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JAPANESE AMMUNITION

C.I.AMM. TECHNICAL REPORT

No. 31

TYPICAL PRIMERS USED IN GUN AMMUNITION.

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FEBRUARY 1945.

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G E N E R A L.

In dealing with Japanese gun ammunition there are certain components such as primers and fuzes, which necessarily repeat themselves in different equipments. It is, therefore, intended, in the interests of connected Reports and for quick reference, to publish Technical Reports describing these components. This Report deals with Primers and methods of ignition used in Japanese gun ammunition.

2. Japanese primers so far encountered have been divided into 5 different types. For convenience of reference and identification these are classed as below :-

- (i) Type 'A':- .5-in. - push in - for 13-mm. primer hole.
- (ii) Type 'B':- .5-in. - screwed - for 13½-mm. primer hole.
- (iii) Type 'C':- .9-in. - screwed - for 23-mm. primer hole.
- (iv) Type 'D':- .5-in. - screwed - for 13½-mm. primer hole.
- (v) Type 'E':- 1.07-in. - screwed - for 27-mm. primer hole.

It should be noted that the above nomenclature has nothing to do with the Japanese nomenclature which is not known and which, even if it were, would be most difficult and confusing to use. Primers are not marked with Japanese "Type numbers".

3. The general appearance and construction of the primers will be seen from the photograph at Plate A and the drawing at Plate B. All primers examined were taken from actual rounds of gun ammunition and therefore the method of packing and issue of separate primers is not known.

4. It is interesting to note that in practically all cases the primer, which fits flush with the base of the case, is covered with a piece of tissue paper varnished on. This extends partially over the case and acts as a waterproof seal, preventing the ingress of moisture to the propellant charge or past the hammer, to the cap of the primer.

During the examination of a large number of different types of gun ammunition, no instance has been found of the use of luting or equivalent composition on the screw threads of the primers or in the primer hole.

5. With the exception of the Type 'A' primer, the mechanism of all the primers conforms generally to the American system, a hammer integral with the primer, copper cap and a screwed anvil plug. The shank of the hammer is approximately .01-in. below the base of the primer. The 'push in' type 'A' primer follows American practice for small arm ammunition, i.e., the Boxer type cap and anvil. The base of all primers is usually stamped with the month and year of manufacture followed by

the

the inspection mark in Japanese characters. There does not seem to be any special base markings used to differentiate between types of primers. The inference is that the Japanese do not consider seriously the need for repriming in the field or in forward depots. If repriming is done, provision must be very difficult. The following points explain this :-

- (a) Cartridge cases for rounds of the same equipment have as many as three different sizes of primer holes; three different types of primers.
- (b) With a flake propellant loaded loosely in the case, the long primer Type 'D' is used, but with flake propellant loaded in a silk bag or strip propellant Type 'B' primer is used. Externally, however, both primers are identical in appearance; markings also appear to be identical. The difference can be detected only when the primer is removed or by shaking the case to detect whether the propellant charge is in a bag or loosely loaded. It has, however, been noticed that in all cases where the long primer 'D' is used, the base of the primer has been covered with violet or purple varnish. This may be intended by the Japanese as a quick field method of identification.
- (c) Although three different types of cartridge cases, requiring three different types of primers, may be found in the same equipment it would seem that each type is restricted to one type of shell, see Plate B. For example, the use of cartridge cases taking the Type 'E' primer, appears to be restricted to A.T. Ammunition.

6. The general standard of workmanship and the materials used are good. Primers are well sealed and appear generally to be up to the standard of similar British primers. The gunpowder used in the magazine is a good quality and its approximate size as compared with British gunpowder is G.20.

In all cases the cap composition has been analysed as a composition of potassium chlorate, antimony sulphide and mercury fulminate. Quantitative analysis has not been possible but the mercury fulminate content appears high and the caps are very sensitive - see firing figures below. This sensitivity of the primers is due to their method of construction as well as to the composition used.

D E S C R I P T I O N .

7. The construction of the primers and method of action is shown clearly in Plate B.

Some explanatory remarks on each type of primer follow :-

(1) Type 'A' :-

The primers were an extremely tight fit in the cases examined. After trying all the usual methods of removal it was necessary to cut open the case before the primer could be removed. The primer is made from brass throughout and is a Naval type - see C.I.AMM. Technical Report No.28. Only two primers were available and no cap sensitivity tests were possible.

(11)

(ii) Type 'B' :-

This appears to be the most common type used. With the exception of the copper hammer and cap it is made of brass throughout.

Cap sensitivity is of the order of about 3 inch-pounds.

(iii) Type 'C' :-

This primer has been found only in ammunition for 47-mm. equipments. Again, with the exception of the copper hammer and copper cap it is made of brass throughout.

Cap sensitivity of samples examined is of the order of about 6 inch-pounds.

(iv) Type 'D' :-

This primer is identical with Type 'B', except that it has been specially made to take a magazine extension. It has been found only in 75-mm. ammunition having a flake propellant charge loosely loaded in the case.

Cap sensitivity of samples examined is of the order of about 5 inch-pounds.

(v) Type 'E' :-

This primer in appearance is identical with our Service Primer No.18. It will fit the 40-mm. cartridge correctly while the No.18 primer will fit the Japanese cartridge case correctly, i.e. the thread forms and sizes, etc. are the same. Similarly the studs of Key No.143 fit exactly the slots of the Japanese primer. This key will not, of course, fit the 75-mm. cartridge case owing to the greater diameter of the latter.

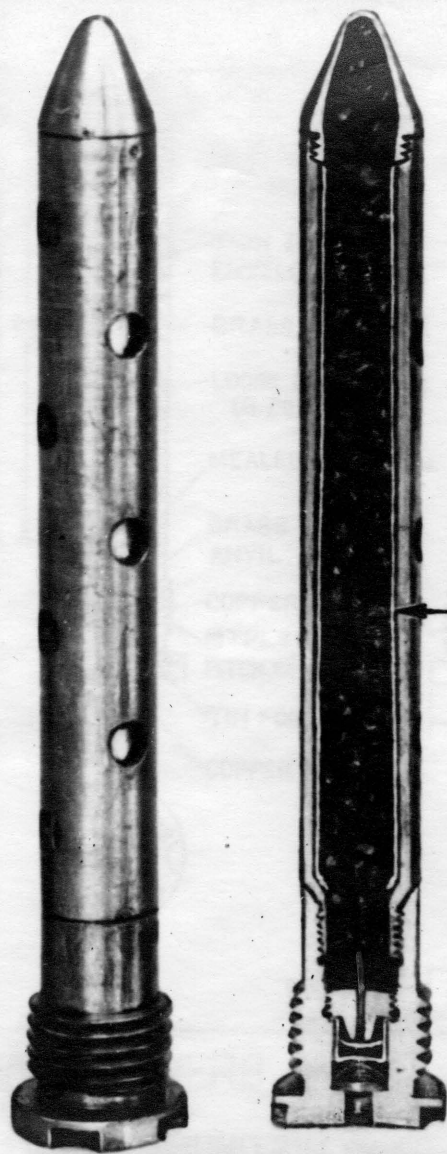
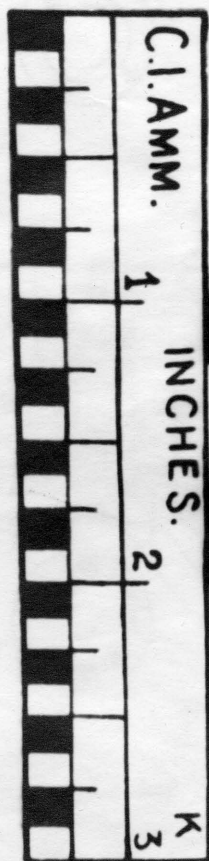
Cap sensitivity of samples examined is of the order of about 5 inch-pounds.

8. The tests for sensitivity of caps were carried out with a number of primers, in no case less than six. The apparatus used was the normal drop type using a one pound weight in guides to ensure concentric strike. All primers were at least two years old and in some cases sensitivity may have been affected by damp etc.

It is therefore considered that for general purposes all primers may function with a strength of blow as low as 3 inch-pounds which is the same as that for American percussion primers of similar types.

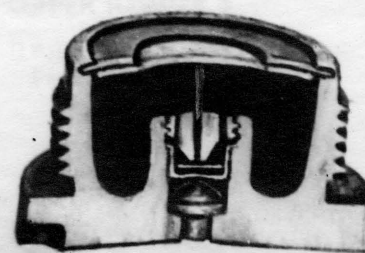
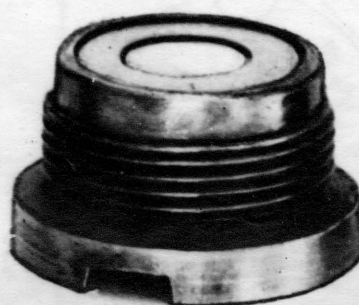
Although these primers are very sensitive they are well protected by a fairly thick primer base and the effective area of the hammer shank has a diameter of only 0.13 inches. Nevertheless Japanese gun ammunition should receive more than the usual care in handling and transport on account of this sensitive primer.

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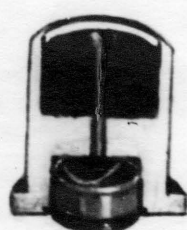
TYPE	DESCRIPTION.	PRIMER HOLE (APPROX.)
A.	.5" DIA. PUSH IN FITTING.	13 MM.
B.	.5" DIA. SCREWED.	13 1/2 MM.
C.	.9" DIA. SCREWED.	23 MM.
D.	.5" DIA. SCREWED.	13 1/2 MM.
E.	1.07" DIA. SCREWED.	27 MM.

TIN FOIL LINING



D.

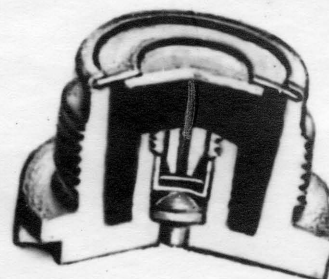
E.



A



B



C

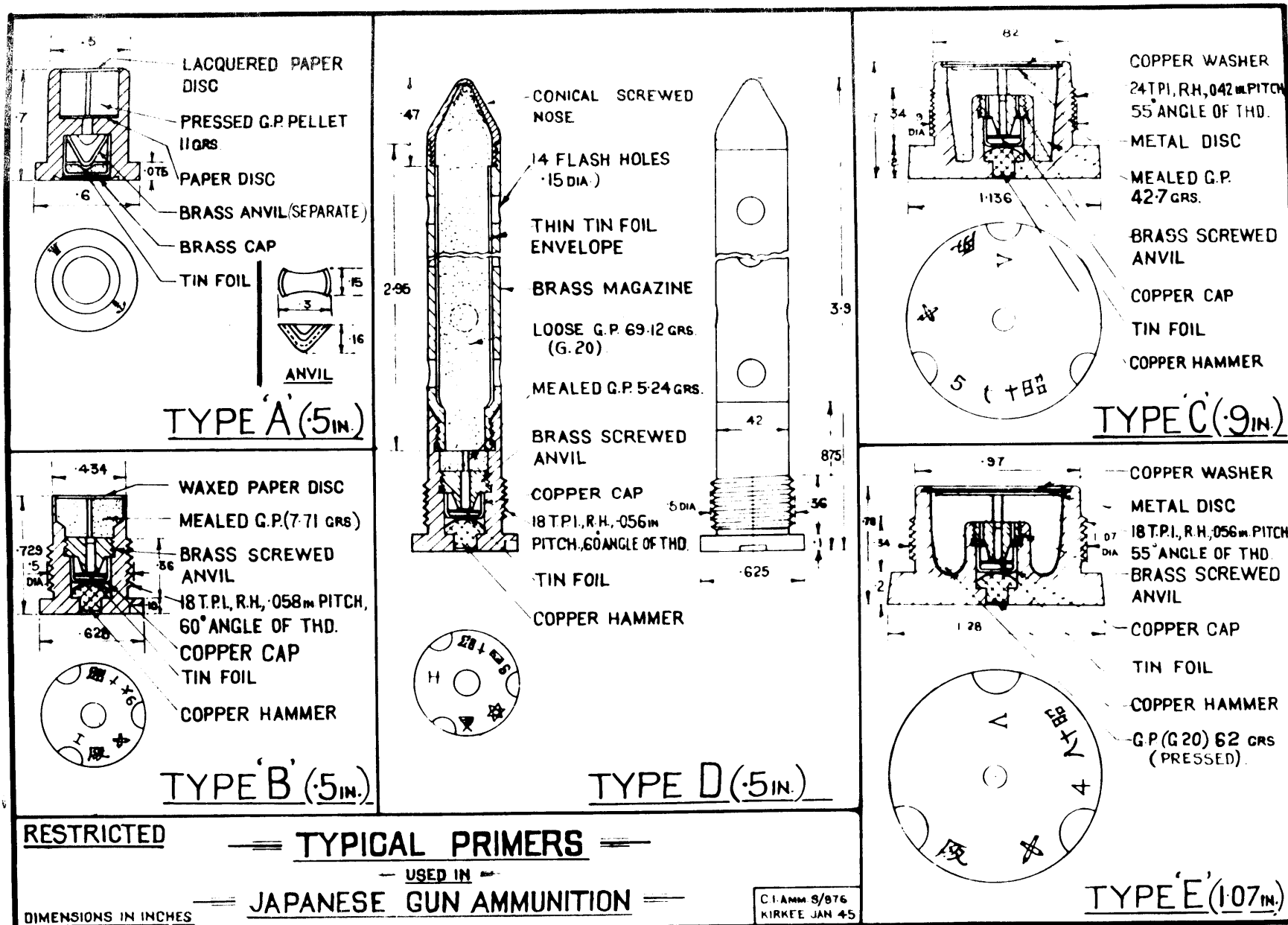
— TYPICAL PRIMERS. —

— USED IN —

— JAPANESE GUN AMMUNITION. —

C.I. AMM. S/995.
KIRKEE. FEB. 1945.

PLATE A.



KEY TO CHART OPPOSITE.

TYPE.	APPROX. SIZE & WEIGHT OF G.P. IN MAGAZINE.	WEIGHT OF PRIMER (COMPLETE)	IGNITER IN CARTRIDGE.	USED IN *
A - 5" DIA. PUSH-IN FITTING, BRASS CAP AND SEPARATE ANVIL (BOXER TYPE).	PRESSED, MEAL, 11 GRS.	195.0 GRS.	—	CARTRIDGE, Q.F., 25 mm., H.E./T & H.E., NAVAL, AA/AT.
B - 5" DIA. (SCREW THREADS) SCREWED ANVIL, WITH HAMMER, AS IN AMERICAN SYSTEM. APPROX. 13½ mm. PRIMER HOLE.	PRESSED, MEAL, 7.71 GRS.	213.8 GRS.	37 mm. 40 GRS. OF G.P. (G. 20) IN A RAW SILK POCKET SECURED TO THE BASE OF PROPELLANT BAG. 70 mm. 46.3 GRS. OF G.P. (G. 20) IN A SHALLOW SILK BAG. 75 mm. 80 GRS. OF G.P. (G. 20) IN A RAW SILK POCKET SECURED TO THE BASE OF PROPELLANT BAG. (TYPE MEIJI 41 AND TYPE 94 MOUNTAIN GUNS). 233 GRS. OF G.P. (G. 20) IN A RAW SILK BAG STITCHED INSIDE A CARDBOARD CUP (TYPE 88 FIELD/AA GUN.) 80 GRS. OF G.P. (G. 20) IN A RAW SILK BAG STITCHED INSIDE A CARDBOARD CUP (TYPE MEIJI 38 FIELD GUN).	CARTRIDGE Q.F. 37 mm., H.E., A.P./H.E., TYPE '94 TANK & A.T. GUNS AND TYPE TAISHO II INFANTRY GUN. " 70 mm., H.E. TYPE '92 BATTALION GUN. " 75 mm., H.E., TYPE 'MEIJI 38 FIELD, 'MEIJI 41 REGIMENTAL' AND '94 MOUNTAIN' GUNS. " 75 mm., H.E., TYPE '88 FIELD/AA GUN. " 75 mm., SHRAPNEL, TYPE MEIJI 41 REGIMENTAL & TYPE '94 MOUNTAIN' GUNS. " 105 mm., H.E. GUN '1926' MODEL. " 150 mm., H.E. HOW '1915' MODEL.
C - 9" DIA. (SCREW THREADS), SCREWED ANVIL ETC., AS FOR TYPE B. APPROX. 25 mm. PRIMER HOLE.	PRESSED, MEAL, 42.7 GRS.	546.8 GRS.	—	CARTRIDGE, Q.F., 47 mm., H.E., & A.P./H.E., TYPE '1 MOBILE A.T. GUN.
D - 5" DIA. (SCREW THREADS) BRASS MAGAZINE, SCREWED ANVIL ETC., AS FOR TYPE B. APPROX. 13½ mm. PRIMER HOLE.	LOOSE, 69.12 GRS., OF G. 20 IN MAGAZINE. PRESSED, MEAL 5.24 GRS. IN BODY OVER FLASH CHANNEL.	612.5 GRS.	—	CARTRIDGE, Q.F., 75 mm., H.E., TYPE '94 MOUNTAIN AND 'MEIJI 41 REGIMENTAL' GUNS.
E - 1.07" DIA. (SCREW THREADS) SCREWED ANVIL ETC., AS FOR TYPE B. APPROX. 27 mm. PRIMER HOLE.	G. 20, 75 GRS., PRESSED.	1050.0 GRS.	—	CARTRIDGE, Q.F., 75 mm., H.E., HOLLOW CHARGE, TYPE MEIJI 41 GUN. " 75 mm., A.P./H.E. TYPE '94 MOUNTAIN GUN. " 75 mm., A.P./H.E. TYPE MEIJI 38 FIELD GUN.

NOTES:-

- PERCUSSION CAPS FROM TYPES "B, C, D & E" ARE GENERALLY IDENTICAL & APPEAR TO BE INTERCHANGEABLE.
- TYPES "B & D" ARE INTERCHANGEABLE IN SO FAR AS SCREW THREADS ARE CONCERNED. THE REMAINDER ARE NOT INTERCHANGEABLE.
- DETAILS GIVEN IN * COLUMN ARE BASED ON ACTUAL EXAMINATIONS AT KIRKEE. THE PRIMERS MAY BE USED IN OTHER TYPES OF AMMUNITION, OR OTHER PRIMERS USED OF WHICH WE HAVE AT PRESENT NO DETAILS.