

AMMUNITION BULLETIN Nº 33

ITEM 686-748

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APRIL 1943

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THE CHIEF INSPECTOR OF ARMAMENTS.

ISSUED BY :-

CHIEF INSPECTOR OF ARMAMENTS.

ITEM NO.

- 737 Amendments
- 697 Bombs, M.L. 3 inch Mortar - Packing of Batches.
- 703 Bombs, M.L., Star, 3 inch Mortar, 10 lb. Mk.I.
- 726 Bombs, S.B., 4.2" Mortar - Guide Bands.
- 706 Boxes, Inst. Fuze - Marking.
- 686 Cartridges, Q.F. - Reduction of stencilling on cases.
- 736 Cartridge, Q.F. 17 pdr. - Increase of Tinfoil.
- 729 Cartridge, S.A. - Tracer.
- 702 Charges, 2 1/2-inch Projector, 10 drs. Mk.I and II (Fig.288)
- 707 Cracker, Blank, Mk.I T.P. (Fig.290)
- 695 Crates, Mine, A.T. M.138.
- 723 Demonstration Bomb.
- 701 Fuzes, Percussion, D.A. Nos.117 and 119.
- 693 Fuze No.247 - Allways.
- 711 Fuzing - 2 inch Mortar Bombs.
- 687 Gauges, shell, B.L. 7.2 inch.
- 728 Generator, Smoke, No.24 Mk.I, II and III (Figs.294, 295, 296, 297)
727. Generator, Smoke, No.25, Mk.I (Fig.293)
- 704 Grenade, No.68, A.T.
- 699 Grenade, Hand, No.77 F.M. Mk.II (Fig.286)
- 688 Gun, 76 m.m. - Complete round with Shot, A.L.C. 3 inch M.62 (American) (Fig.283)
- 689 " " - Complete round with Shell, Smoke, 3 inch M.88 (American) (Fig.284)
- 735 Hamper, Ammunition, Q.F. 40 m.m. C.280 Mk.I.
- 708 Infantry Mortar Bombs - Marking (Fig.291)
- 721 Marking - Bomb tail units, 4.2 inch Mortar.
- 720 " - Cast iron Shot, Practice and Practice Flatheaded.
- 724 " - Cordite Packages.
- 713 " - Monogram of Filling Factory.
- 715 " - Q.F. 25 pdr. Chemical Shell.
- 717 " - Shell or S.B. Bombs.
- 718 " - S.B. Smoke Bombs, 4.2".
- 719 " - 3 inch Mortar Smoke Bombs, 10 lb.
- 716 Mine, Contact, A.T. Mk.V H.C.
- 705 Primer, 1 cm. Mk.I (Fig.289).
- 709 Pyrotechnic Packages.
- 710 Pyrotechnic Packages - Markings (Fig.292).
- 700 Q.F. 40 mm. Projectile Practice Mk.VII (Fig.287)
- 694 Q.F. 2 pdr. Ammunition - Details in amplification of Statement (Fig.285).
- 722 Q.F. 25 pdr. H.E. Shell.
- 698 Rocket 'U' 3 inch - Tail propelling Mk.II.
- 714 S.B. Bombs - Securing of tail units.
- 725 S.B. 4.2" Mortar Practice - Bursting.
- 712 Shell - Attachment of penetrative caps.
- 730 Shell, Q.F., H.E. 2 pdr. Mk.II - H. of F. (Fig.298).
- 731 Small Arm Ammunition.
- 691 Smoke Boxes.
- 696 Superim.
- 733 Statement of Ammunition, Q.F. 40 m.m.
- 734 " " " Q.F. 4.5 in. Gun.
- 732 Thunderflash, Mk.V. (Fig.299).
- 692 Watertight Steel Boxes.
- 690 Wood Packages.

ENEMY AMMUNITION (GERMAN)

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|-----|---------------------------------------|-----------------|---|
| 745 | Cartridge, Q.F., 7.5 cm. L.G.40. | <u>ITEM NO.</u> | |
| 747 | Cartridge, Q.F., 15 cm. s.F.H.18. | 744 | Gainé 40. |
| 739 | Fuze for Teller Mine 35. | 740 | Igniter, pull, Z.Z.35. |
| 741 | Fuze A.Z.38. | 746 | Shell, hollow charge, Q.F. 17.5 cm. L.G.40. |
| 742 | Fuze, time, mechanical Zt.Z.S/30. | 748 | Shell, anti-concrete, Q.F. 15 cm. s.F.H.18. |
| 743 | Fuze, time, mechanical Zt.Z.S/30 Fg1. | 738 | Teller Mine 35. |

686. CARTRIDGE, Q.F. - REDUCTION OF STENCILLING ON CASES

Approval has been given for the discontinuance of stencilling the word "BATCH" on Q.F. Cartridge Cases in order to save silver nitrate.

687. GAUGES, SHELL, B.L. 7.2 INCH.

The following gauges have been approved for use with the above shell:-

- No.888 - Band, low, 7.45 in.
- " 889 - Band, high, 7.47 in.
- " 890 - Body, 7.195 in.

688. GUN, 76 M.M., M.1. COMPLETE ROUND WITH SHOT, A.P.C. 3 INCH M.62 (AMERICAN)
(Fig.283)

1. The complete round comprises :-

Primer, percussion, M28A2. (See Bulletin No.31, Item 603/2)

Case, cartridge, M26. (See Bulletin No.31, Item 603/3). Propellant consists of 3.75 lb. F.N.H. powder. The case is attached to the shell by four crimps and a sealing of N.R.C. compound.

Shot, A.P.C. 3 inch M62. The shot differs from the M61, described in Bulletin No.19, Item 250, in dimensions only. It is painted black and bears the following marking in white:- "76G PROJ. A.P.C. M62 WITH TRACER".

2. Dimensions and Weight

Overall length of complete round is 33.8 inches.

Weight of complete round approximately 24 lb. 13 ozs.

3. Packing.

Each complete round is packed in Container, Fibre, M92. (See Bulletin No.31, Item 603/8). Details of bundle packing are not yet available.

689. GUN, 76 M.M. COMPLETE ROUND WITH SHELL, SMOKE, 3 INCH. M88 (American)
(Fig.284)

1. The complete round comprises:-

Primer, percussion, M28A2

See Bulletin No.31, Item 603/2.

Case, cartridge, M26.

See Bulletin No.31, Item 603/3. Propellant consists of .219 lb. F.N.H. powder. The case is attached to the shell by four crimps and a sealing of N.R.C. compound.

Shell, smoke, 3 inch, M88.

The shell, of steel, consists of a thick walled base tapered towards the front end which is suitably shaped for the attachment by welding or brazing of a thin steel cylindrical body. The base is bored centrally and screwthreaded in two diameters to receive a fusible alloy plug and a steel cap. It is fitted with a gilding metal driving band in rear of which is a crimping groove for the attachment of the cartridge case. A central hole through both the plug and cap forms a flash hole which is lightly closed by a thin gilding metal disc inserted between the plug and cap.

Filling.

A paper washer, to which is glued a pellet of H.C., is shellacked to the bottom of the shell cavity. The remainder of the cavity is filled with three pressings of H.C. The first and second pressings comprise a priming charge of approx. 1.4 lb. and the third consists of a smoke charge of approx. 1.75 lb. The flat

headed front end of the shell is closed by a steel disc over a cardboard washer, the mouth of the shell being crimped over the steel disc through 360° and the joint sealed with Pettman cement. No information regarding the period of smoke emission is at present available.

2. Painting and Marking.

The shell is painted blue-grey with a $\frac{1}{2}$ -inch yellow band near the mouth and bears the following markings in yellow:- "SMOKE 76G SHELL M88".

3. Dimensions and Weight

Overall length of the complete round is approx. 28.5 inches.
Weight of complete round is approx. 13 lb. 8 ozs.

4. Packing.

Each complete round is packed in Container, Fibre, 76 m.m. M95. The container is cylindrical with metal end pieces and the lid is marked to indicate the nomenclature of the gun and container. Length of container is approx. 29 inches. Details of painting and bundle packing are not yet available.

690. WOOD PACKAGES.

Contractor's initials or Trade Mark are usually branded on the end grain of the wood, but if difficulty is experienced this information may be branded on the base with the Box Number and Mark. Stamping is not permissible.

691. SMOKE BOXES.

The provision of smoke boxes will be confined to shell filled H.E. of 6-inch and below. Shell above this calibre will not have a smoke box or smoke mixture.

692. WATERTIGHT STEEL BOXES.

Watertight steel boxes are now coming into use and the following instructions on opening and closing lids should be observed to ensure correct functioning:-

To open the Box:-

1. Free the handle by untying the securing string.
2. Turn the handle to the left (i.e. anti-clockwise) and continue to turn until the upper face almost touches the head of the bolt.
3. Engage the handle with the head of the bolt and turn the bolt to the left (i.e. anti-clockwise) for about one eighth of a turn. This will disengage the spider.
4. Lift off the lid.

To close the Box:-

1. See that the handle and nut is screwed back in an anti-clockwise direction until the upper face almost touches the head of the bolt.
2. Engage the handle with the head of the bolt and make sure that the bolt and handle have been turned anti-clockwise so that the spider is in the opening position.
3. Place the lid in position, having first seen that the rubber seal is in position, and is clean and undamaged, and ensure that the lid is correctly seated on the rubber sealing strip.
4. Engage the handle with the head of the bolt and turn to the right (clockwise) at the same time pressing down on the head of the bolt. The handle, bolt and spider will move about one eighth of a turn.

5. Disengage the handle from the head of the bolt and turn the handle to the right (clockwise), until, by exerting hand pressure ONLY, the handle can no longer be turned. The lid should now be satisfactorily clamped onto the rubber joint. As a check, grasp the handle and try to remove the lid by vigorous shaking.
6. Lay the handle down on the lid and lock it by turning the handle under the head of the bolt, or secure it with the string provided.

In the case of boxes with two handles the above procedure must be carried out on both handles.

693. FUZE NO. 247 - ALWAYS.

This fuze, designed for the No.69 grenade has now been extended in use, but modified to suit the special needs of each weapon. Therefore, to ensure correct assembly the top and upper part of the circumference of the safety cap will be given a distinguishing colour.

The modifications and distinguishing colours are as follows :-

	<u>Distinguishing Colour</u>
(i) For use in grenade No.69	Black
(ii) For use in Gammon bomb; this to have a safety tape $4\frac{1}{2}$ inches instead of the standard $11\frac{1}{2}$ inches	Red
(iii) For use in grenade No.79; this to have a percussion cap filled "B" composition instead of the standard "A" composition ...	Green
(iv) For use with drill grenade No.69; this fuze has an empty percussion cap ...	White

694. Q.F. 2 PDR. AMMUNITION - DETAILS IN AMPLIFICATION OF STATEMENT.

The following details are given in amplification of the statement of Q.F. 2 pdr. Ammunition published in Bulletin No.32, Item 679:-

1. Case, cartridge - Markings.

Typical silver nitrate markings on the side and base of 2 pdr. cartridge cases are shown in Fig.285. The word "BATCH" will be omitted in future (see Item 686, this Bulletin).

The following particulars are stamped on the base :-

Calibre of gun
Mark of empty case.
Lot Number.
Maker's initials or symbol.
Year of manufacture.

2. Primer, percussion, No.12.

The Mark II Primer differs from the Mark I in the anvil recess being shaped to accommodate a copper cone in lieu of a ball, with a consequent modification to the arrangement of the fire holes in the anvil and plug.

The base is stamped with the following particulars:-

Number and Mark.
Maker's initials or symbol.
Month and year of manufacture (or year only on Mk.II)
Filled Lot Number.
Filler's initials or symbol.
Month and year of filling.
("Q" added if primer cap is filled with Q.F. composition).

3. Fuze, percussion, D.A. No.243.

There are two Marks of this nose fuze used in the H.E., H.V. Shell. The Mark II differs from the Mark I in being fitted with a thicker aluminium closing disc.

The following markings are stamped around the upper part of the body:-

Number and Mark.
Maker's initials or symbol.
Year of manufacture and Series Lot No.
Filled Lot Number.
Filler's initials or symbol.
Month and year of filling

4. Fuze, percussion, Base, Tracer, No.281.

This base fuze and tracer is used in the 2 pdr. A.P. Shell, Mk.I.T. The Mark II differs from the Mark I (described in the Handbook of the equipment) in having the inertia pellet, creep spring, detonator and detonator plug removed from the fuze, thus in effect the Mark II becomes a plug with tracer.

The tracer body bears the usual markings applicable to a fuze. Where the empty fuze and tracer portions have been supplied by different makers, the number and Mark will be stamped by the filler, other empty markings not being present.

695. CRATES MINE A.T. M.138.

The number and numeral will be branded on the inside of the plain end of these crates instead of on the outside, and the ends of the crates will be painted service colour brown.

696. SUPERIM

This is a cordite of the Carbamite type consisting of a gelatinised mixture of insoluble nitro-cellulose, nitro-glycerine and carbamite with a small amount of calcium carbonate. It is graphited and supplied in the form of discs 0.03 diameter and 0.0006 thick. It is used in Small Arm Ammunition .303-in. H. Mk.IZ, as an alternative to ballistite A (Bulletin 19, Item 257).

697. BOMBS, M.L. 3-IN. MORTAR - PACKING OF BATCHES.

"Fraction" boxes will not be packed, Residual bombs will be set aside until sufficient have accumulated to make up a complete box of 6 bombs. This box will be stencilled showing the batch numbers involved. Batch labels appropriate to the contents will be affixed to the containers inside the box. This procedure is similar to that adopted for the Bombs M.L. H.E. 2-inch Mortar. (See Bulletin No.27, Item 489)

698. 3-IN. TAIL PROPELLING ROCKET U 3-IN. MARK II.L/N.

The above mentioned tail is generally similar to the Mk.I, the only difference being that it is filled with Cruciform cordite, which has a high safe temperature limit of 120°F. as against 83°F. for the Mk.I tails.

The tails will be marked S.U./K/X/12 $\frac{1}{2}$, to identify the cordite charge, and 120°F. to indicate the maximum safe temperature.

They will be packed in the standard Box M96, which will bear the marking "Mk.II[S]K-X-12 $\frac{1}{2}$ 120°F."

699. GRENADE, HAND NO.77 F.M. MK.II
(Fig.286)

This grenade differs from the Mk.I in being charged with Titanium-tetrachloride in lieu of white phosphorus and in certain alterations to the bottom to adapt the grenade to the new filling.

The bottom is prepared with a charging hole, into which, after charging, a plug is inserted. The plug contains a sealing compound and is closed by a sealing cap, screwed into the bottom to prevent leakage.

Fuze No.247 is fitted.

The exterior of the grenade is painted green with white and red bands about the centre.

This Mark of 77 Grenade is Classified for Storage purposes as Group XI but for transport purposes as Group XIII and the letters F.M. are included in the nomenclature to indicate this, consequently the designation used on Carriers Notes and other transport documents must include F.M.

The package used is the box B.167 designed to take nine containers No.56, eight of these containers each hold four grenades, whilst the ninth container takes two grenades and two cylinders No.385 which accommodate detonators No.63, used in the grenade.

Stowage dimensions of the box B.167, are, 21.8-ins. x 9.5-ins, x 9.35-ins.

700. PROJECTILE PRACTICE Q.F. 40 M.M. MK.VII - METHOD OF FILLING.

DD/L/14479 (Fig.287) is applicable to the Projectile, practice, Q.F. 40 m.m. Mark VI.T. An H.E. shell Mk.II or IVT is filled with Gunpowder G.12 or with Composition S.R.274, the base being closed with a Tracer, igniter, No.11, and the nose with a D.A. fuze No.251 fitted with a light cover plate, a felt washer and paper disc lying between fuze and explosive filling,

The projectile is painted black with a yellow band to indicate practice, the usual red filling ring, tracer symbol, Design No. etc.

701. FUZES, PERCUSSION, D.A. NOS.117 AND 119.

Hitherto the practice has been to affix to the striker cover, by means of shellac, a warning label -

"When preparing this fuze for firing, the black steel safety cap only is to be unscrewed and removed"

In future this warning label will be dispensed with, and the striker cover embossed -

"DO NOT REMOVE"

702. CHARGES, 2 $\frac{1}{2}$ INCH PROJECTOR, 10 DRMS. MKS.I AND II
(Fig.288)

The 10 dram. charge has been designed to replace the 5 dram charge hitherto employed with the 2 $\frac{1}{2}$ -inch projector.

The Mark I charge consists of 10 drams semi-smokeless black powder "B" enclosed in a celluloid 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. Before insertion of the air cushion two millboard discs are placed over the G.P. charge and the space between discs and air cushion filled in with sawdust lightly tamped in. The end remote from the air cushion is covered by a cardboard washer.

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.

Packing and Marking.

Packages containing the 10 dram charge are stencilled to show the weight of the charge, packages containing the 5 dram charge do not bear this marking.

50 charges, 10 dr. are packed in Box C.261. Stowage dimensions are 17.2 x 8.25 x 14 inches. The weight of the filled box is approx. 19 $\frac{1}{2}$ lb.

703. BOMBS, M.L. STAR, 3 INCH MORTAR, 10 LB. MK. I.

Reference Bulletin No.17, Item 202. The latest issue of this bomb now contains a 32 inch parasheet, in lieu of parachute, to improve functioning.

704. GRENADE, NO.68, A.T.

No more of these grenades will be made.

705. PRIMER 1-C.M. MARK I
(Fig.289)

The primer consists of two co-axial copper metal tubes, the outer and the upper part of the inner is filled with a cast in charge of 3.5 grams of Nobels explosive 834. The lower part of the inner tube is filled with a booster charge, consisting of 0.5 grams P.E.T.N. pressed at 4000 lb. per square inch.

It is used to initiate service explosive charges, e.g. the new 1 lb. C.E. C.E./T.N.T. cast slab is provided with two sockets to take the primer, the sockets are positioned one in the end and one in the side of the slab. The primer may also be used to initiate Plastic explosive and Ammonal.

The primer is initiated by insertion of an ordinary commercial detonator No.8, (better known as the service detonator No.27 Mk.I) in conjunction with a length of safety fuze secured in the sleeve of the primer by means of the collar provided. Any other detonator may be used with this primer provided it can be comfortably accommodated within the tube and securely held in position.

The primer is packed 10 in a tinned plate box No.379, 20 of which are enclosed in a box, wood, T.9, thus making 200 primers in all.

The total weight of the package and its contents is approx. 25-lb.

Stowage dimensions are 18.6 x 9.25 x 9.25 inches.

706. BOXES, INST., FUZE - MARKINGS

Box, Inst., Fuze, Small, Mk.I and Box, Inst., Fuze Mk.VI will now have the Lot No. of the Fuze, Inst., stencilled in $\frac{1}{4}$ inch Red letters on the outside of the lid of box. This marking will also appear on the side of the reel.

707. CRACKER BLANK, MARK I, T.P. - FOR TRAINING PURPOSES.
(Fig.290)

The cracker is used to simulate rifle fire. The cord loop is placed over the muzzle end of the rifle and the free end of the cord is pulled. Single shots or rapid fire may be simulated.

The cracker consists of 5 bundles of 4 snaps each as shown. Each snap consists of two paper leaves. One end of each leaf is coated, on one side, with powdered glass for about $\frac{3}{8}$ inch. Positioned $\frac{1}{4}$ inch away from the powdered glass, and on only one of the leaves is a blob of Fulminate of Silver.

The snaps are assembled as shown and held together by means of a paper wrapper. Four of these snaps are then placed together and the ends bent round to form a loop. The loop thus formed is secured by means of adhesive tape.

A length of line, cotton cord, is passed through the loops of five bundles and knotted, leaving two free ends as shown. The loops at the opposite ends of these bundles are secured by a longer length of line, cotton cord, approximately 56 inches long. The line is passed through each loop and knotted so that the length of line between each loop is approximately $2\frac{1}{4}$ inches, leaving a free length of line as shown. This free end is then wound round the five bundles.

The Contractor's initials are stamped on the completed cracker.

Packing.

3,000 crackers are packed in a case, wood packing.

Storage.

The crackers are in Group IX Category Y. They require dry storage.

708. MARKINGS ON INFANTRY MORTAR BOMBS.
(Fig. 291)

These markings apply to the 2" M.I. Smoke, 2" Bomb Thrower, Smoke, 2" Signal Bombs and 2" Illuminating Bomb with parachute.

Smoke Bombs are marked in the following manner:-

The body of the bomb is varnished green. Around the body a red band $\frac{1}{2}$ inch wide is painted. This band denotes that the bomb is filled.

Smoke Bombs for use with 2 inch mortar are stencilled on the body in $\frac{1}{4}$ inch black letters, with 2" MOR II or 2" MOR IV as applicable, while those for use with the Bomb Thrower are stencilled 2" B.T. I.

The composition with which the bomb is filled is also stencilled on the body in $\frac{1}{4}$ inch black letters e.g. S.R. 269.

The markings on Signal Bombs are as follows:-

Single Star Signal Bombs have a $\frac{1}{2}$ inch band, of the appropriate colour, painted around the body.

Multi Star Signal Bombs have a similar band with the word MULTI stencilled in $\frac{1}{2}$ inch letters close to the colour band.

The Illuminating Bomb has the following words legibly marked on the body:-

ILLG WITH PARACHUTE

The body of the Practice Bomb is painted white. A $\frac{1}{2}$ inch yellow band denoting that the bomb is dummy filled.

The Signal Success Bomb, which changes colour from Red to Green, the star being suspended by a parachute, is marked on the body as follows. A $\frac{1}{2}$ " red band followed by a $\frac{1}{2}$ inch green band with the words WITH PARACHUTE stencilled next to the green band.

Further to the above markings all bombs are marked with the following particulars:-

The "Empty" Contractor's initials or recognised trade mark, the date of manufacture, and the mark of the bomb.

These markings are necessary for reference should any failures occur which may be attributed to the manufacture of the empty bomb. The monogram of the filling station, the date of filling and the lot number to which the bomb belongs, are also marked on all bombs. These markings are required should the bomb fail to function correctly either at proof or in the Service.

A system of marking Signal and Illuminating Bombs by means of embossed symbols on the lid, for easy night identification, is under consideration, and if approved will be introduced on these bombs.

709. PACKAGES FOR PYROTECHNICS

The following list gives dimensions and filled weights of the packages used for Pyrotechnics and kindred stores. Many of these have already been given in the Bulletins but they have been brought together for convenience in reference.

Owing to supply considerations, instances may occur where packages outside the dimensions given in the list have been accepted so that the weights shown are to be taken as estimated only, although divergencies from the figure quoted will not be large.

Package Box Serial No.	Stowage Dimensions (inches)			Filled Weight (lbs)	Contents
	L	W	H		
B.164, Mk.I	26.875	x 9.75	x 9.3	50	12 Bombs, ground, training, Mk.I
B.164, Mk.II	29.125	x 10.5	x 11.75	54	12 " " " Mk.II
B.165, Mk.I	9.35	x 7.1	x 3.875	5	12 Mk.I Bursters, each in cylinder No.284, Mk.I.
B.165, Mk.II	12.3	x 7.15	x 4.9	6	12 Mk.II Bursters, each in cylinder No.284, Mk.II.
B.167, Mk.I	21.8	x 9.5	x 9.875	46	18 Bombs, M.L., Smoke, Signal or Illuminating, with parachute, 2-inch Mortar or Bombs, Smoke, 2-inch Bomb Thrower, in 3 carriers.
B.168, Mk.I	14.0	x 10.3	x 11.5	39	12 - 2 $\frac{1}{4}$ Bombs, demonstration, incendiary, or 48 lachrymatory Thunderflashes with 2 Brassards.
B.170, Mk.I	23.2	x 10.2	x 10.1	82	10 Bombs, ground, 6-lb. or 10 Bottles, steel, chemical, 1-litre.
B.171, Mk.I	23.625	x 17.45	x 10.35	100	100 Charges, ejection, Bomb, ground 6-lbs. in 10 Cylinders No.315.
G.31, Mk.I	20 $\frac{5}{8}$	x 5 $\frac{7}{8}$	x 12 $\frac{1}{8}$	15	12 - No.31, 32, 38 or 51 Rifle signal Grenades, 12 rods, 14 cartridges, in tinned-plate box and 12 Igniters in tinned-plate cylinder.
G.33, Mk.II	27.0	x 9.0	x 6.75	15	12 No.33 hand Grenades and 12 Detonators in 2 cylinders, No.276, or 12 Detonators in cylinder No.199
G.41, Mk.I.	16.4	x 11.0	x 12.125	17	50 No.41 hand Grenades in 2 tinned- plate boxes.
G.42, Mk.I.	17.125	x 16.375	x 7.75	35	24 No.42, 43, 45, 48 or 52 signal Grenades and 28 Cartridges in 2 tinned-plate boxes.
G.63, Mk.I	13.6	x 6.85	x 8.4	26	15 No.63 smoke Grenades and 20 S.A. Cartridges in tinned-plate box.
G.65, Mk.I.	22.8	x 8.25	x 5.9	27 or 33	12 Nos.59 or 60 signal Grenades, or 12 No.57 illuminating Grenades and 14 cartridges in tinned-plate box.
G.66, Mk.I	22.8	x 8.25	x 8.1	respy. 33 $\frac{1}{2}$ or 35	12 No.61 or 62 signal Grenades, or 12 No.58 illuminating Grenades and 14 cartridges in tinned-plate box.
M.3, Mk.I	24.75	x 16.625	x 5.625	respy. 50	192 Flares, ground, 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " in 96 tinned-plate cylinders.
M.3A, Mk.I	17.45	x 12	x 12.1	65	256 Flares, ground, 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " in 128 tinned-plate cylinders.
M.10, Mk.I	42.75	x 14.5	x 13.65	-	15 Flares, ground $\frac{1}{2}$ hour.
M.11, Mk.I	41.4	x 10.9	x 11.6	-	16 Flares, ground, $\frac{1}{2}$ hour.
M.15, Mk.II	24.75	x 17.0	x 12.65	50	Fireworks, small.
M.25, Mk.I	29.625	x 14.375	x 8.875	59	6 Rockets, life saving boxer.
M.31, Mk.I	26.25	x 14.375	x 7.1	45	50 Generators, lachrymatory, No.2.
M.31, Mk.II	26.625	x 14.375	x 7.25	47	50 Generators, lachrymatory, No.2.
M.34, Mk.I	28.0	x 15.45	x 7.5	57	50 Generators, lachrymatory, No.2
M.34, Mk.II	28.0	x 15.45	x 7.3	55	50 Generators, lachrymatory, No.2
R.4095					

Package Box Serial No.	Stowage Dimensions (inches)			Filled Weight (lbs.)	Contents
	L	W	H		
M.36, Mk.I	16.25	6.875	5.4	12	20 Signals, vertical light ray in 10 Cylinders, No.256.
M.36, Mk.II	13.55	5.8	5.375	10	20 Signals, vertical light ray in 10 Cylinders, No.256
M.44, Mk.I	23.25	10.25	9.5	51	10 Generators, Smoke, No.5.
M.45, Mk.I	23.75	10.5	9.5	57½	10 Generators, Smoke, No.5 or 15.
M.63, Mk.I	29.15	11.25	8.9	69	10 Generators, Smoke, No.8, Mk.I, 10 Charges, propelling in 2 Cylinders No.286 and 12 Cartridges in tinned-plate box.
M.63, Mk.IC	29.15	11.25	8.9	72	10 Generators, Smoke, No.8 (except Mk.I) 10 Charges, propelling in 2 Cylinders No.286, 14 Cartridges in tinned-plate box, and 12 covers, muzzle.
M.63, Mk.II	30.25	11.25	6.85	70	10 Generators, Smoke, No.8 (except Mk.I), 10 Charges, propelling in 2 Cylinders No.286, 12 Cartridges in tinned-plate box, and 12 covers, muzzle.
M.63, Mk.IIC	30.25	11.25	6.85	79	12 Generators, smoke, No.8 (except Mk.I) 14 Cartridges in tinned-plate box and 14 covers, muzzle.
M.63, Mk.III	30.25	11.875	6.75	70	10 Generators, Smoke, No.8 (except Mk.I), 10 propelling charges in 2 cylinders No.286, 14 Cartridges in tinned-plate box and 12 covers, muzzle.
M.63, Mk.IIIC	30.25	11.875	6.75	79	12 Generators, smoke, No.8 (except Mk.I), 14 Cartridges in tinned-plate box and 14 covers, muzzle.
M.63, Mk.IV	25.65	11.875	6.75	62	10 Generators, smoke, No.8 (except Mk.I) 14 Cartridges in tinned-plate box and 12 covers, muzzle.
M.66, Mk.I	22.75	10.45	14.25	75	10 Flares, beach, each in Cylinder No. 297.
M.70, Mk.I	31.25	16.75	5.6	50	50 Generators, smoke, No.10.
M.71, Mk.I	32.75	17.625	5.7	55	50 Generators, smoke, No.10.
M.72, Mk.I	23.0	14.6	12.9	60	6 Bottles, stone, screw stoppered, ½ gall. containing "2" mixture.
M.76, Mk.I	27.0	9.25	10.125	50	24 Generators, smoke, No.13.
M.87, Mk.I	15.0	11.1	16.9	80	20 Burstern, No.1 Chemical mine, each in cylinder No.330.
M.94, Mk.I	21.75	7.45	10.125	46	24 Generators, smoke, No.14.
M.116, Mk.I	18.75	10.75	10.2	63	8 Generators, smoke, No.18.
M.116, Mk.II	18.5	8.85	9.75	56	8 Generators, smoke, No.18.
M.121, Mk.I	26.625	12.0	12.25	73	10 Generators, smoke, No.20.
H.40, Mk.I	17.2	9.3	9.875	29	144 Cartridges, signal or illuminating, 1-inch, in 24 tinned-plate boxes, No.338.
H.13M Mk.IE				Signal 34	114 Cartridges, signal or illuminating, 1 inch in 19 tinned-plate boxes, No.338
				Illg. 26	
				Signal 30	
H.13, Mk.IE				Illg. 32	60 Flares, T.R. Yellow.
R.4095					

Package Box Serial No.	Stowage Dimensions (inches)	Filled Weight (lbs.)	Contents
	L W H		
B.166, Mk.II	19.7 x 9.0 x 13.2	58 40 30 16	24 Grenades, hand, No.79, smoke, Mk.I or 34 Simulators, Gunflash, No.2 or 200 Portfires, common. 10 Bombs, spray, 1-litre.
M.102, Mk.I	25.75 x 11.25 x 11.125	50	28 Bombs, incendiary, 1 $\frac{1}{4}$ -lb.
P.59, Mk.II	19.15 x 8.35 x 7.85	65	12 Generators, smoke, chemical, No.23.
C.224, Mk.I	24.7 x 15.25 x 10.125	46	8 Generators, smoke, chemical, No.20.
C.238, Mk.I	26.1 x 10.1 x 9.6	32	8 Generators, smoke, No.25.
P.60, Mk.I	19.375 x 12.3 x 5.2		
<u>TRADE PACKAGES</u>			
	16 $\frac{1}{2}$ x 16 $\frac{1}{2}$ x 5 $\frac{1}{8}$	-	Requisite number of Flares, ground, 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " or 1 $\frac{3}{4}$ " x 2", in cylinders No.2210 or 218 respectively.
	43.12 x 14.93 x 13.8	30	10 Bottles, stone, screw stoppered, chemical 1-pint, each in cylinder No.322, and 10 adapters, pouring.
	17 $\frac{3}{4}$ x 16 $\frac{1}{2}$ x 9	-	Portfires common.
	24.15 x 18.65 x 14.5	75	144 Signals, light and sound, 3-star red, or Signals, 5-star green, in 12 cartons.
	23 $\frac{3}{8}$ x 18 $\frac{7}{8}$ x 13 $\frac{3}{4}$	75	-"-
	25 $\frac{7}{8}$ x 19 $\frac{3}{8}$ x 21 $\frac{5}{8}$	50	100 Rockets.
	22 $\frac{7}{8}$ x 19 $\frac{1}{2}$ x 11 $\frac{1}{2}$	60	300 Thunderflashes and 20 Brassards in 10 cartons.
	5.9 dia. x 16.25 long.	8	6 Rockets, signal, 3-star white trailer.
	22 $\frac{1}{2}$ x 19 $\frac{1}{2}$ x 10 $\frac{1}{2}$	62	300 Thunderflashes, lachrymatory, and 16 Brassards.
	21 $\frac{3}{4}$ x 16 x 10 $\frac{3}{4}$	49	20 Smoke Floats, distress, marine.
	23 $\frac{5}{8}$ x 19 $\frac{7}{8}$ x 11 $\frac{3}{8}$	60	300 Thunderflashes and 20 Brassards in 10 cartons.
	24 $\frac{1}{2}$ x 9 $\frac{3}{4}$ x 9 $\frac{3}{4}$	75	2 Generators, smoke, No.24, Mk.I.

710. MARKINGS ON PYROTECHNIC PACKAGES
(Fig.292)

- Packages are stained or painted a distinguishing colour according to the nature of the store packed, i.e.
 - Green for packages containing smoke stores.
 - Grey " " " chemical stores.
 - Red " " " incendiary "
 - Brown " " " general pyrotechnic stores.
 - Service colour for steel packages, containing general pyrotechnic stores.
- The particulars relating to the contents are normally stencilled on both sides and both ends of the package.
This detail comprises:-
 - Quantity and description of store.
 - Date of filling and charging.
 - Lot number of store.

- (d) Initials or recognised trade mark of the station filling.
- (e) The word "Charged" or "Filled".

3. In addition to the normal packing and stencilling, packages containing chemical stores have a coloured band, or bands, around the centre of the box on which is stencilled the code letters, the band and letters signifying the nature of chemical used on charging.

4. The words "Deck Cargo Only" are also stencilled on the lid in red lettering in instances where such is necessary such as chemical and incendiary stores. This legend has no significance in war as ammunition, other than loose shell, mines or similar types, is not allowed to be carried on deck. It may be omitted in some instances.

5. Cartridges, Signal and kindred stores are, in some instances, packed into boxes of the A.S.A. H.13 type. In such cases, metal letters and/or figures are affixed to the end of box to assist identification of the contents in the dark.

The letters used to date are "X" for boxes containing 1 inch Signal Cartridges and "1J" for boxes containing 1 inch Illuminating Cartridges.

The painting and stencilling detailed above are, in the first place, to assist Ordnance Depots to arrange correct storage and issues and for future reference should there be any cause for complaints from the Service.

6. Each package containing explosives stores bear a group label indicating the storage group and is sealed by two linen seals over the junction of the lid and body, the linen seals bearing letters which indicate under whose responsibility the packing has been completed.

711. FUZZING - 2-INCH MORTAR BOMBS.

The fuze or plug used with these bombs has a left hand thread whilst the tail has a right hand thread, consequently if the tail is held whilst inserting the fuze or plug there is a likelihood that the tail will be unscrewed wholly or partly.

The correct procedure is to hold the bomb body whilst inserting or removing the fuze or plug, some packing material being used between the tool and body to avoid damaging the varnish coat.

712. SHELL - ATTACHMENT OF PENETRATIVE CAPS

The normal method of attaching penetrative caps to the undermentioned shot is by notches and soldering but in view of urgency and production difficulties they are now being issued in many instances, without the notches.

2 pdr. A.P.C.B.C. Shot	Mk. IX.T.
6 pdr. A.P.C.	Mk. VIII.T.
6 pdr. A.P.C.B.C.	Mk. X.T.

713. MARKING - MONOGRAM OF FILLING FACTORY

For a time, shell, mortar bombs, mines and grenades omitted the Monogram of the Filling Factory in the stencilled marking. This has been restored and this information with the date of filling will be placed immediately below the design number on all filled articles of this kind.

714. S.B. BOMBS - SECURING TAIL UNITS OF.

Until recently these units have been secured to the 4.2" Bombs by Cement but experience has shown this to be not entirely satisfactory as tails are frequently found loose in the Service. A shake proof lock washer for $\frac{1}{8}$ " bolt has been brought into use between tail and bomb and the treatment with cement discontinued.

715. MARKING - Q.F. 25 PDR. CHEMICAL SHELL

When Q.F. 25 pdr. Chemical Shell are fitted with Magnesium Smoke Bag in the head filling a 1 inch square, painted diagonally half white and half black, will be painted on the shell in the same position as the 1 inch green disc and will be in lieu of the same for shell charge Y.18.

716. MINE CONTACT A.T. MK.V. HC.

T.N.T. is the only filling considered suitable for this Mine, and no other filling is permitted.

717. MARKING - SHELL OR S.B. BOMBS.

Head filling particulars will not be marked where the head filling and body charging has been carried out at the same factory within one month of each other.

718. MARKING - S.B. SMOKE BOMBS

The MK. II 4.2 inch Smoke Bombs should have the body painted green and the tail coated with approved varnish. Some bombs may have reached the service with the body and tail coated with approved varnish.

719. MARKING - 3 INCH MORTAR SMOKE BOMBS 10 LB.

The letters F.M. or C.S.A.M. have been added to the nomenclature to indicate Titanium Tetrachloride or Chlorosulphonic Acid/Sulphur Trioxide Mixture, respectively, and an additional band is painted on the bombs adjacent to the white band. A Red Band indicates F.M. and a Yellow Band C.S.A.M.

720. MARKING OF CAST IRON SHOT, PRACTICE AND PRACTICE LANTHEADED.

These shot will have a brown ring painted above the red filling ring.

721. BOMB TAIL UNITS 4.2" MORTAR MARKING.

The Tail Units of these bombs will have normalised tubes and vanes without the two slots. Some tails, however, may be made up of normalised tubes and vanes with slots whilst stocks of the latter exist. These will be identified by painting the face of one vane red. The red marking is not placed on tails having normalised tubes and vanes without slots.

722. 25 PDR. H.E. SHELL.

These shell will be filled with Grade I T.N.T. only, except that 40/60 Amatol may be used in exceptional instances but only with the express sanction of D. of A.

723. DEMONSTRATION BOMB.

A supply of the Roberts MacLean Demonstration Bomb has been ordered and some 50,000 have been issued.

724. MARKING - CORDITE PACKAGES.

Cordite packages will have the gross weight of the case, drum and package material, stencilled externally in lieu of the tare weight at present stencilled.

725. 4.2" S.B. MORTAR PRACTICE - BURSTING.

This is charged with calcium chloride and phosphorus and will be marked with the letters "C.C." stencilled above a $\frac{3}{8}$ -inch white band in lieu of the existing marking "CAL. C."

726. BOMBS S.B. 4.2" MORTAR.

The guide bands of these bombs of the cylindrical type will be rustproofed, parkerised or treated in zinc spray, whilst the streamlined type will be Copal Varnished.

727. GENERATOR, SMOKE, NO.25, MK.I /L/ (FIG.293).

The empty body consists of a tinned-plate or terns-plate body, filler plug, bottom, lid and top and a zinc igniter cup. The top and bottom are seamed on and soldered. The igniter cup is soldered to the top and the filler plug is soldered into bottom after filling.

The smoke composition used in this store is P.N.411 or P.N.317. The igniter cup contains P.N.227 in which is embedded the igniter. The igniter is known as Igniter, Electric, No. G.67 and contains two 18-inch lengths of oil and flame proof cable. The igniter is of a low tension electric commercial pattern operating on a 12 volt circuit, fusing current not more than .5 amp. It is marked G.67 on the head. The ends of the wires in the igniter cup are covered with insulating sleeving. The cable passes through two holes in a waxed pulpwood board and is fastened by wire attached to the Generator lid. The holes are sealed with Chattertons compound. The cable is wound round the inside of the lid and a glazed board disc is inserted just inside the lid. The lid is cemented into the top. The lug on the side of the generator is there to prevent the generators rotating in the package.

The Generator is used on armoured fighting vehicles and ignited electrically. The heat of the igniter fuses the igniter cup and the ignited smoke composition emits smoke for 75-105 seconds. A full emission of smoke begins within 5 seconds of ignition.

The Generator is finished Green and bears the nomenclature of store, initials of filling station, date of filling, Lot number and composition number as applicable.

The filler plug is stamped or printed with the following particulars:-
No.25 I. Initials and date of manufacture of Contractor making empty Generators.

Packing.

8 Generators are packed into Box P.60 Mk.I with corrugated cardboard packing pieces.

Stowage size of Box is 19.375" x 12.3" x 5.2".

728. GENERATOR, SMOKE, NO.24, MKS.I, II AND III.

Mk.I. (Fig.294)

This Generator is of tinned-plate, the top and bottom being secured by an approved compound lined joint. The top is fitted with a tear-off strip for ignition purposes.

A 6-inch square of primed cotton cambric or muslin is secured to the underside of lid with shellac adhesive applied around the ignition hole. This is followed by approximately 1½-lb. priming composition and subsequently the main filling of S.R.264A (M) or P.N.307 or P.N.421.

Ignition is carried out by removing the tear-off strip and applying a portfire or fusee. The Generator should emit an effective smoke cloud within 5 seconds of ignition and continue for a period of 11-18 minutes.

The Generator is finished green and stencilled or painted with instructions for igniting, nomenclature, fillers initials, date of filling, lot number and composition number. The bottom of the generator bears the contractor's initials, date of manufacture, No.24 and I.

The overall size of the generator is 8.125" dia. x 10.375".

Packing.

Two generators are packed per crate as shown in Fig. 295. Owing to the construction of the generator being of a flimsy nature, instances have occurred of spontaneous ignition due to ingress of moisture. Consequently crates and generators are now being labelled with a label bearing the words:- "Danger handle with care. Fire risk if wet". Care in handling and storage must therefore be exercised.

The overall dimensions of the crate are $24\frac{1}{8}$ " x $9\frac{1}{2}$ " x $9\frac{1}{2}$ ".

Storage.

The generators are placed in Group XI, Category X.

Mk. II. (Fig. 296)

This Generator was introduced owing to the flimsy nature of the Mark I design. The body, top and bottom are made of sheet steel of heavier gauge than Mk. I. The top is fitted with a screw neck and cap which is of tinned-plate, terne-plate or sheet steel lacquered.

The top and bottom are secured by an approved compound lined folded joint. The screw cap is fitted with a waxed cardboard or other approved waterproof disc. Inside the neck of the Generator is a primed cotton cambric or muslin disc. The filling is similar to that of the Mark I Generator. To ignite the generator the screw cap is removed and a portfire or fusee is applied.

The generator should emit an effective smoke cloud within 5 seconds of ignition and continue for 11 - 18 minutes.

The generator is finished green and stencilled or printed similar to the Mark I Generator.

The overall size is 8.05 dia. x 12.25 and the weight approx. 42 lb.

Packing.

As this Generator is of a heavier material than the Mark I design and consequently will stand rough usage better. No packing of this generator is being made.

Storage.

As for Mk. I.

Mk. III (Fig. 297)

The generator consists of a terne-plate body, and igniter cup, screw neck and screw cap of tinned-plate or terne-plate and a metal handle.

The Top and Bottom are seamed on and soldered.

This Generator is filled with approx. 44 lb. Smoke Composition, of P.N. 276 or P.N. 314 or P.N. 411, the composition being within approx. 1 inch of the top of the screw neck.

The Igniter cup, contains about $1\frac{1}{2}$ ozs. of igniter composition P.N. 227. A strawboard washer with a primed cotton cambric or muslin disc secured underneath is cemented into the top of the Igniter Cup.

The screwed cap is fitted internally with a disc of waterproof material and screwed hard home.

Means of Ignition is similar to the Mk. I and II designs. The Igniter cup fuses with the heat of the igniter composition and an effective smoke begins within 15 seconds of ignition and continues for 11 - 18 minutes.

The generator is finished green and printed or stencilled similarly to the Mark I and II designs.

DESIGNATION	CALIBRE	PROPELLANT		PROJECTILE	LENGTH OF TRACE
		Nature	Weight grs.		
Cartridge S.A. Armour Piercing .50"	.50"	N.C	240.0	A.P.	-
" Browning W Mk.IIz	"	"	"	"	"
" " Tracer .50" Browning G Mk.IIz	"	"	240.0	Tracer	-
" " Incendiary .50" Browning	"	"	245.0	Incendiary	-
" " Ball .55" Mk.I	.55"	Cordite	186.0	Ball	-
" " " Mk.II	"	"	186.0	"	-
" " " Mk.III	"	"	212.0	"	-
" " Practice .55" P Mk.I	"	"	103.0	"	-
" " " " "	"	"	128.0	"	-
" " " Mk.II	"	"	"	"	"
" " Armour Piercing .55" W Mk.I	"	"	186.0	A.P.	-
" " " " .55" W Mk.II	"	"	212.0	"	-
" " Tracer .55" G Mk.I	"	"	186.0	Tracer	800x
" " Proof .55" Q Mk.I	"	"	214.0	Ball	-
" " " " Q Mk.II	"	"	214.0	"	-
" " " " Q Mk.IIIz	"	N.C.	198.0	"	-
" " Dummy .55" U Mk.I	"	Nil	Nil	Nil	-
" " Drill .55" D Mk.I.	"	"	"	"	-
" " Ball 15 mm. Mk.Iz	15 mm.	Neonite	370.0	Ball	-
" " Armour Piercing 15 mm. W Mk.I	"	Cordite	325.0	A.P.	-
" " " " 15 mm. W Mk.Iz	"	Neonite	370.	"	-
" " " " Tracer 15 mm. W.G. Mk.Iz	"	"	360.0	A.P.Tracer	800x
" " Tracer 15 mm. G. Mk.Iz	"	"	360.0	Tracer	800x
" " Proof 15 mm. Q Mk.I	"	Cordite	265.0	Ball	-
" " Dummy 15 mm U Mk.I	"	Nil	Nil	Nil	-
" " Drill 15 mm. D Mk.I	"	"	"	"	-
" " Ball Revolver .380" Mk.II	.380"	Cordite	4.0	Ball	-
" " " " .380" Mk.IIz	"	N.C.	3.0	"	-
" " Proof Revolver .380" Q Mk.I	"	Cordite	4.9	"	-
" " " " .380" Q Mk.II	"	"	4.9	"	-
" " " " .380" Q Mk.IIz	"	N.C.	4.0	"	-
" " Blank " .380" L Mk.IIT	"	Gun-powder	5.5	Nil	-
" " Drill " .380" D Mk.I	"	Nil	Nil	Nil	-
" " " " .455" D Mk.I	.455"	"	"	"	-
" " Ball Revolver .455" Mk.V	.455"	Cordite	7.0	Ball	-
" " " " .455" Mk.VI	"	"	7.5	"	-
" " " " .455" Mk.VIz	"	N.C.	5.2	"	-
" " " " .455" Mk.II	"	Cordite	5.5	"	-
" " Proof " Q Mk.I	"	"	"	"	-
" " " " Q Mk.Iz	"	Neonite	5.8	"	-
" " Blank " L Mk.IIT	"	Gun-powder	8.0	Nil	-
" " Drill " D Mk.I	"	Nil	Nil	Nil	-

DESIGNATION	CALIBRE	PROPELLANT		PROJECTILE	LENGTH OF TRACE
		Nature	Weight grs.		
Cartridge S.A. Ball 9 mm. Mk. Iz	9 mm.	N.C.	4.8	Ball	-
" " Proof " Q Mk. I	"	Cordite	7.5	"	-
" " Tracer " G Mk. Iz	"	N.C.	-	Tracer	-
" " Ball .310" Mk. Iz	.310"	Schultze Powder	5.5	Ball	-
" Rimfire .22" Mk. I	.22"	Various	-	Ball	-
Cartridge Aiming Rifle 1" Electric Mk. III	1"	Cordite	160	Ball	-
" " " Blank 1" Electric L Mk. IT	1"	Gun-powder	400	Nil	-

LIST OF PACKINGS EMPLOYED WITH S.A.A.

TYPE	PACKED IN	PACKAGE	QUANTITY	GROSS WEIGHT
.303" BALL Mk. VII & VIIz	BANDOLIERS	H. 1	1,000 Rounds	Mk. I 75 lb. Mk. IE 72½ lb.
		H. 3	350 "	" 30 lb.
		H. 4	850 "	67 lb.
		H. 19	1,000 "	75 lb.
		H. 21	700 "	57 lb.
		H. 21	600 "	50 lb.
	CASES CHARGER	H. 1	1,000 Rounds	Mk. I 76 lb. Mk. IE 73½ lb.
		H. 3	360 "	30 lb.
		H. 4	840 "	67 lb.
		H. 19	1,000 "	77 lb.
		H. 21	640 "	53 lb.
	CARTONS	H. 3	500 Rounds	34 lb.
		H. 4	1,100 "	75 lb.
		H. 13	1,248 "	Mk. I 83 lb. 13 oz. Mk. IE 82 lb. 1 oz.
		H. 20	1,300 "	87½ lb.
		H. 22	900 "	64 lb.
		H. 22	700 "	52 lb.
		H. 22	600 "	46 lb.
	STRIPLESS BELTS	H. 15	500 Rounds	40 lb.
		H. 26	500 "	42½ lb.
		H. 29	500 "	Mk. I 48½ lb. Mk. IE 44¾ lb.
	BROWNING LINKS	H. 31	1,000 Rounds	Mk. I 86 lb. Mk. IE 81½ lb.
.303" BALL MK. VIIIZ	BANDOLIERS	H. 1	1,000 Rounds	Mk. I 75 lb. Mk. IE 72½ lb.
		H. 19	1,000 "	75 lb.
	CARTONS	H. 13	1,248 Rounds	Mk. I 83 lb. 13 oz. Mk. IE 82 lb. 1 oz.
		H. 20	1,300 "	87½ lb.
	STRIPLESS BELTS.	H. 29	500 Rounds	Mk. I 48½ lb. Mk. IE 44¾ lb.

TYPE	PACKED IN	PACKAGE	QUANTITY	GROSS WEIGHT
.303" A.P.	CARTONS	H. 13	1,248 Rounds	Mk. I 84 lb. Mk. IE 82 $\frac{1}{4}$ lb.
	BROWNING LINKS	H. 31	1,000 Rounds	
.303" TRACER.	CARTONS.	H. 3	500 Rounds	33 lb.
		H. 13.	1,248 "	Mk. I 84 lb. Mk. IE 82 $\frac{1}{4}$ lb.
		H. 20	1,300 "	87 $\frac{1}{2}$ lb.
.303" BALL & TRACER OR ANY MIXED BELT	STRIPLESS BELT	H. 29	500 Rounds	Mk. I 48 $\frac{1}{2}$ lb. Mk. IE 44 $\frac{3}{4}$ lb.
	BROWNING LINKS	H. 31	900 Rounds	Mk. I 80 lb. Mk. IE 75 $\frac{1}{2}$ lb.
.303" INCENDIARY	CARTONS	H. 3 H. 13.	500 Rounds 1,248 "	33 lb. Mk. I 79 lb. Mk. IE 77 $\frac{1}{4}$ lb.
	BROWNING LINKS	H. 31.	1,000 Rounds	Mk. I 86 lb. Mk. IE 81 $\frac{1}{2}$ lb.
.303" OBSERVING	CARTONS	H. 13.	1,248 Rounds	Mk. I 84 lb. Mk. IE 82 $\frac{1}{4}$ lb.
.303" BALLISTITE	TIN BOXES	H. 3	364 Rounds	22 $\frac{1}{2}$ lb.
		H. 13.	900 "	Mk. I 51 lb. Mk. IE 49 $\frac{1}{4}$ lb.
		H. 13.	1,008 "	Mk. I 51 lb. Mk. IE 49 $\frac{1}{4}$ lb.
.303" RIFLE GRENADE	TIN BOXES	H. 3.	150 Rounds	19 lb.
		H. 13.	1,008 "	Mk. I 51 lb. Mk. IE 49 $\frac{1}{4}$ lb.
.303" BLANK MK. VII MK. V	CARTONS	H. 13	1,248 Rounds	Mk. I 66 lb. Mk. IE 64 $\frac{1}{4}$ lb.
	BUNDLES	H. 13	1,600 Rounds	Mk. I 58 $\frac{1}{2}$ lb. Mk. IE 56 $\frac{3}{4}$ lb.
.303" DRILL, PROOF, DUMMY.	CARTONS.	H. 13	1,248 Rounds	Mk. I 77 $\frac{1}{2}$ lb. Mk. IE 75 $\frac{3}{4}$ lb.
				" 90 lb. " 88 $\frac{1}{4}$ lb.
				" 80 $\frac{1}{2}$ lb. " 78 $\frac{3}{4}$ lb.
.303" DRILL OR DUMMY	BUNDLES	H. 13	1,400 Rounds	
7.92 mm. BALL.	CARTONS	H. 13	990 Rounds.	Mk. I 78 lb. 9 oz. Mk. IE 76 lb. 13 oz.
7.92 mm. PROOF.	CARTONS	H. 13	1,110 Rounds	Mk. I 82 lb. Mk. IE 80 $\frac{1}{4}$ lb.
7.92 mm. MIXED.	LINKED BELTS	H. 29	450 "	Mk. I 57 $\frac{1}{2}$ lb. Mk. IE 53 $\frac{3}{4}$ lb.
.5" VICKERS ALL TYPES	CARTONS	H. 4	270 Rounds	67 lb.
		H. 20	360 "	88 $\frac{1}{2}$ lb.

TYPE	PACKED IN	PACKAGE	QUANTITY	GROSS WEIGHT
.5" VICKERS A.P., S.A.P. S.A.P. TRACER, & INCENDIARY.	ARTICULATED BELTS	H. 24	300 Rounds	104 lb.
.5" VICKERS DRILL	ARTICULATED BELTS	H. 3	80 Rounds	22½ lb.
	BUNDLES	H. 13	420 Rounds	Mk. I 60 lb. Mk. IE 58½ lb.
.5" VICKERS DUMMY	BUNDLES	H. 13	420 Rounds	Mk. I 60 lb. Mk. IE 58½ lb.
.5" VICKERS BALL & A.P.	CARTONS	H. 13	370 Rounds	Mk. I 81 lb. Mk. IE 79½ lb.
.50" BROWNING	CARTONS	H. 32	140 Rounds	
	LINKED BELTS	H. 42		
.55" BALL & PRACTICE	CARTONS	H. 13 H. 28	150 Rounds 170 "	Mk. I 57 lb. Mk. IE 55½ lb. Mk. I 66½ lb. Mk. IE 63 lb.
	BANDOLIERS	H. 27	160 Rounds	Ball Mk. I 61½ lb. Mk. IE 58 lb. Ball Prac. Mk. I 53½ lb. Mk. IE 50 lb.
.55" A.P.	BANDOLIERS	H. 27	160 Rounds	A.P. Mk. I Mk. I 63½ lb. Mk. IE 60 lb. A.P. Mk. II Mk. I 59½ lb. Mk. IE 56 lb.
.55" TRACER & PROOF	CARTONS	H. 13 H. 28	150 Rounds 170 "	Mk. I 57 lb. Mk. IE 54½ lb. Mk. I 66½ lb. Mk. IE 63 lb.
.55" DRILL	CARTONS	H. 28	170 Rounds	Mk. I 56 lb. Mk. IE 52¾ lb.
	BUNDLES	H. 13	260 Rounds	Mk. I 77 lb. Mk. IE 75½ lb.
.55" DUMMY	BUNDLES	H. 13	260 Rounds	Mk. I 77 lb. Mk. IE 75½ lb.
15 mm. ALL TYPES	LINKED BELTS	H. 30	50 Rounds	Mk. I 43 lb. Mk. IE 41½ lb.
15 mm. A.P.	CARTONS	H. 20	90 Rounds	57 lb.
.380" BALL	CARTONS	H. 9	360 Rounds	Mk. III 18 lb. Mk. III E 17 lb. 6 oz.
		H. 13	3,000 "	Mk. I 120 lb. Mk. IE 118½ lb.
		H. 25	180 "	Mk. I 9½ lb. Mk. IE 8 oz. 15 drs.
		H. 9	240 "	13 lb.
	BUNDLES	H. 9	384 "	Mk. III 18 lb. Mk. III E 17 lb. 6 oz.

TYPE	PACKED IN	PACKAGE	QUANTITY	GROSS WEIGHT
.380" PROOF	CARTONS	H. 9 H. 25	360 Rounds 180 "	Mk. III 18 lb. Mk. IIIE 17 lb. 6 oz. Mk. I 9½ lb. Mk. IE 8 lb. 15 oz.
.380" BLANK	CARTONS	H. 9 H. 25	540 Rounds 270 "	Mk. III 12½ lb. Mk. IIIE 11 lb. 14 oz. Mk. I 5 lb. Mk. IE 4 lb. 7 oz.
.380" DRILL	BUNDLES	H. 9 H. 25	384 Rounds 192 Rounds	Mk. III 18 lb. Mk. IIIE 17 lb. 6 oz. Mk. I 9 lb. 2 oz. Mk. IE 8 lb. 9 oz.
9 mm. BALL	CARTONS	H. 9 H. 29 Mod; H. 29 Mod;	420 Rounds 2,500 " 2,400 "	Mk. III 15 lb. Mk. IIIE 14 lb. 6 oz. 85 lb. -
.45" THOMPSON (M/C.)	CARTONS	H. 29 Mod: H. 29 Mod: H. 29 Mod:	1,200 Rounds 1,560 " 1,596 "	75 lb. - -
.455" BALL (REV.)	CARTONS	H. 9 H. 13	240 Rounds 2,160 "	Mk. III 15½ lb. Mk. IIIE 14 lb. 14 oz Mk. I 121 lb. Mk. IE 119½ lb.
	BUNDLES	H. 3 H. 9	828 Rounds 276 "	49 lb. Mk. III 18 lb. Mk. IIIE 17 lb. 6 oz.
.455" PROOF	CARTONS	H. 9	240 Rounds	Mk. III 15½ lb. Mk. IIIE 14 lb. 14 oz
.455" BLANK	CARTONS	H. 9	396 Rounds	Mk. III 8½ lb. Mk. IIIE 7 lb. 14 oz.
.455" DRILL	BUNDLES	H. 9	276 Rounds	Mk. III 17½ lb. Mk. IIIE 16 lb. 14 oz
.455" P.S.L.	CARTONS	H. 3 H. 9	700 Rounds 210 "	42 lb. Mk. III 14 lb. Mk. IIIE 13 lb. 6 oz.
	BUNDLES	H. 9	252 Rounds	Mk. III 15 lb. Mk. IIIE 14 lb. 6 oz.
12 BORE L.G. SHOT & NO. 6 SHOT.	CARTONS	H. 13	400 "	Mk. I 55 lb. Mk. IE 52½ lb.
12 BORE BUCKSHOT	BUNDLES	H. 13	416 Rounds	
.32" AUTO PISTOL	CARTONS	H. 9 H. 9	350 Rounds 425 "	Mk. III 9¾ lb. Mk. IIIE 9 lb. 2 oz.
.310"	CARTONS	H. 9	360 Rounds.	Mk. III 13 lb. 2 oz. Mk. IIIE 12½ lb.
.22" RIFLE	CARTONS	H. 11 H. 11 H. 37 H. 37	10,000 Rounds 12,000 " 10,000 " 12,000 "	99 lb. 102 lb.
1" ELECTRIC AIMING RIFLE BALL	BUNDLES	H. 4 H. 13 H. 20 H. 22	96 Rounds 114 " 108 " 80 "	95 lb. Mk. I 107 lb. Mk. IE 105½ lb. 106 lb. 80 lb.
1" ELECTRIC AIMING RIFLE BLANK	BUNDLES	H. 13 H. 20 H. 22	144 Rounds 144 " 84 "	Mk. I 51 lb. Mk. IE 49½ lb. 52 lb. 33½ lb.

LIST OF PACKAGES USED FOR S.A.A.

Designation	Dimensions (Inches)			Weight Empty.	Battens
	L	W	H		
Box A.S.A. H.1, Mk.I	17.0	8.5	10.85	10 lb. 0 oz.	None
Mk.IE	16.375	8.7	11.1	7 lb. 8 oz.	"
Box, A.S.A. H.3, Mk.I	10.875	8.375	6.95	5 lb. 12 oz.	"
Box A.S.A. H.4 Mk.XI	19.062	8.5	7.02	10 lb. 8 oz.	"
Box, A.S.A. H.9, Mk.III	8.9	6.7	4.8	2 lb. 14 oz.	"
Mk.IIIIE	8.65	6.25	4.65	2 lb. 4 oz.	"
Box, A.S.A. H.11, Mk.I	17.95	14.0	7.75	13 lb. 8 oz.	"
Box, A.S.A. H.13, Mk.I	17.0	8.5	10.85	9 lb. 4 oz.	Plain
Mk.IE	16.375	8.75	11.1	7 lb. 8 oz.	"
Box, A.S.A. H.15, Mk.I	16.875	8.8	7.125	8 lb. 0 oz.	None
Box, A.S.A. H.19, Mk.I.	17.25	10.35	8.95	9 lb. 6 oz.	"
Box, A.S.A. H.20, Mk.I	17.25	10.35	8.95	9 lb. 6 oz.	Plain
Box, A.S.A. H.21, Mk.I	18.45	8.875	7.35	8 lb. 12 oz.	None
Box, A.S.A. H.22, Mk.I	18.45	8.875	7.35	9 lb. 0 oz.	Plain
Box, A.S.A. H.24, Mk.II.	21.812	16.625	6.33	18 lb. 8 oz.	None
Box, A.S.A. H.25, Mk.I	6.6	5.75	4.35	1 lb. 13 oz.	"
Mk.IE	6.35	5.25	3.9	1 lb. 4 oz.	"
Box, A.S.A. H.26, Mk.I	19.5	9.5	6.6	11 lb. 8 oz.	'V' Type
Box, A.S.A. H.27, Mk.I	20.35	8.4	8.625	13 lb. 4 oz.	None
Mk.IE	20.25	8.125	8.35	10 lb. 0 oz.	"
Box, A.S.A. H.28, Mk.I	20.35	8.4	8.625	13 lb. 8 oz.	Plain
Mk.IE	20.25	8.125	8.35	10 lb. 4 oz.	"
Box, A.S.A. H.29, Mk.I	16.9	10.75	9.25	12 lb. 8 oz.	'V' Type
Mk.IE	16.55	10.1	8.9	8 lb. 12 oz.	"
Box, A.S.A. H.29, Modified, Mk.I	16.9	10.75	9.25	12 lb. 8 oz.	'V' Type
Box, A.S.A. H.30, Mk.I	16.1	10.7	8.6	10 lb. 12 oz.	'V' Type
Mk.IE	15.7	10.15	8.25	9 lb. 0 oz.	"
Box, A.S.A. H.31, Mk.I	21.15	9.75	10.2	16 lb. 0 oz.	"
Mk.IE	20.5	9.0	9.7	11 lb. 8 oz.	"
Box, A.S.A. H.32, Mk.I	17.85	7.45	10.1	10 lb. 8 oz.	Plain
Mk.IE	17.75	8.35	9.65	8 lb. 12 oz.	"
Box, A.S.A. H.37, Mk.I	15.55	14.8	6.65		"

MARKINGS USED ON S.A.A.

With the exception of 20 millimetre, all Service S.A.A. made in the United Kingdom, Dominions and Colonies have the following marks on the base:-

- | | |
|--|-------------|
| (i) Contractors initials or recognised trade mark. | } Stampings |
| (ii) Last two figures of year of manufacture. | |
| (iii) Calibre and Mark or Mark only. | |
| (iv) Code letter indicating type if other than Ball. | |
| (v) Varnish. | |

(i) The component factory and the Filling Factory are normally linked, the cases being made and basemarked in the component factory, then sent to the linked filling factory for completion, e.g. Spennymoor to Aycliffe. The identification base mark for Spennymoor is S.R. consequently it is generally safe to assume that any rounds so marked were filled at Aycliffe.

For .5-inch Vickers and .303-inch types a code letter is normally stamped inside the case by the case manufacturer and the base mark etc. with the code letters of the filling factory is subsequently added in the loading field.

Sometimes, owing to unbalanced production, it is necessary to divert cases to a non-related filling factory; in such instances the labels on the packages containing the complete rounds are overprinted, for example, if cases made at Blackpole were diverted to Woolwich for filling, the labels affixed to the packages of resultant rounds would be overprinted "B.E. CASES".

A complete list of Factory base marks for component and filling factories follows. In the case of Royal Ordnance Factories an arrow may be inserted between the two code letters.

MARK	FACTORY	
	COMPONENT	FILLING
B.D.	R.O.F. Burghfield	R.O.F. Burghfield.
B.E.	" Blackpole	" Swynnerton.
H.N.	" Hirwaun.	" Hirwaun.
R.G.	" Radway Green.	" Radway Green.
R.L.	" Woolwich.	" Woolwich.
S.R.	" Spennymoor.	" Aycliffe.
C.P.	Crompton Parkinson, Guiseley.	Crompton Parkinson, Doncaster.
C-P.	" " Doncaster.	" " "
G.B.	Greenwood & Batley, Leeds.	Greenwood, & Batley, Abbey Wood.
G.B.F.	" " "	" " Farnham.
I.C.I.	I.C.I. Witton.	I.C.I. Witton (.22" Rim Fire only)
K.	" "	" "
K.2.	" Standish	" Standish.
K.4.	" Yeading.	" Yeading.
K.5.	" Kiddermminster.	" Kiddermminster.
M.F.	S.A.A.F.1. Footscray, Australia.	
M.G.	" 2. " "	
M.H.	" 3. Hendon.	"
M.J.	" 4. " "	"
M.Q.	" 5. Rocklea.	"
M.W.	" 6. Wolshpool.	"
* D.A.Q.	Dominion Arsenal, Quebec, Canada.	
* D.C.	Defence Industries Ltd., Brownsburg, Canada.	
D.I.	" " " Verdun,	"
K.F.	Ammunition Factory, Kirkoc, India.	
O.K.	Ordnance Factory, Khamaria, Jubbulpore, India.	

* A small arrow inside the Q or C may also be found.

A. CASES

Cases stained Black for their full length indicate Rifle Grenade cartridges (grenade dischargers) loaded cordite.

Cases stained Black half length (front) indicate Rifle Grenade cartridges (grenade dischargers) loaded Ballistite.

Cases stained Red full length indicate proof cartridges.

Cases with a half inch blue band painted on indicate practice cartridges.

Cases with open cap chamber and three flutes in the wall, each of which may be painted red, are drill Rounds.

Cases with holes drilled in them and with open cap chamber are drill or dummy rounds according to marking.

Chromium Plated or White Metal Alloy cases with open cap chamber indicate dummy Rounds.

B. BULLET TIP MARKINGS

Black = .303" Observing.
Blue = Incendiaries.
White = Day Tracers.
Orange Yellow = Night Tracers.

In addition to the above markings the following are also used for the purposes shown

(ii) Rounds may be found which bear the year of manufacture in full on the base. This was an indication, now obsolescent, that the ammunition had been made specially for R A.F.

(iii) The Mark only is used with .303" Ammunition.

(iv) The Code letters used for indicating types are as follows:-

B = Incendiary.
D = Drill.
F = Semi Armour Piercing.
G = Tracer.
H = Grenade Discharger.
* L = Blank
O = Observing.
P = Practice.
Q = Proof.
R = Explosive.
U = Dummy.
W = Armour Piercing.

* There are two kinds of .303-inch Blank ammunition without bullets. One kind made up from new cases and bears normal Service marking, the other is made up from "Second Grade" cases, i.e. cases which were originally marked for other types but rejected as unsuitable. Space does not permit of burring out and re-marking, consequently these rounds go into Service with original markings.

Rounds with two or more characteristics would of course carry a combination of code letters e.g. Semi Armour Piercing would be marked F.G.

(v) The varnish, coloured or colourless, at the junction of cap and cap chamber serves a dual purpose, first to seal the junction and secondly, except for 20 m.m., to indicate type of round, as follows:-

Purple = Ball or Practice.
Green = Armour Piercing or Semi Armour Piercing.
Red = Tracer.
Blue = Incendiary.
Yellow = Proof
Black = Observing or Explosive.
Colourless = Blank and Grenade Discharger.

LIST OF MARKINGS USED ON S.A.A. PACKAGES

Small Arm cartridges are packed in numerous ways viz:- Bundles, Chargers and Bandoliers, Chargers and Cases Charger, Cartons, Tin boxes, Fabric Belts, Metal Belts, Metal-cum-Fabric Belts, and Trade Cartons, all of which, except .22" Rim Fire which are already in Trade Cartons and tin boxes, are then packed and sealed into tinned plate linings or boxes, then, including .22" Rim Fire, into Wooden boxes.

Generally, boxes containing cartridges packed in Bundles, Cartons or Tin Boxes are stained yellowish green, those containing Belt packed, bluish green, and those containing Charger, Case charger and Bandolier packed, stained brown.

Boxes containing Belt packed cartridges are further distinguished by a V-shaped batten on each end, and a stencilled outline of a cartridge indicating the lie of the rounds packed.

Boxes containing carton or Bundle packed cartridges have a plain batten at each end.

Boxes containing machine carbine ammunition viz:- 9 mm. and .45 inch are further distinguished by a 1-inch blue band painted centrally round each perimeter and by a diamond shaped batten on each end.

INTERNAL PACKAGES

(a) Bundles. The Bundle wrapper is usually of chemically pure paper on which is printed the quantity, description, make and date of the ammunition contained.

(b) Chargers and Bandoliers. These are packed two chargers each of five rounds into each of the five pockets of the bandolier the latter being stamped with the make and date of the ammunition.

(c) Chargers and Cases Charger. Four chargers of five rounds each are packed into a Case Charger, the latter is sealed and labelled to show quantity, type, make and date of the ammunition.

(d) Cartons. There are various Cartons, each to hold different quantities and types; the cartons are sealed with a strip band on which is printed quantity, type, make and date of the ammunition.

(e) Tin boxes. Two types only are packed in tin boxes viz:- .22" Rim Fire and .303" Rifle Grenade cartridges, the tins are sealed and labelled to show quantity, type, make and date of ammunition.

NOTE. Future production of .22" ammunition is to be cartoned in the usual way, then wrapped and sealed in cellophane and not in tin boxes.

(f) Belts. These are filled by machinery or hand to the required quantity and are not marked in any way.

Each of the packings at (a) to (d) and (f) are then packed into tinned plate linings or tinned plate boxes, sealed and labelled to show quantity, type, method of packing, and make and date of ammunition, also the box number and any necessary restrictive or instructional label.

Tinned plate boxes containing belted ammunition have in addition the outline of a cartridge embossed on the top indicating the lie of the cartridges.

Tinned plate linings containing machine carbine ammunition have a 1 inch blue band painted centrally round each perimeter.

WOODEN BOXES - EXTERNAL MARKINGS

Stencilled on each box, are the Box No., Gross weight, make and date of the ammunition where possible, also the letters "O.D." (oil dressed) where necessary.

In addition to the usual Group Labels, Linen Seals, etc. all Boxes A.S.A. have a large distinguishing label affixed to each side, a small descriptive label on the top. In some cases raised metal letters and/or figures are fixed at each end, in other cases, a small distinguishing label is placed at each end also any restrictive or instructional label necessary.

Each distinguishing label shows the number of rounds, type of ammunition, method of packing, and a distinctive symbol with the code letter and mark of the ammunition overprinted or silhouetted thereon and in some cases the maker and date of the ammunition; the small descriptive label gives the same information but omits the symbol and overprint, the small distinguishing label, where used, carries the symbol and overprint only.

Boxes with a 1-inch Red Band painted round each end indicates Naval Service.

LIST OF CURRENT DISTINCTIVE SYMBOLS.

SYMBOL	INDICATION	CODE LETTER	COLOUR SYMBOL.	PAPER
Grid	.303" Ball.	-	Green	White.
"	" Proof.	Q	Black	Terra Cotta.
"	" Blank.	E	Red.	Blue.
"	" Dummy.	U	Black.	Cerise
"	" Drill.	D	"	"
Circle.	" A.P.	W	Green	White
Pyramid.	" Tracer.	G	"	"
Star.	" Incendiary.	B	Brown	"
Star.	(Mks. IV, IVz and IVz)			
	.303" Incendiary.	B	Green	"
	(all other marks)			
Ace of Spades.	.303" Rifle Grenade.	H	"	"
	(Ballistite)			
Ace of Clubs.	.303" Rifle Grenade.	H	"	"
	(Cordite)			
Hexagon.	.303" Observing.	O	Brown	"
Padlock.	7.92 mm. Ball.	-	Green	White.
"	" " Proof.	Q	Black	Terra Cotta.
"	" " Dummy.	U	"	Cerise.
"	" " Drill.	D	"	"
Helmet.	" " A.P.	W	Green	White.
Bell.	" " Tracer.	G	"	"
Jug.	" " Incendiary.	B	"	"
St. Andrews Cross.	.5" Vickers Ball.	-	Green	White.
"	" " Proof.	Q	Black	Terra Cotta.
"	" " Dummy.	U	"	Cerise.
"	" " Drill.	D	"	"
Shield.	" " A.P.	W	Green	White.
Acorn	" " S.A.P.	F	"	"
Butterfly.	" " S.A.P. Tracer	F.G.	"	"
Fleur de Lys	" " Tracer	G	"	"
Bulls Head	" " Incendiary.	B	"	"
Hand	.50" Browning Ball.	-	Green	White.
"	" " Practice Ball	P	"	"
Crane.	.50" " A.P.	W	"	"
Kettle	" " Tracer	G	"	"
Light Bulb.	" " Incendiary.	B	"	"

SYMBOL	INDICATION	CODE LETTER	SYMBOL	COLOUR PAPER
Gear Wheel	.55" Ball.	-	Green	White
" "	.55" Ball Practice.	P	"	"
" "	" Proof.	Q	Black	Terra Cotta
" "	" Dummy.	U	"	Cerise
" "	" Drill.	D	"	"
Arrow Head.	" A.P.	W	Green	White
Gear Wheel Segment.	" Tracer.	G	"	"
Weight	15 mm. Ball.	-	Green	White
"	" Proof	Q	Black	Terra Cotta
"	" Dummy.	U	"	Cerise
"	" Drill	D	"	"
Tank	" A.P.	W	Green	White
Maple Leaf	" A.P. Tracer.	W.G.	"	"
Flag.	" Tracer.	G.	"	"
Globe	9 mm. Ball.	-	Green	White
"	" Proof.	Q	Black	Terra Cotta
"	" Dummy.	U	"	Cerise.
"	" Drill.	D	"	"
Watering Can.	" Tracer.	G	Green	White.
Ellipse	.380" Ball.	-	Green.	White
"	" Proof.	Q	Black	Terra Cotta
"	" Blank	L	Red	Blue
"	" Drill.	D	Black	Cerise.
Revolver Chamber	.455" Ball.	-	Green	White
" "	" Proof.	Q	Black	Terra Cotta
" "	" Blank.	L	Red	Blue
" "	" Drill.	D	Black	Cerise.
Ace of Hearts.	1" Aiming Rifle Electric.	-	Green	White
" " "	1" " " Blank.	L	Red	Blue.
Ace of Diamonds.	1" " " Percussion.	-	Green	White.
Concentric Circles.	.22" Rim Fire.	-	Green	White.
Skull & X Bones	.310" Horse Killer.	-	Green	White.
Cockerel.	.30" Ball.	-	Green	White.
"	" Drill.	D	Black.	Cerise.
Swan.	" Rifle Grenade.	H	Green	White.
Elephant.	" A.P.	W	"	"
Lion.	" Tracer.	G	"	"
Fish.	" Incendiary.	B	"	"
Yacht.	.45" Ball.	-	Green	White.
Castle.	" Tracer.	G	"	"

LIST OF RAISED METAL LETTERS OR FIGURES.

Raised Metal letters and/or figures are affixed to ends of certain boxes to assist identification in the dark.

Those in use or contemplated and their indication are as follows:-

RAISED METAL LETTERS
AND/OR FIGURES.

AMMUNITION OR
PACKING INDICATED.

CC.
G
W

.303" Ball in Cases Charger.
" Tracer.
" Armour Piercing.

RAISED METAL LETTERS
AND/OR FIGURES.

AMMUNITION OR
PACKING INDICATED.

B.
O.
H.

.303" Incendiary.
" Observing.
" Rifle Grenade.

5
5W
5F
5B

.5" Ball.
" Armour Piercing.
" Semi Armour Piercing.
" Incendiary.

55
55W
55G

.55" Ball
" Armour Piercing.
" Tracer.

7
7 G
7 B
7 W

7.92 mm. Ball.
" " Tracer.
" " Incendiary.
" " Armour Piercing.

15
15 W
15 G
15 W.G.

15 mm. Ball.
" " Armour Piercing.
" " Tracer.
" " A.P. Tracer.

9
9 G

9 mm. Ball.
" " Tracer.

4

.45" Ball.

M

Mixed packing of any type.

X

Unusual method of packing.

Any boxes bearing labels printed black on white and which do not bear a symbol, contain ammunition which was not at the time of packing an approved Service Store.

732. THUNDERFLASH, MK.V.
(Fig. 299)

The Mk.V Thunderflash comprises a paper tube, paper case and delay tube as shown in the Figure. The paper tube forms a handle, the paper case contains a flash composition of Aluminium and Potassium Chlorate in which is a loop of Sulphurless Quickmatch and the delay tube with a delay composition giving a delay of not less than 6 seconds. The outer end of the delay column is primed with sulphurless mealed powder and match composition protected by millboard and paper discs, a paper capsule and a tear off tape, the latter coloured red. The thunderflash is covered by paper and carries a label, H.1254, bearing the following legend:-

THUNDERFLASH MARK V DIRECTIONS HOLD BY THIS END Tear off paper capsule by pulling away the tape. Strike exposed black surface firmly across brassard. <u>THROW AWAY IMMEDIATELY</u> MADE BY:
--

When functioned a report and flash is given. The Thunderflash should be thrown clear of friendly personnel as the explosion is of a dangerous character. Should the thunderflash fail to explode it should not be handled for some time as the delay column if affected by damp, may be smouldering. It may be moved by a long rod operated from a covered position. In training operations, however, great care must be taken to see that unexploded thunderflashes are disposed of and not left to be picked up by civilians, to whom they may cause accidents.

Packing

30 Thunderflashes are packed in a carton with two brassards, and 10 cartons are placed in a trade pattern wood case measuring overall $22\frac{7}{8} \times 19\frac{1}{2} \times 11\frac{1}{2}$ inches and weighing 60 lb.

Storage.

The Thunderflashes are in Group IX Category Y, whilst stowage on ships is A.S.P. Dry storage conditions are essential.

STATEMENT OF AMMUNITION

733. CARTRIDGES, Q.F. 40 M.M.

CARTRIDGE		MAIN COMPONENTS					
Nature and Mark	M. of F. Design	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze
H.E. Shell Mk. IT Foil	CIA(A)347 Sheet 3 H.E. 1.	Mk. I, I st or II	- 10. 7. Cordite Bofors	Perc. No. 18 Mk. I or II	Shell H.E. Mk. I.T.	40 mm. Mk. I.	Perc. DA. No. 250 Mk. I or II.
H.E. Shell Mk. IIT Foil	CIA(A)347 Sheet 4 H.E. 2.	-do-	-do-	-do-	-do-	-do-	-do-
H.E. Shell Mk. IIIT Foil	CIA(A)347 Sheet 5 H.E. 3.	-do-	- 9. 13. WT. 144-048 or WMT. 148-048	-do-	-do-	-do-	-do-
H.E. Shell Mk. IVT Foil	CIA(A)347 Sheet 6 H.E. 4.	-do-	- 9. 0. WT. 120-040 or WMT. 124-040	-do-	Shell H.E. Mk. IIT or IVT.	No. 12 Mk. I or II	Perc. DA. No. 251 Mk. I, II or III.
H.E. Shell Mk. VT Foil	CIA(A)347 Sheet 8 H.E. 5.	-do-	- 10. 15. N.H. 023 or N.H. 025.	-do-	-do-	-do-	-do-
H.E. Shell Mk. VIT Foil	CIA(A)347 Sheet 9 H.E. 6.	Mk. I st or Mk. II with Adapter or Mk. III or IV.	- 9. 13. WT. 144-048 or WMT. 148-048	Perc. No. 12 Mk. I, II or III.	Shell H.E. Mk. IT	40 mm. Mk. I	Perc. DA. No. 250 Mk. I or II.
H.E. Shell Mk. VIIT Foil	CIA(A)347 Sheet 10 H.E. 7	-do-	- 9. 0. WT. 120-040 WMT. 124-040	-do-	Shell H.E. Mk. IIT or IVT.	No. 12 Mk. I or II	Perc. DA. No. 251 Mk. I, II or III
H.E. Shell Mk. VIIIT Foil	CIA(A)347 Sheet 12 H.E. 8.	-do-	- 10. 14. NH. 023 or NH. 025	-do-	-do-	-do-	-do-

Nature and Mark	M. of F. Design	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze
H.E. Shell Mk. IXT Foil	CIA(A)347 Sheet 13 H.E. 9.	Mk. I st or Mk. II with Adapter or Mk. III or IV.	- 10. 2. N.Q./S. 099-037	Perc.No.12 Mk. I, II or III.	Shell H.E. Mk. IIT or IVT.	No.12 Mk. I or II.	Perc.D.A. No.251 Mk. I, II or III.
H.E. Shell Mk. XT Foil	CIA(A)347 Sheet 6 H.E.10.	Mk. I, I st or II.	- 9. 0. WT.120-040 or WMT.124-040	Perc.No.18 Mk. I or II	-do-	No.11 Mk. I, II or III.	-do-
H.E. Shell Mk. XIIT Foil	CIA(A)347 Sheet 8 H.E.11	-do-	- 10.14. NH.023 or NH.025	-do-	-do-	-do-	-do-
H.E. Shell Mk. XIIT Foil	CIA(A)347 Sheet 10 H.E. 12.	-do-	- 9. 0. WT.120-040 or WMT.124-040	-do-	-do-	-do-	-do-
H.E. Shell Mk. XIIIT Foil	CIA(A)347 Sheet 12 H.E. 13.	Mk. I st or II with Adapter or Mk. III or IV.	- 10.14. NH.023 or NH.025	Perc.No.12 Mk. I, II or III.	-do-	-do-	-do-
H.E. Shell Mk. XIIT Foil	CIA(A)347 Sheet 13 H.E. 14	-do-	- 10. 2. N.Q./S. 099-037	-do-	-do-	-do-	-do-
H.E. Shell Mk. XVT Foil	CIA(A)347 Sheet 8 H.E. 15.	Mk. I, I st or II.	- 11.12. FNH/P.022	Perc.No.18 Mk. I or II	-do-	-do-	-do-
H.E. Shell Mk. XVIIIT Foil	CIA(A)347 Sheet 12 H.E. 16.	Mk. I st , or II with Adapter or Mk. III or IV.	-do-	Perc.No.12 Mk. I, II or III.	-do-	-do-	-do-
H.E. Shell Mk. XVIIIT Foil	CIA(A)347 Sheet 8 H.E. 17	Mk. I, I st or II.	-do-	Perc.No.18 Mk. I or II	-do-	No.12, Mk. I or II	-do-
H.E. Shell Mk. XVIIIT, Foil.	CIA(A)347 Sheet 8 H.E. 18	Mk. I st or II with Adapter or Mk. III or IV.	-do-	Perc.No.12 Mk. I, II or III.	-do-	-do-	-do-
S.A.P. Shot Mk. I Foil.	CIA(A)347 Sheet 7 S.A.P. Shot 1.	Mk. I, I st or II.	- 10.12. WT.144-048 or WMT.148-048	Perc.No.18 Mk. I or II	Shot, S.A.P. Mk. I		

Nature and Mark	M. of F. Design.	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Puze
S.A.P. Shot Mk. II Foil	CIA(A)347 Sheet 11 S.A.P. Shot 2.	Mk. I* or II with Adapter or Mk. III or IV.	- 10. 12. WT. 144-048 WMT. 148-048	Perc. No. 12 Mk. I, II or III	Shot S.A.P. Mk. I.		
S.A.P. Shot Mk. III Foil	CIA(A)347 Sheet 14 S.A.P. Shot 3	Mk. I, I* or II.	- 11. 4. WMT. 211-100	Perc. No. 18 Mk. I or II.	Shot S.A.P. Mk. IIIT or IVT.	Stermed Tracer Cavity filling	
S.A.P. Shot Mk. IVT Foil	CIA(A)347 Sheet 14 S.A.P. Shot 4.	Mk. I* or II with Adapter or Mk. III or IV	-do-	Perc. No. 12 Mk. I, II or III	-do-	-do-	
A.P. Shot, Mk. IT Foil	CIA(A)347 Sheet 14 A.P. Shot 1	Mk. I, I* or II	-do-	Perc. No. 18 Mk. I or II.	Shot A.P. Mk. IIIT or IVT.	-do-	
A.P. Shot, Mk. IIIT Foil	CIA(A)347 Sheet 15 A.P. Shot 2	Mk. I* or II with Adapter or Mk. III or IV.	-do-	Perc. No. 12 Mk. I, II or III.	-do-	-do-	
Practice, Mk. IT Foil	CIA(A)347 Sheet 6 Prac. 1.	Mk. I, I* or II	- 9. 0. WT. 120-040 or WMT. 124-040	Perc. No. 18 Mk. I or II	Projectile Practice A.T. Mk. IVT.	No. 11 Mk. I, II or III	
Practice, Mk. IIIT Foil	CIA(A)347 Sheet 8 Prac. 2.	-do-	- 10. 14. N.H. 025	-do-	-do-	-do-	
Practice, Mk. IIIT Foil	CIA(A)347 Sheet 8 Prac. 3	-do-	- 11. 12. FNH/P. 022	-do-	-do-	-do-	
Practice, Mk. IVT Foil.	CIA(A)347 Sheet 10 Prac. 4.	Mk. I* or II with Adapter or Mk. III or IV.	- 9. 0. WT. 120-040 or WMT. 124-040	Perc. No. 12 Mk. I, II or III.	-do-	-do-	
Practice, Mk. VT Foil.	CIA(A)347 Sheet 12 Prac. 5.	-do-	- 10. 14. N.H. 025	-do-	-do-	-do-	
Practice, Mk. VIT Foil	CIA(A)347 Sheet 12 Prac. 6.	-do-	- 11. 12. FNH/P. 022	-do-	-do-	-do-	
Practice, Projectile Mk. IT Foil.	CIA(A)347 Sheet 5 Prac. Proj. 1	Mk. I, I* or II.	- 9. 13. WT. 144-048 WMT. 148-048	Perc. No. 18 Mk. I & II.	Projectile Practice Mk. I	40 mm. Mk. I.	
Practice, Projectile, Mk. IIIT Foil.	CIA(A)347 Sheet 9 Prac. Proj. 2	Mk. I* or II with Adapter or Mk. III or IV.	-do-	Perc. No. 12 Mk. III.	-do-	-do-	

Nature and Mark	M. of F. Design	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze
Practice, Projectile Mk. IIIT Foil	CIA(A)347 Sheet 6 Prac.Proj.3	Mk. I, I ^x or II.	- 9. 0. WT.120-040 WMT.124-040	Perc.No.18 Mk. I or II	Projectile Practice Mk. IIT	No.12 Mk. I or II.	
Practice, Projectile Mk. IVT Foil	CIA(A)347 Sheet 10 Prac.Proj.4	Mk. I ^x or II with Adapter or Mk.III or IV.	-do-	Perc.No.12 Mk. III.	-do-	-do-	
Practice, Projectile Mk. VT Foil.	CIA(A)347 Sheet 6 Prac.Proj.5	Mk. I, I ^x or II.	-do-	Perc.No.18 Mk. I or II	-do-	No.11 Mk. I, II or III.	
Practice, Projectile Mk. VIIT Foil	CIA(A)347 Sheet 10 Prac.Proj.6	Mk. I ^x or II with Adapter or Mk.III or IV.	-do-	Perc.No.12 Mk. III	-do-	-do-	
Practice, Projectile Mk. VIIT Foil	CIA(A)347 Sheet 6 Prac.Proj.7	Mk. I, I ^x or II.	-do-	Perc.No.18 Mk. I or II	Practice Projectile Mk. VIIT	-do-	
Practice, Projectile Mk. VIIIT Foil.	CIA(A)347 Sheet 10 Prac.Proj.8	Mk. I ^x or II with Adapter or Mk.III or IV.	-do-	Perc.No.12 Mk. III	-do-	-do-	

Weights and stowage dimensions Cartridges Q.F. 40 m.m.

Charge	Projectile	Weight Complete Round. lb. oz. dr.	Overall length Inches				Gross weight Packed in box	
							C.219	C.216
			Mk. I	Mk. II	Mk. III	Mk. IV	lb. oz. dr.	lb. oz. dr.
Cordite Bofors W.T.144-048 or W.M.T. 148-048.	Shell H.E.	5 6 3	17.59	17.647		17.647	163 8 0	153 8 0
N.H.023	" "	5 5 9	"	"		"	162 8 0	152 8 0
F.N.H./P.022	" "	5 6 10	"	"		"	164 0 0	154 0 0
N.Q./S.082-032	" "	5 7 8	"	"		"	165 8 0	155 8 0
W.M.T.211-100	" "	5 5 14	"	"		"	163 0 0	153 0 0
W.T.120-040 or W.M.T.124-040	" "	5 7 7	"	"		"	165 8 0	155 8 0
Cordite Bofors W.T.144-048 or W.M.T. 148-048	Shot S.A.P.	5 4 12	"	"		"	161 4 0	151 4 0
N.H.023	" "	5 6 3	17.64		17.58	17.58	163 8 0	153 8 0
F.N.H./P.022	" "	5 5 9	"		"	"	162 8 0	152 8 0
N.Q./S.082-032	" "	5 6 10	"		"	"	164 0 0	154 0 0
W.M.T.211-100	" "	5 7 8	"		"	"	165 8 0	155 8 0
W.T.120-040 or W.M.T.124-040	" "	5 5 14	"		"	"	163 0 0	153 0 0
Cordite Bofors W.T.144-048 or W.M.T. 148-048	Shot A.P.	5 7 7	"		"	"	165 8 0	155 8 0
N.H.023	" "	5 4 12	"		"	"	161 4 0	151 4 0
F.N.H./P.022	" "	5 6 3		17.58		17.58	163 8 0	153 8 0
N.Q./S.082-032	" "	5 5 9		"		"	162 8 0	152 8 0
W.M.T.211-100	" "	5 6 10		"		"	164 0 0	154 0 0
W.T.120-040 or W.M.T.124-040	" "	5 7 8		"		"	165 8 0	155 8 0
	" "	5 5 14		"		"	163 0 0	153 0 0
	" "	5 7 7		"		"	165 8 0	155 8 0
	" "	5 4 12		"		"	161 4 0	151 4 0

Stowage Dimensions:- Box C.219 or C.216 - 20.6 x 17.75 x 10.45 inches.

STATEMENT OF AMMUNITION

734. Q.F. 4.5 INCH GUN.

CARTRIDGE		MAIN COMPONENTS						COMPLETE ROUND	
Nature and Mark.	M. of F. Design.	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze	Length (Inches)	Weight (Approx.)
H.E. Shell Mk. III foil	DD/L/8155 Sheet 5 Sch. H.E. 3C.	Brass Mk. VI.	11. 4. 4. Cordite W. 145 or W. M. 152.	Perc. No. 9 Mk. I, II or III.	H.E. II. C. with Gaine No. 11 Mk. I, II, III or IV.		Time No. 209 Mk. I or II.	44.83	1b. oz. dr. 86. 8. 0.
H.E. Shell Mk. IVC foil	DD/L/8155 Sheet 5 H.E. 4C.	-do-	-do-	-do-	-do-		Fuze Perc. D. A. No. 230 Mk. I, II or III.	48.095	-do-
H.E. Shell Mk. VC foil	DD/L/8155 Sheet 5 Sch. H.E. 5C	-do-	-do-	-do-	-do-		Time No. 207 Mk. I, IV or V.	48.23	-do-
H.E. Shell Mk. VIC foil	DD/L/8155 Sheet 5 Sch. H.E. 6C	-do-	-do-	Perc. No. 11 Mk. I, II or III	-do-		-do-	-do-	-do-
H.E. Shell Mk. VIIC foil	DD/L/8155 Sheet 5 Sch. H.E. 7C	-do-	-do-	-do-	-do-		Time No. 209 Mk. I or II	44.83	-do-
H.E. Shell Mk. VIIIC foil	DD/L/8155 Sheet 9 Sch. H.E. 8C	-do-	13. 6. 2. N.C.T. 065	Perc. No. 9 Mk. I, II or III.	-do-		-do-	-do-	88. 9. 4.
H.E. Shell Mk. IXC foil	DD/L/8155 Sheet 9 Sch. H.E. 9C	-do-	-do-	-do-	-do-		Time No. 207 Mk. I, IV or V.	48.23	-do-
H.E. Shell Mk. XC foil	DD/L/8155 Sheet 9 Sch. H.E. 10C	-do-	-do-	Perc. No. 11 Mk. I, II or III.	-do-		Time No. 209 Mk. I or II.	44.83	-do-

8.4095

-74-

H.E. Shell Mk.XIC foil	DD/L/8155 Sheet 9 Sch.H.E.11C	-do-	-do-	-do-	-do-		Time No.207 Mk.I, IV or V.	48.23	-do-
H.E. Shell Mk.XVC foil	DD/L/8155 Sheet 10 or 11. Sch.H.E.15C	-do-	13. 10. 0. N.S.198-054	Perc.No.9 Mk.I, II or III	-do-		-do-	-do-	88. 13. 12.
H.E. Shell Mk.XVIC foil	DD/L/8155 Sheet 13 Sch.H.E.16C	-do-	-do-	Perc.No.11 Mk.I, II or III.	-do-		-do-	-do-	-do-
H.E. Shell Mk.XXVIIC foil	DD/L/8155 Sheet 14 Sch.H.E.27C.	-do-	13. 9. 0. N.H.055.	Perc.No.9 Mk.I, II or III.	-do-		-do-	-do-	88. 12. 12.
H.E. Shell Mk.XXXIVC foil.	DD/L/8155 Sheet 5 Sch.H.E.34C	-do-	11. 4. 4. Cordite W145 or WM.152.	-do-	-do-		Fuze Time No.208 Mk.I	-do-	86. 8. 0.
H.E. Shell Mk.XXXVC foil.	DD/L/8155 Sheet 5 Sch.H.E.35C	-do-	-do-	Perc.No.11 Mk.I, II or III.	-do-		-do-	-do-	-do-
H.E. Shell Mk.XXXVIC foil.	DD/L/8155 Sheet 10 or 11. Sch.H.E.36C	-do-	13. 10. 0. N.S.198-054	Perc.No.9 Mk.I, II or III.	-do-		-do-	-do-	88. 13. 12.
H.E. Shell Mk.XXXVIIC foil.	DD/L/8155 Sheet 13 Sch.H.E.37C	-do-	-do-	Perc.No.11 Mk.I, II or III	-do-		-do-	-do-	-do-
H.E. Shell Mk.XXXVIIIC foil.	DD/L/8155 Sheet 14. Sch.H.E.38C	-do-	13. 9. 0. N.H.055	Perc.No.9 Mk.I, II or III.	-do-		-do-	-do-	88. 12. 12.

Q.F. 4.5 INCH GUN. - CONTINUED.

CARTRIDGE		MAIN COMPONENTS						COMPLETE ROUND	
Nature and Mark	M. of F. Design.	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze	Length (inches)	Weight (Approx.) lb. oz. dr.
H.E. Shell Plugged Series "A"	DD/L/8155 Sheet 10 and 11. H.E. A.	Brass Mk.VI	13. 10. 0. N.S.198-054	Perc.No.9 Mk.I, II or III.	H.E.II.C.with Gaine No.11 Mk.I, II, III or IV.		Plugged.		88. 13. 12.
H.E. Shell Plugged Series "B"	DD/L/8155 Sheet 9 H.E. B.	-do-	11. 4. 4. W.145 or WM.152.	-do-	-do-		-do-		86. 8. 0.
H.E. Shell Reduced Charge Mk.IC foil.	DD/L/8155 Sheet 6 H.E. R.10.	-do-	5. 10. 0. W.057 or W.M.061.	-do-	-do-		Time No.199 Mk.I,II,IIA, III,IV,V,VI, VII or VIII.	48.416	80. 9. 12.
H.E. Shell Burst short charge Mk.IC foil.	DD/L/8155 Sheet 4 B.S.H.E.10	-do-	1. 6. 0. WT.154-136	-do-	-do-		-do-	-do-	76. 5. 12.
H.E. Shell Burst short charge Mk.IIC foil.	DD/L/8155 Sheet 12 B.S.H.E.20	-do-	1. 8. 12. M.4.X.	-do-	-do-		-do-	-do-	76. 8. 8.
H.E. Shell Burst short charge Mk.IIIC foil.	DD/L/8155 Sheet 17 B.S.H.E.30	-do-	1. 13. 4. N.H.013	-do-	-do-		-do-	-do-	76. 13. 0.
Shrapnel Mk.IC T.foil.	DD/L/8155 Sheet 7 Shrap.10.	-do-	11. 4. 4. W.145 or WM.152.	-do-	Shell Shrapnel Mk.I.C.	Shell No.1 Mk.V.	Time No.209 Mk.I or II	44.83	86. 8. 0.
Shrapnel, Mk.IIC T. foil.	DD/L/8155 Sheet 7 Shrap.20.	-do-	-do-	-do-	-do-	-do-	Time No.199 Mk.I,II,IIA, III,IV,V,VI, VII & VIII.	45.012	-do-

Shrapnel, Mk. IIIIC.T. foil.	DD/L/8155 Sheet 9 Shrap. 3C.	-do-	13. 6. 2. N.C.T. 065	-do-	-do-	-do-	Time No. 209 Mk. I or II.	44.83	88. 9. 4.
Shrapnel, Mk. IVC.T. foil.	DD/L/8155 Sheet 9 Shrap. 4C.	-do-	-do-	-do-	-do-	-do-	Time No. 199 Mk. I, II, IIA, III, IV, V, VI, VII & VIII.	45.012	-do-
Shrapnel, Mk. VC.T. foil	DD/L/8155 Sheet 9 Shrap. 5C.	-do-	-do-	Perc. No. 11 Mk. I, II or III.	-do-	-do-	Time No. 209 Mk. I or II.	44.83	-do-
Shrapnel, Mk. VIC.T. foil.	DD/L/8155 Sheet 9 Shrap. 6C.	-do-	-do-	-do-	-do-	-do-	Time No. 199 Mk. I, II, IIA, III, IV, V, VI, VII & VIII.	45.012	-do-
Shrapnel, Mk. VIIC foil	DD/L/8155 Sheet 5 Shrap. 7C.	-do-	11. 4. 4. W. 145 or W.M. 152	Perc. No. 9 Mk. I, II or III.	Shell Shrapnel Mk. II.C.		-do-	45.03	86. 8. 0.
Shrapnel, Mk. VIIIC foil.	DD/L/8155 Sheet 13 Shrap. 8C.	-do-	13. 10. 0. NS. 198-054	Perc. No. 11 Mk. I, II or III.	-do-		-do-	-do-	88. 13. 12.
Shrapnel, Mk. IXC foil	DD/L/8155 Sheet 13 Shrap. 9C.	-do-	-do-	-do-	-do-		Time No. 209 Mk. I or II.	44.848	-do-
Shrapnel, Mk. XC foil.	DD/L/8155 Sheet 10 and 11 Shrap. 10C	-do-	-do-	Perc. No. 9 Mk. I, II or III.	-do-		Time No. 199 Mk. I, II, IIA, III, IV, V, VI, VII & VIII.	45.03	88. 13. 12.
Shrapnel, Mk. XIC foil	DD/L/8155 Sheet 10 and 11 Shrap. 11C	-do-	-do-	-do-	-do-		Time No. 209 Mk. I or II.	44.848	-do-

Q.F. 4.5 INCH GUN - CONTINUED.

CARTRIDGE		MAIN COMPONENTS						COMPLETE ROUND	
Nature and Mark.	M. of F. Design	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze	Length (Inches)	Weight (approx.)
Shrapnel Mk.XIIC foil	DD/L/8155 Sheet 5 Shrap.120	Brass Mk.VI.	11. 4. 4. W.145 or W.M.152.	Perc.No.9 Mk.I, II or III.	Shell Shrapnel, Mk.II.C.		Time No.209 Mk.I or II.	44.848	1b. oz. dr. 86. 8. 0.
Shrapnel Mk.XIIIC foil	DD/L/8155 Sheet 5 Shrap.130	-do-	-do-	Perc.No.11 Mk.I, II or III.	-do-		Time No.199 Mk.I, II, IIA, III, IV, V, VI, VII & VIII.	45.03	-do-
Shrapnel Mk.XIVC foil	DD/L/8155 Sheet 5 Shrap.140	-do-	-do-	-do-	-do-		Time No.209 Mk.I or II	44.848	-do-
Shell S.A.P. Mk.IVC foil	DD/L/8155 Sheet 5 S.A.P. 4.	-do-	-do-	Perc.No.9 Mk.I, II or III.	Shell, S.A.P. Mk.IVC or VC.		Perc.Base No.501 Mk.I or II.	47.99	-do-
Shell S.A.P. Mk.VIC foil	DD/L/8155 Sheet 5 S.A.P.6.	-do-	-do-	-do-	Shell S.A.P. Mk.III.C.N.T.		-do-	-do-	-do-
Practice Projectile Mk.IIC foil	DD/L/8155 Sheet 6 Prac.Proj. R.2.	-do-	5. 10. 0. W.057 or W.M.061.	-do-	Shell Proof of 2" Fuze Mk.I.C.		Time No.199 Mk.I, II, IIA, III, IV, V, VI, VII & VIII.		
Burst Short Practice Projectile Mk.I.C.foil	DD/L/8155 Sheet 4 or 8. B.S.Prac. Proj.1.	-do-	1. 6. 0. Wt.154-136.	-do-	-do-		-do-		

WEIGHT AND STOWAGE DIMENSIONS CARTRIDGES Q.F. 4.5-IN. GUN.

R.4095

COMPLETE ROUND.					PACKED IN CONTAINER.					
Charge	Projectile	Weight			Overall length	Container No.	Gross Weight			Stowage dimensions.
		lb.	oz.	dr.	Inches		lb.	oz.	dr.	Inches
Full W.145 or W.M.152	Shell, H.E. Fuzed No.199	86.	8.	0.	48.416	C.217	108.	0.	0.	51.5 x 7.5
" " " "	" " " " "	86.	8.	0.	48.416	C.221	114.	8.	0.	50.8 x 7.2
" N.C.T.065.	" " " " 207	88.	9.	4.	48.23	C.217	110.	2.	0.	51.5 x 7.5
" " " "	" " " " "	88.	9.	4.	48.23	C.221	116.	10.	0.	50.8 x 7.2
" N.S.198-054	" " " " 208	88.	13.	12.	48.23	C.217	110.	6.	0.	51.5 x 7.5
" " " "	" " " " "	88.	13.	12.	48.23	C.221	116.	14.	0.	50.8 x 7.2
" N.H.055.	" " " " 209	88.	12.	12.	48.33	C.217	110.	4.	0.	51.5 x 7.5
" " " "	" " " " "	88.	12.	12.	48.33	C.221	116.	12.	0.	50.8 x 7.2
Reduced W.057 or W.M.061	" " " " 230P	80.	9.	12.	48.095	C.217	102.	2.	0.	51.5 x 7.5
" " " "	" " " " "	80.	9.	12.	48.095	C.221	108.	10.	0.	50.8 x 7.2
" N.C.T.033.	" S.A.P.	81.	4.	0.	47.99	C.217	103.	4.	0.	51.5 x 7.5
" " " "	" "	81.	4.	0.	47.99	C.221	109.	12.	0.	50.8 x 7.2
Burst Short W.T.154-136	Shrapnel I.C. 209	76.	5.	12.	44.83	C.217	97.	14.	0.	51.5 x 7.5
" " " "	" "	76.	5.	12.	44.83	C.221	104.	6.	0.	50.8 x 7.2
" " M.4.X.	" 199	76.	8.	8.	45.012	C.217	98.	0.	0.	51.5 x 7.5
" " " "	" "	76.	8.	8.	45.012	C.221	114.	8.	0.	50.8 x 7.2
" " N.H.013	" II.C. 209	76.	13.	0.	44.848	C.217	98.	8.	0.	51.5 x 7.5
" " " "	" " "	76.	13.	0.	44.848	C.221	105.	2.	0.	50.8 x 7.2

735. HAMPER, AMMUNITION Q.F. 40 M.M. C.280 MK. I.

This is a wicker hamper, comprising body, lid and internal fittings, designed for Airborne conveyance of 40 m.m. ammunition. Twenty four cartridges are carried in six containers. The lid is secured by two quick release straps. A canvas cover to provide weather protection is issued with the hamper and secured by two quick release straps. Two Manilla rope handles are fitted to the hamper and pass through slits in the cover.

The dimensions are 24" x 13" x 23" and the loaded weight approximately 138½ lb.

736. CARTRIDGE, Q.F. 17 PDR. - INCREASE OF TINFOIL.

Reference Bulletin No.32, Item 662. The following list shows the Batch and Box numbers of Q.F. 17 pdr. Cartridges containing the increased amount of tinfoil:-

Batch No.	A.P. Shot	From Box No.
E.13A.	"	1724
" E.13C	"	" " " 246
" X.1A.	Prac. Flath'd.	" " " 550
" E.10A.	A.P.C. Shot	" " " 276
" T.38A.	Prac.	" " " 116

and subsequent sub-batches.

737. AMENDMENTS.

Bulletin No.30, Item 589. Page 12, Table of Practice Shot for full charge rounds, column 2, last line:-
Delete "Cast Iron" and substitute "Steel"

Bulletin No.32, Item 646. Delete "245 fuze" and substitute "247 fuze"

Bulletin No.32. Last Item. Renumber "685".

Bulletin No.32, Page 34. Col.1. Shell H.E. Mk.IV Foil. For "Fuze Perc. D.A. No.214 Mk.I,II and III" in Col.7 substitute "Fuze, Perc. D.A. No.244"

Col.1. Delete "Shell H.E. Mk.XI" and details.

ENEMY AMMUNITION

738. GERMAN TUNNEL MINE 35. (Fig. 300).

The mine is designed to function by pressure applied to a contact fuze (T.M.Z 35) in the cover plate or by detonators in the side and base which may be initiated by "booby trap" devices (Z.E.35) or a length of instantaneous detonating fuze connected to another mine.

The body of the mine, containing 11 lb. 6 oz. of T.M.T., is circular with a flat base and a convex head which is fitted with a convex cover plate through the centre of which the fuze protrudes. The sockets and containers for the disturbance initiator devices are situated one in the base and the other in the side. The diameter of the mine is 13 inches and the height, including the fuze is 3.9 inches. The mine and cover plate are painted a dull red and the assembly camouflaged with green and brown paint. A lifting handle is fitted at the side. The weight of the complete mine is approximately 20 lb.

BODY

The body is made in two main parts, the cylindrical charge container with convex head which is stamped from sheet steel and the flat steel base plate. Strips for the attachment of a hoop are spot welded at eight spaced positions around the side of the charge container. The head is shaped at the centre to form a recess for the fuze and the cover plate spring, the base of the recess being closed by the socket for the main detonator container. The socket is fitted with the container at its base and is threaded internally for the closing arrangement. This arrangement consists of a number of washers inserted above the detonator and compressed by a screwed plug with a central flash hole. These washers are not always used. A screwed adjusting plug is inserted to bear on the first plug and is locked to it by a fixing screw. The second plug carries a rubber sealing ring on its upper surface which is compressed by the base of the fuze. The flash hole formed in this upper plug coincides with that in the lower plug and is shaped to form a neck by a reduction in diameter near the top. The socket and container in the side of the body is of a suitable size to take the German type of No.8 detonator and is screwthreaded for the insertion of a pull igniter (Z.E.35). The base plate is shaped to form a step near the circumference. The plate is attached after the mine is filled by turning over the rim of the charge container on to the step formed on the plate. The joint is completed and made watertight by the application of a fusible alloy. The inside of the charge container and of the base plate is coated with black varnish.

BURSTING CHARGE AND EXPLODERS.

The bursting charge consists of 10 lb. 13 oz. of cast T.M.T. filled in four layers with a density of 1.58. The T.M.T. appears to have been cast in the "creamed" condition, i.e. as a semi-fluid mass consisting of a suspension of fine crystals which had solidified from the melt before pouring. This method has the advantage of reducing cavitation and ensuring a good density.

Three unwrapped recessed exploder pellets of pressed T.M.T. crystals are inserted in the process of filling to form surrounds for the three detonator containers. The pellets have a density of 1.45 and are of the following weights :-

Exploder for main detonator	-	$3\frac{3}{4}$ oz.
Exploder for side detonator	-	$2\frac{1}{2}$ oz.
Exploder for base detonator	-	$3\frac{1}{4}$ oz.

COVER PLATE

The cover plate is supported on a spiral spring which is located in the recess in the top of the body. The plate has a central hole, threaded to take the fuze and carries a rubber skirting attached round its tapered periphery by means of a tapered ring secured to the plate by screws. The lower part of the skirting fits over a chamfer formed round the body at the top of the wall and extends down over a part of the cylindrical wall. The skirting is held in this position by a surrounding hoop which is shaped internally to

conform with the cylindrical wall and chamfer of the body and is provided with an internal shoulder at the top to engage the flange of the cover plate. The hoop is secured to the body by screws which are inserted through a hole near the upper end of each of the eight strips attached to the body and screwed into the hoop. The lower edge of the hoop has a semi-circular piece cut away at one point to provide access to the detonator holder in the side of the body.

Another type of cover plate met with consists of two superimposed convex plates connected at the centre by a threaded fuze-hole bush. With this type the rubber skirting is held between the two plates and an outer cover plate is used which fits over the assembled cover plate and overlaps the top of the hoop.

FUZE AND PULL IGNITER.

Details of the fuze, T.Mi.35 and the pull igniter Z.Z.35 are included in this Bulletin. The mine is transported plugged and is fuzed when required. A combined gauge and adjusting tool is supplied for the purpose of obtaining the correct depth of fuze-hole. The depth is adjusted by manipulation of the upper screwed plug in the main detonator socket so that the clearance between the base of the fuze and the upper plug is between .06 and .08 inches.

739. GERMAN TELLER MINE FUZE T.Mi.Z.35.

(Teller Mine Zünder 35)

Figs.301 and 302.

The fuze mechanism consists of a striker, with spring under initial compression, held off an igniferous detonator by a steel shearing pin. Two safety devices are included to relieve the shearing pin of the spring pressure, a safety bolt passing through a hole in the stem of the striker and a safety lug engaging the head of the striker.

The brass body of the fuze is screwthreaded externally below the flange for insertion in the cover plate of the Teller Mine and is recessed from the base to receive the striker with its guide and the spindle of the safety lug.

The recess is designed to permit the guide to move further into the body when the fuze functions. A cylindrical projecting sleeve, screwed into the side of the body, is aligned with a radial channel which intersects the upper part of the striker recess for the insertion of the safety bolt. A stop pin is fitted inside the sleeve at the lower side near the outer end to limit the withdrawal of the safety bolt. A recess formed in the top of the body is connected by a short channel with the interior and accommodates the setting head for the spindle of the safety lug. A stop pin on the top of the body limits the turning movement of the setting head.

The striker assembly consists of the striker, spring, shearing pin and striker guide. A transverse hole is drilled in the cylindrical stem of the striker to receive the safety bolt. A collar formed near the head supports one end of the spring and is stepped to engage the safety lug. A radial recess in the collar coincides with a channel in the guide for insertion of the steel shearing pin. A vertical recess is also formed in the periphery of the collar, this is probably intended for the escape of air as the striker is forced downwards. The striker guide protrudes from the base of the body and is retained in the body recess by a screwed collar, which does not prevent it moving inwards. The collar screws into the body recess and has an internal flange which engages a step formed round the exterior of the guide. The guide is in the form of an inverted cup with an internal diameter to suit the collar formed on the striker. The closed end of the cup engages the upper end of the spring and has a hole at the centre for the striker stem. A hole is formed in the side of the spring case portion of the guide for the escape of air pressure and a slot is provided through which the safety lug protrudes to engage the stop in the striker head. The guide is closed at the base by a screwed detonator plug which carries an igniferous detonator. The detonator includes an anvil and the .3 grain filling consists of mercury fulminate 14.2%, potassium chlorate 37.8%, antimony sulphide 41.7% and glass 6.3%.

The safety lug is formed near the lower end of the spindle which is reduced in diameter and enters a recess formed in the guide. The lug is fan shaped and extends through 130 degrees. The surface of the lug is inclined so that as it is rotated away from the striker (anti-clockwise) the pressure exerted by the spring is gradually transferred to the shearing pin. The spindle has flats formed near the upper end to engage with the setting head and a pintle at the top locates one end of a spiral spring. The setting head has a tool slot in the top and a red spot which is the setting index. A stepped flange formed round the head has a projection which, in conjunction with the stop pin in the top of the body, limits the rotary movement of the setting head. The lower part of the head is cylindrical and fits into the recess in the top of the body. The cylindrical portion is recessed and has two slots, diametrically opposite, which engage the flats on the spindle. A spiral spring contained in the recess permits the spindle to move further into the setting head when it is forced in with the striker guide during the functioning of the fuze.

The top plate is secured to the body of the fuze by three screws and is marked to indicate the armed and safe setting positions for the setting head. The armed setting position is indicated by a red rectangular patch and the word "Scharf". The safe setting position is indicated by a white rectangular patch and the word "Sicher". Rotation of the setting head, counter clockwise, so that the red index spot is moved from "Sicher" to "Scharf" causes the safety lug to disengage from the step in the collar on the striker. Two recesses in the edge of the top plate correspond with similar recesses in the fuze body to form key slots.

The safety bolt consists of a slotted cylindrical body with a hook attachment which is contained in the sleeve projecting from the side of the fuze body and a stem which passes through a hole in the striker. The cylindrical body portion has a vertical slot extending from its outer end along the greater part of its length to receive the claw which engages a pin inserted transversely in the slot. The claw is a flat key with a hook at its inner end to engage the pin in the slot and has about 5 feet of flexible wire attached at its outer end. The outward movement of the safety bolt is limited by the end of the slot coming into contact with the stop pin near the outer end of the sleeve.

ACTION

After the mine has been laid the setting head is turned so that the red spot on the setting head is aligned with the red rectangular patch marked "Scharf", thus disengaging the safety lug from the striker, and the safety bolt is withdrawn from the striker by pulling the claw wire. When the bolt has been withdrawn to the extent permitted by the stop pin in the sleeve the claw becomes detached from the bolt and the striker is then supported only by the shearing pin. When pressure is applied to the fuze, or the cover plate of the mine, the spring supporting the cover plate is compressed and the fuze is forced downwards. The striker guide, supported by the mine beneath, enters further into the fuze body. The movement of the striker guide, relative to the striker, breaks the shearing pin and the striker is driven down by its springs and fires the igniferous detonator. The flash produced passes through the channel in the closing discs of the detonator socket of the mine and initiates the main detonator which with the amplifying effect of the exploder pellet detonates the bursting charge.

The load required to actuate the fuze in the mine has been found by experiment to be approximately 350 lb. Five fuzes were used in the trial and the required loads were found to vary between 342 lb. and 357 lb. With the fuze removed from the mine, so that the resistance of the spring under the cover plate is excluded and only the shearing pin has to be severed, the load required is approximately 231 lb. The loads required with ten fuzes at a trial varied between 225 lb. and 239 lb.

740. GERMAN PULL IGNITER Z.Z. 35.
(Zugzünder 35)
(Fig. 303)

The brass igniter, fitted with a detonator of the No. 8 type, is used with a pull wire in the side and base of the Teller Mine and in conjunction with trip wires to function the shrapnel mine. Booby traps operated by pull wires may also be fitted with this igniter. The mechanism consists of a striker, with spring under initial compression, held off an igniferous detonator by supporting pins which are held in position by a guide until the pull is applied.

The body of the igniter is a cylindrical casing fitted with a projecting sleeve at the outer end and screwthreaded internally at the inner end for the insertion of the guide. The sleeve is perforated to receive the safety pin which passes through a hole in the release cylinder. The outer end of the retaining spring bears against a flange on the inner end of the sleeve.

The release cylinder extends through the body and the guide and protrudes from the outer end of the body where an eyelet is formed for the attachment of the pull wire and a hole for the safety pin. A collar is formed round the cylinder to support the inner end of the spiral retaining spring. The cylinder is recessed from its inner end through the greater part of its length to accommodate the striker and striker spring. Holes are formed in the cylinder wall, where it fits in the guide, to receive the pins supporting the striker.

The striker is contained inside the inner end of the release cylinder and consists of a cylindrical body with pointed head. A recess is formed in its outer end to seat one end of the striker spring and a groove round the body to engage the supporting pins. The outer side of the groove is inclined outwards to facilitate the ejection of the pins in functioning.

The striker spring is assembled under compression in the release cylinder between the striker and the closed end of the cylinder recess.

The safety pin is fitted with a finger ring and is inserted through the sleeve and release cylinder where it is retained by a nut screwed on at the end and a spring clip which clips round the sleeve.

The guide is screwed into the inner end of the body and is also threaded to receive the screwed ring for the attachment of the detonator holder. The channel through the guide is a close fit round the inner end of the release cylinder so that the pins supporting the striker are held in engagement with the groove in the striker.

The screwed ring is screwed on the inner end of the guide for the attachment of the detonator holder and acts as a distance piece between the striker head and the percussion detonator.

The detonator holder carries a percussion detonator and is bored to receive a detonator of the No. 8 type. The exterior of the holder is screwthreaded for insertion in the store with which the igniter is used.

ACTION

With the safety pin removed the striker is held, against the pressure of its spring, only by the support pins. When the pull wire is pulled the retaining spring is compressed and the cylinder is drawn outwards. After moving about .2 inches the holes containing the support pins in the cylinder wall emerge from the guide and the pins are ejected by the inclined side of the striker groove under the pressure of the striker spring. The striker is then driven on to the percussion detonator by its spring and the flash passes into the detonator inserted in the open end of the holder.

741. GERMAN FUZE A.Z. 38.
(Fig. 304)

The fuze is of the direct action type and is used in conjunction with a gain in hollow charge shell. The portion of the fuze protruding from the impact cap of the shell is dome shaped with a flat circular disc of aluminium at the top. The marking "A.Z.38" is stamped in the side of the fuze above the flange.

The body of the fuze is screwthreaded externally to .69 inch gauge with a pitch of approximately 1 mm. for insertion in the shell. A recess formed in the underside is screwthreaded to receive the magazine which contains a 6.2 grain filling of P.E.T.N. under a 5.9 grain detonator of lead azide/calcium silicide 65/35). The upper part of the body is recessed to accommodate six pivoted centrifugal segments and threaded internally to receive the aluminium head of the fuze. A central channel is formed between the upper and lower recesses for the needle.

The steel needle is carried in an aluminium pellet supported by the centrifugal segments which are retained in the supporting position by an expanding spring ring.

The aluminium head of the fuze is recessed in the underside to accommodate the needle pellet and recessed at the nose to take the hammer which passes through a hole in the diaphragm between the recesses. The hammer is of wood and rests on the head of the needle pellet. The recess containing the hammer is closed at the nose against air pressure by an aluminium disc sealed with a fillet of synthetic resin.

ACTION

During flight the coil of the expanding spring ring is enlarged and the segments rotated clear of the needle pellet by centrifugal force. The needle is then held off the detonator by the creep action resulting from deceleration. On impact the hammer and needle are driven in and the detonator is pierced. The impulse set up by the detonation is communicated through the aluminium tube in the shell to the gain in the base of the shell cavity. The construction of the detonator in the gain is such that it could be initiated either by a flash or a pressure pulse.

742. GERMAN MECHANICAL TIME FUZE S/30
(Zt.Z.S/30)
(Figs. 305, 306)

The fuze has a time of running of 30 seconds and is similar in design to the British No.207 fuze. The base piece is not graduated for setting and the dome, with its hand race, is inserted into the cap where it is held, to turn with the cap, by four lugs on its base flange which engage in steps formed in the base of the cap. The tensioning of the cap is approximately 400 inch/oz.

The mechanism is assembled in a cylindrical unit of superimposed brass plates and consists of:-

The centre arbor in the form of a tubular shaft with a pinion at its base end. The upper end of the shaft is open and has two slots formed in the wall which engage the hand centre. An external projection is formed near the base of the shaft to engage one end of the main spring.

The main spring coiled under tension in a brass barrel or casing. One end of the spring engages the centre arbor whilst the other engages the casing. The cylindrical casing fits around the lower end of the centre arbor and has ratchet teeth formed around its periphery. These teeth are engaged by a ratchet and provide the means of revolving the case to wind the spring during the assembly of the fuze.

An escapement engaging the base pinion of the central arbor comprising two spurs with pinions and a spur with the escapement wheel. The ratchet teeth of the escapement wheel are engaged by two vertical arms on the pallet which is weighted at each end and controlled by a straight adjustable hair spring.

The hand assembly carried at the upper end of the centre arbor consists of the hand centre, the hand and the hand spring. The hand centre consists of a short hollow cylinder, open at the base, fitted with two rectangular brass arms carrying a ring near the head. The hand is of aluminium and is fixed to the ring of the hand centre. The outer end of the hand is recessed at one side to engage the spring catch on the trigger. The spiral hand spring is inserted in the open base end of hollow cylinder in the hand centre and is compressed when the hand assembly is inserted in the centre arbor and depressed to engage the rectangular arms in the slots of the arbor. The hand is retained in this position by the hand race on the dome inset and is thus prevented from rising until it has been rotated into alignment with the cut away portion of the hand race.

The brass trigger, holding the outer end of the hand, consists of a brass arm pivoted at one end and stepped at the other to engage the hand. The step is slightly undercut. A small hole in the outer side of the trigger contains a minute spring loaded plunger. The plunger is pressed into the hole by contact with the side of the slot in the top plate in which the trigger is located. A safety bridge, fitted across the slot has a projection which overlaps the hand and thus prevents the hand rising until it has been rotated clear of the projection. This movement takes approximately one second of time.

The striker, located near the circumference of the cylindrical mechanism unit, is a steel spindle with a cam collar near the lower end and a pyramid shaped point at the base. Two flats are formed at the upper end of the spindle to engage with corresponding surfaces in the safety lever. The striker is held off the detonator by its cam collar resting on a conical headed steel pillar and on a step in the centrifugal safety catch. The spiral striker spring fits over the spindle and is compressed between the cam collar and the sleeve portion of the safety lever.

The safety lever is of steel and consists of a sleeve, shaped internally to fit the flat surfaces on the spindle of the striker, and carrying an arm with an upturned end. The arm bears against the underside of the top plate and the upturned end is held adjacent to the centre arbor by the ring of the hand centre. A curved slot is cut in the top plate to permit a swinging movement of the arm.

The centrifugal safety catch pivoted in the lower plate is of brass and has a step formed in one side to support the cam collar on the striker. The pivot pin is slotted to engage a coil spring which keeps the catch in the safe position. The swinging movement of the catch is limited by a steel pin fixed in the catch near the free end and a curved slot, through which the pin moves, in the lower plate.

Two tapered steel locking plungers are carried in vertical slots formed down the side of the cylindrical mechanism unit. The slots are diametrically opposed and each has a hemispherical recess in one side to receive a corresponding projection on the side of the tapered plunger. The plungers are comparatively weighty and consists of steel strips tapering towards the base on the inner side. On the outer side of each, approximately at the centre, a projecting vertical knife edge is formed. The plungers project below the base of the mechanism unit into recesses formed in the platform of the fuze body. The recesses are sufficiently deep to permit the plungers to set back during acceleration.

ACTION

The time of running is governed by the size of the arc extending counter-clockwise between the position of the hand when held by the trigger and the position of the cut away portion of the hand race. The fuze is set by turning the cap with the aid of a setting device. The dome inset, with the hand race formed in its upper part, is rotated with the cap to the set position. The turning of the cap is retarded by the waved wire tension spring between the screwed collar and the flange at the base of the cap.

On acceleration the two tapered plungers set back into the recesses in the platform. As their wider portions with the projecting knife edge move back through the slots, the knife edges cut into the wall of the dome and thus prevent rotation of the dome relative to the mechanism. At the same time the trigger, hinging on its pivot, sets back and releases the hand. The spring loader plunger in the side of the trigger then emerges and prevents rebound of the trigger. The release of the hand enables the main spring to rotate the centre arbor, under the control of the escapement. The rotating hand, moving clear of the safety bridge, is pressed up against the hand race by the spiral spring in the hand centre.

During flight, the safety catch is swung clear of the striker which is then supported only by the pillar. When the hand reaches the part of the hand race which is cut away, it is forced upwards and the ring on the hand centre moves clear of the upturned end of the safety lever. The end of the safety lever is then swung outwards by centrifugal force. The striker is turned by the lever so that the cam collar loses the support of the pillar. The spring, bearing on the cam collar, then drives the striker away from the safety lever on to the detonator.

743. GERMAN MECHANICAL TIME FUZE S/30 Fg¹.
(Zt.Z.S/30 Fg¹)
(Figs. 307 and 308)

The fuze is used in 8.8 cm. H.E. shell and resembles the Zt.Z.S/30 in external appearance but differs in the mechanism in which the motive power is derived from centrifugal force instead of from a clock spring. The type is identified by the stamping "Zt.Z.S/30 Fg¹" around the side of the body above the flange. The fuze is igniferous and has a maximum time of running of 30 seconds. The mechanism governing the setting is designed to prevent the fuze functioning at settings shorter than approximately 1 second.

The fuze consists of the base piece or body, the cap, the screwed collar and the mechanism.

The base piece is screwthreaded externally below the flange for insertion in the shell and has a large cylindrical recess in which the mechanism is located. The recess is screwthreaded internally for the assembly of the screwed collar retaining the cap and has a flash hole and a number of holes for the retaining bolts of the mechanism in the base.

The cap is cone shaped with a rounded head and is screwed to a base ring with which it forms a groove to receive an internal rib on the screwed collar and the waved tensioning wire. The base ring carries the setting pin and the hammer spring and is secured by a fixing screw. The steel pin is let into the base and engages an upturned forked strip on the setting disc of the mechanism. The hammer spring is secured to the shoulder in the cap base by two screws at one end and extends diametrically across the interior of the cap. The unsupported end is forked to fit round the setting pin and is fitted with three brass hammer pieces on the underside. The two larger of these pieces are fitted one on each projection of the fork, i.e. each side of the setting pin, and the third smaller piece is nearer the centre of the spring. These positions coincide respectively with the projections on the fork end of the strip on the setting disc and a locking pin carried in the setting disc.

The screwed collar fitting over the lower portion of the cap is attached to the cap but is free to turn for insertion in the base piece.

The mechanism is assembled in a cylindrical unit of superimposed plates of brass and aluminium and consists of:-

A central shaft with a spur near the lower end and a pinion at the base. The upper part of the shaft is reduced in diameter to receive the bush carrying the setting and safety discs and is screwthreaded to receive the tensioning and locking nuts. The sloping shoulder formed by the reduction of the diameter is serrated to engage with similar serrations on the bush so that the bush is locked to the shaft. The pinion at the base of the shaft is fitted with a stop pin which limits its rotation.

Two weighted centrifugal toothed segments pivoted near the circumference of a circular plate and each enmeshed with a spur. The spurs carry pinions at their base ends which are enmeshed with the spur on the central shaft. The plate carrying the centrifugal segments is cut away to provide clearance for the movement of the segments and the recesses thus formed are fitted with a spring strip which imparts the initial movement to the segment.

An escapement engaging the base pinion of the central shaft comprising three spurs with pinions and a spur with the escapement wheel. The wheel is engaged by two vertical arms on the pallet which is weighted at each end and controlled by a straight adjustable hair spring. The pallet is locked at one end by a centrifugal safety lever which is fitted with a weighting pin and held by a retaining spring. A step formed on the pivoted end of the lever is engaged by the end of the spring strip when the lever has swung to the armed position.

A disc assembly fitted at the upper end of the central shaft consists of a bush carrying two discs and a tensioning arrangement. The bush is in the form of a sleeve with a hemispherical flange at the base. The sleeve portion fits over the head of the central shaft and is serrated at the lower end to engage a corresponding shoulder on the shaft. The lower of the two discs, the safety disc, is keyed to the flange of the bush and so must always turn with the central shaft. The disc is smaller in diameter than the upper disc but has a projecting leaf formed at one part of its circumference to close a slot in the upper disc and so prevent the operation of the firing mechanism. The upper disc is the setting disc and is held on the sleeve of the bush under the tension of a saucer shaped spring compressed and locked by two nuts on the central shaft. Before firing, the setting disc can be rotated relative to the bush and safety disc but after firing the discs are locked together when the locking pin carried in the setting disc is driven into the safety disc by the hammer spring. The setting disc has an upturned forked strip which engages the setting pin in the cap and, diametrically opposite, a curved slot which when aligned with a projection on the firing arm releases the firing mechanism.

The firing arm, operated by centrifugal force, consists of a shaft with a flat formed by a recess near its lower end and with a crosshead at its upper end. The crosshead has a weight attached to the underside at the end of one arm and a vertical strip projecting upwards from the end of the other arm. The strip bears against the edge of the setting disc and the lower end of the shaft obstructs the rotation of the retaining bolt.

The retaining bolt securing the retaining catch in contact with the detonator pellet is a centrifugal device held in the safe position by the shaft of the firing arm. The bolt consists of a short shaft with a radial arm attached at the head and a flat formed near the base. The radial arm engages the firing arm and provides the weight for centrifugal action whilst the flat engages the end of the flat side on the retaining catch.

The retaining catch in the form of a hook is pivoted at one end and hooked to engage the detonator pellet at the other.

The detonator pellet contained in a transverse rectangular slot in the base of the mechanism unit is of brass and is rectangular in shape. A notch is cut in the two vertical sides and the detonator is contained in a recess at the inner end. A flash channel from this recess emerges at the underside of the pellet. A curved spring strip between the outer end of the pellet and one end of the pellet slot is held under compression by the retaining catch engaging in one of the side recesses of the pellet. The needle is fixed in the opposite end of the slot. The detonator pellet is also held by a centrifugal safety catch.

The safety catch, located in a channel cut in the side of the pellet slot, consists of a flat brass plate shaped at its inner end to engage the front end and one side of the detonator pellet. The catch is retained in the safe position by a spring loaded plunger with a rounded base which enters a recess in its surface.

ACTION

The time of running is governed by the size of the arc extending clockwise between the curved slot in the setting disc and the position of the vertical projection on the crosshead of the firing arm.

The fuze is met by turning the cap with the aid of a setting device. The rotation of the cap is transmitted to the setting disc by the setting pin engaging in the forked strip of the setting disc whilst the safety disc is held keyed to the stationary bush on the central shaft. The curved slot in the setting disc is thus rotated clear of the projecting leaf on the safety disc. The width of the leaf and its position relative to the vertical projection on the firing arm are so arranged that the leaf still closes the slot at settings up to approximately 1 second and so prevents the fuze functioning dangerously near the gun.

On acceleration the hammer spring sets back flattening permanently the forked strip on the setting disc and thus disengaging it from the setting pin. At the same time the hammer spring strikes the small locking pin and drives it into an unsupported part of the safety disc. The setting disc is then locked to the safety disc. When the safety lever has been thrown clear of the pallet by centrifugal force it is retained in this position by its spring engaging a step at its outer end. The toothed segments, operated initially by the springs fitted in the plate and subsequently by centrifugal force, then revolve the central shaft by means of the spur, and pinions. The disc assembly rotates with the shaft, the rate of rotation being controlled by the escapement. Whilst this movement is in progress the weighted end of the crosshead on the firing arm is tending to swing outwards but is prevented from so doing by the upturned end bearing against the edge of the rotating disc. Also, the spring loaded plunger of the safety catch is eased from the catch by deceleration and the catch is thrown clear of the detonator pellet by centrifugal force.

When the slot in the setting disc reaches alignment with the upturned end of the crosshead the firing arm is revolved to the extent permitted by the slot and the recess cut in its lower part is turned to provide clearance for the arm of the retaining bolt. The arm then moves outwards and the flat surface on its shaft is rotated through a right angle so that it clears the side and the curved end of the retaining catch. The catch is then thrown clear of the detonator pellet which is driven on the needle by its spring.

744. GERMAN GAINC, MODEL 40.
(Zündladung 40)
Fig. 309

The gainc is used in conjunction with the fuze A.Z. 38 in hollow charge shell and is situated in the base of the shell cavity.

The metal body of the gainc is cylindrical with a flange at the base and a rounded top on which a short tubular neck is formed. The neck fits into the lower end of the central tube in the shell and has a broken irregular top. Two rows of holes, 4 in a row, are formed around the body and an internal screwthread is formed at the base to receive the screwed closing plug. A circular paper label on the base of the gainc is marked "Zdlg.40".

The interior of the rounded head, above the filling, is occupied by a suitably shaped washer of moulded bakelite. The filling consists of 78.5 grains of P.E.T.N./Vax 87/13 coloured pink. A cardboard disc is inserted beneath the filling and the top is covered by a transparent disc of viscose paper.

The detonator is fitted in a cavity formed in the top of the filling and consists of a flanged cylindrical shell containing 4.3 grains of lead azide topped with a thin layer of unpressed lead styphnate. The weight of the lead styphnate is .2 grains. A disc of silk fabric of open weave is inserted above the lead styphnate and the mouth of the detonator is closed by a flanged aluminium cup. The cup has a central hole in the base.

ACTION

The detonation of the gainc is brought about by the initiation of its detonator when the fuze functions. The thin layer of unpressed lead styphnate is intended to pick up from flash, but this may be a precaution only and does not exclude the possibility of the gainc detonator being initiated by pressure through the central tube in the shell when the fuze detonates.

745. GERMAN 7.5 CM. L.G.40 Q.F. CARTRIDGE
(7.5 cm L.G.40 Hulsenkart)

The cartridge is used in the 7.5 cm. Leichtes Geschütz 40 (a recoilless gun used in airborne units) and is of the separate loading Q.F. type. The diameter of the short brass case is large in comparison with the calibre of the gun and a distinctive feature is the black plastic disc at the base. The designation of the equipment is given on a label affixed to the cardboard cup which closes the mouth of the case.

CASE

The brass case is 6.1 inches in length and tapers from 4.8 inches in front of the flange to 4.5 inches at the mouth. The base of the case is designed to be destroyed on firing to allow some of the propellant gases to escape to the rear through a jet fitted to the breech block. A large circular hole formed in the base of the case is closed by a disc of black plastic. The disc is 3.4 inches in diameter and has a .65 inch primer hole at its centre.

PRIMER

The primer is the C/113 and is a percussion type. Further details are not yet available.

PROPELLANT CHARGE

The propellant charge is contained in a silk cylindrical bag which is choked at the neck and has an igniter pocket at the base. The bag bears the following markings in red :-

7.5 CM. L.G. 40
1.214 Kg
Digt Str. P-9,2-(125 x 5 x 0,5)
Dbg. Nr. 5747
9.42

The igniter pocket is pale mauve in colour and is sewn to form nine compartments each of which contain a granular igniter composition.

The charge weighs 2 lb. 10 oz. 13 dr. and consists of a double base propellant (diethylene glycodinitrate and nitrocellulose) in the form of strips arranged vertically around a central tubular length. The strips are 4.92 inches long, .197 inches wide and .02 inches thick. The tubular propellant is closed at the ends by a disc of propellant and is of .55" diameter. The cup carries a label giving the same particulars as those marked on the bag.

746. GERMAN 7.5 CM. L.G.40:- HOLLOW CHARGE, STREAMLINED, SHELL
(7.5 cm Granato 38 FES Hl/B)
(Fig.310)

The shell is fired from the 7.5 cm. L.G.40, a separate loading, Q.F., recoilless gun used in airborne units. The streamlined shell is fitted with an ogival impact cap which forms the head and carries the small direct action nose fuze A.Z.38. The single driving band is of iron and a cannellure is formed behind it just above the streamlined portion of the base. The cap and shell are painted the normal dark olive green and has the following distinguishing markings:-

"Hl/B" in black near the nose, indicating hollow charge.

"91" in black near the centre of the body, indicating the nature of bursting charge.

"FES" in white above the driving band and on the base. This probably relates to the iron driving band.

The designation of the projectile and fuze are stencilled in black on the base of the shell.

The overall length of the fuze shell is 12.2 inches and the weight, filled and fuze, is 10 lb.

SHELL

The body of the shell is comparatively thin walled with the cavity for the bursting charge tapered towards the base. An internal screwthread is formed at the front end for the assembly of the impact cap. The impact cap is more pointed than the dome-like cap of the shell for the 7.5 cm. tank gun and has a thicker wall. A fuze hole is formed at the nose and two flats, for the assembling tool, are formed near the base of the cap. On the inside of the cap a circumferential shoulder is formed to engage the adjusting washers which are inserted above a steel washer covering the mouth of the cavity liner. The cone shaped cavity liner is of steel with an aluminium tube fitted in a hole at the base. The tube extends from the liner to the gaine in the base of the shell cavity.

BURSTING CHARGE

The bursting charge weighs 1 lb. 2 oz. 6 dr. and consists of three blocks of cyclonite/wax 55/5. The upper block has the "hollow" cavity formed in its head and all three have a central channel in which the aluminium tube and the gaine are located. The charge is contained in a paper carton which is secured to the wall of the shell cavity by a bituminous composition.

FUZE AND GAIN

A description of the A.Z.38 fuze is included in this Bulletin. Details of the gaine, which differs from the Zldg.40 used in other types of hollow charge shell, are not yet available.

PERFORATION OF ARMOUR PLATE

The shell will perforate 50 mm. homogeneous armour at 30 degrees to the normal.

747 GERMAN 15 CM. s.F.H.18 Q.F. HOWITZER CARTRIDGE

The cartridge is of the separate loading Q.F. type consisting of a brass case containing a charge of double base propellant in 6 sections. The case is fitted with a C/12 percussion primer and is closed at the mouth by a cardboard cup. A special charge, consisting of sections 7 and 8, is packed in a cylindrical metal container. These sections are inserted in the cartridge case, in place of the normal contents, when required.

CASE

The brass case is 10.2 inches in length and has stamped in the base the model number of the case, "6350", and the model number of the equipment "s.F.H.18".

PROPELLANT CHARGE.

The charge, comprising sections No.1 to No.6 inclusive, consists of 2 lb. 13 oz. 15 dr. of double base flake propellant (diethylene-glycoldinitrate and nitrocellulose) and a 1 lb. 3 oz. 6 dr. igniter also of double base propellant flake (nitroglycerine and nitrocellulose). These weights are based on a normal charge temperature of 25 degrees centigrade.

Each of the sections is enclosed in a flat bag of artificial silk. The bags for sections No.1 and No.2 are semi-circular, No.1 being stitched to the top of circular igniter bag and No.2 being placed beside it to form a circle. The remaining bags are circular, the diameter being approximately 6.5 inches

The bags are stencilled in black to indicate the model number of the equipment, the charge numeral, the weight, nature and size of the propellant and the dates of manufacture and filling. Sections No.1, 5 and 6 are also stencilled "Eisdraht im Beutel" to indicate the inclusion of lead wire in the bag as a decoppering agent. The standard normal for the charge temperature is stencilled in red, (P.T. + 25°C.).

The weights, natures and sizes of the flake propellants, as marked on the bags, are as follows :-

Section	Nature of Propellant	Size of Flake		Weight of Section		
		Metric	Inches	Grams	lb.	oz. dr.
Igniter	Ngl.Bl.P.12,5	40 x 40 x 0.2	.16 x .16 x .008	550	1	3 6
1	Digl.Bl.P.10,5	4 x 4 x 1,2	.16 x .16 x .05	62	-	2 3
2	-do-	-do-	-do-	122	-	4 5
3	-do-	-do-	-do-	124	-	4 6
4	-do-	-do-	-do-	208	-	7 5
5	-do-	-do-	-do-	312	-	11 0
6	-do-	-do-	-do-	475	1	0 12

SPECIAL CHARGE (SONDERKART 7u8)

The special or supercharge comprises sections No.7 and 8 and is packed in a cylindrical metal container. The lid of the container is stencilled "D Sondkart. 7 u 8 s F H.18 o.B.D.". The letters "o.B.D." indicate the absence of the lead wire decoppering agent. An instructional label on the container is worded to the effect that before inserting sections 7 and 8 in the cartridge case, the sections in the case, including the igniter, should be removed.

Section No.7 is contained in a cylindrical bag of artificial silk about 8.5 inches long and 6 inches in diameter with an igniter formed in the base and choked at the neck. The bag is marked with the charge numeral "7D" in black. The numeral is enclosed by a red circle. The following details are stencilled on the side of the bag in black:-

- s.F.H.18 - Model of equipment.
- 2.387 Kg - Weight of propellant charge.
- Digl. Rg. P.10,5 (1.9 x 15/4) - Nature, shape and size of propellant.

The place and date of manufacture of the propellant and the filling of the section are also given. The marking "P.T. + 25°C." is in red.

The igniter at the base of the bag is marked "440 g Digl. Bl.P.-10,5 (3.3.0,8).

The propellant charge, as indicated by the marking, consists of 5 lb. 4 oz. 3 dr. of double base propellant (diethylene-glycoldinitrate and nitrocellulose) in the form of perforated discs. The dimensions of the disc being:- thickness .075, diameter .6, diameter of hole .16 inches.

The propellant filling used in the igniter, as indicated by the markings, consists of 15 oz. 8 dr. of double base propellant (diethylene-glycoldinitrate and nitrocellulose) in the form of square flake. The dimensions of the flake are .118 x .118 x .032 inches.

Section No.8 is contained in a flat circular bag of artificial silk about 7 inches in diameter. The bag is marked with the charge numeral "8D" in black with a red circle around the numeral. The remaining markings are the same as those on the side of Section 7 except that the weight is given as "768g" i.e. 1 lb. 11 oz. 1 dr.

7u8. GERMAN 15 CM. s.F.H.18:- ANTI-CONCRETE STREAMLINED SHELL, MODEL 19. (Granate 19 Be) (Fig.311)

The shell is fired from the 15 cm. s.F.H.18, a separate loading Q.F. medium field howitzer, and is fitted with a ballistic cap, two bi-metal driving bands and base fuze. The abbreviated designation of the shell, "Gr.19 Be", is included in the stamping in the base of the fuze. The shell and ballistic cap are painted the normal dark olive green and stencilled in black. The overall length of the capped shell is 23.5 inches and the weight, filled and fuzed, is approximately 95 lb. 5 oz.

SHELL

The shell is of the pointed type and is fitted with a base adapter. The head of the shell is coned near the nose and has a flat tip. The cavity for the bursting charge is larger than that in a piercing shell and has a wooden block occupying the reduced forward end. The light ballistic cap, welded to the shell, is shaped to correspond with the contour of the shell and has a rounded head. A steel exploder container is screwed into the base adapter from the underside. The weight of the empty shell is 83.5 lb.

BURSTING CHARGE

The bursting charge, weighing 7 lb. 2 oz. is contained in a cardboard carton and is of the block type comprising 4 pressed pellets. The two upper pellets are of T.N.T./Wax, the percentage of T.N.T. and wax in the first being 90/10 and in the second 25/5. The two lower pellets are of T.N.T., the base pellet being formed with a cavity to receive the exploder container. The carton containing the charge is cemented to the wall of the shell cavity.

G.AINE

The gaine, carried in the exploder container above the fuze, is a Zldg. C/98 filled picric acid (for details see Bulletin 32, Item 669).

FUZE

The base fuze is screwed into the enlarged base end of the exploder container and is provided with a setting plug and setting graduations in the base for optional delay. Further details are not yet available.

FIG. 283 (ITEM 688)
GUN, 76 M.M. SHOT A.P.C. 3 INCH M. 82.
AND COMPLETE ROUND.

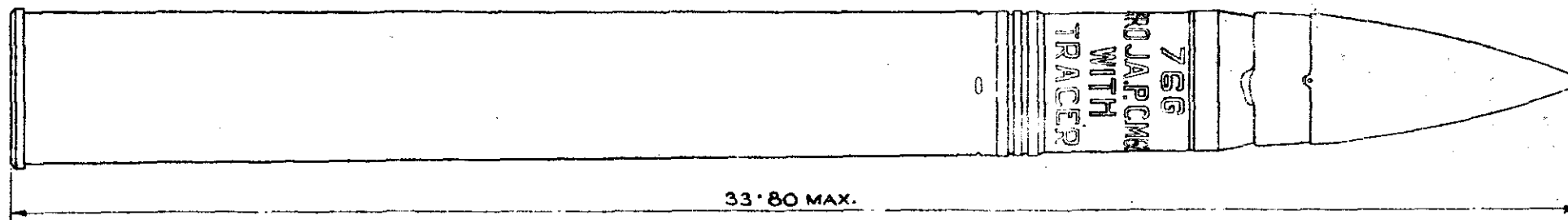
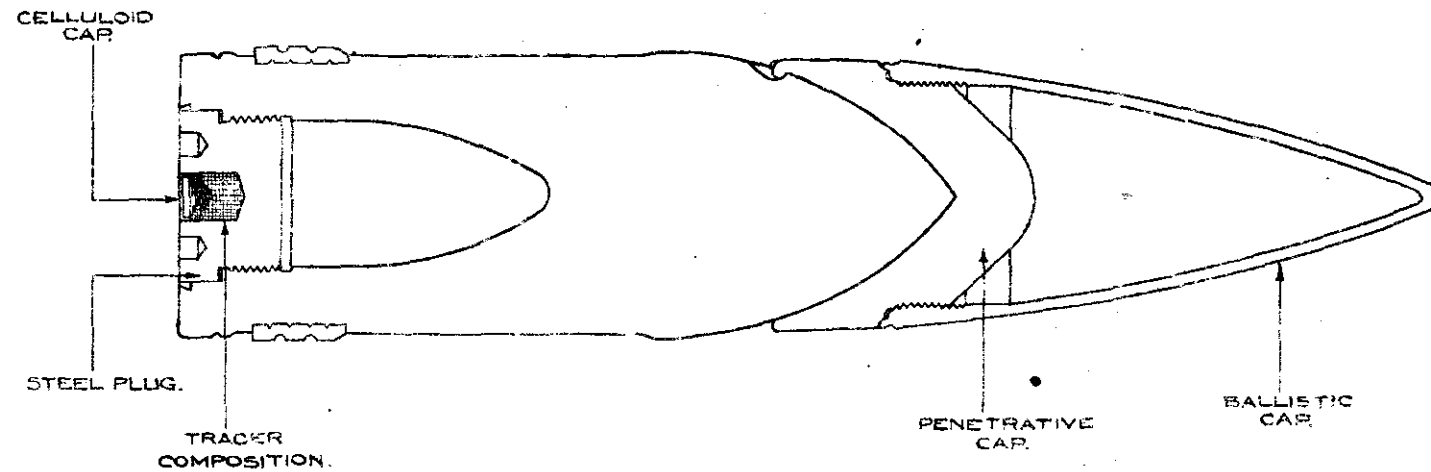


FIG 284 (ITEM 689)

GUN, 76 MM. COMPLETE ROUND, WITH SHELL SMOKE M88

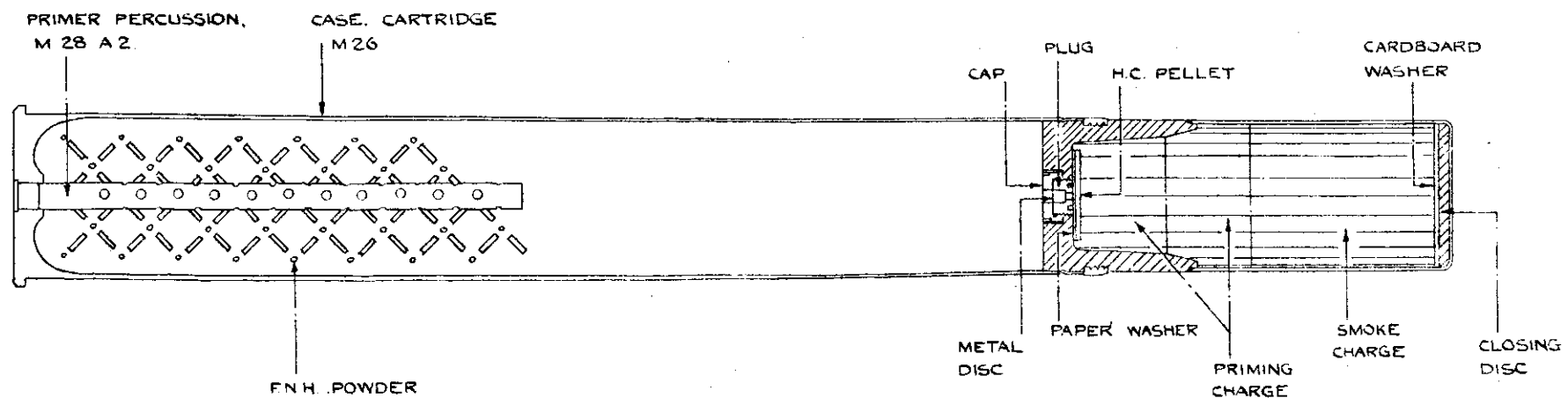
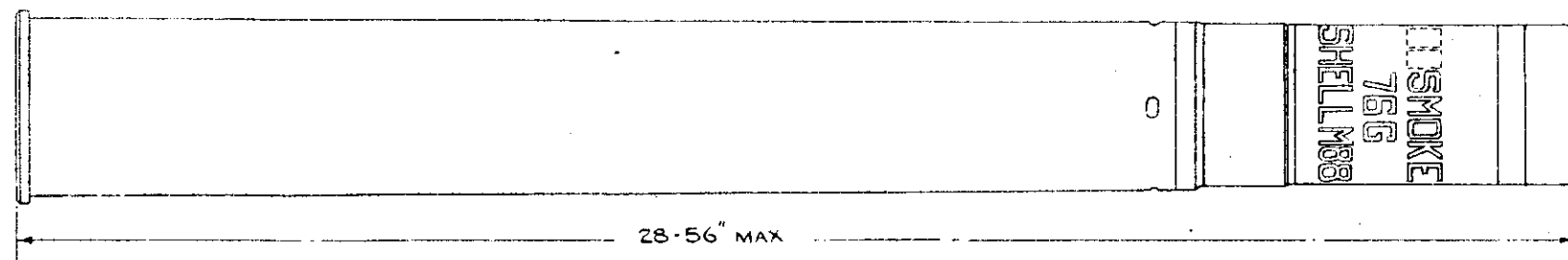
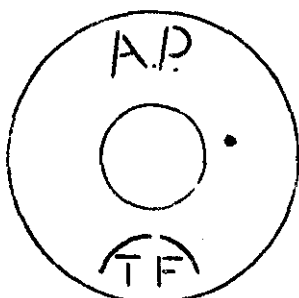


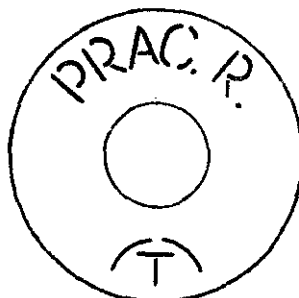
FIG 285 (ITEM 694)

ARMOUR PIERCING WITH TRACER FUZE



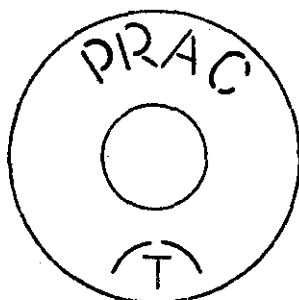
①

SHOT PRACTICE, REDUCED CHARGE WITH TRACER



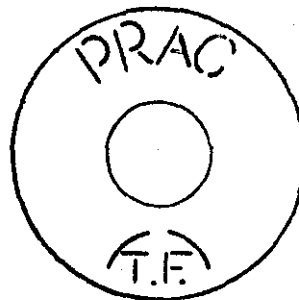
②

SHOT PRACTICE, FULL CHARGE, WITH TRACER.



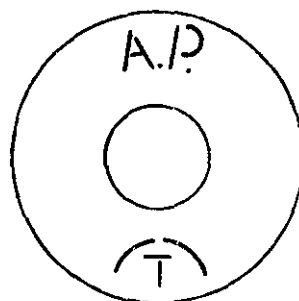
③

PRACTICE PROJECTILE, FULL CHARGE WITH TRACER FUZE.



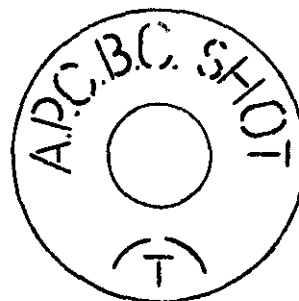
④

ARMOUR PIERCING, WITH TRACER.



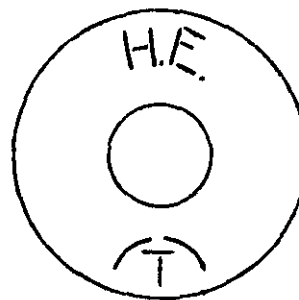
⑤

A.P.C. B.C. SHOT WITH TRACER.

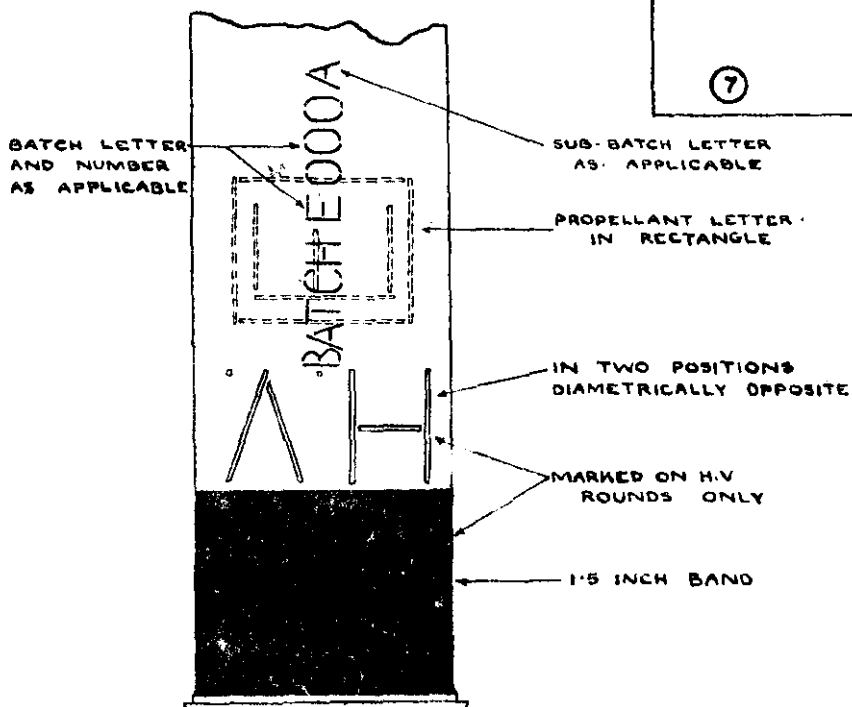


⑥

SHELL H.E. FULL CHARGE, WITH TRACER.



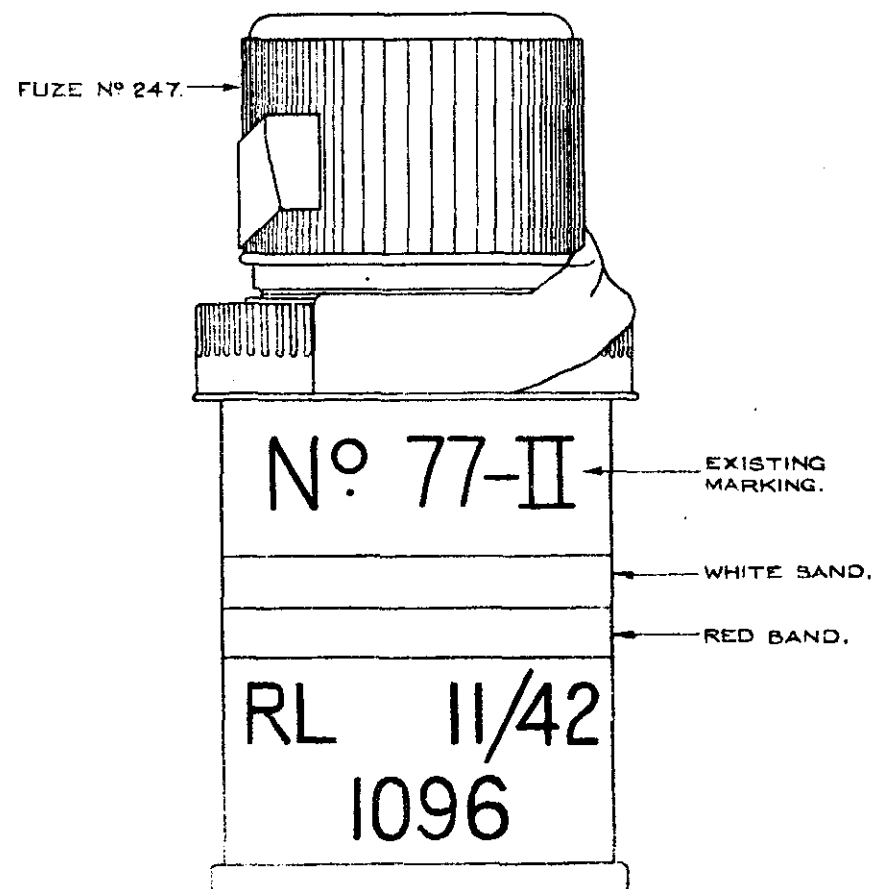
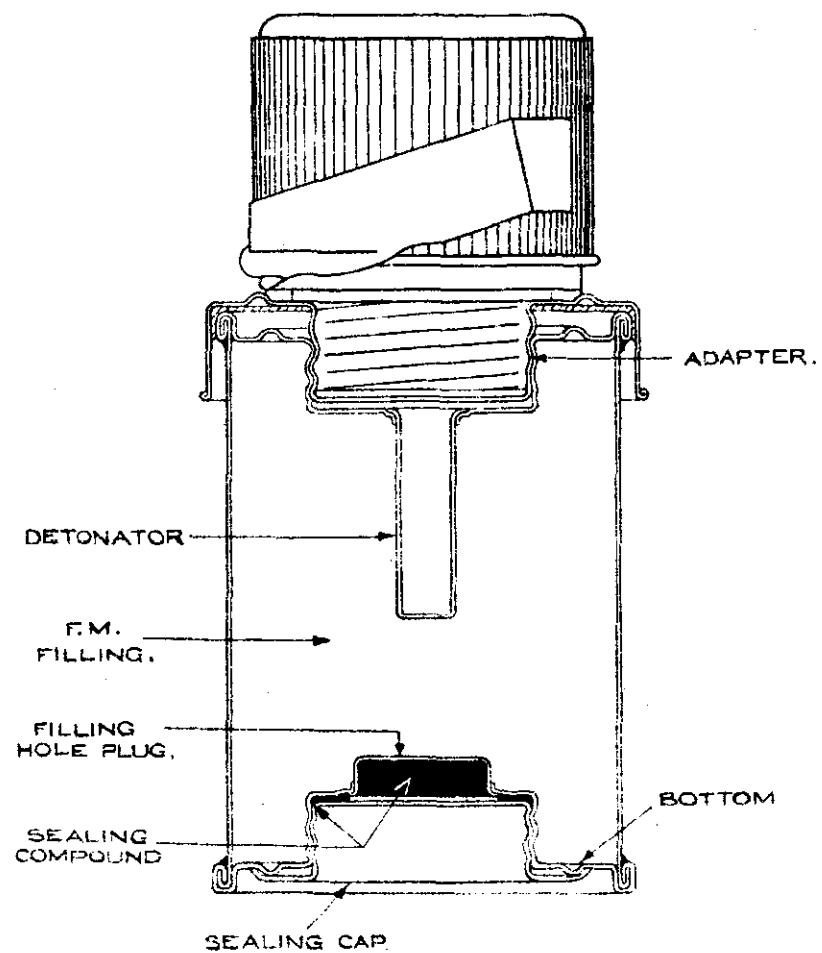
⑦



**Q.F. 2 PR. MARK
IX to XA GUN**

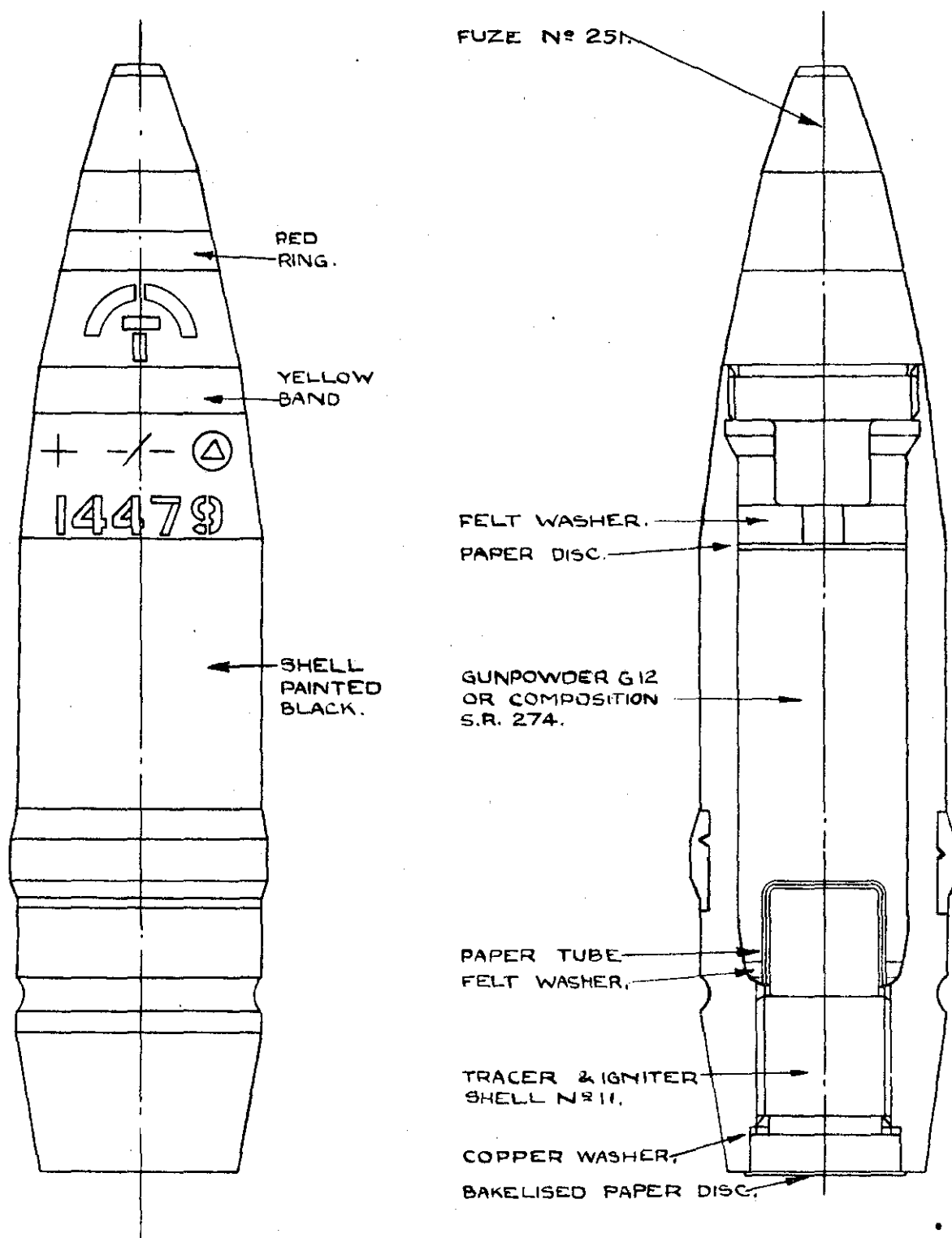
TYPICAL MARKINGS
IN SILVER NITRATE
ON SIDE AND BASE
OF CARTRIDGE CASE

FIG. 286 (ITEM 699)
HAND GRENADE N° 77 MK.II



PROJECTILE, PRACTICE, Q.F., 40-MM. Mk VI T.

FIG 287 (ITEM 700)



+ INITIALS OR MONOGRAM OF FIRM OR STATION FILLING.

-/- DATE OF FILLING (MONTH AND YEAR).

⊙ SERIES NUMBER IN RING, DISTINGUISHING FILLED LOT.

FIG. 288. (ITEM 702.)

CHARGE, 2½ IN. PROJECTOR:-10DR, POWDER. Mk. II.

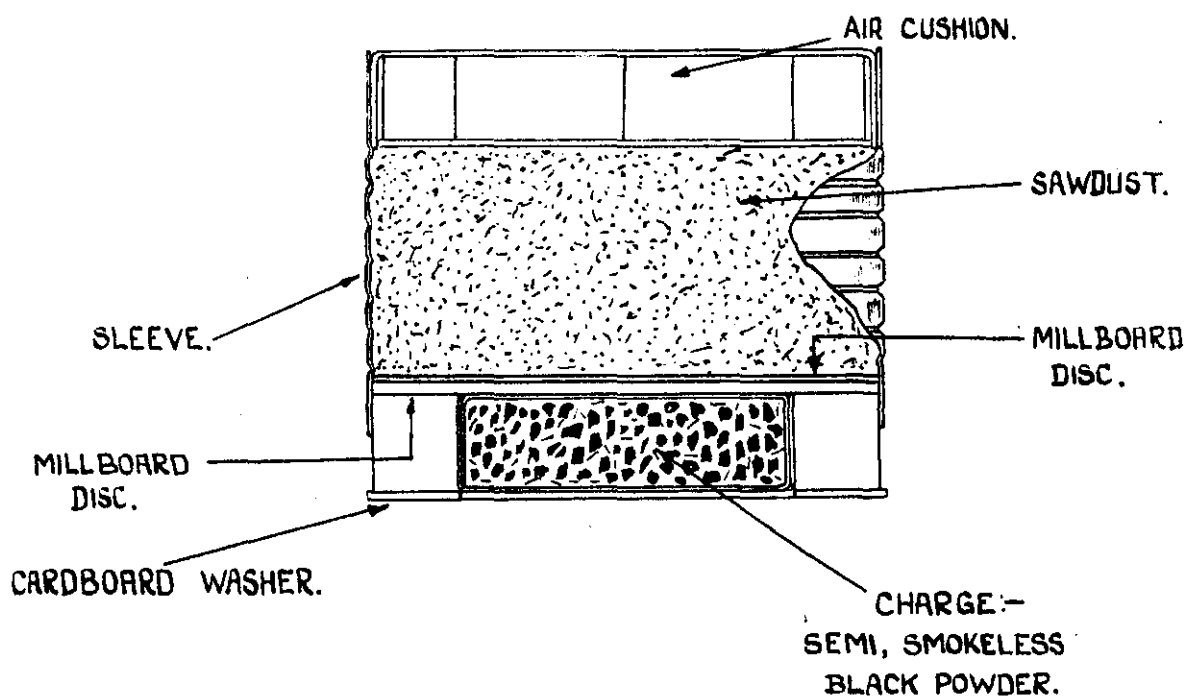
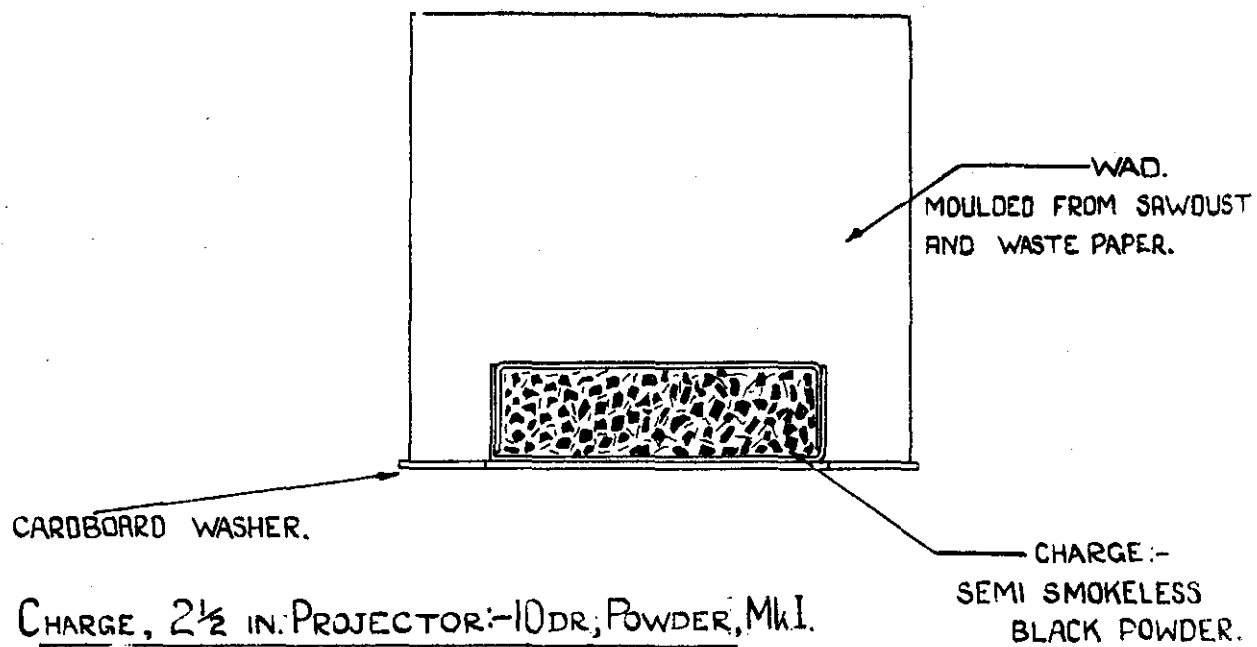
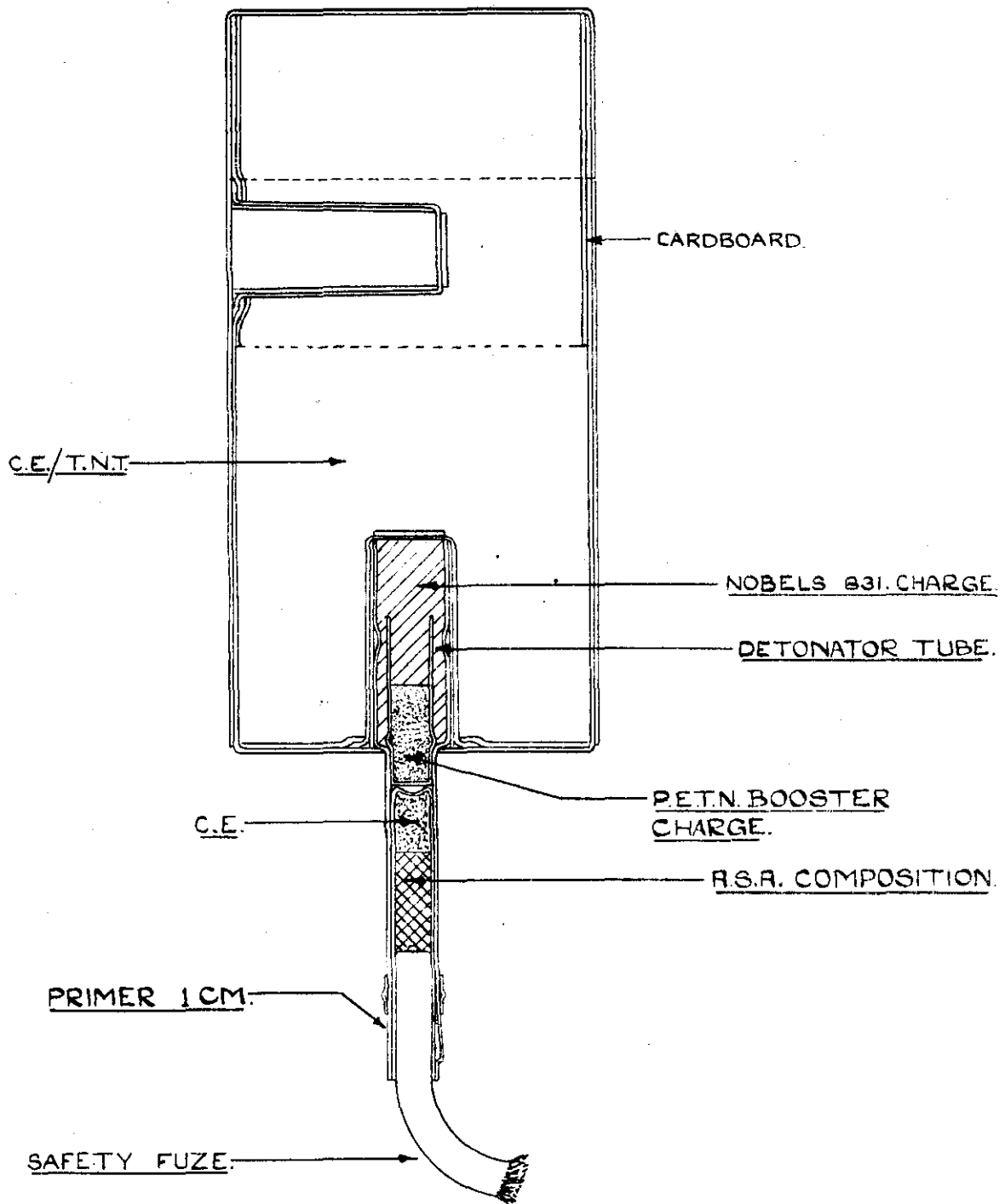


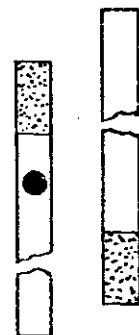
FIG 289 (ITEM 705)

PRIMER 1cm. Mk.I, DETONATOR N°.27 Mk.I.
C.E./T.N.T. SLAB -11b.
ASSEMBLY.

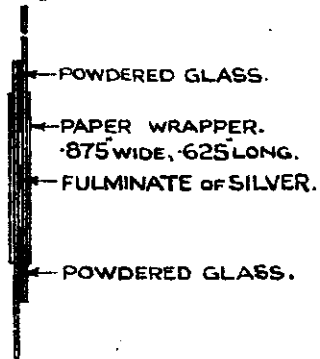


CRACKER BLANK M^KI TP

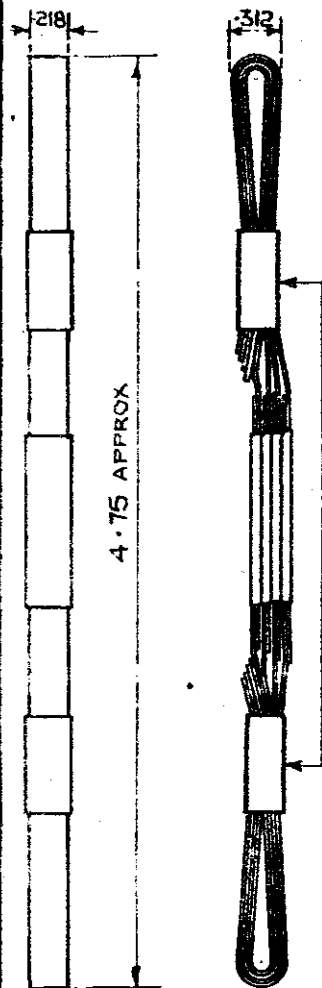
FIG 290 (ITEM 707)



SINGLE SNAP ASSEMBLY.



ASSEMBLY OF 4 SNAPS
5 PER SET



SELF SEALING ADHESIVE
TAPE, .5" WIDE, 1.25" LONG
APPROX.

LENGTH OF LINE BETWEEN
SNAPS 2.25" APPROX.

LINE, COTTON CORD, 12 STRAND,
INITIAL LENGTH 13.0 APPROX.,
KNOTTED, LEAVING TWO FREE
ENDS 3.0" LONG APPROX.

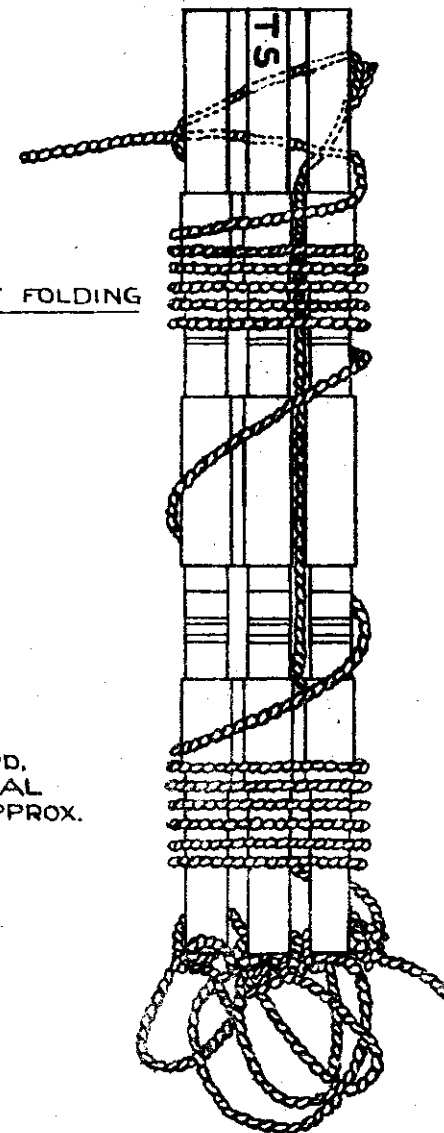
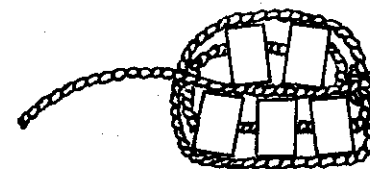
METHOD OF FOLDING

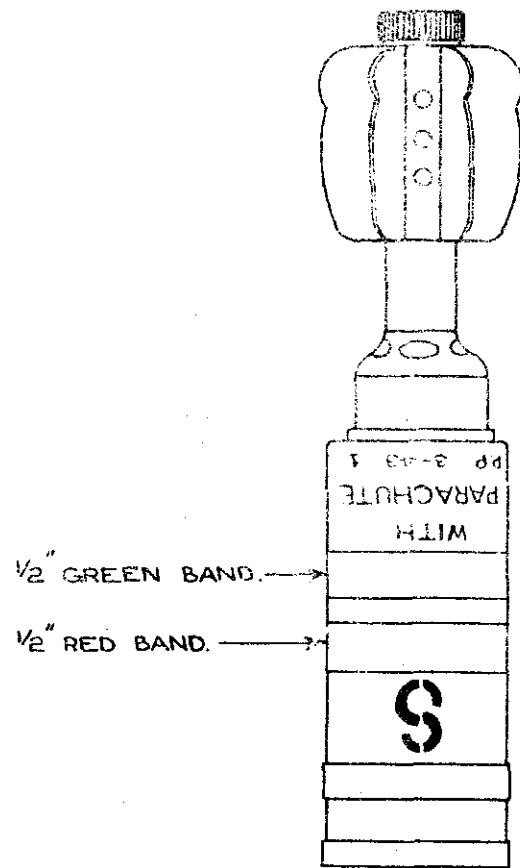
LINE, COTTON CORD,
12 STRAND, INITIAL
LENGTH 56.0" APPROX.

FREE END, 1.0" APPROX.

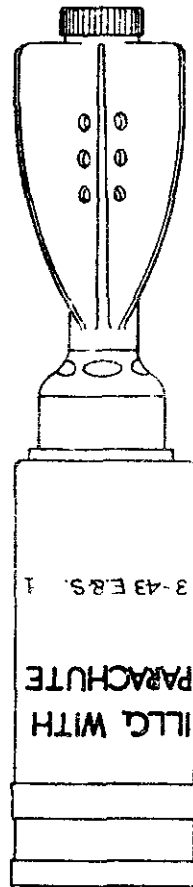
FREE END, 33.0" APPROX.

GENERAL ASSEMBLY

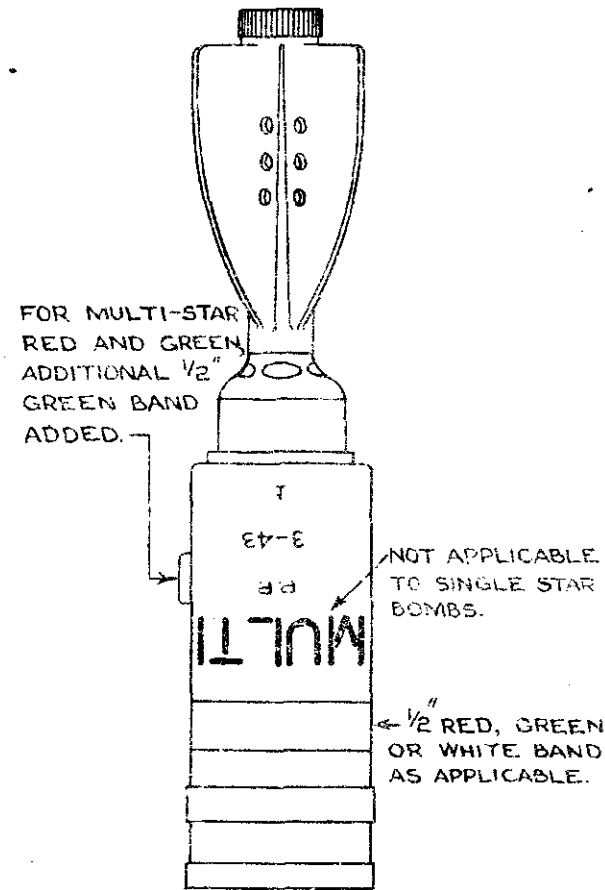




BOMB, M.L., SIGNAL SUCCESS, 2-INCH
MORTAR, CHANGE COLOUR, RED TO
GREEN, MK.I.

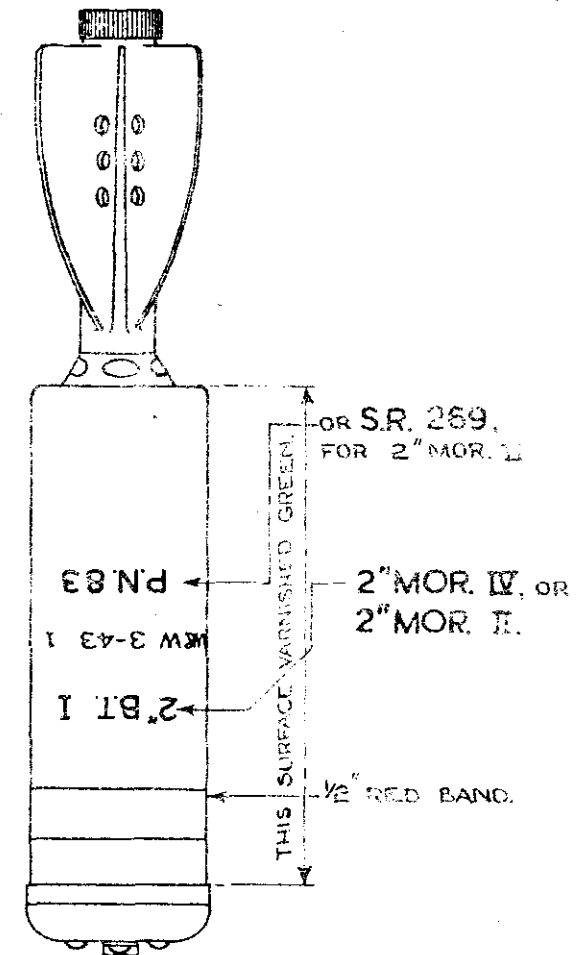


BOMB, M.L., ILLUMINATING,
WITH PARACHUTE. 2-INCH
MORTAR, MARK I.



BOMB, M.L., SIGNAL, 2-INCH
MORTAR, MULTI-STAR
RED AND GREEN, MARK I.
RED, MARK I. GREEN, MARK I.
WHITE, MARK I.

BOMB, M.L., SIGNAL, 2-INCH
MORTAR, SINGLE STAR
RED, MARK I.
GREEN, MARK I.



BOMB, SMOKE, 2" BOMB-THROWER, MK.I.

BOMB, M.L., SMOKE, 2" MORTAR, MARK II.

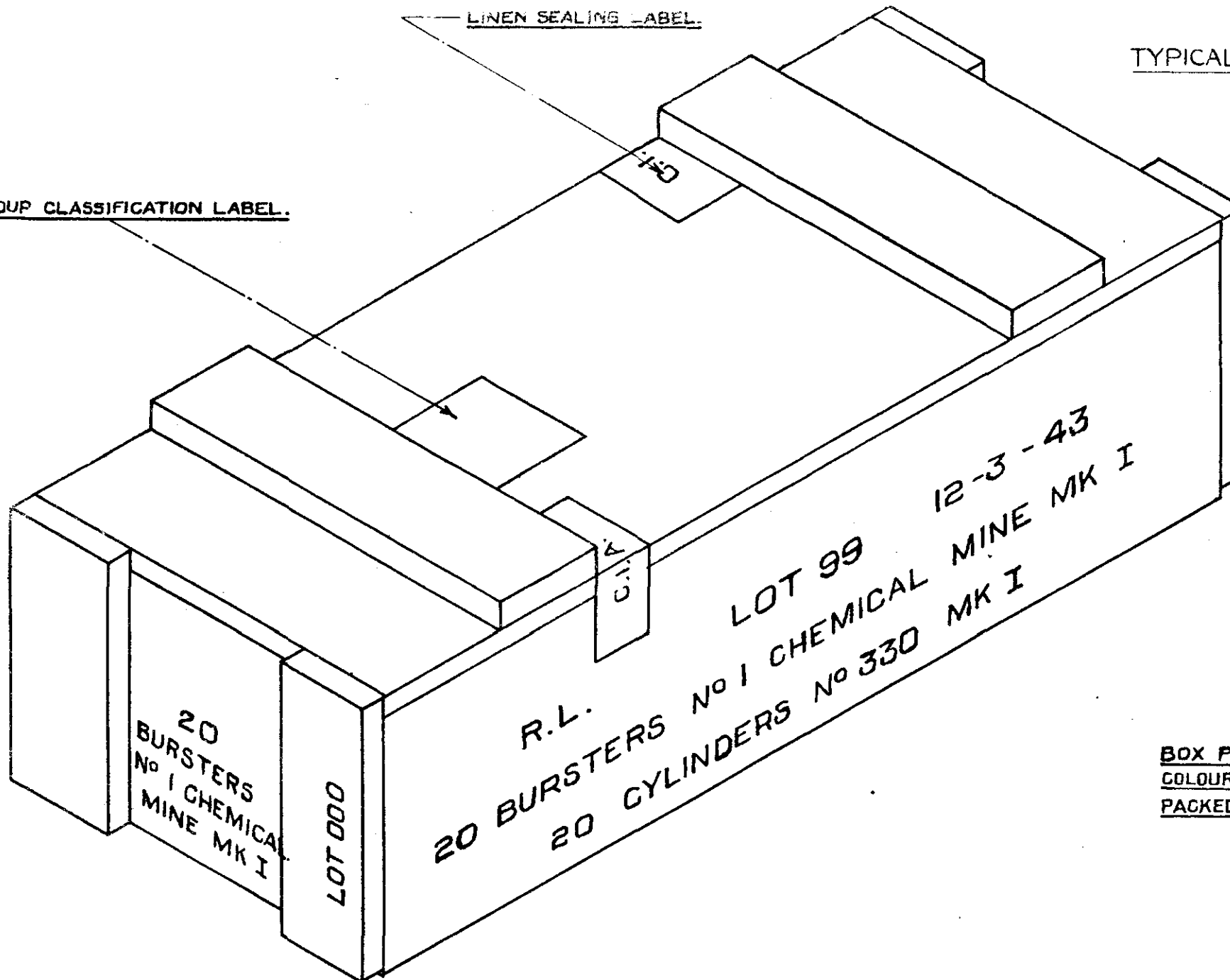
BOMB, M.L., SMOKE, 2" MORTAR, MARK IV.

FIG 292 (ITEM 710)

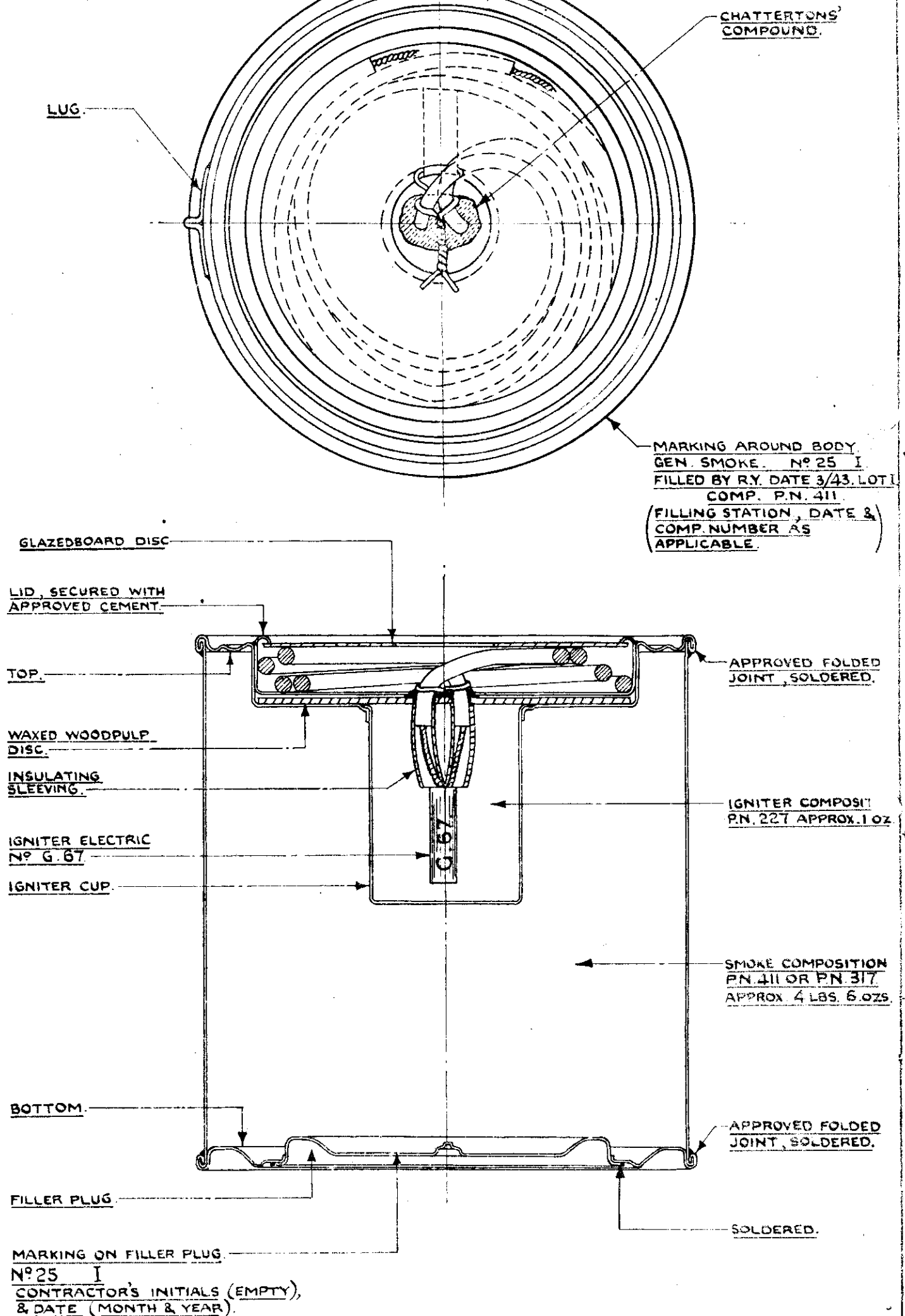
TYPICAL PYROTECHNIC PACKAGE

GROUP CLASSIFICATION LABEL.

LINEN SEALING LABEL.

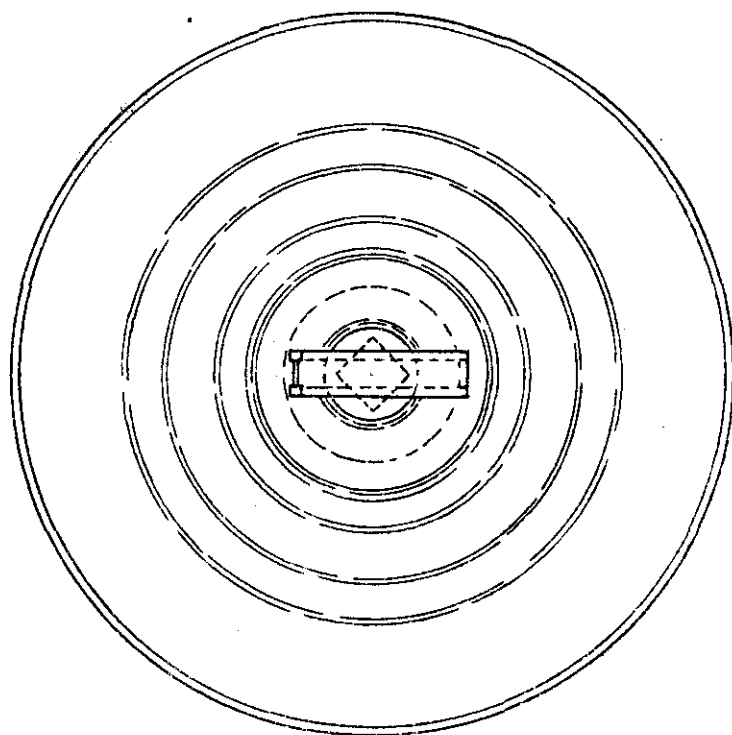


BOX PAINTED OR STAINED DISTINGUISHING
COLOUR, ACCORDING TO NATURE OF STORE
PACKED.



GENERATOR, SMOKE, No. 25, MKI, /L/.

FIG. 293 (ITEM 727)



APPROVED FOLDED JOINT,
COMPOUND LINED.

TEAR OFF COVER.

PRIMED COTTON CAMBRIC OR
BOOK MUSLIN 6-0 SQUARE.

COMPOSITION S.R.269(M) WHEN
MAIN FILLING IS S.R.264A(M)
OR P.N.280 WHEN MAIN
FILLING IS P.N.307 OR P.N.421.

TEAR OFF PATCH AND LIGHT
WITH PORTFIRE OR FUSEE.

S.R.264A(M) ABOUT 32LB
OR P.N.307, ABOUT 37LB, OR
P.N.421 ABOUT 34 LB.

DANGER LABEL

GENERATOR SMOKE
Nº 24 I

FILLING STATION.

FILLED BY SYN. DATE 3/43
LOT Nº I
COMPOSITION S.R.264A(M)

COMPOSITION Nº AS APPLICABLE

H 10-375 FOR STOWAGE

APPROVED FOLDED JOINT,
COMPOUND LINED.

H 8-125 FOR STOWAGE

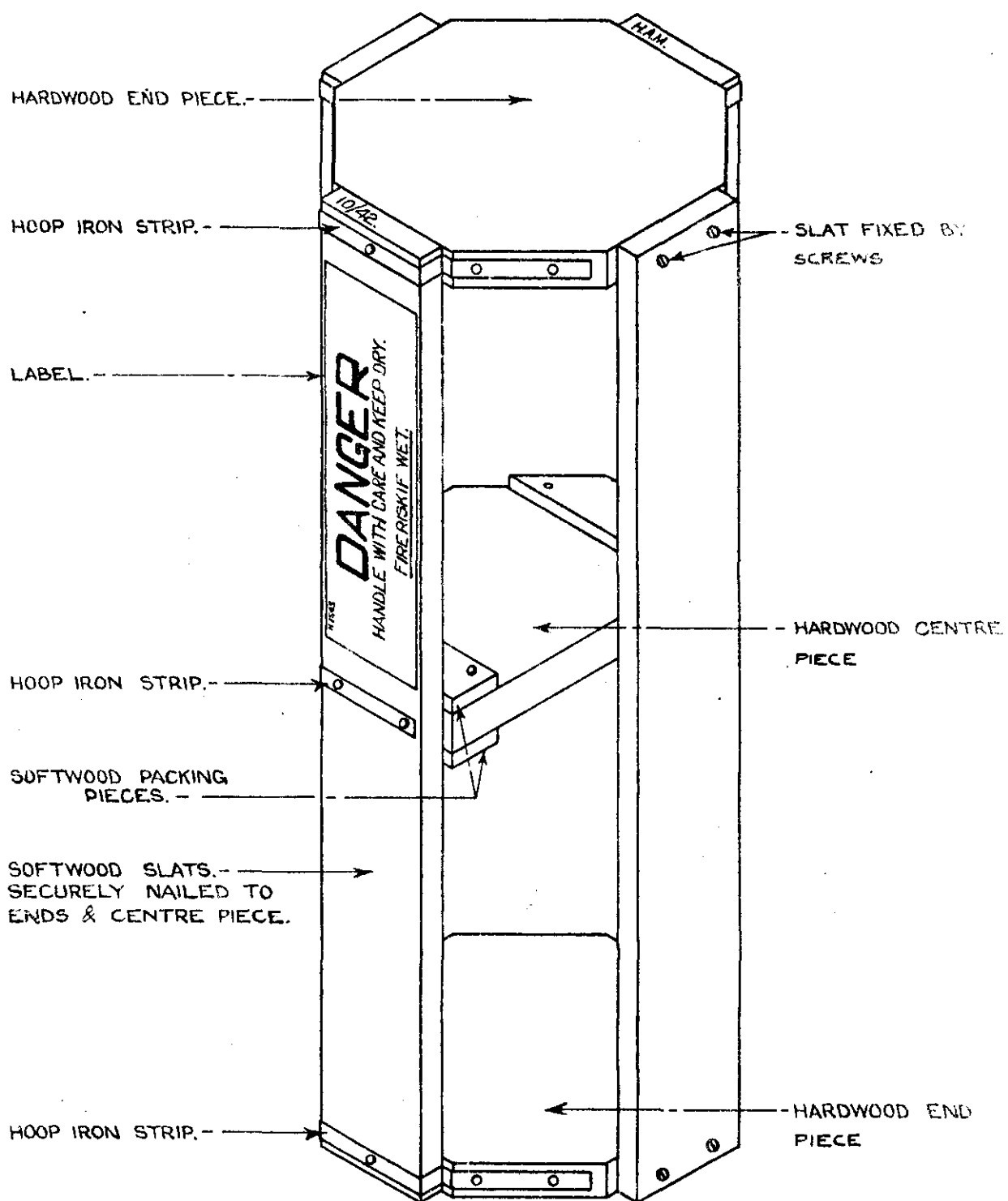
MARKING ON BOTTOM
CONTRACTOR'S INITIALS, AND
DATE (MONTH AND YEAR)

Nº 24 MK I

GENERATOR , SMOKE , Nº 24 , MK. I /LN/.
FIG.294 (ITEM 729)

CRATE N°24 SMOKE GENERATOR M^N I

FIG 295 (ITEM 728)

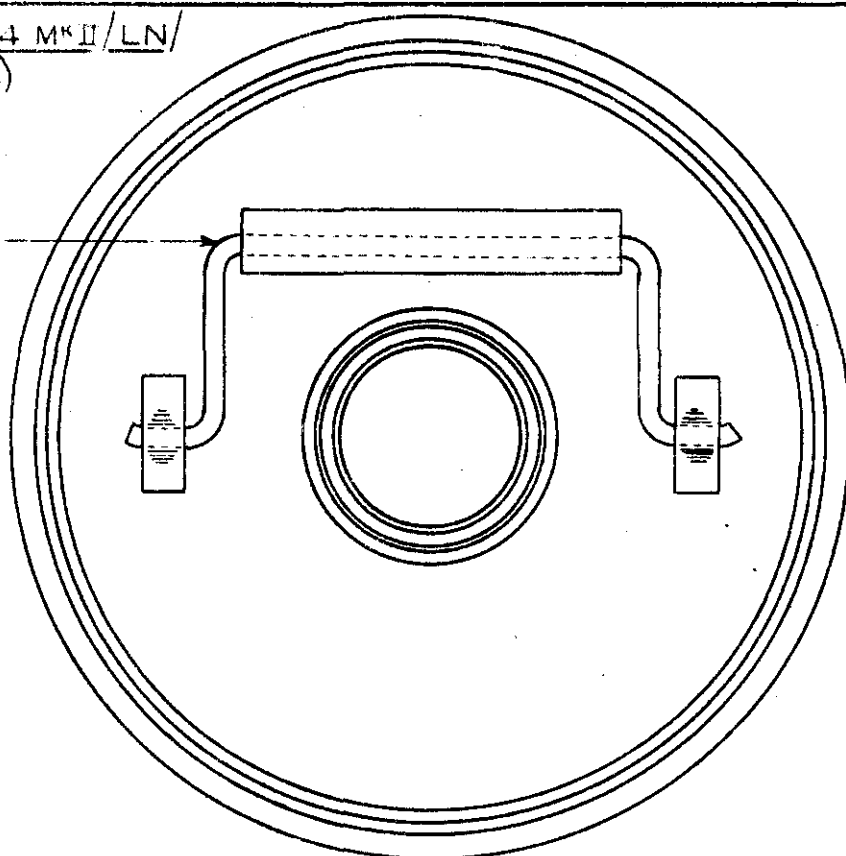


CRATE STAINED OR PAINTED GREEN.

GENERATOR SMOKE N° 24 MK II / LN/

FIG 296 (ITEM 728)

HANDLE



APPROVED FOLDED JOINT,
COMPOUND LINED

IGNITING COMPOSITION
SR 263 (M) WHEN MAIN FILLING
IS 264 A(M) OR PN 280
WHEN MAIN FILLING IS PN 307 OR PN 421

SR. 264 A(M) ABOUT 32 lb.
OR
PN. 307 ABOUT 37 lb.
OR PN. 421 ABOUT 34 lb.

ALTERNATIVELY JOINTS
SEAM WELDED

DISC

DISC, PRIMED COTTON
CAMBRIC OR MUSLIN.

REMOVE SCREW CAP AND
LIGHT WITH PORTFIRE OR FUSEE.

GENERATOR, SMOKE, N° 24, MK II

FILLING STATION

FILLED BY SYN. DATE 3/43.

LOT N° I

COMPOSITION NUMBER
AS APPLICABLE.

COMPOSITION 264 A(M)

H. 12.25 FOR STOWAGE

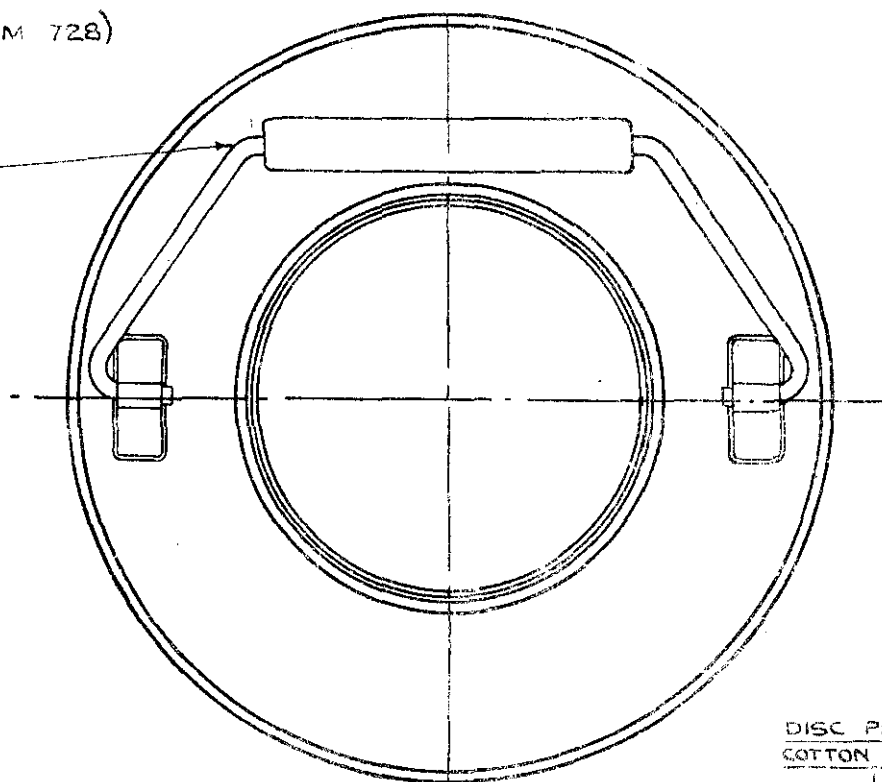
APPROVED FOLDED JOINT,
COMPOUND LINED.

MARKING ON BOTTOM:-
CONTRACTORS INITIALS, (EMPTY).
DATE OF MANUFACTURE (MONTH & YEAR).
N° 24. II.

H. 8.05 FOR STOWAGE.

FIG 297 (ITEM 728)

HANDLE.



DISC PRIMER
COTTON CAMBRIC

DISC
WASHER

APPROVED FOLDED JOINT
SOLDERED.

COMPOSITION LEVEL
APPROX. 1-0 BELOW SCREW
NECK.

IGNITER COMPOSITION
P.N. 227 ABOUT 1 1/2 OZS.

SMOKE COMPOSITION
P.N. 276 OR P.N. 314 OR
P.N. 411 ABOUT 44 LBS.

REMOVE SCREW CAP AND
LIGHT WITH PORTFIRE OR FUSEE.

IGNITER
CUP

GENERATOR, SMOKE, No. 24, MK. III

FILLING STATION.

FILLED BY SWN. DATE 3/43.

LOT No. 1

COMPOSITION NUMBER
AS APPLICABLE.

COMPOSITION P.N. 276.

H 12.25 FOR STOWAGE.

MARKING ON BOTTOM.

CONTRACTOR'S INITIALS (EMPTY) & DATE (MONTH & YEAR).

No 24.

III

GENERATOR, SMOKE, No 24, MK. III / LN /.

FIG. 298 (ITEM. 730).
SHELL, Q.F., H.E. 2 PR. H.V. MARK I.T.

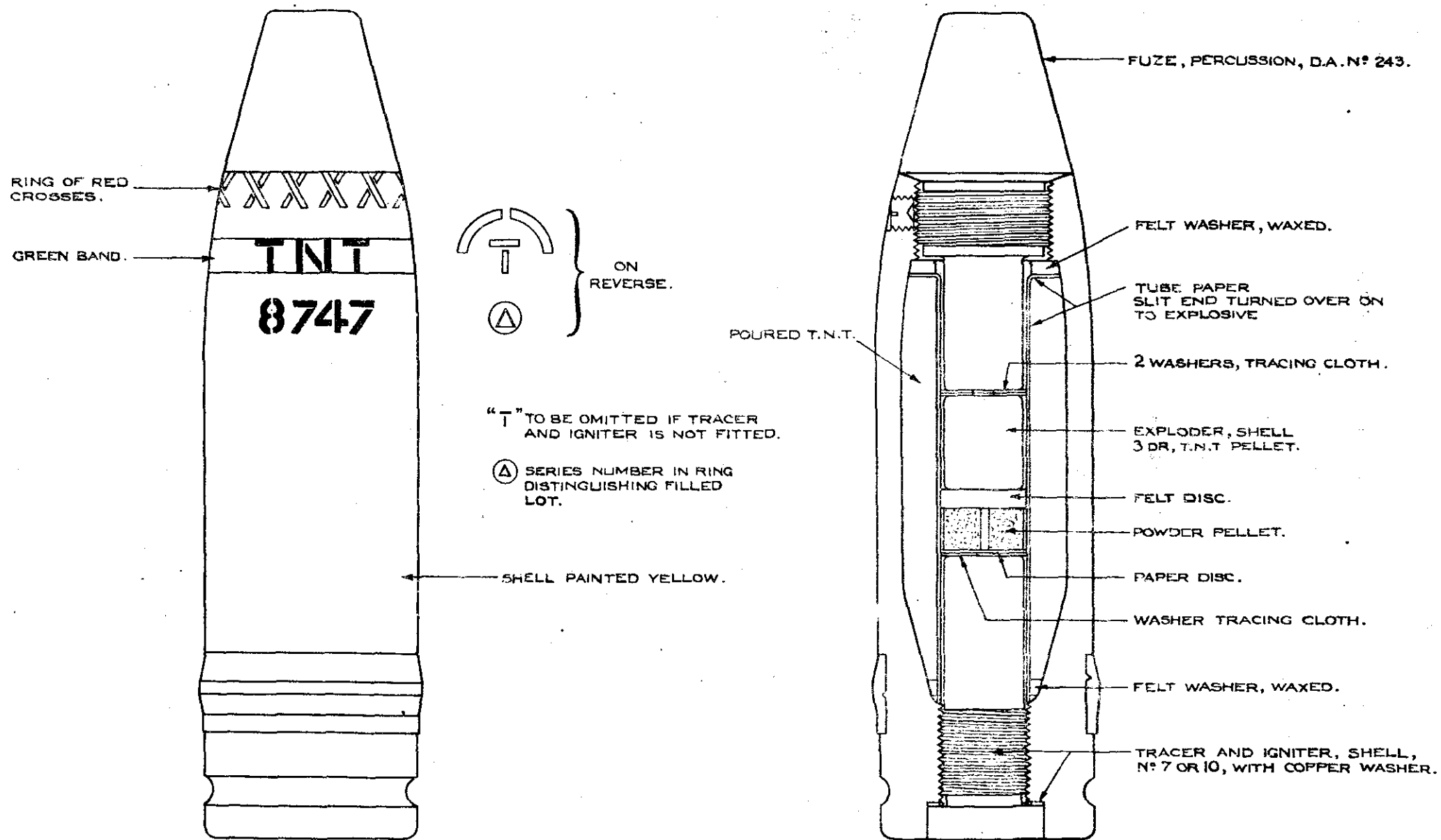
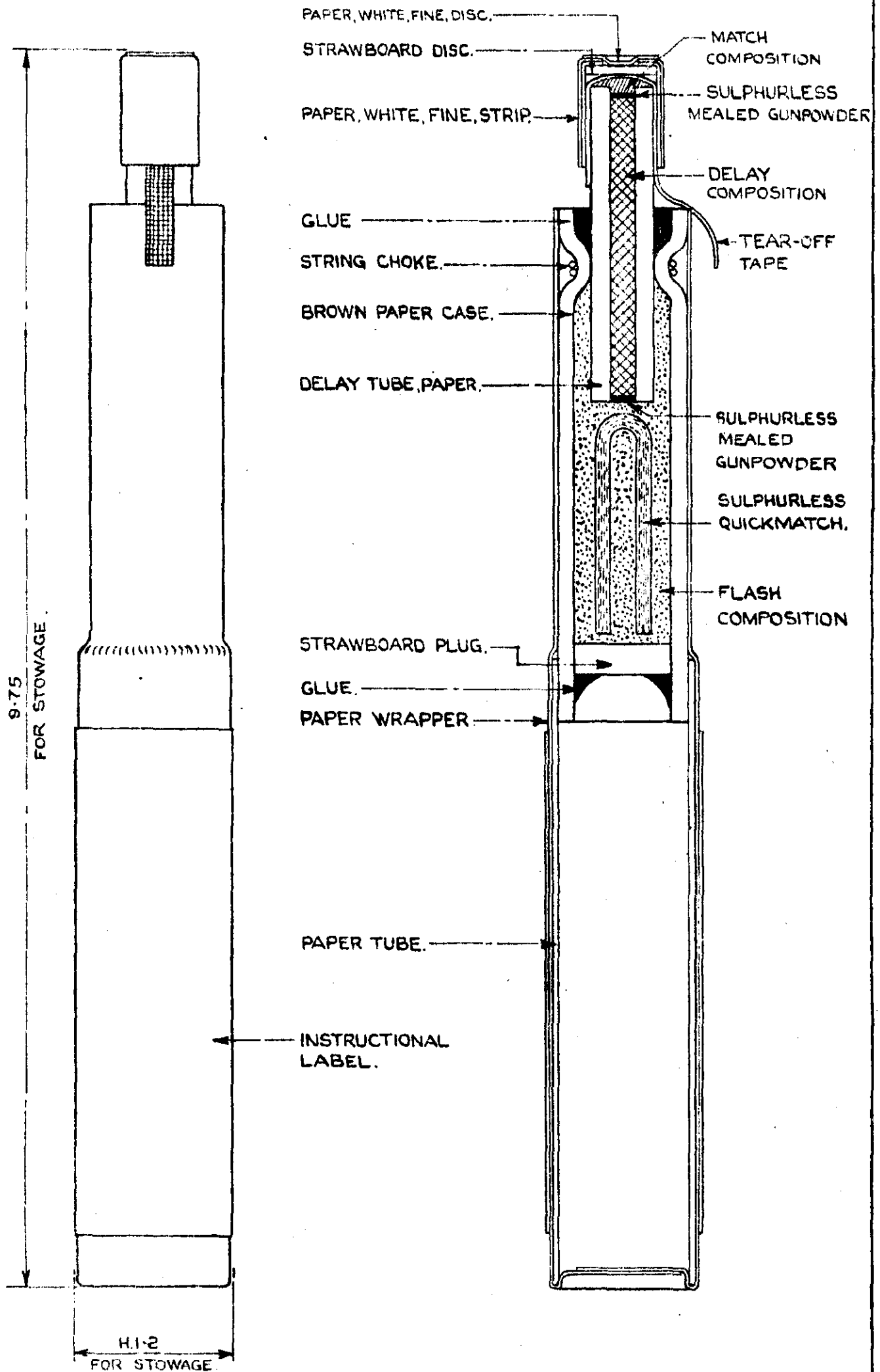


FIG 299 (ITEM 732)



THUNDERFLASH Mk V/L

FIG.300 (ITEM 738)
GERMAN TELLER MINE 35.

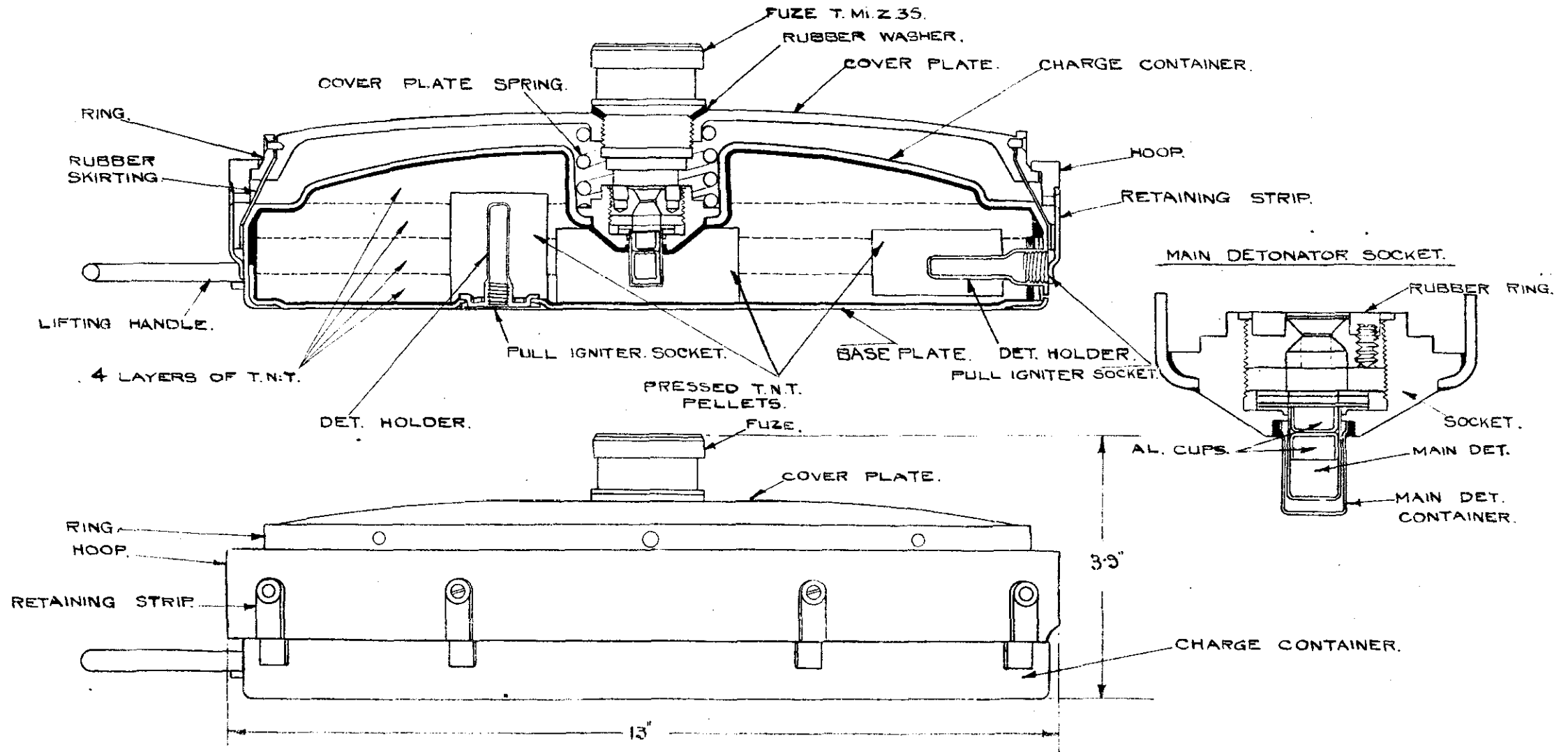


FIG. 301 (ITEM 739)
GERMAN TELLER MINE FUZE T. M. Z. 35.
(TELLER MINE ZÜNDER 35.)

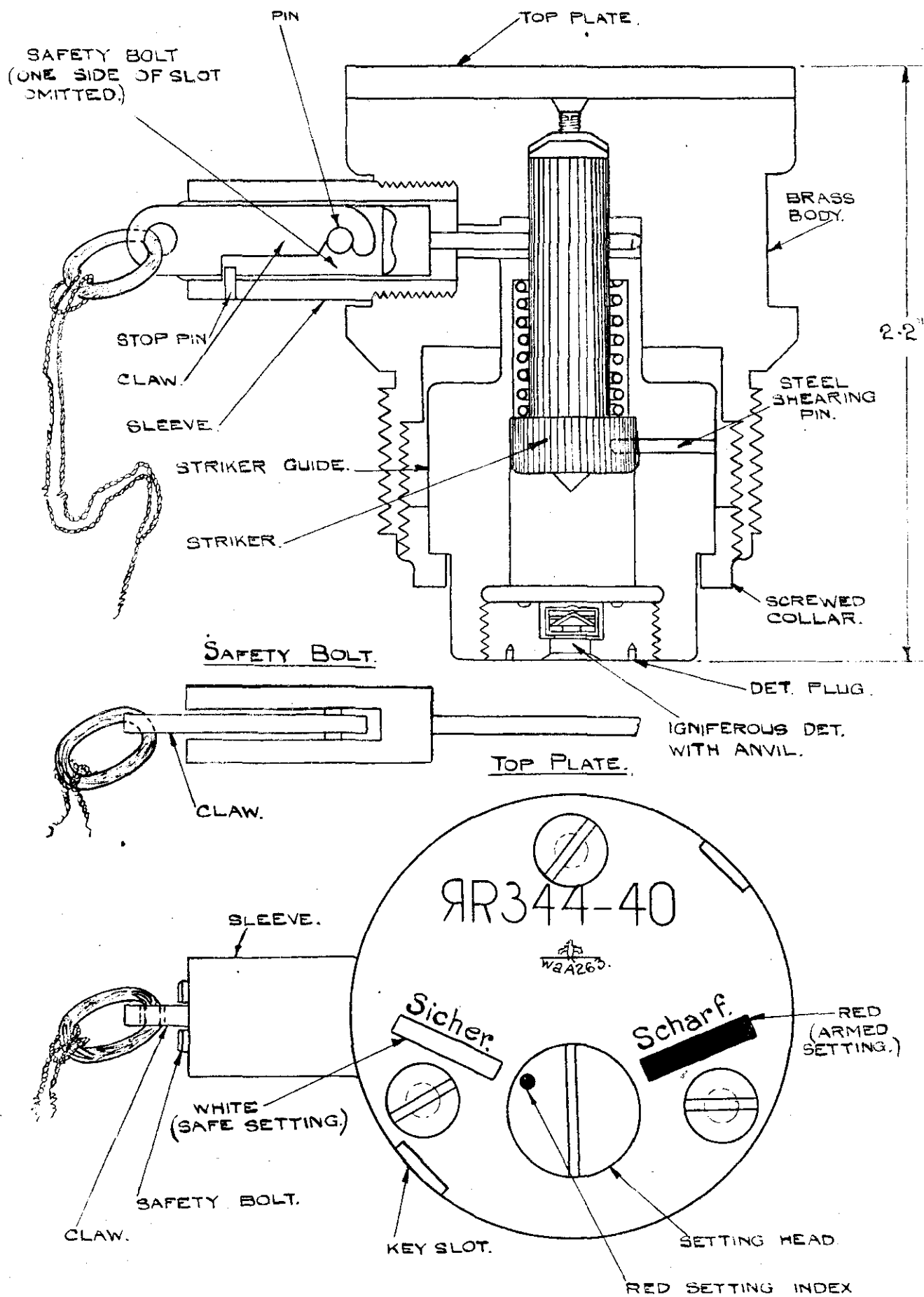
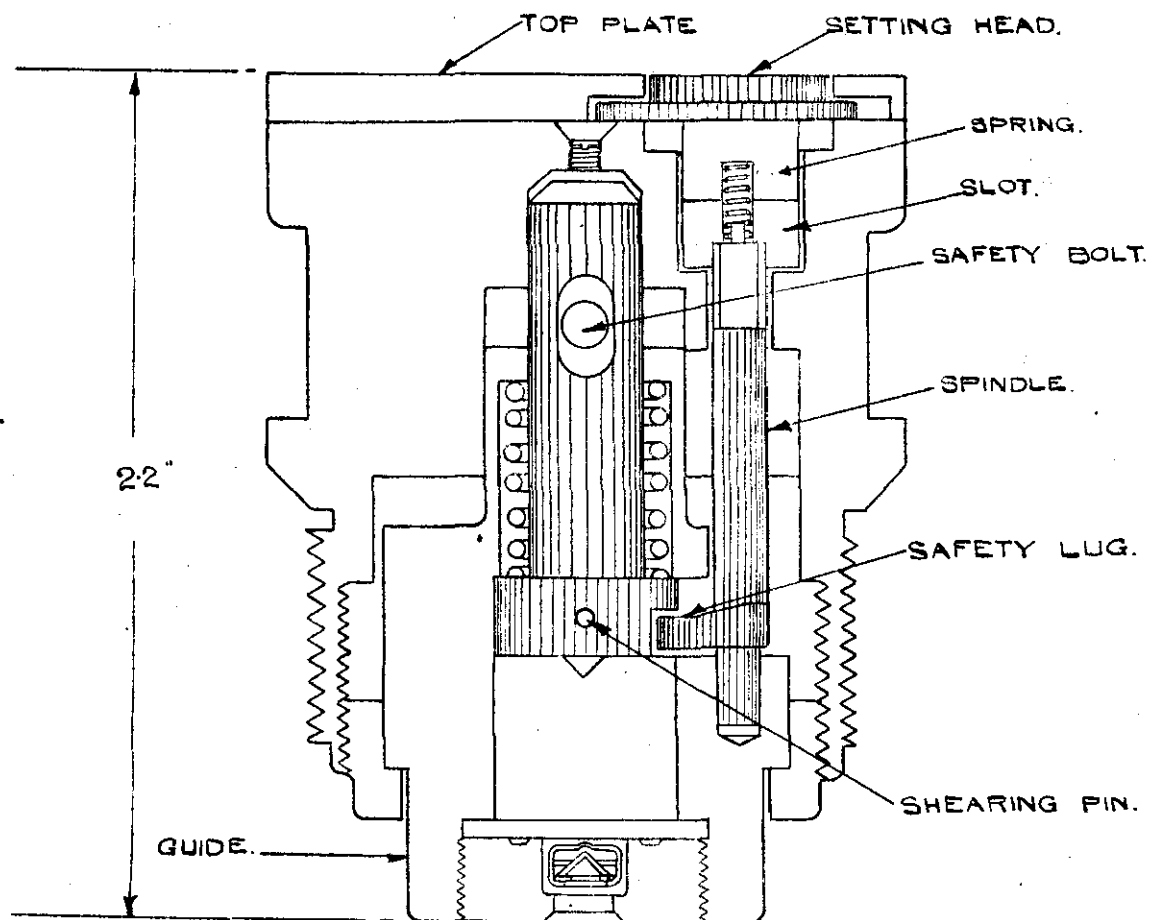


FIG. 302 (ITEM 735)
GERMAN TELLER MINE FUZE T. M. Z. 35.
(TELLER MINE ZÜNDER 35.)



TOP PLATE REMOVED.

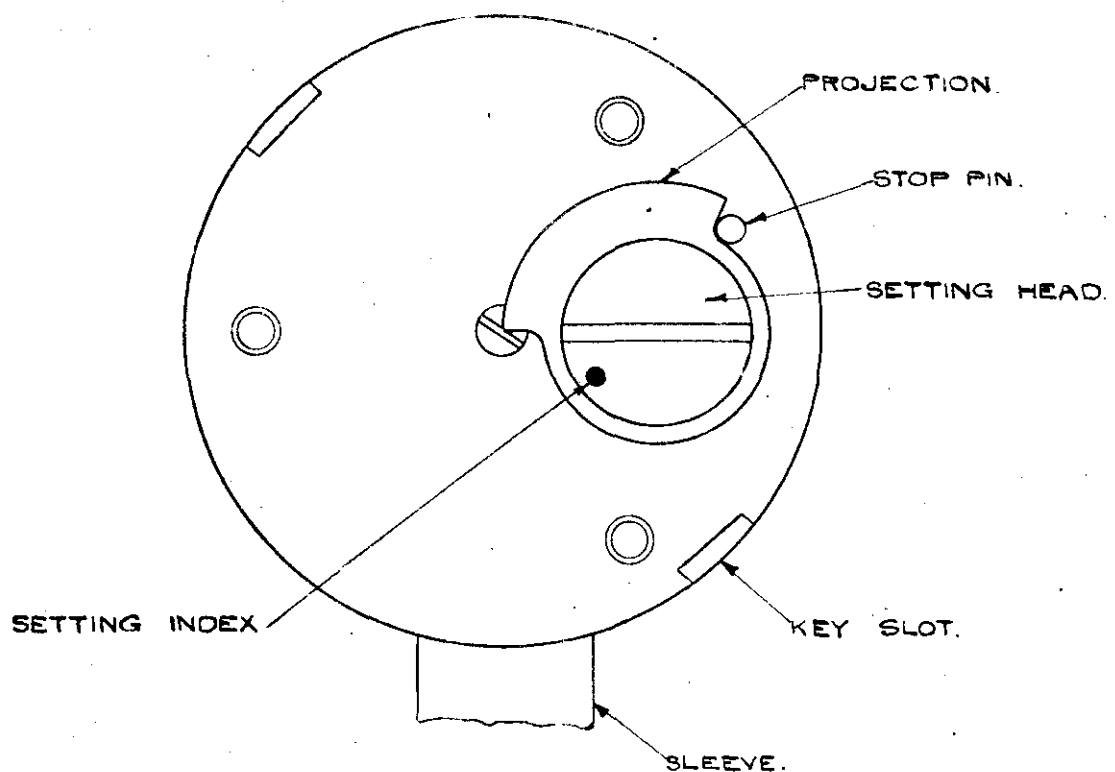


FIG. 303 (ITEM 740)
GERMAN PULL IGNITER Z.Z. 35.
ZUGZÜNDER 35.

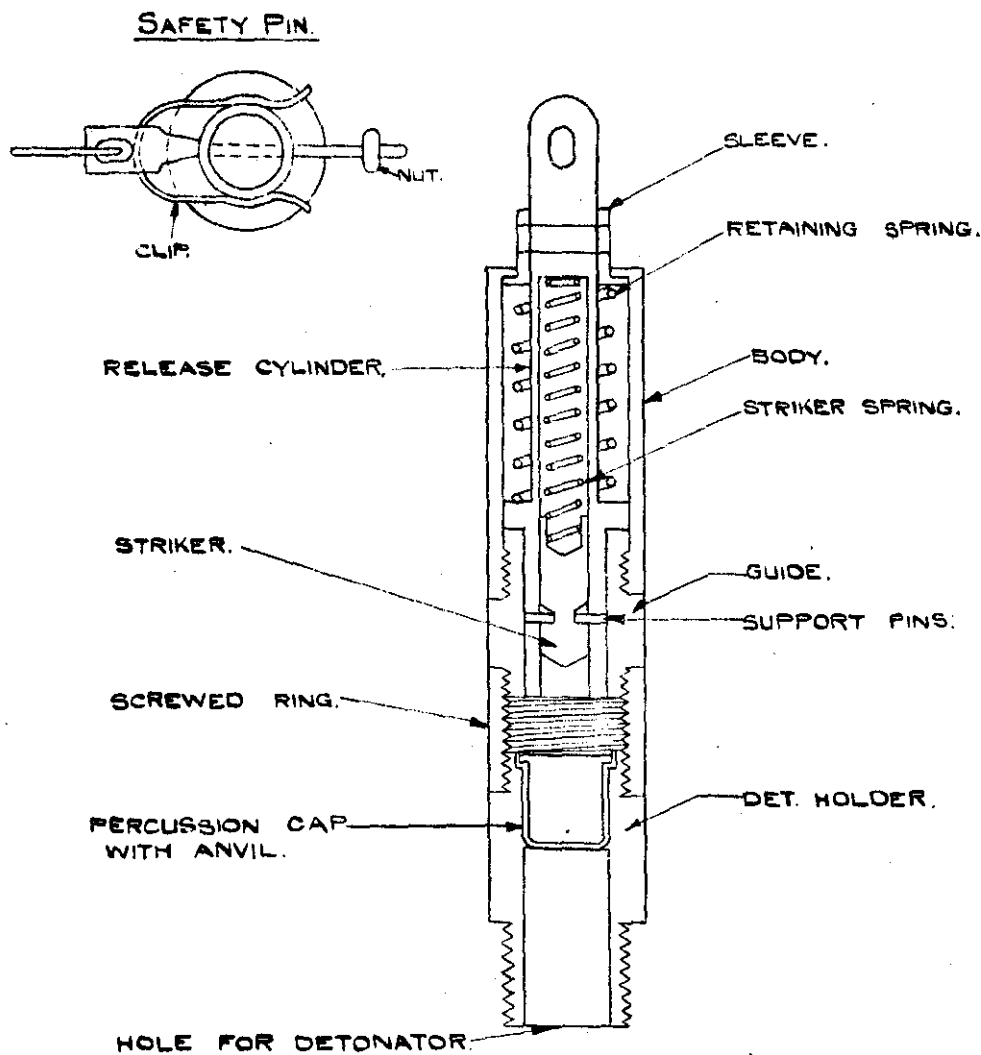
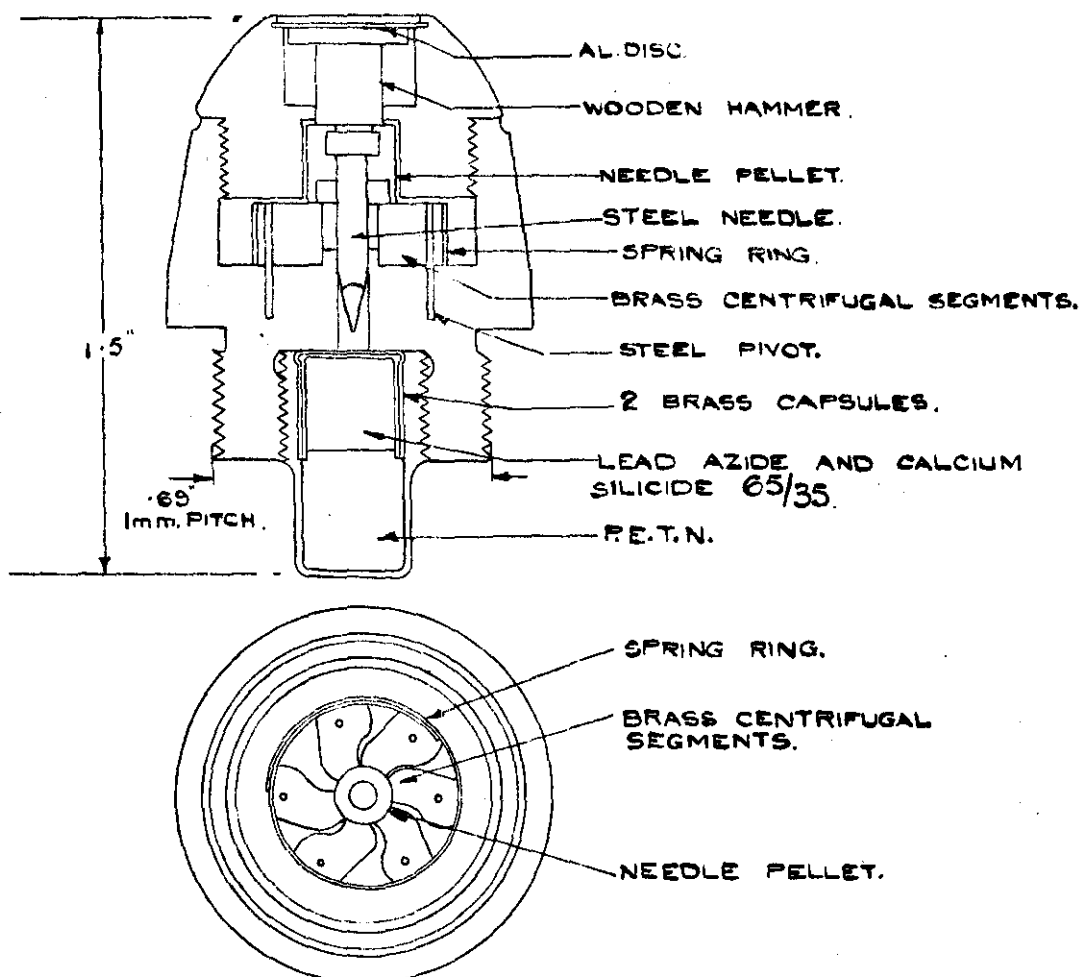
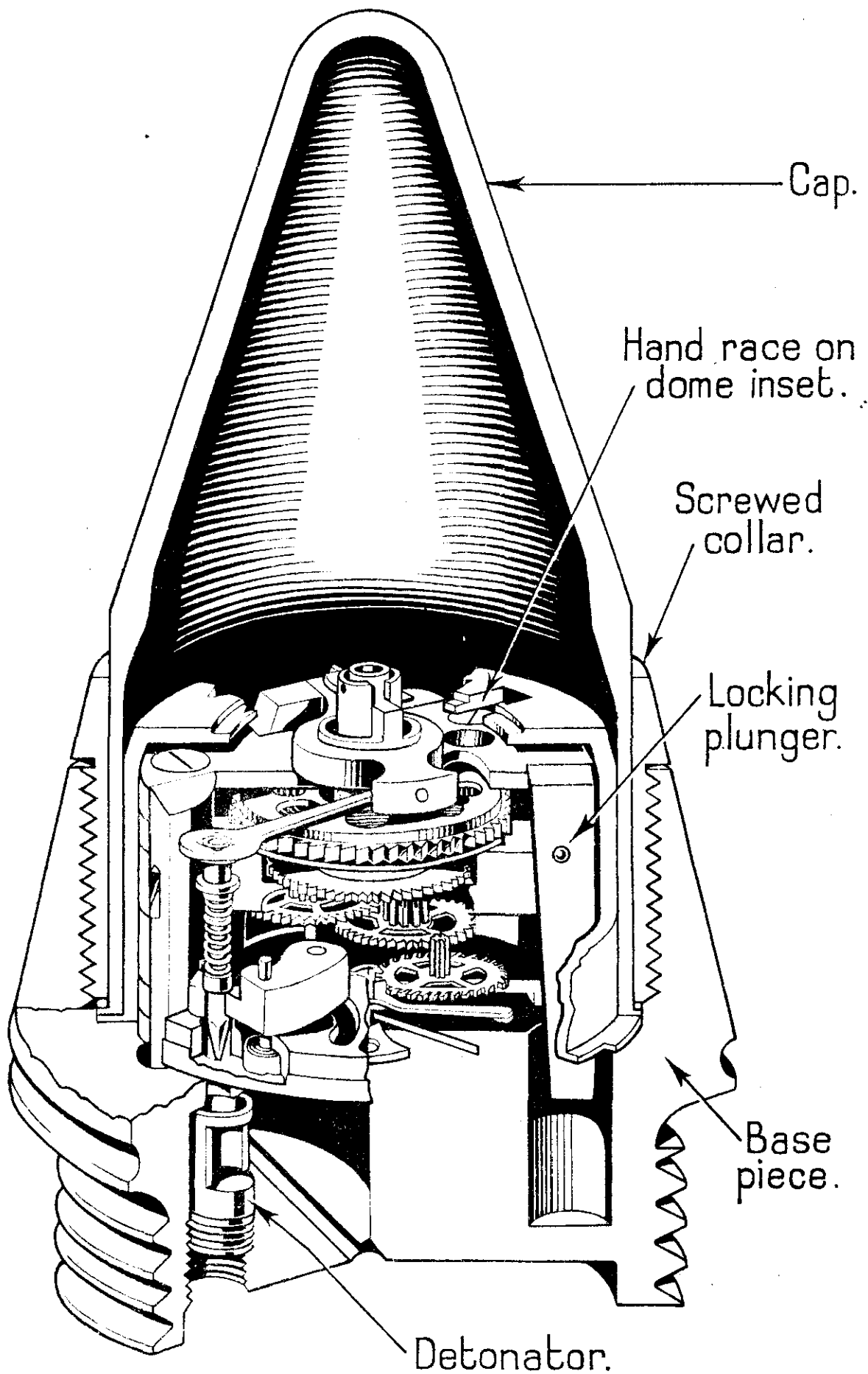


FIG. 304 (ITEM 741)
GERMAN FUZE A.Z. 38.

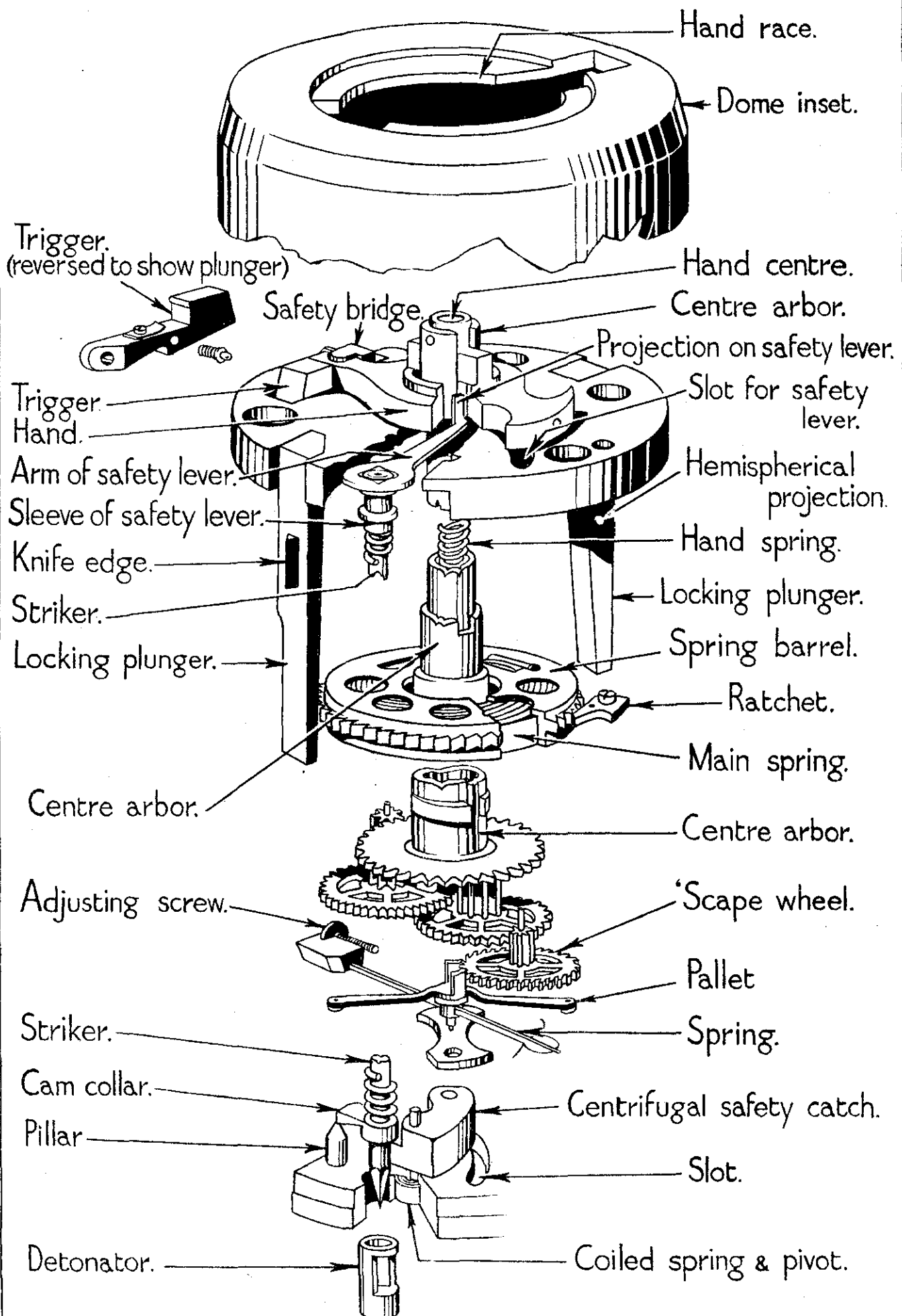


GERMAN MECHANICAL TIME FUZE. S/30
(Zt. Z. S/30.)



GERMAN MECHANICAL TIME FUZE S/30. (Zt. Z. S/30.)

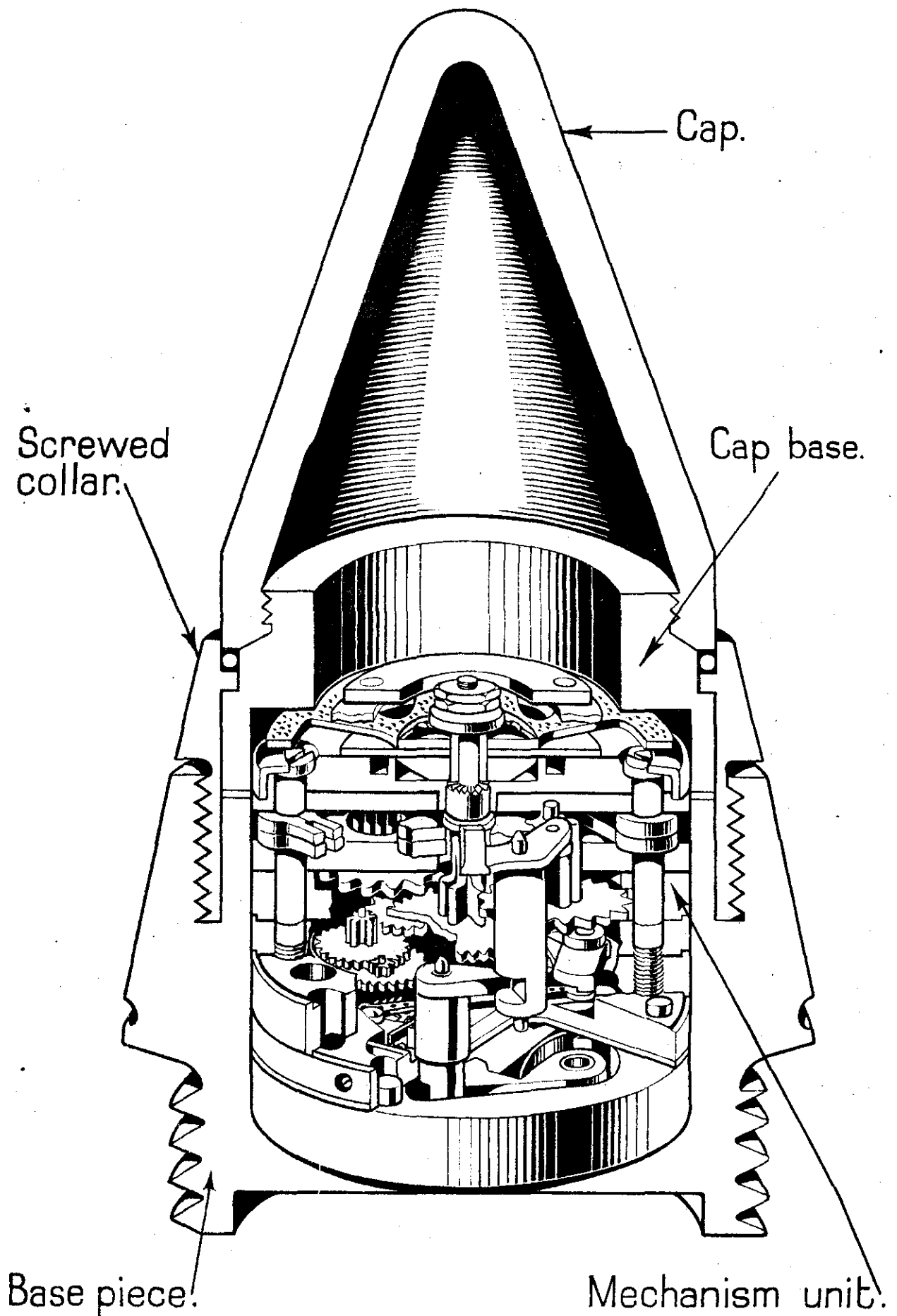
DIAGRAMMATIC ARRANGEMENT OF MECHANISM.



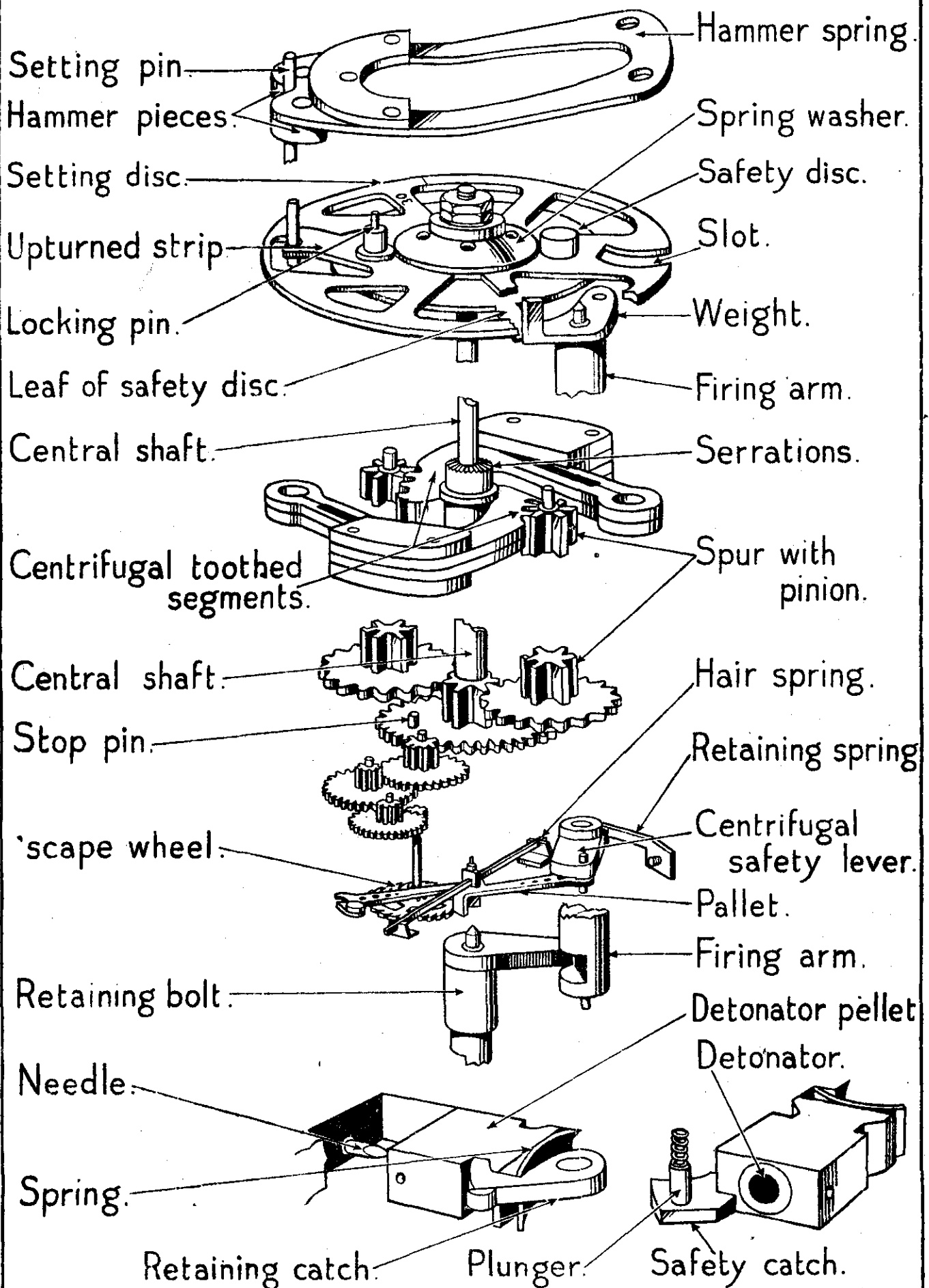
GERMAN MECHANICAL TIME FUZE, S/30 Fg 1.

(Zt. Z. S/30 Fg 1.)

FIG. 307 (ITEM 743)



GERMAN MECHANICAL TIME FUZE S/30 Fg1. DIAGRAMMATIC ARRANGEMENT OF MECHANISM.



715. MARKING - Q.F. 25 PDR. CHEMICAL SHELL

When Q.F. 25 pdr. Chemical Shell are fitted with Magnesium Smoke Bag in the head filling a 1 inch square, painted diagonally half white and half black, will be painted on the shell in the same position as the 1 inch green disc and will be in lieu of the same for shell charge Y.18.

716. MINE COMPACT A.T. MK.V. HC.

T.N.T. is the only filling considered suitable for this Mine, and no other filling is permitted.

717. MARKING - SHELL OR S.B. BOMBS.

Head filling particulars will not be marked where the head filling and body charging has been carried out at the same factory within one month of each other.

718. MARKING - S.B. SMOKE BOMBS.

The Mk. II 4.2 inch Smoke Bombs should have the body painted green and the tail coated with approved varnish. Some bombs may have reached the service with the body and tail coated with approved varnish.

719. MARKING - 3 INCH MORTAR SMOKE BOMBS 10 LB.

The letters F.M. or C.S.A.M. have been added to the nomenclature to indicate Titanium Tetrachloride or Chlorosulphonic Acid/Sulphur Trioxide Mixture, respectively, and an additional band is painted on the bombs adjacent to the white band. A Red Band indicates F.M. and a Yellow Band C.S.A.M.

720. MARKING OF CAST IRON SHOT, PRACTICE AND PRACTICE LATHHEADED.

These shot will have a brown ring painted above the red filling ring.

721. BOMB TAIL UNITS 4.2" MORTAR MARKING.

The Tail Units of these bombs will have normalised tubes and vanes without the two slots. Some tails, however, may be made up of normalised tubes and vanes with slots whilst stocks of the latter exist. These will be identified by painting the face of one vane red. The red marking is not placed on tails having normalised tubes and vanes without slots.

722. 25 PDR. H.E. SHELL.

These shell will be filled with Grade I T.N.T. only, except that 40/60 Amatol may be used in exceptional instances but only with the express sanction of D. of A.

723. DEMONSTRATION BOMB.

A supply of the Roberts MacLean Demonstration Bomb has been ordered and some 50,000 have been issued.

724. MARKING - CORDITE PACKAGES.

Cordite packages will have the gross weight of the case, drum and package material, stencilled externally in lieu of the tare weight at present stencilled.

725. 4.2" S.B. MORTAR PRACTICE - BURSTING.

This is charged with calcium chloride and phosphorus and will be marked with the letters "C.C." stencilled above a $\frac{3}{8}$ -inch white band in lieu of the existing marking "CAL C."

726. BOMBS S.B. 4.2" MORTAR.

The guide bands of these bombs of the cylindrical type will be rust-proofed, parkerised or treated in zinc spray, whilst the streamlined type will be Copal Varnished.

727. GENERATOR, SMOKE, NO.25, MK.I /L/ (FIG.293).

The empty body consists of a tinned-plate orterne-plate body, filler plug, bottom, lid and top and a zinc igniter cup. The top and bottom are seamed on and soldered. The igniter cup is soldered to the top and the filler plug is soldered into bottom after filling.

The smoke composition used in this store is P.N.411 or P.N.317. The igniter cup contains P.N.227 in which is embedded the igniter. The igniter is known as Igniter, Electric, No. G.67 and contains two 18-inch lengths of oil and flame proof cable. The igniter is of a low tension electric commercial pattern operating on a 12 volt circuit, fusing current not more than .5 amp. It is marked G.67 on the head. The ends of the wires in the igniter cup are covered with insulating sleeving. The cable passes through two holes in a waxed pulpwood board and is fastened by wire attached to the Generator lid. The holes are sealed with Chattertons compound. The cable is wound round the inside of the lid and a glazed board disc is inserted just inside the lid. The lid is cemented into the top. The lug on the side of the generator is there to prevent the generators rotating in the package.

The Generator is used on armoured fighting vehicles and ignited electrically. The heat of the igniter fuses the igniter cup and the ignited smoke composition emits smoke for 75-105 seconds. A full emission of smoke begins within 5 seconds of ignition.

The Generator is finished Green and bears the nomenclature of store, initials of filling station, date of filling, Lot number and composition number as applicable.

The filler plug is stamped or printed with the following particulars:-
No.25 I. Initials and date of manufacture of Contractor making empty Generators.

Packing.

8 Generators are packed into Box P.60 Mk.I with corrugated cardboard packing pieces.

Stowage size of Box is 19.375" x 12.3" x 5.2".

728. GENERATOR, SMOKE, NO.24, MKS.I, II AND III.

Mk.I. (Fig.294)

This Generator is of tinned-plate, the top and bottom being secured by an approved compound lined joint. The top is fitted with a tear-off strip for ignition purposes.

A 6-inch square of primed cotton cambric or muslin is secured to the underside of lid with shellac adhesive applied around the ignition hole. This is followed by approximately 1½-lb. priming composition and subsequently the main filling of S.R.264A (M) or P.N.307 or P.N.421.

Ignition is carried out by removing the tear-off strip and applying a portfire or fusce. The Generator should emit an effective smoke cloud within 5 seconds of ignition and continue for a period of 11-18 minutes.

The Generator is finished green and stencilled or painted with instructions for igniting, nomenclature, fillers initials, date of filling, lot number and composition number. The bottom of the generator bears the contractor's initials, date of manufacture, No.24 and I.

The overall size of the generator is 8.125" dia. x 10.375".

Packing.

Two generators are packed per crate as shown in Fig.295. Owing to the construction of the generator being of a flimsy nature, instances have occurred of spontaneous ignition due to ingress of moisture. Consequently crates and generators are now being labelled with a label bearing the words:- "Danger handle with care. Fire risk if wet". Care in handling and storage must therefore be exercised.

The overall dimensions of the crate are $24\frac{1}{8}$ " x $9\frac{1}{2}$ " x $9\frac{1}{2}$ ".

Storage.

The generators are placed in Group XI, Category X.

Mk.II. (Fig.296)

This Generator was introduced owing to the flimsy nature of the Mark I design. The body, top and bottom are made of sheet steel of heavier gauge than Mk.I. The top is fitted with a screw neck and cap which is of tinned-plate, terne-plate or sheet steel lacquered.

The top and bottom are secured by an approved compound lined folded joint. The screw cap is fitted with a waxed cardboard or other approved waterproof disc. Inside the neck of the Generator is a primed cotton cambric or muslin disc. The filling is similar to that of the Mark I Generator. To ignite the generator the screw cap is removed and a portfire or fusee is applied.

The generator should emit an effective smoke cloud within 5 seconds of ignition and continue for 11 - 18 minutes.

The generator is finished green and stencilled or printed similar to the Mark I Generator.

The overall size is 8.05 dia. x 12.25 and the weight approx. 42 lb.

Packing.

As this Generator is of a heavier material than the Mark I design and consequently will stand rough usage better. No packing of this generator is being made.

Storage.

As for Mk.I.

Mk.III (Fig.297)

The generator consists of a terne-plate body, and igniter cup, screw neck and screw cap of tinned-plate or terne-plate and a metal handle.

The Top and Bottom are seamed on and soldered.

This Generator is filled with approx. 44 lb. Smoke Composition, of P.N.276 or P.N.314 or P.N.411, the composition being within approx. 1 inch of the top of the screw neck.

The Igniter cup, contains about $1\frac{1}{2}$ ozs. of igniter composition P.N.227. A strawboard washer with a primed cotton cambric or muslin disc secured underneath is cemented into the top of the Igniter Cup.

The screwed cap is fitted internally with a disc of waterproof material and screwed hard home.

Means of Ignition is similar to the Mk.I and II designs. The Igniter cup fuses with the heat of the igniter composition and an effective smoke begins within 15 seconds of ignition and continues for 11 - 18 minutes.

The generator is finished green and printed or stencilled similarly to the Mark I and II designs.

Packing.

A crate similar to that used for packing the Mark I Generator but packing one generator only is used.

It is finished green and comprises 2 ends and 4 slats. Three slats are fixed by hoop iron and nailed, the fourth is screwed into position after packing the generator.

The stowage size of the crate is $9\frac{5}{8} \times 9\frac{5}{8} \times 14\frac{1}{4}$ and the gross weight 54 lb.

Storage.

Similar to Mk.I and II.

729. CARTRIDGES, S.A. TRACER.

A quantity of Cartridges S.A. Tracer .303" G. Mk.II, without base marking, has been accepted for Service. They will be issued packed in belts with .303" Ball Mk.VII in the proportion of 5 Tracer to 19 Ball.

730. SHELL, Q.F., H.E. 2 PDR. MK. I.T. METHOD OF FILLING. (Fig.298)

The shell is filled to M. of F. Design No.DD/L/8747. The shell body is prepared at the base end to receive a Tracer and Igniter, Shell, No.7 or 10 which is screwed in over a copper washer, and at the front end to take Fuze, Percussion, D.A. No.243 which is screwed in and secured by a fixing screw.

A waxed felt washer is positioned on the bottom of the shell cavity and the space around a central cavity is filled with poured T.N.T. The central cavity is lined with a paper tube the split upper end of which is turned over on to the H.E. filling with a waxed felt washer pressed in on top. Between the fuze and tracer are two tracing cloth washers, a 3 dr. T.N.T. exploder pellet, felt disc and a 38 grain powder pellet.

The shell is painted yellow and marked as indicated in the Figure.

731. SMALL ARM AMMUNITION.

In this and the following pages is set out the types of Small Arm Ammunition now in use together with details of the methods of packing, the packages used, with their dimensions and filled weights, also the markings on the cartridges and on the packages. The subject has been dealt with comprehensively and is intended to present a complete picture of the existing position.

Small Arm Ammunition is packed in hermetically sealed tin linings and is impervious to wet or damp so long as the linings remain undamaged. This does not imply that the packages require or should be given less careful attention in storage and transport than other forms of ammunition not packed similarly. Every effort should be made to maintain dry conditions in storage and transport. Wet or damp leads to rusting and destruction of the linings resulting in defective ammunition. Keep the ammunition dry.

Experience and experiment has shown that Small Arm Ammunition will function satisfactorily in extremes of temperature provided it has been given reasonable attention in storage and transport.

The ammunition should be used as issued, i.e. clean and dry. Grit may cause damage to the weapon whilst oil or moisture may cause inaccurate shooting.

With the exception of .303" Incendiary B. Marks IV and IV^x and .303" Observing "O" which are in Group XII all small arm ammunition is classified for storage purposes in Group VI, the Category for explosive risk being X for Ball, tracer, and Armour Piercing, Y for incendiary and Z for H.E./Incendiary or H.E. Small Arm Ammunition of the Ball and Tracer types, including Armour Piercing come within the Home Office definition of Safety Cartridges which permits of their being despatched, in Service Packages by Passenger Train in Great Britain and Northern Ireland.