

No. 1775

No 2106

HANDBOOK OF THE  
VICKERS MACHINE GUN

MODEL OF 1915

WITH

PACK OUTFITS AND ACCESSORIES

(SIXTEEN PLATES)

MARCH 19, 1917  
REVISED JULY 11, 1917



WASHINGTON  
GOVERNMENT PRINTING OFFICE

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(Form No. 1775.)

THE OFFICIAL NUMBER OF THIS COPY

IS 2106

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WAR DEPARTMENT,  
OFFICE OF THE CHIEF OF ORDNANCE,  
Washington, July 6, 1917.

This manual is published for the information and government of the Regular  
Army and National Guard of the United States.  
By order of the Secretary of War.

WILLIAM CROZIER,  
*Brigadier General, Chief of Ordnance.*

(3)

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## EQUIPMENT OF MACHINE-GUN COMPANY OR TROOP.

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Each machine-gun company or troop is provided with six guns, including tripods, ammunition, spare parts, tools, and accessories, together with the necessary packs.

The equipment for each organization is carried on 24 mules, constituting 6 sections of 4 each. The sections are essentially complete units, although certain articles are not carried in every section.

The equipment of each section consists of one gun, with tripod, ammunition, and the necessary equipment for maneuvering the piece in the field. It is divided into the following parts:

Part I. The gun with its ammunition and accompanying parts.

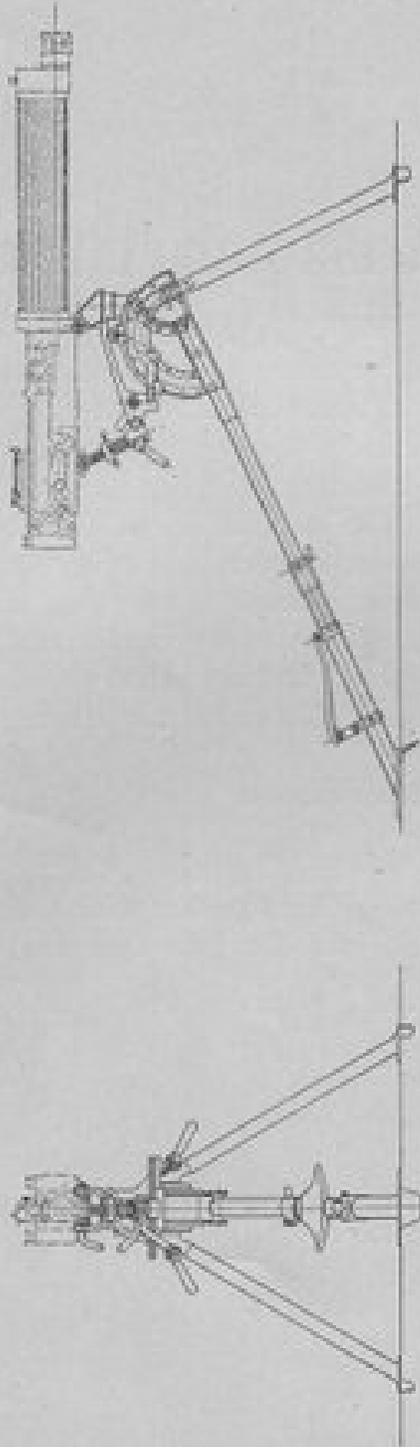
Part II. The pack harness.

Part III. The special pack equipment.

Part IV. The pioneer tools.

Part V. Signal equipment.

A description of each of these parts, together with a statement of total equipment issued to one machine-gun company or troop, follows.



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PART I. THE GUN WITH ITS AMMUNITION AND  
ACCOMPANYING PARTS.

DESCRIPTION OF THE VICKERS MACHINE GUN, MODEL OF 1915.

GENERAL DESCRIPTION.

[Plates II to V.]

The Vickers machine gun, model of 1915, belongs to that class of automatic guns in which the force of recoil is utilized to operate it. After the first shot the gun is self-operative, until the ammunition in the cartridge belt is exhausted or until the trigger is released. The force of recoil opens the breech, extracts the empty case, and inserts and fires the next cartridge.

The ballistics of this machine gun are similar to those of the service rifle and the data given in the handbook of the service rifle, No. 1923, is equally applicable.

In firing, the action of the mechanism is as follows:

The barrel and lock move to the rear a short distance. At the end of the recoil the lock is drawn back from the chamber, thus opening the breech and at the same time drawing a loaded cartridge from the belt and extracting the empty case from the chamber. During the last part of the motion of the lock the empty case and the loaded cartridge are lowered until the latter is in line with the chamber and the former drops to the ground. Under the influence of a spring, which the movement of recoil has extended, the lock is then pressed forward, the fresh cartridge is pushed into the chamber, the belt is fed forward one round, and the carrier and barrel finally returned to the firing position. During the recoil the firing pin is cocked, and unless the trigger has been released the sear is struck at the conclusion of the movement described above, and the gun is again fired. Continuous fire is obtained, therefore, simply by keeping the trigger pressed after firing the first round.

To secure efficient mechanical operation of machine guns, the officers and noncommissioned officers assigned to supervise their manipulation must themselves be thoroughly familiar with all details of the construction, operation, and troubles of the gun, and means of keeping it continually in action, and be able to assemble and disassemble the gun readily and personally correct all jams and malfunctions.

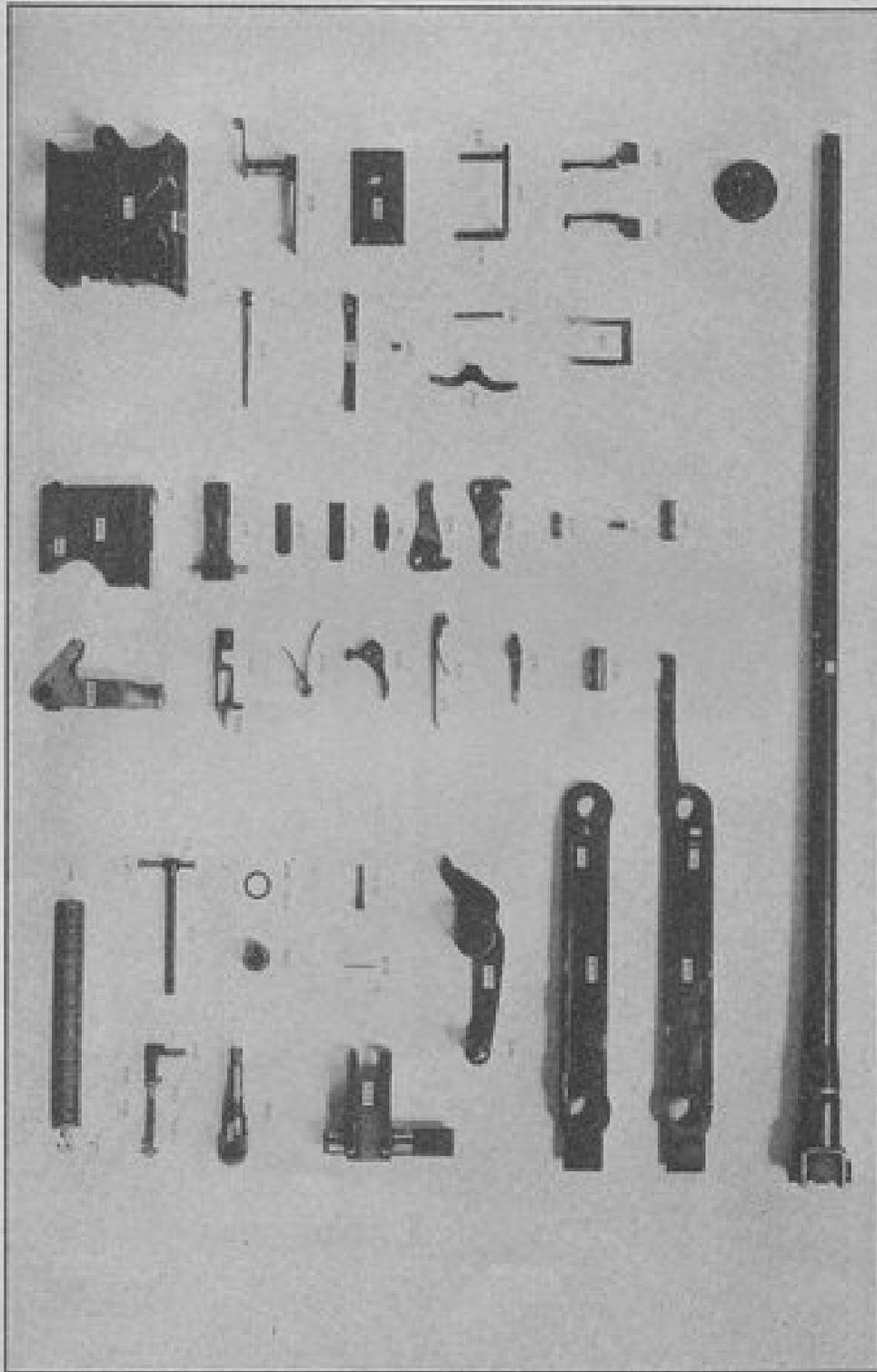
## SERIAL LISTS OF COMPONENT PARTS.

## THE GUN.

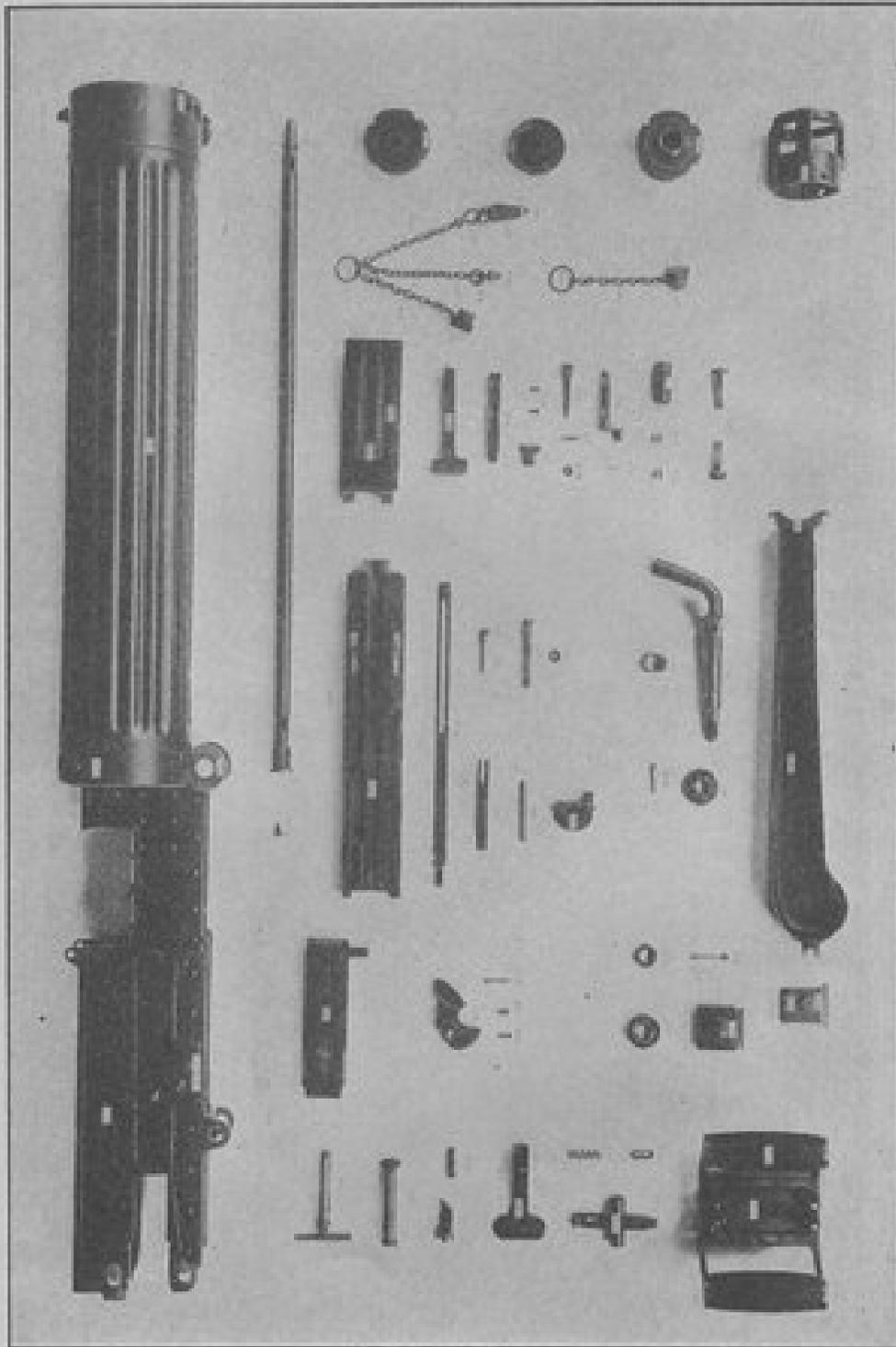
(Numbers before components refer to numbers shown on Plates II and V.)

B2A Aperture disc.	Handle block.
B2B Pivot.	13E Handle grip.
B2E Slide cap screw, large.	13C Oil reservoir cap.
B2F Slide cap screw, small.	13D Reservoir cap washer.
B3G Slide cap.	13E Handle block oil reservoir.
B3H Drift slide.	13F Brush hobler.
B2J Leaf joint pin.	13G Brush.
B2K Elevating screw head.	15A Trigger lever.
B2S Pivot spring.	16B Trigger pawl.
B2T Base spring.	19C Safety catch.
B2X Leaf.	16D Thumb piece.
4A Trunnion block.	16E Handle block pin.
5A Outside plate, right.	16F Trigger.
5B Outside plate, left.	17A Rear cover.
6C Cam, left hand.	17B Trigger bar.
5D Cam, right hand.	17C Rear cover catch.
6A Bottom plate.	17E Movable base stop screw.
6B Bottom plate slide.	17F Movable base trunnion.
6C Bottom plate stop.	18A Front cover.
6D Slide catch head.	18B Front cover catch cap.
6E Bottom plate slide catch.	19C Front cover catch sub.
6F Roller bracket.	18D Cover guide, right hand.
6G Outside plate filling piece.	18E Cover guide, left hand.
6H Front cover stop.	18F Front cover catch bracket.
7A Water-jacket cap.	18G Front cover catch.
7D Steam outlet tube.	19A Feed box.
7C Trunnion block distance piece.	20A Bottom pawl, left hand.
7D Stuffing box.	20B Bottom pawl, right hand.
8A Water jacket.	20C Bottom pawl connecting plate.
8D Outer steam tube.	20D Bottom lever.
8C Steam tube plug.	20E Feed-box slide.
8D Inner steam tube.	20F Cartridge guide and stop.
8E Steam tube socket.	20H Upper pawl, left hand.
8F Water-jacket trough.	20I Upper pawl, right hand.
8A Barrel.	21A Front sight.
10A Recoil plate, left hand.	21D Front-sight cover.
10B Recoil plate, right hand.	21E Front-sight carrier.
11A Crank.	22A Water plug.
11B Crosshead.	22B Water-plug top piece.
11C Fuse link (rear).	22C Stem covering.
11D Fuse link (front).	22D Water-plug fastening link.
12A Roller handle.	22E Water-plug fastening ring.
12C Roller handle knob.	22F Water-jacket cap base connection.
12D Dead stop.	22G Stem.
12E Dead-stop bracket.	22H Eyeball.
12F Roller.	22J Securing 5 link.
13A Lock frame.	22K Securing chain (6 links).
13B Filling piece.	22L Securing chain (12 links).
13C Hand gear.	24A Spring box.
13D Tumbler.	24E Spring-box fixing (front).
13E Firing pin.	24C Spring-box fixing (rear).
13F Safety gear.	24D Fuse.
13G Distance piece for lock frame.	24E Recoil-spring lock.
14A Side lever.	24F Recoil-spring nut.
14B Lifting lever, right hand.	25A Sleeve.
14C Lifting lever, left hand.	25B Front disc.
14D Carrier.	25C Muzzle attachment securing chain.
14E Gib.	25D Securing chain ring.
14F Gib spring plate.	25E Muzzle gland.

PLATE II.



COMPONENT PARTS OF GUN.



COMPONENT PARTS OF GUN.

## SERIAL LISTS OF COMPONENT PARTS—continued.

## THE GUN—continued.

25F	Front disc cap.	27T	Spring box front stud.
25G	Barrel disc.	27U	Tumbler pin.
25K	Follower.	27V	Hand-car pin.
26A	Bottom lever pin.	27W	Muzzle attachment stop pin.
26B	Locking pin.	27X	Bottom pawl pin.
26C	Slide-lever pin.	27Y	Trunnion block and outside plate rivet.
26D	Trigger pin.	27Z	Tension-screw handle.
26E	Bottom pawl rivet.	28A	Handle block hinge pin.
26F	Rivet.	28B	Cover-hinge pin.
26G	Rivet.	28C	Rear-cover catch hinge pin.
26H	Bottom and outside plate rivet.	28D	Front-plug screw.
26J	Bottom and outside plate rivet.	28E	Steam tube front plug.
26K	Dead-stop bracket and outside plate rivet.	28F	Front-sight carrier screw.
26L	Carrier supporting spring rivet.	28G	Howe-connection screw.
26M	Fuse rivet.	28H	Safety-catch pin.
26N	Chain-link rivet.	28J	Recoil spring tension screw.
26P	Lock-frame rivet.	28K	Crank handle securing screw.
26Q	Adjusting washer (thick).	28N	Cover-hinge pin nut.
26R	Adjusting washer (thin).	28B	Adjusting nut.
26S	Water plug washer.	29A	Carrier supporting spring, left hand.
26T	Tension screw handle washer.	29B	Carrier supporting spring, right hand.
26U	Stein washer.	29C	Gib spring.
26X	Roller washer.	29E	Rear cover catch spring.
26Y	Slide lever-pin bushing.	29F	Bottom-pawl spring.
27C	Dead-stop pin.	29G	Bullet-guide spring.
27D	Slide-catch pin.	29H	Upper-pawl spring.
27E	Trigger-pawl pin.	29I	Main spring.
27F	End-link pin.	29K	Safety-sear spring.
27G	Crank pin.	29L	Recoil spring.
27H	Crank-pin fastening pin.	29N	Trigger-lever spring.
27J	Upper-pawl pin.	29P	Trigger-bar spring.
27K	Filling-piece pin.	29Q	Front-cover catch and spring.
27L	Safety-sear pin.	29R	Slide-catch spring.
27M	Trunnion block and outside plate pin.	B1A	Trunnion pin.
27Q	Cartridge guide and stop rivet.	B1B	Trunnion pin collar.
27R	Cartridge guide rivet.	B1C	Trunnion pin adjusting nut.
27S	Spring box rear stud.		

## THE TRIPOD.

[Numbers before components refer to numbers shown on Plates VII and VIII.]

4B	Pivot yoke stop screw.	5D	Elevating nut.
4C	Screw-securing trail key.	5E	Elevating clamp.
4D	Traversing-stop screw.	5F	Elevating pin.
4E	Top-carriage clamp hinge pin.	5K	Elevating pin ring.
4F	Traversing-clamp stop pin.	5L	Elevating pin spring.
4G	Top-carriage clamp stop pin.	5M	Elevating pin securing chain.
4H	Securing-clamp pin.	6A	Pintle.
4J	Side-plate bolt.	6B	Traversing arm.
4K	Elevating-hinge pin.	6C	Pivot yoke.
4L	Stop screw.	6D	Pivot stud.
4M	Elevating-clamp nut.	6G	Traversing pivot.
4N	Nut.	7A	Top carriage.
4P	Trail-clamp nut.	7B	Top carriage clamp link.
4Q	Pivot-stud nut.	7C	Top carriage clamp hinged plate.
4R	Link-stud nut.	7D	Top carriage clamp bushing.
4T	Leg-clamp nut.	7E	Top carriage clamp bolt.
4U	Side-plate bolt nut.	7F	Clamp bolt handle screw eye.
4A	Inner elevating screw.	7G	Top carriage clamp bolt handle.
4B	Outer elevating screw.	7H	Securing chain (short).
4C	Handwheel.	7K	Securing chain (long).

## SERIAL LISTS OF COMPONENT PARTS—continued.

## THE TRIPOD—continued.

7L	Securing chain ring.	120	Side-plate bolt tube.
8A	Traversing arc.	12H	Top-carriage guide, left-hand.
9A	Outer trail tube.	12A	Front leg.
9H	Trail sleeve.	12B	Front shoe.
9C	Trail clamp.	12C	Front leg clamp, right-hand.
9D	Stiffener.	12D	Front leg clamp, left-hand.
9E	Trail shoe.	12E	Link.
9F	Inner trail tube.	12F	Link stud.
10A	Guide and distance piece rivet.	12I	Trail sleeve key.
10B	Socket and adjusting arc rivet.	12K	Leg clip.
10C	Arc and distance piece rivet.	14A	Circular level.
10D	Trail rivet.	14B	Traversing clamp.
10E	Trail rivet.	14C	Traversing-clamp bushing.
10F	Seat-hinge pin.	14D	Traversing-clamp claw.
10G	Front leg clamp plunger.	14E	Traversing-stop plunger.
10H	Hinge-pin washer.	14F	Circular level screw.
10J	Traversing stop spring.	11A	Seat.
10K	Seat packing piece.	11B	Seat-link collar.
10L	Front leg clamp spring.	11C	Seat-sliding collar.
10M	Elevated nut hinge pin key.	11D	Seat link.
10N	Side plate and adjusting arc rivet.	11E	Seat hinge.
10P	Handwheel and outer elevating rivet.	11F	Strap for binding tripod legs.
11A	Traversing stop, left-hand.	11G	Strap plate.
11B	Traversing stop, right-hand.	18A	Segment for adjusting arc, right-hand.
12A	Side plate.	16B	Adjusting arc, right-hand.
12B	Top-carriage guide, right-hand.	16C	Segment for adjusting arc, left-hand.
12C	Socket for trail.	16D	Adjusting arc, left-hand.
12F	Side-plate distance piece.		

## ALPHABETICAL LIST OF COMPONENT PARTS.

## THE GUN.

[Numbers after the components refer to numbers shown on Plates II to V.]

Adjusting nut (28R).	Carrier supporting spring rivet (26L).
Adjusting washer (thick) (29Q).	Cartridge guide and stop (20F).
Adjusting washer (thin) (28H).	Cartridge guide and stop rivet (27Q).
Aperture disc (B2A).	Cartridge guide rivet (27R).
Barrel (9A).	Chain-link rivet (26N).
Barrel disc (20G).	Cover guide, left-hand (18E).
Base spring (B2T).	Cover guide, right-hand (18D).
Bottom and outside plate rivet (26H).	Cover hinge pin (26B).
Bottom and outside plate rivet (26I).	Cover hinge pin nut (28X).
Bottom lever (26D).	Crank (11A).
Bottom lever pin (26A).	Crank pin (27G).
Bottom pawl, left-hand (26A).	Crank-pin fastening pin (27H).
Bottom pawl, right-hand (26B).	Crosshead (11B).
Bottom pawl connecting plate (26C).	Dead stop (12D).
Bottom pawl pin (27X).	Dead-stop bracket (12E).
Bottom pawl rivet (26E).	Dead-stop bracket and outside plate rivet (26K).
Bottom pawl spring (26F).	Dead-stop pin (27C).
Bottom plate (6A).	Distance piece for lock frame (10G).
Bottom plate slide (8B).	Drift slide (B2H).
Bottom plate slide catch (8E).	End link pin (27F).
Bottom plate slide stop (9C).	Eyebolt (26H).
Brush (15G).	Feed box (19A).
Brush holder (15F).	Feed box slide (26E).
Bullet-guide spring (29Q).	Elevating screw (29Q).
Cam, left-hand (5C).	Elevating screw head (B1K).
Cam, right-hand (5D).	Filling piece (13B).
Carrier (14D).	Filling piece pin (27K).
Carrier supporting spring, left-hand (26A).	Firing pin (13E).
Carrier supporting spring, right-hand (26D).	Follower (26K).

## ALPHABETICAL LIST OF COMPONENT PARTS—continued.

## THE GUN—continued.

- Front cover (18A).  
 Front-cover catch (18G).  
 Front-cover catch bracket (18F).  
 Front-cover catch cap (18D).  
 Front-cover catch knob (18C).  
 Front-cover catch and spring (20Q).  
 Front-cover stop (4H).  
 Front disc (26D).  
 Front disc cap (26F).  
 Front plug screw (28D).  
 Front sight (21A).  
 Front sight carrier (21E).  
 Front sight carrier screw (28F).  
 Front sight cover (21D).  
 Fuse (24D).  
 Fuse link (front) (11D).  
 Fuse link (rear) (11C).  
 Fuse rivet (20M).  
 Gibs (14E).  
 Gib spring (28C).  
 Gib spring plate (14F).  
 Half nut (22B).  
 Half nut spring (B2B).  
 Hand rear (13C).  
 Hand rear pin (27V).  
 Handle block (15A).  
 Handle block hinge pin (28A).  
 Handle block oil reservoir (15E).  
 Handle block pin (16K).  
 Handle grip (15B).  
 Base connection screw (28G).  
 Inner steam tube (8D).  
 Leaf (B2X).  
 Leaf joint pin (B2J).  
 Lifting lever, left hand (14C).  
 Lifting lever, right hand (14B).  
 Lock frame (13A).  
 Lock frame rivet (26P).  
 Locking pin (26H).  
 Main spring (20J).  
 Movable base (22A).  
 Movable base stop screw (17E).  
 Movable base trunnion (17F).  
 Muzzle attachment securing chain (25C).  
 Muzzle attachment stop pin (27W).  
 Muzzle gland (25E).  
 Oil reservoir cap (15C).  
 Outer steam tube (8B).  
 Outside plate filling piece (6G).  
 Outside plate, left (5B).  
 Outside plate, right (5A).  
 Pivot (B2B).  
 Pivot spring (B2B).  
 Rear cover (17A).  
 Rear-cover catch (17C).  
 Rear-cover catch hinge pin (28C).  
 Rear-cover catch spring (20E).  
 Recoil plate, left-hand (10A).  
 Recoil plate, right-hand (10B).  
 Recoil spring (20L).  
 Recoil spring hook (24E).  
 Recoil spring nut (24F).  
 Recoil spring tension screw (28J).  
 Reservoir cap washer (15D).  
 Rivet (26F).  
 Rivet (26G).  
 Roller (12F).  
 Roller bracket (6F).  
 Roller handle (12A).  
 Roller handle knob (12C).  
 Roller washer (26X).  
 Safety catch (16C).  
 Safety catch pin (28H).  
 Safety sear (13F).  
 Safety sear pin (27L).  
 Safety sear spring (29K).  
 Screw round head bronze .125x.15 (21F).  
 Screw securing crank handle (28K).  
 Securing chain (8 links) (23K).  
 Securing chain (12 links) (23L).  
 Securing chain ring (25D).  
 Securing S hook (23J).  
 Side lever (14A).  
 Side lever pin (26C).  
 Sleeve (25A).  
 Slide (22E).  
 Slide cap (B2G).  
 Slide cap screw, large (B2E).  
 Slide cap screw, small (B2F).  
 Slide catch head (6D).  
 Slide catch pin (27D).  
 Slide catch spring (20S).  
 Spring box (24A).  
 Spring box fixing, front (24B).  
 Spring box fixing, rear (24C).  
 Spring box front stud (27T).  
 Spring box rear stud (27S).  
 Steam outlet tube (7B).  
 Steam tube front plug (26B).  
 Steam tube plug (8C).  
 Steam tube socket (8E).  
 Stem (23G).  
 Stem covering (23C).  
 Stem washer (26U).  
 Stuffing-box (7D).  
 Tension screw handle (27E).  
 Tension screw handle washer (20T).  
 Thumb piece (16D).  
 Trigger (18F).  
 Trigger bar (17B).  
 Trigger bar spring (20P).  
 Trigger bar spring plunger (28S).  
 Trigger lever (16A).  
 Trigger lever spring (20N).  
 Trigger pawl (16B).  
 Trigger pawl pin (27E).  
 Trigger pin (26D).  
 Trunnion block (4A).  
 Trunnion block and outside plate pin (27M).  
 Trunnion block and outside plate rivet (27Y).  
 Trunnion block distance piece (7C).  
 Trunnion pin (B1A).  
 Trunnion pin adjusting nut (B1C).  
 Trunnion pin collar (B1B).

## ALPHABETICAL LIST OF COMPONENT PARTS—continued.

## THE GUN—continued.

Tumbler (13D).	Water jacket trough (8F).
Tumbler pin (27U).	Water plug (23A).
Upper pawl, left-hand (26H).	Water plug fastening link (23D).
Upper pawl, right-hand (26J).	Water plug fastening ring (23E).
Upper pawl pin (27J).	Water plug top piece (23F).
Upper pawl spring (26H).	Water plug washer (26B).
Upper slide lever (26K).	Windage screw (22C).
Water jacket (8A).	Windage screw collar (22D).
Water jacket cap (7A).	Windage screw knob (22E).
Water jacket cap hose connection (23F).	Windage screw spring (22F).

## THE TRIPOD.

(Numbers after components refer to numbers shown on Pls. VII and VIII.)

Adjusting arc, right hand (16H).	Securing chain (short) (7H).
Adjusting arc, left hand (16D).	Securing chain (long) (7K).
Arc and distance piece rivet (19C).	Securing chain ring (7L).
Circular level (14A).	Securing clamp pin (4H).
Circular level screw (14F).	Segment for adjusting arc R. H. (16A).
Clamp-bolt handle screw eye (7F).	Segment for adjusting arc R. H. (16C).
Elevating clamp (5E).	Side plate (12A).
Elevating clamp nut (4M).	Side plate and adjusting arc rivet (10N).
Elevating hinge pin (4K).	Side plate bolt (4J).
Elevating nut (5D).	Side plate bolt nut (4U).
Elevating nut hinge pin key (10M).	Side plate bolt tube (12G).
Elevating pin (5F).	Side plate distance piece (12F).
Elevating pin ring (5K).	Socket and adjusting arc rivet (10B).
Elevating pin spring (5L).	Socket for trail (12C).
Elevating pin securing chain (5M).	Strap for binding tripod legs (15F).
Front leg (13A).	Strap plate (15G).
Front leg clamp, right hand (13C).	Stop screw (4L).
Front leg clamp, left hand (13D).	Top carriage (7A).
Front leg clamp plunger (10G).	Top carriage clamp bolt (7E).
Front leg clamp spring (10L).	Top carriage clamp bolt handle (7G).
Front shoe (13B).	Top carriage clamp bushing (7D).
Guide and distance piece rivet (10A).	Top carriage guide, right (12B).
Hinge-pin washer (10H).	Top carriage guide, left (12H).
Handwheel (5C).	Top carriage clamp hinged plate (7C).
Handwheel and outer elevating screw rivet (10P).	Top carriage clamp hinge pin (4E).
Inner elevating screw (5A).	Top carriage clamp link (7B).
Inner trail tube (9F).	Top carriage clamp stop pin (4G).
Link (13E).	Trail clamp (9C).
Link stud (13F).	Trail clamp nut (4P).
Link stud nut (4S).	Trail rivet, short (10D).
Nut (4N).	Trail rivet, long (10E).
Outer elevating screw (5B).	Trail shoe (9E).
Outer trail tube (9A).	Trail sleeve (9B).
Pintle (6A).	Trail sleeve key (13J).
Pivot stud (6D).	Traversing arc (8A).
Pivot stud nut (4Q).	Traversing arm (6B).
Pivot yoke (6C).	Traversing clamp (14B).
Pivot yoke stop screw (4B).	Traversing clamp bushing (14C).
Screw securing trail key (4C).	Traversing clamp claw (14D).
Seat (15A).	Traversing clamp stop pin (4F).
Seat hinge (15E).	Traversing pivot (6G).
Seat hinge pin (10F).	Traversing stop, left hand (11A).
Seat link (15D).	Traversing stop, right hand (11B).
Seat link collar (15B).	Traversing stop plunger (14E).
Seat packing piece (10K).	Traversing stop screw (4D).
Seat sliding collar (15C).	Traversing stop spring (10J).

## DETAILED DESCRIPTION OF THE GUN.

The gun consists of the following principal parts: The barrel, trunnion block, water jacket, condensing apparatus, water-jacket cap, steam tube, filling and drain plugs, casing, handle block, recoil mechanism, lock mechanism, firing mechanism, feed box, muzzle attachment, and sights.

## THE BARREL.

The barrel is chambered and rifled the same as the United States magazine rifle. On its exterior, near the muzzle and breech ends, are turned two cylindrical bearings which rest in corresponding supports in the trunnion block and water-jacket cap, and on these bearings the barrel slides back and forth in action. Both bearings are packed with asbestos to prevent water leaking from the water jacket. On the breech end of the barrel are formed two trunnions, by which the two recoil plates are attached to the barrel. The muzzle end is threaded for the barrel disc. To prevent rusting from the water in the water jacket, the exterior of the barrel is copper plated.

## THE TRUNNION BLOCK.

The trunnion block is a steel casting, carrying at its lower end a lug, through which passes the trunnion pin of the tripod. The trunnion pin secures the gun to its mount and forms the axis about which the gun is moved in elevation. The front end of the casting is cylindrical and is threaded to receive the rear end of the water jacket. Under the circular section the steam tube socket furnishes a seat for the rear plug of the inside tube and directly in rear of this circular section the block is rectangular in shape and serves as the front support of the casing inclosing the lock and recoil mechanisms. A horizontal hole is drilled through the rectangular part of the trunnion block and serves as the rear support for the barrel, and back of this in the bottom plate is the opening through which the cartridge cases fall. On the upper right-hand side a hole is drilled and tapped for the filling plug.

## THE WATER JACKET.

The water jacket consists of a piece of drawn-steel tubing threaded on the exterior at each end. The rear end screws in the trunnion block and the front end in the water-jacket cap. Near the front on the bottom a hole is drilled and tapped for the water plug, through which the water in the jacket may be drawn off.

The adjustment of water jacket and trunnion block brings the barrel, when in position, below the center of the water jacket. By this arrangement a sufficient space above the barrel is obtained for

the insertion of a steam exhaust consisting of an inside tube and an outside slide. The inside tube has two holes cut in its upper side, one near each end. A steam vent running down through the water-jacket cap is connected with the inside tube by means of a hole in the front plug. By this arrangement, no matter whether the piece be horizontal or in maximum depression or elevation, steam can always escape, as the outside slide will automatically cover the lower opening in the tube, preventing water from entering it and will leave the other hole open for the passage of steam from the jacket through the tube and water-jacket cap hole to the condensing apparatus. From the arrangement of this tube and slide, if the piece be left horizontal in filling and the stopper closing the steam-escape hole in the water-jacket cap be removed, water will issue from the steam outlet as soon as the water jacket has been filled above the level of the tube. This is an indication that the jacket is sufficiently full of water. Should the stopper not be removed, the jacket may of course be filled up to the level of the filling hole. This will do no harm, but will result, after firing a number of rounds sufficiently to develop steam pressure, in the blowing off of hot water through the water-jacket cap hole which will continue until the level of the water in the jacket has been reduced sufficiently to allow the free escape of steam to the condensing apparatus or to the open air.

#### THE CONDENSING APPARATUS.

This consists of a hose and a water box nearly full of water. In place of a water box, a pail, can, or a hole in the ground that will hold water, may be used. The hose leads from the steam outlet of the water jacket into the water, thereby condensing the steam as it comes in contact with the water.

When a container is used, the condensed steam and water may be returned to the water jacket of the gun and used over again.

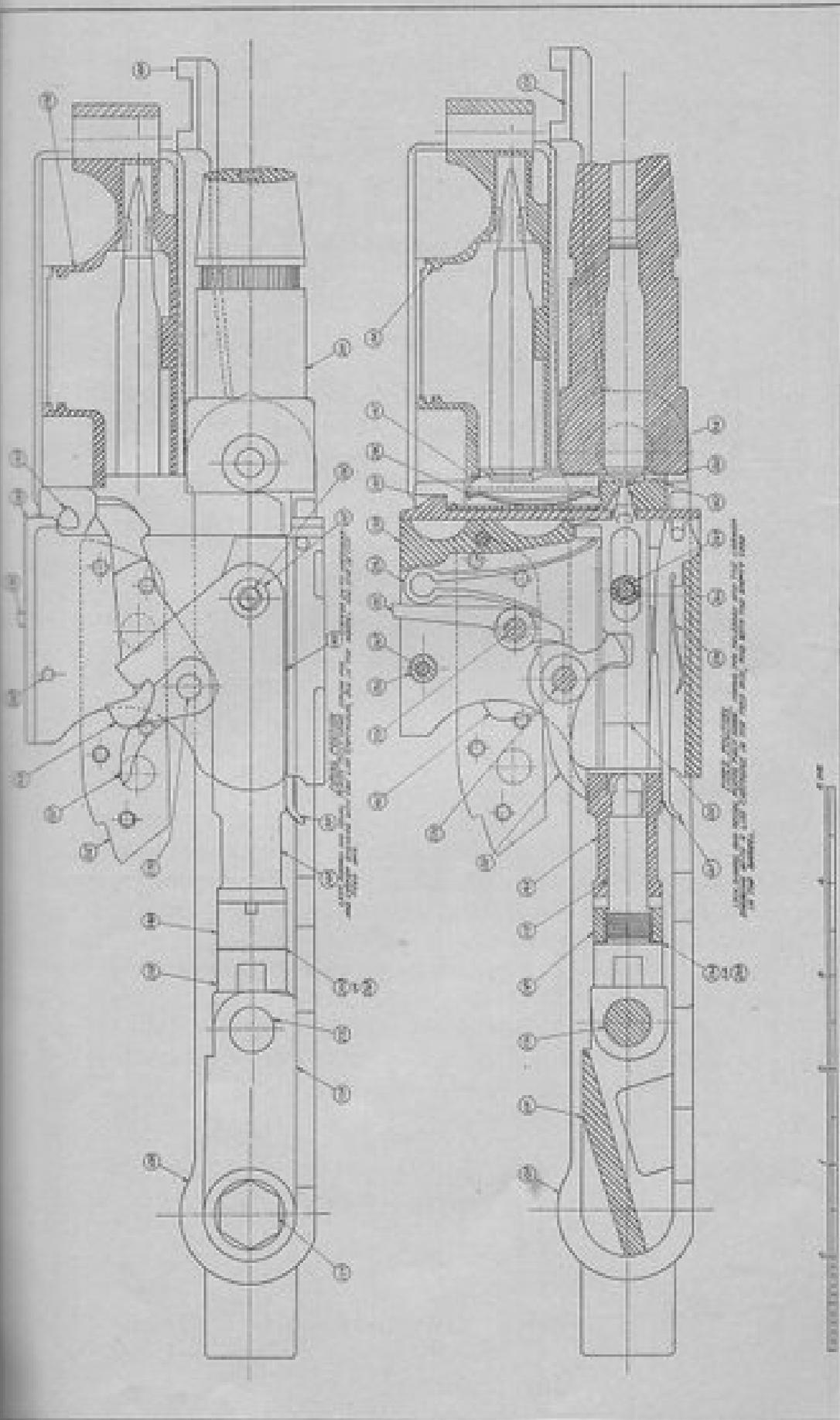
#### THE WATER-JACKET CAP.

The water-jacket cap is a steel casting which screws on the front end of the water jacket. It contains a threaded seat for the stuffing-box follower, which forms the front support for the barrel, and also a threaded seat for the front plug on the inside tube. On the front of the cap is screwed the follower and on top is screwed the front sight. The water-jacket cap tube for the escape of steam, mentioned above, is screwed into the cap and runs from the front plug hole of the inside tube diagonally down to its opening at the under side of the cap. On the top of the cap is stamped the name, model, and serial number of the gun.

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## FILLING PLUG.

The filling plug consists of a water plug, chain, hook, and eyebolt. The water plug screws into a tapped hole in the trunnion block and the construction is such as to allow the easy unscrewing of the plug for insertion of the nozzle of the filling cup. When the nozzle is withdrawn the plug is screwed again into place. The chain, hook, and eyebolt secure the plug to the trunnion block.

## THE CASING.

The casing consists of the right and left outside plates, the bottom plate, slide, and two covers which are all made of steel. The outside plates are slotted to permit the free movement of the projecting parts of the recoil mechanism and to guide them in recoil. They are drilled for the pins and rivets by which they are attached to the handle block, trunnion block, covers, and bottom plate. The bottom plate is a channel cross section, the side flanges providing a support for the outside plates. The space beneath the flanges serves as a seat for the slide. On the underside are the lugs to which the head of the elevating screw is pinned. The covers are hinged to each other and to the side plates, and are held closed by a spring catch at the rear end and a rotating bolt at the front end. On the underside of the rear cover the cover guides are riveted for guiding the carrier in recoil. On top of the rear cover is the rear sight. On the underside of the rear cover the trigger bar is guided in a groove.

## THE HANDLE BLOCK.

The handle block is a steel casting which closes the rear end of the casing and carries the handles by which the gun is held during firing. Between these handles is pivoted the trigger, which consists of a straight lever, on the upper end of which a thumbpiece is riveted. The trigger is pointed to engage the safety catch. The upper end of the trigger engages a projection on a catch which is pivoted between the handles and prevents accidental movement of the trigger. The handle block is pivoted about a bolt passing through its lower end and the two side plates. The upper end is held in place by a T-headed pin passing through it from the left side plate and screwing into the right side plate.

On the inside of the handle block the trigger lever is pivoted, the lower end of which engages a pawl which in turn is pivoted to the trigger. Between the upper end of the trigger lever and the safety catch is a compression spring which keeps these parts in constant contact. The upper end of the trigger lever engages the rear end of the trigger bar between two projections on its lower side.

## THE RECOIL MECHANISM.

The recoil mechanism consists of the recoil plates, crank, roller handle, fusee, crosshead, dead stop, recoil spring, recoil-spring tension screw, and spring box.

The recoil plates are two parallel steel plates which embrace the trunnions of the barrel at their front ends, and at their rear ends include and furnish bearings for the crank. On their inner surfaces are formed guides in which the lock frame slides back and forth in action.

The crank consists of a shaft which extends through the side plates on both sides and carries at its center, between the recoil plates, a slotted arm to which the crosshead is pinned and about which pin the crosshead rotates. Its right end is hexagonal in shape and carries the roller handle secured to it by a pin. On the left end is a short arm called the fusee, to which is pinned the link chain for connecting it to the recoil spring. The crosshead is a short piece pivoted at the rear end to the arm on the crank and secured at its front end to the side levers of the locking mechanism by a bayonet joint. It serves as a link to connect the crank arm with the side levers. On its shank near the center is screwed the adjusting nut. By inserting thin washers between the shoulder on the shank and the nut the position of the side lever with reference to the crosshead can be varied. This causes a change in the location of the lock frame, and by this means an accurate adjustment of the head space required by the cartridges can be obtained. The dead stop is a steel lever pivoted on the right side plate and serves to prevent rebounding of the roller handle. The recoil spring is a helical tension spring inclosed in the spring box attached to the left side plate by means of two small studs in front and one in the rear. The rear end of the spring is held by two short links to the fusee and the front end is secured to the box by means of the tension screw threaded to the recoil-spring nut and passing through a hole in the spring box. The tension of the recoil spring is regulated with the tension screw which is turned by a sliding pin handle.

## THE LOCK MECHANISM.

The lock mechanism is contained between the recoil plates and consists of the lock frame, filling piece, carrier, gib, gib spring, gib-spring plate, side lever and pin, lifting levers, firing pin, mainspring, tumbler and pin, safety sear, pin and spring, and hand sear and pin. All these parts are contained in or assembled to the lock frame. The latter is a steel forging having at its front a narrow vertical face about 3.25 inches long in which are cut the

guide ribs which mount the carrier. The filling piece is located in the center of the narrow vertical face. On the bottom part of the lock frame are formed two horizontal ribs on each side that support the lock in the recoil plates and are the bearings on which it moves during recoil. Above these ribs the frame is slotted out horizontally to form a seat for the firing pin. The top of these ribs forms a seat for the lifting levers.

The carrier has a vertical sliding motion on the front face of the lock frame. Its face is provided with flanges which, with the gib projecting through from the rear, embrace the base of the cartridge case in the operations of withdrawing it from the belt, inserting it in the chamber, and extracting it after firing. Near the bottom a conical hole is drilled to permit the passage of the point of the firing pin.

The side levers consist of a fork-shaped shank, the solid end of which is bored out to fit the crosshead, while each arm of the forked end terminates in a lever extending upward and to the rear. The fork embraces the lock frame, and the piece is pinned to the latter at the front end of the fork.

The lifting levers consist of two plates pivoted near one end on a pin. This pin passes through the rear part of the lock frame, the levers lying outside the frame.

The firing pin is a rectangular-shaped forging, whose front end terminates in a point. On the sides are formed parallel shoulders, by which the pin is supported in the lock frame. The top edge is cut away irregularly, forming a shoulder, against which the mainspring abuts, and also a bearing for the tumbler. The latter, an L-shaped piece, is pivoted to the lock frame at the angle. The shorter arm fits the notch in the upper edge of the firing pin and serves to retract and hold the firing pin in the cocked position. The longer arm is pushed up by the side lever shank as the latter is raised during the recoil, thus forcing the shorter arm to retract and cock the firing pin.

The mainspring is a leaf spring placed vertically in the upper part of the lock frame, the longer end engaging a boss on the firing pin and the shorter abutting against the hand sear. The latter is a straight lever secured near the lower end by a pin passing through the sides of the lock frame, and about which it rotates. The lower end engages a notch on the tumbler, and the upper end fits into the long slot of the trigger bar and is engaged by the front end or shoulder of the slot. In the firing position the side lever shank is horizontal in prolongation of the crosshead. The carrier is therefore dropped to its lowest position by the lifting levers, so that the firing-pin hole is opposite the corresponding hole in the lock frame. Upon firing, the carrier first receives the shock of recoil, distributes it

along its bearing surfaces to the lock frame, which in turn transmits it to the side levers, side lever shank, crosshead, crank, recoil plates, fusee, and finally through the recoil spring to the casing and mount.

#### THE FIRING MECHANISM.

The firing mechanism consists of the trigger, safety catch, trigger bar, and trigger-lever spring. As described above, the trigger is a straight lever secured near its lower end to the handle block by a pin, about which it rotates. The upper end engages the safety catch, which holds it to the rear until it is released by lifting the catch and is pressed in. The trigger bar is a long, narrow plate lying in the channel of the rear cover plate. It contains one long slot. The trigger-lever spring is a small helical spring mounted on a stud in the front face of the safety catch and tends to separate the trigger and trigger lever. It presses the upper part of the trigger to the rear, so that the trigger bar can move forward under the action of the mainspring transmitted through the hand sear and permit the latter to engage the shoulder on the tumbler when the piece is cocked. In continuous firing, as the trigger bar is held back by the trigger, the hand sear will always be pulled before the safety sear is raised, so that the raising of the safety sear fires the piece.

#### THE FEED BOX.

The feed box is a hollow steel casting extending transversely through the casing near its forward end. On the right side it projects beyond the casing, and its lower edge is curved to facilitate the feeding of the cartridge belt. On the front edge of the feed box a vertical bearing is provided in which is seated the arbor of the bottom lever. At the end of the lower lever is a stud which engages in a slot near the front end of the left recoil plate. In the end of the upper lever is a stud which takes a slot on the top of the feed-box slide. The feed-box slide is a flat steel plate seated in grooves in the feed-box casting, which permit it to have a transverse movement. At its right-hand end, on the underside, are formed two lugs. These lugs are drilled for the upper pawl pin, which serves as an arbor for the upper pawls. The long arms of the pawls are pressed downward by a double leaf spring consisting of two parallel leaves joined at the base and secured to the underside of the slide by an undercut lip.

Beneath the curved lower edge of the right-hand end of the feed box are formed two lugs drilled to take the bottom pawl pin. The bottom pawls are mounted on this pin as an arbor, their long arms

projecting through slots in the bottom of the feed box. The shorter arms are slotted at the end, in which a finger plate connecting the two arms is riveted for easy manipulation by the fingers. The pawls are kept in position by a peculiar shaped double leaf spring mounted at the center of the pawl pin.

The action of the feed box is as follows: During the recoil of the parts the slot near the front end of the left recoil plate pulls the stud on the end of the lower lever to the rear. This causes a counter-clockwise revolution of the vertical arbor of the levers, resulting in throwing of the feed-box slide from left to right by the upper arm, so that the pawls on the underside of the slide are pushed back and engage in rear of the next cartridge in the belt. During the counterrecoil the movement is reversed, resulting in the feeding of the next round in the belt to the position for engagement with the carrier grooves. The under pawls prevent the movement of the belt from left to right unless depressed from beneath by hand.

#### THE MUZZLE ATTACHMENT.

The muzzle attachment consists of the follower, barrel disc, front disc, disc cap, and sleeve, which are steel forgings whose functions are to regulate the effect of recoil on the system. The barrel disc consists of a hub which screws on the muzzle of the barrel and carries a disc concaved to the front. The follower is secured to the water-jacket cap by a screw thread. Through the front disc a hole is drilled just large enough to permit passage of the bullet, while the sides of the sleeve are cut away as much as possible to allow free escape of the powder gas. The front disc cap can easily be removed when heavily coated with the products of combustion by unscrewing the front disc and prying it out, after which a new cap may be inserted.

#### SIGHTS.

The front sight, complete, is composed of the front sight, front-sight carrier, and front-sight carrier screw.

The front sight is a forged-steel piece dovetailed into the front-sight carrier, thus allowing lateral adjustment of the sight. It is protected by the front-sight cover.

The rear-sight group is made up of the following principal parts: The movable base, the base spring, the leaf, the elevating screw, the slide, the half nut, the slide cap, the drift slide, the aperture disc, and the windage screw.

The movable base has on its upper surface two ears, in which are the holes for the joint pin which serves as a hinge for the leaf. On the rear end of the movable base are the wind-gauge graduations, each point of which corresponds to a lateral deviation of 4 inches for

each 100 yards. Both ends have lips which fit the undercut of the fixed base, the front lip having also a worm gear for engaging the thread of the windage screw. The base spring fits in the spring seat of the movable base.

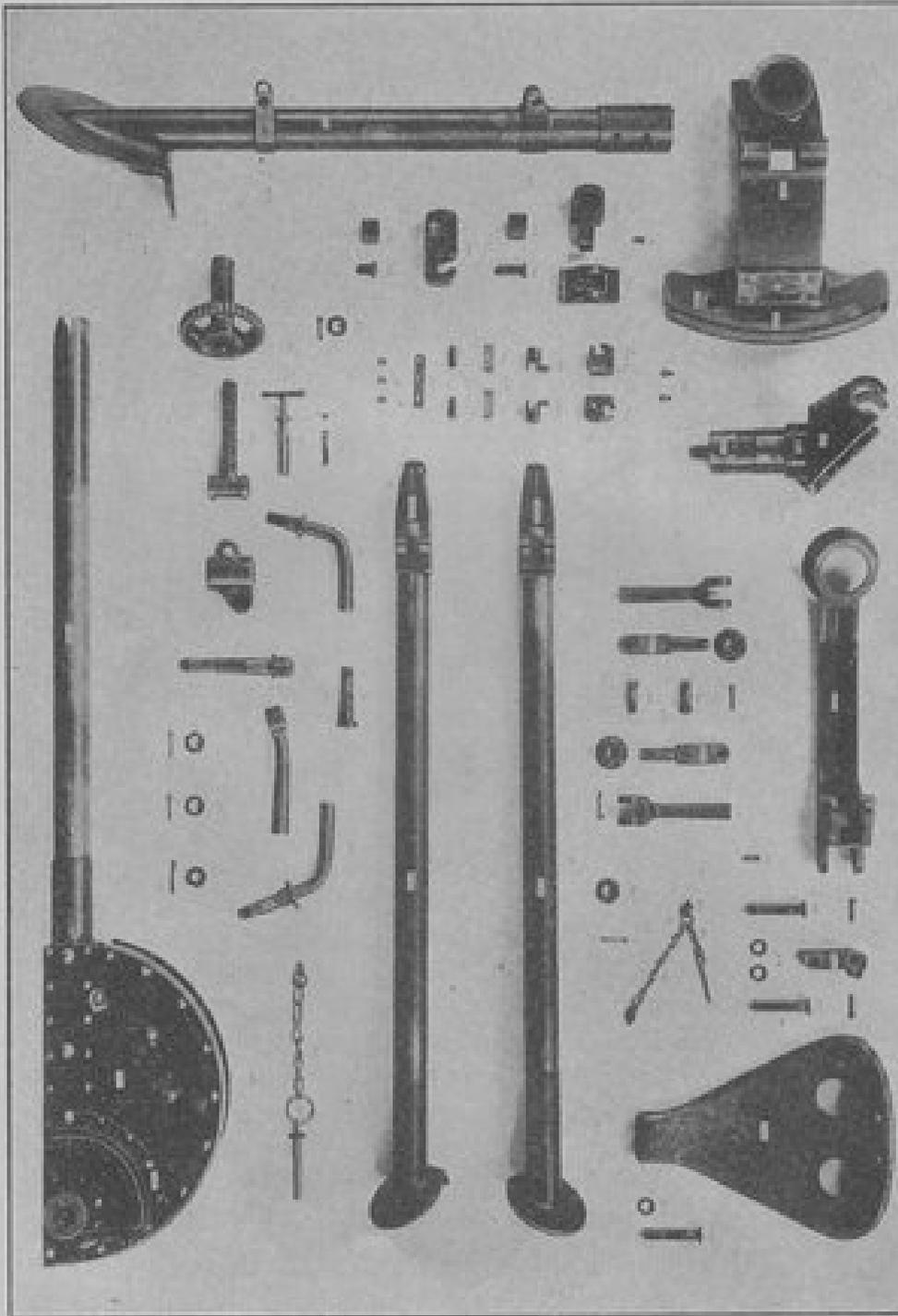
The rear face of the leaf is graduated from 100 to 2,600 yards and its right edge is graduated in mils. On the right side of the sighting opening in the leaf is the groove and seat for the elevating screw, which is a long, thin screw, extending from the bottom of the sighting opening to the top of the leaf, where it is secured in the elevating screw head by the elevating screw pin. This elevating screw allows minute corrections for elevation and also holds the slide in position on the leaf by means of a half nut which is seated in the slide and the half-nut spring, the latter forcing the half nut against the thread on the elevating screw. The pitch of the screw is such that one complete turn corresponds to a change of one mil. The outer end of this half nut is knurled, and by pressing in on the knurled head the half nut can be released from the elevating screw and the slide quickly raised or lowered.

The rear face of the slide is cut out for the leaf, and the drift slide and the right half are made with a seat for the half-nut spring and the half nut. The right and left ends are drilled and tapped for the small slide-cap screw and the large slide-cap screw, which secure the slide cap to the slide. The front face of the slide is slotted and recessed for the pivot.

The slide cap has a circular cut in its upper surface which forms a recess for rotating the aperture disc, and also apertures for sighting and for reading the graduation on the leaf. The center is slotted for the pivot. On the right and left sides are drilled the holes for the small and large slide-cap screws. On the rear face at the bottom of the slide cap is the open or battle sight.

The drift slide moves in the drift slots in the leaf. At the top is a small open sight, while just below are two openings, the upper for the pivot and circular lug on the aperture disc and the lower for a sighting aperture. The drift slide is held in place by a lug on its front face, which bears against the slide and by the lug which contains the open sight. This latter lug extends to the rear and bears against the top of the slide cap. On the lower edge of the open-sight lug is another small lug, which engages in the notches on the perimeter of the aperture disc, locking the latter in the desired position.

The aperture disc is a circular piece containing five sight openings, viz, four peepholes, 0.04, 0.06, 0.08, and 0.10 inch in diameter, and one large aperture which contains an open sight. A circular lug on the front face engages in the central opening of the drift slide, thus causing the aperture disc to conform to the movement of the



COMPONENT PARTS OF TRIPOD.

former. This lug is drilled and tapped for the pivot spring and the pivot. The purpose of the pivot spring is to force the aperture disc to the rear, so that one of the notches, which are cut on its perimeter, will engage in the small lug on the drift slide and prevent rotation. By pressing inward, the aperture disc can be released and rotated until the desired aperture is opposite the sighting opening in the drift slide.

The windage screw consists of the windage screw, the windage screw knob, the windage screw collar, the windage screw spring, and the windage screw pin. It is seated in the front part of the fixed base.

#### DESCRIPTION OF THE TRIPOD.

[Plates VII and VIII.]

The tripod consists of the following principal parts: Front legs, trail, seat and seat bracket, pintle and pivot, top carriage, body, traversing mechanism and elevating mechanism.

#### THE FRONT LEGS.

The front legs consist each of a short length of drawn steel tubing carrying at the upper end the link by which it is attached to the adjusting arc and at the lower end a flattened shoe. One end of the link is turned to fit snugly in the bore of the tubing and riveted thereto in two places. The upper end of the link terminates in three teeth, which fit into a circular rack when adjusted for firing. When it is desired to fold the tripod for transportation or to extend the front legs forward in carrying by hand, the slot in the link permits the clamp to be loosened from its seat on the drum and the teeth to be disengaged from the adjusting arc, swung around, reengaged, and clamped.

#### THE TRAIL.

The trail consists of two lengths of steel tubing, called the outer and inner trail tubes. The inner tube fits into and is riveted to a socket, which is also riveted between two semicircular side plates, and at its front end carries two adjusting arcs for the front legs. The outer trail tube forms the trail clamp and holds the attachment for the seat.

The inner tube is turned to fit closely the bore of the outer tube, in which it has a sliding motion. This motion may be stopped and the inner tube clamped in any position by means of the trail clamp which is riveted to the top end of the outer tube. The sleeve is split for a short distance back from the end, so that by tightening the clamp the lugs are brought nearer together and the inner tube firmly gripped.

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The key inserted in the trail sleeve works in a longitudinal slot cut in the surface of the inner tube on the underside and prevents the tube from turning. To the rear end of the outer tube is attached a shoe similar to those on the front legs. This construction of the trail permits adjustment of its length to uneven surfaces and shortening to a minimum length for transportation.

#### THE SEAT.

The seat is of sheet steel pressed to shape. Its front end is pivoted to fit the seat sliding collar which slides on the trail outer tube. The rear end is pivoted to the seat link, which in turn is pivoted to the seat link collar attached to the outer trail tube.

The seat link collar is of steel and riveted near the end of the outer tube. On the underside of the seat are two lugs of the hinge drilled and riveted to it, the action of which is described below. For transportation the seat slides forward by means of the seat sliding collar to which it is pivoted. The rear of the seat folds down close to the trail and the top of the seat link rests on the trail. In action the seat is slid backward and automatically stops by the contact of the seat link with the seat link collar.

#### THE PINTLE.

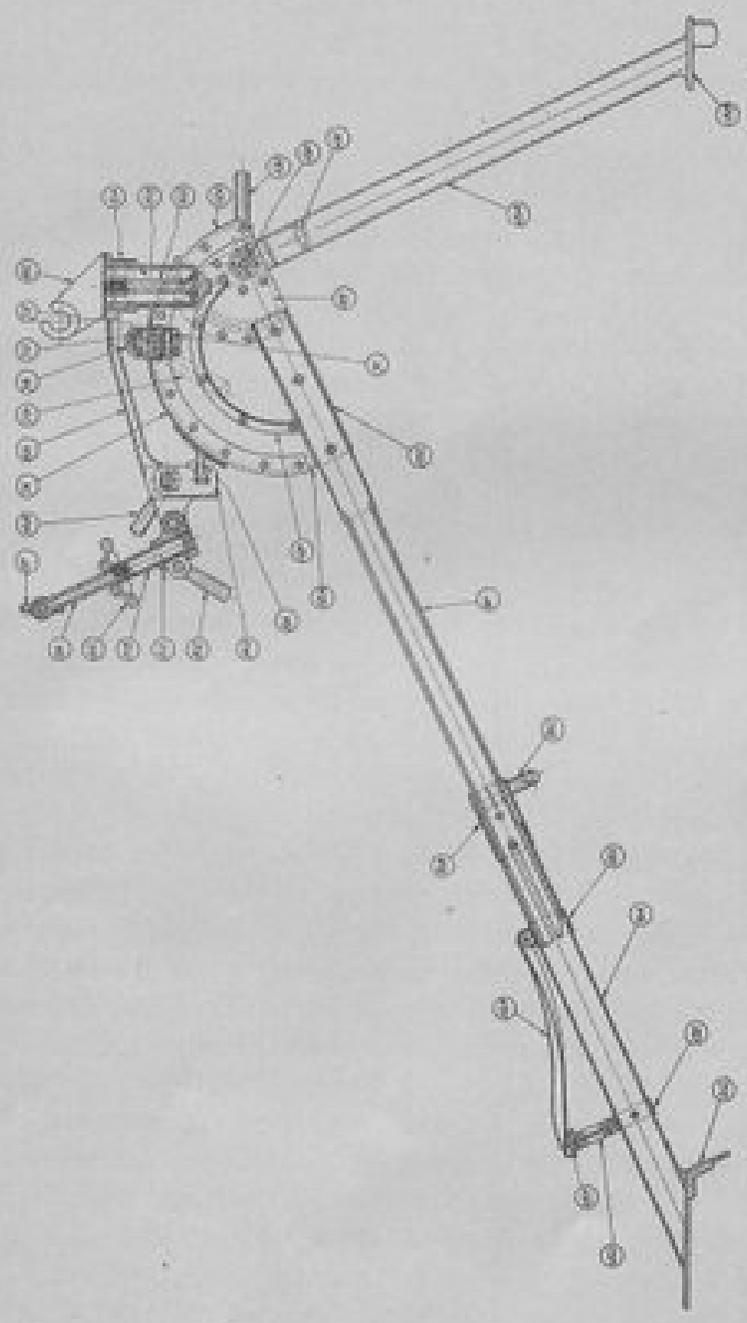
The pintle is a hollow steel forging which furnishes the points of attachment for the legs and trail, the pivot for transverse movement of the gun and top carriage, and the seat for the traversing arc.

In the rear of this casting are machined two surfaces inclining outward to which the traversing arm is riveted. The upper end is turned to form a bearing for the top carriage, traversing pivot, and pivot yoke. The rear end of the traversing arm furnishes pivot bearings for the elevating nut, while on the underside is the clamp for the traversing arc, the rear edge of which is turned to an arc struck from the center of the pintle axis and fits into a corresponding groove in the rear of the traversing arm, thus preventing the latter from jumping. The top surface of this seat is machined to form a flat bearing surface for the rear ends of both the top carriage and the traversing arm.

The top and front of the pintle is turned to form a vertical bearing for the top carriage and traversing arm. The upper part of the pintle forms a bearing for the pivot yoke.

#### THE TOP CARRIAGE.

The top carriage is a steel forging consisting of a hub bored out to fit over the pintle and an arm projecting downward and to the rear, to which the traversing arc is riveted. This arm is also gibbed to the



CONVENTIONAL VIEW

1978-17-5

top carriage guide by means of the groove engaging the circular lip on the latter. On top of the hub is the pivot yoke drilled and slotted transversely for the trunnion pin. The gun rests between the cheeks of this yoke supported by and rotating on the trunnion pin. One end of this pin is bent to a sharp angle to form a handle, while the other is threaded to receive the adjusting nut. The cheeks of the pivot yoke are reamed out and slotted to the size of the ends of the pin. On mounting the gun the pin is dropped through the slots of the pivot yoke and secured by rotating the handle, thereby tightening the cam.

The web at the rear of the top carriage is cut away just in rear of the hub for the top carriage clamp link, and a hole is drilled through the horizontal web for the top carriage clamp bolt, the head of which is fitted with a lever handle. The eccentric portion of the clamp bolt is fitted with a bushing into a link connecting to a hinged plate. By rotating the clamp bolt this plate is raised to engage the notches under the top carriage guide, thereby locking the top carriage to the body.

#### THE BODY.

The body consists of the side plates, top carriage guides, socket for trail side plate distance piece, and adjusting arcs of the front legs.

#### THE TRAVERSING MECHANISM.

The traversing pivot is drilled for the passage of the pivot stud and counterbored slightly as a seat for the shoulder on it.

The traversing arm is a steel casting to one end of which is riveted the pintle and rests upon the shoulder formed at the base of the latter. Slightly in rear of this bearing a curved slot is cut, through which the traversing arc passes, and in rear of this slot the arm is bent downward. At the rear end is formed a yoke in which is pivoted the elevating nut.

In front of the elevating nut is fitted the traversing clamp, which consists of a claw, a bushing, and clamp handle. By swinging the handle one way or the other the claw engages the under surface of the traversing arc, thereby clamping the arm stationary with the traversing arc.

On each side of the traversing arm a traversing stop is fitted to the traversing arc. This stop is fitted with a plunger, a spring and a screw and hooks over the rear of the traversing arc. On the plunger are found teeth to engage the teeth formed under the edge of the traversing arc. By pinching this stop between the thumb and forefinger of either hand it may be disengaged and set at any desired position on the traversing arc. When these stops are placed on the extreme ends of the traversing arc, the traversing arm may be swung  $22\frac{1}{2}^{\circ}$  either side of center. By releasing the elevating gear an all round training may be obtained but without any clamp.

## THE ELEVATING MECHANISM.

The elevating mechanism consists principally of the outer elevating screw, the inner elevating screw, the elevating nut, handwheel, the elevating clamp, the elevating hinge pin, and the elevating pin.

The outer elevating screw is a steel cylinder, on which is screwed at the upper end the handwheel, with six knobs, with which the screw can be turned by hand. A right-hand screw thread is cut on the exterior of the body and a left-hand thread is cut for a short distance on the interior of the body. The remainder of the bore is reamed out to a diameter large enough to clear the inner screw when in place.

The inner elevating screw is a steel forging, at the upper end of which a T-shaped head is formed, which is drilled transversely. This head fits between lugs on the bottom plate of the gun and is secured to them by the elevating pin. The pin has a spring at one end which is held in place by riveting.

On the body of the screw is cut a left-hand thread corresponding to that on the interior of the outer screw. The lower end is drilled and tapped longitudinally for a stop screw, which, by closing the end of the thread, limits the upward movement of the inner screw when it comes in contact with the bottom of the interior thread in the outer. The elevating nut is a long nut, carrying at its lower end a lug drilled to take the elevating hinge pin by which it is hinged to the top carriage and at its upper end a second lug for the elevating clamp. The bore of the nut is threaded for the outer elevating screw for its whole length. The threaded part is slotted longitudinally through the center of the clamp lug. One side of the latter is reamed to take the body of the clamp and the other is threaded. The clamp itself consists of a bent handle and a body partly smooth and partly threaded. It is inserted through the reamed portion of the lug on the nut and screws through the threaded portion, being kept in place by a collar and pin on the projecting end. By screwing in the clamp still farther the two portions of the lug are brought closer together, thus causing the nut to grip the outer elevating screw tightly and prevent any movement of the latter.

As the inner elevating screw is prevented from turning by its attachment to the gun and the elevating nut likewise by its attachment to the carriage, it follows that rotation of the outer screw will cause it to move either up or down in the nut and at the same time force the inner screw in the same direction. The elevating mechanism gives a range in elevation of  $16^{\circ}$ .

By disengaging the T-head of elevating screw from the bottom cover plate the gun may be swung around a complete circle. By swinging it around  $180^{\circ}$  the gun may be elevated to  $75^{\circ}$ , but without any elevating clamp.

## DISMOUNTING AND ASSEMBLING THE GUN.

## TO DISMOUNT THE GUN.

The gun can be dismounted best when in position on the tripod.

(1) *Raise the covers.*—The rear cover by lifting the rear catch and continuing the upward movement.

The front cover by rotating the catch halfway around and lifting the cover.

Both covers by withdrawing the hinge pin.

(2) *Remove the spring box.*—To do this take it firmly by both hands, the right hand near the rear and the left near the front of the box. Push the box forward until the three hooks are clear of the fastening studs. Then gradually allow the box to come to the rear, thus relieving the tension of the recoil spring. Turn the box slightly with the left hand until the fingers of the right hand can reach the fusee links and release the recoil spring from the securing pin.

(3) *Remove the lock.*—Pull the roller handle as far backward as possible with the right hand. Grasp the carrier and lock frame with the left hand. Rotate the handle slowly to the front with the right hand and at the same time lift the lock frame upward and to the rear until the face of the carrier is at an angle of  $45^{\circ}$  to the horizontal. Continue to revolve the handle to the front and lift the carrier and lock frame upward and backward until free from the casing. Rotate the lock frame about  $60^{\circ}$ , thus opening the bayonet joint connecting it with the crosshead. The lock can then be lifted free.

*In view of the fact that the gun is expensive and that the lock is such an important part thereof and offers such difficulties in assembling, it should not be disassembled and assembled except under the direct supervision of an officer or noncommissioned officer especially selected and carefully instructed in the care and operation of the gun and its parts.*

*To disassemble the lock.*—With the special punch or the handle block pin remove the lock from the gun, and the handle block, press out the side-lever pin and side-lever pin bushing, remove the side lever, lifting levers, and slide off the carrier. Press the safety sear down and fire the lock; then press out the tumbler pin and remove the tumbler, press out the hand-sear pin and remove the hand sear and the main spring; press the safety sear down and shake out the firing pin, then raise the safety sear, unhook the same and remove it. Push out the gib-spring plate on the carrier and remove the gib spring and the gib.

*To assemble the lock.*—Insert the gib and its spring in the carrier and slide on the gib-spring plate. Slide the carrier on to the lock

frame, insert the safety sear and the firing pin, place the tumbler and its pin; place the hand sear and its pin, and put on the lifting levers. Put on the side levers and secure them with their pin, then ease the firing pin right forward, insert the main spring and push it into place.

(4) *Remove the feed box.*—Insert the fingers of both hands in the belt openings of the box and lift the feed box vertically out of the outside plates.

*To disassemble the feed box.*—With the special punch or the handle-block pin remove the bottom lever pin from the bottom lever and remove the bottom lever.

Remove feed-box slide, pull off the upper pawls and remove upper-pawl spring.

Pull out axis pin for bottom pawls and then take out bottom pawls and spring.

*To assemble the feed box.*—Reverse the foregoing operations.

(5) *Remove the handle block.*—Withdraw the handle-block pin by unscrewing from right plate; then the block can be swung back.

(6) *Remove the trigger bar.*—Remove the rear cover catch by unscrewing its pivot pin. The trigger bar may then be drawn with its spring out to the rear. This does not ordinarily need to be removed.

(7) *Remove the muzzle attachment.*—Remove the front disk by unscrewing with a spanner wrench. Remove the sleeve by pulling out its fastening spring pin. Rotate the sleeve about 60° and pull forward. Remove the barrel disk by unscrewing. Remove the follower by unscrewing<sup>2</sup> with a spanner from the face of water-jacket cap.

*For ordinary cleaning of the gun, no more dismounting is necessary.* As the recoil spring has been released, the barrel and parts connected with it may be pushed forward and back a slight amount, sufficient for cleaning and oiling.

(9) *Remove the barrel and recoil plates and parts connected with them.*—Unscrew the barrel disc from the barrel. This leaves the barrel, recoil plates, roller handle, crank, crosshead, etc., free to be drawn straight to the rear and removed from the casing. Care must be observed in the withdrawal or insertion of the barrel while the muzzle end is passing through the sliding seats and packing.

(10) *Remove the recoil plates from the barrel.*—With the barrel and recoil plates removed from the casing, remove the fusee and the crank, and the right and left recoil plates are then free to be removed from the trunnions of the barrel.

The water jacket, trunnion block, water-jacket cap, outside plates, bottom plate, front sight, rear sight, steam-escape system, front plug, and set screw are not to be separated.

## TO ASSEMBLE THE GUN.

1. Assemble the barrel and recoil plates and bind them together by inserting and locking the fusee to the crank.
2. Insert the barrel and recoil plates in the casing. Push forward slowly until the muzzle end of the barrel is seen approaching the water-jacket cap. If the top of the left-hand recoil plate is kept level with the bottom of the feed-box cavity in the casing, the barrel will enter its bearing in the water-jacket cap without trouble. Push the barrel as far to the front as it will go and screw in the follower.
3. Screw on the barrel disc.
4. Insert the sleeve and front disc, revolve  $60^{\circ}$  to the right, and secure with the split pin.
5. Insert the right and left crank-slot filler pieces.
6. Insert the feed box.
7. Raise the handle block and lock it with the handle-block pin.
8. Hook the recoil spring to the fusee links and replace the spring box.
9. Insert the lock.
10. Close the covers.
11. Throw the roller handle backward a couple of times and allow it to snap forward to be sure that all is properly together. Also test the trigger action.

## TO TEST THE WEIGHT OF THE RECOIL SPRING AS MEASURED ON THE ROLLER HANDLE.

Weigh the recoil spring with the spring balance, proceeding as follows: First, open the rear cover and remove the lock, then place the loop of the spring balance upon the knob of the roller handle and pull vertically upward; the reading indicated when the roller handle commences to move will be the weight of the recoil spring as measured on the roller handle. This should be between 7 and 8 pounds.

## TO REPLACE FEED BOXES.

Revolve the cover catch upward and raise the front cover as far as possible. Insert the fingers of both hands in the belt openings of the box and lift the feed box vertically out of the outside plates. Take the spare feed box in the same manner and entering it carefully, press it down gently until seated. Close and latch the cover.

## TO REPLACE LOCKS.

Raise the rear cover as before. Pull the roller handle as far backward as possible with the right hand and hold it in that position. With the thumb and forefinger of the left hand grasp the carrier and lock frame. Then allow the roller handle to come slowly forward,

and at the same time lift the carrier and lock frame upward and to the rear until the face of the carrier is at an angle of about  $45^{\circ}$  to the horizontal. Continue to revolve the roller handle forward and lift the carrier and lock frame upward and backward until free from the casing. Hold the roller handle and rotate the lock frame about  $60^{\circ}$ , thus opening the bayonet joint connecting it with the crosshead. The lock can then be lifted free.

Raise the shank of the crosshead to a vertical position, insert it in the end of the side lever on the lock, and turn until the bayonet joint is engaged. Holding the spare lock frame and carrier with the left hand, the carrier inclining  $45^{\circ}$  to the front, rotate the roller handle slowly backward allowing the lock to settle gradually into place. Release the roller handle, close, and latch the cover.

#### OPERATING THE GUN.

##### PREPARING THE GUN FOR FIRING.

1. Remove the gun and tripod from pack.
2. Set up the tripod and secure the gun to the top carriage of the tripod and connect the elevating mechanism to the gun.
3. Fill the water jacket. To do this, bring the gun to a horizontal position and remove the filling-hole plug. *Take water as free from sediment as possible* (as grit will wear copper plating off of the barrel and allow it to rust), and, using the filling cup, insert its nozzle into the filling cavity. Fill until the water runs out of the water-jacket cap steam escape hole, when the jacket will be sufficiently filled. Replace the filling plug.
4. Adjust the sight as required.
5. Insert a loaded belt from the right through the feed-box opening, bullets to the front, and pull the belt by hand through from right to left. As the parts have not yet operated by the recoil, it is necessary to pull the belt to the left as far as it will go and then to hold it in that position while the roller handle is twice thrown backward and allowed to spring forward. The reason for this is that in inserting the belt before firing the leading cartridge can not be pulled fully into place, as the carrier is still in the way. By keeping up the pull on the belt and at the same time throwing the roller handle backward and allowing it to come forward once the carrier is withdrawn, the leading cartridge is moved up to the position in which the carrier may take it, and the carrier at the end of the regular cycle of movements rises and engages the base of the cartridge. During the second cycle, if the belt is still kept pulled to the left the leading cartridge will be introduced into the chamber

and the second cartridge engaged by the carrier. If the belt is not kept pulled during the second movement of the roller handle, only one cartridge will be engaged by the carrier, viz, that in the chamber. If it be desired to fire only single rounds, therefore, do not pull the belt during the second movement of the roller handle.

#### FIRING.

1. Set the rear sight for range and windage.
2. Elevate or depress the gun to the proper elevation and lock the outer elevating screw by turning the elevating clamp screw tight.
3. Fire the gun by pressing the thumbs against the knurled surface on the trigger, and at the same time pulling backward the safety catch with the finger. This releases the trigger bar and the piece is fired.

#### PREPARING THE GUN FOR PACKING.

1. Remove the cartridge belt. If the trigger is released while unfired cartridges still remain in the belt, the mechanism is left with one unfired cartridge in the chamber, one unfired cartridge in the belt which the carrier has already engaged, and one cartridge in the belt next to that referred to above engaged by the lower feed-box pawls. The remaining cartridges in the belt are free of the mechanism.

To withdraw the belt, therefore, the following operations must be performed: Throw the roller handle to the rear and allow it to spring forward twice. During these movements *do not press the trigger or pull the belt through the gun*. The belt will be held from slipping back by the bottom feed-box pawls. The first throw of the roller handle will withdraw the cartridge in the belt engaged by the carrier out of the belt and that in the chamber out of the chamber, and will insert the first in the chamber and the latter will drop out. The carrier rising at the end of the first throw will not engage a new cartridge, as no recoil has occurred and the pawls have not fed the belt forward. The second throw withdraws the cartridge from the chamber and drops it. The carrier now being free of cartridges, release the bottom pawls by pressing on the bar connecting the pawls under the right-hand side of the feed box. The belt may now be withdrawn by pulling from *left to right* out of the feed box.

2. Lower the rear sight.
3. Let the water out of the water jacket. To do this, depress the gun to maximum depression and remove the water plug on the underside of the jacket. The water can then be drained from the jacket.
4. Loosen the trunnion pin and remove the elevating pin.
5. Remove the gun from the tripod and place both in position on packs.

## POINTS TO BE ATTENDED TO DURING FIRING.

- (a) Keep the hand clear of the crank handle to avoid injury.
- (b) See that a sufficient supply of water is kept in the water jacket so that the barrel shall never be uncovered.
- (c) That the belt is on no account pulled when the gun is firing.
- (d) That the belts are refilled without delay and the boxes replaced.
- (e) The men working the gun should keep under cover.
- (f) Should it be necessary to take up a fresh position quickly, remove the feed box and partly used belt from the gun and stow away.
- (g) During a temporary cessation of fire it would be advisable to remove a partly used belt and replace it by a full one.
- (h) In action, if required to remove the belt in a hurry from the feed block, time would be saved by cutting off the empty portion.

## POINTS TO BE ATTENDED TO AFTER FIRING.

- (a) Unload the gun.
  - (b) That the barrel is cleaned out and oiled immediately after firing to prevent erosion.
  - (c) That the mainspring is released.
  - (d) That before moving the gun is securely fixed by clamping the elevating and traversing gears.
  - (e) That the lock is taken out and the carrier, firing pin, and springs are examined to see that they are not damaged.
- (N. B.—It will not be necessary to strip the lock for this.)

## DIRECTIONS FOR RECOMMENCING FIRING PROMPTLY AFTER THE OCCURRENCE OF A STOPPAGE.

The following system is based on the fact that the Vickers machine gun, model of 1915, has the advantage of having all its mechanism contained in two principal components, namely, the feed box and the lock.

It is to be assumed that besides the man firing there are two gunners, one on the right and the other on the left. It is also assumed that the spare feed box and spare lock are available.

When a stoppage occurs it is not always necessary for the firer to know the actual cause; it is sufficient that he should know which of the two components is responsible for the stop, so that he can replace it at once by the spare, and immediately resume firing.

In order to divide the work, it must be arranged that the gunner on the right has the duty of changing the feed box. He should keep the spare feed box, with the ammunition belt already introduced, in readiness and should see that the belt is properly inserted and that the cartridge is properly fed up, so as to be presented fairly to the carrier. He should also be careful to see that the bottom lever is in the correct position to allow the feed box to be correctly inserted in the gun.

The gunner on the left should be ready to give the firer the spare lock, the screw driver, defective cartridge extractor, the oil can, and the cleaning rod. When he receives the faulty lock from the firer his first duty is to put it in order. He should remove any cartridge that may be in the carrier, examine the firing pin, main spring, safety sear, safety-sear spring, carrier gib, gib spring, and lifting levers, stripping the lock if necessary.

If during the firing a stoppage occurs and the roller handle is not down on the dead stop, the firer should try, in the first place, to press down the roller handle. If he can do this correctly everything is in order for continuing firing. He should be careful when pressing down the handle to do it by means of a glancing blow rather than by direct pressure, so that his hand may not be injured should the gun be accidentally fired. If, however, he can not press down the handle, he should try to turn the handle in the other direction, so as to draw back the lock; if he can do this, he should then pull the ammunition belt from right to left so as to feed up a fresh cartridge, then let go the handle and resume firing. If, however, he can not turn the handle so as to draw back the lock, it is probable that a cartridge case has separated and that the front part is fixed on the following cartridge. He should then open the rear cover, and the gunner at the left should then with his screw driver force the cartridge out of the carrier, while the firer turns the handle to draw back the lock. Once the cartridge is clear, the firer should let go the handle, and if it flies back correctly into position, all is clear for resuming firing; but should it be seen that there had been in the carrier the base of a broken cartridge case and that the front portion was not fixed on the succeeding cartridge, then the front part must be left in the chamber and will have to be removed by the defective-cartridge extractor. If the firer finds that he can not push down the handle so as to send home the lock correctly, and if on opening the front cover he sees there is not a broken cartridge case in the carrier, then he should try first to lift out the feed box. If he finds that the feed box is jammed and consequently difficult to remove, he should lift it out by force with its belt complete and replace it by the spare box complete with another belt, and then at once resume the firing. If he finds, however, that the feed box is quite

clear and correct, it is evident that the cause of the stoppage is not there. He should then replace the feed box and press down the carrier, while turning the handle. He should first examine the muzzle attachment with its packing gland, taking care to cool off the sleeve and barrel disk, if possible, by throwing some cold water over them. The water jacket should next be examined to see that it contains sufficient water to well cover the breech end of the barrel.

After this he should pay attention to the following points:

- (a) That the recoiling parts are well lubricated.
- (b) That the recoil spring is neither too heavy nor too light.
- (c) That the cartridge chamber and bore are clear.
- (d) That both the front and rear covers are properly closed.
- (e) That the bottom plate slide is completely opened so as to allow the empty cartridges to fall out.
- (f) That the gun itself has not been hit by bullets or splinters of shell.

The particulars detailed above are comparatively simple and with proper practice the firer will be able to resume firing with but little difficulty and in a minimum of time should any stoppage accidentally occur.

#### CLEANING AND CARE OF THE GUN.

In order that the gun may work smoothly, it is necessary that it be thoroughly cleaned and oiled after firing. All traces of fouling from the powder gases should be removed from those parts exposed to them. This is especially true of an automatic gun of this type. The lock and the feed box should be removed immediately and thoroughly cleaned and oiled. Warm water, with bicarbonate of soda in solution, will aid considerably in removing the fouling. The small pieces of brass, due to the shearing of the cartridge cases on the carrier, should be carefully removed from the mechanism.

It has been found that a deposit of metallic fouling is left in the bore of the gun when ball cartridges, caliber .30, model of 1906, of earlier manufacture are used, and a solution for the removal of metallic fouling has therefore been issued by the Ordnance Department to all post ordnance officers for reissue to organizations in accordance with the following table of annual allowances:

For a machine-gun company or troop (6 guns):	Ounces.
Ammonium persulphate.....	30
Ammonium carbonate.....	30
Ammonia, 28 per cent.....	120

One ounce of ammonium persulphate, 200 grains ammonium carbonate, 6 ounces ammonia (28 per cent), and 4 ounces water will make a sufficient quantity to clean 20 guns. If no scales are avail-

able for weighing the ingredients they may be measured, and the equivalents are as follows:

- 1 ounce of ammonium persulphate equals 2 medium heaping spoonfuls.
- 200 grains ammonium carbonate equals 1 medium heaping spoonful.
- 6 ounces ammonia, 28 per cent pure, equals three-eighths of a pint.
- 4 ounces water equals one-fourth of a pint.

The spoon referred to above is the spoon issued by the Ordnance Department for the mess outfit.

The solution is made as follows:

The carbonate and persulphate should first be pulverized and mixed together and the ammonia and water added, after which the mixture should be thoroughly stirred. The solution should stand for half an hour before using. The bore of the gun should be plugged with a cork or wooden plug at the breech end and just below the metallic fouling. The bore should then be filled with the solution and the muzzle corked or plugged. The solution should remain in the bore for about two hours, or long enough to cut the metallic fouling, after which it should be removed and cotton flannel or other or soft material run back and forth through the bore to remove the residue. Great care must be taken to remove the solution from all metallic parts, as it may start rusting in a very short time. Special care should be used in removing it from the breech mechanism. The solution may be used several times, but after it has been once used it should be placed in a bottle and not mixed with any unused solution. This solvent is expensive and should be used economically.

In order to clean the bore of the barrel the cleaning rod is unbuttoned from its position beneath the gun-box cover. In cleaning from the chamber end it is necessary to remove the lock and drop the handle block in order to bring clear the prolongation of the axis of the bore. This will then allow the insertion of the cleaning rod through the barrel.

If the gun is not to be used for some time, it should be thoroughly cleaned and all the moving parts given a thin coat of cosmic. This can be best accomplished by warming the latter and applying with the grease brush. Before attempting to fire the gun *all cosmic should be removed*, especially around the lock frame; otherwise the gun will not function properly. The moving parts of the mechanism should then be lightly oiled before using.

*No part which is casehardened should be touched with a file in an attempt to remove burring.*

Much care is needed in wrapping the packing for the front and rear bearings of the barrel at the trunnion block and water-jacket cap. It is done in the following manner.

*For the rear bearing.*—Wind the packing in the groove of the barrel, starting in the center and winding alternate strands on each side. As the groove fills up press the packing toward the center by inserting a knife blade between the side of the groove and the packing. The packing should be wound tightly until the groove is completely filled and the packing projects slightly above the surface of the barrel. The free end is then tucked down at the side and beneath several of the strands to prevent unwinding.

*For the front end.*—With the barrel in place and the follower removed, wind the packing around the barrel and continue pressing the coils in with a stiff wire until the seat is filled. Then screw in the follower. The proper amount of packing must be determined by trial.

The packing on the barrel may now be examined and rearranged if necessary. To examine the packing in the water-jacket cap, remove the water-jacket cap follower, using the combined spanner tool to unscrew it. This will leave the packing accessible.

Before assembling the mechanism, all bright parts except springs should be lightly oiled.

Many of the parts can generally be cleaned with dry rags. All parts, after cleaning, should be wiped with an oiled rag.

The best method of applying oil is to rub with a piece of cotton cloth, upon which a few drops of oil have been placed, thereby avoiding the use of an unnecessary amount of oil. This method will, even in the absence of the oiler, serve for the working parts, which should be kept continually oiled.

Any part that may appear to move hard can generally be freed by the use of a little oil.

*Sperm oil only shall be used for lubricating metallic bearings and contact surfaces.*

The tripod is carefully made and is an expensive accessory. It should be studied and handled carefully to avoid replacement of parts which might be damaged through ignorance and carelessness on the part of the operator.

#### POSSIBLE TROUBLES AND THEIR REMEDIES.

With proper care and treatment this machine gun will cause but little trouble. Before firing, all traces of grease or cosmic should be carefully removed from the working parts. After the gun has been set up, *but before the cartridge belt is inserted*, work the mechanism back and forth a number of times to insure that it functions smoothly and freely. Any binding or sluggish working indicates that some foreign substance is in the mechanism, and the latter should be dismounted and examined for such.

When the mechanism works smoothly and the gun fails to function properly when fired, it may be due to the amount of head space between the carrier and trunnion block. When it is found that the face of the carrier is so far from the chamber as to give insufficient support to the cartridge case, or so close as to make the operations of seating and extracting the cartridge difficult, the head space is too great in the first case and too little in the second. The correction for this is made on the crosshead. By adding or removing one or more of the thin washers on the arm of the crosshead, the position of the side lever with reference to the crosshead and crank is altered. This will result in moving the lock and carrier toward or away from the chamber. When issued, the head space will be found correct. Abnormal pressures or the wear and tear of firing, however, may alter the original head space. Having determined on which side the error lies, unscrew the adjusting nut on the crosshead with the aid of the combined spanner and add or remove washers. These washers are issued as spare parts and are of two thicknesses—0.005 inch and 0.003 inch.

#### BREAKAGES.

There appears to be no doubt that a very large percentage of breakages of parts occurring in guns in service can be traced to inexperience on the part of the operator in the use of a complicated machine, and in many cases to careless handling thereof without a thorough study of the gun itself and the information available concerning it. In very exhaustive tests of this gun carried on under service conditions breakages were practically unknown.

Whatever the cause of the breakage may be, it is evident that with nearly all breakages a stoppage of fire is certain to occur, and also that in many cases a serious jam will follow. For a stoppage of fire of this kind the only remedy is naturally to replace the damaged part. Whether a serious jam should follow such breakage depends almost entirely on the extent of familiarity with the construction of the gun by the personnel operating it, and the only suggestion that can be offered for overcoming difficulties of this kind is to study the gun in all its parts and obtain extensive experience by constant practice of taking the gun entirely apart and again assembling it.

#### JAMS.

From all indications it appears that the greatest difficulty experienced with the guns in service is not due to breakage as much as it is due to jams from other causes.

Except for breakage of parts, it is a fact that practically all jams can be traced to a cause that would not exist were the operator thoroughly familiar with the mechanism and were the parts taken care

of properly. This remark applies to a large extent to breakages also, since these in many instances are due to careless handling.

It is, therefore, of the greatest importance that the mechanism should be carefully studied, both from actual observation of the gun as well as from the description given in the handbook. It is essential that before firing all trace of cosmic or grease should be carefully removed. All working surfaces should then receive a light coating of thin sperm oil. Particular care should be taken to see that no foreign substances are located between bearing surfaces.

After careful examination of every part to see that it is thoroughly cleaned and oiled and correctly assembled, it is then simply a question of so adjusting the various parts that the operation is smooth and continuous. To attain this requires constant careful study and considerable experience.

#### RACING.

If the gun fires too rapidly, it is possibly caused by the accumulation of the products of combustion on the front disk cap. This can be remedied by unscrewing the front disk and prying off the fouled cap with a screw driver or other sharp tool and pressing on a new one and replacing the front disk.

#### AMMUNITION.

The ammunition used in this gun is the same as that provided for the United States rifle, caliber .30, model of 1903. It is fed into the gun by means of cartridge belts. The cartridges are loaded in the belts by means of the belt-filling machine.

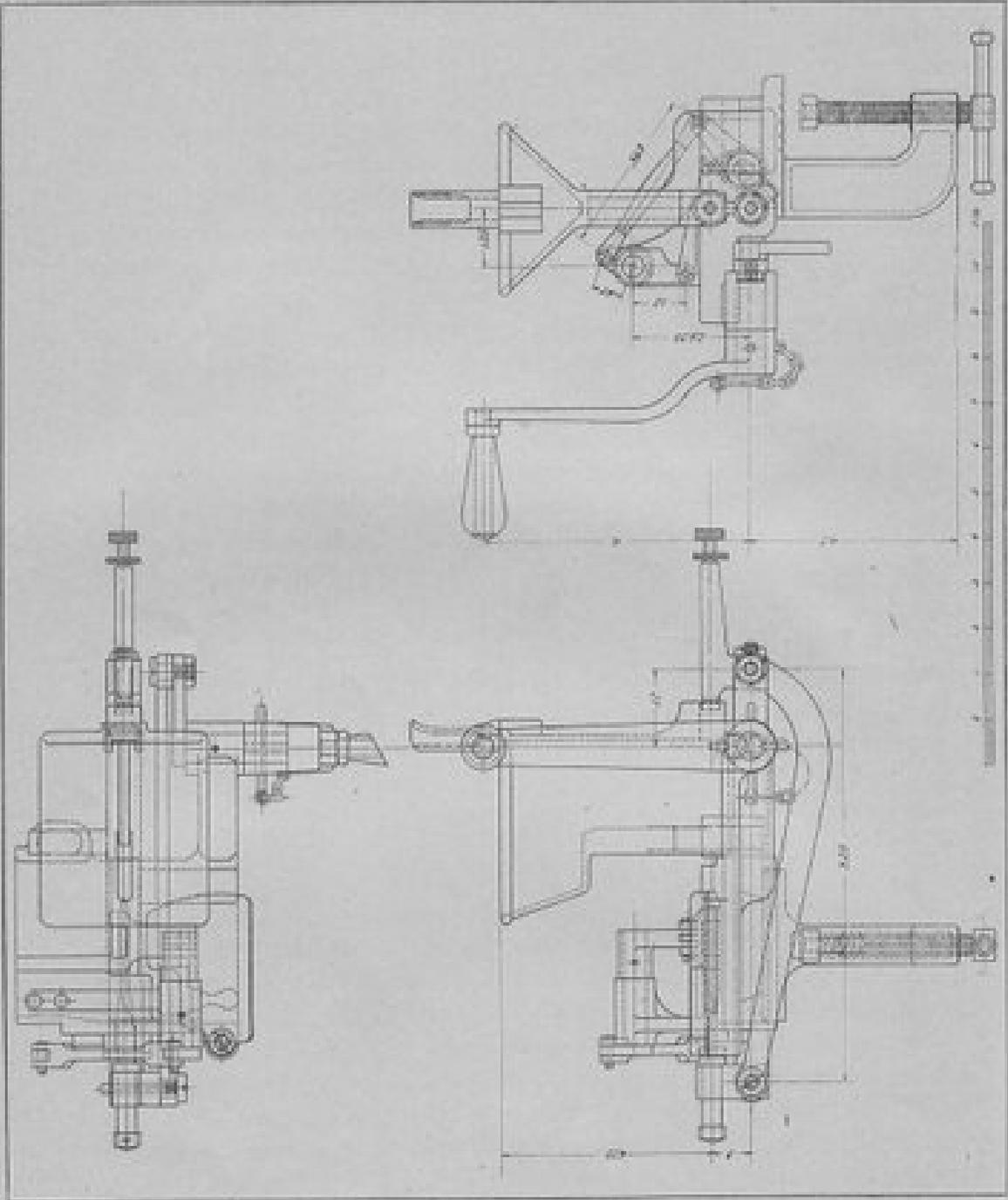
#### CARTRIDGE BELT.

The belt is formed of two pieces of flax webbing connected by brass strips and eyelets between adjacent cartridges, every third strip projecting 0.95 inch beyond the bullet edge of the belt to guide the latter through the feed box and belt-filling machine and to prevent side motion of the belt in the ammunition box. The webbing is made double thick along the bullet edge by turning one-half inch over a cotton cord, which regulates the distance which the cartridges may be inserted in the belt. A brass handle 4 inches long is attached to each end of the belt. Each belt holds 250 cartridges.

#### AMMUNITION BOX.

The ammunition box is made of wood with ends and sides dovetailed together and the bottom secured by screws. It is provided with a hinged lid, secured by a spring catch. All parts of the box are recessed so as to be flush with the surface. *Ammunition should always be loaded into belts before packing in the boxes.*

PLATE D6.



## THE BELT-FILLING MACHINE.

[Plates IX and X.]

The belt-filling machine is for inserting the cartridges into the belts rapidly and evenly.

## LIST OF COMPONENT PARTS.

[Numbers before components are numbers of parts per gun.]

1 belt cover.	1 pin, feed-lever.
1 belt guide.	1 pin, clamping screw.
1 body.	2 pins, feed-lever connecting rod.
1 bracket.	1 pin, feed-lever spring stop.
1 cam shaft.	1 pin, feed pawl.
1 cam-shaft key.	1 pin, handle fixing.
1 cartridge-clip stripper.	1 plunger.
2 chain "S" hooks.	1 plunger collar.
1 clamping screw.	1 plunger guide.
1 clamping-screw collar.	1 plunger holder.
2 clamping-screw pin buttons.	1 screw, belt-cover.
1 connecting rod.	2 screws, belt-guide.
1 crank.	2 screws, cartridge guide spring.
1 eyebolt.	1 screw, connecting rod.
1 feed lever.	1 screw, plunger-guide.
1 feed-lever connecting rod.	1 screw, plunger-holder.
1 feed-lever pin collar.	1 screw, separator.
1 feed-lever roller.	1 separator.
1 feed pawl.	1 separator check nut.
1 feed-pawl lever.	1 separator screw head.
1 feed-pawl lever shaft.	1 sleeve.
1 handle.	1 split pin, .062 ( $\frac{1}{16}$ ) x 1.
1 handle fixing pin chain.	1 split pin, .125 x .75 (plunger collar).
1 handle key.	1 split pin, .125 x 1 (feed-lever pin collar).
1 hopper.	1 spring, cartridge guide.
1 lifting knob.	1 spring, feed-lever.
1 locking segment.	1 spring, feed-pawl.
1 locking-segment handle.	1 stem.
1 locking-segment handle collar.	1 taper pin, .135 x 1.03 (feed-pawl lever).
3 nuts.	1 washer, belt-cover spring.

## DESCRIPTION.

It consists of a bronze body to which the other parts are assembled, a hopper into which the cartridges are stripped from the clips by hand, a bracket by which the machine is attached to the edge of a table or board, and a crank handle for operating.

The principal parts which are assembled to the body are the crank, the connecting rod, the plunger holder, plunger, cam shaft, separator, feed lever, feed-pawl lever, feed-pawl lever shaft, feed pawl, and belt guide. On the under side of the body is a dovetailed seat in which the bracket slips and is secured by a locking segment.

The hopper is a vertical bronze trough attached to the body by a lug on its lower end, which fits into a seat in the body. At its upper end it is shaped to receive the cartridge-clip stripper which retains the cartridge clip while the cartridges are being stripped from it by hand. The cartridges are fed downward by gravity to the separator, which inserts them successively in the belt.

The bracket is a bronze casting on the upper part of which is a projecting undercut lug which slips into a seat in the body. The lower part is L-shaped and carries a clamping screw, by which the machine is attached to a suitable support.

The mechanism is operated by the bronze crank handle which is keyed and pinned to the crank. The pin is secured to the crank handle by a chain and eyebolt. The crank is seated in a hole in the body and consists of a short shaft carrying an arm at its inner end, to which is pivoted one end of the connecting rod. The other end of the connecting rod is pivoted to a lug on the plunger holder. This rod is made of bronze and imparts a reciprocating motion to the cam shaft, plunger, and separator.

The plunger holder is of bronze and is secured to the cam shaft by the plunger-holder screw and has a lug on top which is bored out to form a bearing for the plunger. The latter is of forged steel and consists of a flat blade twisted through an angle of  $90^\circ$  and terminating in a shoulder and cylindrical end, which is held in its bearing in the holder by a collar and split pin. The plunger in its longitudinal movement passes through a rectangular steel guide contained in the body which, on account of the twist in the blade, causes rotation of the latter. The inner end of the blade is rounded and pointed to facilitate its entrance into the loops of the belt. Each loop is opened by the blade before the bullet is forced into it by the separator.

The separator is a steel arm which is pinned to the other end of the cam shaft. It engages the head of the lowest cartridge in the hopper and forces it into the loop in the belt just opened by the plunger. The length of the separator is adjusted by means of the separator screw and its parts.

The cam shaft of forged steel is flattened for about 3 inches near the right end. At the inner end of this surface a deep notch is cut in the shaft, the whole forming a bearing which actuates the belt-feeding mechanism. This mechanism consists of a bronze feed lever, which is pivoted to the body and carries on its short end a small steel roller, which is pressed against the actuating surface of the cam shaft by a spiral spring coiled around the hub of the lever. Its other end is connected to an arm on the feed-pawl lever by the feed-lever connecting rod. The feed-pawl lever is pinned on the feed-pawl lever shaft, which is seated in a bearing in a lug formed on top of the body, and the feed pawl is in turn pivoted to an arm on this shaft. The free end of the pawl is roughened so as to engage the belt, with which it is kept in contact by a spring in the pivot joint. The motion imparted to the feed lever by the cam shaft results in a reciprocal motion of the pawl, which feeds the belt forward intermittently.

Over the bullet edge of the belt seat in the body is screwed the belt guide, a leaf spring terminating in a rounded lug, which presses

down on the belt and prevents its slipping through the machine. The cartridge-spring guide is another leaf spring secured in a transverse slot in the belt seat and having a groove formed in its free end which aligns the bullet with reference to the loop in the belt. The belt passage in the body is covered by the belt cover, a steel plate pivoted at one side so it can be swung out of the way when inserting or removing the belt.

The belt-filling machine, with its tools and accessories, is packed in the belt-filling machine box.

#### DIRECTIONS FOR SETTING UP AND USING THE BELT-FILLING MACHINE.

To assemble the machine, first insert the bracket in its seat in the body and secure by turning locking segment handle 180°. Then securely fasten the machine upon the edge of a table, bench, or other suitable support by means of the clamping screw. Slip the handle on the crank and pin it in place. Turn the handle until it is vertical, and, holding it in that position, insert the lug of the hopper in its seat and press it down until entirely seated.

Swing the belt cover to the left, uncovering the belt passage. Turn the handle so that it points to the right and slightly downward, and, holding the pawl up with one hand, push the end of the belt through the passage with the other, the projecting brass strips pointing to the left, until the first loop is opposite the plunger. Then let down the pawl and swing the belt cover into place over the belt. Place the cartridge clip stripper in its position on the hopper. Fill the hopper with cartridges by stripping them from the clips directly into the hopper. By turning the handle the cartridges will be inserted successively in the loops.

In operating the machine it will occasionally happen, due to inequalities in the belt or slipping of the pawl, that a loop will not be fed so that the plunger can enter. In that case the feed pawl should be lifted and the belt adjusted in the proper position. If the plunger catches on the edge of the belt or passes over it, the loop should be opened by means of the hooked end of the clearing tool.

The feeding of the cartridges from the hopper is sometimes interrupted by a wedging of the column. When this occurs a slight tapping of the hopper will usually correct it.

To insure efficient working of the machine, all bearings should be kept clean and properly oiled. After using, all bright parts should be carefully cleaned and wiped with an oiled rag before replacing the machine in its box.

#### BELT-FILLING MACHINE BOX.

This box is used for carrying the belt-filling machine and other tools and spare parts. It is similar to the ammunition box in size

and construction. Packing is located on the inside to suit the various articles carried.

To distinguish it from other boxes, it has a red band, 1 inch wide, painted longitudinally around the box.

#### TOOL BOX.

This box carries tools and accessories and spare parts of the guns. It is of the same general construction and has fastenings similar to the ammunition box. It has packing on the inside to suit the articles carried.

To distinguish it from the other similar boxes, it has a blue band, 1 inch wide, painted longitudinally around the box.

#### THE WATER BOX.

The water box is similar in size to the other boxes, but has no lid. In its top is located a screw cap by means of which the water is put in. Its handle and cap are recessed so as to be flush with the surface. It is made of sheet metal. It is emptied by means of a nozzle permanently attached and protruding underneath.

#### ARM CHEST.

An arm chest is supplied each gun for its safe-keeping in store or whenever dismantled. It holds a gun, and tripod, with cleaning rod and spare barrel, a tool box, 4 water boxes, a belt-filling machine box, and a steam-condensing device.

## PART II. PACK HARNESS.

[Plates XI, XII, and XIII.]

The group of parts of the pack outfit used for leading the animal and carrying the load with its special holders is called the "pack harness." It consists of the halter bridle, corona, saddle blanket, aparejo, sobrejalma, crupper, and aparejo cincha.

These parts are common to all aparejo outfits and may be used without special frames for packing bundles and boxes.

### HALTER BRIDLE, MODEL OF 1910.

This article is designed to furnish a light, strong head harness for a mule. When leading the animal on the march the bit and its straps are removed from the headstall and fastened to any convenient place on the pack frame. The two snaps of the lead rein are then fastened to the floating ring, the body of the rein forming a loop convenient for holding in the hand.

In riding the animal the lead rein is used in combination with the bit, headstall, and bit straps as a bridle.

When a mule is picketed to a line the lead rein serves as a halter strap.

The bit is made of nickel steel, to prevent rusting.

### CORONA, MODEL OF 1915.

The corona is the first piece of harness placed on the mule's back. It is a saddle pad made of four thicknesses of good quality gray woolen flannel, protected from sweat by a lining of olive-drab cotton duck and with a facing of woolen flannel 14 inches wide extending across the width of the corona to give extra thickness at the backbone. The corona is made in three sizes, and each size is stenciled on the underside to correspond with the size of the aparejo it is intended to accompany. The width is 26 inches for all sizes. In placing the corona it is laid well forward on the mule's back, canvas side down, and then slid to the rear until its front edge is just behind the point of the withers, care being taken that the hair lies smooth beneath it.

When manufactured in quantity, 10 per cent are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch.

## THE SADDLE BLANKET.

The saddle blanket forms additional padding under the aparejo. It is carried under the aparejo and over the corona.

The blanket is made of pure wool, olive-drab shade with an olive-brown border of two stripes. The blankets are rectangular, 72 by 84 inches. Each blanket has the letters "U. S." and the bursting shell located in the center.

## APAREJO, MODEL OF 1911.

This article consists of an aparejo body and an aparejo frame. The aparejo body is made of two rectangular pieces of leather (back and belly pieces) sewed together along the edges and through the middle, forming two pouches. The edges, the middle seams, and particularly the ends are reinforced with heavy leather facings. Hand-holes for stuffing are left in the belly pieces, and holes and slits laced with thongs are made in the back pieces, so that the frame or parts of it may be inserted, removed, or replaced. The carrier pieces and front facings have lacing holes for the attachment and adjustment of the crupper. Two steel chock staples attach the sobrejalma and pack frame to the aparejo. The rib sticks are furnished longer than necessary, and should be sawed off to the proper length after the boot and top sticks are firmly rammed home. The first three sticks (starting at the front) are of uniform thickness; the remainder are tapered to give the rear of the aparejo more flexibility than the front. The sticks are stamped and are intended to be arranged in a gradually diminishing thickness.

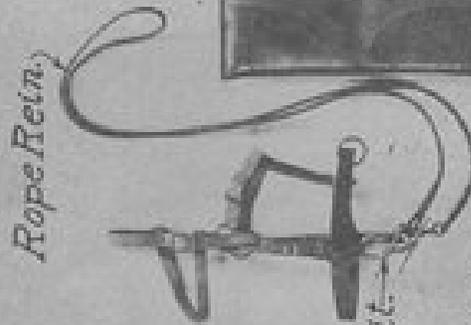
NOTE.—Aparejos are issued to the service with ribs in place. They are furnished in 58, 60, and 62 inch sizes as follows: 10 per cent 58-inch; 15 per cent 60-inch, and 75 per cent 62-inch. Should repairs or alterations make it necessary to rib up, the butt of the fifth rib is seated in its slot, the overlap at its slot in the top stick is marked and cut away, and the other ribs are cut to the exact resulting length.

## SOBREJALMA, MODEL OF 1910.

This article is a waterproof and wear-reducing covering for the aparejo. It is made of one thickness of heavy cotton duck faced around the edges on the upper side with collar leather. Two leather reinforces are placed on the upper side to protect the duck from the wear of the load. Holes are provided through which the chock staples of the aparejo protrude; chock straps passing through these chock staples hold the sobrejalma and pack frame on the aparejo. Two supporting sticks, one at each end, serve as stiffeners and prevent the corners from curling up when in service. Sobrejalmas are made in three sizes and when manufactured in quantity 10 per cent



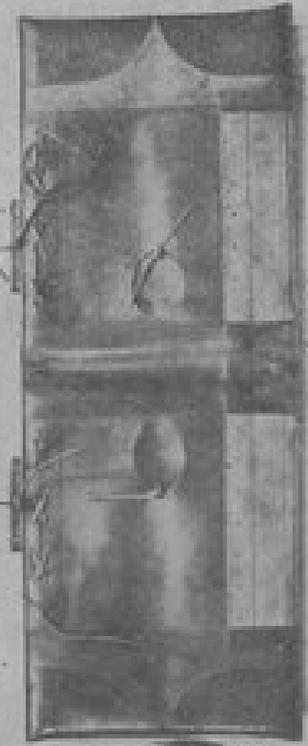
*Blinder, Model of 1916.*



*Rope Rein.*

*Snaffle Bit.*

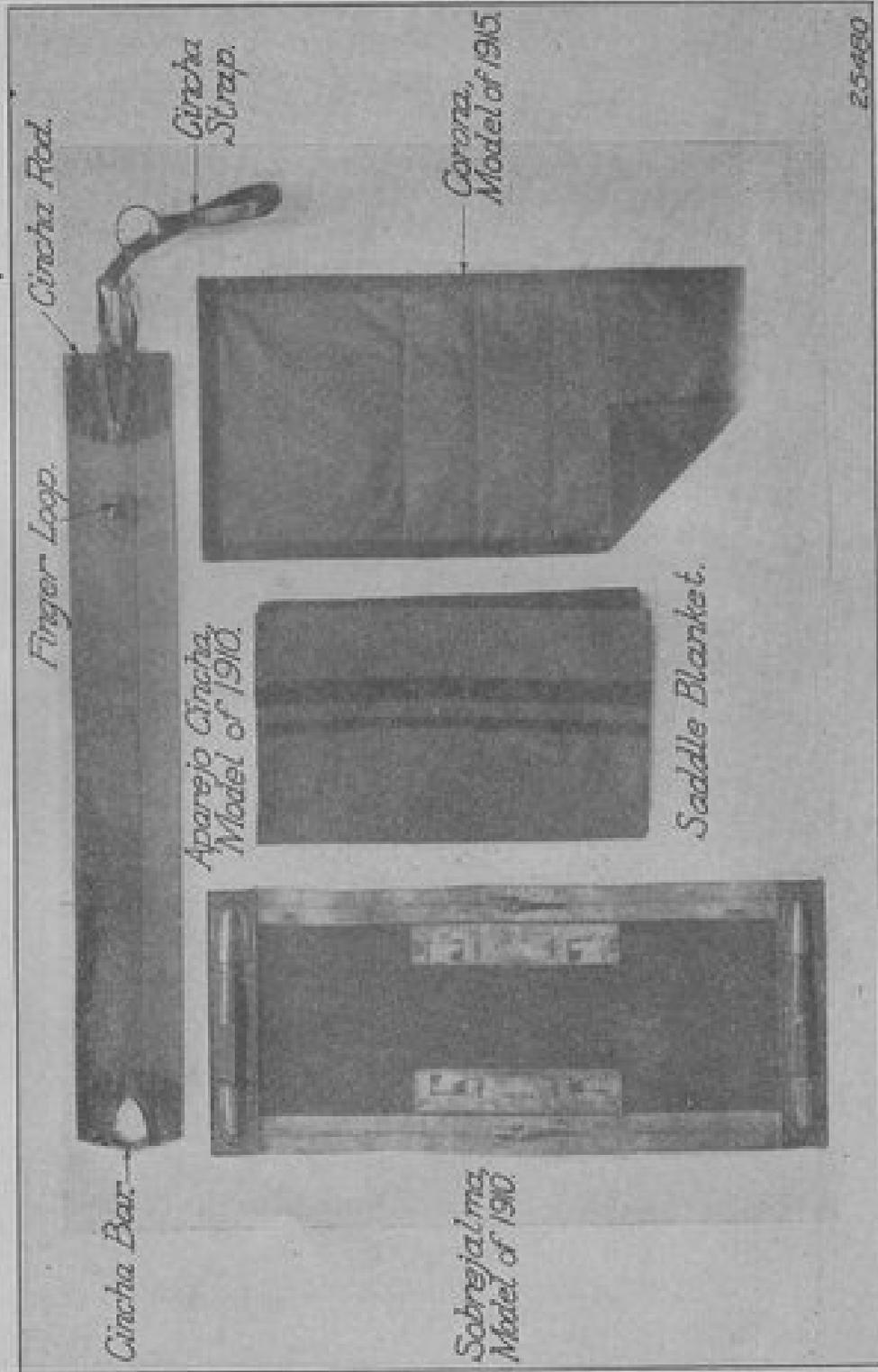
*Halter Bridle,  
Model of 1910.*



*Aparejo, Model of 1911.*



*Crupper, Model of 1912.*



are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch. The size stamped on the *sobrejalma* is the size of the *aparejo* for which it is suited.

#### CRUPPER, MODEL OF 1912.

The crupper is made of russet strap leather, shaped (and padded in the middle) to fit the animal. The side pieces extend forward, across the *aparejo*, and are laced to it in front and held up at rear by *latigo*-leather thongs. The depth of the side pieces affords a broad surface to bear against the animal and also prevents the crupper from sagging. The side pieces are reinforced with leather, and those portions which come in contact with the animal's flanks are lined with duck. Cruppers are now made in but one size, namely, 78 inches long.

#### APAREJO CINCHA, MODEL OF 1910.

The *aparejo cincha* is 10 inches wide and is made of cotton duck, folded and stitched along the middle. Both ends are faced with leather, and the end to which the cincha strap is fastened carries a five-sixteenths-inch steel rod in the fold of the lacing-end piece, while the other end has a curved piece of gas pipe (*cincha bar*). Fifteen inches from the strap end of the cincha a leather thong (*finger loop*) is attached which is used to carry the slack of the cincha strap. The cincha strap is of harness leather and has a 4-inch nickel-steel ring at one end; this end is attached to the cincha body by a *latigo*-leather thong. The metal parts are either of bronze or copper plated to prevent rotting of the leather. The cincha is made in three sizes and when manufactured in quantity 10 per cent are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch. The size stamped on the cincha is the size of the *aparejo* for which it is designed; the cincha body is 10 inches longer than the corresponding *aparejo*.

#### BLINDER, MODEL OF 1916.

A pack mule is ordinarily blinded during harnessing and unharnessing, loading, and unloading. Eighteen per company or troop are provided for this purpose. The blinder is made of medium harness leather and is shaped so as to fit closely around the animal's eyes. When not in use the blinder is ordinarily carried over the packer's shoulder.

#### INSTRUCTIONS FOR SETTING UP THE APAREJO.

*To rib up.*—Unlace the slits and handholes; soak the *aparejo* in tepid water for about 15 minutes; drain it and lay flat, back pieces up; insert the boot stick and the top stick through the slit in rear and press them to their places at the boot and the center stitch line,

slotted sides up; insert the numbered set of nine ribs through the slit in rear in their numerical order and seat them in that order from collar to rear in the slots of the boot stick and top stick, butts at the boot; secure the top of each rib as it is seated by inserting the aparejo key at the front edge below the collar and passing it over the rib in place; fasten the key bar to the collar by the thong.

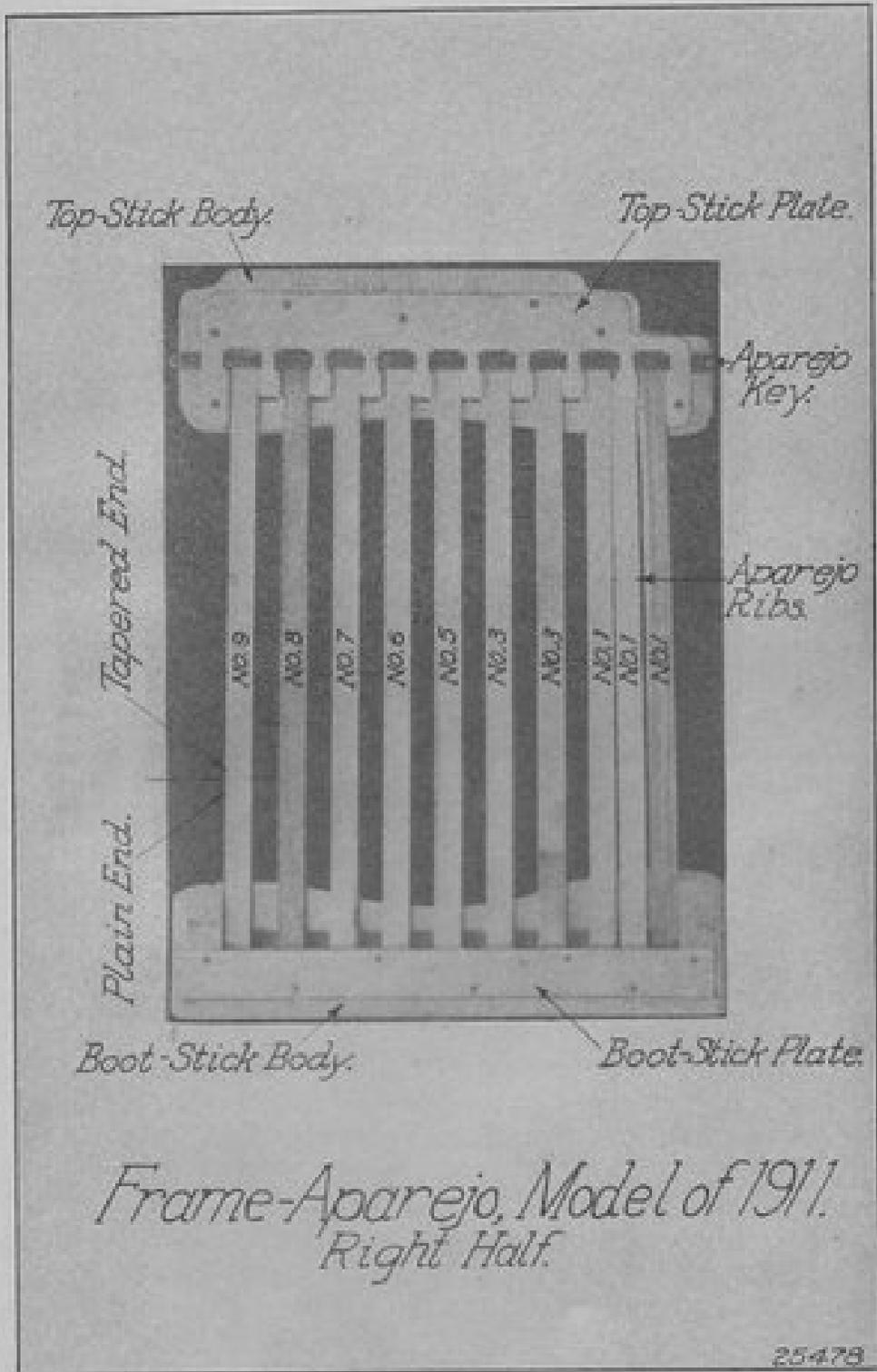
**NOTE.**—The aparejo after being set up should under no circumstances be allowed to dry in the sun.

*To fill or pad.*—Turn the aparejo over, belly pieces up; procure about 6 pounds of long, fine, soft, elastic hay; taking a little at a time, tease or "mix" it carefully; insert it through the handhole and thus gradually fill the body of the aparejo with a smooth and even layer not more than 2 inches thick.

**NOTE.**—Other filling may be used in necessity, such as moss, excelsior, curled hair, or sea grass; but these substitutes are difficult to manipulate in alterations necessary to accommodate the rigging to injuries of the mule. By teasing or "mixing" is meant the arrangement of the stalks of the hay so that they will cross one another. The body of the aparejo is that part which comes in contact with the body of the mule. As 3 inches of the lower portion of each boot stick and 3 inches of the upper portion of each top stick must not come into contact with the mule, no filling should be pressed under the boot stick or within 3 inches of the center of the stitch line. The body course tapers, however, so as to overlap the boot stick and saddle bar, and also tapers toward front and rear.

*To face or dress.*—To adjust the aparejo more accurately to the shape of the mule, introduce filling and press it well into the corner of the front boot; working toward the handhole, continue the facing along the boot stick and front edge, gradually increasing its thickness to about 1 inch at 7 inches from the corner and forming its inner edge into the arc of a circle concentric with the handhole, the thickness tapering to the ends of the arc; continue this for 3 inches more toward the handhole, rapidly decreasing the thickness to nothing. Proceed in exactly the same way at the collar; under no circumstances should the collar facing reach within 7 inches of the center of the handhole. Connect the front boot and collar facings by a dressing along the front edge about 3 inches wide and 1 inch thick, decreasing in thickness toward the handhole and toward the middle of the edge.

**NOTE.**—In facing up, introduce the filling with the palm of the hand up, so as not to disturb the body course. In case the leather will not yield enough to permit the filling to be introduced well into the corners, a tamping stick may be used to raise it. This stick, used with the commercial aparejo, is 4 or 5 feet long, 1½ inches in diameter, wedge-shaped for 4 inches from one end, the edge of the



wedge being about  $\frac{1}{4}$  inch thick and grooved. The object of the boot facing is to cause the boot stick to carry horizontally and parallel to the center of the mule and to give free action to the mule's elbow. Mules of large barrel will require a thicker facing than described. The object of the collar facing is to cause the saddle bar to carry horizontally and parallel with the center of the mule and to protect the mule's withers. Mules with high withers will require a thicker facing than that described. In setting to the shape of the mule, the aparejo bends at the middle of the front edge. It is important that the body course remain undisturbed during dressing, and that the instructions given be carefully followed to avoid sore withers or tails and body or belly bunches.

*To attach the crupper.*—Stand the aparejo on its boots in its normal position; secure a lace thong to the front hole on the upper facing of the crupper on each side, and fasten the crupper with short thongs to the center holes of the carrier pieces on the rear of the aparejo; pass the crupper lace thong through the second hole from the top of the front facing of the aparejo, through the second hole of the crupper, through the third hole of the aparejo facing, through the fourth hole of the crupper, and so on, finishing through the bottom holes of the facing and crupper and tying to the crupper hole.

**NOTE.**—In lacing the crupper to the aparejo, the thong must be passed through the holes from the outside and must not be twisted, the lacing must not cross, and it is important that the tie be made on the last hole of the crupper instead of the aparejo.

Guayaba, willow, dogwood, hickory, or any other wood combining the qualities of permanent elasticity and strength may be used to replace broken ribs. When the set-up aparejo is to be filled, no soaking is necessary; instead, the belly pieces are made pliable by rubbing with a sponge.

Mules weighing 850 to 900 pounds require a 58-inch aparejo; 1,000 pounds, 60-inch; 1,100 pounds, 62-inch; and for heavier mules requisition should be made for larger sizes.

When the mule is loaded, the cincha, in travel, should free the elbow by about 1 inch; more than this will prevent a proper grip on the belly.

If the boots ride high enough on the body of the mule, or if they reach under the belly, even though they ride horizontally and parallel to the center of the mule, the aparejo will be likely to turn easily. This fault encourages injuriously tight cinching.

If one or both boots flare out or turn in toward the mule, cinch sores, sore tails, or belly bunches are caused.

The width of the collar-arch clearances should be at least  $5\frac{1}{2}$  inches. If it is too narrow or too wide, or if the saddle bars slope downward

toward the front, there will be sores on the withers; if they slope to the rear, there will be injuries over the loins called "kidney sores."

If the lacing of the crupper is drawn too tight at the bottom, the lower edge of the crupper will rub the buttocks and cause abrasions.

The object to be attained is the uniform distribution of the weight of a load over that portion of the mule's body which is anatomically suited to the carrying of a burden, so that the saddle will ride with little motion and without friction of the bearing surface on the body. The contact of the bearing surface of the saddle must be close at all points. As the mule's body swells from front to rear, the more or less cylindrically shaped aparejo, after the body course is laid, must be modified by facing up so as to provide a concave surface to fit over the convex surface. But, as the barrel of the properly conformed mule is nearly cylindrical through the rear half or more of the contact surface, no facing, as a rule, is necessary in the rear part of the aparejo, although conformation may require it occasionally. The above instructions were prescribed by H. W. Daly, chief packmaster, Quartermaster's Department.

#### CARE OF RUSSET LEATHER.

In view of the value of leather equipment and due to the fact that it is subject to rapid deterioration when not properly cared for, especial attention should be given to this subject. The instructions given in Ordnance Pamphlet No. 1965, Instructions for the Care and Repair of Small-Arms and Ordnance Equipment, should be carefully followed.

### PART III. THE SPECIAL PACK EQUIPMENT.

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This equipment includes the following:

Pack frame.	Rigging cover.
Ammunition hanger.	Picket pin and eye.
Gun hanger.	Picket rope section.
Tripod hanger.	Rule, boxwood.
Gun case.	Steam condensing device case.
Tripod cover.	Thongs.
Broad-hatched head case.	

Plates XIV to XVII, inclusive, show the special pack equipments with their loads attached placed on the pack harness for the first, fourth, twelfth, and twentieth mules. The loads for the other mules are similar to these except as shown in the table of equipment. Photographs of various articles are shown on Plate XVII.

#### PACK FRAME, MODEL OF 1911.

This article consists of a framework built up of wood and metal to carry the weight of the load and distribute it uniformly over the carrying surface of the aparejo. It is arranged to suit the load to be carried. To the top of the pack frame are attached four bronze castings, known as superframes, which when folded up form a flat surface for carrying boxes or packages which have flat sides, or when folded down form a convenient receptacle to hold picket pins, shovels, picket ropes, or other items of a similar nature. Four steel-loop clevises with straps are fastened to the top of the pack frame, furnishing means of lashing articles to the frame. The steel arches, with the bronze superframes, are interchangeable and may be removed by withdrawal of the steel pins. The sides of the pack frames are riveted together. The hook hinges are made of forged steel and are arranged for hanging boxes or hangers on the sides of the pack frame. Four pack-frame staples are fastened to the brace bar and are used for holding down side loads.

#### AMMUNITION HANGER.

This article consists of a light steel frame for carrying ammunition boxes. The steel loops at the top of the hanger are elongated to

facilitate attaching the hanger to the pack frame. The straps which lash the boxes in place are provided with quick-release devices. Straps with quick-release devices are provided to fasten the hanger to the pack frame.

#### GUN HANGER.

This article consists of a steel frame for carrying the gun case and a box of ammunition. Quick-release devices are provided for facilitating the removal of the gun case and the ammunition box. Holding-down straps with quick-release devices are provided to fasten the hanger to the pack frame. The quick-release devices on the bottom straps are to facilitate the removal of the hanger should a mule fall. Small projections on the back of the hanger are to keep the load away from the aparejo cincha and to form a bearing against the side braces of the pack frame.

#### TRIPOD HANGER.

This article consists of a steel frame for carrying the tripod and two boxes of ammunition. The tripod is held in place by means of tripod front fastening and the tripod clamp. The tripod front fastening has a projection which enters into the tripod trail socket, thereby holding the tripod down in front as well as preventing motion to the front. Movement to the rear is prevented by a stop on the tripod rear rest which engages with the sliding seat collar on the tripod trail. The tripod legs are supported on the tripod rear rest and are held in place by the tripod clamp. The quick-release device which secures the tripod clamp also forms a part of the rear quick-release device for holding the ammunition boxes in place. An additional quick-release device at the front of the hanger pertains only to the ammunition boxes. The lower ends of the diagonal braces are turned outward to act as stops for the ammunition boxes and to render it possible to carry but one box in the ammunition part of the hanger. As in the ammunition and gun hangers, holding-down straps with quick-release devices are provided for securing the tripod hanger to the pack frame.

#### GUN CASE.

This case or pouch is made of sole leather, and its purpose is to protect the gun from damage in transportation and from the weather. It is arranged in such a way that the gun may be removed with great ease and rapidity. The closed end of the case contains a basswood packing block with a circular gain cut in it for receiving the muzzle attachment as attached to the gun. A guide of beech or maple is placed in the bottom of the case to prevent the gun from

touching the leather and to facilitate its insertion and removal. Two handle retainers (aluminum castings), placed in the cover of the case, hold the rear of the gun in position by engaging with the handles. The packing block, guide and handle retainers serve to hold the gun in a fixed position in the case. Two small leather compartments are provided in the upper inside corners of the case, the one in the upper corner nearest the muzzle for the ramrod and the one in the other corner for the spare barrel. Brass reinforces on the outside of the case serve to strengthen and stiffen it and to prevent the leather from coming in contact with the metal gun hanger.

#### TRIPOD COVER.

This is a canvas cover designed to protect the tripod from dust and the weather. It may be attached when the tripod is either removed from or attached to the tripod hanger, but in the former case the tripod legs must first be folded for packing. Two straps of olive-drab webbing with over and under buckles are attached to the body of the cover and serve to secure it to the tripod.

#### BROAD-HATCHET HEAD CASE.

This case, as its name implies, is designed to protect the head of the broad hatchet and to form a convenient means of carrying that tool. A strap with a ring is riveted to the flap of the case to form a convenient means of lashing the broad hatchet to some convenient part of the pack in transportation.

#### RIGGING COVER.

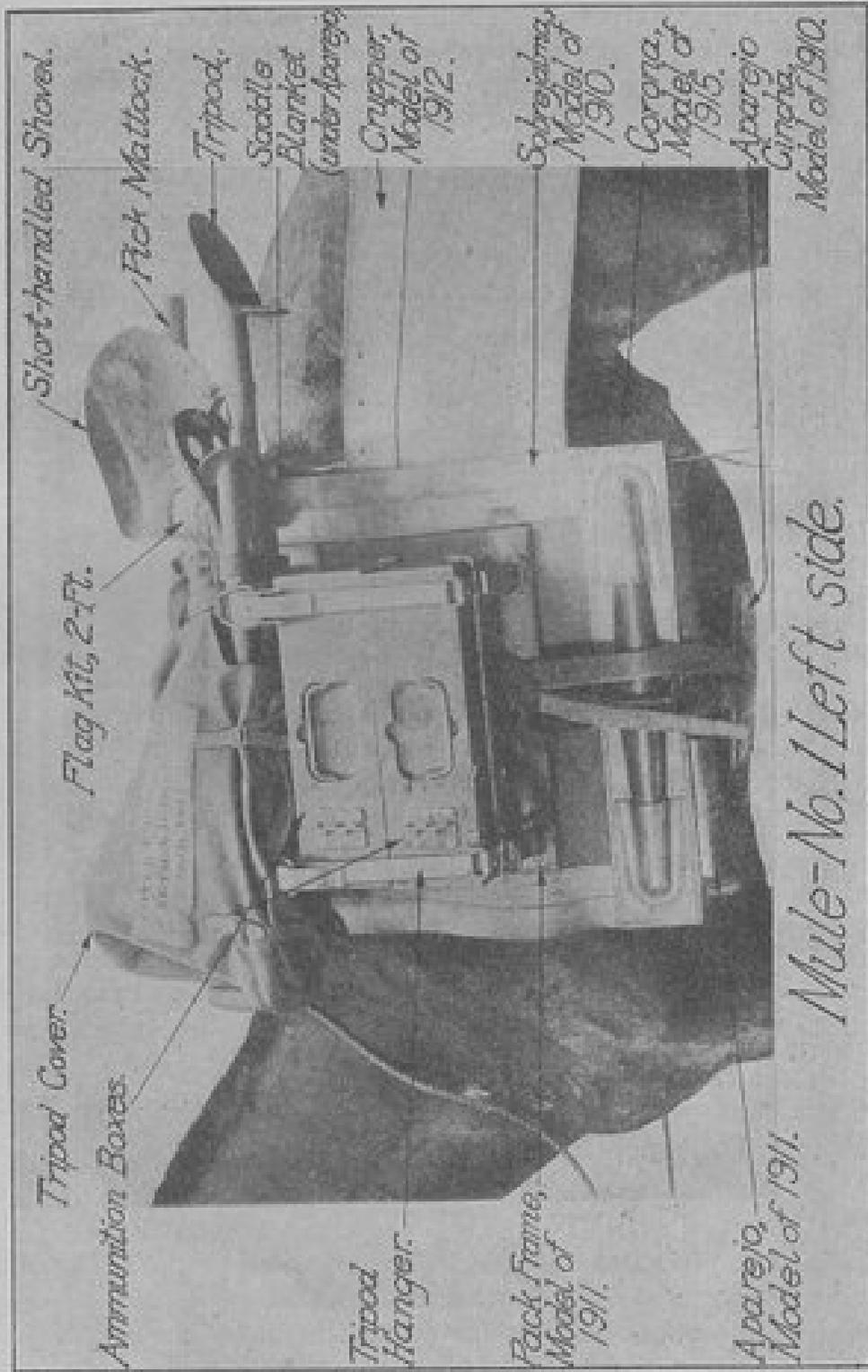
The rigging cover, made of olive-drab duck, is 43 inches wide and 22 feet long. Three are provided for each machine gun company or troop and are designed for covering the packs of the outfit when in park.

#### PICKET PIN AND EYE.

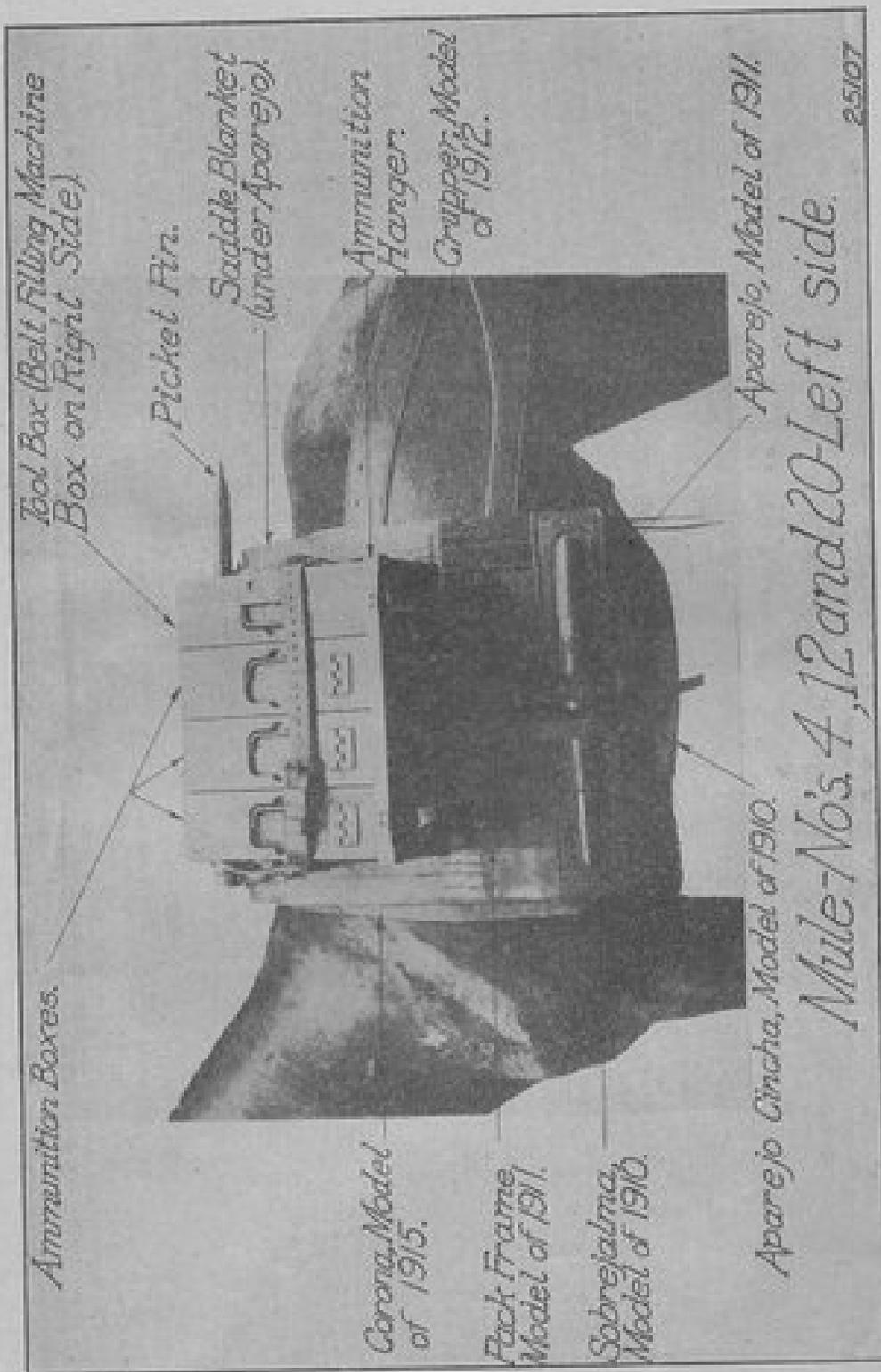
The picket pin and eye are made of steel. Six picket pins and eyes are furnished each company or troop.

#### PICKET-ROPE SECTION.

This article consists of a 1-inch diameter manila rope, 25 feet long, with a loop spliced on each end. It is designed to be stretched along the ground and fastened at the ends with pins. The animals can then be fastened by means of their halter-bridle reins to this rope in the usual way. Six pins and five rope sections are provided for each company or troop, so that when sections are used together the



Mule-No. 1 Left side.



*Ammunition Boxes.*

*Tool Box (Belt Filling Machine Box on Right Side)*

*Picket Pin.*

*Saddle Blanket (under Aparejo)*

*Ammunition Hanger.*

*Corona, Model of 1915.*

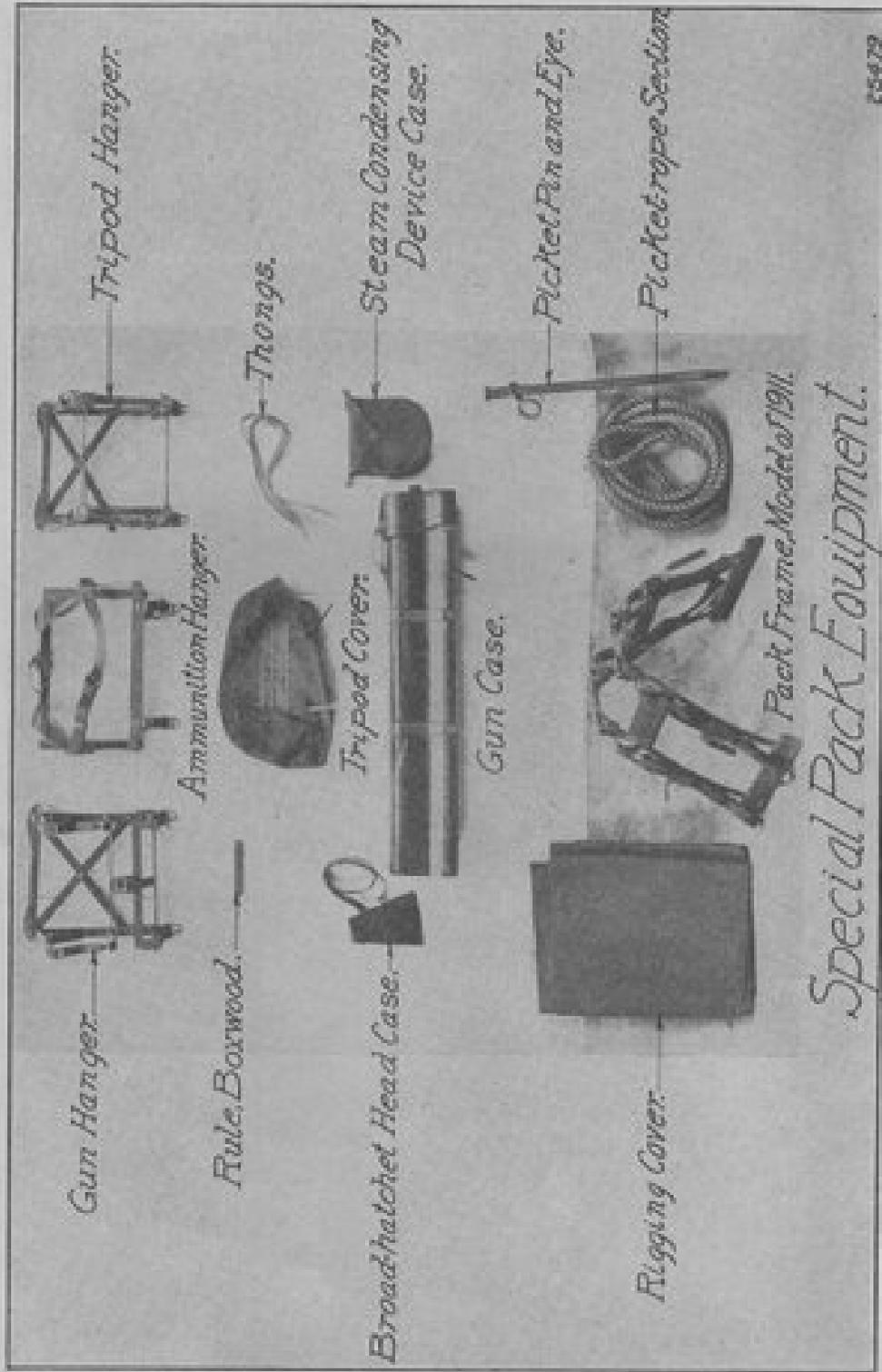
*Pack Frame, Model of 1911.*

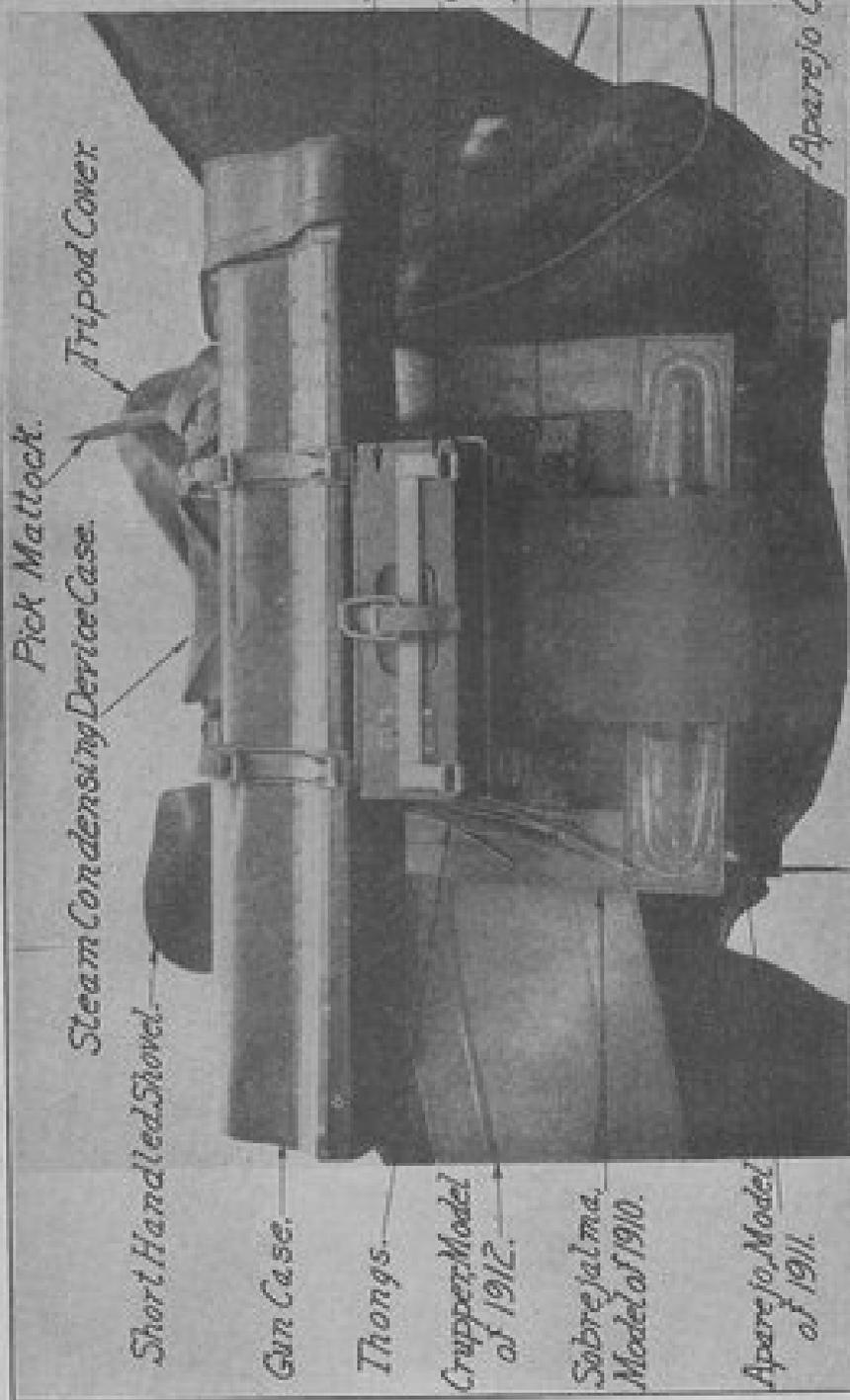
*Sobrejalma, Model of 1910.*

*Aparejo Cincha, Model of 1910.*

*Aparejo, Model of 1911.*

*Mule-Nos. 4, 12 and 20-Left side.*





Pick Mattock.

Steam Condensing Device Case.

Tripod Cover.

Short Handled Shovel.

Gun Case.

Thongs.

Crupper Model of 1912.

Sabrejalma Model of 1910.

Aparesjo Model of 1911.

Ammunition Box.

Gun Hanger.

Peck Frame Model of 1911.

Saddle Blanket.

Corona Model of 1915.

Aparesjo Cincha Model of 1910.

Mule-No. 1 Right side.

55476

end of each rope section can be secured to a pin. If it is necessary to use the sections separately, a shovel or pick mattock could be used as a "dead man."

#### STEAM-CONDENSING DEVICE CASE.

This is made of olive-drab cotton duck and is of sufficient size to carry the steam-condensing device and a pair of asbestos mittens. A leather strap with a snap at each end is attached to the back of the case so that it may be secured to the loop clevises of the pack frame.

#### PART IV. PIONEER TOOLS.

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Broad hatchets.....	3
Pick mattocks.....	3
Short-handled shovels.....	6
Rule, 2-foot.....	1

These tools are commercial articles. They are carried as prescribed on Plates XII and XIV and in the list of total equipment.

## PART V. SIGNAL EQUIPMENT.

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[Flag kit, 2-foot.]

The flag kit is furnished by the Signal Corps and is carried on the packs as shown in Plate XIV. Four are carried for troop and three for company.

**PART VI. EQUIPMENT OF ONE MACHINE-GUN  
COMPANY OR TROOP.**

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The following table sets forth the total equipment of one machine-gun company or troop armed with the Vickers machine gun, model of 1915. It shows, in general, where each article should be carried, but the commander may use his discretion as to the disposition of articles for which no particular fitting or receptacle is provided, and as to reduction in weight of load should such reduction be advisable.

In making requisitions for any of these parts the names used should be those used in this table or on the plates or in the descriptive matter of this handbook. If an article is wanted which is not shown, as a whole, but shown as made up of component parts, these component parts should be stated.





## NOTES FOR TOTAL EQUIPMENT TABLE.

<sup>1</sup> For troops the load is habitually reduced by the removal of two boxes of ammunition, one from each side of the mule. The full load, however, may be carried when conditions warrant.

<sup>2</sup> The hay is not furnished with the aparejo.

1 aparejo consists of—

- 1 aparejo body.
- 2 thongs  $\frac{1}{2}$  by 64 inches.
- 2 thongs  $\frac{1}{2}$  by 20 inches.
- 2 thongs  $\frac{1}{2}$  by 18 inches.
- 2 thongs  $\frac{1}{2}$  by 14 inches.
- 1 aparejo frame, consisting of—
  - 1 aparejo top-stick body, right.
  - 1 aparejo top-stick body, left.
  - 1 aparejo boot-stick body, right.
  - 1 aparejo boot-stick body, left.
  - 2 aparejo keys.
  - 2 aparejo top-stick plates.
  - 2 aparejo boot-stick plates.
  - 2 sets of aparejo ribs (10 to the set).

<sup>3</sup> A halter bridle includes either one leather rein, 12 leather rein, and 12 rope rein are issued to each company or troop.

<sup>4</sup> Carried by man. Twenty provided for each company or troop.

<sup>5</sup> 1 ammunition hanger consists of—

- 1 ammunition-hanger body.
- 2 holding-down straps.
- 2 holding-down clips.
- 2, 1 by 0.5 inch strap loops.
- 1 ammunition strap, clasp billet (with clasp).
- 1 ammunition strap, buckle billet.
- 1 ammunition billet.

<sup>6</sup> 1 gun hanger consists of—

- 1 gun-hanger body.
- 2 holding-down straps.
- 2 holding-down clips.
- 2, 1 by 0.5 inch strap loops.

<sup>7</sup> 1 pack frame consists of—

- 2 pack-frame sides.
- 2 arches.
- 4 superframes.
- 4 strap-loop clevises.
- 4 pack-frame pins.
- 4 split pins.
- 4 pack-frame top straps.

<sup>8</sup> 1 tripod hanger consists of—

- 1 tripod hanger body.
- 2 holding-down straps.
- 2 holding-down clips.
- 2, 1 by 0.5 inch strap loops.

<sup>9</sup> Carried on person.

STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP  
ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915.

Articles.	In tool box.	In belt filling machine box.	Total.	On mule number.	Property classification.	
					Class.	Section.
<b>TOOLS AND ACCESSORIES FOR 6 GUNS.</b>						
Ammunition box containing.....			126	On all mules.....		
1 cartridge belt.....			126	do.....		
Belt filling machine box.....	6	6	12			
Spare part container.....	6	6	12			
Screw driver, large.....	6	6	12			
Files, pair.....	6	6	12	4, 8, 12, 16, 20.....		
Oil can, pint.....	6	6	12			
Belt filling machine.....	6	6	12			
Clearing tool.....	6	6	12			
Belt repairing tool.....	6	6	12			
Cleaning rod.....	6	6	12			
Steam condensing device.....	6	6	12	1, 5, 9, 13, 17, 21.....		
Tool box.....	6	6	12			
Combined spanner.....	6	6	12			
Hammer.....	6	6	12			
Monkey wrench.....	6	6	12			
Drift steel, round.....	6	6	12	4, 8, 12, 16, 20.....		
Drift steel, octagonal.....	6	6	12			
Defective cartridge, extractor.....	6	6	12			
Filling cups.....	6	6	12			
Spring balance.....	6	6	12			
Spanner, water box.....	6	6	12			
Water box.....			24	2, 3, 6, 7, 10, 11, 14, 15, 17, 18, 22, 23.....		
Mittens, pairs, asbestos.....			6	In steam condensing device case.....		
Arm chest.....			6	Not carried.....		

Article.	Com-pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>TOOLS AND ACCESSORIES FOR PACK OUTFITS.</b>					
Broad hatchet.....	3	3	On mules Nos. 5, 12, 21.....	IV	9
Chest for supplies.....	1	1	Combat wagon.....	IV	1
Manila rope, 1-inch, feet.....	200'	200'	do.....	X	10
Pick maul.....	3	3	On mules Nos. 1, 8, 17.....	IV	9
Picket pin and picket-pin eye.....	6	6	On mules Nos. 4, 12, 20.....	IV	1
Picket-rope section.....	3	3	On mules Nos. 5, 9, 13, 17, 21.....	IV	1
Rigging cover.....	3	3	On mules Nos. 8, 16, 24.....	IV	1
Rule, boxwood.....	1	1	On person.....	X	9
Shovel, short handled.....	6	6	On mules Nos. 1, 5, 9, 13, 17, 21.....	IV	9
Set of blacksmith's tools.....	1	1	Schaller forge tool chest, in wagon.....	X	9
Set of saddler's tools.....	1	1	In tool bag, saddler's, in wagon.....	X	9
Supply sack for leather.....	1	1	Combat wagon.....	IV	1
Supply sack for leather and spare parts.....	1	1	do.....	IV	1
Supply bags.....	8	8	Chest for supplies.....	IV	1
Steam condensing device case.....	6	6	On mules Nos. 1, 5, 9, 13, 17, 21.....	IV	1
Triped cover.....	6	6	do.....	IV	1

## STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915—Continued.

Article.	Number.	Where carried.	Property classification.	
			Class.	Section.
<b>SPARE PARTS.</b>				
<b>FOR 4 GUNS.</b>				
Lock, complete.....	4	In tool boxes.....		
Adjusting washer, thin.....	18			
Adjusting washer, thick.....	18			
Asbestos packing sets.....	12			
Barrel.....	4	On mules Nos. 1, 3, 9, 11, 17, 21.		
Feed box, complete.....	4			
Piling pin and striker point.....	4	In tool boxes.....	IV	1
Fuses with link, complete.....	4			
Gib.....	4			
Recoil spring, complete.....	4			
Spring, bullet guide, with screw.....	4			
Spring, bottom pawl.....	8			
Spring, catch bottom.....	12			
Spring, dead stop plunger.....	4			
Spring, front cover catch sub.....	12			
Spring, gib.....	12			
Spring, main.....	24			
Spring, rear cover catch.....	4			
Spring, safety stud.....	4			
Spring, slide catch.....	4			
Spring, trigger bar.....	4			
Spring, trigger lever.....	4			
Spring, upper pawl.....	4			
Front disk cap.....	4			
Handle block pin.....	4			
Striker point.....	4			
Steam-outlet plug, complete.....	12			
Trigger-bar spring plunger.....	4			
<b>FOR 12 BELTS.</b>				
Brass strips, long.....	144	In belt-filling machine boxes.		
Brass strips, short.....	144			
Eyelets, long.....	180			
Eyelets, short.....	60			
Eyelets, medium.....	300			
<b>FOR 4 BELT-FILLING MACHINES.</b>				
Springs, feed lever.....	12	Do.....		
Springs, feed pawl.....	24			
<b>FOR 4 TRIPODES.</b>				
Elevating pin with spring.....	4	In tool box.....		
<b>FOR HARNESS.</b>				
Apron-top stick, right.....	1	In supply sack for leather and spare parts.	IV	1
Apron-top stick, left.....	1			
Apron-heel stick, right.....	1			
Apron-heel stick, left.....	1			
Apron ribs (set of 22).....	2			
<b>FOR SPECIAL PACK EQUIPMENT.</b>				
(For pack frame.)				
Side braces.....	4	In chest for supplies.....	IV	1
Pack-frame pins.....	2			
Strap-loop clevises.....	2			
Superframes.....	2			
Hook hinge.....	1			
Arch.....	1			
Side bar.....	1			
Hence bar.....	1			
Side-bar board.....	1			
Hence-bar board.....	1			
Split pins, 0.150 (2/32) by 0.600 inch.....	10			

STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP  
ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915—Continued.

Article.	Num-ber.	Where carried.	Property classification.	
			Class.	Section.
<b>SPARE PARTS—Continued.</b>				
<b>FOR SPECIAL PACK EQUIPMENT—continued.</b>				
(For ammunition hanger.)				
Rear top braces.....	2	In chest for supplies.....	IV	1
Side braces, 1 right, 1 left.....	2			
Quick-release device.....	1			
3-sided strap loop, with 2-strap fastener.....	4			
Holding-down clip.....	4			
1.5 by 1.5 inch strap loop, with rollers.....	4			
2 by 1.25 inch strap loop, with roller and fastener.....	4			
1 by 0.5 inch strap loop.....	4			
(For gun hanger.)				
Top clamp bar.....	1	.....do.....	IV	1
Gun clamp, with 1 by 1 inch strap loop.....	1			
Ammunition bracket, rear (drilled for front and rear), with 1 by 0.5 inch strap loops.....	1			
Diagonal brace.....	1			
Crossbar, with clamp hook link.....	1			
Rifle hanger plate and clamp, assembled.....	1			
Hanger clamp hook.....	1			
(For tripod hanger.)				
Tripod rest, rear.....	1	.....do.....	IV	1
Tripod clamp.....	1			
Ammunition bracket, front, with 1 by 0.5 inch strap loops.....	2			
Vertical diagonal brace (left and right).....	2			
Clamp hook strap.....	1			
(For rivets.)				
0.25 by 1.5 inch, countersunk head.....	25	.....do.....	IV	1
0.187 (3/16) by 1.50 inch, round head.....	10			
0.25 by 1.75 inch, round head.....	25			
0.187 (3/16) by 0.825 inch, countersunk head.....	25			
0.187 (3/16) by 0.75 inch, countersunk head.....	5			
0.187 (3/16) by 0.75 inch, round head.....	25			
0.25 by 1 inch, round head.....	15			
<b>INSTRUMENTS.</b>				
Range finder, 80 cm. base with carrying case, and tripod.....	1	Where most convenient unless otherwise specified in War Department orders.	V	1
Glasses, field type A, B, or E.K. furnished by Signal Corps.....	4	.....do.....		
Glass, field, type C, furnished by Signal Corps.....	2	.....do.....		

Article.	Com-pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>MISCELLANEOUS.</b>					
Ammunition, rounds.....	31,500	31,500	In cartridge belts.....	VIII	1
Field pocket line with 5 pins <sup>1</sup> .....	1	1	On troop pack.....	IX	5
Plac kit, combination standard, (Furnished by Signal Corps.).....	3	4	Where most convenient, unless otherwise specified by War Department orders.		
Pin and hammer steel <sup>1</sup> .....	1	1	On troop pack.....	X	1
Photoclearing kit.....	1	1	In combat wagon.....	X	9
Pole equipment sets (see C. U. A. S. M.).....	1	2	Not carried.....	IX	5
Stencil, cartons <sup>1</sup> .....	1	1	In combat wagon.....	X	5
Stencil, haversack <sup>2</sup> .....	1	1	do.....		
Stencil, personal equipment <sup>1</sup> .....	1	1	do.....		

<sup>1</sup> For new model equipment only.

<sup>2</sup> For old model equipment only.

## STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915—Continued.

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
MISCELLANEOUS—Contd.					
Target equipment (see pamphlet No. 1921).....			Not carried.....	X	7
Troop pack <sup>1</sup> .....		1	On pack mule.....	IX	5
Troop pannier.....		1	On troop pack.....	X	9
Water buckets, canvas, large <sup>1</sup> .....		8	do.....	IX	5
Water tank <sup>1</sup> .....		1	In wagon or troop pack.....		
Combat wagon.....		1	.....		
Harness for combat wagon.....	Furnished by Quar- ter-	1	.....		
Cooking utensils.....	Master Corps.		.....		
Company equip- age.....			.....		
PERSONAL EQUIPMENT.					
(See U. A. N. M.)					
SADDLER'S TOOLS. <sup>2</sup>					
Awl blades, harness, assorted, Nos. 41 to 45, inclusive.....	12	12	In tool bag, saddler's.....		
Awl, pointing.....	1	1	do.....		
Awl, seat, handled.....	1	1	do.....		
Carriage, printing, 3 wheels, Nos. 1, 2, and 10.....	1	1	do.....		
Compass, 4-teeth.....	1	1	do.....		
Cresset, double, lignum-vitae.....	1	1	do.....		
Edge tool, No. 1.....	1	1	do.....		
Edge tool, No. 2.....	1	1	do.....		
Extra blades with followers for draw gage.....	2	2	do.....		
Gage, draw, brass (without guard).....	1	1	do.....		
Hammer, No. 3, riveting.....	1	1	do.....		
Halts, patent awl, rosewood, with wrench.....	2	2	do.....		
Handle, peg, awl, with wrench.....	1	1	do.....		
Knife, round.....	1	1	do.....		
Knife, splitting.....	1	1	do.....		
Needle case, leather.....	1	1	do.....		
Needles, gloves, No. 3, papers.....	1	1	do.....		
Needles, harness, No. 4, papers.....	2	2	do.....	X	
Needles, harness, No. 5, papers.....	2	2	do.....		
Needles, harness, No. 6, papers.....	2	2	do.....		
Nippers, cutting, 16-inch.....	1	1	do.....		
Calstone, 1.125 by 2 by 8 inches, Washita, unmounted.....	1	1	In chest for supplies.....		
Files.....	1	1	In tool bag, saddler's.....		
Punches, revolving, 4 tubes, Nos. 4, 5, 6, and 7.....	1	1	do.....		
Rivet set.....	1	1	do.....		
Round hand punches, Nos. 8, 7, 6, and 10.....	4	4	do.....		
Rule, boxwood, 2-foot, 4-fold.....	1	1	do.....		
Screw driver, 3-inch blade.....	1	1	do.....		
Sewing palm, leather.....	1	1	do.....		
Shears, 10-inch, head trimmers.....	1	1	do.....		
Shoe knife, broad point.....	1	1	do.....		
Shoe knife, square point.....	1	1	do.....		
Slickers, steel.....	1	1	do.....		
Stitching clamp.....	1	1	In chest for supplies.....		
Stitching horse.....	1	1	For garrison only.....		
Thumbnails, best aluminum-lined, steel.....	2	2	In tool bag, saddler's.....		
Tool bags, saddler's.....	1	1	In wagon.....		
Tool, saw.....	1	1	In tool bag, saddler's.....		

<sup>1</sup> For new model equipment only.<sup>2</sup> Pertains to tools and accessories for pack outfits.

STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP  
ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915—Continued.

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>BLACKSMITH'S TOOLS.*</b>					
Anvil, 34 pounds.....	1	1	In Schaller forge tool chest.....		
Apron, blacksmith's.....	1	1	do.....		
Box, shoeing leather.....	1	1	do.....		
Chisel, handled, for cold iron, 1 pound 6 ounces.....	1	1	do.....		
Cinch cutter.....	1	1	do.....		
Clinching iron.....	1	1	do.....		
Crasser, steel-handled.....	1	1	do.....		
Cutting pliers, 14-inch.....	1	1	do.....		
Drills, flat.....	1	1	Not carried in field.....		
File, 12-inch, second cut.....	1	1	In Schaller forge tool chest.....		
File, 8-inch, 3-square taper.....	1	1	do.....		
Fire rate.....	1	1	do.....		
Fire shovel.....	1	1	do.....		
Hammer, rounding, 3-pound, 14- inch handle.....	1	1	do.....	X	9
Hammer, shoeing, 10-ounce.....	1	1	do.....		
Handles, cold chisel, spare.....	2	2	do.....		
Handle, 3-inch shank 1-inch bit.....	1	1	do.....		
Prictel, 4-inch, flats, 9-inch.....	1	1	do.....		
Ratchet drill for square shank drills	1	1	Not carried in field.....		
Schaller forge.....	1	1	In wagon.....		
Schaller forge tool chest.....	1	1	do.....		
Shoering knife.....	1	1	In Schaller forge tool chest.....		
Shoering pinners, 14-inch.....	1	1	do.....		
Shoering rasp, 16-inch.....	1	1	do.....		
Tongs, horseshoer's, 18.5 ounces.....	1	1	do.....		
Tool set for schaller forge.....	1	1	do.....		
Vise, 2.5-inch jaws.....	1	1	In Schaller forge.....		
Whetstone, 10-inch.....	1	1	In Schaller forge tool chest.....		
Wrench, screw, 8-inch.....	1	1	do.....		
<b>BLACKSMITH'S TOOLS,†</b>					
Anvil, 17.5.....	1	1	In chest for anvil and block.....		
Apron, leather.....	1	1	In cavalry forge chest.....		
Block, anvil.....	1	1	In chest for anvil and block.....		
Box, shoeing leather.....	1	1	In wagon.....		
Bucket, iron.....	1	1	do.....		
Chest, anvil and block.....	1	1	do.....		
Chest, forge, cavalry.....	1	1	do.....		
Chisel, handled, for cold iron, 2 pounds.....	1	1	In cavalry forge chest.....		
File, flat, 12-inch bastard.....	1	1	do.....		
Fore punch and crasser, handled.....	1	1	do.....		
Forge, Krupps, portable, modified for Army use.....	1	1	do.....		
Hammer, hand, handled, 3 pounds.....	1	1	do.....		
Hammer, shoeing, 10 ounces.....	1	1	do.....	X	9
Handle, 4-inch square shank, 14- inch bit.....	1	1	do.....		
Iron, clinching.....	1	1	do.....		
Knives, shoeing, bone handle.....	2	2	do.....		
Knife, saw.....	1	1	do.....		
Pinners, shoeing, 12-inch.....	1	1	do.....		
Prictel, 6.75-inch, flats, 9-inch.....	1	1	do.....		
Punch, nail.....	1	1	do.....		
Rake, fire.....	1	1	do.....		
Rasp, shoeing, 16-inch.....	1	1	do.....		
Shovel, fire.....	1	1	do.....		
Vise, 2½-inch jaws, 1½-inch opening.....	1	1	do.....		
Wrench, forge.....	1	1	do.....		
Wrench, screw, 12-inch, solid bar.....	1	1	do.....		
Tongs, horseshoer's, 12-inch.....	1	1	do.....		

\* Pertains to tools and accessories for pack outfits.

† The blacksmith's tools given in this table are issued to machine-gun company or troop when equipped with the Krupps forge.

STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP  
ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1913--Continued.

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>MATERIALS FOR CLEANING AND PRESERVATION.</b>					
(4 months' supply, all expendable.)					
Black adhesive tape .....		1	In chest for supplies.....		
Borax, pounds.....	3	3	do.....		
Brushes:					
No. 3.....	1	1	do.....		
Varnish, No. 3-0.....	1	1	do.....		
Cloth, emery:					
No. 1, quires.....	1	1	do.....		
No. 0, quires.....	1	1	do.....		
No. 00, quires.....	1	1	do.....		
Cosmetic, No. 80, soft, quarts.....	1	1	do.....		
Chamois skin.....	1	1	In store.....		
Dressing, russet leather, boxes.....	1	2	In chest for supplies.....		
Lye, powdered, 1-pound cans.....	2	2	do.....		
Naphthaline, pounds.....	3	10	In store.....		
Oil, linseed, boiled, gallons.....	1	1	In chest for supplies.....	X	10
Oil, linseed, raw, pints.....	1	1	do.....		
Oil, neat's-foot, gallons.....	3	10	2 in chest, rest in store.....		
Oil, sperm, gallons.....	1	1	In chest for supplies.....		
Paint, olive-drab, 3d coat, pounds.....	12	12	do.....		
Primer, brown enamel, quart.....	1	1	In store.....		
Sul soda, pound.....	1	1	In chest for supplies.....		
Soap:					
Castile, pounds.....	10	20	4 carried for company, 8 for troop, rest in store.....		
H. and H., cakes or "Paco".....	1	1	In chest for supplies.....		
Saddle, Frank Miller's, pounds.....	10	40	20 for troop in store, rest in chest for supplies.....		
Sponges, 3-inch.....	20	70	20 carried for troop, rest in store.....		
Waste, cotton, pounds.....	0	0	In supply sack in wagon.....		
<b>SADDLER'S MATERIAL.</b>					
(6 months' supply, all expendable.)					
Awl blades, harness, assorted.....	3	6	In chest for supplies.....	X	9
Awl hafts, patent, with wrench.....	1	1	do.....		
Buckles:					
Bar--					
1-inch, center.....	1	20	do.....		
1-inch, tongueless.....	1	1	do.....		
1-inch, center.....	1	12	do.....		
1-inch, center.....	1	6	do.....		
1-inch, center.....	1	3	do.....		
1-inch, Sealback.....	1	3	do.....		
1 1/2-inch, center.....	1	2	do.....		
1 1/2-inch, center.....	1	2	do.....		
1 1/2-inch, tongueless.....	1	3	do.....		
Holler--					
1-inch.....	1	3	do.....	X	10
1-inch.....	1	1	do.....		
1-inch.....	1	6	do.....		
1-inch.....	1	1	do.....		
1-inch.....	1	6	do.....		
Wire--					
1-inch.....	1	6	do.....		
1-inch.....	1	2	do.....		
1-inch.....	1	24	do.....		
1-inch, tongueless, roller.....	1	1	do.....		
Cincha straps, sparejo.....	2	2	do.....	IV	1
Check "D".....	1	6	do.....		
Check plates, upper and lower.....	2	2	do.....	X	10
Check staple.....	1	1	do.....		
Duck, cotton, olive-drab:					
No. 3, yards.....	4	4	do.....		
No. 2, yards.....	4	4	do.....		
No. 1, yards.....	3	12	In store.....	X	10
End buckle, 1-inch.....	1	9	In chest for supplies.....		
End clip, 1 1/2-inch.....	1	12	do.....		
Foot straps:					
High.....	1	6	do.....		
Low.....	1	12	do.....	IX	8
Semicircular.....	1	6	do.....		
Hook, double, brass wire.....	4	4	do.....		
Hook, end, brass wire.....	4	4	do.....		
Hook, gunning.....	2	2	do.....	X	10
Hook, wire, for link.....	1	1	do.....		

STATEMENT OF TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP  
ARMED WITH THE VICKERS MACHINE GUN, MODEL OF 1915—Continued.

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>SADDLER'S MATERIAL—Con.</b>					
Leather, bridle, backs.....	1	4	In supply sack for leather.....		
Leather, collar, backs.....	1	4	do.....	X	10
Leather, harness, pounds.....	20	120	do.....		
Leather, latigo, side.....	1	1	do.....		
Loop, running.....	6	6	In chest for supplies.....	IX	5
Nails, saddle.....	3	3	do.....		
Needles, glover's No. 2, paper.....	1	1	do.....		
Needles, harness, No. 4, paper.....	1	1	do.....	X	9
Needles, harness, No. 5, paper.....	1	1	do.....		
Needles, harness, No. 6, paper.....	1	1	do.....		
Ornaments, brass band.....	4	4	do.....		
Ovals, saddle.....	3	3	do.....	IX	5
Ovals, saddlebag.....	3	3	do.....		
Pins, screw, brass, 1-inch, gross.....	1	1	do.....	X	10
Underling rings, 1 1/2-inch.....	2	2	do.....	IV	1
Rings, 1/2-inch diameter.....	6	6	do.....		
Rings, 1-inch diameter, rifle scab-board.....	2	2	do.....		
Rings, 1 1/2-inch diameter, saddle.....	1	12	do.....		
Rings, 1 1/2-inch diameter, throat strap.....	3	3	do.....		
Rings, 2 inches diameter, halter.....	2	6	do.....		
Rings, 4 inches diameter, cincha strap.....	1	9	do.....		
Rings, 4 inches diameter, quarter strap.....	6	6	do.....	X	10
Ring D, 1-inch diameter, feed bag.....	8	8	do.....		
Rivets and lugs, brass, 1/2-inch, No. 12, pounds.....	1	1	do.....		
Rivets and lugs, brass, 1/2-inch, No. 10, pounds.....	1	1	do.....		
Rivets and lugs, brass, 1/2-inch, No. 8, oval head, pounds.....	1	1	do.....		
Rope, 1-inch, halter bridle, feet.....	50	50	do.....		
Rope, 1-inch, halter, feet.....	50	1,000	20 for company in chest for supplies; rest in store.....	X	10
Screws, brass, 1-inch, No. 6, gross.....	1	1	In chest for supplies.....		
Sheepskins, with wool on.....	4	4	1 in chest for supplies; rest in store.....		
Shields, saddle, 11-inch.....	1	1	In chest for supplies.....		
Shields, saddle, 11 1/2-inch.....	2	2	1 in chest for supplies; rest in store.....	IX	5
Shields, saddle, 12-inch.....	1	1	In chest for supplies.....		
Snag hook, custom, cavalry.....	2	2	do.....		
Snag, German, 1/2-inch.....	6	6	do.....		
Snag hook, harness.....	2	2	do.....	X	10
Snag, swivel, oval loop, 1 1/2-inch.....	1	1	do.....		
Snag, swivel, 1-inch, No. 14.....	3	3	do.....		
Snag, German, 1-inch.....	8	8	do.....		
Squee, halter.....	1	18	do.....		
Strap loop, feed bag.....	8	8	do.....	IX	5
Studs, saddlebag.....	1	1	do.....		
Tacks, copper, No. 12, 1/2-pound paper.....	1	1	do.....		
Tacks, copper, No. 20, 1/2-pound paper.....	1	1	do.....		
Thumb, aluminum-lined, steel.....	1	1	do.....		
Thread, shoe, No. 3, brown, pound.....	1	1	do.....		
Thread, shoe, No. 10, brown, pound.....	1	1	do.....		
Wax, stitching, brown, pound.....	1	2	do.....		
Webbing, olive-drab, cotton, heavy, 1-inch, yards.....	1	11	do.....	X	10
Webbing, olive-drab, halter, 1 1/2-inch, yards.....	1	7	do.....		
Webbing, olive-drab, jute, 1 1/2-inch, yards.....	2	9	do.....		
<b>FOR POLO EQUIPMENT.</b>					
Buckles, wire, 1-inch.....	1	1	Not carried.....		
Buckles, wire, 1-inch.....	2	2	do.....		
Buckles, wire, 1-inch.....	12	12	do.....		
Buckles, wire, 1-inch.....	4	4	do.....		
Buckles, stirrup strap, 1 1/2-inch.....	2	2	do.....	X	10
Buckles, girth, 1-inch.....	6	6	do.....		
Ring, 1/2-inch diameter.....	4	4	do.....		
Web, linen, straining, 1 1/2-inch, yards.....	5	5	do.....		
Web, linen, straining, 5-inch, yards.....	7	7	do.....		

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WAR DEPARTMENT,

OFFICE OF THE CHIEF OF ORDNANCE,

Washington, July 11, 1917.

FORM NO. 1773.

Ed. July 11-17-3,000.



