

AMMUNITION BULLETIN Nº 38

ITEMS 920-956

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DECEMBER 1943

PRINTED & ISSUED BY
THE CHIEF INSPECTOR OF ARMAMENTS.

MINISTRY OF SUPPLY

AMMUNITION BULLETIN NO. 38.

Issued by:-

Chief Inspector of Armaments.Item No.

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ITALIAN

- 956 Grenade, hand, H.E., O.T.O. Model 35.

AMENDMENTS.

Bulletin No.12, Item 118.

Page 5. Delete the detail under heading "Method of treating Phosphorus Burns" and substitute "See Bulletin No. 38, Item 928".

Bulletin No.34, Item 793.

Table of cartridges, B.L. 7.2 in. Howitzer, Page 18. Against DD(L)13658A in Col.4, amend weight of No. 3 Section (FMH/P.073) to read "8 lb. 8 oz. 0 dr."

920. CARTRIDGES, Q.F., PACKAGE MARKINGS.

Reference Bulletin No.37, Item 889, covering the omission of the letter "Q" from stencilling on packages of 3.7 in. A.A. cartridges containing "Q" primers, approval has now been given for this to be extended to cover all Q.F. cartridges. With effect from 1/11/43 the letter "Q" will cease to be stencilled on any packages containing Q.F. cartridges. The base stampings on "Q" primers remain unaltered.

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

Reference Bulletin No.34, Item 783. Approval for the use of Pentolite as an alternative to C.E. for the magazine of the abovementioned fuze has now been withdrawn. Item 783 should therefore be deleted.

922. DETONATOR, NO.66 Mk.II.

Reference Bulletin No.30, Item 579. The No.66 Mk.II detonator has been approved for use in Infantry Projector, A/T bombs. The detonator tube is of aluminium with a concave base and contains a pressing of approx. .50 grammes P.E.T.N.

Dimensions are 1.69 x .24 inches.

923. DETONATOR NO.78 Mk.I.

The abovementioned detonator has been approved and is for use with the No.82 Grenade (see Bulletin No.35, Item 808). It consists of a No. 3 (Trade pattern) aluminium tube with concave base and contains a No. 6 filling in two pressings, one of approx. 3.9 grains Tetryl and one of approx. 5.4 grains A.S.A.composition. Dimensions are 1.02 x .26 inches.

Packing. The packing of this detonator is similar to that described for the No.63 detonator in Item 808 referred to above.

924. CARTRIDGES, Q.F., 25 lb. - SUPER CHARGE INCREMENT.

Reference Bulletin No.34, Item 794, page 20. Approval has been given for the re-instatement, for India, of the Super charge increment of 5 oz. Cordite W.M.061, in cambric bag, for use with the 20 lb. A.P. shot.

925. CARTRIDGE, S.A., DRILL, .303 in. - BASE MARKINGS.

Approval has been given for the omission of base markings on .303 in. drill cartridges, as a war time measure.

926. FUZES, VARIOUS - OBSOLETE OR OBSOLESCE.

Sentences, as shown below, for various fuzes used in Imperial Service, have been approved :-

<u>Fuze No.</u>	<u>Mark</u>	<u>Sentence</u>
11	All Marks	Obsolete
12	Mks.I - X (incl.)	Obsolete
	Mk.XI.	Obsolescent
12	Special, Mk.XI.	Obsolescent
12F	" Mk.IX.	Obsolete
12F	" Mk.XI.	Obsolescent
13	All Marks.	Obsolete
15	Mk.VI.	Obsolescent
16	Mk.IV.	Obsolescent
16D	Mks.II, III & IV.	Obsolescent
18	All Marks	Obsolete
44	Mks.I - IX.	Obsolete
44	Mks.X - XI.	Obsolescent
45	Mks. I - VIII.	Obsolete

Fuze No.	Mark	Sentence
45	Mk. I - X	Obsolescent
45P	All Marks.	Obsolescent
80/44	All Marks	Obsolescent
88	All Marks	Obsolescent
450	All Marks	Obsolescent
450P	All Marks	Obsolescent
500	All Marks	Obsolescent

927. GRENADE, HAND, NO. 75 A/T, Mk. II. (FIG. 369).

The body, neck and screwed cap of this grenade are similar to the Mk. I, described in Bulletin No. 23, Item 373, but the detonator holders, instead of being parallel to each other as in the Mk. I, are arranged to form a "Y" with a bridge piece separating the upper ends. A small slot, to take a securing pin, is also cut near the top of the outer side of each detonator holder.

The striker plate of the Mark II is secured over the detonator holders in a similar manner to the Mk. I, but the plate is formed with a centre longitudinal corrugation and assembled with the convex side away from the grenade body, it is not shaped to form a striker as in the Mk. I.

The following fillings may be used :-

- (a) Nobel's explosive No. 704B and 4 exploders.
- (b) Burrowite and 4 exploders.
- (c) $\frac{1}{3}$ Burrowite and $\frac{2}{3}$ explosive No. 704B.

A waxed felt washer is inserted in the neck of the grenade to seal the filling.

The exploders, when required by the appropriate filling, are positioned in the bottom of the grenade body and consist of Polar Dynamite 25% N.G., each in a waxed paper wrapping, 3 in. long and $\frac{7}{8}$ in. in diameter.

Filled weight of the grenade is approx. 2 lb. 4 oz.

Painting and Marking.

The grenade body is painted Service Brown and has two red crosses indicating suitability for hot climates, painted on the top, one each side of the neck. When filled Burrowite and 4 exploders the top of the screwed cap is painted pink.

Empty markings stamped on the side of the body:-

"No. 75 II"
Contractor's initials or recognised trade mark.
Month and year of manufacture.

Filled markings stencilled on the base :-

"704B & 4 EXPRS")
"BUR & 4 EXPRS") As applicable
" $\frac{1}{3}$ BUR $\frac{2}{3}$ 704B")
Monogram of firm or filling station.
Month and year of filling.
Lot number.

Igniter, Special, No. 1 Mk. I.

Details of this igniter, two of which are used with the Mk. II Grenade are included in Fig. 369.

It comprises a No. 27 Detonator, a plastic igniter body and a steel striker pin. The open end of the detonator is secured to the igniter body with approved cement and the igniter is bored to accommodate a glass

capsule containing approved composition and a steel striker pin, the latter protrudes from the igniter body to which it is secured by approved cement. The boring in the igniter body containing the capsule is sealed with approved composition.

Marking. The following marking is moulded on the end face of the igniter body:

"IGNITER NO.1 I"
Contractor's initials or recognised trade mark.
Year of manufacture.

Action. Two igniters are inserted in the pockets provided on the grenade body, with the striker pins adjacent to the striker plate, and retained in position by the securing pin. Movement of the securing pin is prevented by passing one end of the short length of twin provided through an eye in the pin and thence through the bridge piece, the ends being then tied together.

When sufficient pressure is brought to bear on the striker plate or grenade body to depress one, or both striker pins, the glass capsule is pierced and the detonation of the grenade initiated.

Packing. 12 Grenades Mk.II and 1 tinmed-plate Box No.376 holding 24 Igniters, Special, No.1 are packed in the steel box G.70 which is fitted with 1 Shield, packing, No. 4 Mk.I. The Box 376 is marked "IGNITERS."

Estimated filled weight of package is 40 lb. and stowage dimensions are approx. 19.2 x 8.4 x 7.9 inches.

PHOSPHORUS BURNS - TREATMENT OF.

Reference Bulletin No.12, Item 118. The following is substituted for the detail under heading "Method of treating Phosphorus Burns" on page 5 :-

I. At the Incident.

(i) Apply water immediately to the affected part, to extinguish any burning phosphorus and to keep the area moist (water from the water-bottle may be used for this purpose).

(ii) Apply a clean mines dressing, or clean lint, or clean cloth soaked in water over the burn. Whatever dressing is used it must be kept wet, as otherwise it may burst into flame.

(iii) With the wet dressing in place, the casualty, if a sitting case or able to walk, should be conveyed or directed at once to the nearest Regimental Aid Post or Medical Establishment for further treatment.

(iv) Stretcher cases must be sent direct to a hospital with the least possible delay. To ensure immediate attention at the hospital, these casualties must be labelled, and the label marked with a P. The attention of the ambulance attendant must be drawn to the case.

II. At the Regimental Aid Post or Medical Establishment.

(i) Immerse the affected part in water, or, if sufficient water is not available, apply a mines dressing soaked in water. Keep the dressing wet until the following treatment can be applied.

(ii) Thoroughly flood and wash the affected area with bicarbonate of soda solution (roughly two tablespoonsful of the powder to a pint of cold tap water). Pick off with forceps any obvious particles of phosphorus, disclosed by examination in the dark (phosphorescence).

(iii) Swab the affected area with a 1 per cent solution of copper sulphate, which will coat any remaining phosphorus particles with a dark deposit of copper phosphide. Remove, with forceps or gauze, as much of this as is possible without damaging the tissues.

(iv) Immerse the affected area in the bicarbonate of soda solution for a prolonged period. The duration of this soaking depends upon the size and depth of the burn - i.e., small burns $\frac{1}{2}$ hour, large burns 1 to 2 hours. If immersion is impossible keep the sterile dressing repeatedly wetted with the bicarbonate solution.

(v) Finally, re-examine the burn in the dark for phosphorescence. If this is not present, dress as for an ordinary burn. If there is still any doubt about the presence of phosphorus, dress the burn four-hourly with lint soaked in sodium bicarbonate solution (2 tablespoonsful to the pint of water) and retain the patient (if at a Medical Establishment). No oils or greasy dressings and no tannic acid, triple dye or brilliant green must be used in the treatment of phosphorus burns so long as any trace of phosphorus remains in the tissues.

Oils and greases are solvents of phosphorus and their use while it is present will cause risk of poisoning from absorption.

929. CARTRIDGES. Q.F. 6 pr. 7 cwt. WITH SHELL. H.E. 6 pr. 10 cwt. MK. X T. IDENTIFICATION MARKINGS.

In order to distinguish the above complete round from the complete round fitted with 6 pr. 7 cwt. shell the following identification markings have been approved:-

- (a) Complete round. The word "HYBRID" to be stencilled in silver nitrate on the side of the cartridge case in $\frac{1}{2}$ in. letters.
- (b) Batch label. Labels to be overprinted in red $\frac{1}{2}$ in. type with the word "HYBRID".
- (c) Packages. Box C.264. The word "HYBRID" to be stencilled in red on top in $\frac{3}{4}$ in. letters and the letter "H" in $\frac{3}{4}$ in. red stencilling on each end of the box.
Box C.263A. The word "HYBRID" to be stencilled in red on both sides of box after the letters "H.E." in $\frac{3}{4}$ in. letters, and the letter "H" to be stencilled in red on each end of box in $\frac{3}{4}$ in. letters.

930. AMERICAN S. & W. S.

Records of small arms cartridges (except 20 m.m.) the cases of which are made from steel will, in future, have the letter "S" between the manufacturer's initials and the lot number, e.g. F.A. S. 502.

For 20 mm. the letter "X" will have the same significance but will be placed after the lot number, e.g. F.A. 502 X.

This marking will also appear on all boxes containing such ammunition.

931. PROPELLANT CODE LETTERS.

Reference Bulletin No. 32, Item 635 (Part III(b)) and similar references elsewhere in the series of Bulletins. The marking of the propellant code letter on all B.L. and Q.F. cartridges, and their packages will be discontinued and replaced by the letters indicative of the type of propellant, e.g. W.M., F.Q., F.N.H. etc.

The colour of stencilling remains unchanged, but the propellant letters will not be enclosed in a rectangle.

CHARGE, DEMOLITION, NO.3, 15 lb. Mk.I. (FIG. 370)

This demolition charge, formerly known as the Charge, Demolition, Hayrick, Mk.I, comprises a mild steel body containing the H.E. filling with a blast plate fitted internally to give a hollow charge effect, and carries at one end a support to take the fuizing arrangement.

The body is rectangular in shape, one end being open and formed with flanged end plates, while the opposite end is shaped to an apex and carries two detonator sleeves, a sealing plate and the fuze support. About $6\frac{1}{4}$ in. from the open end of the body two indents are made in each end plate to locate the mild steel blast plate which is secured in position inside the body by welding. A $\frac{1}{2}$ in. diameter hole is drilled in each side plate near the underside of the apex of the blast plate to provide an outlet should water enter the open end.

The bursting charge is Pentolite 25/75 with two 1370 grain wrapped C.E. pellet exploders positioned in the top of the filling and sealed with waxed felt washers. Each pellet has a central perforation to take the copper detonator sleeve and a No.27 Detonator. The charge is closed by a waxed millboard sealing plate over which is positioned the fuze support, the two being secured to the body of the charge by 6 screws which enter 6 hank bushes secured in the body. Two corresponding holes are prepared in the sealing plate and base of the fuze support for the insertion of the detonators into the detonator sleeve, the holes being covered by a paper disc shellacked and secured to the fuze support.

The fuze support, of mild steel, is provided with two angular holders, or clamps, positioned over the detonator holes to secure a length of safety fuze, the latter being clamped in the holder by a screw and wing nut.

Overall dimensions of the charge are L.11 $\frac{1}{2}$, W.6, H.17 $\frac{1}{2}$ inches. Estimated weight, filled, is 27 $\frac{1}{2}$ lb.

Painting and Marking.

The charge is painted Service Brown and bears the following markings on one end plate. Stencilling is in yellow unless otherwise stated :-

"CHARGE
DEMOLITION
No.3 15 lb. Mk.I"

Two $\frac{1}{4}$ in. green bands enclosing a $\frac{1}{4}$ in. black band with "25/75" stencilled in white on the black band.

A row of red crosses indicating suitability for hot climates.

Filled Lot Number enclosed in a 1 in. dia. circle.

Monogram of filling station and Month and Year of filling.

Packing.

Two charges, without detonators and safety fuze, are packed in a wood Box, Charge, Demolition No.3, W.116 Mk.I with the open ends uppermost. Stowage dimensions are approx. L.15.75", W.14", H.20.4" and estimated weight, filled, is 92 $\frac{1}{2}$ lb.

The detonators and safety fuze are packed separately.

CARTRIDGES, M.L. 2 INCH MORTAR, 52 and 47 GRAIN 81 MM. POWDER - NOMENCLATURE.

The above cartridges, for production in North America, have been allocated nomenclatures as under. These new cartridges are ballistically identical to the 55 grain Ballistite cartridge.

- (i) Cartridge, M.L. 2 inch Mortar, 52 grain 81 mm. powder, Mk.I/L.
For bombs fitted with zinc or steel tails; North American production.
- (ii) Cartridge, M.L. 2 inch Mortar, Smokeless, 47 grain 81 mm. powder, Mk.I/L. For bombs fitted with zinc or steel tails; North American production.

934. SWITCHES NOS. 1 to 11.

The following is a list of Switches, known in the past as Trip Mechanisms, Booby Trap Devices, etc. which have been approved for Land Service uses. They are classified under a numerical series which, to date, comprises the following:-

Switch No.	Type	Switch No.	Type
1	Pull	7	Pressure/Pull
2	Pressure	8	A/P.
3	Release	9	L. Delay
4	Pull	10	Time Pencils
5	Pressure	11	Contact Electric
6	Release		

All switches and their packages will bear the designation "SWITCH NO.....", which may be stamped, overprinted or otherwise marked on existing labels until such time as new labels are available. Packages will also bear C.I.A. sealing labels.

935. CARTRIDGES, Q.F. 75 mm. GUNS. PACKING OF AMERICAN A.P.C. ROUNDS.

Reference Bulletin No.29, Item 555 and Bulletin No.30, Item 575. Latest information indicates that American Q.F. 75 mm. cartridges with Shot, A.P.C. M.61, are now being packed 4 rounds, each in a fibre container, in a wood box, instead of 3 rounds in a "clover leaf" type clamp.

The box is of the end opening type, the loose end being secured by a central rod and wing nut. Stowage dimensions are 33 x 10 x 9½ inches.

936. BOX, AMMUNITION, Q.F. 75 mm. C.283, Mk.I.

The above wood box, for North American production, has been approved. It is designed to hold 4 rounds Smoke Emission (Tank), each in Container M.21, or 4 rounds H.E. with Mk.I shell, each in Container M.21. Stowage dimensions are :- 29.5 x 10.25 x 10.1 inches.

937. NOBELS RIFLE NEONITE - SYSTEM OF NOMENCLATURE.

1. In the absence of Service Nomenclature, the following system will be adopted:-

A. For small bore S.A. Weapons :-

- (a) N.R.N. No.9 - Unmoderated Flake.
- " " 10 - Unmoderated Tube.
- " " 11 - Moderated Flake.
- " " 12 - Moderated Tube.

- (b) If manufactured with Metallic Tin add 10 to (a).
- (c) If manufactured with Organic Tin add 20 to (a).

B. For large bore S.A. Weapons:-

Add 100 to A.

- 2. N.R.N. No.12 (uncoated) should in future be called N.R.N.No.9.
- 3. The word "uncoated" should not be used to describe an unmoderated propellant.

Example: N.R.N. 119 is a graphited small flake powder containing metallic tin and is unmoderated.

938. SHELL, Q.F., H.E., 40 mm. MARK II, T. MODIFICATION TO TRACER CAVITY.

Design DD(L)9386A of the abovementioned shell has been amended to provide for the threads of the tracer cavity to be modified to take the No.11 or No.12 tracer.

A number of shell of Canadian manufacture with Tracer cavity modified as above will be filled for innocuous practice to Design DD(L)14107. These shell will be identified by being painted black above the driving band and white

below the driving band.

939. SLAB, DEMOLITION, C.E./T.N.T. MK. II AND USES OF MKS. I & II SLABS. (FIG. 371)

The Mk. II C.E./T.N.T. slab has been approved. It differs from the Mk. I slab (described in Bulletin No. 36, Item 845) in the position of the two primer sockets. Fig. 371 illustrates the position of the primer sockets in both the Mk. I and Mk. II slabs and the container marking labels.

These slabs are used for general demolition purposes by R.E.'s and are classified as Group I for storage.

940. FUZE TIME NOS. 207 AND 208, PRECAUTIONS TO BE TAKEN DURING ASSEMBLY INTO COMPLETE ROUNDS.

This fuze requires careful handling during assembly into complete rounds to prevent damage and alteration of setting, especially as there is no fuze cover fitted.

The fuze should be screwed into the shell by hand gently for two complete turns only of the thread, care being taken that the setting is not disturbed.

Completion of the tightening should be carried out using the special key and no further hand screwing is permitted. Great care is required to ensure that the key is fully home in the slots of the fuze body, and in tightening, it is essential that (a) the key is not allowed to slip out of position and (b) the key must be kept square so that no lateral strain is imposed on the fuze slots.

If the key is not kept square and fully home it has been found that the metal around the slots is liable to distort, and this displacement of the metal increases the tensioning of the fuze so that wrong settings are given in the fuze setting machines.

The setting should be checked by means of a setting key to ensure it is set at SAFE.

941. CARTRIDGE, Q.F. 90 mm WITH SHELL, H.E. M. 71 FOR GUN M1 (AMERICAN). (FIG. 372)

This fixed Q.F. round is used for L.A. purposes and may also be used, with a different fuze, in an anti-tank role. The complete round consists of the following components :-

Primer, percussion, M. 28A2, is a 300 grain primer of the "push in type." Details of the difference between this primer and the M. 28A1 (see Bulletin No. 24, Item 394) are not yet available.

Case, cartridge, M. 9 (brass) is described in Bulletin No. 24, Item 394. The M. 9B1 case, which is of steel, may be used.

Propellant. The propellant charge consists of 7.31 lb. N.H. powder.

Shell, H.E. M. 71. The shell is streamlined at the base and is fitted with a gilding metal driving band and a base cover plate of steel. Below the driving band is a groove for the attachment of the cartridge case by indenting and a bakelite fuze well cup is fitted in the nose. The following bursting charges are used :-

- | | | |
|-------|--------------|--|
| (i) | Cast T.N.T. | Approx. 2 lb. |
| (ii) | Anatol 50/50 | " 1 lb. 12 $\frac{1}{2}$ oz., with T.N.T. surround |
| (iii) | Trinonite | " 2 lb. 1 $\frac{1}{2}$ oz. |

The shell is painted yellow and bears the following markings in black:- "90G"; Nature of filling; "SHELL M. 71". Punch marks around the nose indicate the filled weight. Weight zone details are as follows:-

Zone	WEIGHT		Punch Marks
	Over lb.	Up to and including lb.	
1	20.76	21.09	1
2	21.09	21.42	2
3	21.42	21.75	3

NOTE:- According to information in American ammunition publications H.E. shells are now painted olive drab with stencilled markings in yellow. The drawing of the above shell, however, shows the painting to be yellow with black markings.

Booster, M20A1. See Bulletin No.31, Item 603.

Fuze, Time, mechanical, M43A3. Used for A.A. Particulars of the difference between this fuze and the M43A1 (see Bulletin No.24, Item 395) are not yet available.

Fuze, P.D. M48. Used for anti-tank purposes. Fuze is described in Bulletin 1 24, Item 393. The overall length of complete round is 37.44 inches.

Packing. 4 complete rounds, each in a Container M53, are packed in a wood box. Details of this box and filled weight are given in Bulletin No.34, Item 777. Stowage dimensions are 43.5/8 x 13 x 13 inches.

942. A.P. SHOT - ATTACHMENT OF PENETRATIVE AND BALLISTIC CAPS.

Reference Bulletin No.33, Item 712. Designs of the undermentioned shot have been amended to provide for the notching for penetrative and ballistic caps to be deleted :-

DD(L)14729. Shot, A.P.C.B.C., Q.F., 2 pr. Mk.IX B.T.

DD(L)14731. Shot, A.P.C.B.C., Q.F., 6 pr. 7 cwt. Mk.X T and XV T.

DD(L)14481A. Shot, A.P.C., Q.F., 6 pr. 7 cwt. Mk.VIII and XIV T.

943. FUZE, PERCUSSION, D.A. NO.117 MK.VIII.

Reference Bulletin No.36, Item 879. Fuze No.117 incorporating an aluminium striker and striker head, but otherwise similar to the Mark IIIA, will be designated Mk.VIII.

944. CHEMICAL STORES.

Reference Bulletin No.32, Item 660. The following stores have been declared "Obsolescent" in lieu of "Obsolete" :-

Shell, B.L. Chemical bursting, 6 in. howitzer light
Mks.XI, XII/V and XIII/IX.

Shell, Q.F. Chemical, B.E. Streamline Mk.ID.,
bursting, streamline 25 pr. Mk.ID and IID.

Shell, Q.F. chemical bursting, 4.5 in. howitzer, Mk.XII.

945. BOX, NO. 75 A/T GRENADE, NO. G.111 Mk.II.

The abovementioned steel box has been approved. It is designed to hold 4 Grenades, No.75 A/T Mk.I with 8 Igniters and 8 Detonators packed in two separate tinned-plate Boxes No.412 Mk.I.

Stowage dimensions are 13 x 8.3 x 4.5 inches and estimated weight, filled is 14 lb.

946. GRENADE, HAND, NO.75 - FILLINGS.

1. The following have been cancelled as fillings for both the Mk.I and II Grenades :-

- | | |
|---|------------------------------------|
| (a) Nobel's explosive No.704B (without exploders) | } See Bulletin No.23,
Item 373. |
| (b) Military Ammonel and 4 exploders. | |

2. An alternative filling of one third Burrowite and two thirds explosive No. 704B has been approved.

3. The use of Nobel's explosive No.673 as an alternative exploder has been discontinued (see Bulletin No.35, Item 821).

947. CARTRIDGES, B.L. 4.5 in. GUN.

The following table gives particulars of existing cartridges, B.L. 4.5 inch Gun, and their packages :-

Filled Design No.	Cartridge	Arrangement	Nominal Weight lb. oz. dr.	Packages and dimensions	Filled Weight (approx) lb. oz.
DD(L)8202	9 lb.2 oz.Cordite W.124 Mk.I Foil. 9 lb.2 oz.Cordite W.M.124 Mk.I Foil. 9 lb.2 oz.Cordite S.C.109 Mk.I Foil. 9 lb.2 oz.Cordite W.M.130 Mk.I Foil. (Charge 3)	Charge 2 and 1 increment tied together.Igniter B.L.4.5 in.B.	Charge 2 6 7 0 Increment 2 11 0 9 2 0	Box, Cartridge, C.224 to hold 6, each in Container Ctge.No.4 Stowage dimensions:- 24.7 x 15.25 x 10.2 inches	87 0
DD(L)8723	2 lb.15 oz.Cordite W.057 Mk.I. 2 lb.15 oz.Cordite S.C.048 Mk.I. 2 lb.15 oz.Cordite W.M.061 Mk.I. (Charge 1)	Charge 1 with Igniter B.L. 4.5 in. 'A'.	Charge 1 2 15 0	Box, Cartridge, C.224 to hold 6, each in Container, Ctge. No.4 with packing pieces. Stowage dimensions:- (See above)	71 0
DD(L)10794	3 lb.3 oz.4 dr.Cordite H.Q.045 Mk.I. (Charge 1)	Charge 1 with Igniter B.L.4.5 in. 'A'	Charge 1 3 3 4	Box, Cartridge, C.224 to hold 6, each in Container Ctge. No.4 with packing piece. Stowage dimensions:- (See above).	72 8
DD(L)10795	9 lb.13 oz.Cordite H.7/S 173-048 Mk.I Foil. (Charge 3)	Charge 2 with 1 G.12 igniter at each end, and 1 increment tied together	Charge 2 6 14 0 Increment 2 15 0 9 13 0	Not yet clear	- -
DD(L)12499	3 lb.5 oz.8 dr.H.H.025 Mk.I. (Charge 1)	Charge 1 with 1 oz.G.12 Igniter.	Charge 1 3 5 8	Not yet clear	- -
DD(L)12855	10 lb.12 oz.H.H.090 Mk.I Foil. (Charge 3)	Charge 2 and 1 increment tied together. Igniter 1 oz. G.12.	Charge 2 7 12 0 Increment 3 0 0 10 12 0	Box, Cartridge, C.229 to hold 5, each in Container, Ctge. No.52. Stowage dimensions:- 25.4 x 17.6 x 10.3 inches.	78 -

Filled Design No.	Cartridge	Arrangement	Nominal Weight lb. oz. dr.	Packages and Dimensions	Filled Weight (Approx.) lb. oz.
DD(L)15775	3 lb. 1 oz. Cordite M. I. 050 Mk. I. (Charge 1)	Charge 1 with Igniter B. L. 4.5 in. 'A' on head and Igniter 1½ oz. G. 12 around stalk.	Charge 1 3 1 0	Box, Cartridge, C. 224 to hold 6, each in Container Ctge. No. 4 with packing piece. Stowage dimensions:- (See above)	71 8
DD(L)15776	10 lb. 9 oz. Cordite M/S 164-048 Mk. I Foil (Charge 3).	Charge 2, with 1 G. 12 igniter at each end, and 1 increment tied together.	Charge 2 7 9 0 Increment 3 0 0 10 9 0	Not yet clear	- -
DD(L)16279	3 lb. 8 oz. 8 dr. P. M. H. 023 Mk. I. (Charge 1)	Charge 1 with 2, 1 oz. G. 12 Igniters.	Charge 1 3 8 8	Not yet clear	- -

948. CARTRIDGES, B. L., 5.5 in. GUN.

The following table gives particulars of existing cartridges, B. L. 5.5 in. Gun, and their packages :-

Filled Design No.	Cartridge	Arrangement	Nominal Weight lb. oz. dr.	Package and dimensions	Filled Weight (Approx.) lb. oz.
DD(L)9759	4 lb. 4 oz. Cordite W. 057 or W. M. 061, Mk. I. (Charge 2).	Charge 1 and 1 increment tacked together. Igniter 5.5 in. 'D'.	Charge 1 2 10 8 Increment 1 9 8 4 4 0	Box, Cartridge, C. 239 to hold 10, each in Container, Ctge. No. 28. Stowage dimensions:- 25.4 x 17.6 x 10.3 inches.	77 8
DD(L)9878A	9 lb. 2 oz. Cordite W. 104 or W. M. 109, Mk. I Foil (Charge 4).	Charge 3 and 1 increment tied together. Igniter 5.5 in. 'D'.	Charge 3 6 10 8 Increment 2 7 8 9 2 0	Box, Cartridge, C. 224 to hold 6, each in Container, Ctge. No. 4. Stowage dimensions:- 24.7 x 15.25 x 10.2 inches.	87 0
DD(L)10612	9 lb. 13 oz. Cordite M/S 164-048, Mk. I Foil (Charge 4)	Charge 3 with 1, 1 oz. G. 12 Igniter at each end and 1 increment together	Charge 3 7 3 0 Increment 2 10 0 9 13 0	Box, Cartridge, C. 255 to hold 6, each in Container, Ctge. No. 39. Stowage dimensions:- 25.1 x 16.4 x 10.75 inches	99 8
DD(L)12245	5 lb. M. H. 025 Mk. I. (Charge 2).	Charge 1 and 1 increment tacked together. Igniter 1 oz. of G. 12	Charge 1 3 1 0 Increment 1 15 0 5 0 0	Box, Cartridge, C. 239 to hold 10, each in Container, Ctge. No. 28. Stowage dimensions:- (See above)	82 8

Filled Design No.	Cartridge	Arrangement	Nominal Weight lb. oz. dr.			Package and dimensions	Filled Weight (approx) lb. oz.	
DD(L)12246	10 lb. 14 oz. 8 dr. M.I. 047 Mk. I Foil (Charge 4).	Charge 3 and 1 increment tied together. Igniter $\frac{3}{4}$ oz. of G.12.	Charge 3	7	13	0	Not yet clear	- -
			Increment	3	1	8		
DD(L)12464	4 lb. 8 oz. Cordite S.C.048 Mk. I. (Charge 2)	Charge 1 and 1 increment tacked together. Igniter 5.5 in. 'D'.	Charge 1	2	14	8	Box, Cartridge, C.239 to hold 10, each in Container	77 8
			Increment	1	9	8	Ctge. No.28.	
				4	8	0	Stowage dimensions:- (See above)	
DD(L)12465	9 lb. 8 oz. Cordite S.C.103 Mk. I Foil (Charge 4)	Charge 3 and 1 increment tied together. Igniter 5.5 in. 'D'.	Charge 3	7	1	0	Box, Cartridge, C.224 to hold 6, each in Container, Ctge. No.4.	91 0
			Increment	2	7	0	Stowage dimensions:- (See above)	
				9	8	0		
DD(L)13496	22 lb. 8 oz. 10 dr. Cordite W.M.152 Mk. I Foil (Full Charge). (Mk. I Gun).	$\frac{2}{3}$ Charge and $\frac{1}{3}$ charge laced together. 2 Igniters. 5.5 in. 'C' and 2 Igniter covers.	$\frac{2}{3}$ Charge	15	0	7	Cylinder, Cartridge, No.57 to hold 1 in Container, Ctge. No.68	- -
			$\frac{1}{3}$ Charge	7	8	3	Stowage dimensions:- 37.2 x 7.85 inches.	
				22	8	10		
DD(L)14607	5 lb. 5 oz. F.M.M. 023 Mk. I (Charge 2)	Charge 1 and 1 increment tacked together. Igniter 1 oz. of G.12.	Charge 1	3	5	0	Not yet clear	- -
			Increment	2	0	0		
				5	5	0		
DD(L)16776	4 lb. 12 oz. Cordite F.C. 050 Mk. I. (Charge 2)	Charge 1 with 1, 1 oz. G.12 Igniter at each end and 1 increment tied together	Charge 1	2	15	0	Box, Cartridge, C.239 to hold 10, each in container, Ctge. No.28.	80 0
			Increment	1	13	0	Stowage dimensions:- (See above)	
				4	12	0		
CARTRIDGES FOR 80 LB. SHELL IN M. III GUN:-								
DD(L)14715	11 lb. 8 oz. Cordite W.M. 130 Mk. I Foil (Full Charge).	1 Cylindrical bag Igniter 5.5 in. 'H'.	Full	11	8	0	Box, Cartridge, C.255 to hold 6, each in Container, Ctge. No. 39.	110 0
			Charge				Stowage dimensions: (See above)	
DD(L)16407	12 lb. 9 oz. Cordite I/S 164-048 Mk. I Foil (Full Charge)	1 Cylindrical bag with 1, 2 oz. G.12 Igniter at each end.	Full	12	9	0	Box, Cartridge C.1 to hold 6 (temporary package). No ctge. container.	121 8
			Charge				Stowage dimensions:- 26.25 x 17.9 x 17.5 inches.	

GERMAN AMMUNITION949. GERMAN AMMUNITION MARKINGS AND NOMENCLATURE.

The following markings and designations, additional to those given in Bulletin No.31, Item 634, have been met with in the course of examining captured German Ammunition :-

General

The letters "VZ" in the designation of ammunition of Czech origin is the abbreviation for mark or model.

Fuzes

The letter "S" with an oblique stroke immediately in front of the fuze number was given in Bulletin No.31 as an indication of a mechanical time fuze. The same marking has since been found on time fuzes of the combustion type and thus indicates a time fuze of either type.

The stamping "Fg¹" or "F1" following an oblique stroke after the fuze number on a mechanical time, or time and percussion, fuze indicates the time mechanism to be of the centrifugally operated Jungheut¹ type.

The following letters included in the designation of nose fuzes indicate:-

"J.Gr.Z"	Percussion fuze for light infantry gun or howitzer shell. This appears to be an alternative to the abbreviation "L.I.gr.S" given in Bulletin No.31.
"Lg.Zdr.S/"	Time fuze for star shell.
"s.l.gr Z"	Percussion fuze for heavy infantry gun shell.

The abbreviation "Geb" indicates that the fuze is for a mountain equipment.

Projectile Nomenclature.

The dimensions included in the designation of spigot mortar bombs is the diameter of the bomb and is not, as in the case of British nomenclature, the diameter of the spigot of the mortar.

The abbreviation "Lg" is used to indicate star shell.

Projectile Markings.

Star shell, painted a shade of green (lighter than the deep olive green in common use) with a yellow band above the driving band and a black tip have been met with. This may be a naval shell.

H.E. and smoke mortar bombs may be painted a deep olive green as an alternative to the dull red as given in Pamphlet No.6

Bands

The red band above the driving band, referred to in para. 8 (b) of Item 634, is also found on shell without tracers. The significance of this band is not yet apparent.

Stencilling

The Arabic numerals stencilled on the head of H.E. and hollow charge shell to indicate the nature of filling are also used on mortar bombs and on piercing shell. On black piercing shell the stencilling is normally in red. The following additional numerals have been met with or reported :-

<u>Stencilling</u>	<u>Indication</u>
15	T.N.T./Aluminium 90/10
17	T.N.T./Aluminium 90/10
33	P.E.T.N./Wax 85/15
86	Ethylene diamine dinitrate
92	Cyclonite/wax 90/10

The letters "PL" are stencilled on shell of Czech origin to indicate pentol

The following abbreviations are used on labels to indicate the various nature of high explosives :-

Fp 02	-	T.N.T.
Fp 60/40	-	Amatol (The first numeral indicates the percentage of T.N.T.)
Gr 88	-	Picric Acid.
H	-	Cyclonite (A numeral after the letter indicates the percentage of wax).
Np	-	P.E.T.N. (A numeral after the letters indicates the percentage of wax).

The letters "F.E.S." stencilled in white above the driving band and, in some instances, on the base of the shell indicate the driving band to be wholly of iron.

Cartridges.

The following additional abbreviations in the designations marked on cases, bags and labels have been found :-

Nz Gew.	Indicating a small arms nitrocellulose powder stabilized with diphenylamine and including ethyl carbamate, ethyl centralite and potassium sulphate.
Nz Man	Indicating a nitrocellulose powder including potassium nitrate and graphite.
Kr.R.	Indicating a central supporting tube of propellant, of comparatively larger dimensions, used as a core and support in the arrangement of the propellant charge. The size (length x external diameter x internal diameter) is given in millimetres in the form "(345.14/12)".
N.P.	Indicating solid cylindrical granular propellant. The size (length x diameter) in millimetres is given in the form "(1,5.1,5)".
Pl.P.	Indicating propellant in the form of comparatively large diameter discs with multi perforations. The size (diameter x thickness) in millimetres is given in the form "(50.0,2)".
Stb.P.	Indicating propellant in the form of small cylindrical grains. The size (length x diameter) in millimetres is given in the form "(0,8.0,8)".

Code letters for the identification of the shape of Digl. propellant in sectional charges of the howitzer type are met with on charge bags, labels and packages. The letters used and their significance are as follows:-

D	Digl. propellant in the form of flakes or perforated discs (washer form).
DR	Digl. propellant in tubular form.
DST	Digl. propellant in strip form.

These letters are found adjacent to the number of the charge section on the bags (See Fig. 263 in Bulletin No. 31), in bold lettering on labels and stencilled in white on the package, usually on the lid.

The letters "o.B.D.", stencilled in black on the side of the case of a fixed Q.F. round are used to indicate the absence of a decoppering agent from rounds in which this component is normally used.

Standard Charge Temperatures.

The red stencilling "Abgebr. Ldg." on the side of a cartridge case (referred to in Bulletin No. 31, page 30, sub. para (VII)) indicates that the weight of the propellant charge has been reduced for use in hot climates. The standard temperature on which the reduction is based is indicated by the stencilling "SchuBtafelm P.T. + 60°C", also in red. This standard was superseded by that of 25°C.

950. GERMAN SHRAPNEL MINE 35
(S.M. 35)
 Fig. 373

The mine, containing shrapnel bullets and a bursting charge of H.E., is operated by a contact pressure fuze or by pull igniters with trip wires and is projected about 3 feet from the ground where it functions. The radius of the area over which the bullets are dispersed extends up to about 200 yards. The fuze S.M. 35 is described in this Bulletin. The use of an electrical igniter, E.S.M. 40 has also been reported.

The cylindrical exterior, painted the normal deep olive green, is 4 inches in diameter and 5.2 inches high with a closing plate at the top. The plate has a protruding screwed cap of plastic at the centre and carries three small equally, spaced screw plugs and one larger screw plug. The overall height is 6 inches and the filled weight, 9 lb. 7 oz.

The mine consists of the following main parts :-

- (a) The mortar or outer casing
- (b) The body which is a sliding fit in the mortar and contains the shrapnel bullets and an H.E. bursting charge.
- (c) The ejection charge contained in a recess in the base of the body.

The mortar is in the form of a cylinder, open at the top, and is pressed from mild steel of .079 inch thickness. A light metal ring which overlaps the top plate is soldered around the exterior at the mouth.

The body consists of an outer and an inner seamless cylinder of mild steel which are held at the top and bottom between the machined circular cast iron top plate and base plate. The plates are secured by a central tube of mild steel which passes through their centres and is fitted with a nut which bears on the upper surface of the top plate and a flanged adapter which screws into the tube at its lower end and bears against the lower plate. The top plate is .39 inch thick and has what appears to be a filling hole for a cast bursting charge and three holes for the insertion of the detonators. The three holes are closed by screwed plugs, the plug for the filling hole being larger than the others. Three brass tubes, forming detonator pockets, are fitted between the holes in the top plate and delay holders screwed into similar holes in the base plate. These holes lead into a circular recess in the underside of the base plate which contains the ejection charge. The adapter at the lower end of the central tube also leads into this recess at the centre and has a delay holder screwed into it from the top. The recess is closed at the base by a leaden disc which may be flat or concave. The disc is held by a retaining ring of mild steel secured by screws.

The shrapnel bullets contained between the inner and outer cylinders number approximately 350 and are of high carbon steel containing some chromium and nickel. The bullets are about .35 inch in diameter and weigh about 129 to the pound. The V.D. Hardness figure at the surface averages 830. A packing of cordage is inserted between the top of the bullets and the top plate.

The T.N.T. bursting charge weighs approximately 7 oz. 13 drs. and is in the form of a block filling consisting of a cylinder of suitable size for insertion in the body. The wall of the cylinder is .24 inch thick and the inside contains a core of bituminous composition in which there are three smaller cylinders of T.N.T. to form surrounds for the detonator tubes also an axial channel to fit over the central tube. The exterior of the T.N.T. cylinders is waxed and the whole charge is contained in a waxed paper carton.

The total weight is 1 lb. 0 oz. 4 dr. The delay holders are of brass and contain a pressed filling of delay composition. The ejection charge in the recessed base plate consists of approximately 30 grains of gunpowder. The weight of the body (excluding the mortar) filled and fuzeed is approximately 7 lb. 13 oz. Oil is used as a lubricant between the interior of the mortar and the exterior of the body.

Action.

The mine is prepared for use by inserting a No. 8 detonator, open end downwards, into each of the detonator tubes, removing the plastic cap and substituting the fuze S.M.Z. 35. When trip action is required, a Y shaped adapter is screwed on the top of the central tube instead of the fuze. Pull igniters of the Z.Z. 35 type (See Bulletin No. 33 Item 740) are inserted in the arms of the adapter and connected to the trip wires. When the electrical fuze is used, a number of mines can be fired simultaneously from a distance.

When the fuze or a pull igniter, as the case may be, is functioned, the flash passes down the central tube and ignites the composition in the central delay holder which in turn ignites the ejection charge. The explosion of the charge ignites the composition in the other delay holders and ejects the body from the mortar. Whilst in flight the delay composition burns through the length of the holders and initiates the detonators with the result that the bursting charge is detonated and the bullets projected.

Modifications.

The discovery of a shrapnel mine 35 with the following modifications has been reported:-

- (a) Detonator tubes of cardboard instead of brass.
- (b) Shrapnel bullets consisting of short lengths of 3/8 inch mild steel rod instead of hardened steel balls.

Mines of earlier manufacture than the one here described may be found to have three screws in the base of the mortar which are inserted from the exterior to engage with corresponding tapped holes in the base plate of the body. At a later date the use of the screws was discontinued, the holes in the base of the mortar were closed by soldering but base plates with the tapped holes continued to be used.

951. GERMAN SHRAPNEL MINE FUZE 35

(S.M.Z. 35)

Fig. 374

The fuze, mainly of aluminium, is brown in colour as the result of varnishing and is cylindrical with three steel prongs in the top of the plunger which protrudes at the head. For safety in transport a lateral safety bolt is fitted in the plunger where it emerges from the body.

The aluminium body is .7 inches in diameter and is made up of three sections screwed one into the other. The top section forms a casing for the supporting spring and has a hole in the head for the plunger. At its lower end it is screwthreaded internally to receive the middle section. After assembly the two sections are locked by a plug inserted between coinciding semi-circular recesses formed in the two sections. The middle section has a band of milling around the centre of its exterior. Internally, at the upper part, it is reduced in diameter to locate the two steel retaining balls in the plunger and to act as a guide for the plunger. Screwthreads are formed externally at the upper end for insertion in the top section and internally at the lower end to receive the bottom section. The bottom section also has a milled band and is locked to the middle section by a plug inserted between semi-circular recesses. A diaphragm in the top of this section has a central hole in which the cap assembly is fitted. The lower end is screwthreaded internally for assembly with the mine. For transport the fuze is closed at the base by a screwed plug of the moulded plastic type.

The aluminium plunger is cylindrical with an external flange at the centre which limits its upward movement and engages the end of the supporting spring. From the base the plunger is recessed to accommodate the striker with its spring and has two radial holes in which steel balls are located to engage a groove in the striker. In the upper part of the plunger there is a lateral channel to receive the safety bolt. A screwthreaded channel, drilled from the head, leads into the centre of this channel and contains a spring-loaded ball which engages a groove in the centre of the bolt. The ball and spring are retained in position by a screwed plug which also retains two steel washers securing the steel prongs. The prongs are inserted in holes in the head of the plunger and are splined by notches in the inner circumference of the lower washer and in the outer circumference of the upper washer.

The safety bolt is of aluminium and has a steel split ring at one end and a retaining nut at the other. A groove of semi circular section is formed in the bolt to engage the ball in the head of the plunger.

The steel spiral supporting spring fits around the plunger below the flange and is held in compression between the flange and the upper end of the middle section of the body.

The aluminium striker has a stem formed on its upper end over which its steel spiral spring is assembled. The spring is held under compression between the body of the striker and the end of the recess in the plunger. A groove, with the upper side inclined, is formed in the striker body to engage with the two steel retaining balls.

The cap assembly consists of a copper sheath containing the cap and the anvil. The sheath is flanged at the top and is turned in at the base to secure the anvil. The anvil is formed by a bent brass strip with half collars formed on each end under which the sheath is turned inwards. The copper cap contains 8 grains of composition consisting of 40.8% of lead styphnate, 40.7% of barium nitrate, 2.9% of antimony sulphide and 15.6% of calcium silicide.

Action.

The safety bolt is withdrawn by removing its retaining nut and pulling the bolt out of the plunger against the resistance of the spring-loaded ball.

When pressure is applied to the prongs the plunger is forced down into the body against the resistance of the supporting spring. When the two steel balls in the plunger have moved down sufficiently to lose the support of the low diameter portion of the body, these are ejected by the inclined surface in the striker groove, under the pressure of the striker spring, which drives the striker onto the cap assembly. The weight required to operate the fuze is approximately 7 lb.

952. GERMAN MECHANICAL TIME AND PERCUSSION FUZE S/60s.

(Dopp. Z.S/60s)

Figs. 375 and 376

The fuze is used in H.E. shell for the following equipments:-

Geb.G.36 (7.5 cm mountain gun)
F.K. 16 n.A. (7.5 cm field gun)
l.F.H.16 and 18 (10.5 cm howitzer)
10 cm K.17 & K.17/04 n.A. (10.5 cm field guns)
s10 cm K.18 (10.5 cm field gun)
lg.s.F.H.13 (15 cm howitzer)
s.F.H.18 (15 cm howitzer)

The external appearance of the fuze is the same as that of the Zt.Z.S/30, described in Bulletin No.33, except that it bears the stamping "Dopp Z S/60s" just above the flange. The time mechanism of the fuze is of the clock spring type and is the same as that described for the Zt.Z.S/30 but has a time of running of 60 seconds.

The percussion mechanism is of the graze type and is contained in a central recess below the time mechanism. The recess has a flash hole at the base and has two increases in diameter towards the mouth. The mouth is screw-threaded to receive the needle disc.

The graze mechanism is of the type commonly used in German nose fuzes and consists of a brass inertia pellet, with detonator, which is held off a fixed needle by a creep spring and four centrifugal segments. The segments are pivoted on pins in the platform formed by the change in diameter and are encircled by the usual expanding spring ring.

Action

The time action is the same as that described for the Zt.Z.S/30 in Bulletin No.33.

The fuze is set to the safety mark on the graduated setting key when percussion action is required. When set at this position, the cut away part of the hand race at the top of the dome inset is masked by the safety bridge. Thus, although the hand is released by the trigger when acceleration occurs and is rotated by the mechanism during flight, it cannot rise to release the striker. The percussion arrangement is armed by centrifugal force during flight by the enlargement of the expanding spring ring which permits the pivoted segments to be swung clear of the inertia pellet. The pellet is prevented from creeping during the period of deceleration by the creep spring between the needle disc and the pellet. On graze the momentum of the pellet overcomes the spring and the detonator is impinged on the needle.

953. GERMAN MECHANICAL TIME AND PERCUSSION S/60 F1.

(Dopp.Z.S/60 F1).

Figs. 377 and 378.

The fuze is used in H.E. shell and the F.H. Gr 40 Nb (smoke shell) for the 10.5 cm l.F.H.18 (gun-howitzer).

The time mechanism is of the centrifugally operated type with a maximum time of running of 60 seconds and is designed to prevent functioning at settings of less than approximately one second. The explosive content consists only of an igniferous detonator which serves for both the time and the percussion action. When functioned by percussion, the pellet carrying the detonator is released from the control of the time mechanism on impact.

The external appearance of the fuze differs from the mechanical time fuzes of the S/30 type (See Bulletin No.33) in that the top of the cap is flat and is closed by a metal disc. The fuze is identified by the stamping "Dopp.Z.S/60 F1." just above the flange. The stamping "F1" and the flat top distinguishes this centrifugally operated type from the Dopp.Z.S/60s, which is similar in appearance but is operated by a clock spring.

The weight of the fuze is approximately 1 lb.

The main components of the fuze consist of the body or base piece, the cap base, the cap, the time mechanism and the percussion mechanism.

The base piece is screwthreaded externally below the flange for insertion in the shell and has a large cylindrical recess in which the time mechanism is located. A brass cylinder is fitted to line the wall of the recess and below this cylinder a circular groove is formed in the wall to correspond with a similar external groove in the cap base. A spring wire with four semi circular bonds is fitted within these two grooves to tension the cap base and the cap. For the adjustment of the tensioning during assembly, three small screws are fitted from the exterior at equally spaced positions around the groove in the body.

Semi-circular recesses are formed in the groove at the points where the screws bear on the bonds in the tensioning spring. Three larger screws are also inserted through the wall of the body and the brass liner to engage a second groove in the cap base and thus secure it to the body without preventing the rotation necessary in setting the fuze. Inside the recess, at the base, there are two small recesses to receive corresponding locating studs on the base of the time mechanism unit. An inclined flash channel is formed near the centre of the base and three holes are provided for the bolts securing the time mechanism unit.

The cap base consists of an aluminium sleeve which fits into the recess in the body and surrounds the time mechanism unit. The sleeve is flanged near the top to coincide with the contour of the fuze. Above the flange is reduced in diameter and screwthreaded externally to receive the cap and internally to receive the percussion mechanism unit. The internal shoulder formed by the reduction in diameter carries the setting pin and the hammer spring. Two circumferential grooves are formed on the outside of the sleeve near the base. The lower groove

receives the wire tensioning spring, the upper groove is engaged by the securing screws in the body.

The cap is cone shaped with a flat top which is closed by a metal disc. Internally, at the base, it is screwthreaded for assembly with the cap base.

The time mechanism is assembled in a cylindrical unit of superimposed plates of brass and aluminium and consists of a central shaft rotated by two centrifugally operated segments and controlled by an escapement. The shaft carries a slotted setting disc which releases the firing arm when the slot in the disc has been rotated into alignment with the arm.

The central shaft is tubular 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 in diameter is serrated to engage with similar serrations on the bush so that the bush is locked to the shaft. The percussion rod of the percussion mechanism passes through the tubular shaft.

Two weighted centrifugal toothed segments, each pivoted on a semi circular disc, are enmeshed with spurs which, through pinions formed at their base ends, drive the central shaft.

A train of four spurs and pinions transmits the motion of the pinion at the base of the central shaft to 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.

The setting disc, with the safety disc beneath it, is carried by a bush which fits over the upper end of the central shaft. The bush is in the form of a sleeve with a hemispherical flange at the base. The sleeve is serrated at the lower end to engage a corresponding shoulder on the shaft so that it rotates with the shaft. The safety disc is keyed to the flange of the bush and is of smaller diameter than the setting disc but has a projecting leaf at one part of its circumference which can close the slot in the setting disc and so prevent the operation of the firing arm. The setting disc is capable of rotation on the bush but is tensioned by a saucer-shaped spring washer which is compressed by the tensioning and locking nuts. An upturned forked strip on the setting disc engages the setting pin in the cap base above. A curved slot, diametrically opposite the strip, provides clearance for a projection on the firing arm and thus permits the arm to rotate when these two are in alignment.

The firing arm is positioned near the periphery of the mechanism unit and consists of a short vertical shaft with a small pivot at each end. The upper end of the shaft is fitted with a crosshead which is weighted at one end and has a vertical projection at the other. Near the base, the shaft is cut away to provide clearance for the arm of the retaining bolt when the shaft is turned. The projecting pivot at the base of the shaft is held by a centrifugal plate. The plate is held at its inner end by a spring catch which engages a vertical projection on the plate. The spring catch consists of a bent strip secured at its outer end and shaped at the inner end to engage the centrifugal plate. A ramp, or inclined projection, near its inner end is in contact with the base of the percussion rod. A spring plunger bears on the catch where it engages the plate and assists in keeping the catch engaged.

The retaining bolt consists of a short vertical shaft with an arm at the top which is held by the firing lever. Near the base of the shaft a flat surface is formed which keeps the retaining catch in engagement with the detonator pellet.

The retaining catch consists of a flat hook which is pivoted at one end and engages a notch in the detonator pellet at the other.

The detonator pellet is contained opposite to a fixed needle in a transverse rectangular slot in the base of the mechanism unit and consists of a rectangular brass pellet carrying a detonator at one end. Near the other end, which is held against a spring plunger, two vertical notches are cut in the sides. A flash channel leads from the detonator to the base of the pellet. In addition to the retaining catch, the pellet is also held by a centrifugal safety catch.

The safety catch, located by a spring plunger in a channel cut in the side of the pellet slot, consists of a flat brass plate shaped at its inner end to engage a corner of the detonator pellet. A recess is formed in the catch to receive the rounded head of the spring plunger.

The percussion mechanism is contained mainly in the cap and consists of a wooden hammer fitted over a percussion rod which is supported by a centrifugally operated mechanism under the control of an escapement. The lower end of the rod bears against the inclined projection on the spring catch and when pushed in releases the centrifugal plate. The outward movement of the plate results in the release of the detonator pellet.

The percussion rod fits into a recess in the base of the wooden hammer and has a flanged sleeve fixed near its upper end. The flange is supported by a toothed segment which is pivoted at one end and is enmeshed with a spur carrying a pinion. The pinion is enmeshed with a spur carrying the escapement wheel which works in conjunction with two pins on an oscillating disc. The disc is fitted loosely over the upper end of the percussion rod and has two semi circular recesses in its periphery. One of these recesses has a pin near each end to engage the escapement wheel, the other receives one side of a ~~detent~~ in the form of a solid cylindrical pellet with a notch in its outer side. The detent is supported by a straight wire spring engaging the notch.

Time 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 set by turning the cap with the aid of a graduated setting key. The rotation of the cap with its base 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 projection on the crosshead of the firing arm are so arranged that the leaf still closes the slot at settings up to approximately one second and so prevents the fuze functioning dangerously near the gun.

On acceleration the hammer spring sets back and flattens down the forked strip on the setting disc, thus disengaging it from the setting pin. During flight the centrifugal safety lever is swung clear of the pellet and releases the escapement mechanism. The toothed segments, operated by centrifugal force, then swing outwards and, through their spurs and pinions, rotate the central shaft with the disc assembly under the control of the escapement. Whilst this movement is in progress the weighted end of the crosshead on the firing arm tends to swing outwards but is prevented from so doing by the vertical projection at the other end bearing against the edge of the rotating setting disc. Also, the spring 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 has rotated into alignment with the vertical projection on 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 swings outwards and the flat surface on the shaft releases the retaining catch. The catch is thrown clear of the detonator pellet which is driven on the needle by its spring plunger.

Percussion Action

With the fuze set for percussion, that is to the safety mark on the graduated setting key, the leaf on the safety disc closes the slot in the setting disc. Thus although the disc assembly is rotated during flight, the two discs move together and the slot remains closed.

On acceleration the detent locking the oscillator sets back and releases the oscillator. The toothed segment supporting the flange on the percussion rod is swung outwards by centrifugal force. This movement is controlled by the escapement mechanism and limited by a stop pin. The percussion rod is then supported by the creep resulting from deceleration.

On impact the percussion rod is driven in by the hammer. The thrust of the rod on the inclined projection of the spring catch, disengages the catch from the centrifugal plate which is then free to move outwards taking with it the base end of the firing arm. This movement of the firing arm sets free the arm on the retaining bolt and thus releases the retaining catch and the detonator pellet.

954. GERMAN 7.5 CM. L.G.40 Q.F. CARTRIDGE
(7.5 cm. L.G.40 HULSENKART)
 Fig. 379.

A description of this separate loading Q.F. cartridge for the recoilless airborne gun is given in Bulletin No.33 Item 745, where the case is described as being of brass. Since the bulletin was published a critical examination has revealed the case to be of steel with brass plating.

The components of the cartridge are illustrated in Fig.379.

The C/113 primer used in this cartridge is a percussion type which differs from the C/13na (See Bulletin No.32 Item 671) in having a base diaphragm of .023 inches instead of .051 inches.

955. GERMAN 10.5 CM. L.G.40, Q.F. CARTRIDGE
 Fig. 380.

The cartridge is used in the 10.5 cm recoilless airborne gun (10.5 L.G.40, previously known as L.G.2) and is a separate loading type with a plastic disc closing the base and a percussion primer fitted in the side of the case near the base.

The designation of the equipment is given on the label attached to the closing cup in the mouth of the case and is also imprinted in a circle on the plastic base. Only the earlier designation "L.G.2" or L.G.2" has been found on cartridges examined to date.

The weight of the complete cartridge is 13 lb. 14 oz.

Case.

The steel case, plated with brass, is 15.7 inches in length and tapers from 4.9 inches in front of the flange to 4.73 inches at the mouth. A large circular hole in the base has an internal flange on which a disc of brown plastic inside the base of the case is supported. A locating plate for the primer is fitted to the wall of the case near the base. The plate has a projection at the base which engages in a recess in the flange of the case and, near its forward end, is bored and screwthreaded to receive a screwed adapter for the primer. The inner end of the adapter engages a curved rectangular plate inside the case. This plate has a central hole for the adapter and, at its base, has a projection which engages a step formed in the plastic base piece.

The base piece is 4.1 inches in diameter and 1.1 inches in depth. The forward end of the cylindrical disc of plastic is chamfered along the part of its circumference which corresponds with the primer. The base is inserted with an adhesive and is located by a step at one end of the chamfer engaging the

projection at the base end of the inner plate. Coinciding lines on the base of the plastic disc and under the flange of the case indicate the correct position for assembly.

The following variations in the construction of the case have been met with:-

- (a) Locating plate integral with the body of the case.
- (b) Absence of chamfer on base piece and of the projection on the inner plate.
- (c) Absence of coinciding lines for assembly of chamfered base pieces.

Primer.

The percussion primer, C/13NA.St, used is described in Bulletin No.32.

Propellant Charge.

The charge is contained in a cylindrical bag of white artificial silk with an igniter at the base which also extends to form a collar around the lower end of the bag. The mouth of the bag may be choked or folded flat and secured by adhesive.

The 6 lb. 11 oz. $4\frac{1}{4}$ dr. propellant charge consists of a double base propellant (nitrocellulose and diethylene glycoldinitrate, including nitroguanidine) in the form of tubular cords, the diameter of the tubes .102 inch externally and .039 inch internally. The charge is arranged in two bundles one above the other. The bundle at the base consists of 2.4 inch tubular cords contained in a paper cylinder which has an external flange at the top. The tubular cords in the upper bundle are 11 inches in length and are secured by ties. The weights of the upper and lower bundles are 14 oz. and 5 lb.13 oz. $4\frac{1}{4}$ dr. respectively. The markings indicating the weight, nature and size of the propellant are shown in the drawing.

The igniter, in the form of a cap which fits over the base of the cartridge bag, contains 30 grams (approx. 1 oz. 1 dr.) of the nitrocellulose powder Nz Man N.P. (1,5,1,5). This is the powder normally used for igniters and consists of nitrocellulose with the addition of potassium nitrate and is in the form of cylindrical grains. The white material forming the igniter bag is stitched to form nine compartments for the powder at the base and twelve compartments in the band which fits around the lower end of the cartridge bag.

The charge is retained in the case by a cardboard cup inserted in the mouth of the case. The cup carries an adhesive label giving the same particulars as those marked on the bag.

Packing.

The cartridge is carried in a rolled paper container weighing 2 lb.10 $\frac{1}{2}$ oz. The approximate overall dimensions of the container are, length 16 inches, diameter 5.8 inches.

956. ITALIAN H.E. HAND GRENADE OTO MODEL 35.

Fig.381.

The grenade is of the percussion type with an "Always" action. The body is in two parts, a cylindrical cup shaped base with rolled-on thread which mates with a similar thread rolled-on to the flange of the coned top. Two diametrically opposite slots are cut in this top immediately above the flange. When filled these two parts are secured by means of the locking spring shown in the diagram. The body is of pressed aluminium painted red, and carries the safety cover drogue which is painted black. Protruding from the side of the safety cover is the end of the brass safety strip to which is attached a rubberised tab.

The bursting charge consists of about 2 $\frac{1}{2}$ -oz. of low grade T.N.T. with a

central detonator cavity. This is cast within a pressed metal cup. The cup is necked down at the top and is carried within the body of the grenade narrow end upwards. The detonator cap is pressed into a hole punched in the narrow end of the burster container, the lower end of this container being closed by means of a metal cover. Beneath the cap a flash sensitive detonator is inserted. Details of the composition of these detonators are not yet available.

Fuze.

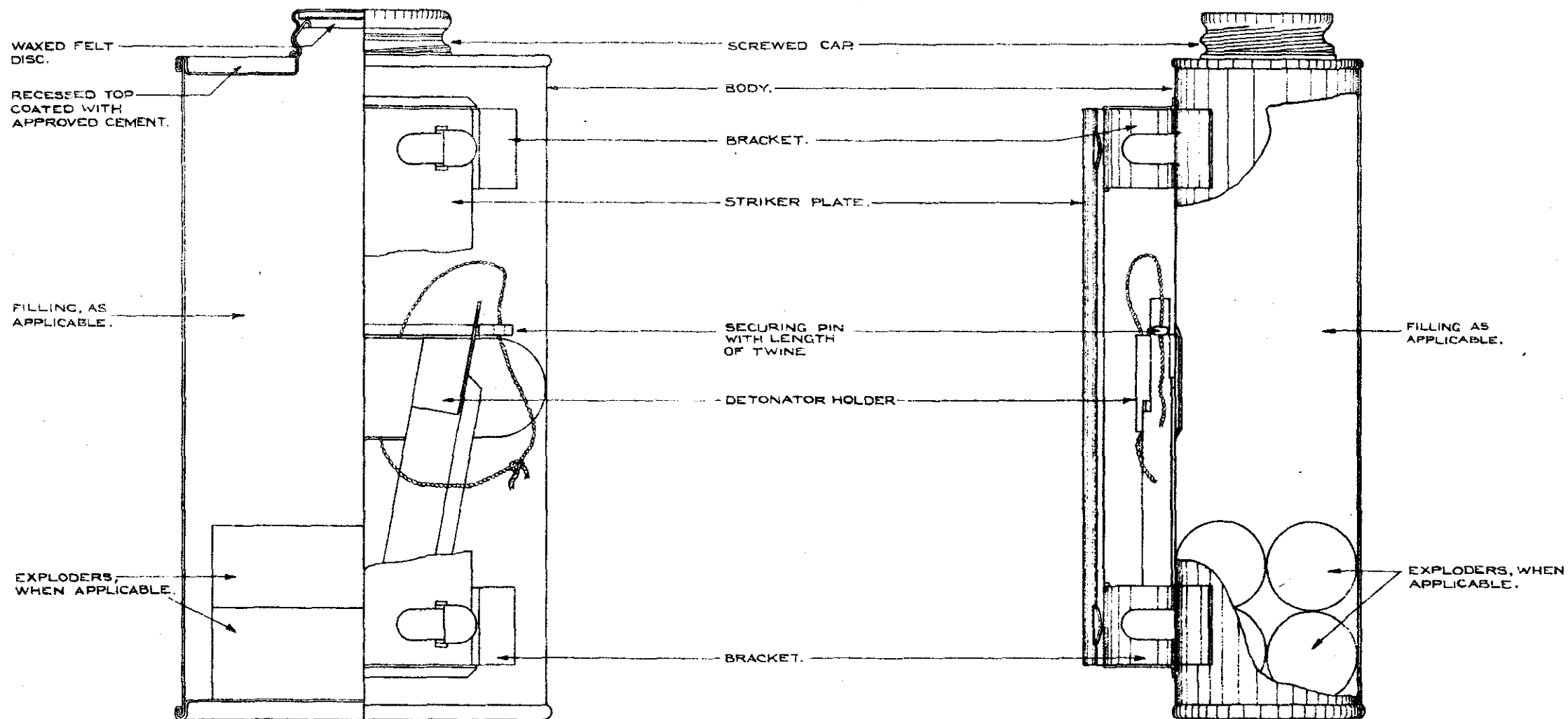
The "Always" fuze which resembles the British 247 fuze in its basic principles, is mounted within the coned cover of the grenade. It consists of a light aluminium cup fitting freely within the cover, a lead ball being carried between the cover and cup. Two diametrically opposite slots are cut in the walls of this cup to correspond with those cut in the outside cover. The striker is carried by an aluminium bush secured to the centre of the cup. Attached to the drogue by means of a light linkage is the safety-bar which comprises an open square section channel member.

In the "safe" position this safety-bar passes through the slots in the grenade cover, and striker cup, the open side being uppermost. The striker passes through a hole in the centre of the flat striker spring and the whole assembly is kept clear of the detonator by the closed side of the safety-bar. The drogue safety cover then folds over the top of the grenade and is secured in position by the brass safety strip which passes through two slots cut in its side, the lower longer portion passing beneath the safety-bar and being secured thereto by turning over on to a recess provided for that purpose.

Action.

The safety strip is withdrawn and the grenade thrown in the normal manner. The safety cover opens and acting as a drogue withdraws the safety-bar. The striker spring cushions the striker assembly from the cap until impact. Upon impact the two portions of the grenade i.e. the burster container and the ball loaded striker cup set into one another and thus actuate the detonating train and bursting charge.

FIG. 369 (ITEM.927).
GRENADE, HAND, N° 75. A/T., MK. II.



IGNITER, SPECIAL, N° 1, MK. I.

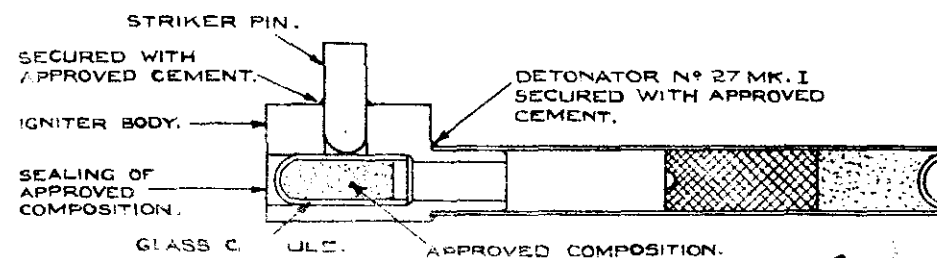
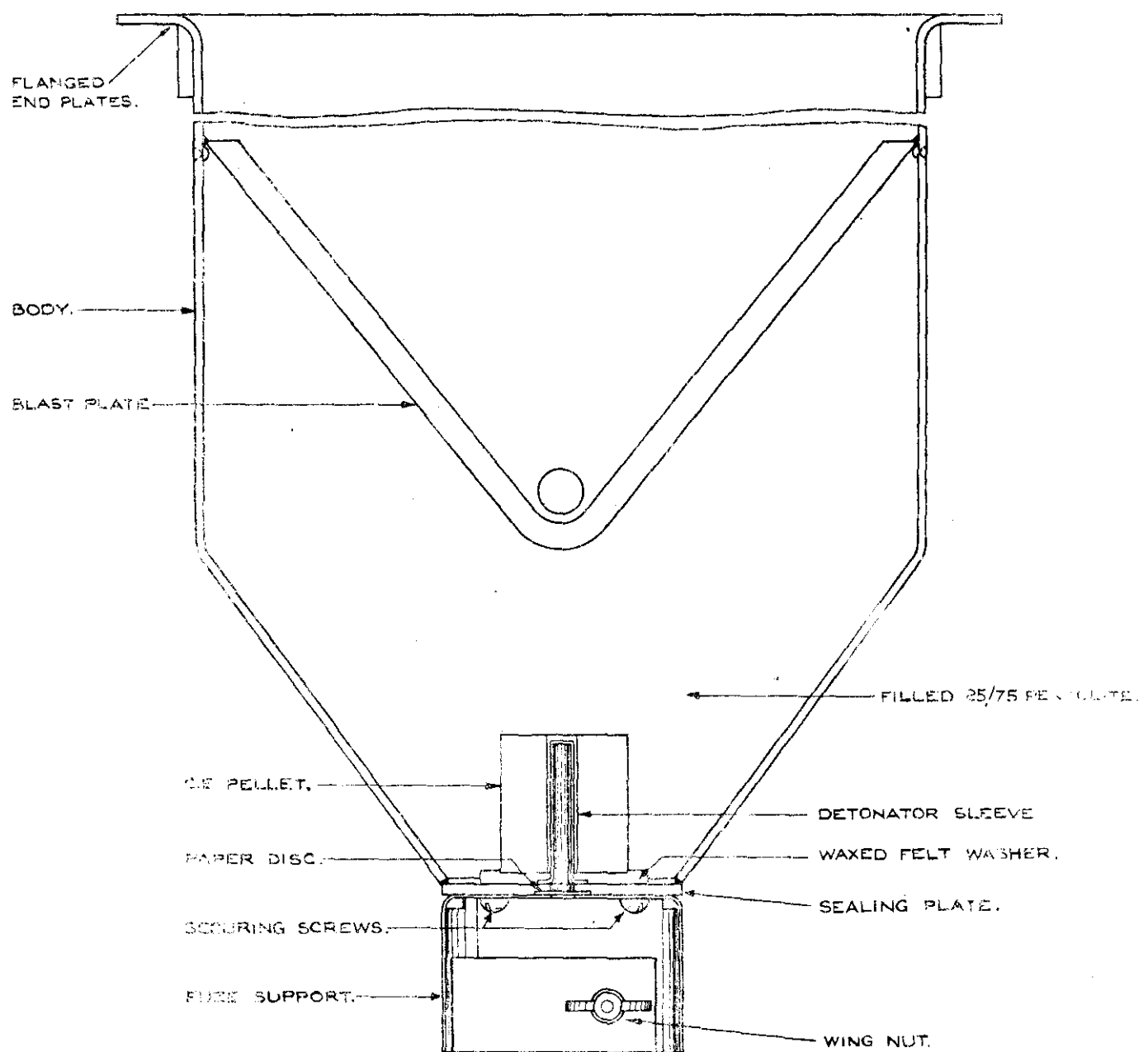


FIG. 370. (ITEM. 937.)
CHARGE DEMOLITION, N° 3, 15 lb, MKI.



PLAN VIEW.

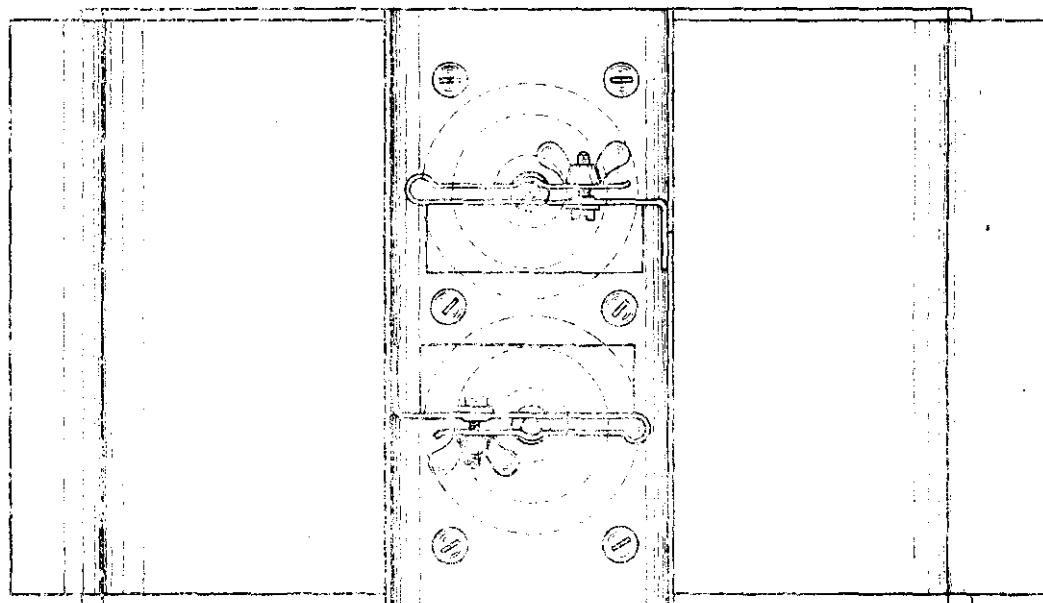
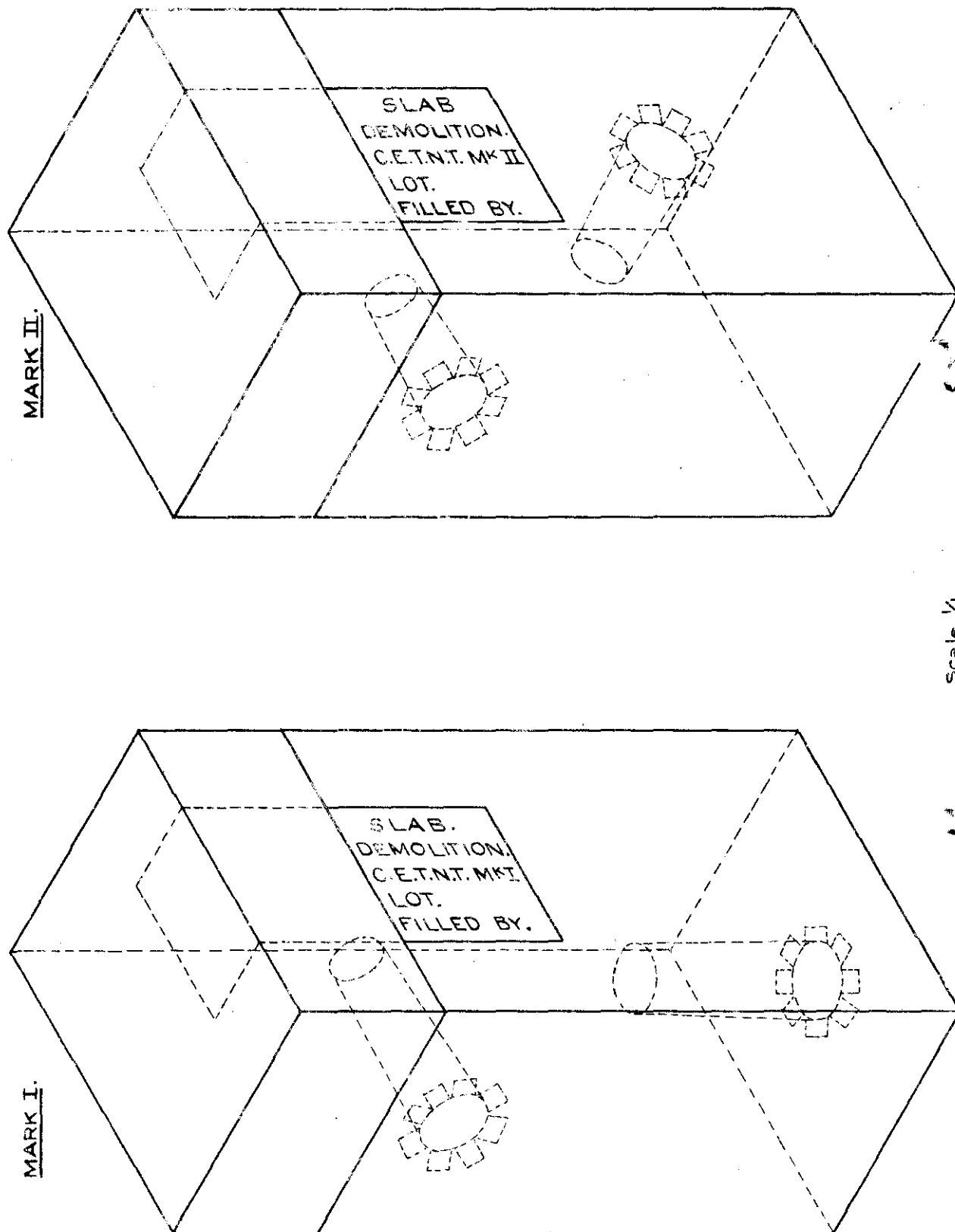


FIG. 371 (ITEM. 939)
SLABS DEMOLITION, C.E./T.N.T., MKS. I AND II.

Positions of Primer sockets and marking labels.



Scale 1/2

FIG. 372. (ITEM 341.)
 CARTRIDGE, Q.F. 90 m.m. WITH SHELL H.E., M.71. FOR CUN M.I. (AMERICAN.)

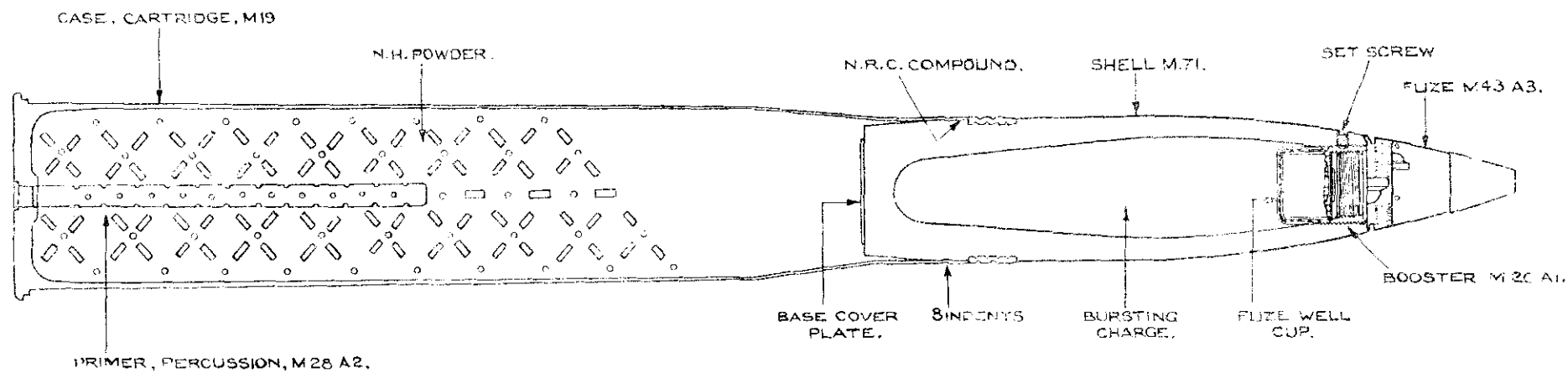
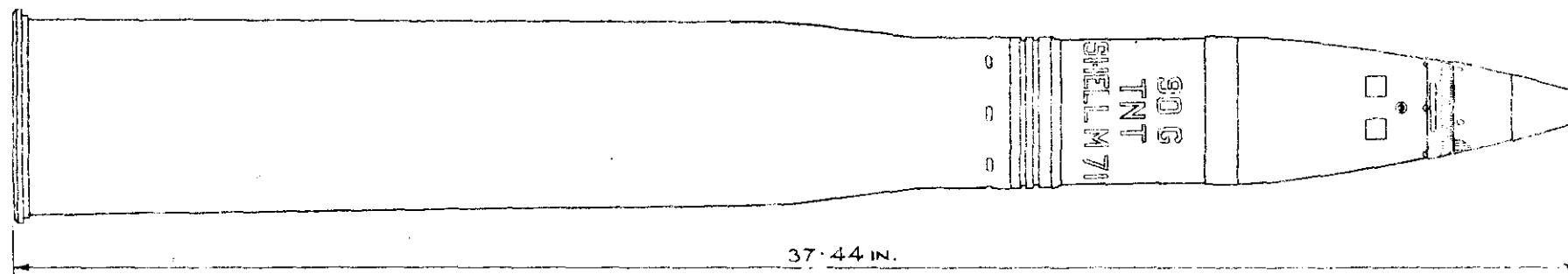
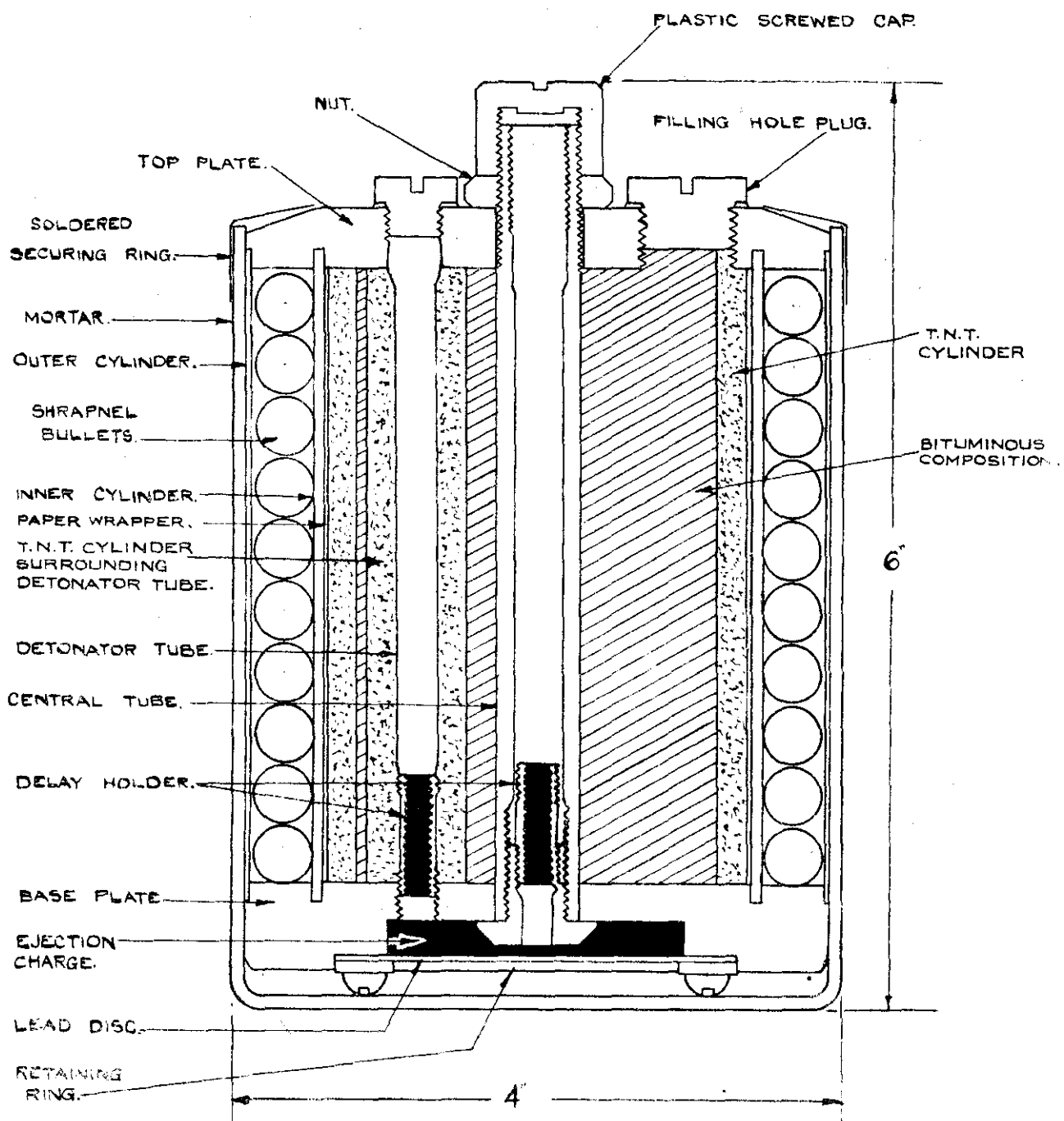


FIG. 373. (ITEM. 950.)
GERMAN SHRAPNEL MINE.
(S.M.I. 35)

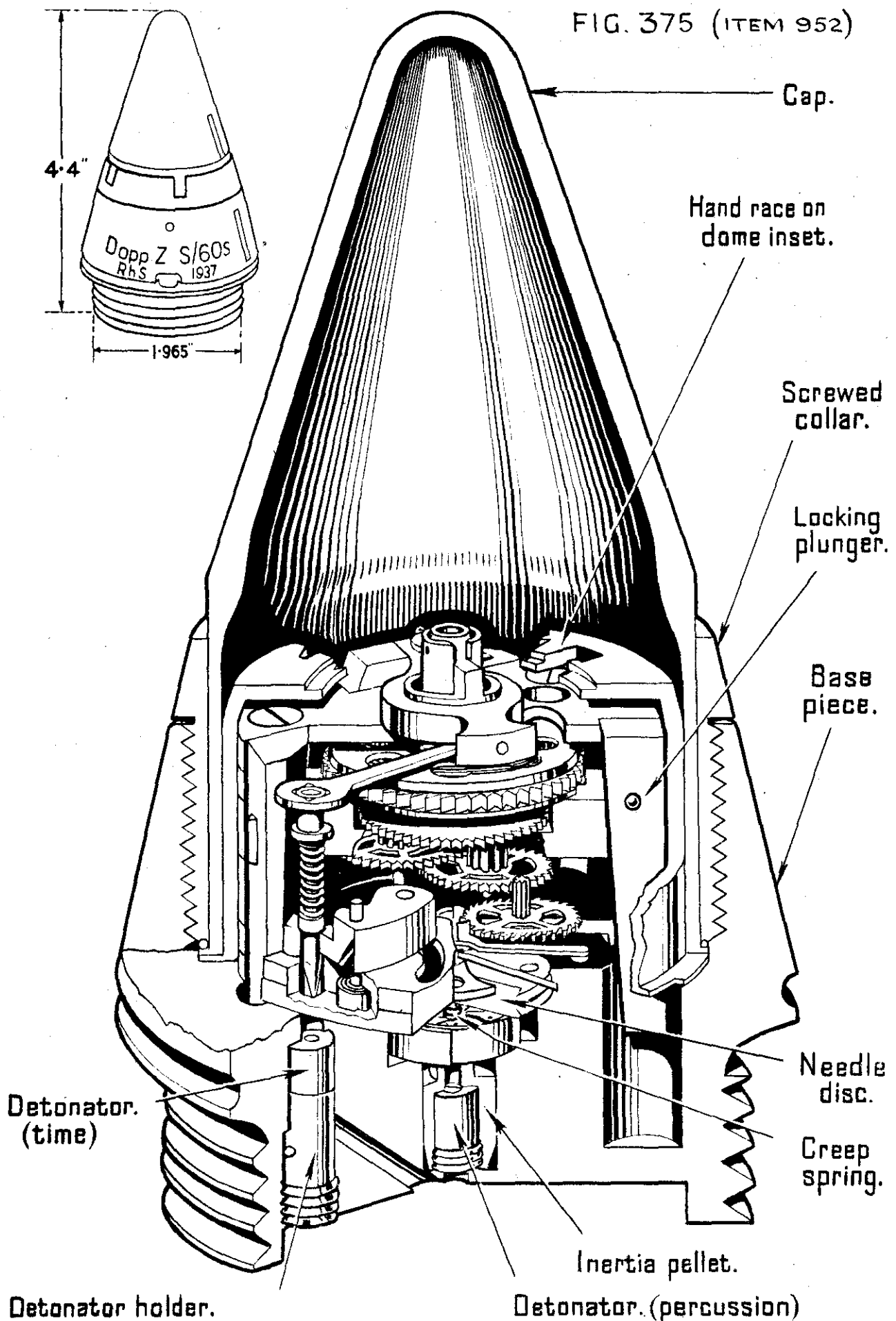


GERMAN SHRAPNEL MINE FUZE 35.
(S.M.I.Z. 35.)



GERMAN MECHANICAL TIME & PERCUSSION FUZE S/60 s. (Dopp. Z. S/60 s.)

FIG. 375 (ITEM 952)



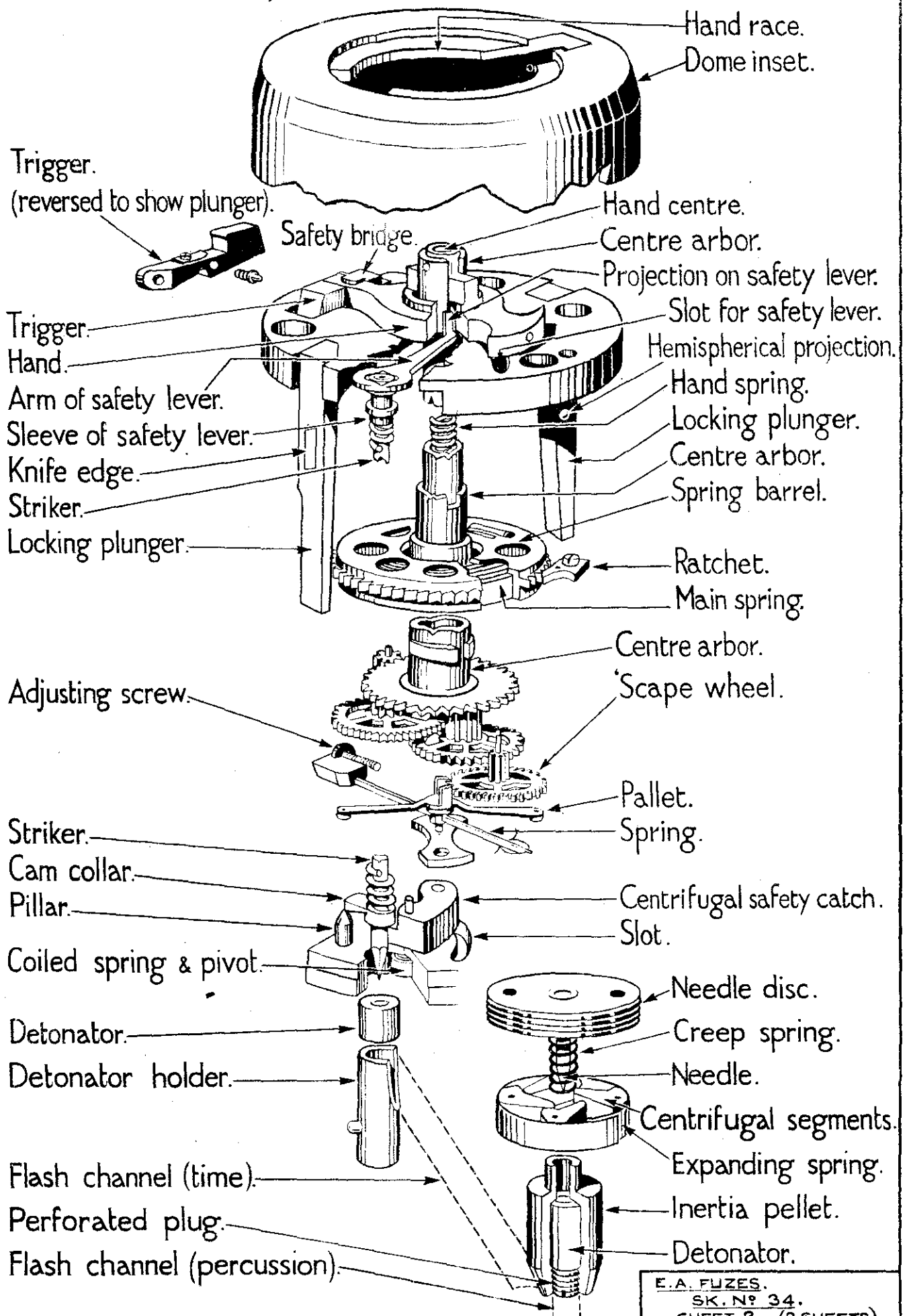
E.A. FUZES.
SK. N° 34.
SHEET 1. (2 SHEETS.)
C.I.A./A. 16-11-43.

GERMAN MECHANICAL TIME AND PERCUSSION FUZE S/60s.

Dopp. Z.S/60s.

DIAGRAMMATIC ARRANGEMENT OF MECHANISM

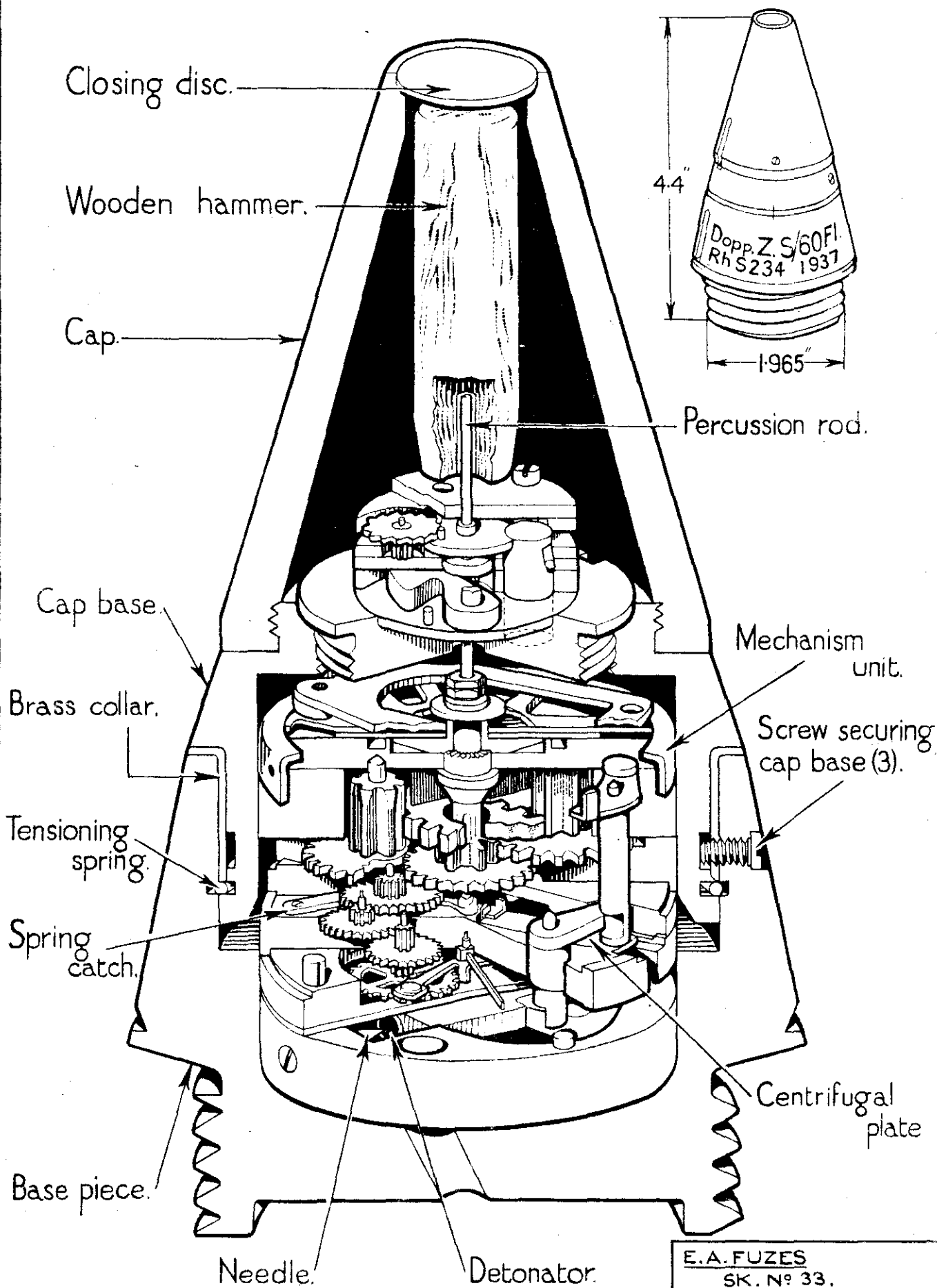
FIG. 376 (ITEM 952)



GERMAN MECHANICAL TIME & PERCUSSION FUZE S/60FI.

(Dopp.Z. S/60 FI.)

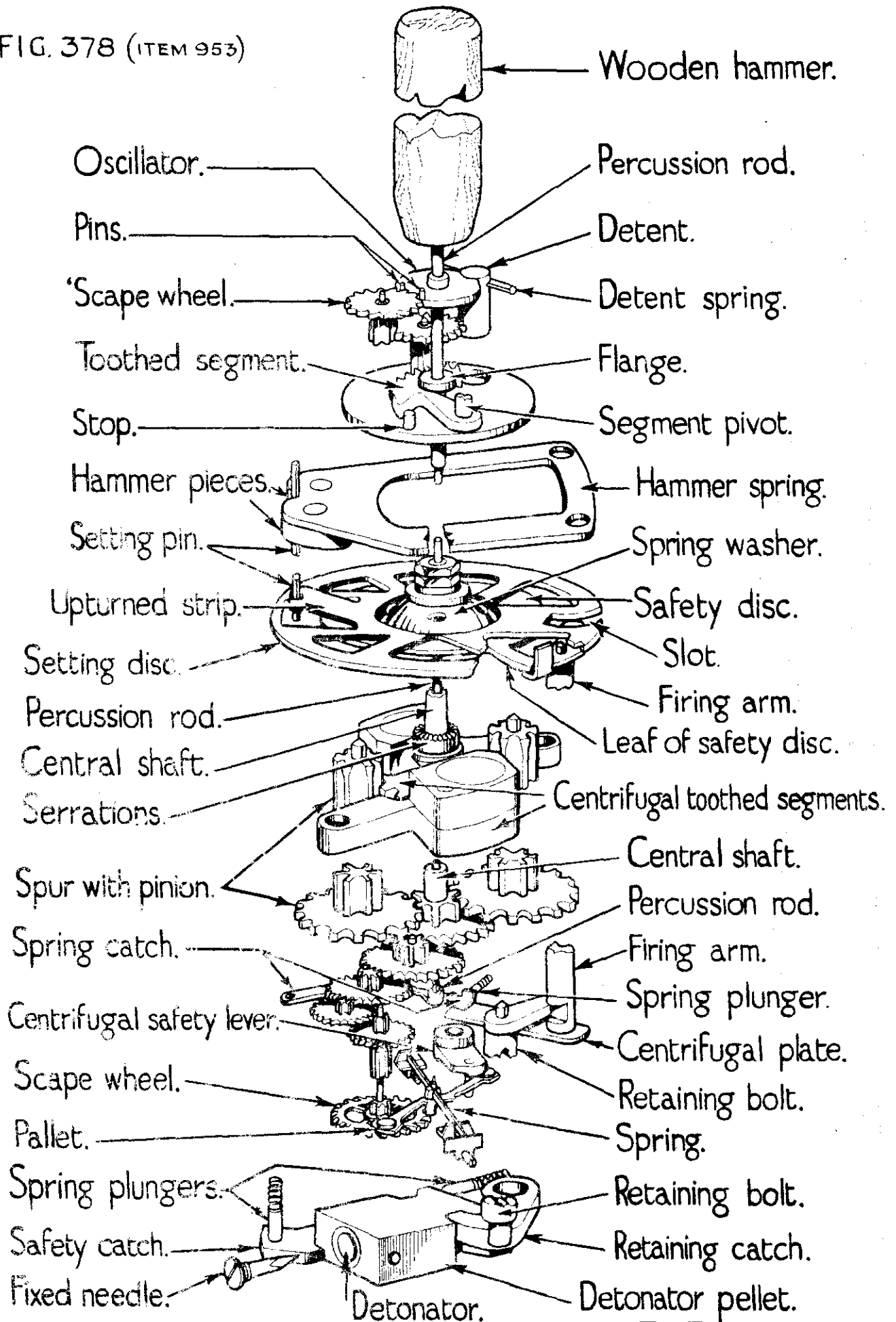
FIG. 377 (ITEM 953)



E.A. FUZES
SK. N° 33.
SHEET 1. (2 SHEETS)
C.I. A./A. 16-11-43.

GERMAN MECHANICAL TIME & PERCUSSION FUZE S/60 FI. **(Dopp Z. S/60 FI.)** **DIAGRAMMATIC ARRANGEMENT OF MECHANISM.**

FIG. 378 (ITEM 953)

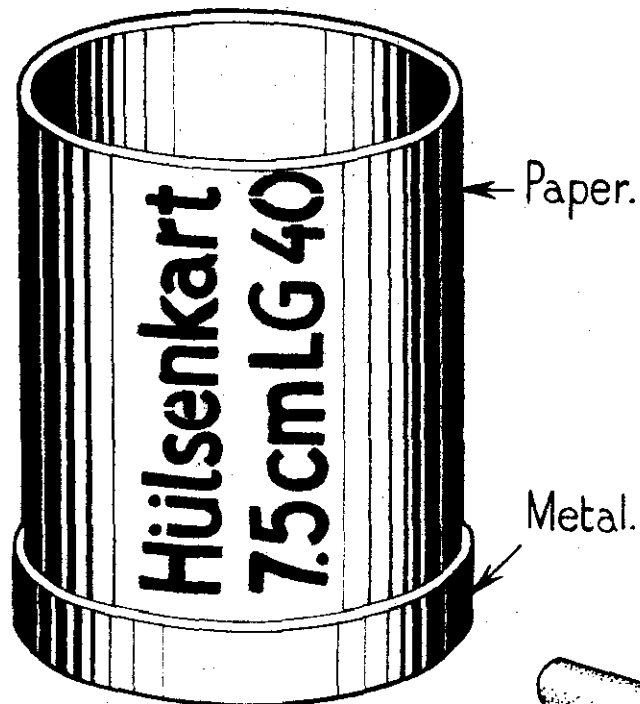


E.A. FUZES
 SK. N° 33
 SHEET. 2. (2 SHEETS.)
 C.I.A./A. 18-11-43.

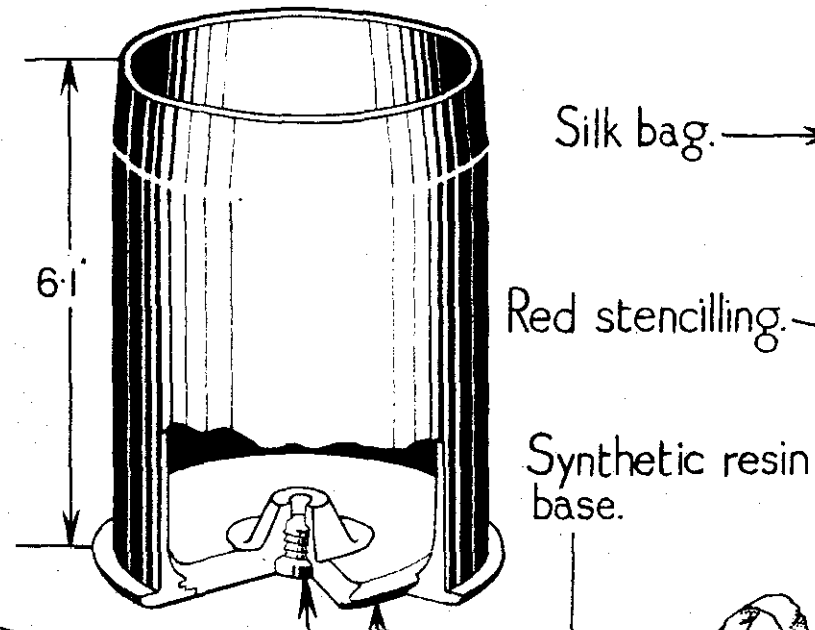
FIG. 379. (ITEM.954.)

GERMAN 7.5cm L.G.40 SEPARATE LOADING Q.F. CARTRIDGE.

CONTAINER.



STEEL CASE WITH BRASS PLATING.



CHARGE.

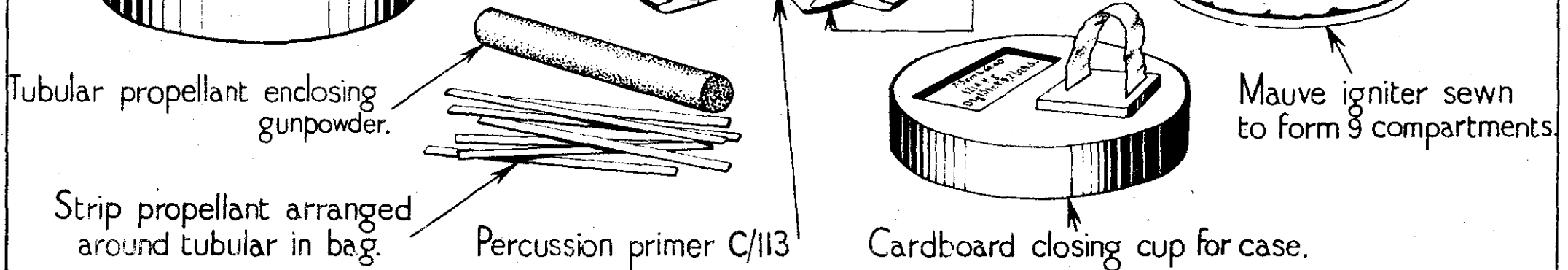


FIG. 381. (ITEM 956.)

ITALIAN H.E. HAND GRENADE OTO MODEL 35.

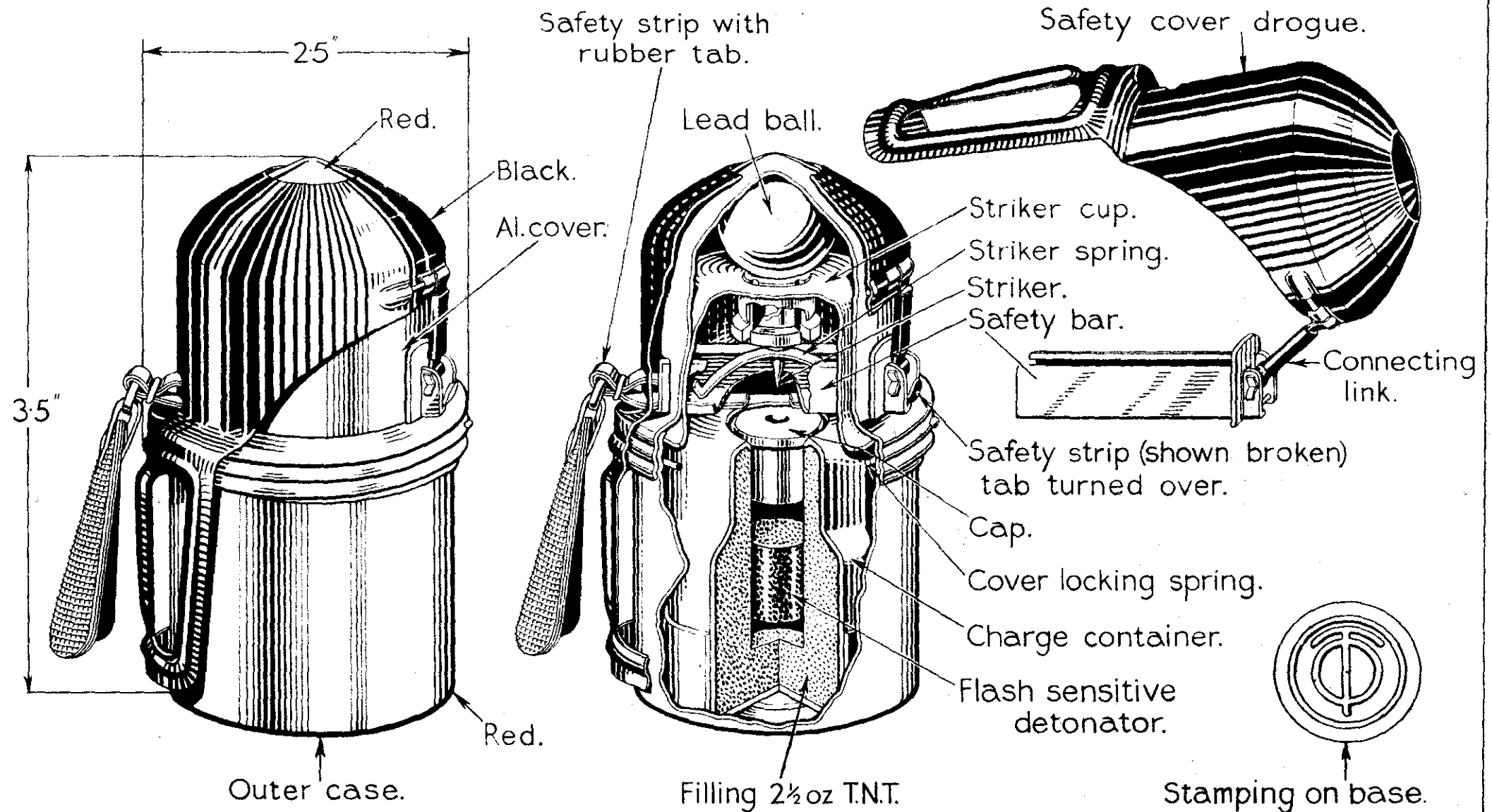


FIG. 380. (ITEM 955.)

GERMAN 10.5cm. L.G. 40 SEPARATE LOADING Q.F. CARTRIDGE.

