DIRECTOR OF ARMAMENTS (INDIA) PUBLICATION.

RESTRICTED.

The information contained in this Report is not to be communicated, either directly or indirectly, to the press or to any person not authorised to receive it.

JAPANESE AMMUNITION

C.I. AMN. TECHNICAL REPORT

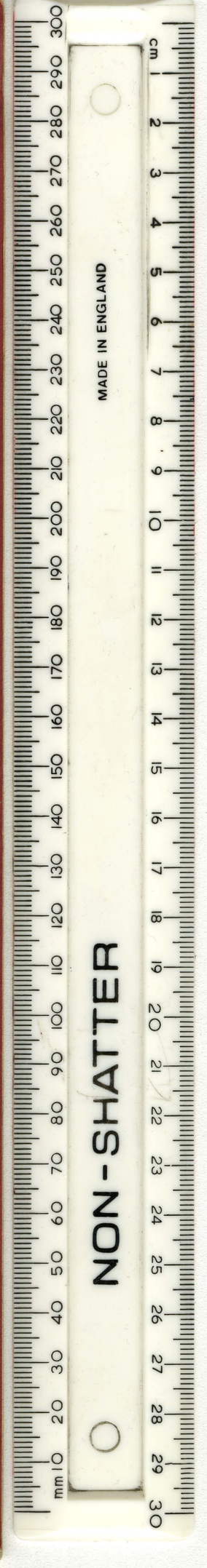
No. 6 (SECOND ISSUE)

(This Supersedes the *First Issue* which should now be destroyed).

AMMUNITION
FOR
50 M.M. RIFLED (GRENADE) DISCHARGER, TYPE '89

COMPILED BY
THE CHIEF INSPECTOR OF AMMUNITION,
KIRKEE.

1945



RESTRICTED

JAPANESE AMMUNITION

C. I. AMN. TECHNICAL REPORTS

REPORT NO.6 (SECOND ISSUE) AUGUST 1945

AMMUNITION FOR 50-mm. RIFLED (GRENADE) DISCHARGER, TYPE '89

G E N E R A L

Since the issue of the first Report on ammunition for the "50-mm. rifled grenade discharger Type '89", considerable additional information has been received and a Second Issue is therefore being made, forming a complete Report on the ammunition for this 50-mm. Discharger.

2. It will be useful, before describing the ammunition, to give a brief description of the Discharger, a photograph of which is shown at Plate C. The main dimensions of the Discharger are:-

Bore	..	50-mm. Nominal (actual measuremant 1.97-ins.)
Rifling	..	8 grooves - right handed.
Length of barrel	..	10-ins.
Overall length	..	23.8-ins.

3. The Discharger is fired by hand, by means of a short lanyard (or thong) attached to a lever which cocks and fires in one downward operation, (Trip action firing mechanism).

4. There is no mechanical elevation, the Discharger being held by hand at some fixed elevation and the different ranges for each charge are obtained by altering the chamber capacity. This is attained by means of a moveable striker barrel which is traversed up or down the bore by an external thumb screw operating on an internal rack. The striker barrel, therefore, acts as a stop for the shell and according to its position allows it either just to enter the barrel, giving a large chamber capacity and low range, or to travel to the bottom of the barrel, giving a small chamber capacity and long range.

5. The range scales are in Arabic figures engraved on the shank of the Discharger and read against a part of the firing mechanism which moves with the striker.

6. The exterior of the barrel is tapered, the section thickening at the breech end to compensate for the increased pressure.

7. The base plate is a segment of a cylinder (approximately

8-ins. x 3½-ins.) concave about the major axis and a fixture to the Discharger. It is used as a spade to support the Discharger while firing. It is believed that it can also be supported on the thigh of the firer but in this position owing to the very heavy recoil it is doubtful whether it could be supported without some special pad or other arrangement to protect the firer when using H.E. shell. Although the range scale on the Discharger is graduated for firing Type '91 grenades and flares it is doubtful whether current practice is to use grenades from this Discharger - see C.I.Amn. Technical Report No.5.

8. The interesting feature of this rifled Discharger is that it is muzzle loaded, the maximum diameter of the driving band being less than the diameter of the lands of the bore. On firing, however, spin is imparted to the projectile similar to a small howitzer shell. This is attained somewhat ingeniously by having a propellant container of the same diameter as the shell screwed into the base of the shell. Round this propellant container is a copper driving band. On ignition of the propellant charge the driving band is forced out into the rifling by the propellant gases and also by 'set-up' caused by the explosion of the propellant charge. This arrangement will be clear from Plate A.

9. Range Scales. There are two range scales, one graduated from 120 to 650 metres for H.E. shell and the other from 40 to 190 metres for the Type '91 grenades and flares - see Plate C.

10. According to information now available there are five different types of projectiles for use with this Discharger. A brief description of these is, for convenience, being included in this Report.

H.E. Shell Type '89

11. This is the standard anti-personnel projectile and is very widely used. Large numbers of these have been received from time to time at Kirkee for critical examination. It has been possible also to carry out firing trials and static fragmentation trials details of which are fully detailed later in this Report.

Smoke Shell Type '95

12. This projectile is fitted with a Time Fuze, Type '89 (small), the fuzed shell weighing about 1.9-lbs. In design and action it is somewhat similar to the H.E. Shell Type '89 but functions on the base ejection principle. The following are the main differences from the H.E. shell:-

(a) The base adapter is a press fit and is secured in the body of the shell by four screwed shear pins to allow the smoke mixture container to be expelled from the base. The propellant container is screwed onto the adapter similar to the H.E. shell.

(b) The head is screwed onto the body just behind the bourrelet to facilitate the assembly of the smoke container and bursting charge.

(c) The smoke mixture, about 3.7-ozs. of H.C.E. composition,

is contained in a container which is fastened by means of a length of wire to a copper cup housed in the base adapter. On ejection of the smoke container this copper cup acts as a retarder to reduce the terminal velocity of the smoke container.

(d) The shell is painted black with two white bands 5/16-in. wide one just below the bourrelet and the other above the base adapter.

13. None of these shell has been received in Kirkee and no reports of their use in the Burma theatre have been received.

Incendiary Shell (Grenade)

14. This is reported to have a cylindrical sheet metal body containing about 7.7-ozs. of an incendiary mixture. This mixture is reported to consist of:-

Potassium Nitrate	..	49%
Aluminium	..	22%
Sulphur	..	20%
Antimony Trisulphide	..	6%
Wax	..	3%

This projectile has no driving band or vanes and is therefore not stabilized during flight. The range is probably of the order of 200 yards and the filling of the grenade is ignited by the flash from the propellant gases.

15. There is also report of a similar projectile being used which is filled with a smoke composition of the H.C.E. type.

Practice Shell, Type '94

16. This shell has the same shape, dimensions and weight as the H.E. shell, Type '89 and is presumably used only for drill p - poses. The fuze is formed integral with the head of the project . The projectile is painted black and the usual red filling band a the junction of the fuze and shell is omitted.

50-mm. Flares

17. Numerous natures of flares are also fired from this Discharger. The flares are not fitted with a driving band or vanes and are therefore not stabilized during flight. Various combinations of flare colours are used and some are fitted with parachutes. They will be described fully in a later Report.

SHELL, H.E., 50-mm., TYPE '89

DESCRIPTION

SHELL

18. The details of construction, method of assembly and details of components are shown in the drawing at Plate A.

19. The overall length of a fuzed shell is 5 3/4-ins. with a diameter of 1.94-ins. over the parallel portion of the body and 1.96-ins. over the bourrelet. The complete shell consists of three sections:-

(i) Body,
(ii) Base adapter, and
(iii) Propelling attachment.

20. Body (3). This is made of steel and has a bourrelet about 0.9-in. below the nose. The nose is screw-threaded internally to form a 20-mm. left hand threaded fuze hole. The shell filling, about 5-ozs. of T.N.T., houses at the top an aluminium or copper flanged cup (1) to receive the fuze gaine and at the base it is screw threaded to receive the base adapter (4).

21. Base adapter (4). This is made of steel and has an inner concave surface in which is fitted a pre-pressed T.N.T. pellet. The general construction of the adapter will be clear from the drawing in Plate A.

22. Propelling attachment. This consists of:-

(i) A propellant container cup (8) of copper, holding 46-grs. of N.C. wrapped in a paper tube of the form of a ring (7). The cup is closed by a copper lid (6) fitting into the mouth of the container cup (8). In the base of the propellant container cup is a perforation to accommodate a brass percussion cap holder (9).

(ii) A brass percussion cap holder (9). This is in the form of a cylinder holding 4 3/4-grs. of G.P. The base of the holder is shaped to form an anvil and cap chamber. The cap chamber takes a Berdan type of brass percussion cap similar in construction to that used in Japanese S.A.A. cartridges. The holder (9) is a press fit in the propellant container cup (8) and is finally secured in position by the propellant assembly holder (10). This arrangement will be clear from the enlarged details in Plate A.

(iii) Propellant assembly holder (10). This is a steel cup having eight holes 0.2-in. in diameter equi-spaced round the circumference of the holder (8). Externally the holder (10) is shaped to receive the copper driving band (5) which fits over the eight holes and is a close fit in the groove of the holder. It is secured in position by five anti-rotation steel pins. Under the driving band and fitting lightly over the holes is a tinfoil strip to prevent ingress of moisture through holes. The base of the holder (10) has eight equi-distant holes round the perimeter 0.2-in. in diameter. There is also a central hole 0.165-in. in diameter to allow the firing pin of the Discharger to reach the percussion cap. The base is covered by a thin shellacked paper disc to prevent the ingress of moisture to the propellant and percussion cap. Internally the holder (10) is hollow to accommodate the propellant container cup (8) and is screw-threaded at the mouth to screw onto the base adapter (4). These details of construction will be clear from Plate A.

23. Alternatively the shell body may be divided into two parts forming the head and body as shown in the drawing at Plate A.

24. All steel portions of the shell are rust-proofed internally with a dark purple lacquer and threads have been found usually lightly smeared with grease.

25. Filling. All shell examined have been found with a filling of Grade I T.N.T. The base adapter is filled with a pellet of T.N.T. pre-pressed to shape. The main filling of T.N.T. is stemmed into the shell from the base. No exploder is used and initiation is direct from fuze gaine, nevertheless good fragmentation is obtained - see Plates E and F.

ACTION

26. On firing, the striker in the Discharger initiates the cap, the flash from which passes via the booster charge in the cap holder (9) to the propellant (7). The propellant gases then rupture the copper cup (8) and pass through the holes in the wall of the holder (10) to force the driving band into the rifling and also escape through holes in the base to propel the shell to a range dependent on the position of the striker barrel in the bore of the Discharger. The sealing of the driving band in the Discharger is also assisted by set-back as the body of the shell is propelled violently forward by the gases.

FUZE, PERCUSSION, D.A., TYPE '88 (SMALL), 20-mm. F.H.

27. This is a direct action nose fuze with left hand screw threads to fit the 20-mm. fuze hole of the shell. So far as is known this fuze is used in 70-mm. 11 Year Type mortar smoke shell and sometimes adapted for booby traps. The details of the components and the general construction of the fuze is clearly shown in the drawing at Plate B. For purposes of description the fuze may be divided into three main parts:-

(i) Brass body, upper half (1) containing the striker mechanism.

(ii) Brass body, lower half (10) to which is fitted the gaine (14).

(iii) Gaine (14) holding the main filling and detonator holder (12).

The body upper half is centrally bored to varying diameters to take the striker comprising a brass striker head (2), a steel striker (2A) and a slotted striker sleeve (2B). Under the striker head and bearing on a brass sliding piece (5) is the upper spring (3). Below the brass sliding piece (5) is the lower spring (6). Both the springs tend to force the striker out of the upper half of the body but are prevented from doing so by the flange on the striker head (2) Fitting round the slotted striker sleeve (2B) and resting on the brass sliding piece (5) is a brass setback ferrule (4). The setback ferrule (4) at its lower end surrounds a cupro-nickel stirrup spring (7), the mouth of the setback ferrule (4) resting on the prongs of a stirrup spring (7). Immediately below the slotted striker sleeve (2B), preventing its downward movement (and that of the striker (2A)), are four brass centrifugal segments (8) which are held under the striker sleeve (2B) by the barrel of the stirrup spring (7).

The lower half of the body screws onto the upper half thus forming a housing for the striker mechanism. A mild steel safety fork (9) passes through holes in the lower body and prevents any

appreciable downward movement of the setback ferrule (4) and thus prevents the fuze from arming. At its lower end the body (10) is screw-threaded externally with a left-handed thread to screw into the shell. It is centrally perforated to provide a passage for the striker (2A) and screw-threaded internally to take the gaine (14).

28. The method of filling of the gaine will be clear from Plate B. The mouth is closed by a screwed detonator holder (12) in which is fitted a detonator secured by turning over. Note that a somewhat complicated method of filling is used in this gaine. It is possible, however, that different methods of filling are used and a more simplified method of gaine filling is used as in the slight delay and graze action fuze Type '88 (24-mm. fuze hole), see Plate D in Technical Report No.34.

29. Rough tests were carried out to determine the pressure required for the ferrule (4) to be pushed back over the stirrup spring (7). It was found that the load required was of the order of 12 to 13-lbs.

30. Safety Devices. The fuze incorporates three safety devices:-

(a) A safety fork (9) which during handling and transport secures the setback ferrule (4) and prevents it from riding over the stirrup spring (7) to arm the fuze in case of a fall or severe jolt to the round.

(b) Four centrifugal segments (8) which fit round the lower striker spring (6) and are seated inside the stirrup spring (7) to prevent any appreciable downward movement of the striker (2A). This is effected by the brass slotted striker sleeve (2B) of the striker (2A) bearing on these segments.

(c) Two steel springs which prevent any inward movement of the striker onto the detonator which might be caused by a slight check during flight.

ACTION

31. Before loading, the safety fork (9) is removed. On discharge, the setback ferrule (4) sets back over the stirrup spring (7) compressing the three spring projections and locking itself by means of these projections to the stirrup spring (7). At the same time, by means of the sliding piece (5), the lower spring (6) is compressed by the ferrule (4) setting back. After initial setback, when acceleration decreases, the set-back ferrule (4) and stirrup spring (7) move forward together under force of the spring, freeing the brass segments (8) which fly outwards owing to centrifugal force. The striker is then held off the detonator only by the springs and functions normally on impact.

PACKING AND TRANSPORT

PACKING

32. A number of different methods of packing have been reported and found. Typical packing of shell received at Kirkee is shown in Plate D.

(a) A wooden case holding 20 plugged shell each contained in an unbleached brown paper envelope which had been treated with tar to render it waterproof. Five shell each in a paper envelope, together with five fuzes, each in a tinned plate container, are packed in between a pair of shaped wooden packing trays. Four of these trays are placed horizontally, two in each of the two compartments inside the case. The case is either painted yellowish green or left unpainted and bears black stencilled markings on the sides as in Plate D. These markings are unfortunately upside down as the bottom of the case had been opened instead of the top owing to the construction of both being the same. The packing tray also obscures the markings indicating the number of shell and fuzes packed. A free translation of the markings is "20 shell with fuzes for 50-mm. Type '89 Grenade Discharger". A cross batten at each end is provided which acts as a lifting handle. A printed label is sometimes found pasted on the underside of the lid. The wood used was unseasoned and the case with its packing pieces appeared, according to our standards, to be insufficiently robust to withstand rough handling during transit etc.

(b) Another method of packing appears to be a copy of the American system. Two plugged shell are packed in a rolled paper asphalt impregnated cylinder. The shell are held 'snug' in the container by wooden packing pieces. The ends of the container are pressed metal sheet with embossed markings indicating the nature of the contents etc. The container is constructed from three layers of paper, the outer and inner layers are specially wound and impregnated with pitch and a waxy matter respectively. The paper used is 0.012-in. thick manufactured from rags and wood pulp. The two fuzes for the shell are packed separately in a tinned plate container, each fuze being wrapped in a blue waxed paper secured by a piece of string. Details of this method of packing are shown clearly in the photograph at Plate D.

Ten of these containers are understood to be packed in a wooden case together with ten cylinders each containing two fuzes. The dimensions of this packing case are reported to be 27⅛-ins. x 19⅜-ins. x 3¼-ins.

(c) Another method of packing received at Kirkee is a cardboard container holding one plugged shell with one fuze wrapped in a piece of blue waxed paper secured by a piece of string. The construction of this container is of rolled paper throughout coated with a waxy matter. The paper base is rags and wood pulp. Wooden packing pieces hold the shell and fuze snugly in the cardboard container. These details will be clear from the photograph at Plate D. Twenty containers each holding one plugged shell and one fuze are packed in a wooden case with four compartments, five in each compartment. The dimensions of the case are 25½-ins. x 18-ins. x 3 3/4-ins.

33. In addition to the above methods of packing which have been examined at Kirkee the following methods have also been reported:-

(a) A wooden case holding 40 plugged shell designed for carriage on a pack horse. Wooden packing pieces in the case form four round units each held together with 3/4-in. tape. The four round units are held in place inside the

case by metal brackets which allow their withdrawal from the case without disturbing other units. The hinged lid is provided with a canvas cover with an overhanging rim all round. The dimensions of the case are reported to be 30-ins. x 9-ins. x 11½-ins. and the filled weight is about 103-lbs.

(b) A five round unit in a wooden packing tray which is wrapped in an asphalt impregnated paper container. The method of packing these in a wooden case is not known. It is probably on the same lines as 32 (a) above.

(c) Bulk issue of fuzes is reported to be in a wooden case holding 100 fuzes. Although the report does not say so it is presumed that each fuze is packed in a tinned plate cylinder. The dimensions of the case are reported to be 27 3/4-ins. x 12-ins. x 4 1/4-ins. and the filled weight is about 29-lbs.

TRANSPORT

34. Transport on the man is in pouches slung on a leather strap over the shoulder or on the belt by means of a loop at the back of the pouch. Two types of pouches have been examined at Kirkee and details are shown in Plate C.

METALLURGICAL ANALYSIS
(Inspector of Metal and Steel, Ishapore)

35. Three shell were examined.

Shell No.1. Yellow painted band on mid-body, red tip on head. Shell stamped (Oct. 1940).

Shell No.2. Colour markings as shell No.1. Shell stamped (Oct. 1940).

Shell No.3. White painted band above driving band, yellow painted band at shoulder and red tip on head. Shell stamped (Jan. 1938).

36. All the three shell were identical in shape and external and internal assembled dimensions but in respect of construction, shell No.1 differed from No.2 and No.3 in the base of the cavity having been formed integral with the body and being fitted with screwed head whereas No.2 and No.3 had a screwed plug forming the base of the cavity and the head integral with the body. In all the three shell the base onto which the driving band is fitted, was a separate section.

37. The results of examination were:-

A. Shell Bodies.

(i) Shell No.1
All the three sections of the shell have been machined from the solid.

(a) Head:-

Analysis:- Carbon .. 0.25%
Manganese .. 0.67%
Alloying elements - traces only.

Mild steel.

Hardness:- 137 V.P.H.

(b) Body Main:-

Analysis:- Carbon .. 0.32%
Manganese .. 0.80%
Tungsten .. 0.60%
Chromium .. 0.22%
Other alloying elements - traces only.

Hardness:- From surface of body to axis of shell 215, 214, 196, 187 V.P.H.

Tensile (Tensometer test - long test piece from the thin wall.)

Yield strength .. 26.0 tons/sq. in.
Ult. tensile strength 44.0 tons/sq. in.
Elongation .. 32.0%
Reduction of area .. 50.0%

Note:- May have been machined from finish cold drawn or normalised bar.

(c) Base:-

Analysis:- Carbon .. 0.53%
Manganese .. 0.75%
Alloying elements - traces only.

Plain carbon steel.

Hardness:- 275 V.P.H.

Note:- Heat-treated.

(ii) Shell No.2

Body has been hollow forged. The screwed plug at base and the base have been machined from the solid and heat-treated.

(a) Body Main:-

Analysis:- Carbon .. 0.30%
Manganese .. 0.77%
Alloying elements - traces only.

Mild steel.

Hardness:- From surface to axis uniform at 139/142 V.P.H.

Tensile (Tensometer test piece from wall).

Yield strength .. 17.0 tons/sq. in.
Ult. tensile strength 29.0 tons/sq. in.
Elongation .. 35.0%
Reduction of area .. 55.0%

(b) Screwed plug forming base of cavity:-

Analysis:-	Carbon	..	0.35%
	Manganese	..	0.53%
	Tungsten	..	0.6%
	Chromium	..	0.2%
	Nickel	..	Nil.
Hardness:-	239, 240 V.P.H.		

(c) Base:-
Similar in composition and hardness to base of shell No.1 at (i) (c) above.

(iii) Shell No.3
Same type of construction as shell No.2 but in this case all the three sections have been machined from the solid.

(a) Body:-

Analysis:-	Carbon	..	0.25%
	Manganese	..	0.65%
	Tungsten	..	1.0%
	Chromium	..	0.28%
	Other alloying elements - traces only.		
Hardness:-	Uniform from outside to shell axis at 190 V.P.H.		
Tensile:-	Yield strength	..	25 tons/sq. in.
	Ult. tensile strength		38.3 tons/sq. in.
	Elongation	..	24.0%
	Reduction of area	..	50.0%

Note:- Apparently machined from normalised bar.

(b) Screwed plug forming base of cavity. Similar in composition and hardness to shell No.2.

(c) Base:-
Similar in composition to base on shell Nos.1 and 2 but showed somewhat higher hardness, 325 V.P.H.

B. Driving Bands etc.

In the cases of all the three shell, the driving bands have been made from solid drawn copper tube of 99.95% purity.

The propellant container in each case has been pressed from semi-soft copper sheet also of 99.95% purity.

The .0015" thick foil covering the holes in the base of each shell has been made of pure tin.

C. Finish

The finish of all the three shell was excellent.

38. Comparing the three shell it may be noted that while the body main of the shell of 1939 and 1940 makes have been machined from the solid bar containing low tungsten, the mild steel body

of shell of 1941 make has been forged. The use of mild steel for the body is probably adequately suited to the design and functioning requirements of the shell.

CHEMICAL ANALYSIS
(Chief Inspector of Military Explosives, Kirkee)

39. Shell

Shell filling	..	T.N.T. Grade I (S.P. 80°C)
Propellant charge	..	N.C. + Volatile matter 97.5% D.P.A. 2.5% (Square flakes size 0.03-in. x 0.03-in. x 0.004-in. thick)
Igniter charge (9)	..	Gunpowder - Approx. G.20. Quantity insufficient for quantitative determination.
Cap composition (9A)	..	Composition of Mercury Fulminate, Antimony Sulphide and Potassium Chlorate.

40. Fuze

Detonator (11)	..	A mixture of Potassium Chlorate, Antimony Sulphide and Mercury Fulminate.
Composition in copper capsule (13)	..	Mercury Fulminate pressed in three increments each separated by a paper disc.
Filling in gaine (14)	..	C.E. (M.P. 129°C)

A P P R E C I A T I O N
(Economic, manufacture and development aspects)

41. This weapon and ammunition appears to be entirely of Japanese origin and fulfils an equivalent role in the Japanese Army as the 2-in. Mortar in the British Army. The materials used in the manufacture of the ammunition are excellent and the standard of workmanship throughout is good but it would seem that nothing has been spared in an effort to place in the hands of the Japanese Infantrymen the best weapon possible. According to reports this has been well justified and the weapon has been very effective and full use of it has been made by the Japanese.

FUNCTIONING AND PERFOIMANCE

42. At small firing trials carried out it was found that the range was 600 yards and upwards, but recoil of the discharger was very heavy and it is thought unlikely that it could be rested on the thigh of the firer. Recoil of the grenade is, however, small and firing from the thigh is practicable.

43. Two shell were detonated statically for recovery of fragments.

Details of these trials are shown at Plates E and F, from which it will be seen that a good standard of fragmentation is achieved.

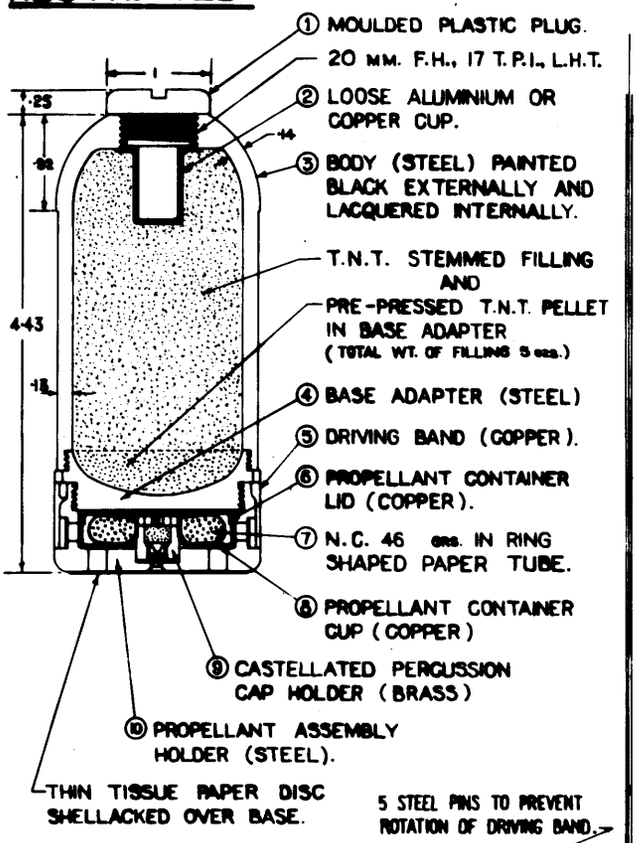
SUMMARY OF DATA

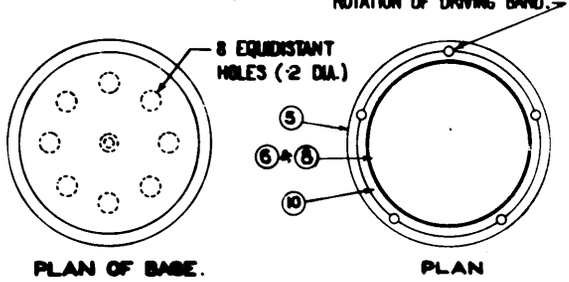
44. Shell	Fuzed	Plugged
Weight of complete round	1-lb. 12.3-ozs.	1-lb. 10-ozs.
Length of complete round	5.75-ins.	4.65-ins.
Diameter over bourrelet	1.96-ins.	..
Diameter over body	1.94-ins.	..
Diameter over driving band	1.96-ins.	..
Weight and nature of shell filling	5.1-ozs. of T.N.T.	..
Weight and nature of propellant	46-grs. N.C. with D.P.A. as a stabilizer	..
Weight and nature of igniter charge in percussion cap holder	4.75-grs. of G.P.	..

45. Fuze		
Overall length	..	2.32-ins.
Weight	..	2.6-ozs.
Weight of detonator filling	..	2.4-grs.
Weight of filling in copper cup	..	11-grs.
Weight of gaine filling	..	15-grs.

PLATE A.

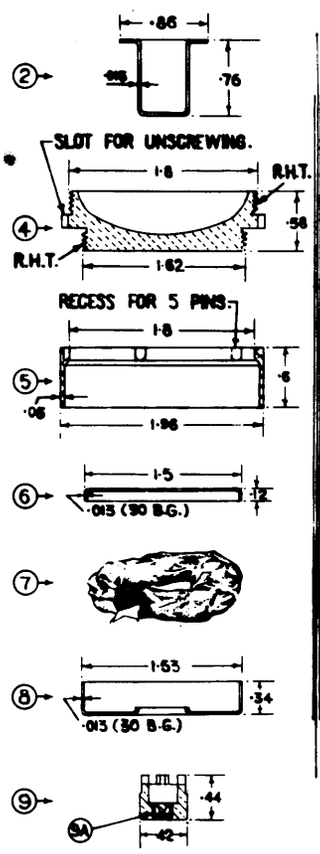
RESTRICTED.

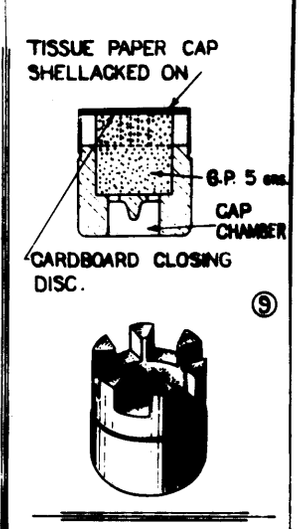




PLAN OF BASE. PLAN

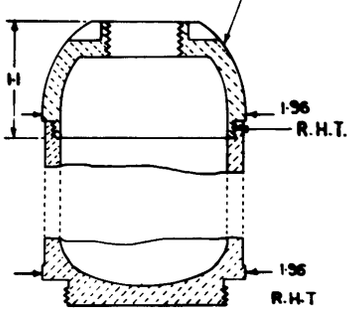
ENLARGED DETAILS.

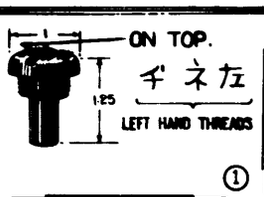




ASSEMBLY SEQUENCE.

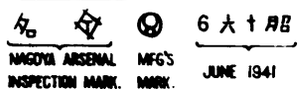
ALTERNATIVE METHOD OF CONSTRUCTION.

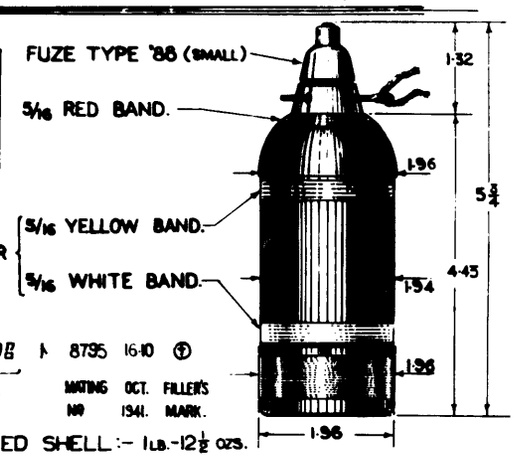




ONE YELLOW BAND ONLY IN THE MIDDLE OF BODY. OR 5/16 YELLOW BAND. 5/16 WHITE BAND.

STAMPED:-





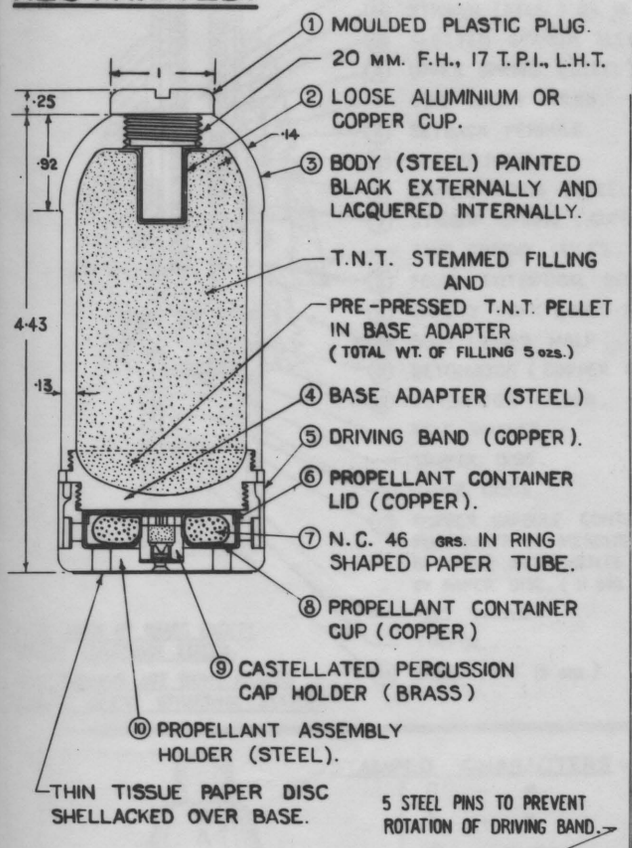
COMPLETE WT. OF FUZED SHELL:- 1 LB.-12½ ozs.

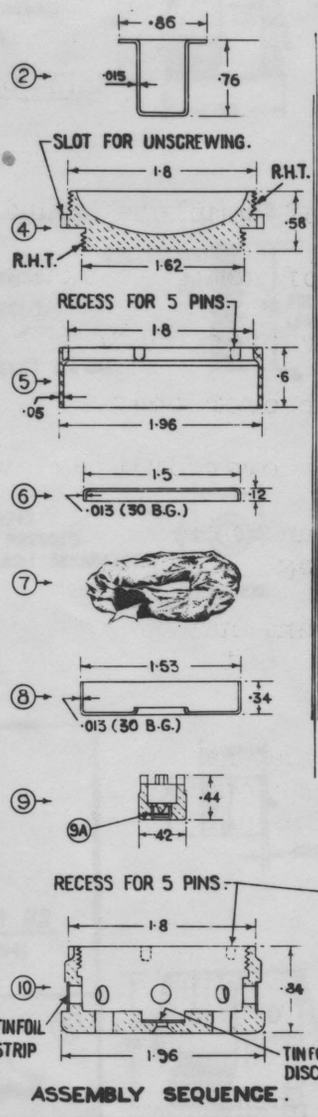
JAPANESE
H.E. SHELL, 50 MM., TYPE '89
FOR
50MM. RIFLED (GRENADE) DISCHARGER, TYPE '89.

DIMENSIONS IN INCHES.

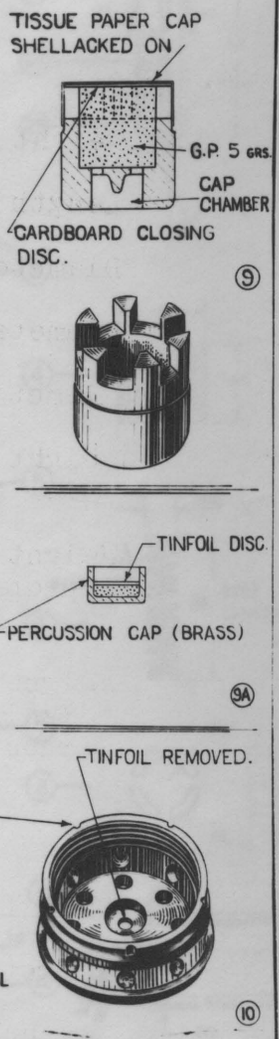
C.I. Amn. S/1184
KIRKEE JUNE '45

RESTRICTED.

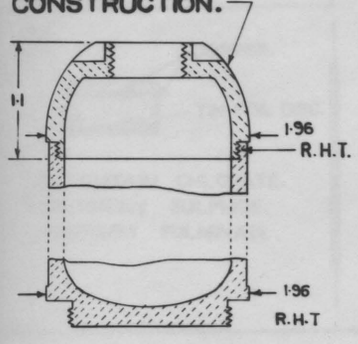


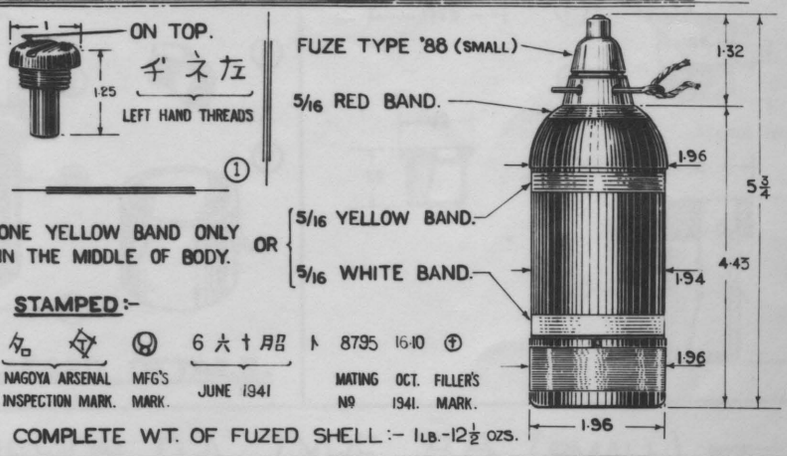


ENLARGED DETAILS.



ALTERNATIVE METHOD OF CONSTRUCTION.

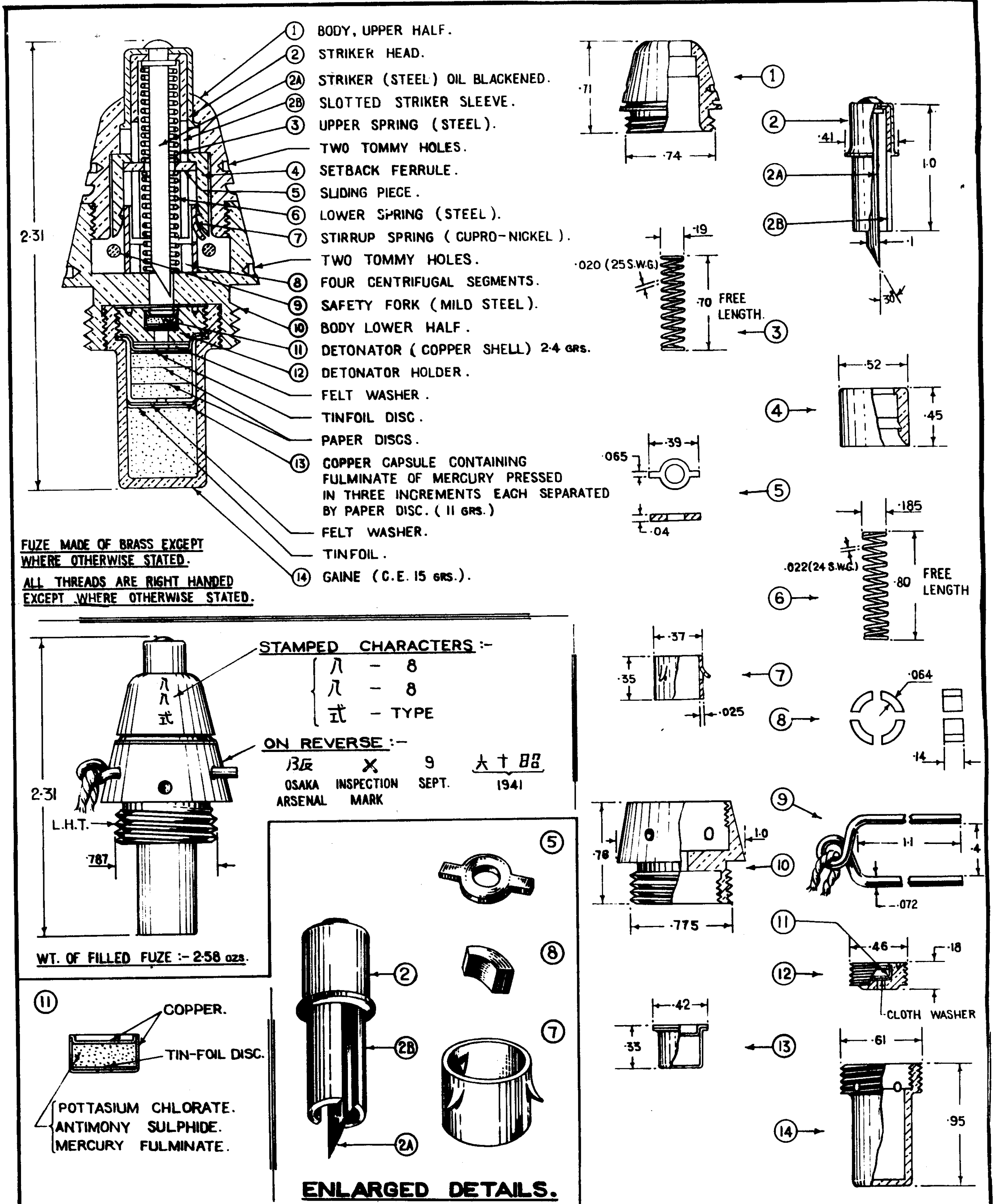




JAPANESE
H.E. SHELL, 50 MM., TYPE '89
FOR
50MM. RIFLED (GRENADE) DISCHARGER, TYPE '89.

DIMENSIONS IN INCHES.

C.I. AMN. S/1164
KIRKEE JUNE '45



FUZE, PERCUSSION D.A. TYPE '88 (SMALL)

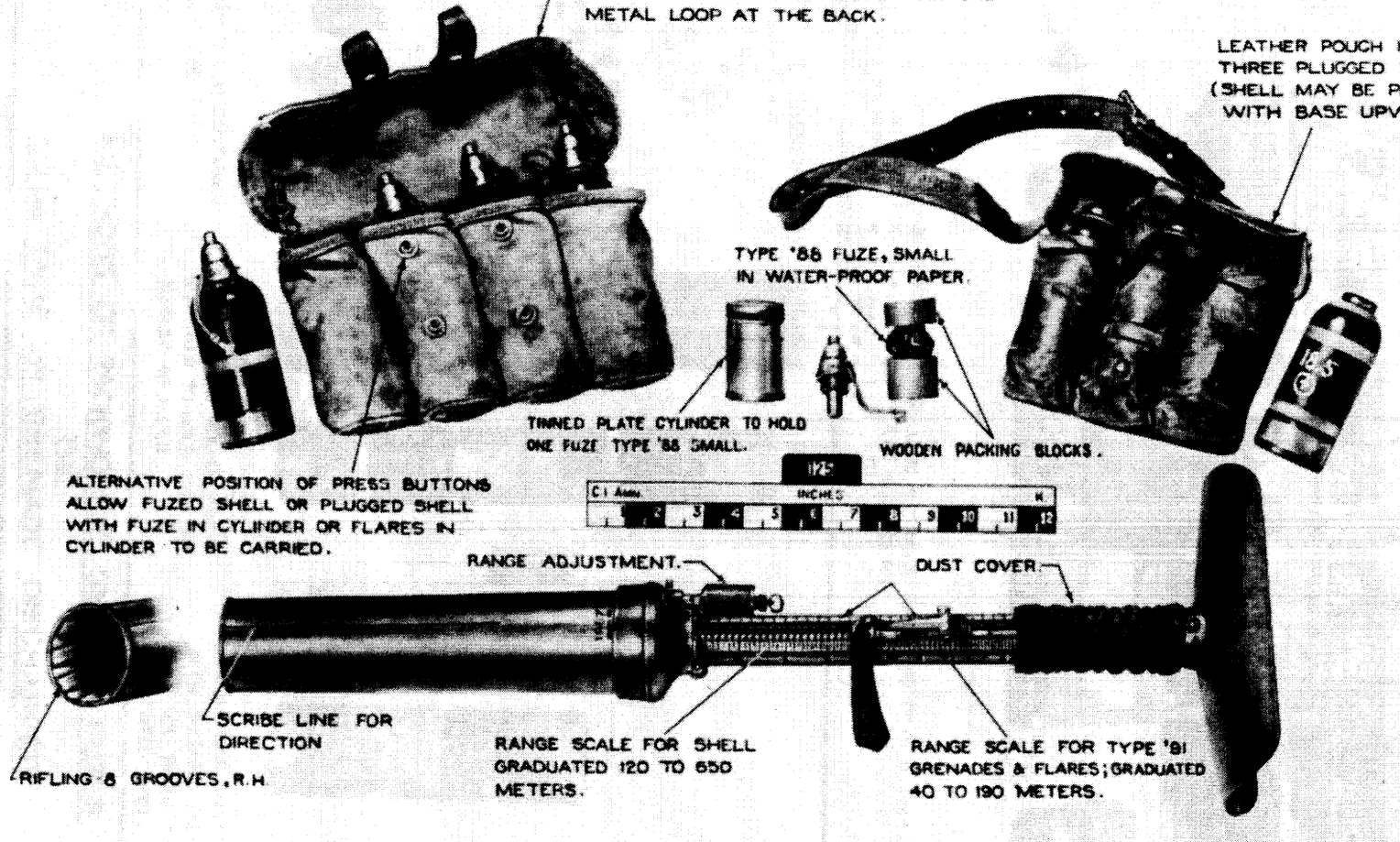
FOR

JAPANESE TYPE '89. 50 MM. H.E. SHELL WITH 20 MM. FUZE HOLE.

DIMENSIONS IN INCHES.

C.I. AMN. S/1188
KIRKEE JULY '45

RESTRICTED.



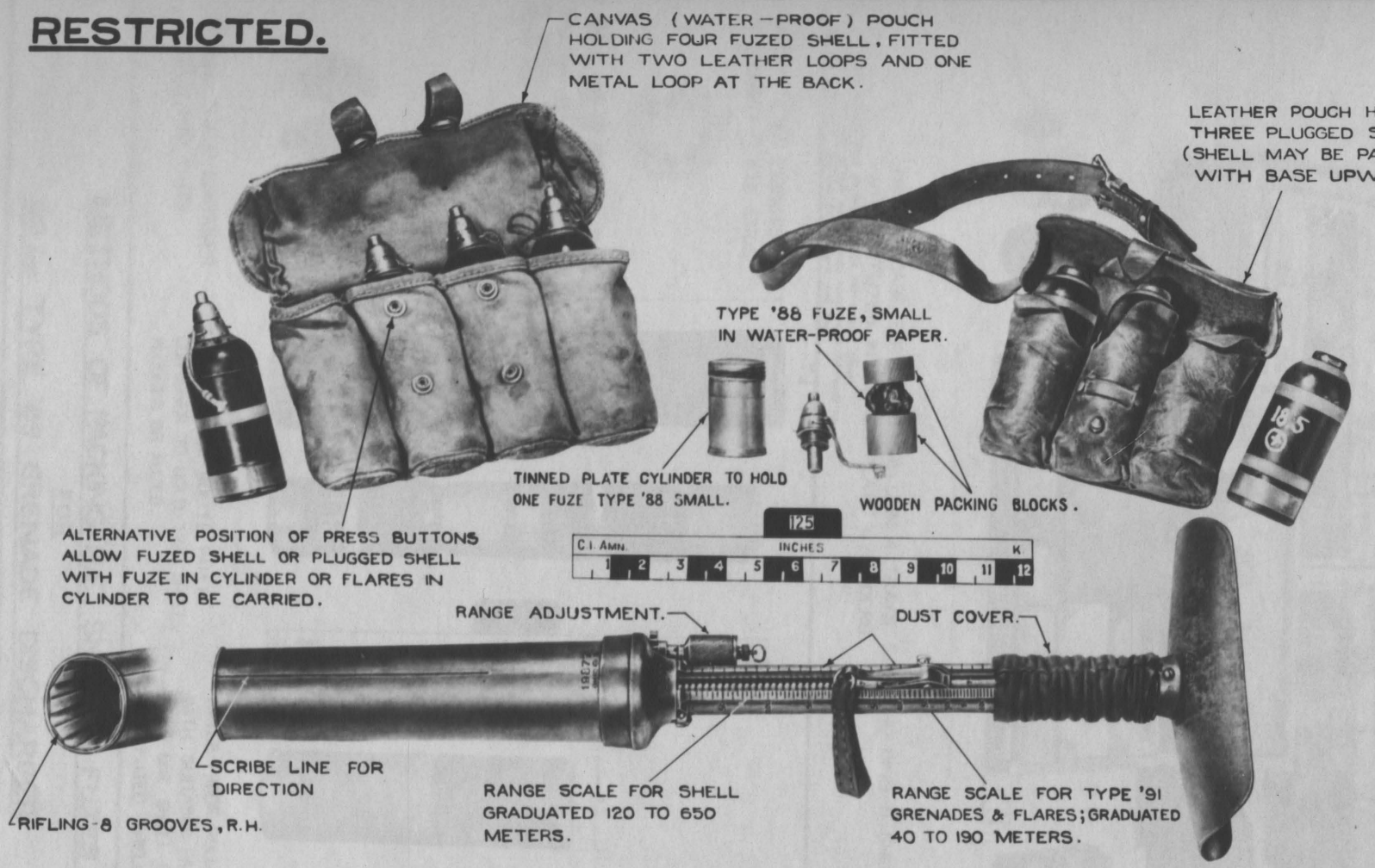
(i) TRANSPORT POUCHES
FOR
50 MM. TYPE '89 GRENADE DISCHARGER SHELL & FLARES ETC.

(ii) 50 MM. TYPE '89 GRENADE DISCHARGER.

PLATE C

C.I.Amn.S/1152
KIRKEE JUNE '45.

RESTRICTED.



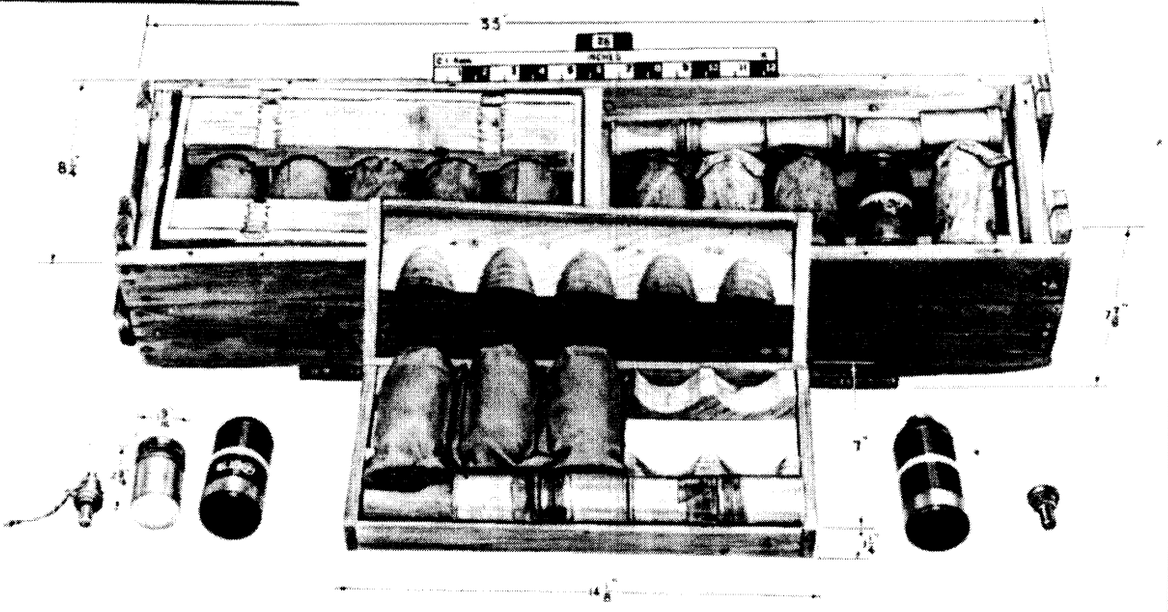
(i) TRANSPORT POUCHES
FOR
50 MM. TYPE '89 GRENADE DISCHARGER SHELL & FLARES ETC.

(ii) 50 MM. TYPE '89 GRENADE DISCHARGER.

C.I.AMN.S/1152
KIRKEE JUNE '45.

PLATE C

RESTRICTED.



PACKING CASE FOR 20 H.E. SHELL, IN 4 TRAYS EACH HOLDING 5 SHELL, WITH 5 FUZES IN TINNED PLATE CYLINDERS.

NOTE. JAPANESE CHARACTERS ON SIDE OF BOX ARE UPSIDE DOWN. PROBABLY THAT SIDE OF BOX WAS OPENED WHICH WAS INTENDED AS BOTTOM. BOTH TOP & BOTTOM OF BOX ARE THE SAME.

CHARACTERS EMBOSSED ON TINNED-PLATE ENDS

☆ 筒2 3彈描擲垂 九八

↓ PIECES TWO GRENADE HEAVY 9 8

TOKYO ARSENAL (SHELL) INSPECTION MARK

TINNED PLATE CONTAINER TO HOLD TWO FUZES

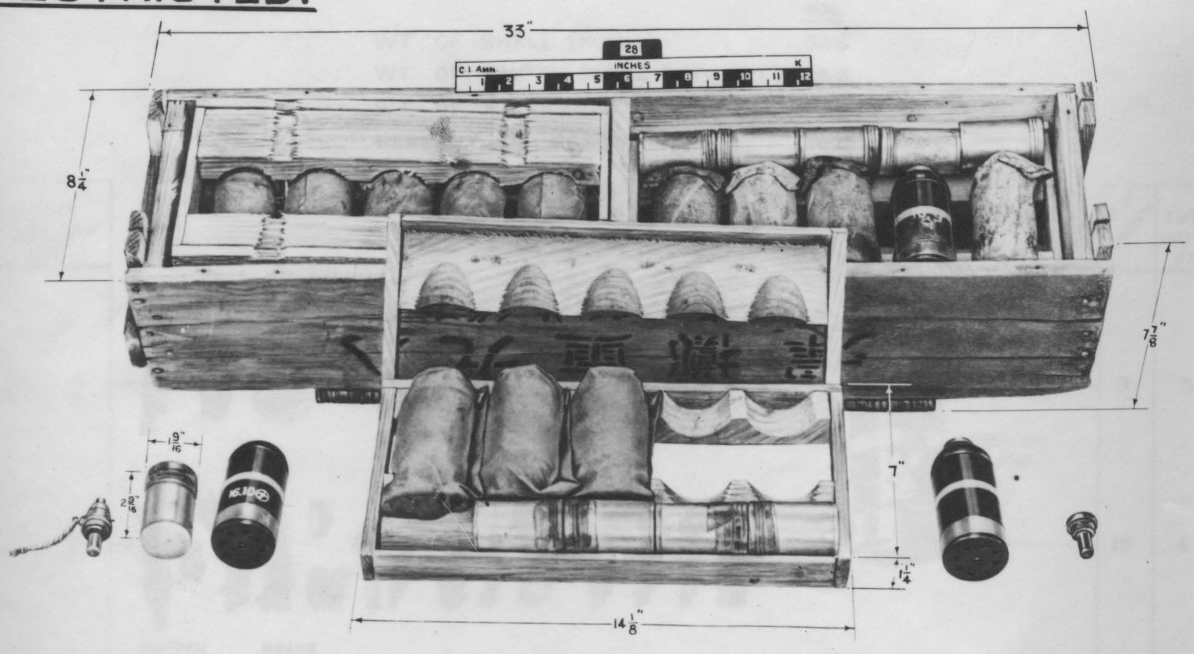
WATER PROOF ROLLED PAPER CONTAINER TO HOLD TWO SHELL, PLUGGED OR FUZED.

WATER-PROOF ROLLED PAPER CONTAINER WITH SUITABLE PACKING PIECES TO HOLD ONE SHELL PLUGGED WITH FUZE OR A FUZED SHELL.

METHODS OF PACKING H.E., SHELL & FUZES FOR 50 MM. TYPE '89 GRENADE DISCHARGER

C.I. AMN. 5/1153
KIRKEE JUNE '45

RESTRICTED.



PACKING CASE FOR 20 H.E. SHELL, IN 4 TRAYS EACH HOLDING 5 SHELL. WITH 5 FUZES IN TINNED PLATE CYLINDERS.

NOTE - JAPANESE CHARACTERS ON SIDE OF BOX ARE UPSIDE DOWN. PROBABLY THAT SIDE OF BOX WAS OPENED WHICH WAS INTENDED AS BOTTOM. BOTH TOP & BOTTOM OF BOX ARE THE SAME.

CHARACTERS EMBOSSED ON TINNED-PLATE ENDS

☆筒2弾擲撹重九八

PIECES TWO GRENADE HEAVY 9 8

TOKYO ARSENAL (SHELL) INSPECTION MARK

TINNED PLATE CONTAINER TO HOLD TWO FUZES.

WATER-PROOF ROLLED PAPER CONTAINER TO HOLD TWO SHELL, PLUGGED OR FUZED.

WATER-PROOF ROLLED PAPER CONTAINER WITH SUITABLE PACKING PIECES TO HOLD ONE SHELL PLUGGED WITH FUZE OR A FUZED SHELL.

METHODS OF PACKING H.E., SHELL & FUZES FOR 50 MM. TYPE '89 GRENADE DISCHARGER

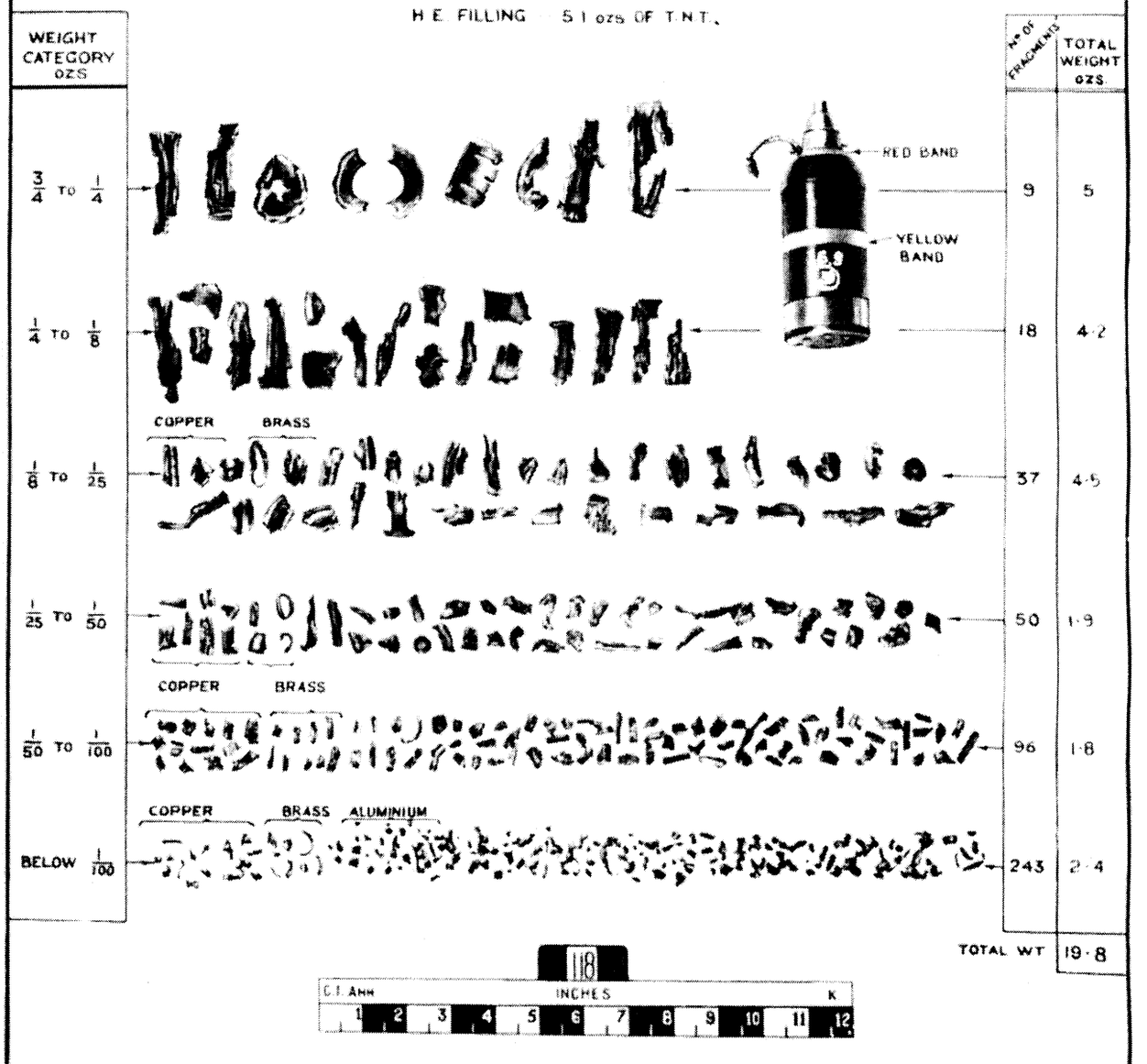
C.I.AMN.S/1153
KIRKEE JUNE 45.

PLATE E

RESTRICTED.

	OZS
WT OF SHELL (FUZED)	30·8
WT OF EMPTY SHELL (WITH FUZE)	25·8
WT OF RECOVERED FRAGMENTS	19·8
PERCENTAGE RECOVERY	76·75%

H.E. FILLING 5·1 ozs OF T.N.T.



STATIC FRAGMENTATION

— OF —

A JAPANESE 50 MM. SHELL H.E. TYPE '89 FOR TYPE '89 RIFLED (GRENADE) DISCHARGER.

MANUFACTURED 'OSAKA' JULY 1941 & FILLED AT OKAYAMA IN SEPT. 1941.

C.I.AMN.S/1124
KIRKEE JUNE '45

RESTRICTED

	OZS.
WT. OF SHELL (FUZED)	31·82
WT. OF EMPTY SHELL (WITH FUZE)	26·82
WT. OF RECOVERED FRAGMENTS	19·2
PERCENTAGE RECOVERY	71·6 %

H.E. FILLING :- 5·1ozs OF T.N.T.

STATIC FRAGMENTATION

— OF —

A JAPANESE 50 M.M. SHELL, H.E., TYPE '89 FOR TYPE '89 RIFLED (GRENADE) DISCHARGER.

MANUFACTURED TOKYO, AUGUST 1939 & FILLED AT NAGOYA IN MAY 1943.

C.I. AMN. S/1125
KIRKEE, JUNE 45.