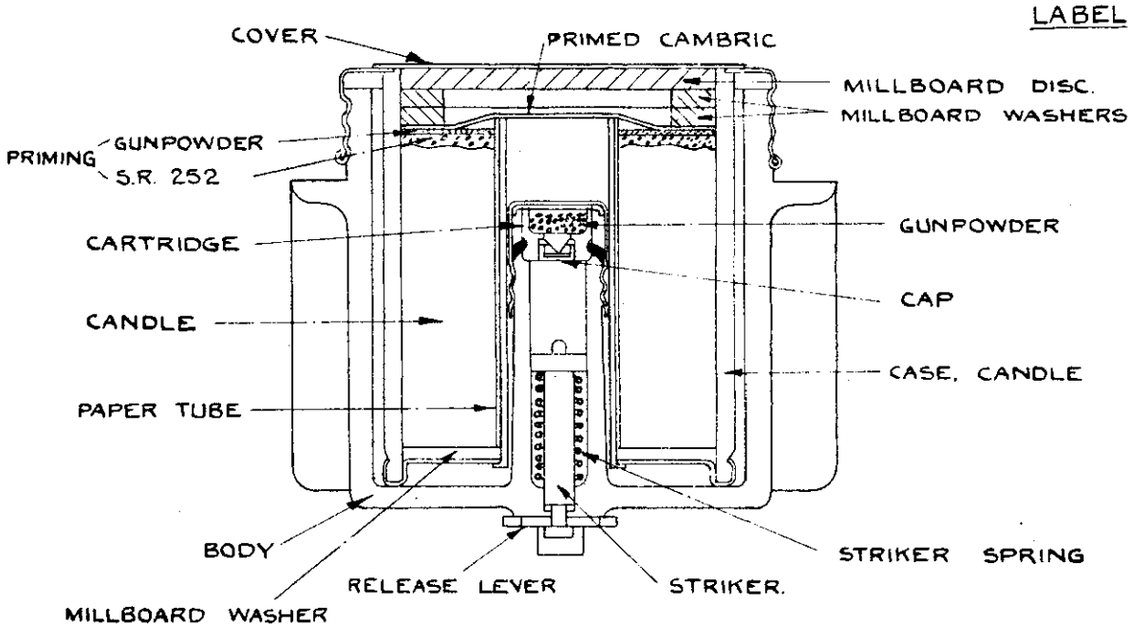


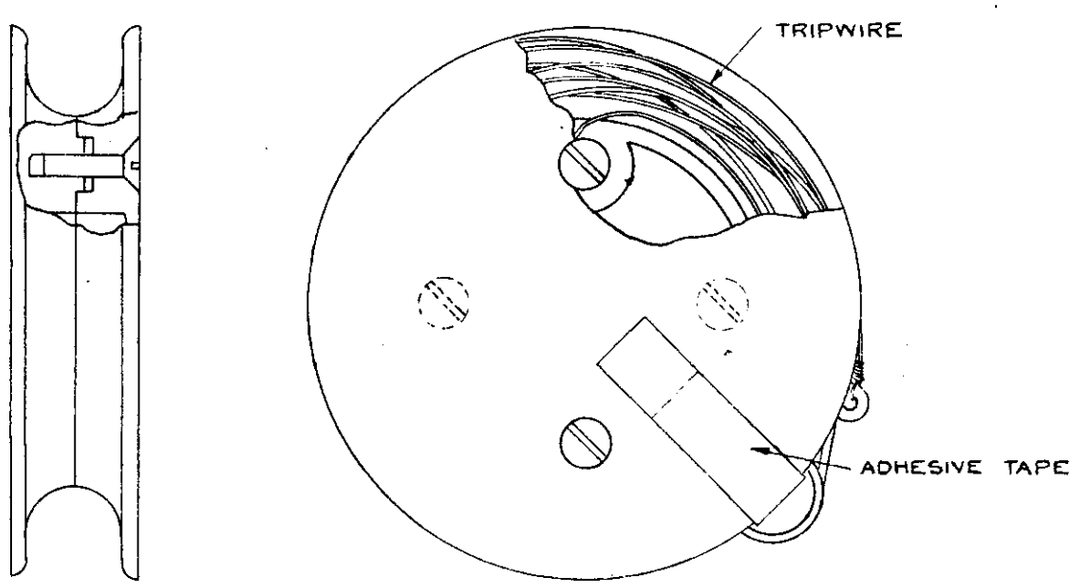
DEFECTIVE TUBE.

Scale ½

FIG 329 (ITEM 836) FLARE, TRIP WIRE Mk I







SPOOL

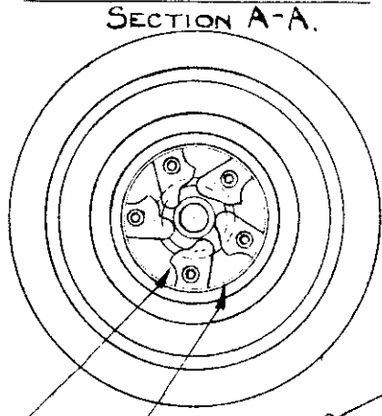
FIG. 332 (ITEM 838)

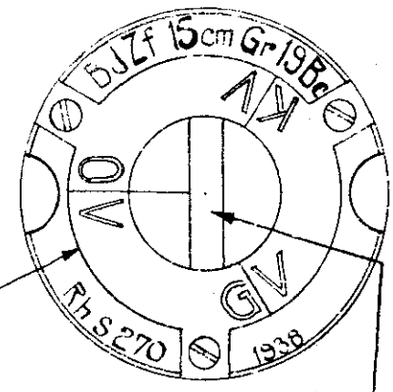
GERMAN BASE FUZE WITH OPTIONAL AND VARIABLE DELAY FOR 15 cm ANTI-CONCRETE SHELL.

(B.J.Z.f 15 cm Gr 14 Be)

CENTRIFUGAL SEGMENTS. BASE.

SECTION A-A.



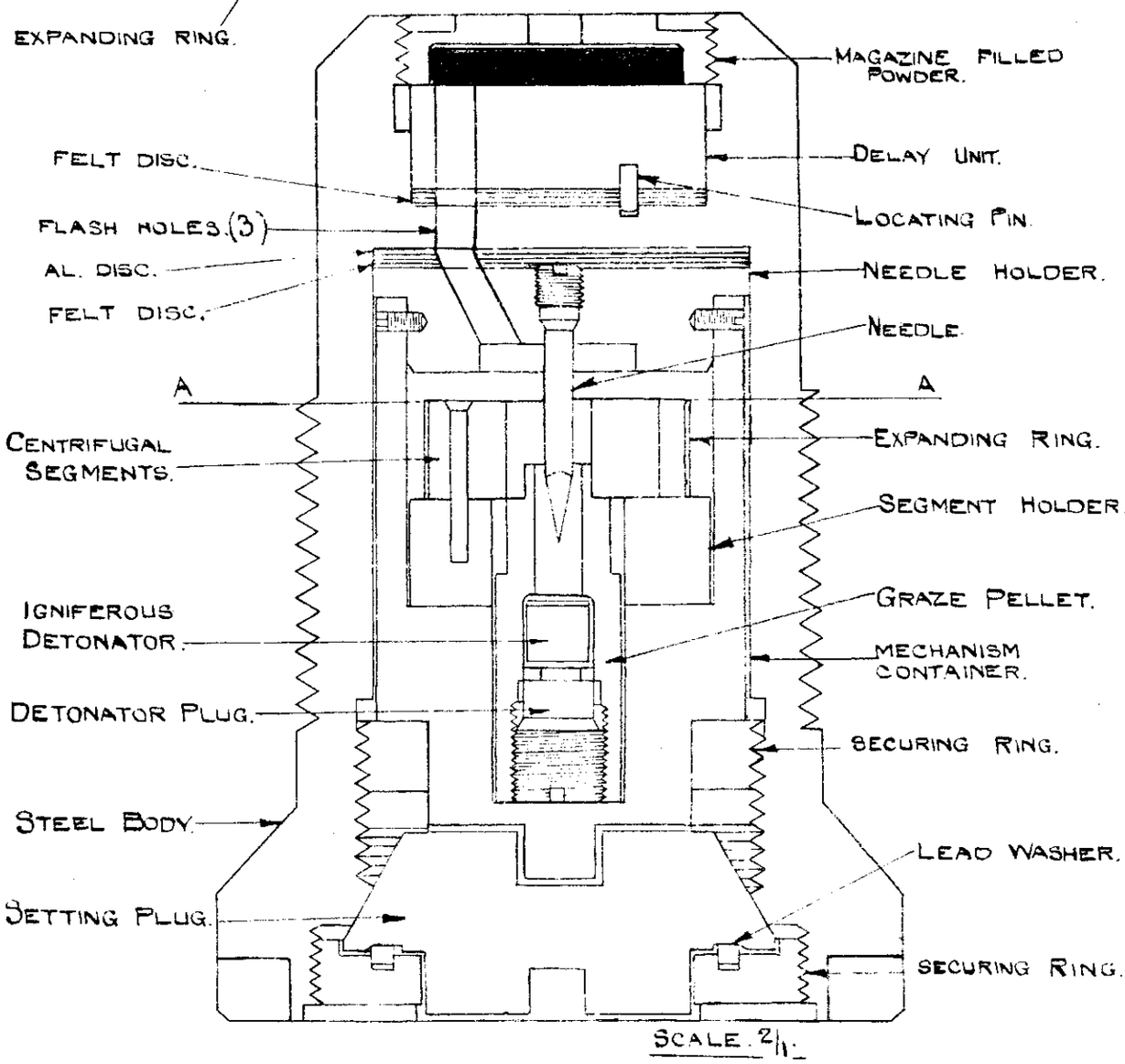


SEGMENTS.

EXPANDING RING.

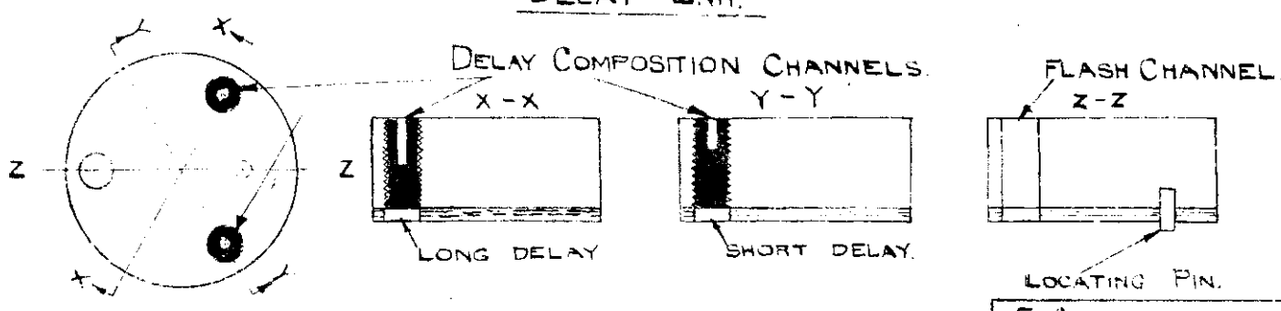
GRADUATED PLATE.

SETTING SLOT.



SCALE 2/1.

DELAY UNIT.



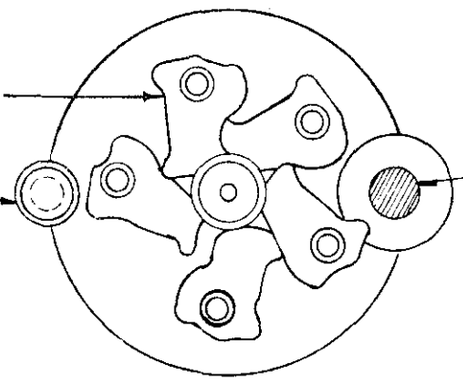
E.A.
FUZES.
SK. Nº 18.
C.I.A. | A. 10-7-40

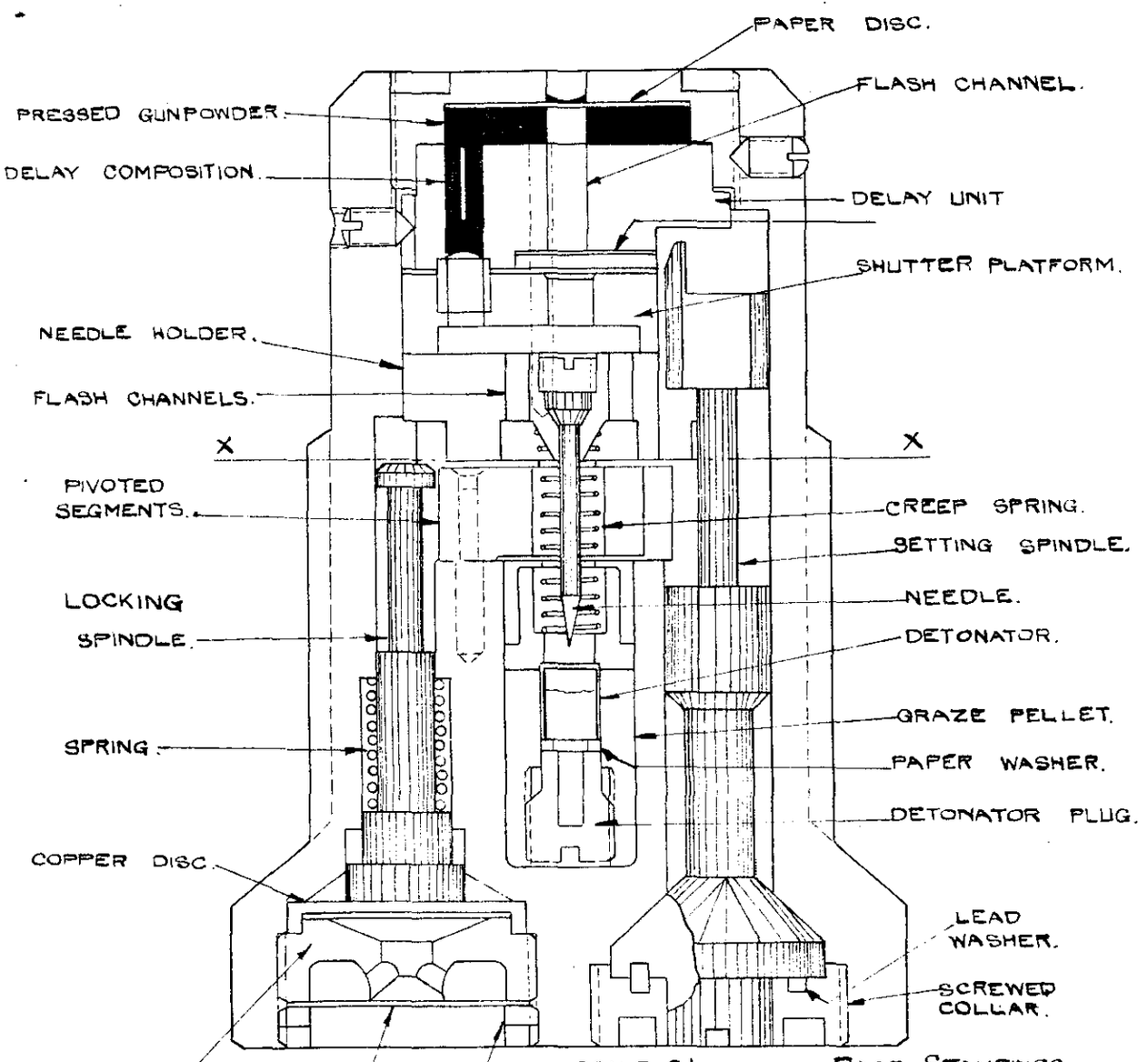
FIG. 3 (ITEM 835)

GERMAN BASE FUZE WITH OPTIONAL DELAY FOR 21 cm. ANTI-CONCRETE SHELL.

E.A.
FUZES.
SK. N° 19.
C.I.A. / A. 10-7-43.

SECTION X-X.





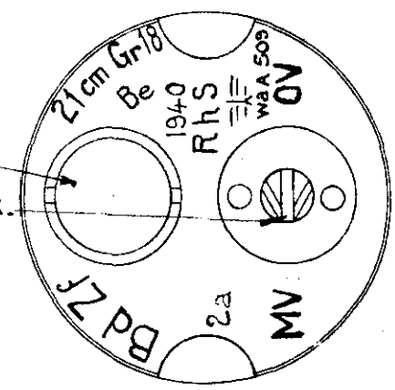
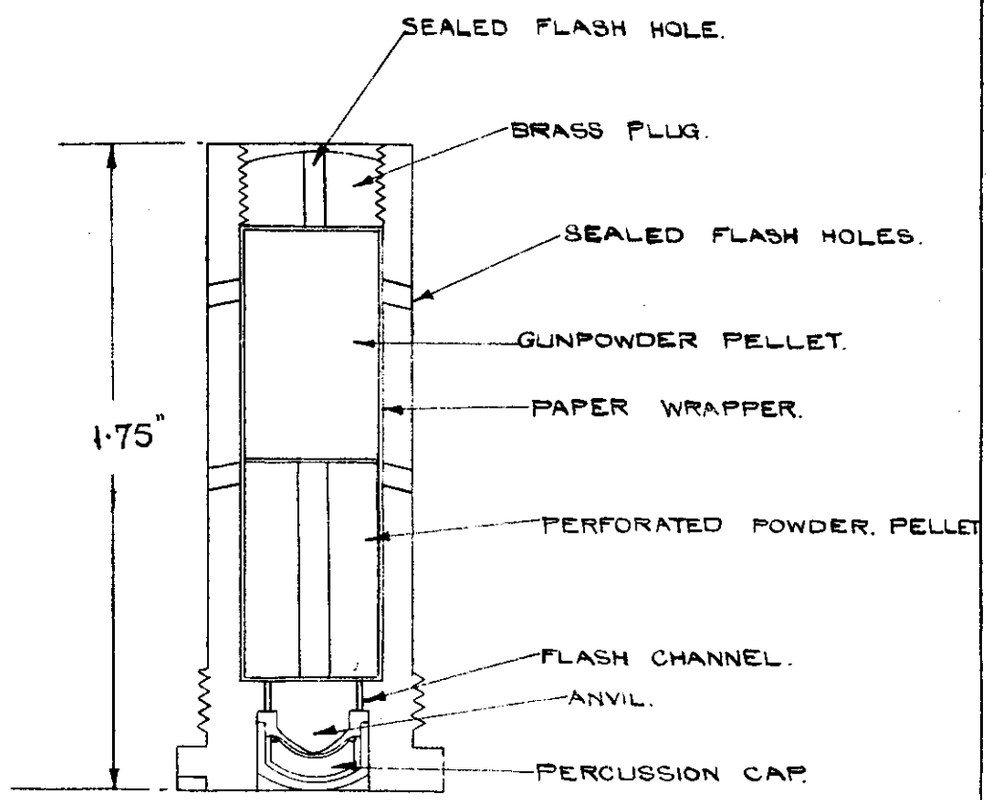
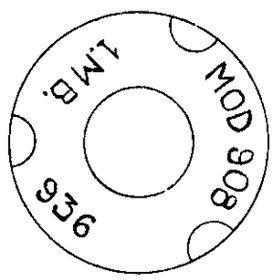


FIG.334. (ITEM. 840.)

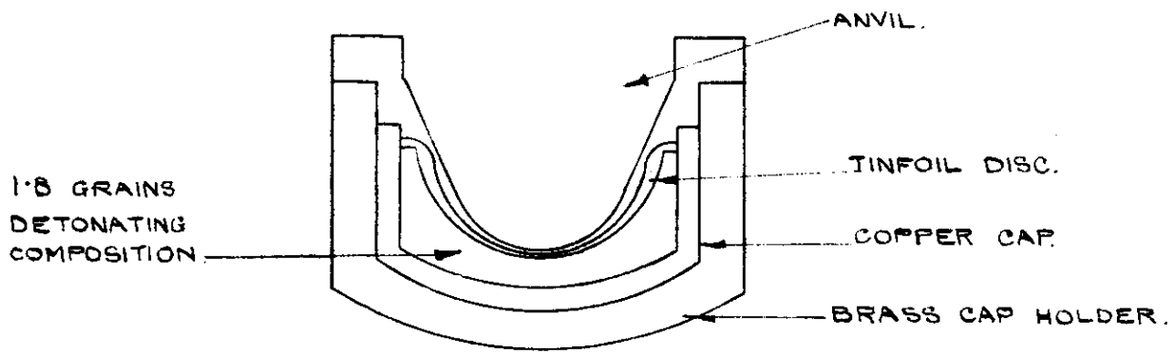
ITALIAN PRIMER PERCUSSION G.F. CTGE. MODEL 908.



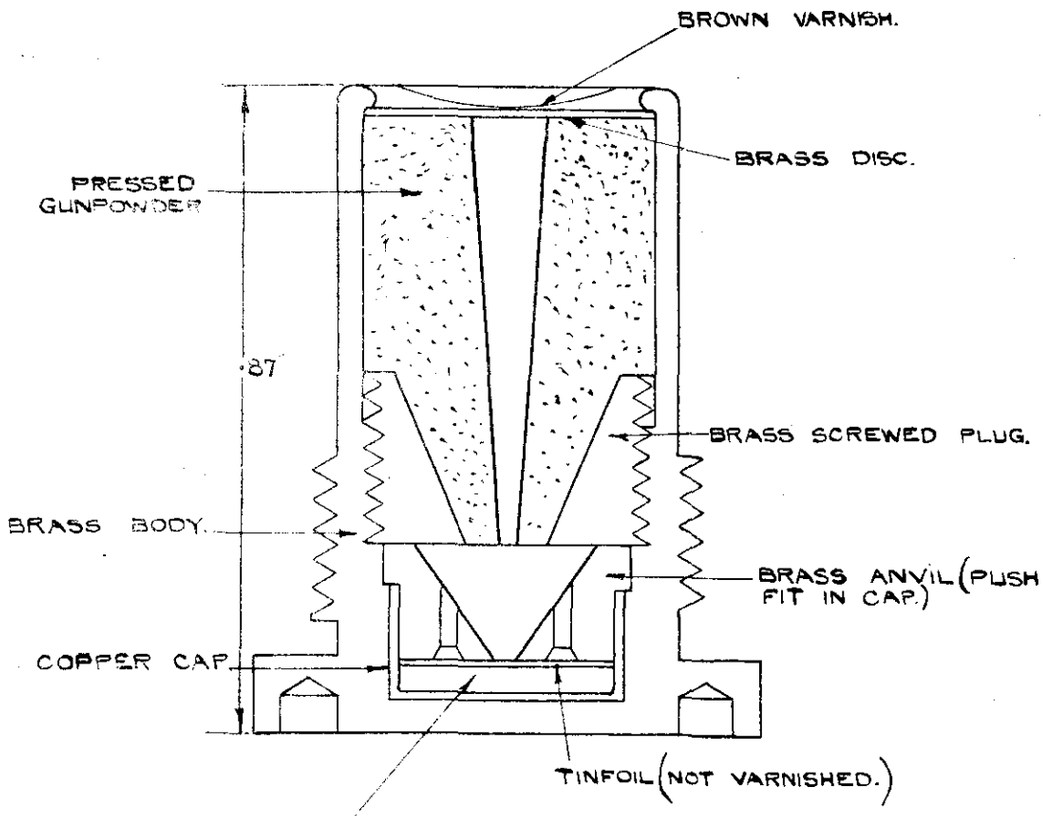
BASE STAMPINGS.



CAP.



ITALIAN PRIMER PERCUSSION Q.F. CARTRIDGE MODEL 930.



BASE STAMPING.

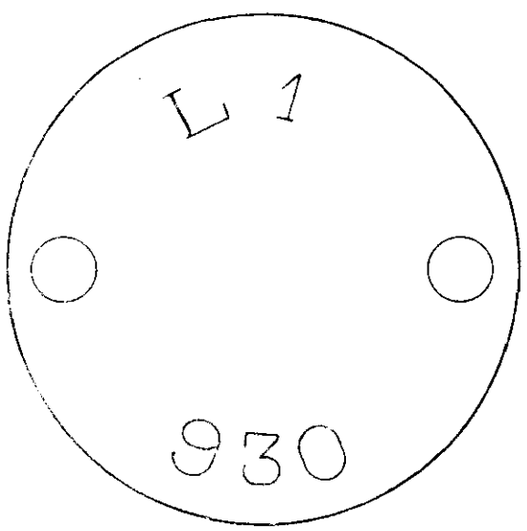


FIG 330 (ITEM 836.) FLARE, TRIP-WIRE, Mk I

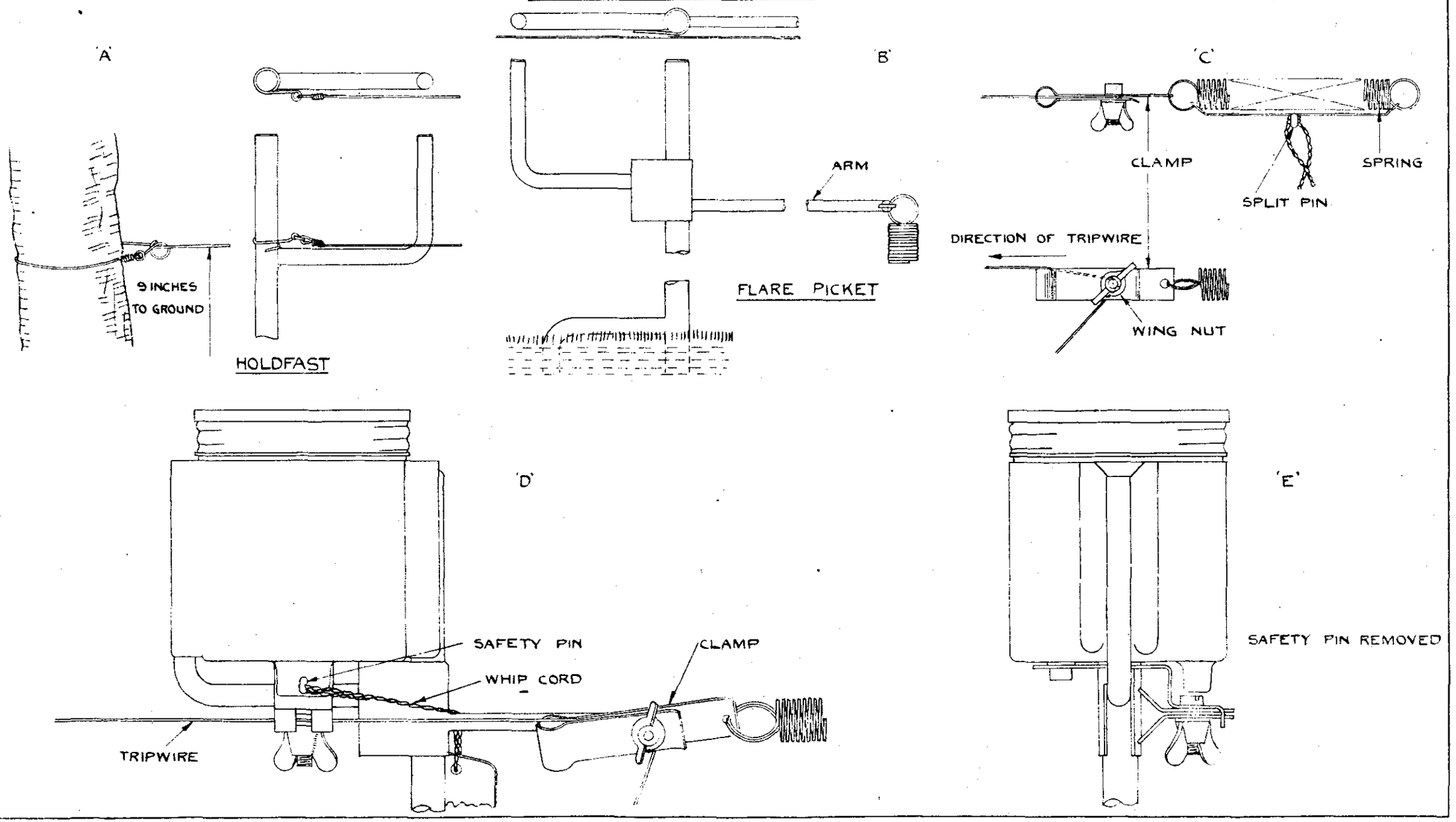
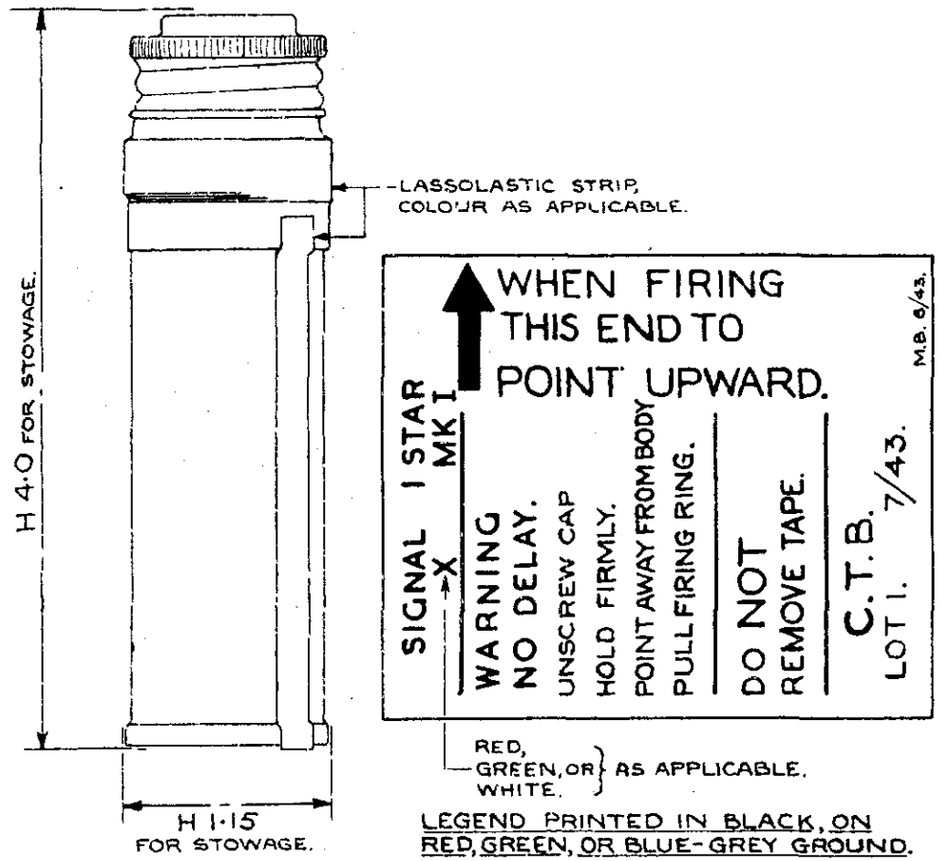
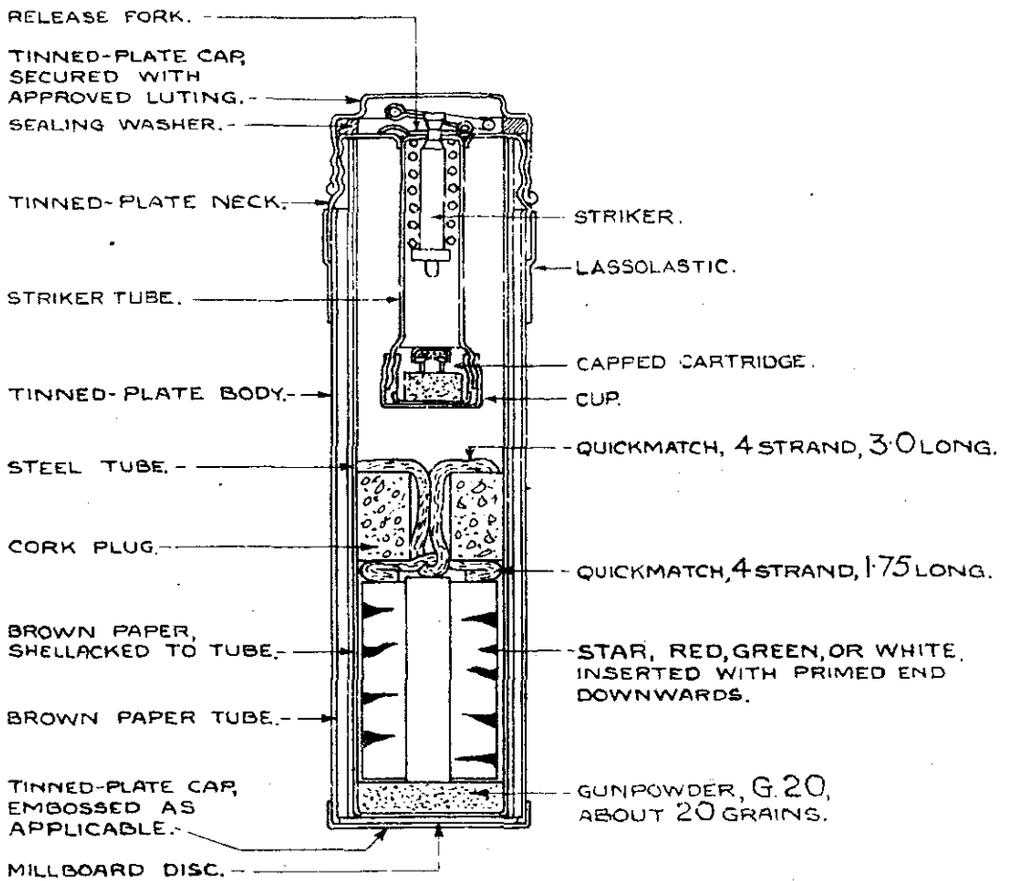


FIG. 331. (ITEM 837.)





SIGNAL, 1 STAR, RED, GREEN, OR WHITE, MARK I.

FIG. 336. (ITEM 842)

ITALIAN 149/13 G.F. HOW. LIGHT CASE H.E. SHELL.

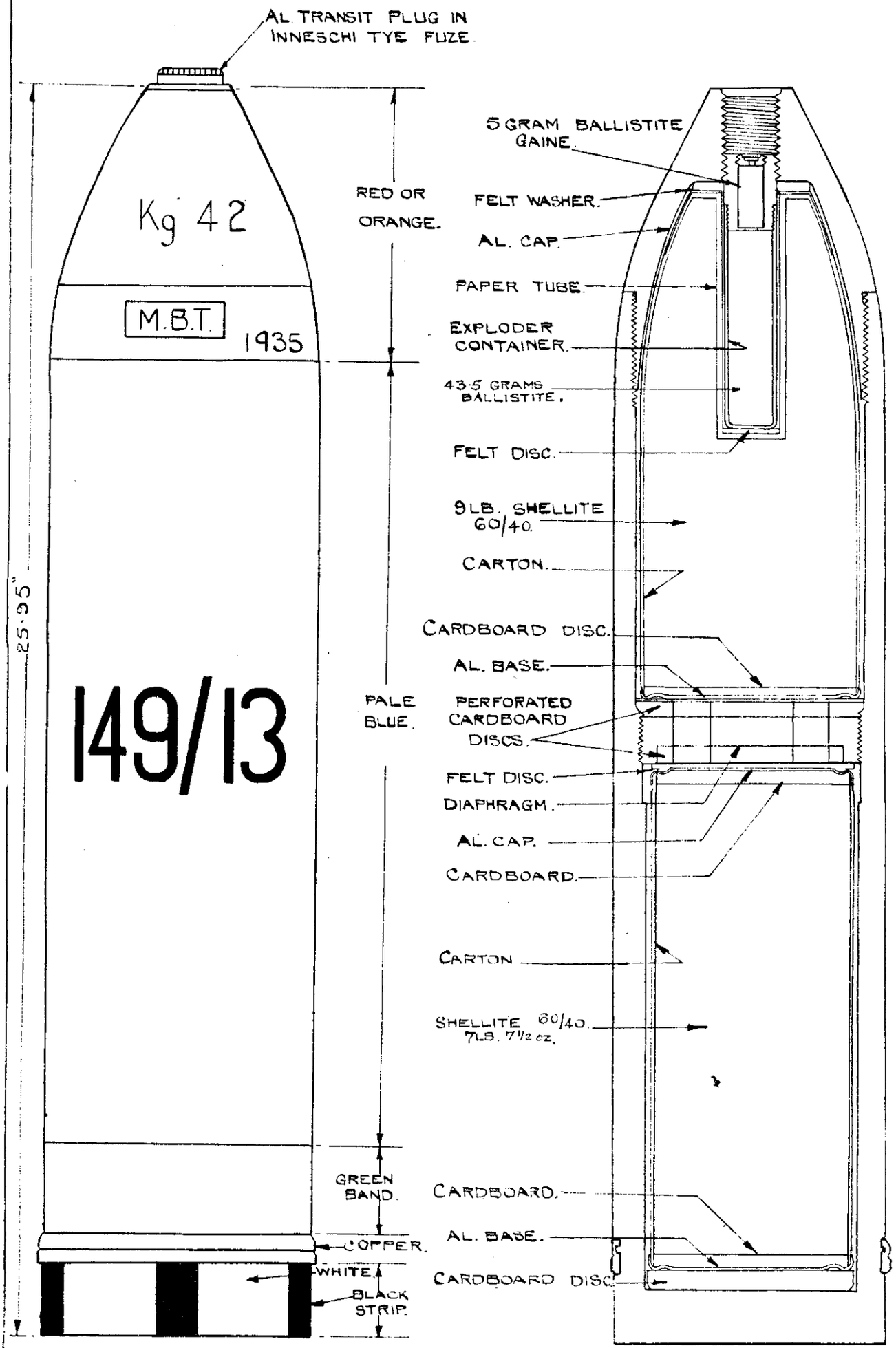


FIG. 397. (ITEM. 843.)

ITALIAN TIME FUZE GRADUATED TO 59.