

AMMUNITION BULLETIN Nº 44

ITEMS 1178-1218

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MINISTRY OF SUPPLY
AMMUNITION BULLETIN NO. 14.

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Issued by
CHIEF INSPECTOR OF ARMAMENTS

Item No.

- 1190 Cylinders and Boxes for Fuzes, Gages, Primers, Tracers, Detonators, etc.
- 1184 Cartridges, Q.F. 40 mm. H.E. Standard propellant, Land Service.
- 1193 Cartridges, Q.F. 75 mm. American M2 and M3 guns. Decoppering charge.
- 1179 Cartridges, Q.F. 6 pr. 7 cwt. (N.H.033). Use of No.34 Primer.
- 1203 Cartridges, Q.F. 6 pr. 7 cwt. Extension of use to Air Service.
- 1200 Cartridge, Q.F. 17 pr. N.H.055, 7 lb. 11 oz. 8 dr.
- 1202 Cartridge, Drill, Q.F. 3.7 in. Mks.I to III Guns, Mk.IV "Obsolescent"
- 1178 Cartridges, Q.F. H.E., 3.7 in. A.A. Incorrect Design No.
- 1204 Cartridge, Q.F. 4.5 in. Gun. Reduced charge, N.H.033.
- 1197 Cartridges, Q.F. 5.25 in. Mk.II Gun. Alternative package.
- 1194 Cartridge, M.L. 3 in. Mortar, Smokeless, 90 Grs. Ballistite Mk.I.
- 1195 Cartridge, M.L. 3 in. Mortar, 95 Grain. "Obsolescent"
- 1196 Clips, Q.F. Cartridge, Nos. 42 and 43.
- 1205 Container, Ctge. No.246 Mk.I (for Q.F. 17 pr.)
- 1188 Container, Ctge. No.249 Mk.I (for Q.F. 6 pr. 7 cwt.)
- 1189 Container, Ctge. No. 250 Mk.I (for Q.F. 2 pr. Mks.IX to XA.)
- 1185 Fuze, Time, No.214. Use in 3.7 in. Mks.I to III Guns.
- 1201 Generators, Smoke "Obsolete"
- 1187 Grenade, Hand, No.83, Smoke, Mk.II.
- 1183 Grenade, Hand, No.83, Smoke. New filling compositions.
- 1180 Igniter, electric, No.84 Mk.I (FIG.479)
- 1182 M.L. 3 in. Mortar Ammunition, Package.
- 1207 Shell, H.E. Details of M. of F. Designs, Q.F.40 mm. (Figs.481, 482)
- 1206 Shell, B.L. or Q.F. Coloured Smoke, B.E. M. of F. Design DD(L)17625. (Fig.480).
- 1198 S.A.A. 20 mm. Oerlikon. Marking.
- 1199 S.A.A. 20 mm. Hispano gun, Mk.I Z. Identification marking
- 1186 Striker Mechanism, No.2 Mk.I & No.3 Mk.I.

Item No.

1192 Tracer & Igniter, Nos. 11 & 14. Method of closing.
 1191 Tracer, Shell, Nos. 21 & 22. Time of burning.
 1181 Tracers, Shell, Nos. 24 Mk.I and 26 Mk.I.

ENEMY AMMUNITION

GERMAN

1208 Fuze FF.Z.8001 (Fig.483)
 1209 Fuze AZ.5095 (Fig.484)
 1210 Fuze Bd. Z. DOV (Fig.485)
 1211 Fuze 1e Jgr Z 23 nA (Fig.486)
 1212 Fuze Hbgr Z 35 K (Fig.487)
 1213 Fuze Wgr.Z 50 + (Fig.488)
 1214 Fuze Electric (ERZ.39) for ignition of rockets (Fig.489)
 1215 7.3 cm Propaganda Rocket (Fig.490)
 1216 15 cm H.E. Rocket (15 cm Wgr. 41 Spr) (Fig.491)
 1217 21 cm H.E.B.C. Rocket (21 cm Wurfgrazate 42 Spr)
 (Figs.492, 493 and 494)
 1218 30 cm H.E. Rocket (30 cm Wurfkorper Spreng)(Figs.495 and 496)

AMENDMENTS

Bulletin No.20 Item 282. Add new para. "Any rounds which may have been assembled without the paper collar prior to this instruction are, however, considered safe to fire."

Bulletin No.38 Item 937. Line 7. Against N.R.N. No.11. For "Moderated Flake" substitute "Moderated Tube".
 Line 8. Against N.R.N.No.12 For "Moderated Tube" substitute "Moderated Flake".

" No.41 Item 1041. Pages 5 & 7. Delete all reference to 95 mm.
 " No.42 Item 1094. Pages 7 & 8. Against LD(L)14261, Q.F.3.7", 4.5" and 5.25" Guns. Insert in Remarks Column "Amatol 50/50 - Obsolescent".
 " " Page 9. Col.I For "Q.F. 5.5 in. Gun" substitute "B.L. 5.5 in. Gun"
 " No.43 Item 1141. Page 7, Line 28. Amend abbreviation to read "3.7 AA FUZ 223 RED"
 Item 1155 Page 14, Line 14. After "pressure" insert "plate"
 " " Item 1176 line 1. Add "(Fig.484 Bulletin No.44)"
 line 9. For "four" substitute "two"
 " " Item 1177 line 4. After "modifications" Add "See also Bulletin No.44 Item 1211".

1178.

CARTRIDGES, Q.F. H.E. 3.7 A.A. - INCORRECT DESIGN NUMBER

Certain Batches of above ammunition, ex Canada, have been received with incorrect Design No. stencilled on the ammunition. The ammunition is stencilled DD(L)12056 (i.e. Amatol 50/50) although the filling is T.N.T. (i.e. DD(L)8029).

Following is a list of Batch No's affected.

<u>Batch</u>	<u>Batch</u>	<u>Batch</u>
B.1677A	B.2229A	B.2265A
B.2068B	B.2237A	B.2266A
B.2069A	B.2244A	B.2267A
B.2071A	B.2245A	B.2269B
B.2072A	B.2245B	B.2270A
B.2073A	B.2246A	B.2271A
B.2073B	B.2247A	B.2272A
B.2074A	B.2247B	B.2273A
B.2075A	B.2248A	B.2274A
B.2091A	B.2249A	B.2276A
B.2092A	B.2249B	B.2276B
B.2097A	B.2250A	B.2278A
B.2097B	B.2251A	B.2278B
B.2098A	B.2251B	B.2453
B.2124A	B.2252A	B.2454
B.2219A	B.2253A	B.2455
B.2220A	B.2254B	B.2577
B.2221A	B.2255A	B.2578
B.2221B	B.2256A	B.2581
B.2222A	B.2256B	B.2583
B.2223A	B.2257A	B.2592
B.2223B	B.2258A	B.2594
B.2224A	B.2259B	B.2595
B.2225A	B.2260A	B.2596
B.2225B	B.2260B	B.2597
B.2226A	B.2261A	B.2598
B.2227A	B.2261B	B.2599
B.2228A	B.2262A	B.2600
B.2228B	B.2263A	B.2601

1179.

CARTRIDGES, Q.F., 6 pr. 7 cwt. (N.H.033). USE OF NO.34 PRIMER

Approval has been given for the use of the Primer, No.34 (described in Bulletin No.40, Item 1002) in cartridges Q.F. 6 pr. 7 cwt. N.H. 033 Charge.

1180.

IGNITER, ELECTRIC, NO.84 Mk.I (FIG.479)

This igniter, used with the No.24 Smoke Generator when fired electrically, consists of a celluloid capsule containing $\frac{1}{2}$ gram composition S.R.252 over which is inserted a No. F.53 Mk.I electric fuze. The fuze is fitted with two 15" lengths of yellow plastic covered electric cable. A strip of lassolastic or approved alternative, 4" long x $\frac{1}{2}$ " wide, spirally wound, secures the capsule to fuze.

Package details are not yet clear.

1181.

TRACERS, SHELL, NOS.24 Mk.I and 26 Mk.I.

The abovementioned internal type tracers, for proof of shell, Q.F. 40 m.m., have been approved.

1182.

M.L. 3 in. MORTAR AMMUNITION, PACKAGE.

Reference Bulletin No.42, Item 1108, page 18. Design of Stool, packing, No. 3 Mk.I for use in Box B.167A when packing 4 round M.L. 3 in Mortar bombs in two steel Carriers No. 10, has been approved.

1183.

GRENAD, HAND, NO.83, SMOKE

Reference Bulletin No.39, Item 980. Approval has been given for the following new compositions to be used in the filling of the No.83 Grenade :-

<u>Colour of Smoke</u>	<u>Composition</u>
Red	P.N. 469A
Yellow	P.N. 473A
Green	P.N. 468A
Blue	P.N. 471A

1184.

CARTRIDGES, Q.F. 40 mm. H.E. - STANDARD PROPELLANT, LAND SERVICE

The adoption of N.H.025 as the standard propellant for Q.F. 40 mm. H.E. rounds, Land Service, has been approved.

1185.

FUZE, TIME, NO.214. USE IN Q.F. 3.7 in. MKS.I to III GUNS.

The use of Fuze, Time, No.214 in Q.F. 3.7 in. Mks.I to III Guns has been approved.

1186.

STRIKER MECHANISM, NO.2 Mk.I and No.3 Mk.I.

Designs of the abovementioned Striker Mechanisms have been approved.

The No. 2 Mk.I mechanism is used with the No.80 Smoke Grenade (see Bulletin No.39, Item 972). The fly-off lever of the mechanism is rust-proofed white.

The No. 3 Mk.I mechanism is used with the Nos. 81 and 83 Mk.II grenades and differs from the No. 2 Mk.I in that the fly-off lever is rustproofed black.

1187.

GRENAD, HAND, NO.83, SMOKE, MK.II.

This grenade, filled coloured smoke composition, differs from the Mk.I (described in Bulletin No.39, Item 980) in the ignition arrangement. It is fitted with Striker Mechanism, No. 3 Mk.I in lieu of a striker and match head and is not provided with a lid. Packing is not yet clear.

1188.

CONTAINER, CARTRIDGE, NO.249 MK.I (Q.F. 6 pr. 7 cwt.)

The above container, in waterproof board, has been approved for Far East use. It is designed to pack one round Q.F. 6 pr. 7 cwt. A.P.C.B.C.

One end of the container tube is prepared internally to locate the projectile and the end closed by a sheet metal cap secured to the container tube. The opposite end is shouldered to receive a waterproof board lid with sheet metal end. A strip of waterproof adhesive tape, 1½" wide, seals the joint between cap and container.

Stowage dimensions are:- Length 30.55 inches, Dia. 3.9 inches.

1189.

CONTAINER, CARTRIDGE, NO.250 MK.I (Q.F. 2 pr. Mks.IX to XA.)

This container, in waterproof board, has been approved as an interim package for Far East use. It is designed to pack one round Q.F. 2 pr. (Mks.IX to XA guns) A.P. Shot.

One end of the container tube is prepared internally to locate the projectile and the end closed by a sheet metal cap secured to the container tube. The opposite end is shouldered to receive a sheet metal lid. The joint between lid and container is sealed by a 1" wide strip of waterproof adhesive.

Stowage dimensions are:- Length 17.15 inches, Dia. 2.5 inches.

1190.

BOXES AND CYLINDERS FOR FUZES, GAINES, PRIMERS, TRACERS, DETONATORS, &c.

The following list of cylinders and boxes used for packing the above stores together with details of contents and external dimensions, is published for information :-

CYLINDERS:

CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS
6	Tinned Plate Tape Banded	Exploders H.E. Shell	Dia. H 3.15 L. H 8.175	
6D	Tinned Plate	25 Detonators No.6.	Dia. H 3.18 L. H 2.1	
8D. III.	" "	" " No.8	Dia. H 3.125 L. H 2.92	
8D. IV.	" " Push on Lid.	" " No.8	Dia. H 3.125 L. H 3.15	
9 II	Tinned Plate	" " Electric No.9, & Rectifier Mk.VI.	Dia. H 4.16 L. H 7.83	
II F. I	" "	1 Fuze Per Base Large No.11, Mk.III or No. 15 Mk.I.	Dia. H 2.575 L. H 3.775	
12D I.	" "	25 - Detonators Electric No.12 & Rectifier (For Colonies)	Dia. H 4.1 L. H 8.375	
12F. I.	" "	1 - Fuze Per Base Medium No.12 Mk.I to V.	Dia. H 2.345 L. H 2.9	
13D II.	" "	25 - Detonators Electric No.13 & Rectif- ier.	Dia. H 4.1 L. H 8.375	
14 III	Tinned Plate Tape Banded	25 - Fuzes Electric No.14	Dia. H 6.09 L. H 6.47	
18F I.	Tin	1 - Fuze Per. D.A. Impact No.18 or No.18 P.	Dia. H 1.9 L. H 3.62	

CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS
18 II	Tin	25 - Fuzes Electric No.18	Dia. H 4.13 L. H 8.375	
27 III	Tinned Plate	24 - Tubes Friction; - Machine Rocket Signal	Dia. H 2.84 L. H 2.59	
45 F. III	Tinned Plate Watertight Cap	1 - Fuze Percussion D.Impact No.45 or 45 P.	Dia. H 2.11 L. H 4.49	
47 I.	Tinned Plate	150 - Caps Q.F. 2.95" - 6 & 3 Pounders	Dia. H 3.4 L. H 1.05	
56 II	Tinned Plate	1 - Gaine No.8	Dia. H 2.1 L. H 3.25	
65F I	Tinned Plate	1-Fuze, T. & P. No.65A, Percussion D.A. No.17 or No.44 or Percussion D.A.Impact No.13 or Fuze Percussion No.44/80.	Dia. H 1.85 L. H 3.12	
65F I	Tinned Plate	Method of Packing Fuze 44/80.	Dia. H 1.85 L. H 3.12	
70 II	Tinned Plate	20 Primers No.23.	Dia. H 3.37 L. H .93	
80F II	Tinned Plate	1 - Fuze T & P.No.80 Transport to India.	Dia. H 2.59 L. H 2.53	
80 F. VIII.	Tinned Plate	1 - Fuze T. & P. No.80, 80B, 83, 88R, 80/44, 80B/44, 180, 180B,183, 188, & 197 with or without cover.	Dia. H 2.9 L. H 3.08	
100F.	Tinned Plate	1 - Fuze Percussion No.101B, 101E, or 102 with Gaine No.2 & Paper Collar.	Dia. H 2.65 L H 8.2	

CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS
101F VII, VIIRT XI or XIR & XII.	Tinned Plate	1-Fuze Percussion No.101B, or 101E, with Gaine No.2, or Per: D.A.106, 106E, 106 PD 106 P.E. 115E, or 117, or D.A. & Per: No.119, or Per: No.231; or Time No.210; or Per No.232; with Exploder, or Per: Base, Large No.159, 270, 346, or 480.	Dia. H 2.6 L. H 7.97	With fitments fuze 701 is packed in this cylinder.
101F VII XI & XII	Tinned Plate	1 - Fuze No.117 with Exploder Pellet.	Dia. H 2.6 L. H 8.3	
101F. VIII.	Cardboard Sides with tinned Plate Ends & Diaphragms.	1-Fuze Per No.101B or 101E, with Gaine No.2, or Per: D.A. No.106, 106E, 106 P.D. 106 P.E. 115 E, or 117, or D.A. & Per. No.119, or Per No.231 & No.232. or Time No.210, with Exploders.	Dia. H 2.6 L H 8.3	Obsolescent.
101F IX.	Tinned Plate with Press Cap.	1 - Fuze Percussion No.101B, or 101E, with Gaine No. 2 or Percussion D.A. No. 106, 106E, 106 P.D. 106 P.E, 115E, or 117, or D.A. & Per: No.119, 231, or 232, or Time 210, with Exploders or 207 & 208 without Exploders.	Dia. H 3.05 L. H 8.03 Dia. H 3.05 L. H 8.03	Cylinder No.101 Mk.V Cardboard with T.P.Ends Fuze 117, 119 or 231 with exploder (For North American Production) Obsolescent.
101F. XII.	Tinned Plate	1 - Fuze Per: No.101B or 101E, with Gaine No.2 or Per: D.A. 106, 106E, 106 P.D. 106 P.E. 115E or 117, or D.A. & Per: 119, 231, 232, or Time 210 with Exploder, or Base Large 159, 270, 346 or 480.	Dia. H 2.6 L. H 7.97	
101F XIII	Rolled Paper	1 - Fuze Per: D.A.No.117 or D.A. & Per No.117 or Per No.231 or 232 with Exploder.	Dia. H 2.6 L. H 8.15	Obsolescent
103 I	Tinned Plate	10 - Primers Percussion No.1	Dia. H 6.04 L. H 1.2	Cylinder No.101F Mk.XV. T.P. 1-Fuze 222 with cover (For North American Production).

CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS
105 I.	Tinned Plate	20 - Primers Percussion No.2 Mk.I.	Dia. H 5.1 L. H.725	
106 I.	" "	10-Primers Percussion No.2 Mk.II	Dia. H 4.8 L. H 1.05	
106F II	Tinned Plate Converted No.100F, Cyl:	1-Fuze Percussion D.A. Nos.106E, 106P.E or 106 P.D. with or without exploder.	Dia. H 2.7 L. H 8.28	
113 I	" "	20-Primers, Percussion No.2 Mk.III.	Dia. H 5.1 L. H 2.6	
114 II.	" "	10-Primers, Percussion No.2 Mk.IV & VII.	Dia. H 4.84 L. H 2.61	
115 I.	Tin	10-Tracers, Shell No.2.	Dia. H 3.94 L. H 2.55	
119 F I.	Tinned Plate	1-Fuze D.A. & Percussion No.119, or 1 Fuze Percussion D.A. No.117.	Dia. H 2.64 L. H 5.31	
124 IV.	" "	12- Detonators No.36, or 36M Grenade		
124 V.	Tinned Plate	12 - Detonators No.36 M, Grenade	Dia. H 3.92 L. H 2.75	
124 VI.	" "	" " "	Dia. H.3.9 L. H 2.8	
130 I.	" "	Detonators No.8, Large	Dia. H 2.1 L. H 2.8	

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CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS.
131 I.	Tinned Plate	Fuze, Percussion, D.A. Impact No.131 or 132.	Dia. H. 1.9 L. H. 2.5	
134 I.	Paper	500 Caps for No.1 Percussion Primers or Detonator Fuzes.	Dia. H. 3.02 L. H. 3.0	
138F. I.	Tinned Plate	1-Fuze, Percussion, D.A. No.138.	Dia. H. 1.93 L. H. 5.34	
139F. I.	" "	1 - " " " No.139 or 139P.	Dia. H. 2.48 L. 2.15	
150 F. I.	" "	1 - " " " No.150 or 150 P.	Dia. H. 2.23 L. H. 4.32	
159 F. I.	" "	1 - " " Base Large No.159, 346 or 480.	Dia. H. 2.9 L. H. 4.68	
167 I.	" "	1 - " Electric Base Large No.15 or 16.	Dia. H. 2.48 L. H. 9.25	
168 I.	" "	1 - " " " Med: No.12.	Dia. H. 2.33 L. H. 9.2	
169 I.	" "	15 - " " " Hotchkiss	Dia. H. 5.1 L. H. 4.88	
199F. I.	" "	1 - " Time No.199 or 390 or T. & P.No.221 or 223.	Dia. H. 3.09 L. H. 5.32	
199 F. II.	Rolled Paper	1 - Fuze, Time, No.199, with cover	Dia. H. 3.05 L. H. 5.28	Obsolescent
208F. I.	" "	1 - " No.208, without Exploder.	Dia. H. 2.5 L. H. 5.7/8	Obsolescent

CYLINDER NO.	MATERIAL	CONTENTS.	External Dimensions Dia. Length	REMARKS.
216 I.	Tinned Plate	1 - Rocket Message Carrying:- With Whistle	Dia. H. 1.87 L. H. 36.1	
220.F. I.	" "	1 - Fuze Time & Percussion No.220 without cover	Dia. H. 2.97 L. H. 3.36	
220 F. II.	" "	1 - " " " No.220 or 220 B. with cover.	Dia. H. 3.14 L. H. 3.67	
222 F. I.	Steel	1 - Fuze No.222 or 222B with Cover without Exploder.	Dia. H. 3.1 L. H. 6.15	
230 F. II.	Tinned Plate	1 - Fuze Percussion D.A. No. 230 or 230.P.	Dia. H. 2.64 L. H. 4.98.	
234 II.	" "	5 - Fuzes Rocket Boxer No.20 (For use by Board of Trade)	Dia. H. 4.58 L. H. 3.72	
237 I.	" "	For Storage of Adhesive Tape.	Dia. H. 5.75 L. H.5.25	
242.F. I.	Tinned Plate	5 - Fuzes Percussion D.A. No.242 for India	Dia. H. 4.83 L. H. 2.37	
244 I.	" "	1 - Gaine No. 9	Dia. H. 2.17 L. H. 2.97	
259 I.	" "	5 - Gaines No. 8,	Dia. H. 4.6 L. H. 3.43	
262 I.	" "	10 - Primers Percussion No.9.	Dia. H. 5.98 L. H. 6.04	

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CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS
271 I.	Tinned Plate	10 - Primers, Percussion No.11.	Dia. H. 5.96 L. H. 2.94	Obsolete
274 I.	" "	25 - Detonators No.27 & Rectifier	Dia. H. 2.92 L. H. 4.67	
281F. I.	" "	5 - Fuzes Per Base Tracer No.281	Dia. H. 3.21 L. H. 3.64	
283F. I.	" "	5 - " " " " No.283	Dia. H. 4.82 L. H. 4.0	
291 I.	" "	20 - Primers, Percussion No.12.	Dia. H. 5.18 L. H. 3.05	
296 I.	" "	10 - Fuzes, Electric No.31.	Dia. H. 2.62 L. H. 7.63	
309 I.	" "	10 - Detonators Electric No.33.	Dia. H. 3.17 L. H. 2.65	
319 I.	" "	5 - Fuzes Mine Contact A.T. No.2.	Dia. H. 3.59 L. H. 4.28	
323 I.	" "	5 - " " " " A.T. No.3	Dia. H. 6.65 L. H. 4.4	
337 I.	Rolled Paper	1 - Reel Containing 500 ft. Fuze Instantaneous Detonating Cordtex Mk.IV for Box M 93.		
344 I.	Tinned Plate	20 - Primers Per: No.16 or 27.	Dia. H. 5.16 L. H. 1.3	
359 I.	" "	Container with Sealing Disc. & Screw Cap To Hold 7 oz. Acetone.	Dia. H. 2.5 L. H. 4.25	

CYLINDER NO.	MATERIAL	CONTENTS	External Dimensions Dia. Length	REMARKS.
360 I.	Tinned Plate	10 - Celluloid Discs.	Dia. H .625 L. H 1.6	
362 I.	" "	10 - Primers Percussion No.18.	Dia. H. 5.9 L. H. 1.05	
500 F. I.	" "	1 - Fuze Percussion Base Medium No.500	Dia. H. 2.42 L. H. 3.92	
600 F. I.	" "	1 - Fuze Time No.600	Dia. H. 3.11 L. H. 5.62	
620 F. I.	" "	1 - Fuze No.620 or 2 Detonators Electric No. D.62	Dia. H. 2.53 L. H. 5.47	
396 I.	Steel	5 - Fuzes, Mine Contact A.T. No.3 & 5 Covers.		
BOXES :-				
NOMENCLATURE	MATERIAL	CONTENTS	External Dimensions L. W. D.	REMARKS
Box, Fuze F.24/31 R.Y.G. - I.	Steel	12 - Fuzes 24/31 R.Y.G. M.46 or M.47.	6.5: 5.0 :6.0	
Box No. 334 - I.	Tinned Plate	48 - Detonators, Mine, Shrapnel in 12 Cartons No.15.	6.8: 4.06:2.76	
" No. 376 - I.	" "	24 - Detonators No.27 or Igniters for 75 A/T Gren: 50 - Spare Cap Holders for Ig. Safety Fuze.	6.8: 2.9: 1.25	
" No.379 - I.	" "	10 - Vent Tubes .5" or .4" or 10 Rifle Grenade Cartridges, or 10 - 1 C.M. Primers.	6.87:3.1: 1.0	

NOMENCLATURE	MATERIAL	CONTENTS	External Dimensions	REMARKS
			L. W. D.	
Box No. 380 - I	Tinned Plate	20 - Per: S.A. Tubes or 20 No. 110 Fuze Detonators, or Igniters, or 10-Friction or Perc. T Tubes.	2.57: 2.2: 2.82	Obsolescent
Box, Tubes Friction or Percussion T Field - I.	Iron or Steel	Quantity not Given.	5.3: 3.4: 3.9 (approx.)	
Box Tubes, Percussion S.A. Cartridge - I.	Tinned Plate	To hold 20.		
Box Tubes Friction or Percussion "T" - II.	"	To hold 10.	2.57: 2.2: 2.75	
Box Tube Vent. 5" - I.	"	10 - Tubes Vent. 5".	6.82: 2.9: 1.03	
Box, Tubes Vent .4" - II	"	To hold 10.	5.71: .31: .81	
" " " .5" - II	"	To hold 10.	6.9: 3.1: 1.03	
Box Instantaneous Fuze - VI	"	300-Ft. of Mk. III or V Fuze: or 400 Ft. of Detonating Fuze.	Dia. 13.7 D - 3.71	
Reel for Box, Instantaneous Fuze VI.	"	Reel for above.	Dia. 13.25 D - 3.35	
Box No. 4 Flexible Fuze Covers - I.	"	To hold 50	6.1: 4.4: 4.75	
Box Detonator Burster Drum Projector - I.	Cardboard	To hold 10 - Mk. I Detonators	11.9: 5.7: .96	
Box Detonator Burster Drum Projector - IV.	Tinned Plate	To hold 12	14.0: 4.0: 1.45	

NOMENCLATURE	MATERIAL	CONTENTS	External Dimensions	REMARKS.
			L W. D.	
Box Igniter Safety Perc.-I.	Tinned Plate	To hold 10 - Mk.III Igniters	7.66: 3.7: .84	Obsolescent for Imperial Service
Box No. 1 Per: Primers - II	" "	To hold 4.	3.3 : 3.3: 1.45D	
Box No.146 Per: Fuze - II	" "	To hold 1.	2.16: 1.85:2.35	
Box No. 1 Per: Primers - III	" "	To hold 4.	3.17: 3.17: 1.48	
Box .303" S.A. Type Cartridges - I.	" "	20 - Rifle Grenade or Percussion Tube Cartridges.	2.61: 2.3: 2.8	

1191.

TRACER, SHELL, NO.21 and No.22. TIME OF BURNING

Reference Bulletin No.41, Items 1049 and 1067. The specified minimum time of burning of the abovementioned tracers has now been amended to 1.5 seconds.

1192.

TRACER AND IGNITER, Nos. 11 and 14. METHOD OF CLOSING

Approval has been given for the "jam" washer method of closing tracer cavity to be extended to cover Tracer and Igniter No.11 Mks.III,IIIB and IIIE and No.14 Mks. II, IIB and IIE. Details of this method are shown in Bulletin No.41, Fig. 417.

To avoid the necessity of re-stamping tracer bodies no advance of Mark will be made to indicate this change.

1193.

CARTRIDGES, Q.F. 75 m.m. AMERICAN M2 and M3 GUNS. DECOPPERING CHARGE.

A decoppering charge of 2/3 oz. tin or leadfoil, to be used in cartridges for Q.F. 75 mm. American M2 and M3 guns, has been approved.

R.4475

1194.
CARTRIDGE, M.L. 3 in. MORTAR, SMOKELESS, 90 Grs. BALLISTITE, MK.I.

This cartridge, filled 90 grains Ballistite with a priming of 10 grains NC(Y), has been approved. The priming is contained in the lower portion of the cartridge, immediately above the cap chamber, and is kept separated from the ballistite by a cup shaped celluloid diaphragm which is a closefit in the cartridge body.

1195.
CARTRIDGE, M.L. 3 in. MORTAR, 95 GRAIN "OBSOLESCE"

Designs for the M.L. 3 in. Mortar 95 grain, Mks.VIII and IX cartridges have been endorsed "OBSOLESCE".

1196.
CLIPS, Q.F. CARTRIDGE

Reference Bulletin No.34, Item 792. Approval has been given for the use of Clips, Q.F. Cartridge Nos. 42 and 43 (in steel) as alternatives to Clips No's 36 and 30 respectively, in order to conserve material.

1197.
CARTRIDGES, Q.F. 5.25 in. Mk.II GUN, ALTERNATIVE PACKAGE.

Approval has been given for the use of Cylinders, Cartridge No.36 as an alternative to Container, Cartridge No. C.227 for packing Q.F. 5.25 in. Cartridges.

1198.
S.A.A. 20 mm. OERLIKON. MARKING

An amendment to cartridge case design for the abovementioned ammunition to show stamping in 3/32" type on the side (near the base), has been approved.

1199.
S.A.A. TRACER, 20 mm. HISPANO GUN, Mk.IZ. IDENTIFICATION MARKING.

To facilitate identification of the above round a red band, immediately in front of the driving band, in lieu of the red T, has been approved.

1200.
CARTRIDGE, Q.F. 17 pr. N.H. 055, 7 lb. 11 oz. 8 dr.

M. of F. design for the abovementioned cartridge for Mk.II H.E. shell has been approved.

1201.
GENERATORS, SMOKE, "OBSOLETE".

The undermentioned smoke generators have been declared "OBSOLETE":-

No.10
No.13
No.14

1202.
CARTRIDGE, DRILL, Q.F. 3.7 in. Mks.I to III GUNS, Mk.IV.

The abovementioned drill cartridge has been declared "OBSOLESCE"

1203.
CARTRIDGES, Q.F. 6 pr. 7 cwt. EXTENSION OF USE TO AIR SERVICE.

(a) Reference Bulletin No.42, Item 1087. The approval given for the extension of use to Air Services of the ammunition quoted therein has been cancelled and an amendment deleting Item 1087 appears on page 2, this Bulletin.

(b) Approval has now been given for the extension of use of the undermentioned Land Service ammunition and all relevant stores to Air Service:-

Cartridges, Q.F. 6 pr. 7 cwt.

A.P.C. Shot
H.E. shell with fuze No.244.

1204.

CARTRIDGES, Q.F. 4.5 in. GUN. REDUCED CHARGE, N.H.033.

Approval has been given for the abovementioned cartridges to be filled to a fixed charge weight of 7 lb. 0 oz. 10 dr. N.H.033.

1205.

CONTAINER. CARTRIDGE, NO.246 Mk.I (for Q.F. 17 pr.)

This steel cartridge container, for use in A.F.V's, has been approved. It is designed to hold one round Q.F. 17 pr. A.P., A.P.C. or H.E.

Overall dimensions are Length $24\frac{1}{2}$ inches, Dia. 5.35 inches.

1206.

SHELL, B.L., or Q.F. COLOURED SMOKE, B.E. - M. of F. DESIGN DD(L)17625 (FIG. 480)

The abovementioned typical M. of F. design for base ejection coloured smoke shell, details of which are shown in Fig. 480 has been approved. Shell to which this method of filling is applicable together with particulars of fuze; plug, fuze hole; type of smoke container, weight of filled and fuzed shell; are as shown in the following table:-

Shell		Fuze Number	Plug, Fuze Hole 2 inch No.1.	Number & Type of Containers Smoke (Red, Yellow, Green, Blue)	Weight of Shell, Filled and Fuzed	
Calibre	Mark				Red, Yellow or Green lb. oz. dr.	Blue lb. oz. dr.
25 pr.S/L	ID	221	Mk.II or III	3 No.3 Mk.II	19 13 4	20 0 4
25 pr.S/L	IID	221	Mk.II or III	3 No.3 Mk.II	19 14 12	20 1 12
3.7 in. How.	I	83	Mk.II or III	3 No.4 Mk.II	18 1 12	18 8 2
3.7 in. How.	II	221	Mk.II or III	3 No.4 Mk.II	18 8 7	18 14 13
95 mm.S.P. & Inf.How.	IA	221	Mk.II or III	4 No. 4 Mk.II	22 7 11	22 12 3
95 mm.Tank How.	IA	390 Mk.I	Mk.II or III	2 No.1 Mk.I	22 2 5	22 6 13

1207.

H.E. SHELL, DETAILS OF M. OF F. DESIGNS, Q.F. 40 mm. (Figs. 481 & 482)

(1.) Reference Bulletin No.42, Item 1094, Table, p.4. The undermentioned designs have been amended as shown :-

Q.F. 40 mm. DD(L)11606 and DD(L)14279. All reference to R.D.X/BWX filling deleted.

The detail under column headed "Bursting Charge" in the table referred to above should be amended to read "T.N.T. or Pentolite" and under column headed "Fuze" add "or 255", in respect of each of the above quoted designs.

(2) The following new M. of F. designs to cover R.D.X./BWX 91/9 filling for Q.F. 40 mm. have been introduced:-

DD(L)19674. For fuze No.251 or 255 and Tracer and Igniter Shell No.14 (See FIG.481)

DD(L)19675. For fuze No.251 or 255 and Tracer and Igniter Shell No. 11 (See FIG.482)

R.4475

1208.

GERMAN FUZE (F.P.Z.8001) for H.C. ANTI-TANK BOMB
(Faustpatrone)
(Fig. 483)

The main parts are accommodated in a cylindrical steel container, closed by a steel washer, and consists of an inertia pellet with needle, arming collar, three springs, detonator, and detonator holder. The whole, except the detonator, are made of steel.

The inertia pellet and arming collar are hollow cylinders with an external flange at one end to form bearing for a steel spring surrounding them. Both have free longitudinal movement inside the container, the arming collar being arranged to move telescopically over the inertia pellet. The other end of the inertia pellet is closed except for three flash holes and has the needle and a distance piece secured to it.

The distance piece is made in two diameters. It supports a spiral spring, whilst the fuze is in the unarmed condition, and a wire locking spring, hexagonal in shape, is fitted around the smaller diameter.

The detonator holder and closing washer are supported on a step at the end of the container and secured by turning over the continuation of it.

ACTION

On acceleration, the arming collar sets back so that the spiral and hexagonal springs expand. The hexagonal spring locks the arming collar to the inertia pellet and the whole is free to move forward through the expanded spiral spring when the flight of the projectile is checked.

1209.

GERMAN FUZE AZ 5095
(Fig. 484)

Reference Bulletin 43, Item 1176. An illustration of this fuze is shown in Fig. 484.

1210.

GERMAN BASE FUZE Bd.Z.DOV. FROM 15 cm H.E. ROCKET
(Fig. 485)

This is a direct action base fuze used in the 15 cm. H.E. Rocket. It may be identified by the stamping "Bd.Z.DOV" in the base. The overall length of the fuze is 1.4 inches and its maximum diameter, over the threads, is 1.75 inches.

The fuze consists of a steel body, steel needle, five centrifugal segments of light alloy, expanding spring ring, creep spring, steel detonator holder, igniferous detonator and steel screwed plug. All steel components are rustproofed.

The body is screwthreaded externally with a left hand thread for insertion in the base of the rocket, and the forward end is reduced in diameter and screwthreaded for the attachment of the detonator holder. It is bored centrally from the front in two diameters to form chambers to house the needle pellet and centrifugal segments.

The needle is integral with the inertia pellet. The pellet is housed in the base of the body, and provided with two shoulders below the needle which is located centrally in the larger chamber.

The five centrifugal segments are pivoted on pins and are shaped so that one locks the other. In the unarmed position, the segments engage the larger shoulder of the needle pellet and holds the needle off the detonator. They are surrounded and retained in this position by an expanding spring ring.

The spiral creep spring surrounding the needle is held between the smaller shoulder of the needle pellet and a seating in the detonator holder.

The detonator holder is bored centrally to form two chambers which are connected by a coned boring with a seating for one end of the creep spring. The larger chamber is screwthreaded to receive the forward end of the fuze body. The smaller chamber houses an igniferous detonator and is closed by a perforated screwed plug secured by stabbing.

ACTION

Before firing

The needle is held off the detonator by the centrifugal segments which are retained in the closed position by the expanding spring ring.

During flight

On deceleration and when the necessary rotational velocity is reached, the segments, overcoming the spring ring, swing outwards under centrifugal force clear of the needle pellet. Creep action by the needle pellet is prevented by the creep spring.

On impact or graze, the pellet moves forward compressing the creep spring and carries the needle onto the detonator.

1211.

GERMAN PERCUSSION FUZE 1e Jgr Z 23 nA
(Fig. 486)

The fuze, which may be identified by the stamping "1e Jgr.Z.23 nA" (or 1e Igr 23 nA) on the fuze body, is used in the 21 cm H.E. B.C. rocket (wurfgranate 42 Spr) under the ballistic cap. It is designed to function on impact through a wooden extension rod or on graze and has an optional delay of 0.15 seconds.

The fuze consists of an aluminium body, needle, needle holder, creep spring, centrifugal segments, expanding spring ring, detonator pellet, detonator collar, delay mechanism and a magazine.

The body is in three sections, to facilitate the assembly of the mechanism which are screwed together and secured by spinning.

The nose section is bored centrally in two diameters to form a chamber at the base to accommodate the needle holder, and above it, a recess to accommodate a wooden rod forming an extension to the striker. The top of the recess is coned outwards. Externally at the bottom it is screwthreaded for insertion in the centre section. The steel cylindrical needle holder is bored centrally in two diameters to receive the steel needle. The needle is secured in the holder by turning the metal at the top of the boring over the head of the needle. The underside of the holder is recessed to form a bearing for one end of the creep spring which surrounds the stem of the needle.

The centre section is bored centrally in two diameters, screwthreaded internally at the top to receive the nose section and externally at the bottom for insertion in the base section. The chamber formed in the top houses five brass centrifugal segments each pivoting on a pin. The segments are surrounded by an expanding spring ring which, at rest, prevents the needle and detonator pellet moving towards each other to fire the detonator. The lower chamber houses the detonator pellet.

The detonator pellet is of steel, cylindrical in shape, and smaller in external diameter at its forward end, it is bored centrally in three diameters to form an internal flange separating two chambers. The upper chamber receives the base end of the creep spring and the point of the needle, and the lower chamber the detonator. The detonator is retained in the pellet by a light alloy plug with central fire channel. The plug is secured by a steel pin. The base of the plug is coned and located in an iron inertia collar. Paper washers are inserted between the plug and detonator.

The base section of the fuze body is bored, centrally to form chambers for the collar, delay holder and magazine, and radially to accommodate the delay mechanism. It is screwthreaded internally at the top to receive the centre section and externally at the base below the flange for insertion in the shell. The chamber at the top houses an iron inertia ring rustproofed by some process which leaves a matt surface. The ring is square in section and coned internally at the top to match the coned portion of the plug in the detonator pellet. The diameter of the ring is considerably less than that of the chamber which houses it. The ring is centred by five upturned lugs of a rustproofed steel washer which fits closely at the bottom of the chamber. The chamber at the bottom houses the delay holder above a magazine which closes the base of the fuze.

The delay holder is an aluminium pellet with a central flash channel, and another channel, displaced from the centre, filled with delay composition. Both channels are in communication with the magazine filling and there is an inclined channel between the delay composition and the centre of the fuze. A recess in the top surface of the holder accommodates a centrifugal shutter. The delay composition, in a similar fuze, consisted of sulphur 9.2 per cent, potassium nitrate 72.6 per cent, charcoal 18.2 per cent.

The magazine is screwthreaded externally and contains a perforated pressed pellet of gunpowder. A flash hole in the base of the magazine is closed by a paper disc inserted below the pellet.

The central flash channel in the delay holder may be closed or opened by an optional delay mechanism. The delay mechanism consists of a setting plug, centrifugal bolt, spiral spring, plate and screwed ring. The setting plug is tubular steel closed at one end and has a slot on the outside which serves as a setting index. The plug is retained in the fuze body by the steel screwed ring. The cavity in the plug houses a cylindrical steel centrifugal bolt and spiral spring. When the fuze is set to non-delay, a slot, cut diametrically across the mouth of the cavity, receives a centrifugal copper shutter that slides in a recess in the top surface of the delay holder and unmarks the central fire channel. A brass plate with holes bored to correspond with the delay and central fire is placed on the holder and forms an upper surface for the copper plate.

ACTION

Before firing

The needle is separated from the detonator by the centrifugal segments which are retained in the closed position by the expanding spring. The shutter of the delay mechanism closes the central fire channel by pressure from the centrifugal bolt. This position is maintained whether the fuze is set delay or non delay. The delay channel is always uncovered.

To set the fuze for non delay action, the slot in the setting plug is turned to a position in prolongation with the axis of the fuze to the marking "0" on the fuze body thereby bringing the slotted recess in the plug opposite the shutter. For delay action the setting plug is turned at right angles to the axis of the fuze to the marking "H" and "V" on the fuze body, and in this position the plug prevents movement of the shutter during flight so closing the central fire channel.

During flight

Non-delay action

The centrifugal segments swing outwards one after another, and the surrounding spring expands. During deceleration only the creep spring prevents the detonator pellet carrying the detonator on to the needle. The centrifugal bolt of the delay mechanism moves outwards compressing its spring, and the plate under centrifugal action slides into the plug and opens the central flash channel.

Delay action

When set to delay, the plug prevents the shutter sliding under centrifugal action and the central fire channel remains closed.

On impact

By direct action the extension rod forces the needle directly on to the detonator. On graze, the detonator pellet is carried forward on to the needle, or it may be forced on to the needle by a sideways movement of the inertia collar. The flash from the detonator passes either through the delay channel or through the central channel to the magazine according to the setting of the fuze, and thence to the mine in the shell.

1212.

GERMAN FUZE H bgr Z 35 K.

(Fig. 487)

This fuze which may be identified by the stamping Hbgr.Z.35 K on the body, is of the direct action and graze type with an optional delay of 0.10 secs. It is designed for use under a ballistic cap and is used in the 21 cm. H.E. rocket.

The fuze mechanism is substantially the same in design and dimensions as the AZ 23 umg 0,15 described in Bulletin No.42, Item 1117 except that the wooden hammer and closing disc are removed and the following arrangement substituted, to enable the fuze to be used under a ballistic cap.

The recess in the top of the setting head is screwthreaded to receive an adapter which screws on to a metal disc and is secured by a satscrew. The disc closes the bottom of the recess and supports the base end of a rod forming an extended hammer.

The adapter is bored centrally and has a coned opening at the top.

The hammer is a tube of light alloy with a solid extension piece, slightly less in diameter, inserted in each end. The lower extension piece is housed in the fuze adapter whilst the upper is held by another adapter in the nose of the ballistic cap and retained by a brass closing disc.

ACTION

The fuze is normally set at non delay for transport, and may be set for delay by the aid of a special fuze key.

The action of the fuze is the same as that described in Bulletin No.42 for the AZ 23 umg 0,15 except that at direct action, the ballistic cap is shattered and the hammer forces the needle on to the detonator.

1213.

GERMAN FUZE Wgr Z 50 +
(Fig. 488)

The German fuze Wgr.Z.50 + is a direct action and graze fuze with provision for allways action should flight be abnormal, and is used in the 32 cm. Incendiary rocket and the 28 cm and 30 cm H.E. rockets. It is identified by the marking "Wgr. Z 50 +" stamped in the body above the flange. The overall length of the fuze with cap is 2.95 inches and its diameter across the threads is 1.4 inches. It is provided with a cap and safety pin.

The fuze consists of a body, needle, needle holder, two centrifugal bolts, expanding spring ring, creep spring, detonator and holder, inertia collar, centring washer, base plug, cap and safety pin.

The body is of aluminium 2.5 inches in length. Externally below the flange, it is screwthreaded for insertion in the rocket. Above the flange, it is coned and has a flat top. A circumferential groove is cut in the coned portion to accommodate an expanding spring ring. Internally the body is bored in three diameters, to form chambers 0.6 inches and 1.1 inches in diameter respectively, and an internal flange at the base.

The needle is of steel and provided with a head; it is held in the needle holder by a screwed plug. The needle holder is of aluminium formed with an external flange at its base; it is recessed and screwthreaded to receive the head of the needle and securing plug. The needle and holder are assembled from the inside of the fuze body so that the head of the holder protrudes from the top; its upward movement is limited by the flange on the holder which bears against the internal flange in the body. The needle is retained in this position by a safety pin and two centrifugal bolts and is protected by a cap.

The cap is of thin metal, cone shaped with a flat top; it is pierced horizontally to receive the safety pin.

The safety pin passes through the cap, fuze body and the needle holder. The pin is prevented from falling out by a piece of wire passing through a hole at one end and secured by a lead seal.

The two centrifugal bolts, are cylindrical in shape and slotted at one end. They are partially housed in two radial channels and protrude to support the needle holder on its underside, thereby preventing the needle being forced on to the detonator. The bolts are retained in position by a thin expanding spring ring which engages the slots and fits into the circumferential groove in the fuze body.

The detonator holder is of steel, cylindrical in shape and bored in three diameters to form an internal flange separating two recesses. The recess at the top accommodates the point of the needle, and the flange provides a seating for one end of the creep spring which surrounds the needle. The recess below the flange accommodates the detonator which is secured by a screwed plug with central flash hole. The plug is secured by a retaining pin let into a radial hole in the body of the detonator holder. The base of the plug is coned and fits into an inertia collar.

The inertia collar, is of steel, cylindrical in shape and bored centrally to form a flash hole. The flash hole has a coned opening at the top to match and accommodate the coned portion of the plug in the detonator holder. The diameter of the collar is considerably less than that of the chamber which accommodates it. The collar is centered by five upturned strips cut in a brass centring washer which is a close fit in the chamber. The chamber is closed by a screwed base plug with central flash hole.

ACTION

Before firing. The safety pin is withdrawn and the cap removed. The needle is separated from the detonator by the centrifugal bolts which are retained in the closed position by the expanding spring ring.

After firing. The centrifugal bolts swing outwards under centrifugal action, overcoming the expanding spring ring, thereby permitting the needle and detonator holder to move towards one another. The creep spring prevents creep action. On impact the needle is forced on to the detonator by direct action. On graze the detonator is carried forward on to the needle, or it may be forced on to the needle by a sideways movement of the inertia collar. The flash from the detonator passes through the central fire channel in the inertia collar and base plug to the gaine in the shell which in turn detonates the shell.

1214.

GERMAN FUZE ELECTRIC (ERZ 39) FOR IGNITION OF ROCKETS.
(Fig. 489)

This electric fuze has been found in the 15 cm and 21 cm H.E. rockets. The fuze is inserted in the appropriate venturi opening and pressed in with a screwing motion. The overall dimensions and general shape of the fuze are shown in Fig.489.

The fuze consists essentially of a body, holder, fuze head, two loads, two contacts, priming composition and gunpowder pellets.

The body is of black plastic material, the lower half is cylindrical and the upper half coned and formed with a spigot. It is bored centrally in three diameters to form two chambers and, in the base, a recess. The top chamber forms a magazine containing three perforated pellets of gunpowder; it is closed by turning the top of the spigot over an aluminium closing disc. The lower chamber accommodates a pellet of wax substance in a tubular cardboard container which forms a holder for the fuze head and the end of two insulated leads. The fuze head is surrounded by a blob of priming composition, composed of a mixture of lead picrate, nitrocellulose, charcoal and potassium nitrate. The recess in the base is closed by an inverted tin plate cup which forms a contact, to which the end of one of the leads is soldered. The other lead is passed through a radial hole and a channel cut in the periphery of the body, the end being soldered to a thin aluminium or tin plate sheath covering the coned surface of the body which forms the earth return contact.

ACTION

The electrical circuit is through the base contact, insulated lead, fuze head, return lead and the earth return sheath.

The electrically heated bridge wire in the fuze head ignites the priming composition which in turn fires the gunpowder pellets in the magazine. The flash from the magazine ignites the igniter in the rocket.

1215.

GERMAN 7.3 cm. PROPAGANDA ROCKET
(Fig.490)

This rocket is designed for dispersing propaganda leaflets, but the projector from which it is fired has not been identified. The overall length of the complete round is 16.1 inches, its maximum external diameter 2.87 inches and, including leaflets (weighing 8 ozs.), weighs 7 lb. 2 oz. It is fired by percussion and fitted with base venting venturis half of which are inclined to rotate the rocket in flight. "Pr.G.41" is painted on the lid of the metal box container which hold 4 complete rounds.

The rocket consists mainly of :-

- Nose cap
- Head tube with split case to accommodate propaganda leaflets
- Ejector with fixed delay unit
- Connecting collar
- Tail tube containing propellant charge and ignition system
- Venturi block with percussion cap

The nose cap is of plastic material weighing 4 oz. shaped to a low crh. and slightly reduced in diameter near the base end which fits into the head tube. The cap is easily detached from the tube for insertion of reading matter.

The head tube is a steel cylinder 7.48 inches in length and open at both ends. The external and internal diameters are 2.56 inches and 2.36 inches respectively. Internally, at the forward end, the diameter is slightly increased to receive the nose cap which fits against a shoulder. The rear end of the tube is screwthreaded externally to enable the head and tail tube to be united by means of a connecting collar.

The leaflets are rolled and contained in a split case which is a sliding fit in the head tube. The split case is held between the base of the nose cap at the forward end and two millboard discs above a plastic disc at the base. The discs act as a piston in ejecting the leaflets. A light V shaped spring held in compression fits into the centre of the roll of leaflets.

The ejector unit is housed immediately below the plastic disc; it consists of a short brass tube with an internal diaphragm separating a top and bottom chamber. The chambers are connected by a communicating hole in the diaphragm displaced from the centre.

The forward chamber contains the ejection charge consisting of approximately 1.13 drams of gunpowder and is closed by a millboard disc. The rear chamber is screwthreaded internally and houses a delay holder. The delay holder is screwthreaded externally and, in its upper surface, provided with a circular groove filled with a delay composition of slow match. The delay composition is in communication with the ejector charge and the central flash hole in the base of the holder. No box washer is used to cover the delay composition and no escape is provided for the products of combustion. The time of burning is not adjustable. The flash hole in the base of the holder is screwthreaded to receive a short tubular adapter, filled with gunpowder, which also screws into a steel disc fitted into the head of the tail tube.

The connecting collar unites the head and tail units. It has an internal flange formed near its centre and is screwthreaded internally to receive the head and tail tubes.

The tail tube is 6.35 inches in length and of similar wall thickness and bore to that of the head; it is screwthreaded internally at each end and, at its forward end, provided with an internal flange spun over to form a groove in its under side. At the venturi end, the internal surface is chamfered.

A steel disc 0.4 inch thick with a stepped upper surface, fits into the head of the tail tube so that the step bears against the internal flange of the tube. The disc is bored centrally and screwthreaded to receive the adapter.

Below the steel disc is an igniter support. The support consists of a washer with a ring, L shaped in section, to accommodate the igniter centrally below the adapter, and three small pieces of spring steel equally spaced near the periphery, with their lower edges bent inwards, all welded to the under-side. The latter serve as distance pieces between the propellant charge and the igniter.

The igniter consists of a pressed pellet of gunpowder contained in a circular flat aluminium capsule 1.17 inches in diameter, with its open side facing the propellant.

The propellant charge consists of a single cylindrical stick of propellant with a central axial hole surrounded by eight annular holes throughout its length. The stick weighs $15\frac{3}{4}$ oz., is 5.25 inches long and 2.25 inches in diameter. Three longitudinal ribs are formed on the propellant when extruded from press. It is presumed they are designed to fix the charge during transport and centralize it for ease of ignition. There are no metal grids. The main stick of propellant is held off the venturis by a small washer of propellant approximately 0.16 inches thick and 1.06 inches diameter of the same composition as the main charge, cemented to the base of the propellant.

A provisional analysis of the propellant is as follows, nitro-cellulose 60.6 per cent, diglycoldinitrate 32.9 per cent, akardite 0.8 per cent, graphite 0.2 per cent, ash (carbonated) 0.7 per cent and undetermined matter 4.8 per cent.

No auxiliary materials are employed to transmit the flash from the percussion cap to the igniter.

The venturi block is screwthreaded internally for attachment to the tail tube and is chamfered at the base. It is provided with 14 coned venturis arranged in two concentric circles of 7 in each, and a central hole bored in three diameters to house a percussion cap. The outer ring of venturis have a throat diameter of 0.118 inches and are inclined about 30 degrees, while those forming the inner ring have a throat diameter of 0.138 inches and are not inclined. The full angles of the emergent cones are about 30 degrees. No attempt has been made to seal the venturi end of the tail tube.

ACTION

On the percussion cap being struck, the flash passes through the central hole in the propellant to the igniter which ensures complete ignition of the propellant charge. The igniter also ignites the priming composition in the adapter which in turn ignites the delay composition. Pressure set up inside the rocket and escaping through the venturis propels the rocket forward, the inclined outer ring of venturis causing the rocket to rotate.

The delay composition burns until such time as it ignites the ejector charge. Gas pressure from the ejector charge forces the discs forward to expel the contents of the head tube. As the split case emerges it falls apart allowing the spring to scatter the leaflets.

1216.

GERMAN 15 cm H.E. ROCKET
(15 cm Wurfgranate 41 Spr.)
(Fig. 491)

This is a self propelled, circumferential venting H.E. rocket filled T.N.T. The shell is in rear of the propelling unit. It is fired electrically and projected from either the 15 cm Panzerwerfer 42 or the 15 cm Nebelwerfer 41.

The general shape of the rocket and its external markings are shown in Fig. 491. The complete round weighs approximately 76 lb. 10 oz. and its overall length is 36.4 inches. It is painted either a deep olive green or light grey green and stencilled in white on the propelling unit and in black on the shell.

The complete round consists of the following principal components:-

Shell filled T.N.T.
Base fuze Bd Z DOV
Gaine Gr Zdlg C/98 Np.
Motor Unit
Electric ignition fuze (ERZ 39)

SHELL

The body is of malleable iron, cylindrical in shape with a radiussed base. The overall length, including the obturator, is 10.4 inches, and the external diameter 4.97 inches. The wall of the body is approximately 0.4 inches thick. The base is bored centrally and screwthreaded to receive a fuze adapter to which the steel gaine container is attached by indenting the mouth of the latter to an internal cannellure in the former. The forward end of the body is screwthreaded internally to receive the base of the venturi block which screws on to the flange of an inverted cup shaped cast iron obturator, accommodated in a recess in the base of the venturi block.

The bursting charge, weighing approximately 5 lb. 10 oz. consists of two pressed pellets of T.N.T. completely enclosed in a shaped cardboard carton with a cavity to accommodate the gaine at the rear end and reduced in diameter at the forward end to fit into the obturator. The carton is cemented to the body by a magnesium oxychloride composition.

BASE FUZE - BdZ. DOV

This fuze is described as a separate item in this Bulletin.

GAINE - Gr Zdlg C/98 Np.

A description of this type of gaine is given in Bulletin No.26 Item 464 and illustrated in Fig. 170.

MOTOR UNIT

The motor unit with venturi block weighs approximately 50 lb. 11 oz. and has an overall length of 18.9 inches. It consists mainly of a tube, ballistic cap, venturi block, propellant charge, grid, spacing ring and ignition system.

The tube is cylindrical with a closed end and appears to be a solid forging, machined inside and out to a diameter of 5.05 inches and 5.5 inches respectively, and to an internal depth of 18 inches. It weighs 24 lb. 13 oz. The closed end is bored centrally and screwthreaded for the attachment of the ballistic cap. The open end is chamfered internally and screwthreaded externally to receive the venturi block.

The ballistic cap is of thin pressed steel and provided with a perforated internal diaphragm with a central screw to enable the cap to be secured to the tube.

The venturi block, which unites the motor unit and shell, weighs 10 lb. 14 oz. The top is cup shaped and screwthreaded internally to a depth of 1.75 inches to receive the tube; externally it is chamfered from the skirt towards the top. The base is provided with a screwed boss for the attachment of the shell unit and is recessed to accommodate the shell obturator. Twenty-six venturis, equally spaced to form an annular ring, are bored in the skirt near the periphery. Each venturi has a throat diameter of 0.22 inches and is inclined at 14 degrees to rotate and stabilize the rocket in flight. The venturis are sealed by a thin aluminium disc inserted on the inside.

The propellant, as indicated by the Stencilling "Digl" on the tube is of the double base type consisting of nitrocellulose 61.1 per cent, diethylene-glycol-dinitrate 33.3 per cent, stabilizer (probably

akardite) 2.1 per cent, graphite 0.24 per cent ash (carbonated) 0.75 per cent and undetermined matter 2.51 per cent. The charge weighs 13 lb. 1 oz. and is in the form of six tubular sticks surrounding a seventh. Each stick is 16 inches long, 1.65 inches and 0.25 inches external and internal diameter respectively. The charge is held between a grid at the base and a spacing ring at the head.

The grid which weighs 1 lb. 3 oz. is a cast iron ring 4.4 inches external circumference on a web of six spokes radiating from a central ring. It is centered by the chamfered interior of the tube which suits the chamfered end of the spokes. Longitudinal movement of the grid is prevented by means of a felt disc which is compressed when the venturi is screwed to the tube.

The spacing ring at the head is a split ring with ten pairs of lugs bent inwards to form a "U" shape in section.

The ignition system comprises a rear and forward igniter and a length of primed celluloid tubing.

The rear igniter consists of an annular transparent plastic ring containing approximately 1 oz. 7 dr. of black powder, and a silk flat bag containing approximately 3 dr. of gunpowder. The ring is housed immediately inside the venturis. Stuck to the inside of the ring is an opaque plastic flange with a felt disc cemented to it. The flat bag is sewn to the centre of the felt disc.

The forward igniter consists of 3 oz. of gunpowder in a circular cardboard box which is housed in a metal cup with a wide flange. The flange is held against the head of the tube by the spacing ring so that the igniter is held centrally within the ring and facing the central stick of propellant. The igniter ensures complete ignition of the propellant.

The celluloid tubing is housed in the central stick of propellant. It contains quickmatch and is closed at each end by a small gunpowder pellet.

ELECTRIC IGNITION FUZE

The electric ignition fuze is described as a separate item in this pamphlet. It is inserted in one of the venturis.

ACTION

MOTOR UNIT

An electrical current generated from a remote control fires the electric fuze thereby producing a flash which in turn ignites the rear igniter, the primed celluloid tubing, the forward igniter and the propellant charge. Pressure set up by the gases and escaping through the venturis propels the rocket forward. The venturis, being inclined, cause the rocket to rotate and so stabilising it in flight.

1217.

GERMAN 21 cm. H.E. B.C. ROCKET

21 cm. Wurfgranate 42 Spr.

(Figs. 492, 493 and 494)

This is a self propelled base venting H.E. rocket stabilized by rotation and fired electrically from either the 21 cm. Nebelwerfer 42 projector (a two wheeled field carriage with five barrels) or the 21 cm. airborne projector beneath each wing of the ME 109G-6 (Trop) and FW 190. When fired in the former the nose fuze le.Jgr.Z.23.nA. is used whilst in the airborne projector the clockwork fuze Zt.Zdr.S/30 is employed. The complete round weighs approximately 242 lb. and its overall length is 49.5 inches. The centre of gravity is 18 inches from the base. The exterior of the rocket is painted deep olive green and stencilled in black. External markings on the round are shown in Fig. 492.

The complete round consists of the following components:-

Shell H.E. B.C. filled Amatol 40/60
Nose fuze 1c Jgr.Z.23.nA. or Zt.Zdr. S/30.
Gaine Zdlg. 36 Np.
Tail tube with propellant charge and ignition system
Venturi block with grid
Electric Ignition fuze (ERZ 39)

SHELL (Fig.493)

The general shape of the shell is a truncated ogive of high crh. from the base. The filled shell including the fuze weighs approximately 98 lb. The bursting charge, indicated by the numeral "13" stencilled on the body, is Amatol 40/60 and weighs approximately 22.4 lb. The shell body is of steel with a solid base; it is screwthreaded externally at the base for the attachment of the tail tube and, on the shoulder to receive the ballistic cap. The overall length of the shell including the threaded portions is 15.8 inches. The diameters at the base and shoulder are 8.38 inches and 5.3 inches. The shoulder is screwthreaded internally to receive an adapter which in turn takes the fuze and a steel exploder container. A steel distance piece 1.5 inches long and 1.54 inches in diameter, with a central flash hole 0.32 inch in diameter, separates the fuze from the gaine. A cork washer attached to the end of the distance piece is in contact with the fuze.

The ballistic cap, approximately 8.5 inches long, is of thin metal and shaped to the general contour of the shell body. The nose is flat and bored centrally to receive a screwed adapter supporting the upper end of a wooden rod. The wooden rod rests on the top of the fuze and forms an extension to the striker. It is retained by spinning the nose of the adapter over a flat retaining disc. The base of the cap is screwthreaded internally for attachment to the shell body.

FUZE AND GAIN

The fuze 1c.Jgr.Z.23.nA is described as a separate item in the Bulletin. The gaine Zdlg.36.Np. is described in Bulletin No.42 Item 1122. Fuze Z.S/30 is described in Bulletin No. 33 Item 742.

TAIL UNIT (Fig. 494)

The tail unit has an overall length of 27.2 inches and weighs approximately $114\frac{1}{2}$ lb. filled. The main parts comprise a steel tail tube, steel venturi block, propellant charge, steel grid and an ignition system.

The tail tube weighing 87 lb. 2 oz. is cylindrical in shape 26.6 inches long and 8.27 inches in diameter except at the venturi end and near the head end where the diameters are slightly increased. The wall is machined inside and out to a thickness of 0.394 inches. The head end is closed by a diaphragm formed in the tube. A cavity approximately 1.25 inches deep in front of the diaphragm is screwthreaded internally to receive the base end of the projectile. The opposite face of the diaphragm is recessed to the shape of a saucer approximately 7 inches in diameter across the rim. The centre of this recess has a cavity to partially accommodate the forward igniter. Internally, the venturi end is screwthreaded to receive the venturi block.

The venturi block is solid, flanged and screwthreaded externally for insertion in the end of the tube. Twenty-two venturis, equally spaced on a circle 6.08 inches in diameter, have their axis inclined at an angle of 16 degrees to the axis of the rocket so that the escaping gases cause the round to rotate in flight. An axial venturi in the centre of the block extends into a boss formed on the front face. The boss is screwthreaded externally to take a grid supporting the base end of the propellant charge. The venturis have a throat diameter of 0.362 inches and open at an inclusive angle of 26 degrees.

The propellant charge, weighing approximately 39 lb. 9 $\frac{1}{4}$ ozs. consists of six sticks of tubular propellant surrounding a seventh. Each is 21.66 inches long, 2.45 inches and 0.32 inches external and internal diameters respectively. The forward end of the outer sticks is held by a shoulder formed in the tube near the rim of the saucer shaped recess; the centre stick is held by the lugs of the igniter holder. A preliminary chemical analysis shows that charge is basically approximately 59 per cent nitrocellulose and 37 per cent diglycoldinitrate.

The grid supporting the charge at the venturi end is shaped to form three concentric circles on a web of six radial arms; it weighs 1 lb. 10 oz. and its overall diameter is 7.3 inches. The centre circle is screwthreaded internally to enable the grid to be screwed to the boss on the front face of the venturi block. The arms are chamfered on the base side towards their outer ends.

The ignition system comprises a forward igniter, a length of primed celluloid tubing and a rear igniter.

The forward igniter, which weighs 3 ozs. is housed within a steel split ring, forming an igniter holder, with 6 lugs bent inwards to form distance pieces. The igniter consists of a pellet of pressed grey powder composed of aluminium and barium nitrate under a thin black layer of compressed zirconium metal and potassium nitrate. Across the face of this thin layer is a perforated strip of nitrocellulose. The filling is contained in a flat circular aluminium container 2.57 inches in diameter, and retained by turning over the lip of the container on to a ring of compressed paper.

The rear igniter, accommodated immediately in front of the venturis and in rear of the grid, is in the form of a celluloid U section ring filled gunpowder. The external and internal diameters of the ring are 6.78 inches and 5.6 inches respectively, and its outer and inner thickness .5 inches and .33 inches respectively.

The celluloid tubing is 22.35 inches long and is accommodated in the central stick of propellant. It contains quickmatch and at each end a perforated gunpowder pellet. The forward pellet is accommodated centrally within the lugs of the igniter holder. The rear pellet protrudes slightly from the base of the central stick.

The outer venturis are closed by a thin ring of aluminium foil, 6.76 inches in diameter, fitted against the front face of the venturi block. The centre venturi is closed by a thin disc of aluminium foil 1.96 inches in diameter fitting in the cavity in the front face of the grid.

FUZE (ERZ. 39)

This is an electric ignition fuze and is described elsewhere in this bulletin. It is pushed into one of the venturis when the rocket is loaded into the projector for firing.

ACTION.

TAIL UNIT

An electric current fires the ignition fuze and the flashignites the rear igniter which in turn ignites the length of quickmatch in the celluloid tube and the forward igniter. The latter ensures complete ignition of the propellant charge. Pressure set up inside the tube and escaping through the venturis propels the rocket forward. The inclined venturis cause the rocket to rotate and stabilize it in flight.

HEAD UNIT

On impact, the ballistic cap is shattered and the wooden rod is driven in to fire the fuze. The flash from the fuze passes through a flash channel in the steel distance piece to detonate the gaine which in turn detonates the shell filling.

1218.

GERMAN 30 cm. H.E. ROCKET
30 cm. Wurfkorper Spreng
(Figs. 495 & 496.)

This is a self propelled base venting rocket, stabilized in flight by rotation caused by the inclined venturis. The rocket is fired electrically from the 30 cm. Nebelwerfer 42. The complete round weighs approximately 277 lb. Its overall length is 46.5 inches; the maximum diameter of the bomb is 11.75 inches and of the tail tube 8.56 inches. The centre of gravity is 21.75 inches from the base. The exterior of the rocket is painted deep olive green, and the stencilling in black except the abbreviated nomenclature of the round "30 cm. WK Spr" near the nose and which is stencilled in white. External markings on the round are shown in Fig. 495.

The complete round consists of the following components:-

- Shell H.E. filled Anatol 40/60
- Nose Fuze
- Gaine
- Tail Unit with propellant charge and ignition system
- Primer electric C/23 with contact unit.

SHELL (Fig. 495)

The weight of the filled shell without fuze and gaine is approximately 147 lb. The general shape of the shell is an ogival head of medium crh whilst the remainder of the body is streamlined towards the base. The body consists of two wall sections and a solid nose and base, welded together circumferentially. The wall sections are approximately 0.1 inch thick and welded at their maximum diameter. A rib is formed in the body behind the weld. The rear section is also welded longitudinally. The nose section is screwthreaded internally to receive a nose fuze and a steel exploder container. In transport the nose is closed by a plastic plug. The base is screwthreaded internally for the attachment of the tail tube.

The bursting charge, as indicated by the numeral "13" stencilled on the body is Anatol 40/60.

FUZE AND GAINE

Details of the fuze and gaine are not yet available.

TAIL UNIT (Fig. 496)

The tail unit has an overall length of 22.6 inches and weighs approximately 129 lb. 10 oz. filled. It consists mainly of the tail tube, venturi block, propellant charge, two grids, and an ignition system with electric primer and spring contact.

The steel tail tube is cylindrical in shape, 3.34 inches in diameter except near the base where a humped band is formed to increase the diameter to 8.56 inches. The wall of the tube is 0.43 inches thick and machined both externally and internally. The head end is closed and screwthreaded externally for insertion into the shell. Internally, at the base end, it is screwthreaded and provided with a shoulder to receive the venturi block.

The solid venturi block is flanged and screwthreaded externally for insertion in the venturi end of the tube. Eighteen venturi holes are drilled in the block with their centres on a circle of 3.05 inches radius. The throat diameter of each venturi is approximately 0.365 inches and the exit diameter approximately 0.82 inches. The axis of the venturis are inclined at an angle of $12^{\circ} 42'$ so that the effluent gases cause the round to rotate in flight. A thin tin plate ring fits into a circular recess in the base of the block and seals the venturi exits. The base of the block is stamped thus "W 18 x 9.3 ϕ $12^{\circ} 42'$ asw 5a" indicating the number, the throat diameter in millimeters, and the inclination angle of the venturis. The centre of the venturi block is bored and screwthreaded to receive an adapter. To facilitate assembly in the tail tube, two key recesses are provided in the base of the block.

The propellant charge weighs 33 lb. and consists of six tubular sticks of propellant surrounding a seventh. Each is 18.4 inches long, 2.45 inches and 0.32 inches external and internal diameter respectively. Preliminary chemical analysis has shown that the charge contains 59.9 per cent nitrocellulose and 35.4 per cent diglycoldinitrate.

The cast steel grid supporting the venturi end of the charge is shaped to form four concentric circles on a web of six arms. The webs are chamfered on their base side towards their outer ends. The grid is bolted to the venturi block by the primer adapter.

The grid at the forward end of the charge consists of a split ring with eight pairs of lugs and a sheet of metal mesh. Each pair of lugs is bent inwardly to a "U" shape in section, and the metal mesh is welded to two adjacent lugs diametrically opposite the split. In addition to spacing, the grid prevents the igniter being crushed by the charge.

The ignition system consists of an igniter, a primed celluloid tube and an electric primer unit.

The igniter, which weighs 3 ozs. is housed within the split ring and held centrally opposite the central stick of propellant by an igniter holder. The igniter consists of a pellet of pressed black powder with a perforated N.C. powder pellet in strip form across its surface. The pellets are contained in a flat aluminium capsule and retained by turning over the lip of the capsule on to a compressed paper ring. The igniter holder is a plate of sheet steel 0.04 inch thick, 3.95 inches wide and 7.42 inches long, radiussed at the ends to suit the curvature of the grid split ring. A hole 2.6 inches in diameter is bored in the centre of the holder, and a ring shaped in section, to hold the igniter, fits into the hole and is spot welded at six points.

The celluloid tube, accommodated in the central stick of propellant, is 19.7 inches long and 0.23 inches and 0.0394 inch external and internal diameters. It contains quickmatch and at each end a perforated gunpowder pellet. The forward pellet is accommodated centrally within the forward grid and is in contact with the igniter. The pellet at the other end is accommodated in the vent of the primer adapter.

The primer adapter, which also bolts the rear grid to the venturi block, is screwthreaded externally and flanged at one end; it is inserted into the venturi block from the front, and two flats formed on the periphery of the flange enable it to be screwed home with the aid of a spanner. The adapter is bored centrally in four dimensions with a coned vent at the flanged end. Two chambers formed in the base end of the boring are screwthreaded to receive the electric primer and contact unit respectively, and the others form a necked flash channel which houses the gunpowder pellet and the rear end of the inflammable tube. The smaller of the threaded borings, formed in the centre of the adapter, receives the electric primer "C/23" described in Bulletin No. 42 Item 1123. The larger boring nearer the base houses the spring contact unit. The unit consists of a plastic

insulating bush, steel pin, steel spring and brass cover cap. The bush is cup shaped with a central hole bored in its base; it is screw-threaded externally for insertion in the adapter and internally to receive the cover cap. The contact pin is a stem with circular flat head and is inserted inside the bush so that the stem portion protrudes through the hole to make contact with the contact plug of the electric primer. The pin is kept in contact by the spring held in compression between the head of the pin and cover cap. The cover cap is cup shaped to house the spring and head of the pin, and screwthreaded externally for insertion in the bush.

ACTION OF TAIL UNIT

An electric current passes through the contact unit and fires the primer. The flash from the primer ignites the gunpowder pellet and quickmatch in the celluloid tube which in turn ignites the igniter bringing about ignition of the propellant. Pressure set up in the tail blows off the thin metal ring closing the venturi exits, propels the projectile, which, owing to the inclination of the venturis is rotated.

R.4475

FIG.479 (ITEM 1180)
IGNITER, ELECTRIC, N° 84. MK.I.

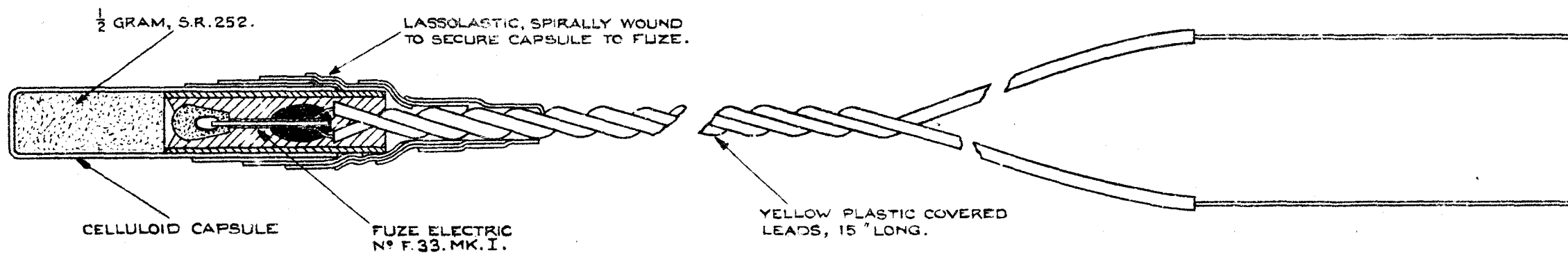


FIG. 480 (ITEM 1206.)
SHELL, B.L. OR Q.F. COLOURED SMOKE, B.E. (TYPICAL.)
M. OF F. DESIGN D.D(L) 17625.

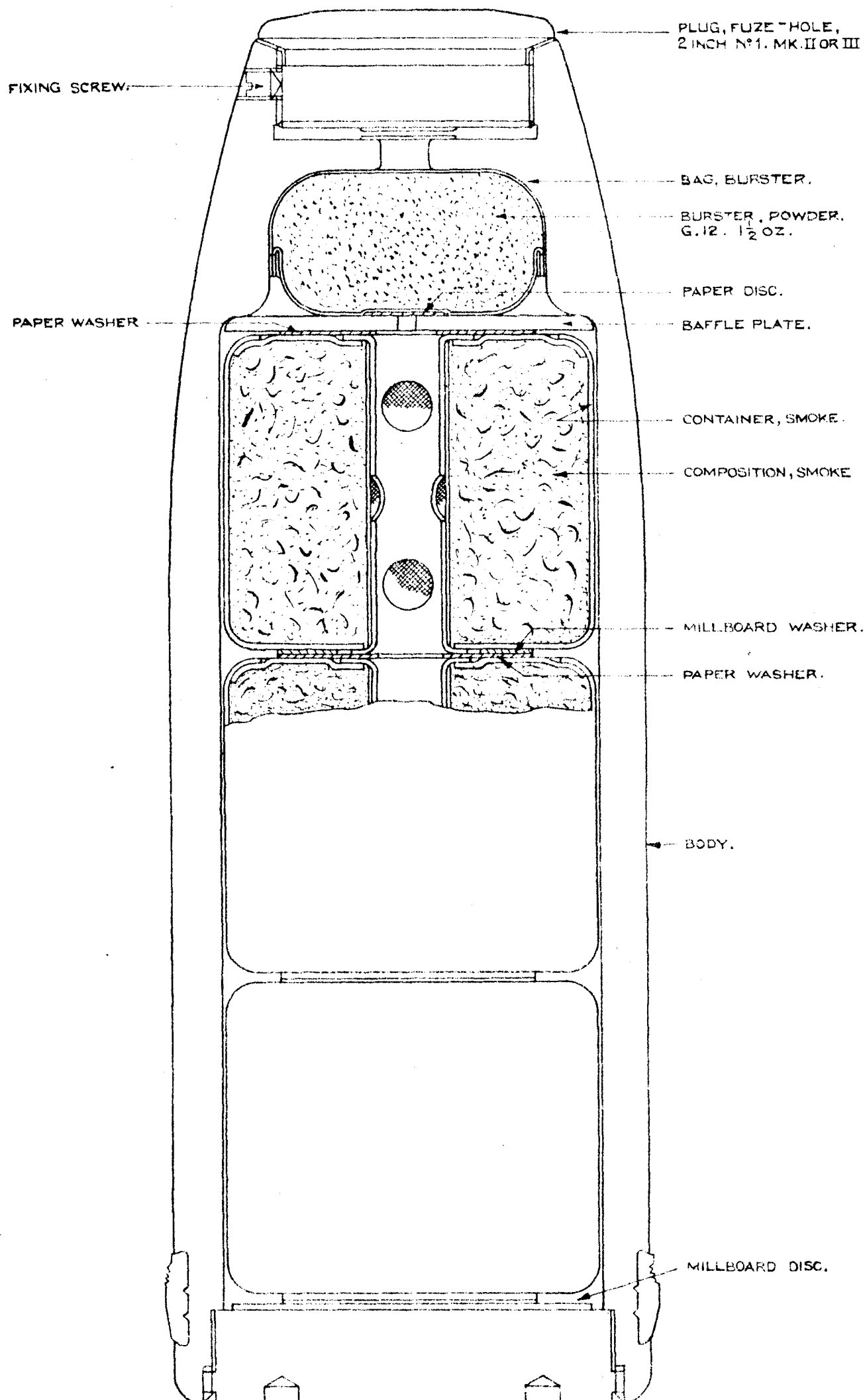


FIG.481 (ITEM 1207)
SHELL, Q.F., H.E., 40 mm.
M.of F. DESIGN DD(L) 19674

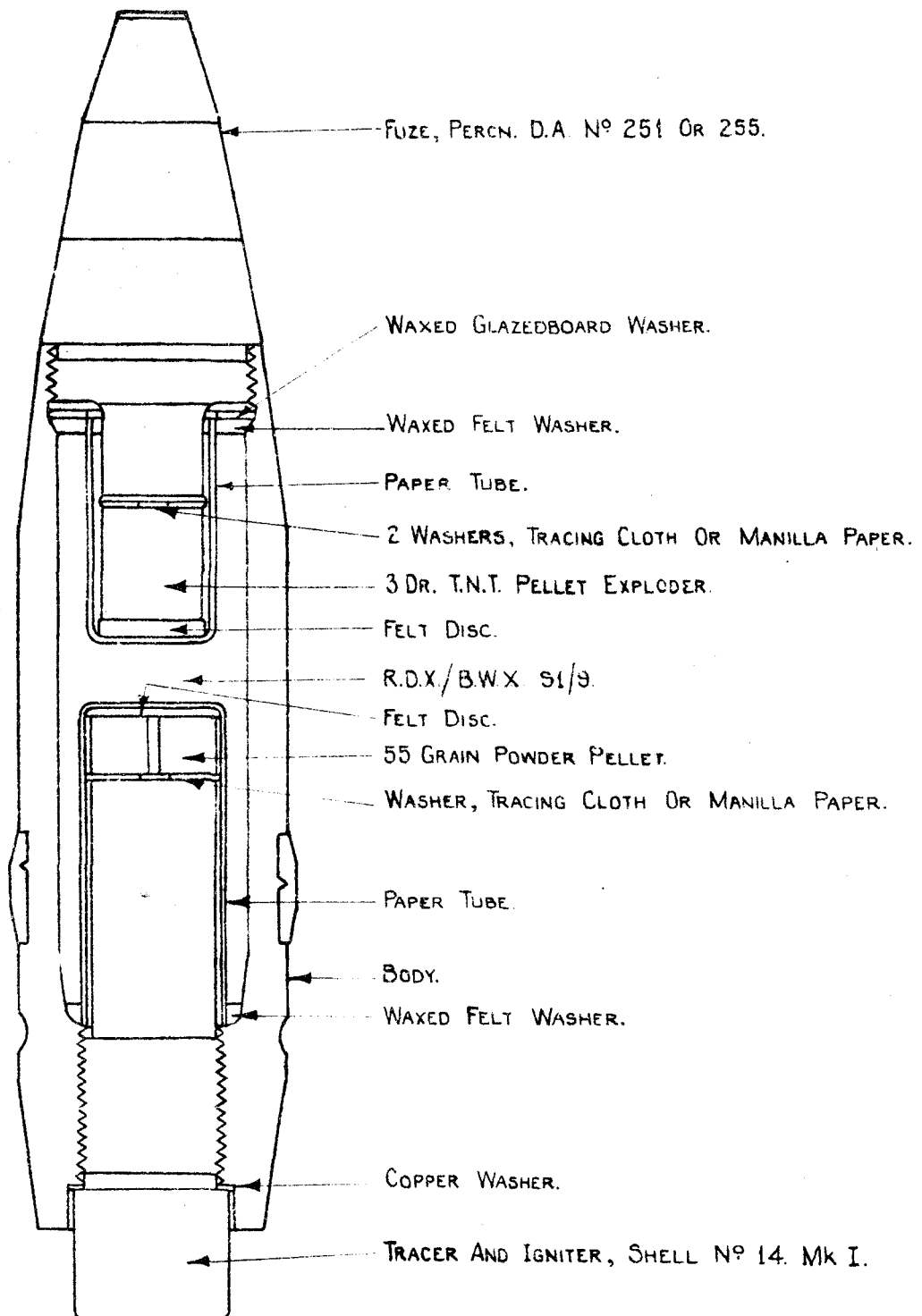


FIG. 482 (ITEM 1207)

SHELL, Q.F., H.E., 40 mm.

M. of F. DESIGN D.D. (L) 19675.

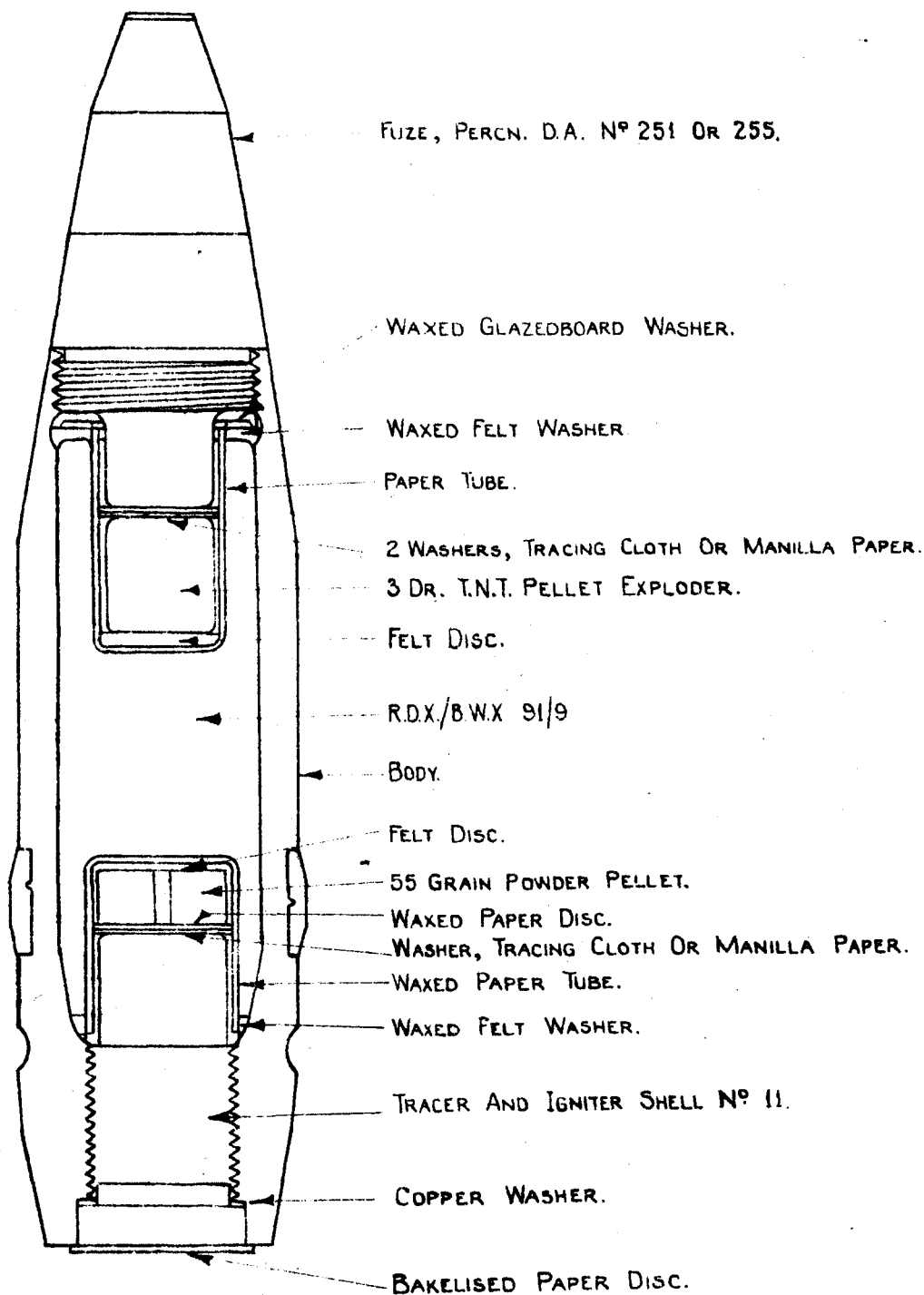


FIG. 483 (ITEM. 1208.)

German Fuze F.P.Z. 8001 for H.C. Anti-tank Bomb.

(Faustpatrone.)

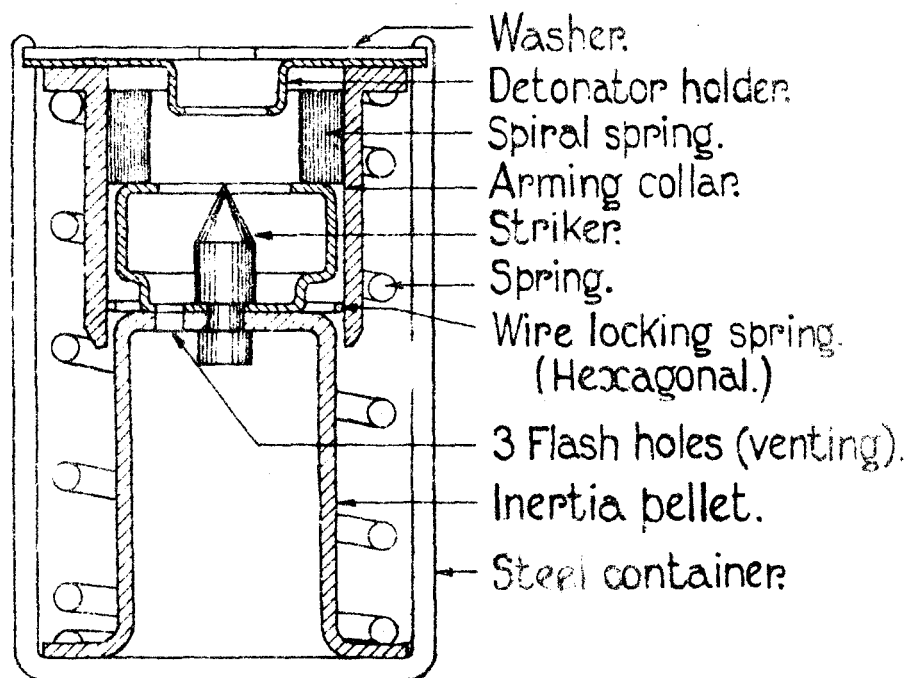


FIG. 484. (ITEM. 1209.)

GERMAN FUZE AZ. 5095

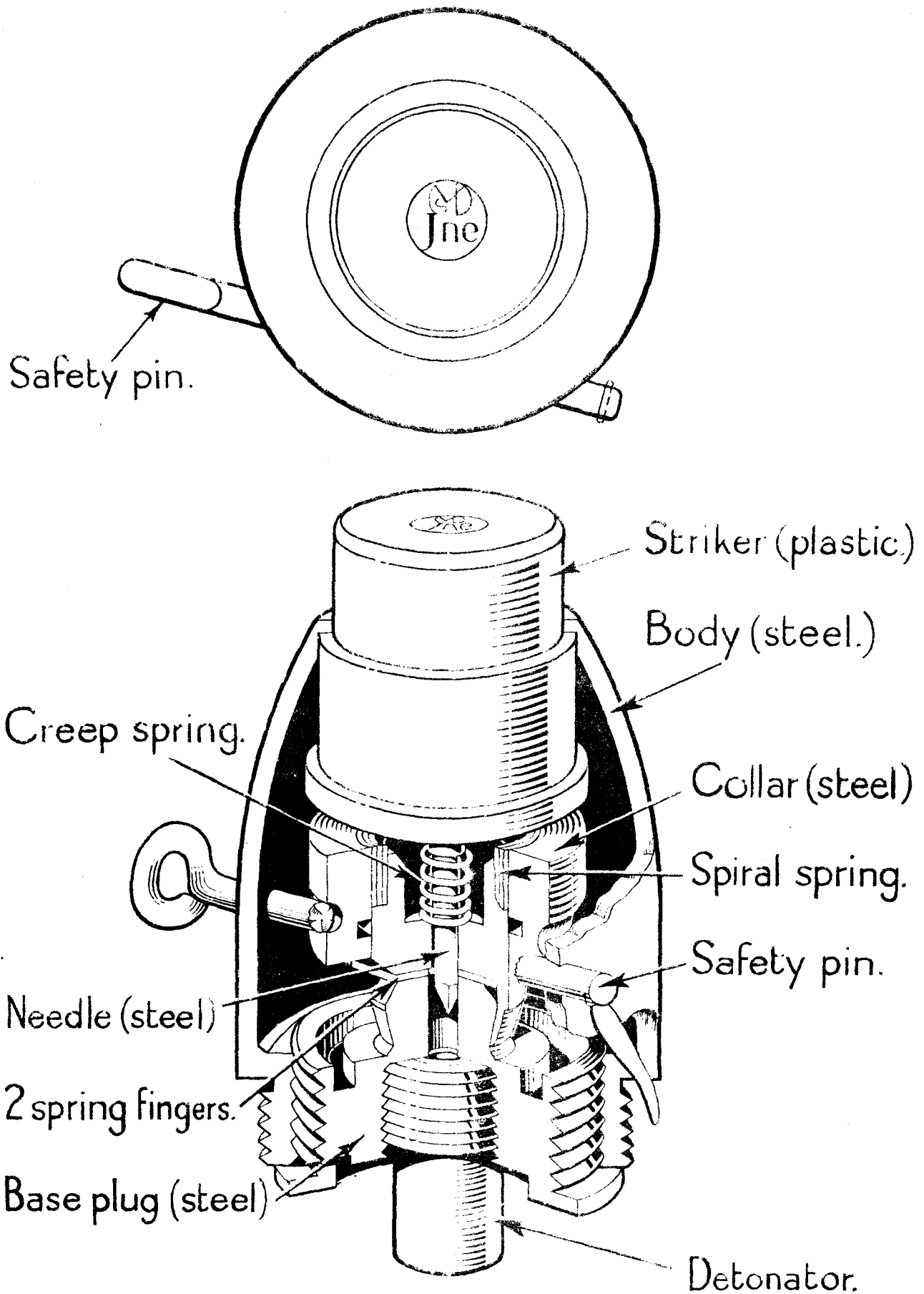
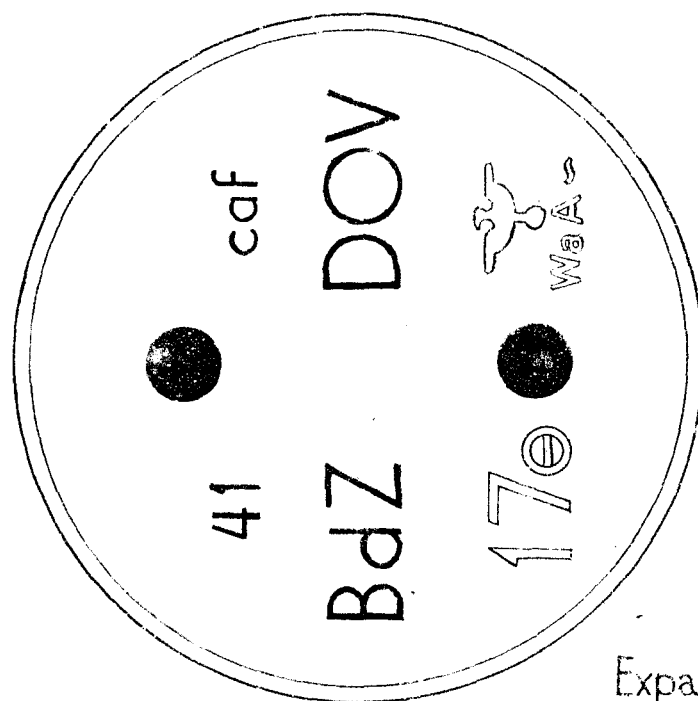
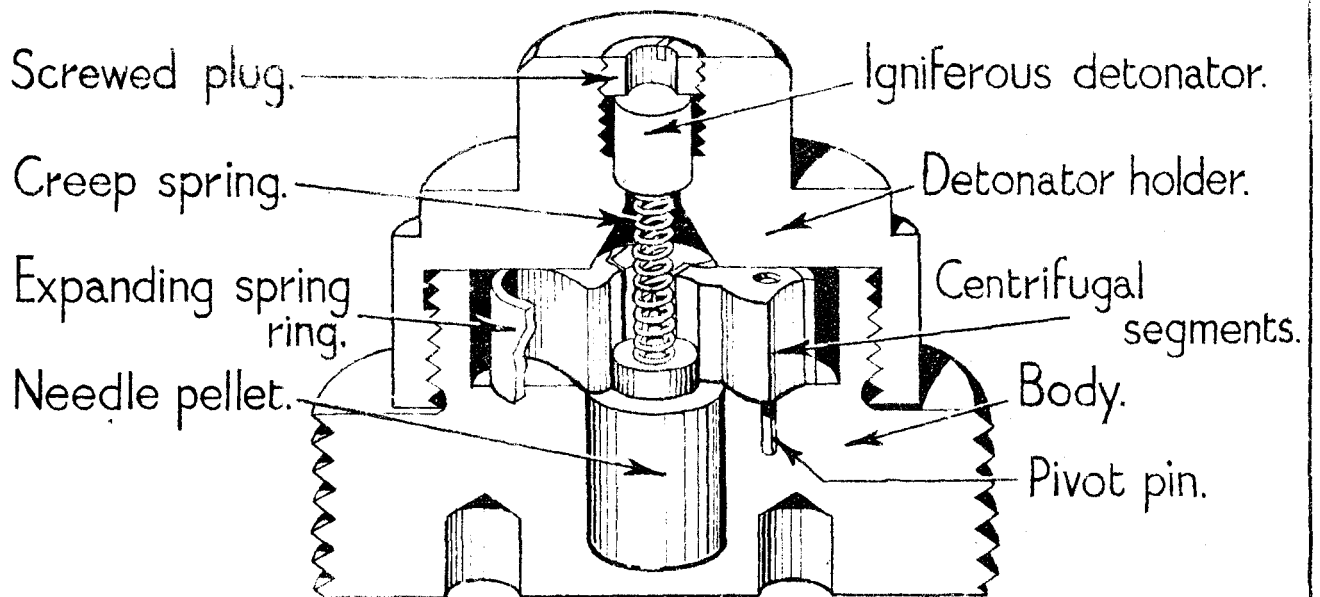


FIG. 485. (ITEM 1210.)
GERMAN BASE FUZE BdZ DOV.



MARKING ON BASE.

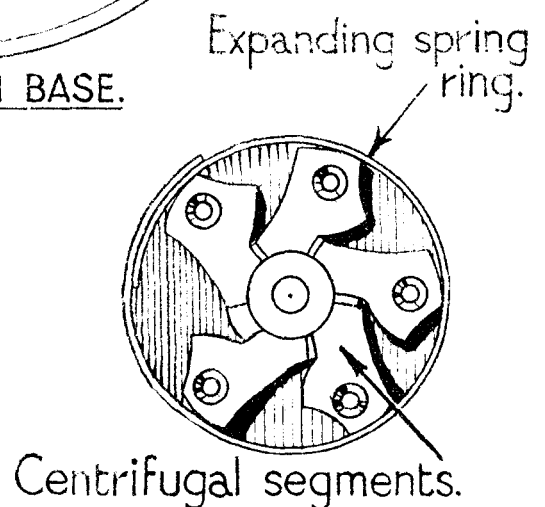
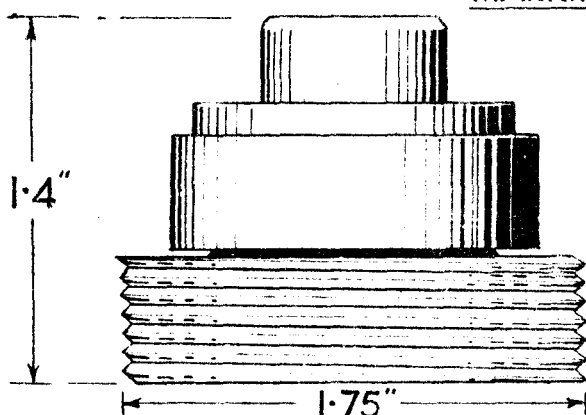
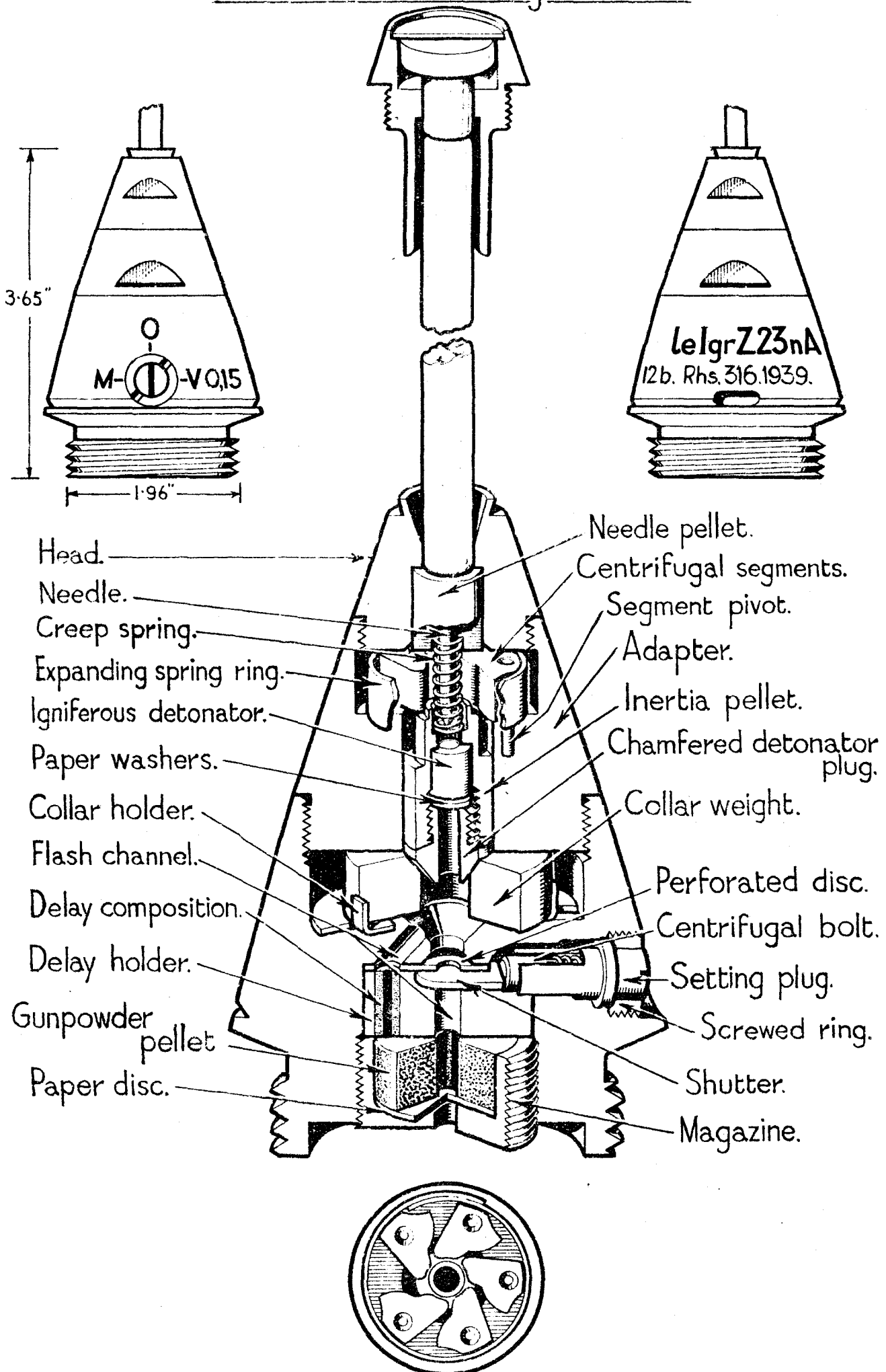


FIG. 486 (ITEM 1211.)
GERMAN FUZE Le Igr. Z 23nA.



CENTRIFUGAL SEGMENT ASSEMBLY.

GERMAN FUZE Hbgr Z 35 K.

FIG. 487. (ITEM. 1212.)

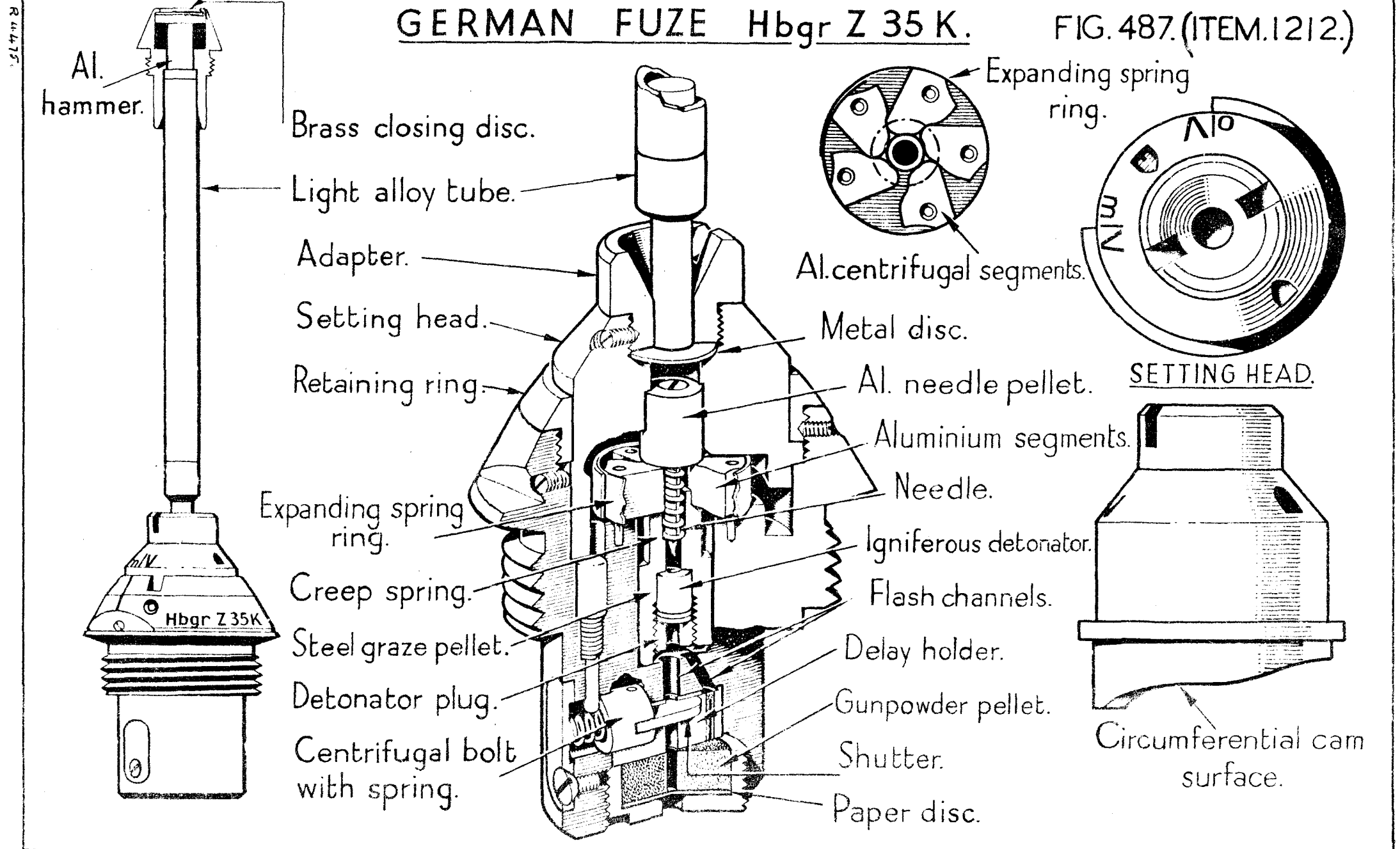


FIG.488. (ITEM 1213.)

GERMAN FUZE Wgr Z 50+.

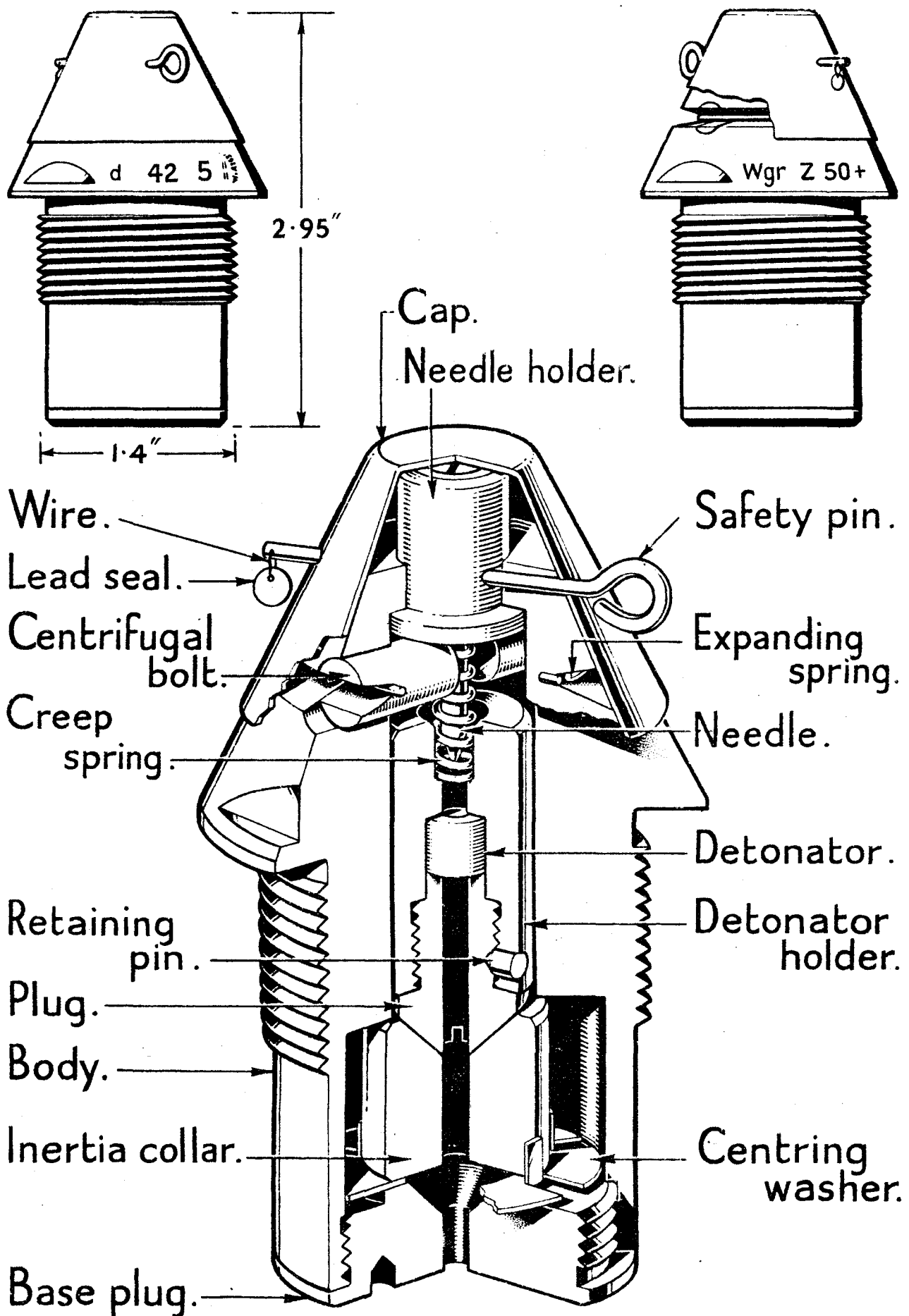


FIG.489. (ITEM.1214.)
GERMAN FUZE ELECTRIC FOR IGNITION OF ROCKETS.
 (ERZ.39.)

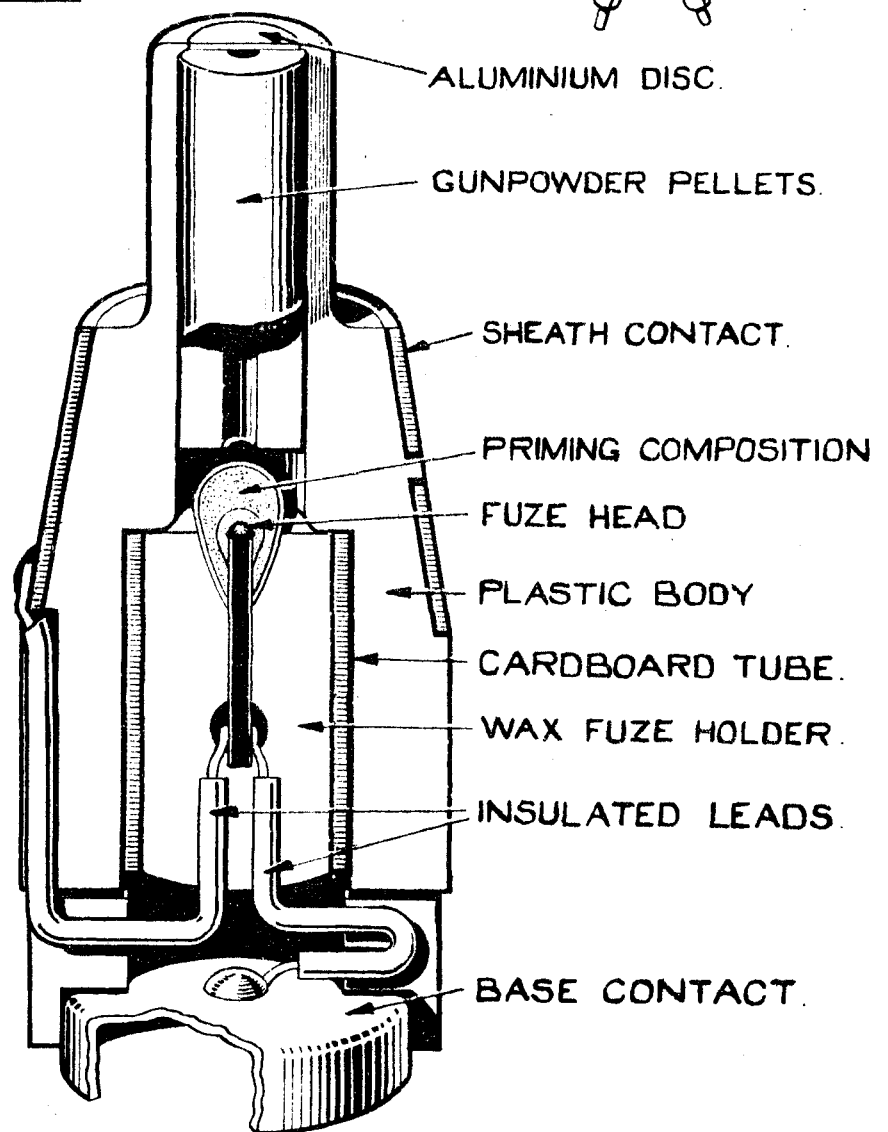
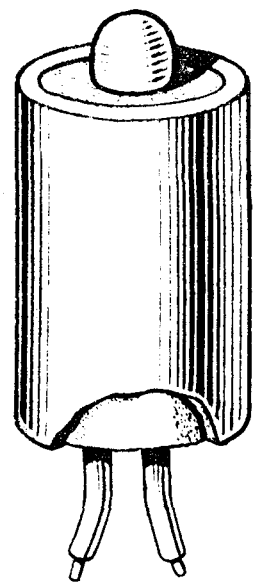
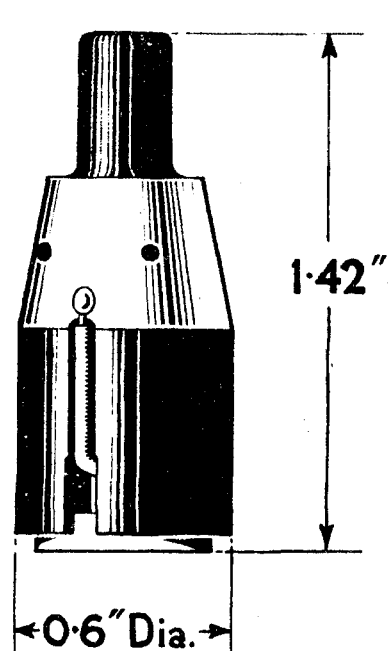


FIG. 490. (ITEM 1215.).

GERMAN 7.3 cm. PROPAGANDA ROCKET.

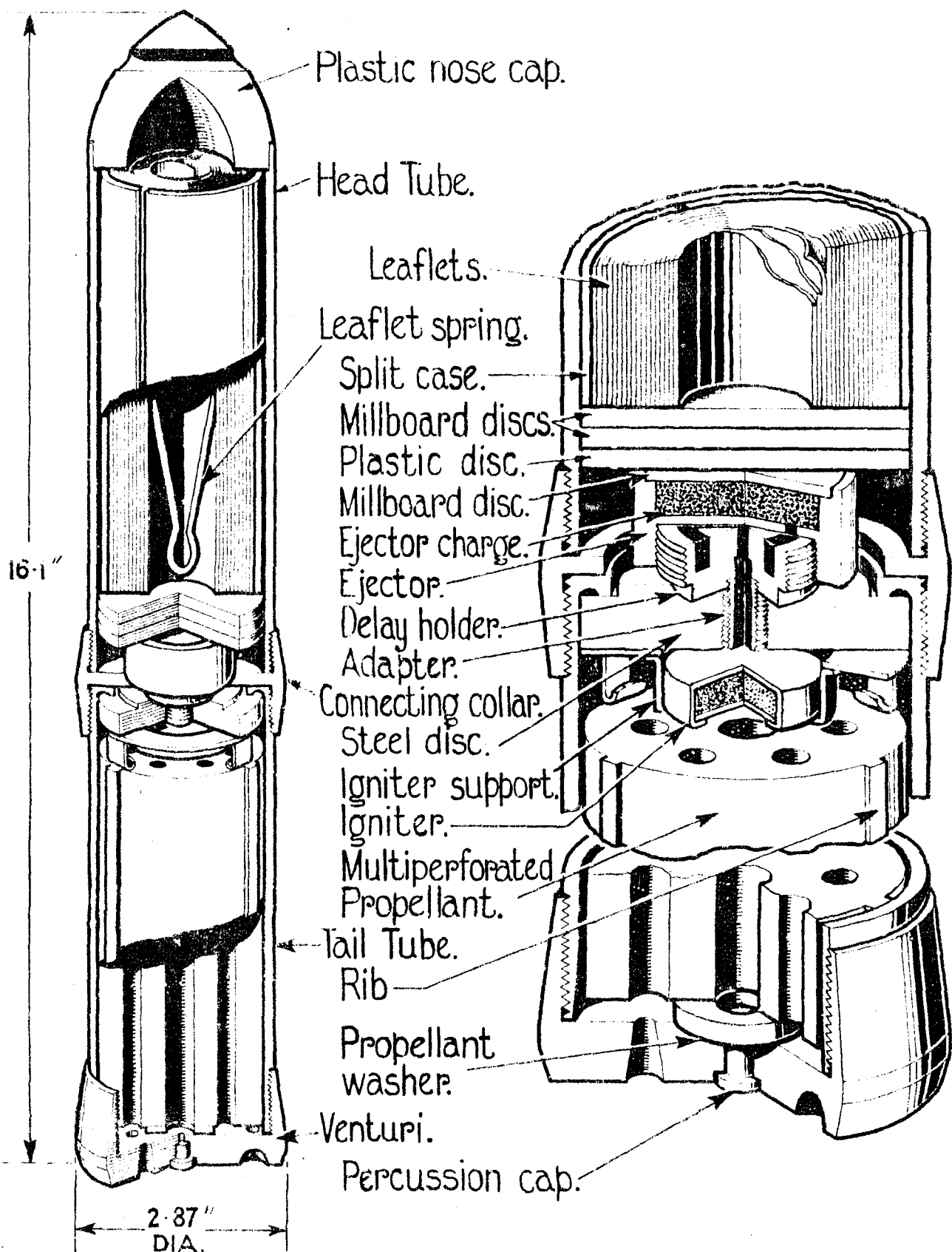


FIG. 492. (ITEM.1217.)
GERMAN 21 cm. H.E.B.C. ROCKET.
(21 cm. WURFGRANATE SPR.)

GENERAL ARRANGEMENT.

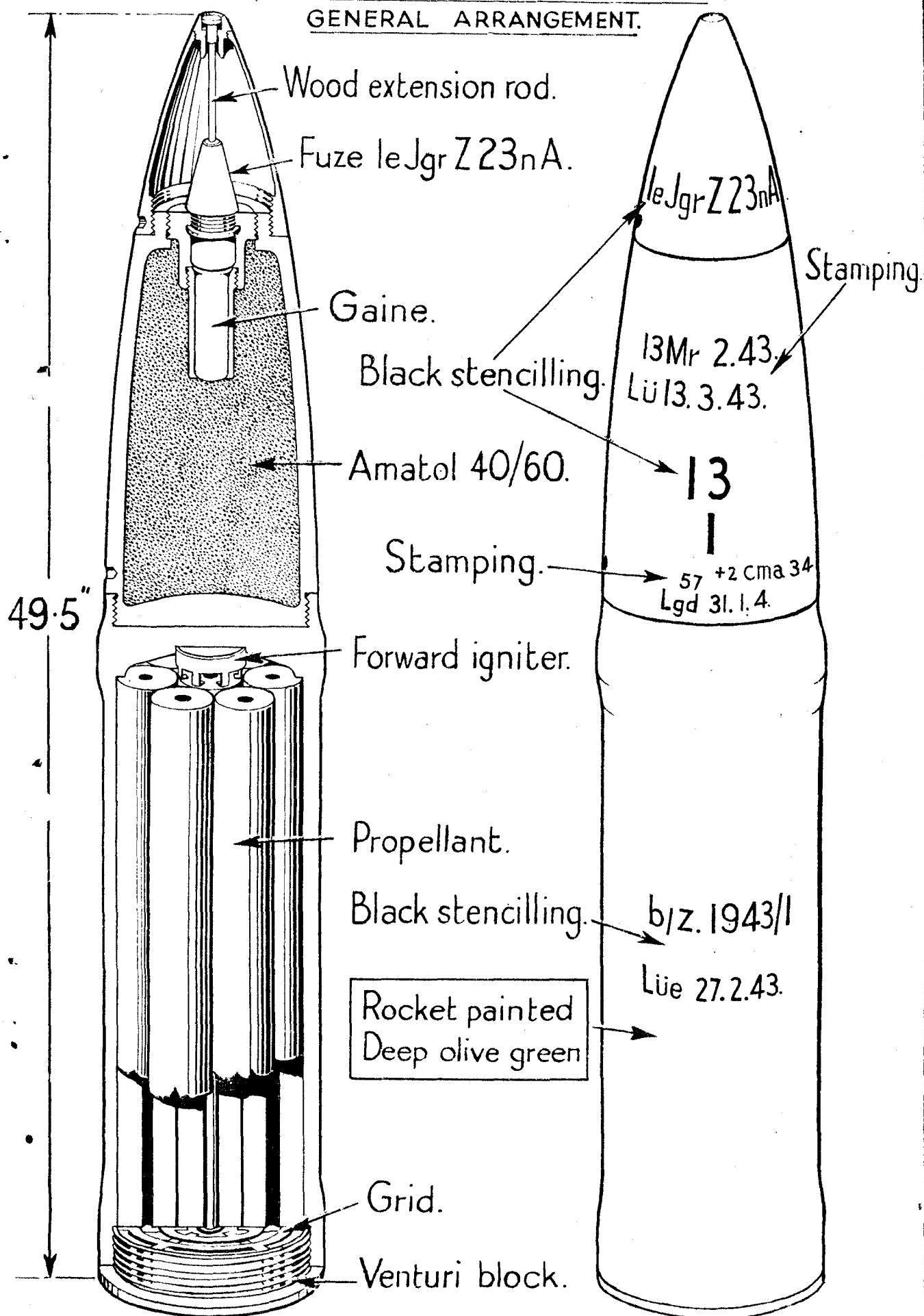


FIG. 491 (ITEM.1216.)
GERMAN 15cm. H.E. ROCKET.
(15cm. WURFGRANATE 41 SPR.)

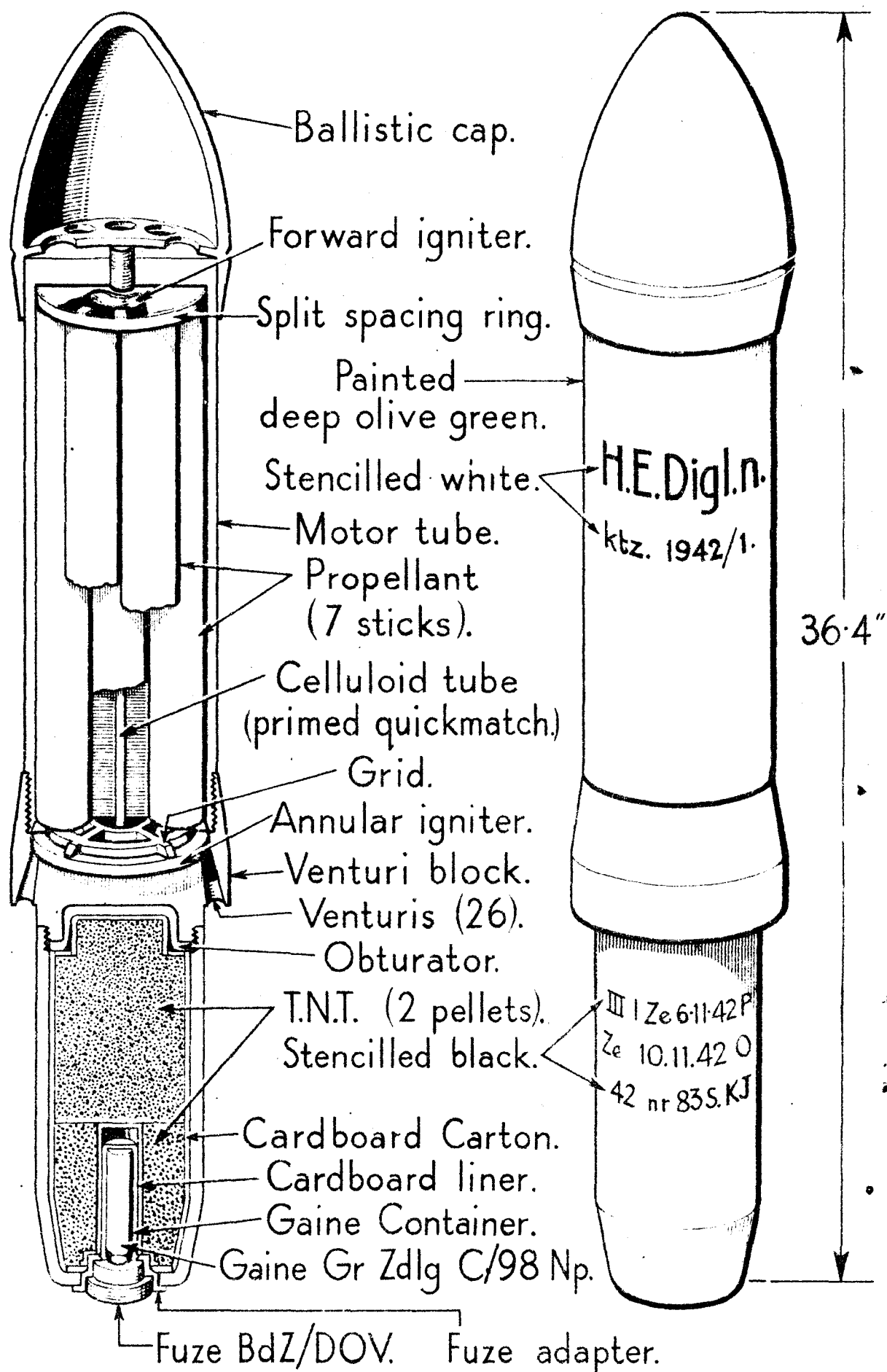


FIG. 493. (ITEM 1217.)
GERMAN 21cm. H.E.B.C. ROCKET SHELL.
 (21cm. Wgr. 42 Spr.)

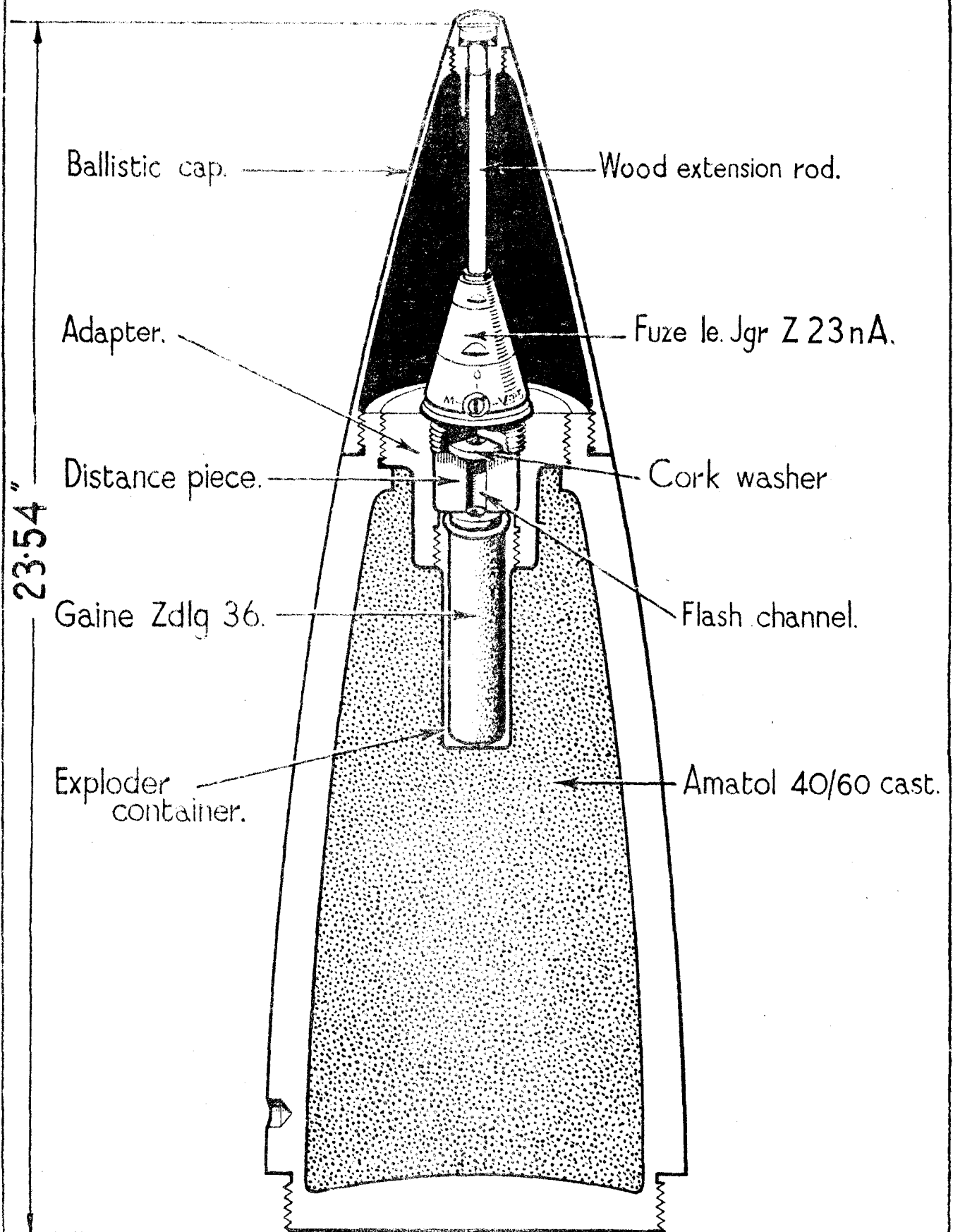
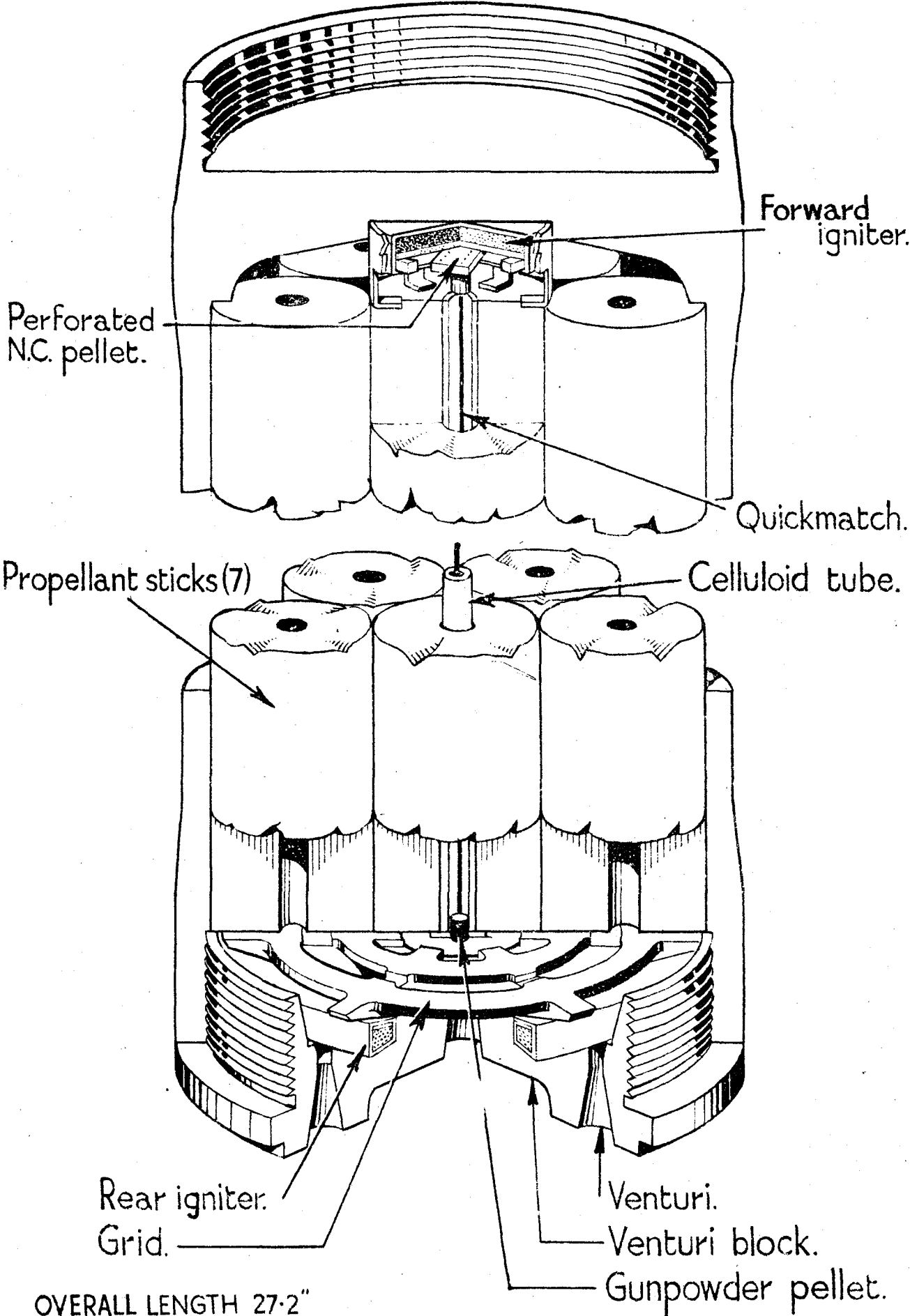
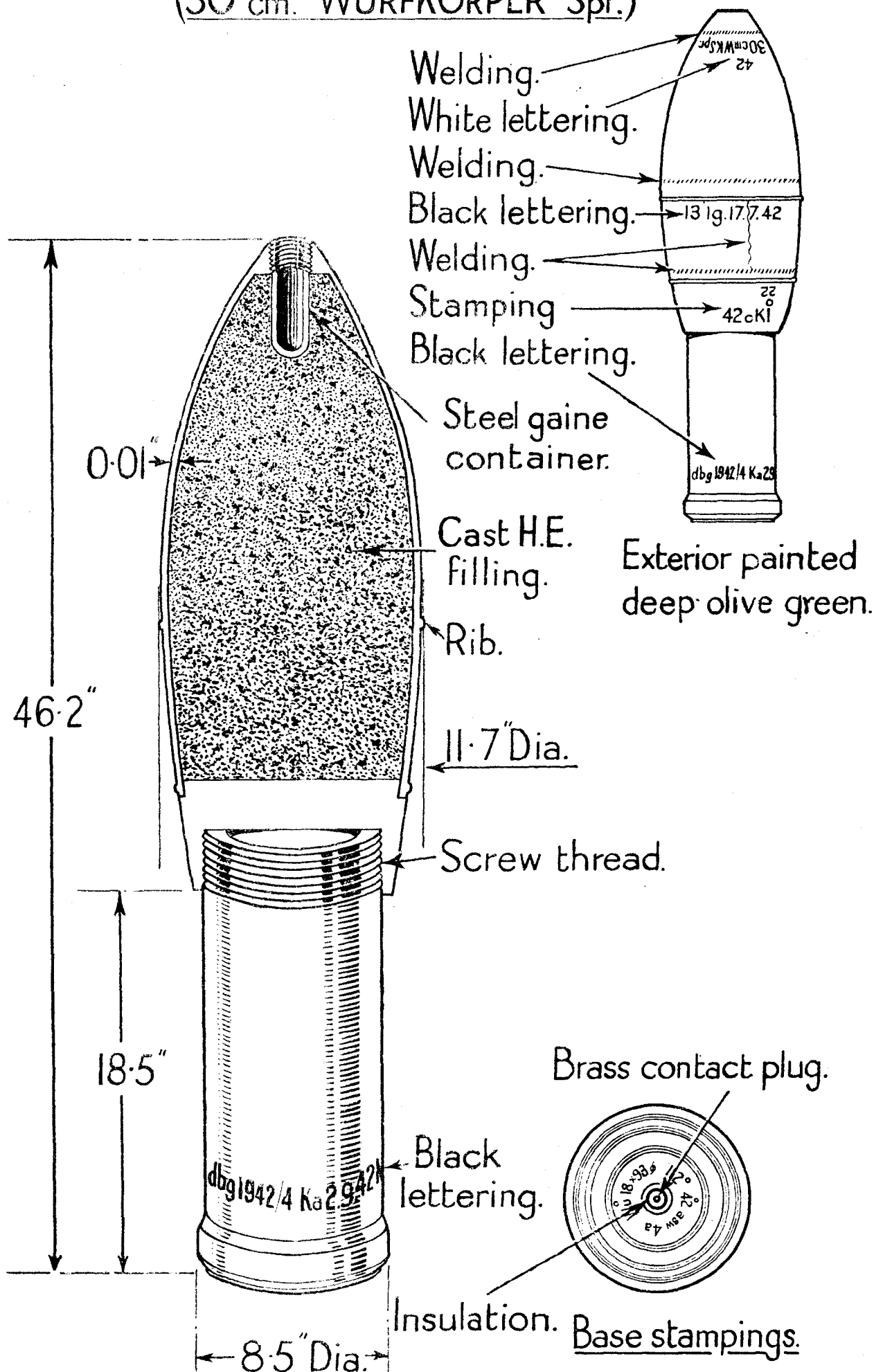


FIG.494. (ITEM 1217.)
GERMAN 21cm. H.E.B.C. ROCKET TAIL-UNIT.
 (21cm. Wgr. 42 Spr)



OVERALL LENGTH 27.2"
 MAX. DIAMETER 8.4"

FIG. 495. (ITEM. 1218.)
GERMAN 30 cm. H.E. ROCKET.
 (30 cm. WURFKÖRPER Spr.)



GERMAN 30cm. H.E. ROCKET:- TAIL UNIT. FIG.496 (ITEM 218.)
(30 cm. WURFKORPER Spr.)

