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SECURITY

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AMMUNITION BULLETIN Nº 5.

FOR INSPECTING ORDNANCE OFFICERS.

(NOVEMBER 1939).

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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S.E.18.

SECURITY

AMMUNITION BULLETIN No.5

for Inspecting Ordnance Officers.

November, 1939.

Issued by :-

The Chief Inspector of Armaments,
Woolwich.

Contents.

Ammunition Bulletin.

Contents of previous issues.

DETAILS OF

39

CALIBRE	APPROXMATE WEIGHT OF				APPROXMATE LENGTH (IN INCHES)	WEIGHT OF BURSTING CHARGE			
		LB	OZ	DR		NATURE	LB	OZ	DR
2 PR Mks IX & X GUNS	COMPLETE ROUND	4	4	0	16·75	A.P.	-	-	-
	SHELL	2	6	0					
	SHOT	2	6	0	16·75				
3·7 INCH MORTAR	COMPLETE ROUND HE OR SMOKE BURSTING SHELL	17	8	0	13·75	H.E. SMOKE. BURSTING	1	8	12
		15	0	0			-	-	-
	COMPLETE ROUND SMOKE EMISSION	12	12	4	11·65	SMOKE EMISSION	-	-	-
	SMOKE EMISSION SHELL	10	7	8					
3 PR 2 CWT.	COMPLETE ROUND SHELL	6	4	0	18·75	A.P.	-	-	-
		3	6	6					

ITEM Nº 25. ERRATUM 2 INCH MORTAR.
AMEND TO READ.

CALIBRE	APPROX: WEIGHT OF COMPLETE CARTRIDGE		APPROX: WEIGHT OF BOMB				APPROX: LENGTH IN INCHES.	APPROX: DIA. OF BOMB.
				LB	OZ	DR		
2 INCH MORTAR	CARTRIDGE	226 GRS.						
			H.E.	1	14	3	9·62	2·01
			SMOKE	1	15	0	"	"

TANK AMMUNITION.

PROPELLANT NATURE AND WEIGHT.				FUZE	PRIMER	* EXPLOSIVE QUANTITY.	
NATURE	LB	OZ	DR				LB
W.T.	-	8	15	- TRACER ONLY.	No 12	CHARGE	35
144-048	-	8	15				
"		9	½	TRACER FILLING			
R.D.Q.T.		10	½				
M.D.T. R.D.B.T. 15-13 W.T. 154-136		1	10	106 E OR 231	No. 1	H.E	1·7
						SMOKE BURSTING.	·15
M.D.T. 15-13 W.T. 154-136		1	13½	FUZELESS	No 1	SMOKE EMISSION.	·16
M.D. OR R.D.B. 2¼ W. 016		5	14	FUZE PERCUSSION BASE HOTCHKISS TRACER No 280	No 2	CHARGE	·25

ITEM No 25. ERRATUM 2 INCH MORTAR.
AMEND TO READ

ESTIMATED WEIGHT & NATURE OF BURSTING CHARGE				PROPELLANT NATURE AND WEIGHT.			FUZE	* EXPLOSIVE QUANTITY	REMARKS.
NATURE	LB	OZ	DR	NATURE	GRNS.			LB.	
				CARTGES: BALLISTITE	47			·01	
	-	5	11				151	·3	

DETAILS OF TANK

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CALIBRE	Nº OF PACKAGE	MATERIAL & TYPE		STOWAGE DIMENSION		
		TYPE	MATERIAL	LENGTH	BREADTH	DEPTH
2 PR MKS. IX & X GUNS.	C.198	BOX	WOOD	14·4	14·125	19·7
	C.207	BOX	STEEL	13·2	12·1	18·4
		CONTAINER MK II	TINNED PLATE			
3·7 INCH MORTAR	C.225	BOX	STEEL	17·0	11·0	10·2
3 PR. 2 CWT.	C.176.D.	BOX	WOOD	15·7	13·7	24·6
	C.193	BOX	WOOD	12·6	12·6	21·9
	C.181	BOX	STEEL	14·5	10·65	21·5

AMMUNITION PACKAGES.

ESTIMATED WEIGHT POUNDS		CONTENTS.
EMPTY.	FILLED	
22 LBS.	112 ½ LBS.	16 ROUNDS IN 2 TINNED PLATE CONTAINERS, EACH ROUND IN ROLLED PAPER CONTAINER Nº 9.
16 LBS	106½ LBS.	16 ROUNDS IN 2 TINNED PLATE CONTAINERS, EACH ROUND IN ROLLED PAPER CONTAINER Nº 9.
8¼ LBS.	45 ¼ LBS.	8 ROUNDS EACH IN ROLLED PAPER CONTAINER Nº 9.
18 LBS.	96 LBS. H.E. 98 LBS. SMOKE 78 LBS. SMOKE EMISSION.	4 ROUNDS EACH IN ROLLED PAPER CONTAINER (H.E. CONTAINER Nº 2. FUZED SMOKE CONTAINER Nº 3 AND 1 STEEL PACKING PIECE. SMOKE EMISSION CONTAINER Nº 10 AND 2 STEEL PACKING PIECES.)
34 LBS.	134 LBS.	16 ROUNDS
34 LBS.	109 LBS.	12 ROUNDS
32 LBS.	107 LBS.	12 ROUNDS.

41. Mines, Contact, A.T., Mks.I,II and III

A full description of the Mks.I and II mine together with the fuzes used and full details of packing, marking &c., are given in the official handbook.

The Mk.III Mine Fig.2, consists of a body, cover and bottom.

The body is of tinned plate, drum shaped, and closed at the top with a lid soldered in. The lid is formed with a socket in the centre to take the No.2, Mk.I fuze.

The steel cover (fig.3) fits over the top of the body when the mine is laid, and is raised 1/5 inch at the centre to form a seating for the top of the fuze. For transit purposes the cover fits over the bottom of the mine and is secured by a band of adhesive tape.

The filling consists of T.N.T. poured or biscuit, a C.E. pellet surrounding the No.27 Detonator with a T.N.T. pellet below it, the whole being covered with a T.N.T. topping.

After filling, the mine is closed at the bottom with a bottom piece pressed in and coated with R.D.No.1, cement to prevent the entry of moisture.

Weight of mine (approx)	5 lb. 10 ozs.
Diameter	6 inches
Height	$5\frac{1}{4}$ "

Marking The body is painted khaki green with a $\frac{1}{2}$ inch green band at the bottom, a similar band in red at the top, and a $\frac{1}{5}$ inch green vertical stripe over the seam. The top of the body is stencilled in black "Mine A.T. Mk.III" together with the monogram of the Firm or filling station and date of filling.

The cover is painted khaki green all over and the outside surface afterwards daubed with black or brown paint. The inside of the cover is stamped or stencilled "A.T.III" with the month and year of manufacture.

Packing. The Mark III mines are packed in "Crate, Mine, Contact, A.T.M.84 Mk.I to hold 5. Stowage dimension: L.$27\frac{3}{4}$", B.8", D.8". Weight empty $5\frac{1}{2}$ lbs. Filled 41 lbs.

The No.2 fuze is packed in Box No.2 fuzes, Mine, Contact, A.T.M.83 Mk.I. The box contains 10 cylinders No.319, each cylinder holding 5 fuzes Stowage dimensions L.$19\frac{1}{2}$", B.$8\frac{1}{2}$", D.$5\frac{1}{2}$". Weight empty $5\frac{1}{2}$ lbs. Filled 21 lbs

42. Fuze, Mine, Contact, A.T. No.2.Mk.I (Fig.2). The No.2 fuze which is used in the Mark III mine, consists of a body, striker, detonator holder, steel spring, shearing wire and safety pin.

The body, of brass, is formed with a shoulder at the top to support it in the socket of the mine body, the lower part is plain and dimensioned to fit in the socket. Internally it is bored out to receive the striker, spring and detonator holder.

The striker of rust proofed steel, is dome shaped at the top below which it is bored through in two places to receive a steel safety split pin and a brass shearing wire respectively. A shoulder on its lower end forms a bearing for the bottom end of the spring holding the latter in close compression. The striker is coated with thin luting after filling to prevent the entry of moisture.

The brass detonator holder is burred into the lower end of the body below which it is reduced in diameter and grooved circumferentially to secure the No.27 detonator. Internally it is bored out to receive a 1.7 grain detonator and to form a fire channel. Its lower end is fitted with a No.27 detonator crimped into the groove.

To arm the mine.

The fuze is pressed into the mine socket, the safety pin withdrawn and the cover of the mine placed over the fuze. The striker is then held from the detonator by the shearing wire only.

The safe load for this fuze is 320 lbs.

Action - On the safe load being exceeded on the mine cover the shearing is broken thus releasing the striker which is forced on to the detonator by the spring. The flash from the detonator passes through the fire channel in the holder to the No.27 detonator, the latter detonates the C.E. pellet and the bursting charge of the mine.

Note The protecting sleeve of the No.1.Mk.I fuze is of very thin construction and must always be handled with special care. If any fuze is removed from a mine (e.g. as when a mine field is lifted) the fuze must be re-inserted in its cardboard packing cylinder and carefully re-packed in the special mine transport box provided.

A fuze with a damaged sleeve is in a dangerous condition.

The No.1.Mk.II fuze has a brass sleeve of much stronger construction but should be handled in a similar manner.

43. Steel Ammunition boxes

With further reference to item 34 of No.4 Bulletin all the later designs of steel ammunition boxes are designed to be weatherproof, where stored or carried with the top uppermost, consequently the instructions contained at (IV) and (V) of the above quoted item in No.4 Bulletin are now only applicable to the following types of steel ammunition boxes which are to be found mainly with A.A. Units.

Box Ammunition 3" 20 cwt. Q.F. C.204
Box Ammunition 3.7 inch Q.F. A.A. C.213 for H.E. shell
Box Ammunition 3.7 inch Q.F. A.A. C 231 for Shrapnel

44. German aircraft Bombs.

The following data on German Aircraft Bombs is circulated; it is not entirely complete, but will be helpful to those called upon to deal with unexploded Bombs.

There are four general types of aircraft bomb viz.

Anti-personnel H.E.
G.P. or General Bombardment Bombs, H.E.
Incendiary
Gas.

H.E. Anti-personnel.

These are not likely to be used over towns as they are intended to burst on impact. There are two types - the S.C.10 and S.C.10t, the former has vanes, the latter has not. The S.C.10t is intended for low flying attacks on personnel and has an "allways" fuze with short delay action, on impact, for the protection of the aircraft. The S.C.10 has a Direct Action fuze.

The bodies of the S.C.10 and S.C. 10t are indentical, being cylindrical of pressed or cast steel, about 2 feet long, 3½ inches diameter, weight 10 Kilogrammes. The charge is 6 kg. of T.N.T. plus a smoke composition of Phosphorus and Paraffin. The body produces about 700 fragments of a density approximating to 1 splinter per sq.metre at 25 metres. The fuze is in the nose of the bomb.

The low flying bomber must use the S.C.t bomb with a 2 second delay fuze and troops exposed to this form of attack are given some little opportunity for taking cover by reason of the delay action.

H.E. General Bombardment Bombs.

These are most likely to be used in the attack of towns, factories etc. They are fitted with the Rhinmetall electric fuze. This fuze may be set (a) for direct action (b) short or long delay, ranging from 10 seconds to 168 hours, or even longer; or (c) it may comprise a booby trap, designed not to burst the bomb on impact, but only when an attempt is made to move it afterwards. So far as is known the external appearance of the fuze is the same for direct action, delay or booby. The fuze or fuzes are placed in the side of the bomb, one fuze being used with the 50 Kg. bomb, two fuzes with the heavier bombs.

The sizes of bombs are :- S.C. 50Kg. S.C.100Kg. S.C.250Kg. S.C.500Kg. and possibly S.C.1000Kg. The most likely size to be met is the 250Kg. eight of which can be carried on the Heinkel III, and 4 on the Dornier 17 type of Bombers.

The general design of the bombs is the same as shown in the accompanying figure (fig. 4 & 5) details of these are set out in the following table. The explosive used is T.N.T. cast or pressed in position. Vanes are fitted in all cases.

Size	length	diameter	Wall Thickness	Bursting charge
S.C.50	3½ ft.	8 inches	4 m.m.	23 Kg.
S.C.100		Not Known		
S.C.250	5 ft.	14 inches	4 m.m.	136 Kg.
S.C.500	7 ft.	18 inches	4 m.m.	270 Kg.

As the fuze or fuzes are placed in the side of the bomb and electrically actuated there is no necessity to obtain direct impact in order to cause them to function.

The disposal of such bombs, if unexploded, is clearly attended with grave risks on account of the likely existance of delay and booby trap devices.

Incendiary.

There are three known types, viz :-

G.C.50. which is the same design as the S.C.50 type, filled H.E. but with a central tube to receive the exploder or igniter, viz. 300 grains of G.R.F.88 (Picric Acid). The incendiary filling 19Kg. thermit, is inserted through a hole in the side, the electric instantaneous fuze is used and the total weight of the bomb is 30Kg.
B.1.E.1. electron. These weigh 9Kg., are 350 m.m. long and 50 m.m. diameter, and have an electron body which is incendiary. The initiating charge is thermit, about .25Kg. and a simple percussion cap with striker and spring is used. Vanes are fitted and the bomb functions on impact.
12 Kg. Length 60 c.m., diameter 16½ c.m., casing, electron, i.e. 80% magnesium, 20% aluminium, plus a small proportion of manganese, charge 8½ Kg. thermit - fuze probably of the simple percussion type.

Bombers of the Heinkel III type can carry 8 canisters each containing 15 incendiary bombs of the G.C.50 type. i.e. 120 such bombs per machine. A larger quantity of the smaller incendiary bombs can be carried though the exact number is not known.

The Incendiary bomb may also contain a quantity of explosive for the purpose of discouraging the attentions of A.R.P. personnel.

Gas Bombs.

The only known bomb of this type is the G.C.10 which is similar in external form, length and construction to the S.C.10 for Anti Personnel previously described. The H.E. charge is omitted, and a gas container inserted, the same type of fuze being used. There are numerous reports concerning other gas bombs and gas spray but no further precise information.

45. Markings on bombs.

H.E. Bombs are painted a field grey, with code marks on apposite sides to indicate the explosive filling, which is usually T.N.T.

Incendiary Bombs have the body an aluminium colour, the tail dark green, the lettering on the tail black.

Gas Bombs. Body colour not known, but the following markings may be found :-

White Cross	indicating	Tear Gas
Blue Cross	"	Arsenic Compound
Green Cross	"	Chlorine
Yellow Cross	"	Lewisite.

46. Exploders. These are used to build up the initial impulse of the fuze magazine for the purpose of detonating the main charge of H.E. Bomb. The following may be met with.

(a) Ring type A pressed picric acid ring about 37 m.m. long which fits over the stem of the fuze. Used in all 50 Kg. H.E. Bombs and larger sizes.

(b) S.C.50/500 A cylindrical body 50 m.m. dia. 42 m.m. long consisting of pressed G.R.F. - 88 (picric acid) in paraffin wax paper wrapping. Used in all H.E. Bombs 50 Kg. and upwards, next to the fuze in the container.

(c) C/98 a short exploder screwed on to the ends of all fuzes but stored separately.

47. Fuzes.

(A) For S.C.10 and Anti personnel Bombs. This is a clockwork fuze, percussion, with or without delay. The clockwork is employed (a) to release the fuze (b) to provide a safety interval for the aircraft on release. The clockwork runs for 2 seconds after the safety pin is withdrawn by the act of releasing the bomb. Two bolts, under spring pressure, are then pushed out of their recesses, freeing the striker. On impact the striker hits the cap, the flash of which functions the C/98 exploder, which detonates the main filling. If the bomb is to be dropped "without delay" a grub screw at the bottom end of the fuze must be removed, but if it is to be dropped "with delay" the screw must be left in the fuze, the action of the screw being to block the immediate transmission of the ignition to the C/98 exploder, the percussion cap igniting a .5 sec. delay pellet before the C/98 charge is affected.

(b) The Rheinmetall electric fuze as used in all H.E. Bombs G.P. 50 Kg. and upwards. Two are fitted to the 100 Kg. bomb and above. They are inserted into containers in the side of the bomb, and make contact with the exploder. The diagrams at fig.4 and fig 5 show the general arrangement and method of fitting.

The fuze comprises two condensers, the first of which, A., is connected to two contact poles which project from the head of the fuze. When the bomb is fitted into the carrier on the Bomber the two poles are covered by a cap connected electrically to the charging gear. As the bomb slides down the shute on release an electrical current is passed into Condenser A, which is charged. Condenser A is connected to Condenser B by a short resistance C, so that for the first 7 seconds or so of bomb flight, Condenser A is discharging slowly through the resistance C into Condenser B, thus forming a safety device to prevent premature explosion of the bomb until the Bomber is clear. Eventually Condenser B has a firing current.

Below Condenser B is an "allways" inertia switch which forms an electrical break whilst the bomb is falling.

On impact at whatever angle, the "allways" switch closes the circuit and condenser B discharges either through a "bridge" which fuzes and fires the priming, or by a "spark" so initiating the fuze.

On initiation in this manner, direct action may take plece exploding the bomb. The insertion of a delay pellet or the use of an alternative charging system may retard explosion for periods up to 7 days, according to the setting. The insertion of a booby trap device may delay explosion until the bomb is moved. There is no detailed information available at the moment about the design of the delay or booby trap devices.

48. General.

Unexploded Bombs of the Anti Personnel, Incendiary or Gas types present no serious problem regarding disposal, and any experienced I.O.O. can deal with them on the general lines laid down in R.A.O.S., Part II. Incendiary bombs should be collected and disposal of by burning in some isolated spot. Care should be taken to avoid starting grass or forest fires and not too many bombs should be burned at the same time. The burning ground should be surfaced or cleared of grass for a radius of 50 yards at least, and it should not be used for the disposal of H.E. or Gas Bombs. Gas Bombs should be dealt with by trained Anti-Gas personnel fully equipped with the necessary protective clothing, etc.

Unexploded Bombs of the H.E. type present a very definite problem owing to the probability of long delay fuzes and the possibility of booby trap devices being used. If the bomb lies in open ground it should be disposed of where it lies. In view of the delay action, it would be preferable in such cases to mark the position and place a sentry near the spot, i.e in a dug-out at a suitable distance, and leave the bomb there for 10 days. Don't move it then, in view of possible booby traps, but carefully complete the arrangements laid down in Regulations and blow it up insitu. Sandbags should be piled round the bomb and care should be taken to ensure that its destruction is assured at the first attempt. If the destruction of the bomb lying in the open is likely to affect important drainage, water, gas electric or other supplies, it may be found preferable to defer its destruction the spot being patrolled, or otherwise protected. The reason for suggesting this course is the difficulty of ascertaining whether a delay or booby trap is fitted. If the former, the bomb could be removed after 10 days, but risk of the latter precludes this action. If the bomb is not in the open, the above considerations are aggravated and the best procedure to adopt must be deduced from a careful consideration of all the relevant circumstances. A number of experiments are in hand with the object of finding a solution to this problem.

Information The vital necessity for the efficient functioning of the services connected with the destruction of unexploded bombs is information. All that is available to date is contained in the preceeding notes. If the complete demobilization of Key industries, due to the risk of a large unexploded H.E. bomb being a booby trap, is to be avoided, we must avail ourselves of every possible bit of information likely to throw light on the type of fuze actually in use. If it can be established that an unexploded H.E. bomb in a large machine shop, departmental stores, etc. is actually a non-delay, non booby trap type, its removal for disposal elsewhere becomes a reasonable proposition. Again, if it can be established that a delay fuze is fitted it may be possible to establish a clear area for 10 days, and arrange for the removal at some risk of valuable articles. A greater risk may be faced in very special and exceptional cases by the immediate removal of the bomb, but this course should not be attempted without higher authority.

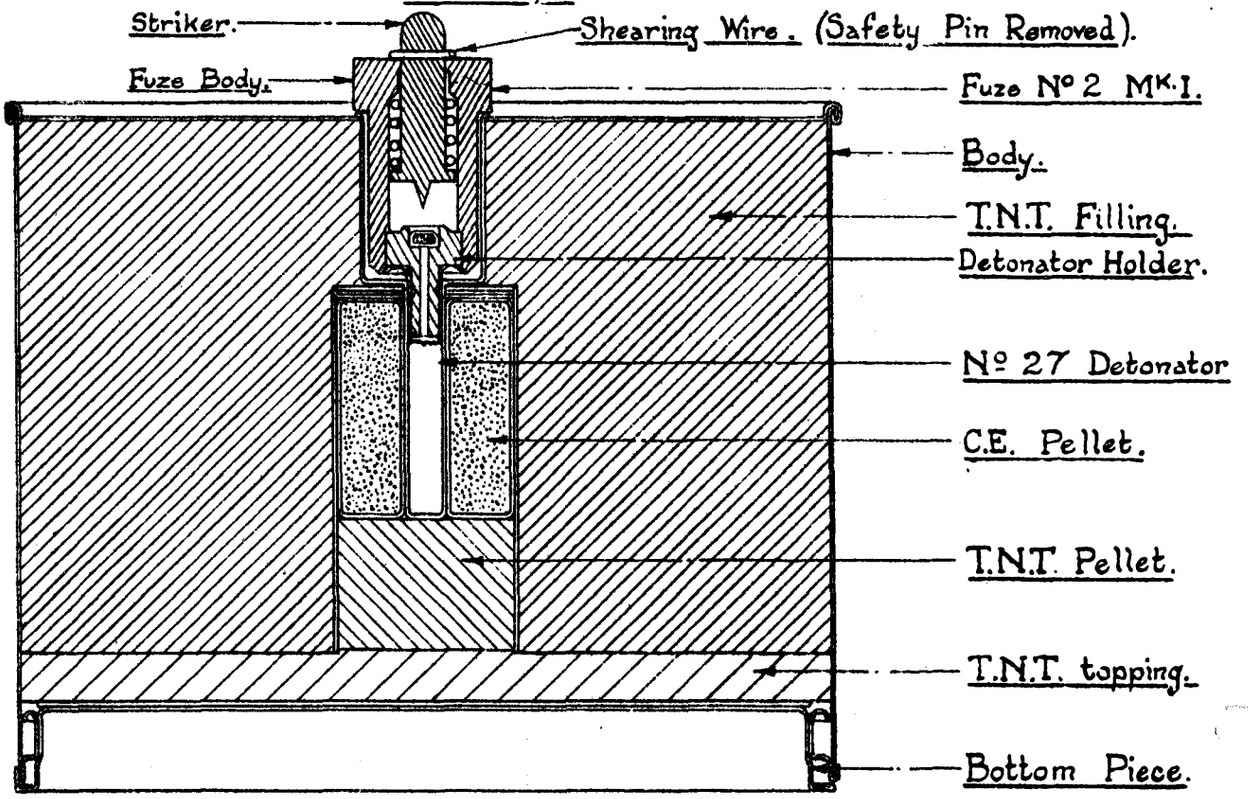
To help in the solution of these difficulties all details of enemy bombs obtained by military personnel should be sent immediately to C.I.A. who will collate and circulate them through the medium of these Bulletins for the information of I.O.Os. and Ordnance Officers generally. Early information of this kind may be the means of saving life, as the handling of unexploded H.E. Bombs is a risky business.

NOTE It will be seen from figures 3 and 4 that the H.E. bombs of the G.P. type are fitted with one or two lifting eyes. Some use may be made of these in open country for spring booby traps by attaching a wire to a lorry and driving away at a safe distance.

MINE, CONTACT, A.T. MARK III |L|.

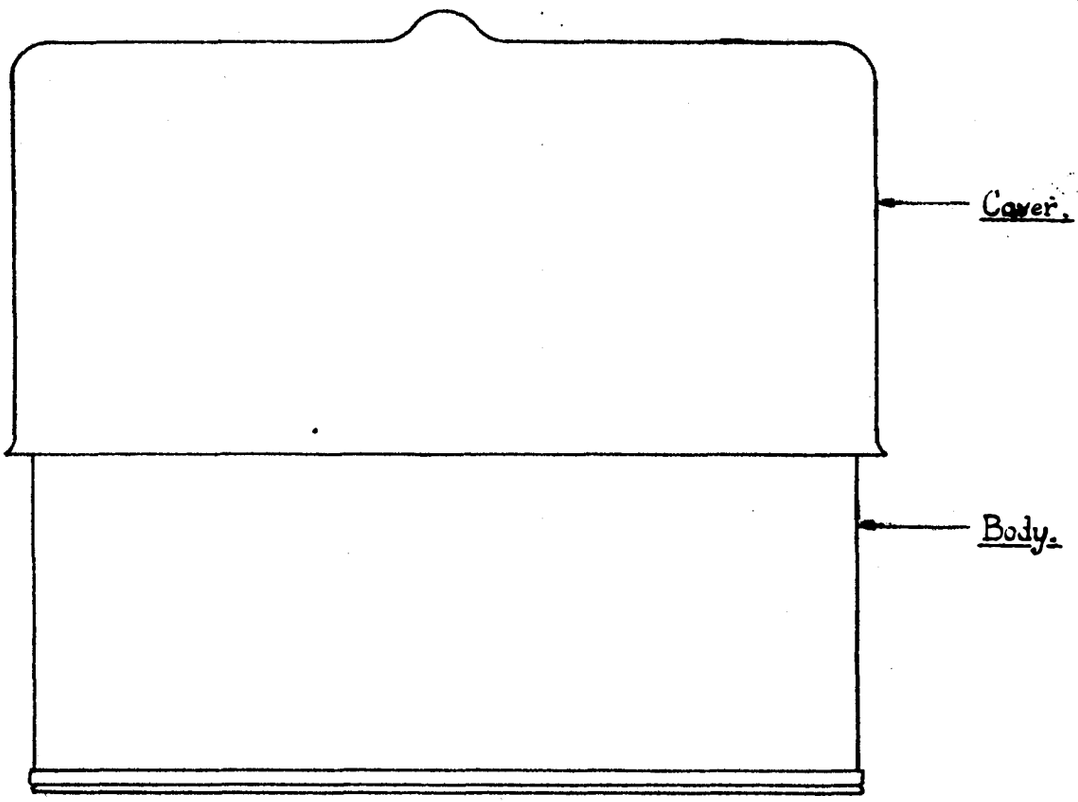
FIG. 2.

— SCALE:- 3/4. —



SECTION OF FILLED MINE
(With Cover Removed.)

FIG. 3.



EXTERIOR VIEW OF MINE.
(With Cover in Position.).

W.L.

GERMAN 50 KG H.E. BOMB.

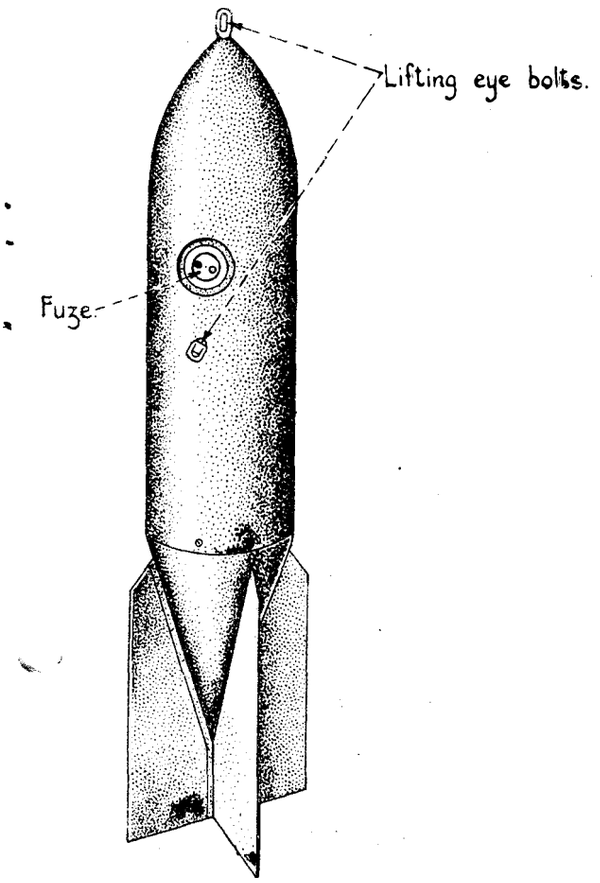


FIG. 4.

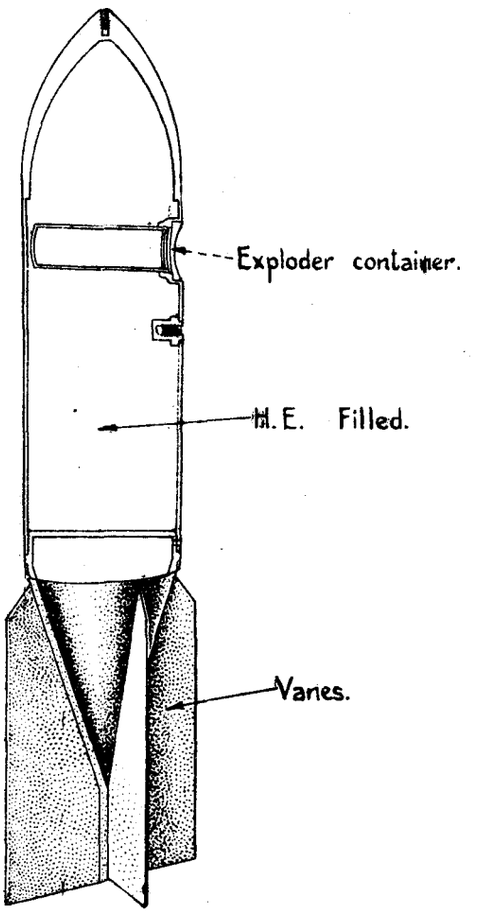


FIG 5.