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ENEMY WEAPONS

PART II.—ITALIAN AND GERMAN INFANTRY WEAPONS

1942

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THE WAR OFFICE,
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*Prepared under the direction of
The Chief of the Imperial General Staff*

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FOREWORD

It was originally intended to confine the present booklet to Italian Infantry Weapons, but since it is now possible to add considerably to the information already given in Part I (German Infantry Weapons) on the German Pistol 38 and Light Mortar 36, it has been decided to take this opportunity of issuing revised particulars of these two weapons.

ENEMY WEAPONS

PART II.—ITALIAN AND GERMAN INFANTRY WEAPONS

PART I.—ITALIAN PISTOLS

1. Introductory note

A revolver and two self-loading pistols are issued as standard weapons. Certain N.C.Os. and men, e.g. members of M.G. and gun detachments, are armed with the revolver, while officers and warrant officers carry one or other of the two self-loading pistols.

2. 10-35 mm. Revolver, Mod. 89--Bodeo. (See Fig. 1)

Pistola a rotazione Bodeo, Mod. 89

This is a double action, solid framed revolver of somewhat old-fashioned design. The cylinder does not "swing out" to assist loading and the empty cases can only be extracted and ejected one by one. A trigger guard is not usually fitted.

General particulars

Calibre : 10·35 mm. (.41 in.)

Weight : 2 lb.

Overall length : 9¼ in.

Cylinder capacity : 6 rounds.

Safety

"Bodeo" revolvers of recent manufacture are provided with a safety catch on the left. In addition, safety is provided for during loading and ejection by the action of the "loading gate" which, on being pulled back, disconnects the hammer and trigger mechanisms.

To load

Pull back "loading gate" and insert a cartridge in the chamber thereby exposed. Rotate the cylinder by pressing the trigger (the hammer mechanism is disconnected so long as the loading gate is open) and insert a cartridge in the next chamber. Continue loading in this manner until all chambers of the cylinder are full. Finally push loading gate forward again.

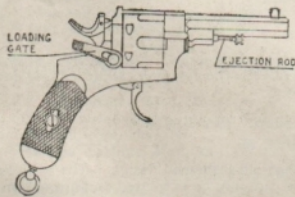


FIG. 1.—10·35 MM. REVOLVER 89

To cock and fire

The revolver can be cocked and fired either "single action," by first cocking the hammer with the thumb and then pulling the trigger, or "double action," by a strong pressure on the trigger which cocks the hammer and then releases it to fire the cartridge cap.

Extraction and ejection

Open the loading gate and pull the ejection-rod forward. Shift the ejection-rod over to the right by swinging its carrier across beneath the barrel and push out the empty cases one by one by pressing the ejection-rod and rotating the cylinder by means of the trigger.

Stripping

Remove:—1. Left side plate and pistol grip. 2. Cylinder axis. 3. Cylinder. 4. Main spring. 5. Pawl. 6. Trigger. 7. Hammer.

3. 9 mm. Self-loading Pistol, Mod. 910—Glisenti. (See Fig. 2)

Pistola automatica Glisenti, Mod. 910

The action of this S.L. Pistol, which resembles that employed in the 1914 and 1935 Fiat (Revelli M.Gs., is briefly as follows:—On firing, the barrel and bolt recoil together a short distance, temporarily interlocked by a wedge lever which is pivoted in the body. As this movement proceeds the wedge lever rotates back into the body, and at the correct moment leaves the bolt free to be forced to the rear by the thrust of the spent case. The action of the wedge lever is not a positive locking action, but what is sometimes called a "semi-locking" action.

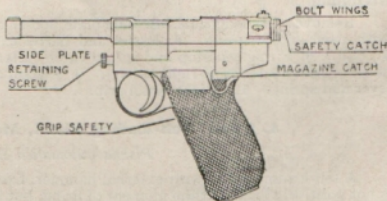


FIG. 2.—9 MM. S.L. PISTOL 910

General particulars

Calibre: 9 mm. (.35 in.).

Weight: 1 lb. 12 oz.

Overall length: 8½ in.

Feed: 7 round magazine in butt.

Safety

A safety catch at the back end of the bolt, when in the "safe" position, prevents movement of the firing pin, and a "grip safety" (which co-operates with the trigger) is provided in front of the butt below the trigger guard.

Preparation for firing

Insert a full magazine. Set safety catch to "fire." Grip the bolt wings. Pull bolt back to its full extent and then allow it to go smartly forward again to transfer a round from the magazine to the chamber.

To fire

Press trigger, squeezing "grip safety" at the same time.

Stripping

Remove:—1. Magazine. 2. Side plate (loosen retaining screw). 3. Left pistol grip. 4. Trigger with pawl and V-spring. 5. Barrel and barrel extension. 6. Firing pin housing and firing pin. 7. Bolt. 8. Firing pin stop and safety catch (after pulling back firing pin stop into oval slot and shifting safety catch from right to left). 9. Ejector and ejector lever. 10. Safety catch. 11. Wedge lever and spring. 12. Right pistol grip.

4. 9 mm. Self-loading Pistol, Mod. 34—Beretta. (See Fig. 3)

Pistola automatica Beretta, Mod. 34

A self-loading pistol with external hammer, fixed barrel and recoiling breech slide. The breech is not positively locked at the moment of firing, but is kept closed merely by the inertia of the breech slide assisted by spring pressure.

The ammunition for this pistol is the short 9 mm. type which is interchangeable with the .380-in. auto. ammunition used in the American .380-in. Colt automatic pistol.

General particulars

Calibre: 9 mm. (.35 in.)

Weight: 1 lb. 7½ oz.

Overall length: 6 in.

Feed: Removable 7 round magazine in butt.

Safety

Shift safety catch back (exposing letter "S") for "safe" and forward (exposing letter "F" and red spot) for "fire."

There is no "grip safety," but the hammer can be set at half cock.

Preparation for firing

Insert full magazine. Set to "fire." Cock hammer. Pull back breech slide and then allow it to go smartly forward.

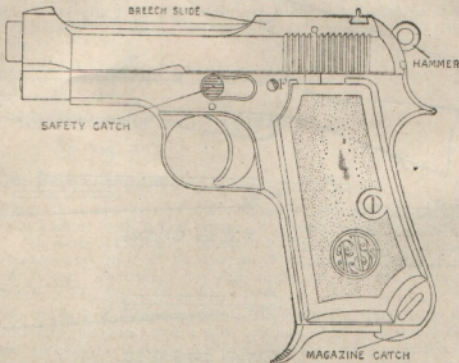
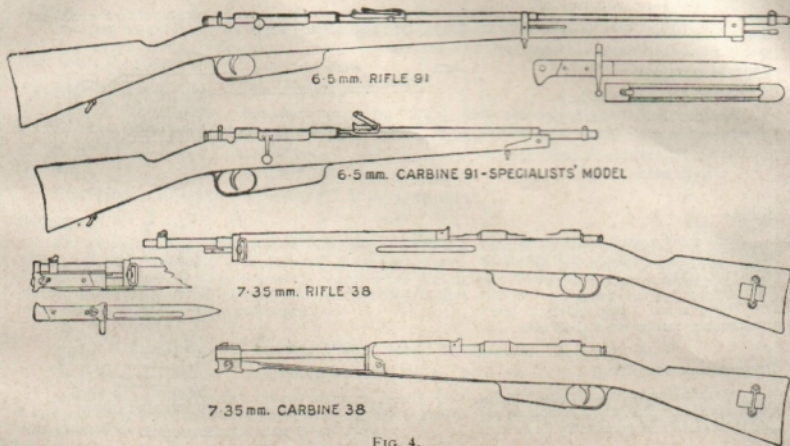


FIG. 3.—9 MM. S.L. PISTOL 34



Stripping

Unload. Cock hammer. Set to safe. Pull breech slide back until safety catch snaps into recess on left. Push barrel backward (if necessary tap muzzle lightly on a wooden surface to free it) and remove through ejection opening. Grip milled surfaces of breech slide and disengage safety catch from recess. Let breech slide go forward. Remove breech slide, return spring and return spring rod. Pull out safety catch to left.

PART II.—ITALIAN RIFLES AND CARBINES

(See Fig. 4)

5. Introductory note

The basic Mannlicher-Carcano design, which is embodied in all Italian service rifles and carbines combines the Mannlicher system of clip loading with a bolt action of Mauser type developed by M. Carcano of the Turin S.A. factory. With the Mannlicher system of loading, each clip is inserted in the magazine together with the cartridges and after all the cartridges have been forced up out of it by a spring-loaded lever known as the "elevator," the clip drops out through a hole in the bottom.

Shortly before the present war the Italians decided to increase the calibre of their rifles and L.M.Gs. from 6.5 mm. (.256-in.) to 7.35 mm. (.289-in.) and a new rifle and carbine of this calibre were actually introduced (see Secs. 9 and 10 below). It seems, however, that the change-over has not yet progressed very far and it may even have been postponed, since rifles of the new 1938 pattern have been found to be fitted with a 6.5 mm. barrel.

6. 6.5 mm. Rifle, Mod. 91*Fucile, Mod. 91***General particulars**

Calibre: 6.5 mm. (.256 in.).

Weight (without bayonet): 8½ lb.

Length (without bayonet): 51 in.

Rifling: 4 grooves R.H., increasing twist.

Sights: "V" notch and barleycorn, sighted 600-2,000 metres.

Feed: Vertical box magazine holding one 6-round clip.

Safety

For "safe," first disengage safety catch (finger lever on plug at back of bolt) by pushing it forward and to the left; and then raise it and draw it back. The mainspring is now no longer under compression. For "fire," push catch forward and down to the right until stud on bolt plug engages in recess in bolt. The mainspring is now compressed.

Preparation for firing

Set to "fire." Open breech. Insert clip of 6 rounds in magazine. Close breech.

Removal and stripping of bolt

Draw bolt back and remove, while pressing trigger. Move safety catch toward "safe," and slightly before end of this movement, shift it over to left. Unscrew striker nut, withdraw cocking-piece, bolt plug, striker and mainspring.

Re-assembling and replacing bolt

Proceed in reverse order, taking care that line marked on striker is opposite that on bolt plug, and that flat portion on striker fits against corresponding part in cocking piece.

7. 6.5 mm. Carbine, Mod. 91*Moschetto, Mod. 91*

Similar to rifle Mod. 91, but has a shorter barrel, a bent-down bolt lever and a folding bayonet. It is sighted from 600-1,500 metres, weighs 7 lb. (approx.) and is about 36 in. long with the bayonet folded.

8. 6.5 mm. Carbine, Mod. 91 per T.S.*Moschetto, Mod. 91 per T.S.*

Similar to carbine Mod. 91, but has a separate bayonet like the rifle Mod. 91. "Per T.S." (*truppe speciali*) means "for special troops," e.g., gunners and specialists.

9. 7.35 mm. Rifle, Mod. 38*Fucile, Mod. 38*

This rifle is based on the rifle Mod. 91, the main differences being the increased calibre and reductions in weight and length. It has a light folding bayonet which is normally attached to the barrel, but can be removed and used as a dagger.

As regards model 38 rifles fitted with a 6.5 mm. barrel—*see* Sec. 5 above.

General particulars

Calibre: 7.35 mm. (.289 in.).

Weight (without bayonet): 7½ lb.

Length (without bayonet): 40 in.

Rifling: 4 grooves R.H. constant twist.

Sights: "Battle sight" fixed for 300 m. only.

10. 7.35 mm. Carbine, Mod. 38*Moschetto, Mod. 38*

Compares with carbine 91 in much the same way as rifle 38 compares with rifle 91.

PART III.—ITALIAN MACHINE CARBINES

11. Introductory note

Machine carbines, i.e. light automatic weapons firing pistol ammunition of which a typical example is the American Thompson, have not so far been extensively used by the Italians. Nevertheless they possess, in the Model 38 Beretta machine carbine, a weapon of this kind which is considered to be above the average, both as regards functioning and convenience in handling.

12. 9 mm. Machine Carbine, Mod. 38—Beretta. (See Fig. 5)

Moschetto Autom. Beretta, Mod. 38

This weapon operates on the inertia or "blow-back" system and incorporates no means for locking, or delaying the opening of the breech. It will fire 9 mm. Parabellum type ammunition of British, German or Italian manufacture, i.e. ammunition of the same types as can be fired by the British 9 mm. "Sten" machine carbine.

In recent examples of this weapon, provision is made for mounting a detachable folding bayonet similar to that used with the model 38 rifle.

General particulars

Calibre : 9 mm. (.35 in.)

Weight (without magazine) : 9 lb. 1 oz.

Overall length : 37½ in.

Ammunition : 9 mm. Parabellum.

Maximum rate of fire : 570 r.p.m.

Sights : Radial leaf "V" backsight, graduated from 100 to 500 m. Barleycorn foresight.

Feed : Box magazine fitted underneath body : there are three different sizes of magazine holding 10, 20 and 40 rounds respectively.

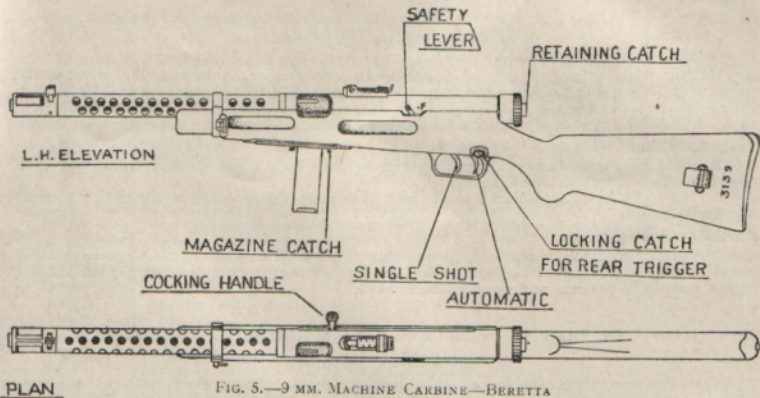


FIG. 5.—9 MM. MACHINE CARBINE—BERETTA

Safety

Lever on left of body locks trigger mechanism and breech block in closed or open position. Shift lever, forward to "S" for "safe" and back to "F" for "fire."

Provision for single shots and automatic fire

Has two triggers, front trigger for single shots and rear trigger for automatic. The automatic trigger is provided with a catch in the form of a plunger which, when applied by pressing it from left to right, locks this trigger and thus prevents inadvertent automatic fire. If the catch is shifted to the left, either single shot or automatic fire are obtainable at will by pressing the appropriate trigger.

Preparation for firing

Insert filled magazine into magazine opening beneath body. Set safety lever to "fire" and adjust automatic trigger catch as required.

Cock, by pulling cocking handle to the rear. Machine carbine can now be fired by pressing appropriate trigger.

Partial stripping

Press retaining catch on rear of body and turn milled head on end cap anti-clockwise until it stops. Withdraw end cap and pull out return spring contained in tubular housing. Pull cocking handle smartly to the rear and remove breech block.

PART IV.—ITALIAN LIGHT MACHINE GUNS**13. Introductory note**

Three different models of the same L.M.G. are in service, the calibre of the two older models being 6.5 mm. (.256-in.), while that of the new model is 7.35 mm. (.289-in.), so that it can fire the same ammunition as the model 38 rifle.

14. 6.5 mm. L.M.G., Mod. 30—Breda. (See Figs. 6 to 9)

Fucile Mitragliatore Breda, Mod. 30

The barrel and breech block of this L.M.G. are locked together by a locking nut on the rear end of the barrel, this locking nut being formed with interrupted screw-threads which engage with corresponding screw-threads on the front end of the breech block. On firing, the barrel and breech block recoil together until the locking nut is rotated by a cam way in the body. The breech block is then free to move to the rear.

The rearward movement of the breech block is brought about by the thrust of the empty cartridge case. To insure clean extraction of the case from the chamber and to increase the thrust acting on the breech block, both case and chamber are automatically lubricated from an oil reservoir at the top of the body.

An unusual feature of this L.M.G. is its permanent box magazine, which is hinged to the body and can be swung forward into the position shown in Fig. 7 for loading from a charger (Fig. 8). A folding butt rest is sometimes fitted underneath the butt.

General particulars

Calibre: 6.5 mm. (.256-in.)

Weight (with magazine and bipod): 25½-lb.

Overall length: 48½ in.

Maximum (cyclic) rate of fire: 450—500 r.p.m.

Practical rate of fire: 150 r.p.m.

Feed: Permanent box magazine, charger-loaded and holds 20 rounds.

Sights: i. Open "V" leaf backsight graduated 300 to 1,500 metres. Barleycorn foresight;

ii. Fixed battlesight for 300 metres.

Provision for single shots fire: None.

Mounting: Bipod.

Safety

Lower safety catch (on right of sear housing) to " S " for " safe " and raise it to " F " for " fire."

Preparation for firing

Set safety catch to " F." Press magazine catch, releasing magazine which will swing forward until retained parallel with gun. Insert a filled charger (Fig. 8) into magazine. When magazine platform is fully depressed and cartridge catch has engaged last round, withdraw charger, leaving magazine fully charged. Disengage loading position catch by shifting lever on top of magazine to the left. Rotate magazine into feed opening until engaged by magazine catch. During this

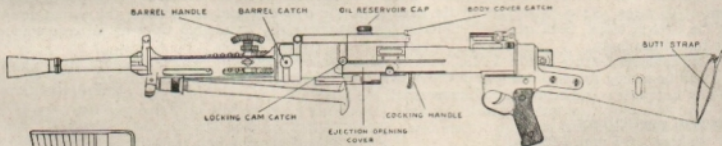


FIG. 6.



FIG. 8.

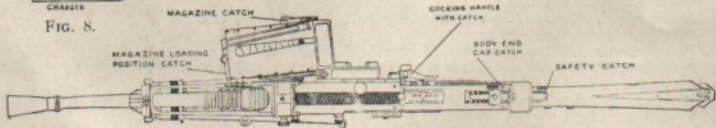
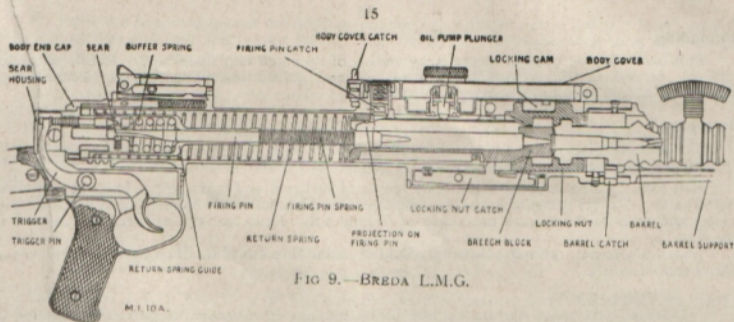


FIG. 7.



movement cartridge catch will automatically be disengaged, so that magazine spring can expand to feed up first round.

Pull back and release cocking handle.

Cessation of fire

On ceasing fire with a hot barrel, pull back cocking handle, secure it by means of its catch and make safe. The reason for doing this is that the gun stops with the breech closed on a live round and, if the breech is not promptly opened again, the round in the chamber may "cook off," i.e. be fired by transfer of heat from the barrel.

Unloading

Pull back cocking handle, secure it by means of its catch and make safe. Rotate magazine forward, depress cartridge catch below magazine and unload remaining rounds. Remove four rounds left in feed opening of magazine mouthpiece.

Stripping

i. Barrel changing

After about 150 rounds, change barrel as follows:—

Pull back cocking handle, secure it by means of its catch and make safe. Pull out and lower barrel catch. Rotate barrel to the left by means of carrying handle until handle almost touches barrel casing and push barrel forward until clear of locking nut. Raise rear end of barrel and remove to the rear.

Insert new barrel, reversing above procedure. Make sure barrel catch engages properly so new barrel cannot rotate.

ii. Stripping sequence

(a) Unload and make certain no live round remains in chamber, magazine mouthpiece or magazine.

(b) Squeeze and push forward body end cap catch. Rotate butt 60 degs. and remove butt, return spring, return spring guide and buff r spring.

(c) Pull back cocking handle and remove breech block, firing pin and firing pin spring (if not already out). Pull cocking handle fully back and then outwards and remove it.

(d) Shift body cover catch to A. Remove body cover hinge pin and body cover.

(e) Swing out magazine until at 45 degs. to gun. Depress magazine hinge catch (in front of magazine) and pull magazine outwards to remove it.

(f) Raise and remove magazine mouthpiece retainer (located right rear of body). Insert finger in breech block way and push out ejector holder. Shift magazine mouthpiece back until its teeth are opposite gaps in body and remove it.

(g) Remove barrel as described above under "Barrel changing."

(h) Further stripping will not normally be required, though it is possible to remove the locking nut and locking cam as follows:—

Raise locking cam catch horizontally front or rear and remove it. Depress locking nut catch and rotate locking nut clockwise. Pull back and remove locking cam (some difficulty may be experienced in doing this without the use of suitable tools). Insert finger in locking nut and lift it out.

To reassemble the gun, proceed in the reverse order.

15. 6.5 mm. (.256 in.) L.M.G., Mod. C—Breda

Fucile Mitragliatore Breda, Mod. C.

The 6.5 mm. L.M.G. Mod. C (or 5 C) is basically the same weapon as the Model 30. The Model C, however, has a rear crosspiece with traversing handles instead of a butt and pistol grip. It is also provided with a tripod mounting instead of a bipod and weighs about 4 lb. more than the Model 30.

16. 7.35 mm. (.289 in.) L.M.G., Mod. 38—Breda

Fucile Mitragliatore Breda, Mod. 38

This L.M.G. is similar to the Model 30 in all respects except calibre. As already stated, it fires the same ammunition as the Model 38 rifle.

PART V.—ITALIAN MEDIUM MACHINE GUNS

17. Introductory note

Medium machine guns of various different types and calibres are in service in the Italian Army. The commonest of these at present is the 8 mm. (.315 in.) model 35 Fiat, which is, in effect, a modernised version of the last war 6.5 mm. (.256 in.) model 14 Fiat. The model 14 Fiat is now obsolescent, though it is still used for training.

The 8 mm. Breda model 37, which fires the same ammunition as the Fiat model 35, is not yet very widely used, but is probably intended to replace the Fiat in due course.

Certain units are equipped with the 8 mm. Austrian Schwarzlose (Sec. 34), although the rimmed case ammunition of this M.G. will not fit Italian made M.Gs.

The 7.7 mm. (.303 in.) Breda-Safat aircraft M.G. is of interest because it will fire British .303 in. Mark VII ammunition, and can easily be adapted for land service, e.g. on an A.A. mounting.

18. 6.5 mm. Medium M.G., Mod. 14—Fiat (Revelli). (Fig. 10)

Mitragliatrice Fiat, Mod. 14

A water-cooled machine gun with box magazine feed. The magazine is in the form of a rectangular box divided into ten compartments, each of which holds five rounds.

General particulars

Calibre : 6.5 mm. (.256 in.).

Weight of gun (without water) : 37½ lb.

Weight of mounting : 50 lb. (approx.).

Length overall : 46½ in.

Maximum (cyclic) rate of fire : 500 rounds per minute.

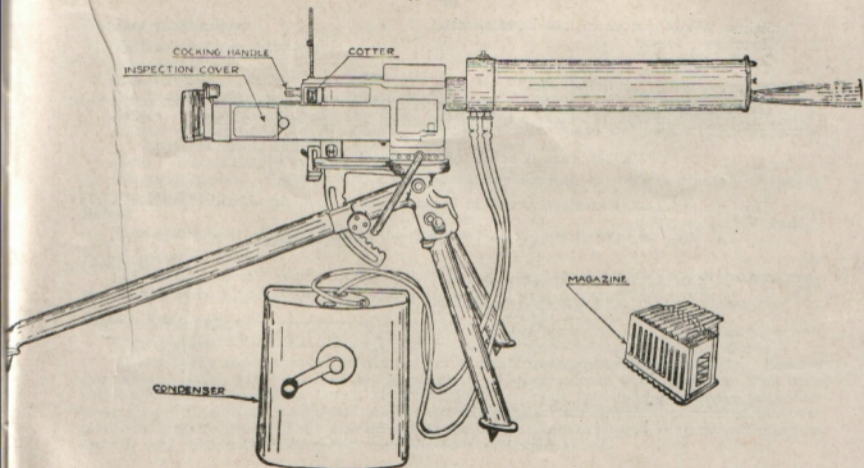


FIG. 10.—6.5 MM. M.M.G. MOD. 14—FIAT (REVELLI)

Sights : V and barleycorn, 200-2,000 metres.
 Mounting : Tripod.
 Cooling : Water.

Safety, preparation for firing, etc.

The procedure is similar to that given below at Sec. 20 for the model 35 Fiat, with certain minor differences resulting from the employment of magazine feed and water cooling.

19. 7.7 mm. Aircraft M.G.—Breda-Safat. (Fig. 11)

Mitragliatrice Breda-Safat, Cal. 7.7

This gun, which is extensively used in Italian aircraft, will fire British standard .303 in. Mark VI] ammunition.

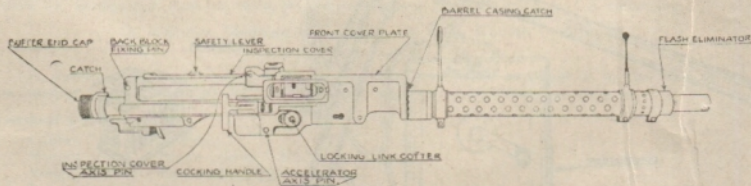


FIG. 11.—7.7 MM. AIRCRAFT M.G.—BREDASAFAT.

General particulars

Calibre : 7.7 mm. (.303 in.)

Weight : 27 lb.

Length overall : 44 in.

Maximum (cyclic) rate of fire (firing British Mark VII ammunition) : 800 rounds per minute.

Sights : Foresight : $\frac{3}{16}$ in. ball on pillar. Backsight : $1\frac{1}{16}$ in. ring with cross-wires on pillar.

System of operation : Recoil, assisted by muzzle blast. Barrel and breech block are locked together during first $\frac{3}{16}$ in. recoil.

Feed : Disintegrating metallic link belt.

Direction of feed : Right to left in gun illustrated, but feed in opposite direction is equally common.

Safety

Shift safety lever on feed cover to the right for "safe" and forward for "fire".

Preparation for firing

Set safety lever to "fire". Insert belt in feed opening. Draw cocking handle twice to the rear, and then let it go forward again to transfer a round from magazine to chamber.

Partial stripping*i. Body group*

Rotate buffer end cap about 45 degrees left or right, keeping its catch disengaged. Remove end cap and buffer. Pull out back block fixing pin and remove back block upwards. Pull back cocking handle and withdraw breech block and feed cam plate from body. Remove inspection cover after withdrawing its axis pin. Slide front cover plate backward until projections on cover plate are opposite gaps in body and lift out cover plate. Shift feed pawl slide towards ejection opening and, depressing feed pawl, remove feed pawl slide.

ii. Barrel group

Press in barrel casing catch in front end of body. Unscrew barrel casing clockwise and remove. The barrel can only be removed after dismantling the locking and accelerator mechanism. This necessitates the removal of the locking link cotter and the accelerator axis pin, and it is not, therefore, an easy or rapid proceeding.

To reassemble the gun, reverse the procedure for stripping.

20. 8 mm. Medium M.G., Mod. 35—Fiat (Revelli). (Fig. 12)

Mitragliatrice Fiat, Mod. 35

This M.G. is a modification of the model 14 M.G., an 8 mm. air-cooled barrel and belt feed being substituted for the 6.5 mm. water-cooled barrel and multiple box magazine of the older model. Some, though not all, model 35 M.Gs. are actually converted model 14's.

The barrel and breech block are temporarily interlocked by a spring-loaded locking wedge, which is pivoted in the body. On firing, the barrel and breech block recoil together, rotating the locking wedge until it frees the breech block. The breech block is then forced to the rear by the thrust of the spent case.

There is no automatic lubrication of cartridge or chamber.

General particulars

Calibre : 8 mm. (.315 in.).

Weight of gun : 39 lb. 12 oz.

Weight of mounting : 50 lb. (approx.)

Length overall : 49½ in.

Maximum (cyclic) rate of fire : 600 rounds per minute.

Sights : Open "V" leaf backsight graduated 200-2,400 metres ; barleycorn foresight.

Mounting : Tripod.

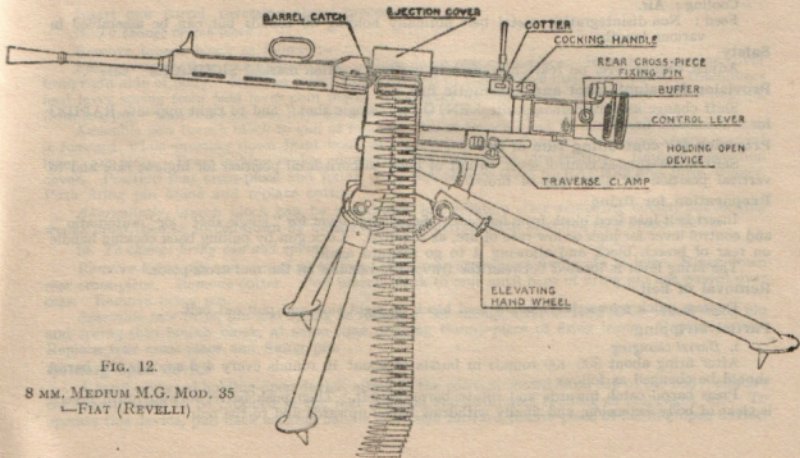


FIG. 12.

8 MM. MEDIUM M.G. MOD. 35
 —FIAT (REVELLI)

Cooling : Air.

Feed : Non-disintegrating metal belt normally holding 50 rounds but can be assembled in various lengths.

Safety

Adjust change lever on rear cross-piece to vertical position marked SICURA for " safe ".

Provision for single shot and automatic fire

Shift change lever to left opposite LENTO for " single shot " and to right opposite RAPIDO for " automatic fire ".

Provision for controlling rate of fire

Shift arrow-shaped control lever on left of body to horizontal position for highest rate and to vertical position for slow rate of fire.

Preparation for firing

Insert belt into feed block from left side. Set change lever for " single shot " or " automatic ", and control lever for high or low rate of fire, as required. Cock gun by pulling back cocking handle on rear of breech block and allowing it to go forward again.

The firing lever is located between the traversing handles on the rear cross-piece.

Removal of belt

Depress quick release lever below feed block on right side and pull out belt.

Partial stripping

i. Barrel changing

After firing about 300-400 rounds in bursts of about 10 rounds every 4-5 seconds the barrel should be changed as follows :—

Press barrel catch inwards and rotate barrel to left. Then push barrel forward until breech is clear of body extension, and finally withdraw barrel upwards and to the rear.

Insert new barrel, reversing above procedure.

ii. *To change breech block*

Remove breech block as follows :—

Pull rear cross-piece fixing pin to left. Hinge down rear cross-piece. Remove inspection cover from right side of body. Remove cotter from rear end of body above inspection plate. Disconnect feed lever spring from feed lever cam plate. Disengage locking wedge connecting rod and spring from seating. Breech block can now be removed by pulling back cocking handle.

Assemble new breech block to gun as follows : Insert breech block in barrel extension and push it forward, while pressing down front hook of connecting rod. Connect feed lever spring to feed lever cam plate. Press locking wedge connecting rod and spring into seating. Replace inspection cover. Position rear cross-piece and fixing pin. Set change lever to RAPIDO and press trigger. Push firing pin home and replace cotter.

Alternatively, breech block can be withdrawn immediately after removing cotter, but locking wedge must then be forced down by means of a screwdriver when inserting new breech block.

iii. *To change firing pin and spring*

Remove firing pin and spring as follows : Pull rear cross-piece fixing pin to left. Hinge down rear cross-piece. Remove cotter. Pull breech block to rear until bent of firing pin has passed over sear. Remove firing pin.

Assemble new firing pin and spring as follows : Set change lever to RAPIDO. Push firing pin and spring into breech block, at same time pressing thumb-piece of firing lever. Replace cotter. Replace rear cross-piece and fixing pin.

Holding-open device

A hand-operated holding-open device, either in the position shown or on top of the body, enables the breech block to be retained in the rear position and facilitates clearing of stoppages, etc. To operate this device, pull back cocking handle and push forward thumb-piece of holding-open device.

Cleaning and oiling

It is essential that the chamber and cartridges should be clean and well lubricated. The same applies to a lesser extent to the mechanism of the gun.

The oil should be freely applied and larger supplies of oil are necessary than with most other medium M.Gs.

Laying

The gun can be laid "direct" by means of the open sights, or "indirect" using the elevation and traversing scales on the tripod mounting.

The traversing scale is graduated from 600-1,000 mils (34-56 degrees), the central position being the 800 mil graduation (45 degrees) and the elevation scale from 621 mils (35 degrees) depression to 444 mils (25 degrees) elevation. For particulars of the *mil* system of angular measurement, see Sec. 42.

Range table

A range table is attached at Appendix A.

21. 8 mm. Medium M.G., Mod. 37—Breda. (Fig. 13)

Mitragliatrice Breda, Mod. 37

This M.G. has a fixed barrel and is gas operated.

The breech is positively locked at the moment of firing, the breech block being forced up (without tilting) by the action of inclined surfaces on the piston extension, so that a projection on its upper surface engages in an opening in the top of the body.

The cartridges are fed from plate chargers holding 20 rounds, each round being housed in a separate compartment. After firing, the empty cases, instead of being ejected, are replaced in the compartments of the plate charger.

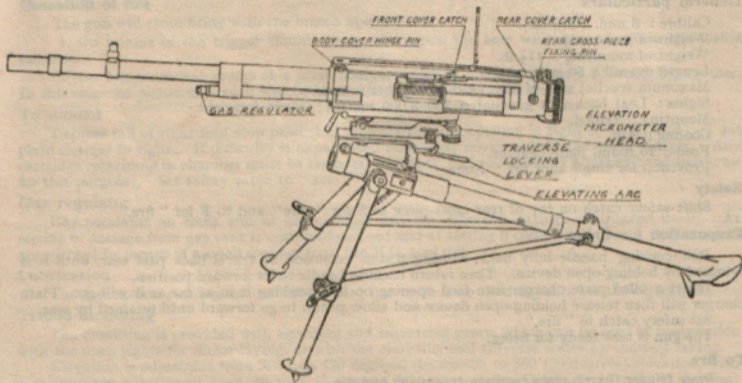


FIG. 13.—8 MM. M.M.G. MOD. 37—BREDA

General particulars

Calibre : 8 mm. (.315 in.).

Weight of gun : 42½ lb.

Weight of mounting : 41½ lb.

Length overall : 50 in.

Maximum (cyclic) rate of fire : 450 rounds per minute.

Sights : Leaf backsight graduated 300-3,000 metres ; blade foresight.

Mounting : Tripod.

Cooling : Air.

Feed : 20 round plate charger.

Provision for single shot fire : None.

Safety

Shift safety catch on top of rear cross-piece to S for "safe" and to F for "fire."

Preparation for firing

Pull cocking handle fully back, causing piston extension to travel back past sear, until it is retained by holding-open device. Then return cocking handle to its forward position.

Insert a filled plate charger into feed opening on left, pushing it in as far as it will go. Plate charger will then release holding-open device and allow piston to go forward until retained by sear.

Set safety catch to "fire."

The gun is now ready for firing.

To fire

Press trigger thumb-piece between traversing handles.

Successive plate chargers can now be fired off without a break by maintaining pressure on the trigger thumb-piece and inserting fresh filled chargers, one immediately behind the other.

Cessation of fire

The gun will cease firing with the breech open :—

i. On release of the trigger thumb-piece, whereupon the sear will rise and retain the piston extension.

ii. On firing the last round of a plate charger which is not immediately followed by another. In this case the piston extension will be retained by the holding-open device.

To unload

Depress tail of right feed stop pawl (tail projects through opening in right of body) and pull out plate charger to right. If difficulty is experienced raise body cover and lift out plate charger. Any cartridge remaining in chamber must be removed (the M.G. tool roll contains a forked hand extractor for this purpose). Set safety catch to "safe."

Gas regulator

Gas regulator on front end of gas cylinder has ten different settings (numbered 0—9). At setting 0, passage from gas vent is completely closed and at setting 9 completely open. Adjustments are effected by means of a small spanner from the M.G. tool roll.

Lubrication

The mechanism requires normal lubrication, but there is no need to lubricate the cartridges.

Tripod mounting

The mounting is provided with elevating and traversing gears, which can be used in conjunction with the open sights for direct laying, or with the elevating and traverse scales for indirect laying.

Elevation is adjustable from 360 mils (20 degrees) depression to 360 (20 degrees) elevation, with a micrometer adjustment from 48 mils (2 degrees 30 minutes) depression to 36 mils (2 degrees) elevation. For particulars of the *mil* system of angular measurement, see Sec. 42.

The main traverse scale is graduated from 450 mils (25 degrees) to 1,150 mils (65 degrees) in

10 mil steps, the central position being at 800 mils (45 degrees). An additional 150 mils (8 degrees 30 minutes) traverse is provided by an independent micrometer adjustment.

Partial stripping

i. Barrel changing

The barrel is sufficiently heavy to enable it to fire a large number of rounds in quick succession without overheating. The barrel must, however, be changed from time to time, as follows:—

Unload. Pull cocking handle fully back. Rotate body cover hinge pin, thereby disengaging barrel catch. Place barrel key from M.G. tool roll over gas block, rotate barrel 60 degrees and remove. Fit new barrel, reversing above procedure.

ii. To change breech block

Disengage body cover catches by shifting lever of front cover catch from C to A and pushing forward rear cover catch. Raise body cover and fold it forward. Pull out rear cross-piece fixing pin and remove rear cross-piece, easing compression of return spring. Remove return spring. Pull cocking handle smartly to rear and remove piston and breech block. Remove breech block from piston extension.

Fit new breech block, reversing above procedure. Note, however, that holding-open device must be kept depressed to permit replacement of piston and breech block.

Range table

A range table is attached at Appendix A.

22. 8 mm. Medium M.G., Mod. 38—Breda. (Fig. 14)

Mitragliatrice Breda, Mod. 38

This is a tank pattern M.G. and is fitted as standard in the following Italian tanks:—

The 6½ ton L 6/40, the 11 ton M 11/39, and the 13 ton M 13/40.

It is included briefly here because the Italians have also adapted it for use as an infantry M.G.

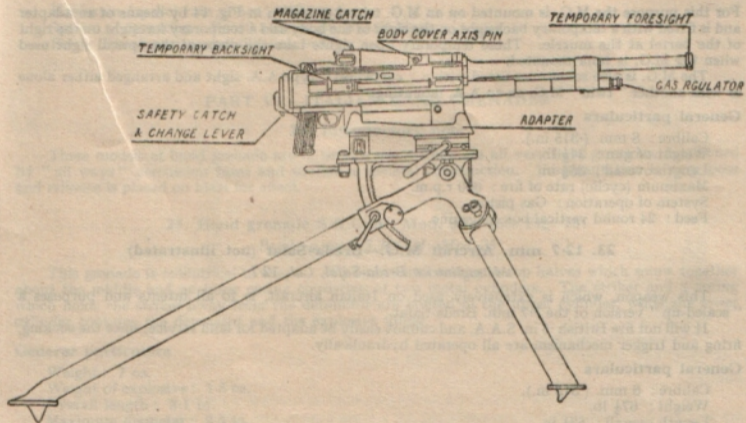


FIG. 14.—3 MM. M.M.G. MOD 38—BREDA

For this purpose the M.G. is mounted on an M.G. tripod as shown in Fig. 14 by means of an adapter and is fitted with a temporary backsight on the right of the body and a temporary foresight on the right of the barrel at the muzzle. These temporary open sights take the place of the optical sight used when the M.G. is tank mounted.

The M.G. is also sometimes fitted with a "cartwheel" type A.A. sight and arranged either alone or with another "twin" M.G. on an A.A. mounting.

General particulars

Calibre : 8 mm. (.315 in.).
 Weight of gun : 34½ lb.
 Length overall : 35½ in.
 Maximum (cyclic) rate of fire : 600 r.p.m.
 System of operation : Gas piston.
 Feed : 24 round vertical box magazine.

23. 12·7 mm. Aircraft M.G.—Breda-Safat (not illustrated)

Mitragliatrice Breda-Safat, Cal. 12·7

This weapon, which is extensively used on Italian aircraft, is to all intents and purposes a "scaled-up" version of the 7·7 mm. Breda-Safat.

It will not fire British .5 in. S.A.A. and cannot easily be adapted for land service, since the cocking, firing and trigger mechanism are all operated hydraulically.

General particulars

Calibre : 8 mm. (.315 in.).
 Weight : 67½ lb.
 Length overall : 53½ in.

Maximum (cyclic) rate of fire : 650 r.p.m.

System of operation : Recoil assisted by muzzle blast.

Feed : Disintegrating metallic link belt.

PART VI.—ITALIAN HAND GRENADES

24. Introductory note

Three models of hand grenade are in service use. They are all very light grenades, functioned by "all ways" percussion fuzes and similar in general construction. Fragmentation is very poor and reliance is placed on blast for effect.

25. Hand grenade S.R.C.M., Mod. 35. (See Fig. 15)

Bomba a mano S.R.C.M., Mod. 35

This grenade is cylindrical in shape. It has an outer casing in top halves which screw together about the middle and an inner casing consisting of two metal cylinders. The striker and a spring which holds the striker away from the detonator are housed in the upper cylinder, while the lower cylinder contains the detonator and the explosive filling.

General particulars

Weight : 7 oz.

Weight of explosive : 1.5 oz.

Overall length : 3.1 in.

Maximum diameter : 2.5 in.

Safety

A large safety cap covers the top and part of the side of the grenade and is held in position by a metal strip, to which is attached a rubber tab. The safety cap is connected by a short chain to a safety bar. In addition a shutter is fitted between the striker and the detonator which does not open until impact takes place.

To arm and fire

The grenade is grasped in the right hand and the rubber tab pulled away with the left hand. The grenade is then thrown in the usual manner.

The safety cap comes away during flight and, after a short delay, pulls out the safety bar by means of the chain. On impact the shutter moves and the striker can fire the detonator.

26. Hand grenade Breda, Mod. 35. (See Fig. 16)

Bomba a mano Breda, Mod. 35

This grenade is longer and thinner than the S.R.C.M., Mod. 35, and has hemispherical ends.

General particulars

Weight: 7 oz.

Weight of explosive: 2.1 oz.

Overall length: 3.8 in.

Maximum diameter: 2.1 in.

Safety

The safety arrangements consist of a safety cap held in position by a brass strip with a rubber tab and a safety bar secured to the safety cap by a brass tape wound round the grenade.

ITALIAN HAND-GRENADES

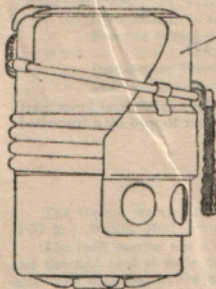


FIG. 15.—S.R.C.M. MOD. 35

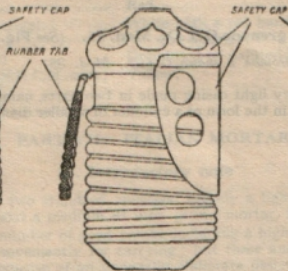


FIG. 16.—BREDA MOD. 35

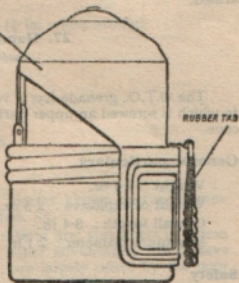


FIG. 17.—O.T.O. MOD. 35

To arm and fire

The grenade is held in the right hand and the brass strip pulled out by means of the rubber tab. In flight the safety cap falls off and, after a delay, pulls out the safety bar. The grenade is then armed.

27. Hand grenade O.T.O., Mod. 35. (See Fig. 17)

Bombà a mano O.T.O., Mod. 35

The O.T.O. grenade has a very light casing made in two parts, namely, a cylindrical lower part to which is screwed an upper part in the form of a cylinder of smaller diameter topped by a truncated cone.

General particulars

Weight: 7.4 oz.

Weight of explosive: 2.5 oz.

Overall length: 3.4 in.

Maximum diameter: 2.1 in.

Safety

This is very similar to the Breda, Mod. 35.

To arm and fire

As for the Breda, Mod. 35.

28. Markings on hand grenades

All three models are marked in the same way, the colour of the body denoting the filling. The large safety caps are not painted in these characteristic colours.

Live (H.E.)	...	...	...	Red.
Practice (small charge)	...	...	...	White with a red band ($\frac{1}{2}$ in. wide) around the centre.
Instruction (inert)	...	...	...	Unpainted or painted black.
Practice, smoke (S.R.C.M. only)	...	...	...	Yellow.

PART VII.—ITALIAN MORTARS

29. Introductory note

The Italian Army have two standard mortars, namely a light mortar known as the 45 mm. (1.77 in.), Brixia, Mod. 35, and a medium 81 mm. (3 in.) mortar, Mod. 35.

The light mortar has a number of good points, including a high rate of fire, steadiness in action and the fact that it folds conveniently for carrying; but these and other advantages, which have only been obtained at the expense of an unusually elaborate design, are largely offset by the poor fragmentation of the mortar bomb.

The 81 mm. mortar is a good weapon of conventional Stokes-Brandt design. Using a light $7\frac{1}{2}$ lb. bomb, it has a high maximum range at full charge, due mainly to the use of six large ballistite-filled secondaries. Fragmentation of both the light and heavy bombs is, however, relatively ineffective.

30. 45 mm. light mortar, Mod. 35—Brixia. (See Fig. 18)

Mortajo d'assalto Brixia. Mod. 35

This is a breech-loaded trigger-fired weapon which is capable of "high angle" and "low angle" fire (i.e. it can fire at elevations above and below 45 degrees). Only one charge is employed, but a reduced charge effect can be obtained by firing with ports in the barrel open.

The cartridges are fed from a detachable box magazine fitted on top of the body, but the bombs have to be loaded singly by hand.

The mounting is a folding tripod, with a padded frame hinged to its rear leg. When the mortar is in the firing position, this padded frame acts as a cushion for the firer's chest and, when folded for transport, it eases the load on his shoulders.

General particulars

Calibre: 45 mm. (1.77 in.).

Weight (with mounting): 34 lb.

Maximum range (ports closed): 586 yards.

Maximum range (ports open): 352 yards.

Magazine capacity: 10 cartridges.

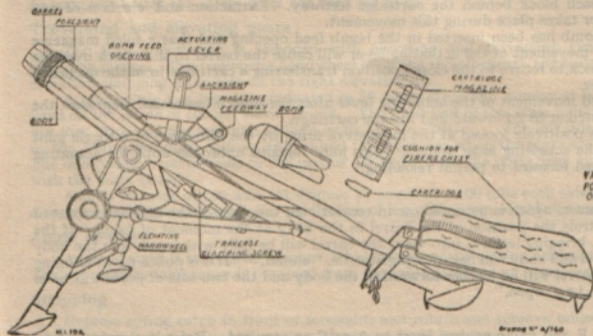
Weight of H.E. bomb: 1 lb.

Sights: Pillar backsight with vertical slot aperture; barleycorn foresight.

Rate of fire (without re-aiming between rounds): 25-30 r.p.m.

Safety

Shift safety lever, on left of body, back (exposing letter S) for "safe" and forward (exposing letter F) for "fire."



RANGE SCALE

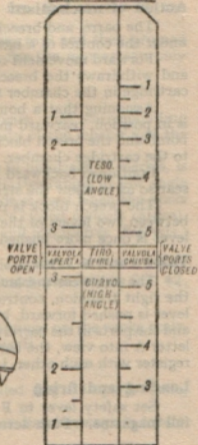


FIG. 18.—45 MM. MORTAR, MOD. 35—BRIXIA

Action of mechanism

The barrel and breech block are both arranged for sliding movement in the body of the mortar under the control of a hand-operated actuating lever.

Forward movement of this lever causes the barrel to slide forward clear of the bomb feed opening and withdraws the breech block behind the cartridge feedway. Extraction and ejection of any cartridge in the chamber takes place during this movement.

Assuming that a bomb has been inserted in the bomb feed opening and that a filled magazine is in position, rearward movement of the actuating lever will cause the barrel to slide back over the bomb and the breech block to return to the closed position transferring a cartridge from the magazine to the cartridge chamber.

Continued backward movement of the actuating lever after the breech has closed depresses the sear so as to allow the striker to go forward and fire the cartridge.

The breech block is positively locked at the moment of firing by the formation of a toggle joint between two levers of the actuating lever system. This joint remains unbroken until the actuating lever is once more pushed forward to permit reloading.

Valve control lever

The valve control lever, which is mounted on an eccentric on the right of the mortar in front of the right trunnion, controls the position of the barrel in the body at the moment of firing. If the lever is pushed forward, bringing letter C into view, the barrel will be fully withdrawn into the body and the ports in the barrel and body will be out of register, i.e. "closed." If it is pulled back, bringing letter A into view, the barrel will be further forward in the body and the two sets of ports will be in register with each other, i.e. "open."

Loading and firing

Set safety lever to F and valve control lever to A or C as required. Raise backsight and fit full magazine. Push actuating lever forward. Insert bomb (previously uncapped) into bomb feed

opening, and pull actuating lever fully back to close the breech and fire the mortar in one movement.

If an interval is required before firing, commence by setting safety lever to S and then proceed as above. In this case, however, the movement of the actuating lever to fire the mortar can only be completed after the safety lever has been set to F.

Traversing and elevating gears

The tripod mounting is provided with elevating and traversing gears, and corresponding clamping means. The traversing handwheel is on the right beneath the body of the mortar and the elevation clamping lever acts on the right elevating arc.

A range scale (*see* Fig. 18) graduated in 50 metre steps and numbered in hundreds of metres, is fixed on the inside of the left elevating arc. The front half of this scale indicates ranges at low angle fire (*tiro teso*) and the rear half at high angle fire (*tiro curvo*). The left side is used when the ports in the barrel are open (*valvola aperta*) and the right side when the ports are closed (*valvola chiusa*). The mid position corresponds to 322 metres (352 yds.) with the ports open and 536 metres (586 yds.) with the ports closed.

A total traverse of 200 mils (11 degrees 27 minutes)—100 mils each side of zero—is indicated on a scale on the traversing arc. For particulars of the *mil* system of angular measurement, *see* Sec. 42.

Angle of sight

Angle of sight is taken into account, when necessary, by setting a false range on the range scale. The appropriate false range is obtained from the table attached at Appendix B.

Stripping

Depress spring catch in front of foresight, and rotate and remove milled ring. Depress spring catch at rear end of body, and rotate and remove body end cap.

Push actuating lever forward until keys on pivots are opposite corresponding keyways in levers.

Depress actuating lever catch and remove actuating lever. Remove intermediate lever, breech block lever and barrel lever.

Remove barrel and breech block from body.

Slide sear housing partly out of its guide on top of rear end of body. Raise sear vertical. Remove sear axis pin and sear.

Rotate traversing handwheel until rear end of body is clear of its guide on traversing arc and lift body off tripod mounting.

Insert forked end of combination tool (from spare parts box) between striker head and striker retainer. Pull back striker until retainer is free to rotate. Rotate striker head and retainer and remove together from breech block, gradually releasing the pressure of the striker spring.

Using point of striker, push out extractor axis pin and then remove extractor.

The mortar bomb

The H.E. bomb has a steel body and an aluminium tail. The tail is painted red to distinguish it from practice and instructional bombs, which have yellow and unpainted aluminium tails respectively.

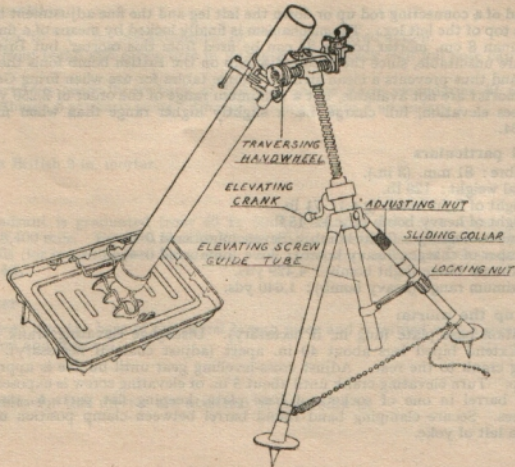
It is nose fuze and is fitted with a safety cap which is held in position by a transverse safety strip. The safety cap provides for safety during transport and has to be removed prior to loading.

31. 81 mm. Mortar, Mod. 35. (See Fig. 19)

Mortaio da 81 mm., Mod. 35

This mortar is of the same general type as the British 3-in. mortar. The chief differences are in the recoil gear and the cross-levelling gear. The recoil gear consists of two cylinders arranged side by side each containing a recoil spring and a pneumatic buffer. The cross-levelling gear includes rough and fine adjustments. The rough adjustment is obtained by moving a sliding collar on the

FIG. 19.—
81 MM. MORTAR,
MOD. 35



outer end of a connecting rod up or down the left leg and the fine adjustment by turning a milled nut near the top of the left leg. The mechanism is finally locked by means of a fluted clamping nut.

German 8 cm. mortar bombs 34 can be fired from this mortar, but British M.L. 3-in. mortar bombs are unsuitable, since the needle disc clip on the British bomb fouls the striker housing of the mortar and thus prevents a clean strike. Range tables for use when firing German bombs from the Italian mortar are not available, but a maximum range of the order of 2,250 yds. can be expected at 45 degrees elevation, full charge, i.e. a slightly higher range than when fired from the German mortar 34.

General particulars

Calibre: 81 mm. (3 in.).

Total weight: 129 lb.

Weight of light bomb (g.a.): 7½ lb.

Weight of heavy bomb (gr.c.): 15 lb.

Number of charges (light bomb): Seven (numbered 0-6).

Number of charge: (heavy bomb): Five (numbered 0-4).

Maximum range (light bomb): 4,429 yds.

Maximum range (heavy bomb): 1,640 yds.

To set up the mortar

Position base plate (dug in, if necessary). Disengage elevating crank from traversing screw yoke. Extend bipod legs about 40 in. apart (adjust chain if necessary). Position bipod with elevating crank to the rear. Adjust cross-levelling gear until bubble is approximately central and clamp up. Turn elevating crank until about 5 in. of elevating screw is exposed, insert ball on breech piece of barrel in one of sockets of base plate, keeping flat parts to the side. Rotate barrel 90 degrees. Secure clamping band round barrel between clamp position marks. Place sight in socket on left of yoke.

Preparation of ammunition

Adjust arrow on fuze to " I " for instantaneous, or " R " for delayed action.

Remove felt plug from bomb and screw fuze in its place. The black lead foil nose cap cover is not removed for firing.

Insert primary cartridge centrally in back of tail and one or more secondaries (if required) between the vanes. (Charge 0-primary alone. Charge 1-primary plus 1 secondary.)

To load and fire

Same procedure as British 3-in. mortar.

Dial sight

The elevation quadrant is graduated from 40 to 90 degrees and deflection scales (dial and micrometer) from 0 to 6,400 mils. Beneath the black main scale on the dial is arranged a red slipping scale also marked in mils (for recording zero lines, etc.). For particulars of the *mil* system of angular measurement, see Sec. 42.

To change the striker

The striker is screwed into the base of the barrel breech piece and is formed with a screw-driver slot to facilitate insertion and removal.

Range tables

Abridged range tables for this mortar are attached at Appendix C.

PART VIII.—ITALIAN ANTI-TANK RIFLES

32. 20 mm. A.Tk. Rifle—Solothurn. (See Fig. 20)

Fucile anticarro Solothurn da 20 mm.

This A.Tk. rifle is a self-loading, single shot weapon based on the Swiss 20 mm. A.Tk. rifle model S.18/1000. It is fired from the shoulder off its bipod.

General particulars

Calibre: 20 mm. (.79 in.).

Weight with empty magazine: 120½ lb.

Overall length: 7 ft. 1 in. (including recoil reducer).

Rate of fire: 10-20 aimed rounds per minute.

Sights: (a) Blade foresight, leaf backsight graduated to 1,500 metres.

(b) Telescopic sight mounted on bracket.

System of operation: Recoil. Breech positively locked on firing by rotation of locking lugs.

Feed: Magazine capable of holding 10 rounds, but normally loaded with 8 rounds only. On firing the last round, it is ejected automatically.

Safety

The gun can be set to "safe" or "fire" by means of a thumb-operated catch on the pistol grip. The catch is moved down for "safe" and up for "fire."

Preparation for firing

Rotate cocking handle clockwise three or four turns until the breech block is retained by the sear. Then rotate cocking handle anti-clockwise to its original position; the gun will not fire unless this is done.

Insert a full magazine, thereby disengaging the sear from the breech block which will go forward and feed a live round into the chamber.

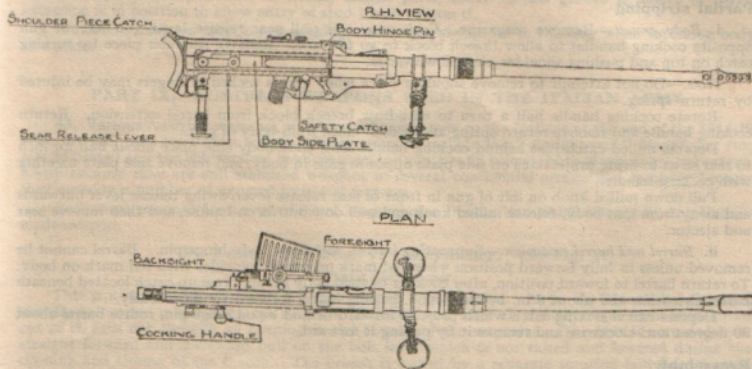


FIG. 20.—20 MM. A/TK RIFLE—SOLOTHURN

Partial stripping

i. *Body group*.—Remove magazine. Cock gun, and pull sear release lever (on left of gun opposite cocking handle) to allow breech block to go forward. Remove shoulder piece by turning catch on top and pushing shoulder piece downwards.

Note.—Do not attempt to remove shoulder piece when gun is cocked or fingers may be injured by return spring.

Rotate cocking handle half a turn to withdraw breech block from barrel extension. Return cocking handle and remove return spring and breech block from body of gun.

Depress milled catch just behind cocking handle axis, slide body side plate about half an inch to rear so as to bring projections on side plate opposite gaps in body, and remove side plate together with cocking handle.

Pull down milled knob on left of gun in front of sear release lever, swing release lever outwards and away from gun body, release milled knob and pull downwards on handle, and then remove sear and ejector.

ii. *Barrel and barrel extension*.—Supporting barrel, withdraw body hinge pin. Barrel cannot be removed unless in fully forward position when red mark on barrel coincides with red mark on body. To return barrel to forward position, after cocking to strip body group, press up catch located beneath barrel extension and about 8 in. behind bipod, pulling barrel forward simultaneously.

Depress barrel locking catch which projects forward behind bipod hinge pin, rotate barrel about 90 degrees anti-clockwise and remove it by pulling it forward.

Reassembly

Reverse procedure for stripping, noting following points :—

Barrel extension must be in forward position before barrel can be inserted.

Barrel and barrel extension must be in recoiled position before body hinge pin can be replaced.

If difficulty is experienced in closing hinged parts, make certain groove in sleeve of barrel extension is in position to allow entry of stud which rotates it.

Indication mark on sprocket of cocking mechanism should be to the rear when replacing body side plate.

PART IX.—AUSTRIAN WEAPONS USED IN THE ITALIAN ARMY

33. Various Austrian weapons, which were handed over to the Italians at the end of the 1914-18 War, are still used by Italian troops. These weapons include the "straight-pull" Mannlicher rifle (*see 34 below*) and the Schwarzlose medium machine gun (*see 35 below*), both of which are important, firstly because they are still standard weapons in several continental armies and secondly because they embody a number of unusual technical features.

Both these weapons fire a type of 8 mm. rimmed case ammunition which will not fit any Italian-made weapon.

34. 8 mm. Rifle, Mod. 95—Mannlicher. (*See Fig. 21*)

Fucile Mannlicher

This is a clip-loaded rifle with a "straight-pull" bolt action. As in the Mannlicher-Carcano, the clip is inserted in the magazine with the cartridges and, after all the cartridges have been forced out of it, falls out through an opening in the bottom of the magazine. The bolt is actuated by a straight forward and backward pull on the bolt lever which is not raised and lowered during the opening and closing of the breech. The breech is locked by a separate rotating bolt head formed with locking lugs that engage in recesses in the body. The rotation of the bolt head into and out of the locking position is brought about by the interaction of helical feathers in the stem of the bolt head with corresponding helical grooves in the bolt cylinder.

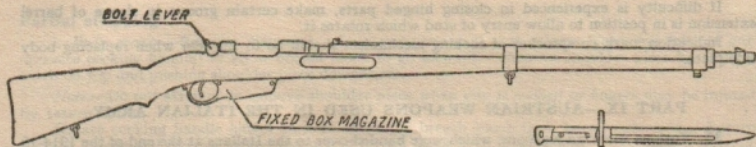


FIG. 21.—8 MM. RIFLE, MOD. 95—MANNLICHER

General particulars

Calibre : 8 mm. (3.15 in.)

Weight (without bayonet) : 9 lb. 1 oz.

Length (without bayonet) : 51 in.

Sights : i. Open "V" tangent backsight and barleycorn foresight ; backsight graduated from 600 to 2,400 paces.

ii. Battle sight for 500 paces, obtainable by laying tangent sight flat.

iii. Extreme range mark for 2,600 paces is provided on top of tangent sight frame.

Feed : Fixed magazine, clip-loaded with 5 cartridges.

Safety

Rotate safety catch, located on left rear of cocking lever upwards for "safe" and over to the left for "fire." This can be done when either cocked or uncocked.

Preparation for firing

Set safety catch to "fire." Pull bolt fully back. Insert a clip of cartridges into the magazine and then push bolt forward again.

Removal of bolt

Pull bolt back. Push trigger forward to disengage bolt stop and remove bolt to the rear.

Replacement of bolt

Make sure that locking lugs are in line with bolt guides and that dovetail guide rib on bottom of bolt enters dovetail guide groove in body. Push bolt to the front, keeping trigger pressed forward.

35. 8 mm. Medium M.G., Mod. 07/12—Schwarzlose. (See Fig. 22)*Mitragliatrice Schwarzlose*

This M.G. operates on the "blowback" principle, i.e. the breech block is not locked to the barrel and is forced to the rear by the projection of the spent case. To facilitate clean ejection every round is automatically lubricated from an oil reservoir in the cover of the body.

The essential delay in the opening of the breech block is brought about by the combination of a strong return spring, exceptionally heavy moving parts, and the partial formation of an elbow joint by the crank and link which connect the breech block to the body.

The combination of those three factors presents considerable resistance to the initial movement of the spent case and breech block, which allows the gas pressure in the barrel to fall to within safe limits before the breech opens. An additional factor that increases the safety margin is the use of an unusually short barrel.

General particulars

Calibre: 8 mm. (.315 in.)

Weight of gun and tripod mounting: 80 lb. (approx.)

Weight of gun only (less water and oil): 44 lb.

Length overall of gun: 37 in. (approx.)

Maximum (cyclic) rate of fire: 400 rds. per min.

Sights { Foresight—barleycorn, adjustable laterally.
 Backsight—radial "V," graduated 200-2,400 paces.

Feed : 250 rd. fabric belt, fed from right to left.
 Cooling : Water, $6\frac{1}{2}$ pints.

Preparation for firing

Insert belt from right over "paddle" type feed wheel and pull back crank handle three times.

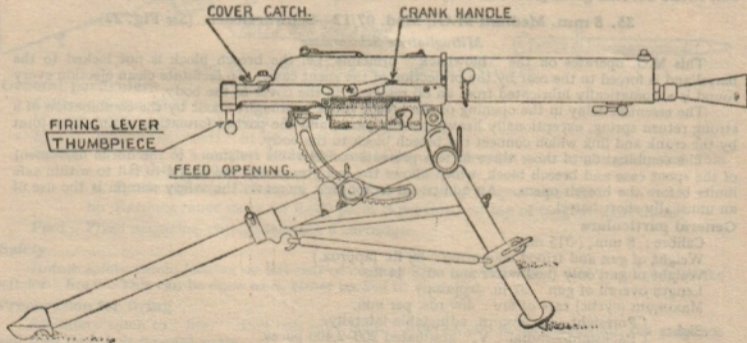


FIG. 22.—8 MM. M.G. MOD. 07/12—SCHWARZLOSE.

To fire

Press safety lever between traversing handles to the right and simultaneously press trigger lever.

Partial stripping

- i. *Breech block*.—Unscrew body locking pin at right of trigger. Rotate rear cross-piece one quarter turn and remove, being careful to release the powerful return spring gently. Remove firing pin, breech block crank and link.
- ii. *Feed mechanism*.—Rotate feed locking pin, draw back sideplate and lower. Swing out feed mechanism and lower.
- iii. *Barrel*.—Rotate pin at chamber end and unscrew flash eliminator, turn barrel clockwise one-third turn and disengage.

PART X.—GERMAN WEAPONS (Revised particulars)

36. The German 9 mm. (.35 in.) Pistol 38 and the 5 cm. (2 in.) Mortar 1.Gr.W.36 have already been dealt with briefly in "Enemy Weapons, Part I—German Infantry Weapons." Further information on these two weapons is now available, and revised particulars are given below.

37. 9 mm. Pistol 38—Walther. (See Fig. 23)*Pistole 38.*

This self-loading pistol, which is now a standard German army weapon, is also used in the Swedish army. It is an accurate weapon and handles well, the general feel being similar to that of the Luger pistol 08, except that the upward kick on firing is not so marked.

The breech is positively locked at the moment of firing by a locking cam, which is pivoted under the barrel and has locking lugs for engagement with recesses in the slide. On firing, the barrel recoils a short distance with the slide, causing a plunger to strike part of the body and unlock the breech, after which the slide continues to the rear under the action of the spent case.

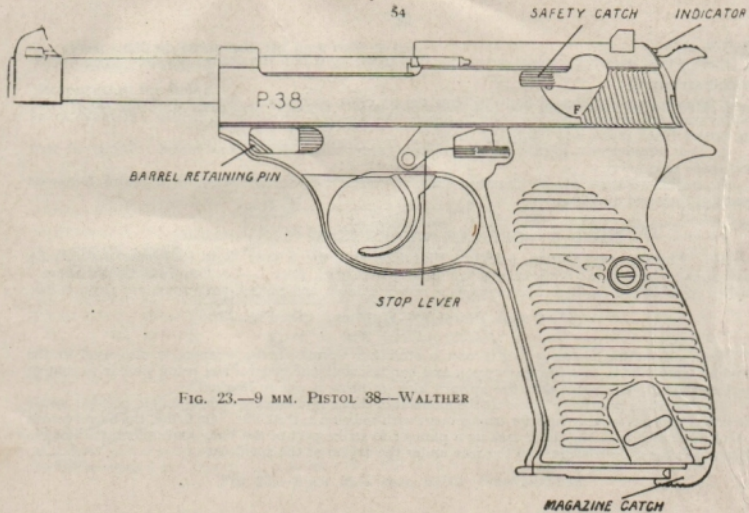


FIG. 23.—9 MM. PISTOL 38—WALTHER

The trigger and hammer mechanism is of the "Walther" single or double action type, and can operate independently of the recoiling portions of the pistol. Thus, if a misfire occurs, the trigger can be re-pressed without having to pull the slide back.

A holding-open device retains the slide in the rear position when the magazine is empty, and an indicator in the form of a pin protrudes about $\frac{1}{4}$ in. from the rear of the slide when a round is in the chamber. The latter is a useful adjunct for night work, since it enables the firer to tell by feel whether there is a round in the chamber.

General particulars

Calibre : 9 mm. (.35 in.).

Weight without magazine : 1 lb. 15 oz.

Weight with empty magazine : 2 lb. 1 $\frac{1}{4}$ oz.

Weight with full magazine : 2 lb. 5 $\frac{1}{4}$ oz.

Length overall : 8 $\frac{1}{2}$ in.

Length of barrel : 4 $\frac{1}{4}$ in.

Ammunition : 9 mm. parabellum as for pistol '08 (will fire same ammunition as British "Sten" machine carbine).

Feed : Removable 8 round magazine in butt.

Safety

Raise safety catch, uncovering letter F for "fire" and lower it, uncovering letter S for "safe".

When cocked, the pistol can be uncocked by setting safety catch to "safe". This releases the hammer, and at the same time locks the firing pin in its rear position.

Preparation for firing

Set safety catch to "fire". Insert full magazine. Pull slide fully back and let it go smartly forward again to transfer a round from magazine to chamber. The pistol is now loaded and cocked and can be fired "single action".

Alternatively, set safety catch to "safe" and proceed as above. The pistol is now loaded, but not cocked. When ready to fire, push safety catch up and fire first round "double action", i.e. by a strong pull on trigger, which cocks and fires pistol, or "single action" after cocking the hammer by thumb as with a service revolver.

Partial stripping

Insert empty magazine. Pull slide back until engaged with stop lever on left of body. Rotate barrel retaining pin clockwise about 135 degrees. Remove magazine, allow slide to go forward by depressing lever on left of body. Press trigger and remove slide forward from body. Withdraw barrel from slide.

Reassembly

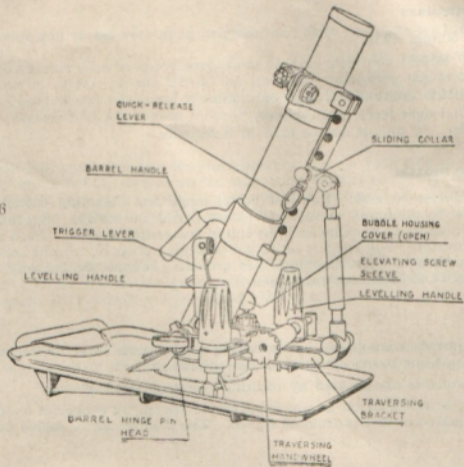
Reassemble in reverse order. Note that, when inserting barrel and slide into body, they should be locked together. To lock them, pull out locking cam plunger and press up locking cam. Barrel and slide will remain locked if pistol is assembled upside down, but it will then be necessary to press up ejector and two levers of safety mechanism to prevent them fouling rear end of slide.

38. 5 cm. Light Mortar 56. (See Fig. 24)

Leichter Granatenwerfer 36—1.Gr.W.36.

This weapon is the standard light mortar of the German Army. It is muzzle loaded and trigger fired, and is designed for high angle fire only, i.e. fire at angles of not less than 45 degrees. The mortar is a two-man load, the baseplate with traversing and cross levelling gear being carried on the back of one man and the barrel and elevating screw on the back of the other.

FIG. 24.—
5 CM. LIGHT MORTAR 36



General particulars

Calibre : 50 mm. (2 in.).

Weight in action : 31 lb.

Maximum range : 568 yds.

Weight of H.E. bomb (5 cm. Wgr. 36) : 2 lb.

Sights : Dial sight (early models only).

Rate of fire : 6 rounds can be fired in 8 seconds.

To set up the mortar

Adjust traverse to zero. Pull out barrel hinge pin. Holding barrel by its handle, adjust elevating screw to minimum elevation. Insert barrel in socket. Squeeze catches and engage lower end of elevating screw pillar in front end of traversing bracket. Push in barrel hinge pin and raise range indicator. Lay roughly on target or aiming posts by turning baseplate and making use of white line on barrel. Press baseplate into ground. It must be properly embedded and should slope downward in direction toward target.

Elevation

Rough adjustment is effected by depressing quick-release lever to free sliding collar and then elevating or depressing barrel by means of barrel handle.

Fine adjustments are effected by rotating elevating screw sleeve.

Gun range is indicated on an arc fixed to the barrel, by a pointer on the traversing bracket. The arc is graduated in metres from 60 to 520. The pointer can be folded down for transport.

Line

For rough adjustment and to lay mortar in original line, shift baseplate with traverse set at zero.

The traversing handwheel is used to apply corrections for line after first round.

Traverse is indicated on a scale on the left of the cross-bar connecting the levelling handles. The scale has two rows of graduations which are offset so as to provide readings to the nearest 10 mils. For conversion factors (degrees and minutes to mils) *see* Sec. 42.

Levelling

The mortar is levelled by means of two levelling handles, one on each side of the baseplate, in conjunction with a levelling bubble carried on the traversing bracket to the left of the barrel.

To move bubble forward, turn both handles to left; bubble backward, handles right; bubble to left, handles outward; and bubble to right, handles inward.

Loading and firing

Layser lies on his front holding levelling handles and pressing down baseplate with forearms. Loader on right of layer carefully inserts bomb in muzzle and then places hand on trigger. On order to fire, loader pulls trigger lever slowly and evenly to the rear.

To unload

Pull out barrel hinge pin. Fold down range indicator and gently raise breech end of barrel until bomb slides out into hands of member of detachment waiting to receive it.

PART XI.—ITALIAN S.A.A.

39. Markings and identification

Most of the standard types of Italian S.A.A. now in use can be identified with the aid of Fig. 25 and the table at Appendix D.

Types not included in the appendix and Fig. 25 include :—

i. The ammunition for the 8 mm. Mannlicher rifle and the 8 mm. Schwarzlose M.G., which has a rimmed case; and ii. the 20 mm. Solothurn A.Tk. rifle ammunition, which has a belted case and is approximately 8 inches long overall.

The usual base markings on Italian S.A.A. are the year (in full or abbreviated), the makers initials or letter and the initials of the inspecting authority. The makers initials may be given in full, for example S M I (=Societa Metallurgica Italiana) or B P D (=Bombrini, Parodi Delfino) or a single letter to indicate the manufacturer may be inserted immediately before the year, *c.f.* B. 38 on the base of the 7.35 mm. cartridge in Fig. 25.

40. Interchangeability

A table showing which types of Italian S.A.A. are interchangeable with British and American S.A.A. is attached at Appendix E.

PART XII.—ITALIAN UNITS OF MEASUREMENT

41. Distances

Ranges and other distances are measured in metres, hectometres (=100 metres), and kilometres (=1,000 metres). 1 metre=1.0936 yards and 1 yard=0.9144 metres.

Convenient approximate conversions are as follows :—

Yards to metres—subtract 10 per cent. from the number of yards.

Metres to yards—add 10 per cent. to the number of metres.

Most artillery slide rules have a gauge mark Y for converting metres to yards and vice versa.

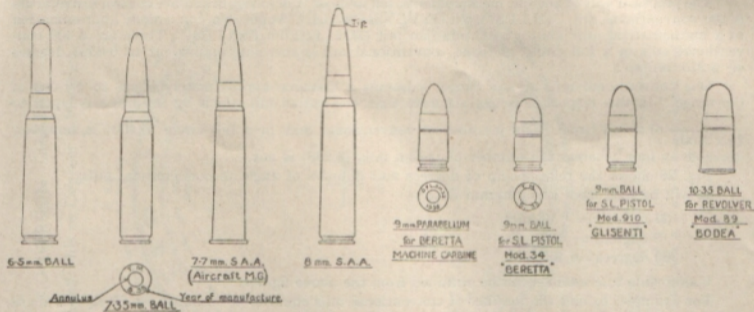


FIG. 25.—ITALIAN S.A.A.

42. Angles

The practical unit of angular measurement used in most Italian sights and fire control instruments is the conventional mil (MILLESIMO CONVENZIONALE), which is a convenient approximation to a mathematical unit known as the radian mil (MILLESIMO ESATTO). There are 6,400 conventional mils in a full circle, and one conventional mil is therefore equivalent to 0.0563 degrees or 3.375 minutes.

One conventional mil, at any range, subtends a distance approximately equal to $1/1,000$ of the range. In this respect it is less accurate than the radian mil which by definition is equal to $\frac{1}{2\pi \times 1,000}$ of a full circle. The number of conventional mils in a full circle (6,400) is, however, divisible by four, whereas the number of radian mils (6,283) is not.

Fig. 26 shows the relationship of degrees and minutes of angle to conventional mils.

It will be seen from this diagram that :—

$$27 \text{ mins.} = 8 \text{ mils.}$$

$$9 \text{ degrees} = 160 \text{ mils.}$$

$$360 \text{ degrees} = 6,400 \text{ mils.}$$

Useful slide rule settings can be obtained from the above figures.

For example, to find the number of conventional mils equal to 40 minutes, set 27 on A scale of slide rule opposite 8 on B scale. Move cursor to 40 on A scale and read off 12 mils (approximately) from B scale.

Similarly, to find the number of degrees and minutes corresponding to 96 mils, set 9 on A scale opposite 160 on B scale. Move cursor to 98 on B scale and read off 5.5 degrees, i.e. 5 degrees 30 minutes, from A scale.

CONVERSION DIAGRAM
(Converting Mills to Degrees & Minutes)

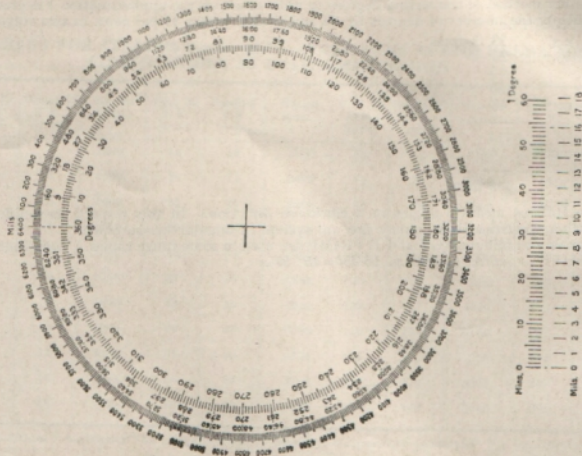


FIG. 26.

Another method of converting degrees to mils, based on the approximation 1 degree = 17.8 mils, is to multiply the number of degrees by 20 and then subtract 11 per cent. in two stages.

e.g.	23 degrees	
multiply by	20	
		460
subtract	46	
		414
subtract	4.6	
		409 mils.

The Italians measure angles in a clockwise direction. In this respect they differ from most of the other countries that employ the mil system of angular measurement.

Degrees and minutes (GRADI E PRIMI) are used in some range tables. Sometimes the degrees are divided into tenths (=6') e.g. $15.95^\circ = 15^\circ 57'$.

APPENDIX A.

RANGE TABLES FOR ITALIAN 8 mm. M.Gs.—FIAT MOD. 35 AND BREDA MOD. 37,
FIRING MODEL 35 BALL AMMUNITION

Range (yds.)	Fiat 35 T.E. (mils)	Breda 37 T.E. (mils)	Range (yds.)	Fiat 35 T.E. (mils)	Breda 37 T.E. (mils)	Range (yds.)	Fiat 35 T.E. (mils)	Breda 37 T.E. (mils)	Range (yds.)	Fiat 35 T.E. (mils)	Breda 37 T.E. (mils)
100	1	1	1200	19	19	2300	68	66	3400	150	148
200	2	2	1300	22	22	2400	74	72	3500	159	158
300	3	3	1400	25	25	2500	80	78	3600	168	168
400	4	4	1500	29	28	2600	86	84	3700	178	179
500	5	5	1600	33	32	2700	93	91	3800	188	190
600	6	6	1700	37	36	2800	100	99	3900	199	202
700	8	8	1800	41	40	2900	108	107	4000	210	214
800	10	10	1900	46	45	3000	116	114	4100	221	226
900	12	12	2000	51	50	3100	124	122	4200	234	239
1000	14	14	2100	56	55	3200	132	130	4300	247	253
1100	16	16	2200	62	60	3300	141	139	4400	261	266

Standard conditions: barometer 750 mm. (29.5 in.) of mercury, temperature 15° C. (59° F.), humidity 0.5 (half saturated air).

RANGE TABLES FOR ITALIAN 45 mm. MORTAR, MOD. 35—BRIXIA

LOW ANGLE FIRE—VALVE PORTS OPEN								LOW ANGLE FIRE—VALVE PORTS CLOSED							
Slant *	A/S Negative.			A/S Positive.				Slant *	A/S Negative.			A/S Positive.			
Range.	-16½	-11	-5½	+5½	+11	+16½	+2:	Range.	-16½	-11	-5½	+5½	+11	+16½	+22
Metres.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	Metres.	degs.	degs.	degs.	degs.	degs.	degs.	degs.
100	—	—	—	1.75	2.25	2.5	3.0	100	—	—	—	2.25	32.5	4.0	4.75
150	—	—	—	2.0	2.5	2.75	—	150	—	—	—	2.75	3.5	4.25	4.75
200	—	—	1.5	2.5	2.75	—	—	200	—	—	—	3.0	4.0	4.5	—
250	—	1.25	2.0	3.0	—	—	—	250	—	—	1.25	3.5	4.25	4.75	—
300	1.0	1.75	2.5	—	—	—	—	300	—	—	1.75	4.0	4.75	—	—
350	1.5	2.5	—	—	—	—	—	350	—	1.0	2.5	4.25	5.0	—	—
400	—	—	—	—	—	—	—	400	—	1.5	3.0	4.75	—	—	—
								450	—	2.25	3.5	—	—	—	—
								500	1.25	2.75	4.0	—	—	—	—
								550	2.0	3.5	4.75	—	—	—	—
								600	2.75	4.25	—	—	—	—	—

HIGH ANGLE FIRE—VALVE PORTS OPEN.										HIGH ANGLE FIRE—VALVE PORTS CLOSED.											
Slant *	A/S Negative.			A/S Positive.							Slant *	A/S Negative.			A/S Positive.						
Range.	-16½	-11	-5½	+5½	+11	+16½	+22	+27½	+33	Range.	-16½	-11	-5½	+5½	+11	+16½	+22	+27½	+33		
Metres.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	Metres.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	degs.	degs.		
100	—	—	—	1.0	1.0	1.0	1.0	1.0	1.0	300	—	—	—	3.0	3.0	3.25	3.25	3.0	3.0		
150	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	350	3.25	3.25	3.5	3.5	3.75	3.75	3.75	4.0	4.0		
200	1.75	1.75	2.0	2.0	2.0	2.25	2.25	2.25	2.25	400	3.5	3.75	3.75	4.25	4.25	4.5	5.0	—	—		
250	2.25	2.25	2.5	2.5	2.75	3.0	—	—	—	450	4.0	4.25	4.25	4.75	5.0	—	—	—	—		
300	2.5	2.75	2.75	—	—	—	—	—	—	500	4.25	4.5	4.75	—	—	—	—	—	—		
350	3.0	—	—	—	—	—	—	—	—	550	4.75	5.0	—	—	—	—	—	—	—		
										600	5.0	—	—	—	—	—	—	—	—		

* The slant range is the range measured along the line of sight from the mortar to the target, i.e. it is the range as measured by a rangefinder and not as measured on the map.

**RANGE TABLES FOR ITALIAN 81 mm. MORTAR, MOD. 35
LIGHT 7½ lb. BOMB (G.A.)**

Charge 0		Charge 1		Charge 2		Charge 3		Charge 4		Charge 5		Charge 6	
Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation
yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.
100	85 —	300	78 —	1,000	75 30	1,500	73 —	2,000	71 30	2,500	70 30	3,000	69 —
200	79 30	700	72 30	1,200	72 —	2,000	66 —	2,500	66 —	3,000	65 —	3,400	65 —
250	76 30	800	69 30	1,400	68 —	2,200	63 —	2,700	63 —	3,200	63 —	3,600	63 —
300	73 30	900	66 —	1,600	64 —	2,300	61 —	2,900	60 —	3,400	60 —	3,800	60 30
350	70 30	1,000	62 —	1,700	61 30	2,400	58 30	3,000	58 —	3,600	57 —	4,000	57 30
400	66 30	1,050	60 —	1,800	58 30	2,500	56 —	3,100	56 30	3,700	55 —	4,200	54 —
450	62 30	1,100	57 30	1,900	55 —	2,600	53 —	3,200	54 —	3,800	52 30	4,300	52 —
500	57 30	1,150	54 —	1,950	52 30	2,650	50 30	3,250	52 —	3,850	51 —	4,350	50 30
550	50 —	1,220	50 —	2,000	48 —	2,700	46 —	3,300	49 30	3,900	48 30	4,400	48 —
557	45 —	1,225	45 —	2,023	45 —	2,707	45 —	3,336	45 —	3,937	45 —	4,429	45 —

HEAVY 15 lb. BOMB (G.C.)

Charge 0		Charge 1		Charge 2		Charge 3		Charge 4	
Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation	Range	Elevation
yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.	yds.	degs. mins.
68	81 —	150	83 —	450	76 30	700	73 30	1,150	67 30
75	80 —	200	80 —	550	72 —	800	71 —	1,250	65 —
109	76 30	250	77 —	600	70 —	900	68 —	1,300	64 —
125	73 —	300	74 —	650	68 —	1,000	65 —	1,350	62 30
156	68 30	350	71 —	700	66 —	1,050	63 —	1,400	61 —
175	64 —	400	68 —	750	63 30	1,100	61 —	1,450	58 30
200	57 30	450	64 —	800	61 —	1,150	59 —	1,500	56 —
219	45 —	500	59 30	850	58 —	1,200	56 30	1,550	53 —
		550	54 —	900	53 30	1,250	52 30	1,600	49 30
		574	45 —	946	45 —	1,296	45 —	1,640	45 —

ITALIAN S.A.A.
(Markings and Recognition)

Serial No.	Calibre	Type	Identification				Service
			Annulus Colour	Colour of projectile			
1	6.5 mm.	Ball (round nose bullet) ...	Plain	Plain	...	...	Land
2	7.35 mm.	Ball	—	Plain	...	...	Land
3	7.7 mm.	Ball	Plain ...	Plain	...	...	Air
4	7.7 mm.	Tracer	Plain ...	Plain with red tip			Air
5	7.7 mm.	A.P.I. pre-1939	Plain ...	Plain with blue tip (pierced) ...			Air
6	7.7 mm.	A.P.I. post-1939	Plain ...	Plain with green tip (pierced)			Air
7	7.7 mm.	A.P.	Green	Plain with green tip			Air
8	8 mm.	Ball	Plain ...	Plain	...	...	Land
9	8 mm.	A.P.	—	Plain with green tip			Land
10	8 mm.	Incendiary observing ...	—	Plain with blue (or black) tip...			Land
11	8 mm.	A.P.T.	—	Plain with red tip			Land
12	8 mm.	Tracer	—	Plain with red (or green) tip ...			Land

13	9 mm.	Ball (Glisenti pistol) ...	Red cap	Plain	Glisenti pistol
14	9 mm.	Ball (parabellum type for Beretta machine carbino, Mod. 38)	Green cap	Plain	9 mm. Beretta machine carbine
15	9 mm.	Ball (short type for Beretta pistol, Mod. 34)	Plain ...	Plain	9 mm. Beretta S.L. pistol, Mod. 34
16	10.35 mm.	Ball (for Bodeo revolver) ...	Plain ...	Plain	10.35 mm. Bodeo revolver, Mod. 89
17	12.7 mm.	Ball	Plain ...	Plain	Air
18	12.7 mm.	Tracer	Plain ...	Plain with red tip	Air
19	12.7 mm.	H.E.	Plain ...	Plain with red band	Air
20	12.7 mm.	H.E./T.	Plain ...	Plain with blue band	Air
21	12.7 mm.	H.E./A.P./I/T.	Plain ...	Plain with white nose	Air

ITALIAN S.A.A.—NOMENCLATURE

<i>Type</i>	<i>Italian name</i>
Ball	CARTUCCIA A PALLOTTOLA ORDINARIA
A.P.	PERFORANTE
Tracer	TRACCIANTE (LUMINOSA)
Incendiary	INCENDIARIA
H.E.	ESPLOSIVA
Observing	PER AGGIUSTAMENTO
A.P.T.	TRACCIANTE PERFORANTE
A.P.I.	PERFORANTE INCENDIARIA
Drill or dummy	DA ESERCITAZIONE
Blank	SALVE

ITALIAN S.A.A.

(Interchangeability)

Italian S.A.A. interchangeable with British and American S.A.A.

Nominal calibre and type of Italian S.A.A.	Weapon from which fired	Nominal calibre and type of British, etc. S.A.A.	Weapon from which fired
7.7 mm. ball, A.P., etc. ...	Breda-Safat Aircraft M.G.	.303 in. ball, A.P., etc. ...	.303 in. British weapons
9 mm. ball (short type) ...	Beretta pistol, Mod. 34	*.380 in. auto. ball ...	.380 Colt auto. pistol
9 mm. ball (parabellum type)	Beretta machine carbine, Mod. 38	9 mm. ball (parabellum type)	"Sten" and Lanchester machine carbine

Italian 6.5 mm., 7.35 mm., 8 mm., 9 mm. (Glisenti) and 10.35 mm. are not interchangeable with any British or American S.A.A.

* .380 in. auto. ammunition should not be confused with .38 auto. which is a longer and more powerful type and is fired from a different weapon, the .38 Colt auto. pistol.

GERMAN S.A.A.

(Interchangeability)

German S.A.A. interchangeable with British S.A.A.

Nominal calibre and type of German S.A.A.	Weapon from which fired	Nominal calibre and type of British S.A.A.	Weapon from which fired
7.92 mm. ball (s.S.) A.P. (S.m.K.), etc.	7.92 mm. German rifles and machine guns	7.92 mm. Besa ball ...	7.92 mm. Besa M.G.
9 mm. ball (Pist. Patr. 08) and semi-A.P. (Pist. Patr. 08 m.E.)	9 mm. pistols 08 and 38. and machine carbines M.P. 38 and M.P. 40	9 mm. (parabellum type)	"Sten" and Lanchester machine carbines

G. man 7.92 mm. anti-tank rifle ammunition cannot be fired from any British or American weapon.

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