HANDBOOK OF THE VICKERS MACHINE GUN

M
614
F7

C. & G.S.S. LIBRARY

623.4224

TECHNICAL TRAINING SERIES

LIBRARY
THE GENERAL SERVICE SCHOOLS
FORT LEAVENWORTH, KANSAS

HANDBOOK OF THE

VICKERS MACHINE GUN

MODEL 1915

WITH MARK IV TRIPOD

APRIL, 1918

CARDED

Prepared and Printed by
THE INFANTRY SCHOOL OF ARMS
FORT SILL, OKLAHOMA

Authority

461.1 (OD)

3RD IND.

War Department, A. G. O., April 3, 1918.—To the Commandant, Infantry School of Arms, Fort Sill, Okla. Through the Commanding General, Fort Sill, Okla.

1. The inclosed "Handbook of the Vickers Machine Gun" is approved. It is desired that you print this pamphlet and distribute it as follows:

25 copies to each division in the United States.

* * * * *

2. In view of the fact that the Vickers gun is now being used for training purposes only in all parts of the army except air service, a larger edition of this pamphlet than that above noted is not deemed advisable at the present time.

By order of the Secretary of War:

F. W. SERVICE,
Adjutant General.

TABLE OF CONTENTS

INTRODUCTION PAGE

PART I
MECHANISM AND HANDLING

DESCRIPTION 1-- 2
ADJUSTMENTS 2
ESSENTIAL PARTS 3--13
Non-recoiling Parts 3-- 8
Recoiling Parts 8--13
TRIPOD 13
BELT FILLING MACHINE 13--15
TOOL BOX 15--16
SPARE PARTS INSTRUCTION 16--18
STEAM CONDENSING DEVICE 18

DETAILED OPERATION OF THE GUN IN FIRING . 18--24
Preliminary 18--20
Functions Of Moving Parts. 21--24
Backward Movement 21--23
Forward Movement 23--24

CARE AND PRESERVATION 24--28
PACKING THE BARREL 28
ABBREVIATED MEMORY TABLE (for before, during, and after firing) 29
STRIPPING AND ASSEMBLING 30--37
Stripping 31--33
Assembling 33--36
Changing Worn Or Bulged Barrels . . . 36--37

DEMONSTRATION 37--39
DETAILED OUTLINE FOR INSPECTION 40--44

PART II
GUN DRILL—DISMOUNTED

ELEMENTARY DRILL 46--60
COMBINED DRILL 60--62
ROUGH GROUND DRILL 62--65

PART III
STOPPAGES AND IMMEDIATE ACTION

STOPPAGES 65--73
IMMEDIATE ACTION 73--85

APPENDICES

SERIAL LIST OF COMPONENT PARTS (Gun And Rear Sight) 86--91
ALPHABETICAL LIST OF COMPONENT PARTS OF GUN 91--96

INTRODUCTION

THE subjects in this *Handbook* have been arranged, as nearly as possible, in the order in which they should be taught. This book does not deal with the question of the relative importance of the subjects a machine gunner is required to know, but it is thought advisable to mention the following points:

A thorough knowledge of the gun and its every part is so essential that great stress must be laid on teaching its mechanism. Technical problems are useless until members of the gun squad understand their gun thoroughly. It is not sufficient to explain the mechanism to the men. They must be required to study every detail of the gun and be able to explain the function of any and all parts.

When this is accomplished they should be given instruction in the reduction of stoppages. Actual practice with ball ammunition is the most efficient way to teach men to correct stoppages rapidly and accurately. The men must be trained in immediate action, even if ammunition is not available.

After the members of the gun squad are thoroughly familiar with the gun and all its good and bad points, tactics may be considered. The drill enumerated herein is primary in nature; it should be performed with three distinct ideas in view:

First, to develop a high state of discipline; *second,* to develop efficiency, speed, and accuracy in handling the weapon; *third,* to instil in the men a thorough knowledge of the application of fire.

No effort has been made to treat the details of advanced drill, fire direction and control, or marksmanship. For these details reference should be made to the Machine Gun Drill Regulations and such manuals as have been or will be published by the War Department.

PART ONE
MECHANISM *and* HANDLING

Description

Type:

The Vickers Machine Gun belongs to the recoil operative, belt fed, water cooled, heavy type machine gun.

Ammunition:

The ammunition used in this machine gun is caliber .30 U.S. ammunition, manufactured by the Frankford Arsenal.

Cooling System:

The water jacket which surrounds the barrel holds 7½ pints of water; this absorbs heat from the barrel, and thus keeps its temperature reduced.

Locking Mechanism:

The mechanism is locked to the barrel by a link connection which, when straight, is on a dead center in rear of the chamber and offers a straight line resistance to the pressure generated in the chamber.

Feeding Mechanism:

The backward and forward motion of the barrel is transmitted by a lever to the feeding mechanism which causes the belt to be fed through the gun.

Forces Which Operate The Gun:

The operation of the gun is divided into two movements: the movement to the rear, and the return movement.

The movement to the rear is accomplished by the natural recoil of the barrel, which is movably attached to the mechanism, assisted by the muzzle attachment which increases the force of recoil.

The return movement is accomplished by the recoil spring which is extended during the movement to the rear. These two movements cause the mechanism to perform the operations of extracting, ejecting, loading, and firing automatically as long as the trigger is pressed and the ammunition is fed.

Adjustments

1—Gas:

If the natural recoil of the barrel is not sufficient to cause the complete movement to the rear, the muzzle attachment is used. This muzzle attachment causes the gas leaving the barrel to be confined between the front disk and the barrel disk, thus increasing the force of recoil.

2—Recoil Spring:

Without the muzzle attachment the recoil spring should be so adjusted that, when the roller handle is raised approximately 1 inch from the dead stop, the tension in the spring will be 6 to 8 pounds. When the muzzle attachment is used, the tension in the recoil spring, measured as described above, should be 8 to 10 pounds.

3—Belts:

The ammunition should be so loaded in the belts that the points of the bullets will be on a line with the ends of the brass strips.

Essential Parts

The parts of this gun are divided into:

1—Non-recoiling parts.

2—Recoiling parts.

Non-recoiling Parts

Follower

The follower is screwed into the water jacket cap and holds the front packing in position in the stuffing box.

Sleeve

The sleeve is connected to the follower by interrupted annular rings and is pinned in position by the locking pin.

Front Disk

The front disk is screwed into the front of the sleeve. Its interior is conical in shape in order to confine or deflect the gases escaping from the muzzle. This confining of gas, or its deflection, brings pressure to bear on the barrel disk, thus adding considerable force to the natural recoil of the barrel.

Front Disk Cap

The front disk cap is a tin cap placed over the interior surface of the front disk and is so made that it can be easily removed. When carbon from the powder gases forms on this cap it should be replaced by the extra one carried with the spare parts.

Barrel Disk

The barrel disk is screwed onto the barrel and assists in confining the gas escaping from the muzzle.

Front Sight

The front sight is dovetailed into the front sight carrier and held in position by the front sight screw. The high point of the front sight is to the rear.

Water Jacket

The water jacket is made of sheet steel and corrugated to give a larger cooling surface for the water. It is threaded and riveted onto the trunnion block and water jacket cap and *should not be stripped.*

Water Jacket Cap

The water jacket cap has four openings: the first for the barrel, follower, etc., the second for the front plug, the third for drainage of the water jacket, and the fourth for the steam to escape. This steam escape tube or opening is connected through the front plug to the inner steam tube. It is closed by inserting the stem.

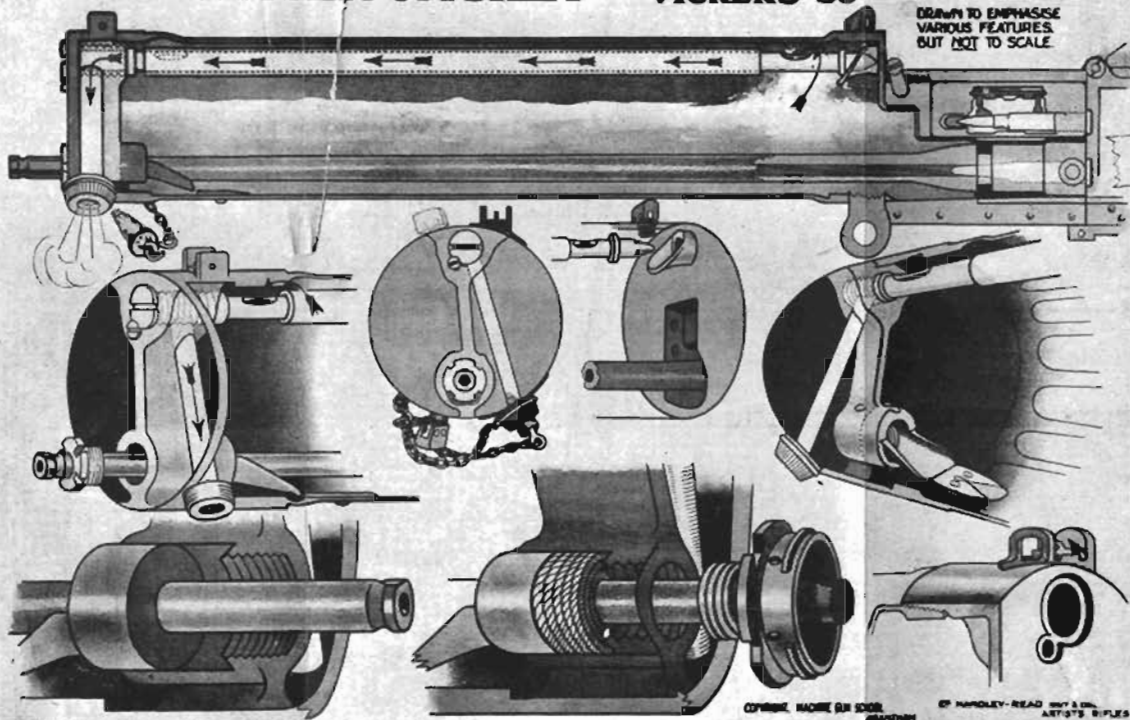
Steam Tubes

The plug at the rear end of the inner steam tube rests in the trunnion block. The inner steam tube is held in position by the front plug which is screwed into the water jacket cap.

There are three openings in this tube, two in the upper surface of the tube in the water jacket about two inches from the front and rear respectively; the third opens into the steam outlet tube in the water jacket cap.

The outer steam tube is slightly larger than the inner tube and of such length that it can cover only one of the upper openings in the inner tube at a time. When the muzzle is depressed, this outer tube slides forward over the forward opening leaving the rear opening uncovered. In this way the steam that is gen-

WATER JACKET VICKERS ·30



REPRINT BY COURTESY OF MACHINE GUN SCHOOL, GRANTHAM, ENGLAND

erated passes through the rear opening, the tube, the steam outlet tube, and out of the water jacket. Since the front opening is closed, there is no escape of water. When the muzzle is elevated, the reverse occurs.

Trunnion Block

The trunnion block connects the water jacket with the breech casing. It has a cylindrical opening to receive the barrel, is cut away for the feed box, and has a clearance cut on the left side for the lower feed lever. To the trunnion block are riveted the two side plates. The trunnion pin passes through the trunnion block distance piece.

Right Side Plate

The right side plate is riveted to the trunnion block and bottom plate, and has assembled to it the dead stop bracket, dead stop, plunger and spring. At the rear of the right side plate is a clearance cut for the roller bracket. On the inner side of this plate is a beveled surface upon which the carrier rides. The small groove at the rear of this beveled surface, used for *hanging the lock*, prevents the carrier from returning to the front, once it has reached this point, unless it drops.

Left Side Plate

The left side plate has assembled to it the two studs for the spring box fixing and the recoil spring box. There is a clearance cut in the rear for the filling piece; there is also a cam on the inner side similar to that on the right side plate.

Front Cover

The front cover is assembled to the two side plates by means of the cover hinge pin.

When down it is fastened by the front cover catch.

Trigger Bar: REAR COVER

A small lug protrudes from the side of the trigger bar in front of the trigger bar spring. By means of this spring the trigger bar is kept in its forward position. At the rear end of the trigger bar is a lug connecting the trigger bar to the trigger lever. At the front end is a cut in which the hand sear rests. The trigger bar is, therefore, a link between the hand sear and the trigger lever.

Rear Cover Catch:

A small projection from the rear cover catch seats under the rear cover catch spring. This insures the cover catch engaging when the rear cover is lowered.

Rear Cover Guides:

The front faces of the rear cover guides form a ramp upon which the ears of the carrier operate. This ramp forces the carrier down in case it fails to drop of its own weight.

Half-Nut: REAR SIGHT

The half-nut is used for large and rapid changes of the slide; the elevating screw for small adjustments.

Aperture Disk:

The aperture disk is set by pressing in the center, turning it to the desired position, and releasing it.

Rear Sight Stop Screw:

The rear sight stop screw just to the right of the rear sight limits the motion of the movable base to the right. This is to prevent the roller handle from striking and breaking the rear sight.

Bottom Plate

The bottom plate has an elevating pin seat bored to receive the elevating pin; it has two slots in which the bottom plate slide fits.

Bottom Plate Slide

To the bottom plate slide are assembled the slide catch plunger and spring. This bottom plate slide, when closed, keeps dust from getting in the mechanism. It is impossible to operate the gun until this bottom plate slide is completely open.

Handle Block

The handle block is assembled to the side plates by the handle block hinge pin and the handle block pin. To the handle block are assembled the trigger, trigger pawl, trigger lever, trigger lever spring and safety catch.

In the handles are two reservoirs for oil and two brushes to be used in oiling the mechanism.

Trigger Mechanism

The trigger is pivoted at the bottom; it is connected to the trigger lever by the trigger pawl. The top of the trigger lever is held in its forward position by the trigger lever spring. This insures that the trigger bar will not be held in its rear position when the trigger is released. The trigger lever spring, in addition to holding the trigger lever forward, forces the safety catch downward; this prevents the trigger being pushed until the safety catch is raised.

Feeding Mechanism

The lower feed lever connects with the left recoil plate; the upper feed lever connects

with the slide. These two levers are connected to a common shaft by a split pin.

Assembled to the slide are the upper pawls and spring. These pawls are of different shape and size.

The bullet guide spring is held in position by a screw; its function is to assist the cartridge into the proper position for loading.

The bullet stop limits the motion of the bullet.

The bottom pawls and spring are assembled to the feed box by the bottom pawl pin. These pawls prevent any motion of the belt to the right.

Ammunition Belts

The belts consist of two web belts bound together with short and long brass strips; they hold 250 cartridges and are transported in a wooden ammunition box with hinged lid that is secured by a catch. The front edge of these web belts is folded under to cause the cartridge to lie horizontal in the feed box. The long brass strips correctly adjust the belt in the belt filling machine and assist in loading the cartridges evenly.

Recoiling Parts

Barrel Disk

The barrel disk is screwed onto the muzzle and assists in confining the gas which escapes from the muzzle.

Barrel

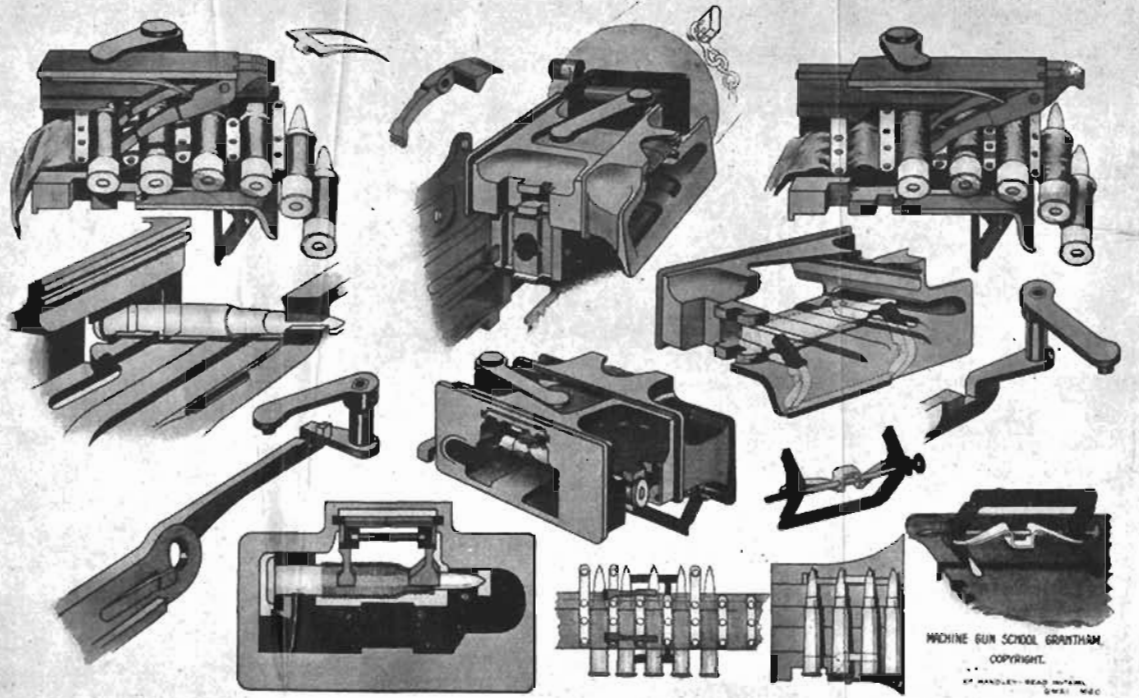
The barrel is made of steel and tapered except at the two points where packing is applied. At these two points the barrel is cylindrical. It is covered with copper to prevent rust due to constant contact with water.

The rear of the barrel has two trunnion lugs which receive the right and left recoil plates. The entrance to the chamber is so

DRAWN TO EMPHASISE VARIOUS FEATURES
BUT NOT TO SCALE

FEED BOX

VICKERS ·30



MACHINE GUN SCHOOL GRANTHAM.
COPYRIGHT.

REPRINT BY COURTESY OF MACHINE GUN SCHOOL, GRANTHAM, ENGLAND

arranged that the barrel can be turned upside down without changing its relative position with respect to the carrier.

Recoil Plates

The recoil plates are attached to the barrel by the barrel trunnions. Near the bottom of these plates are flanges which limit the motion of the lock in a vertical plane. The two carrier supporting springs near the front of the recoil plates insure that the carrier will remain completely up, during and immediately after the explosion in the chamber, until the ears of the carrier reach the side cams.

The left recoil plate has a long arm which connects with the lower feed lever. When the recoil takes place this arm causes the feed mechanism to operate.

Crank

The crank is connected through the crank shaft to the recoil plates, roller handle, and fusee. It has assembled to it the crosshead. The crosshead is held in position by the crank pin and crank pin fastening link.

Crosshead

The crosshead is knurled at the rear to facilitate lifting it by means of the fingers. It has a bayonet joint which connects it to the lock and an adjusting nut under which the washers are placed to correct for excessive headspace.

Lock

The lock contains the loading, firing, and extracting mechanism.

Side Lever:

The side lever is connected to the lock frame by the side lever pin and pin bushing.

The side lever, when forced into the horizontal position, causes the lifting levers to rise, thus lifting the carrier and at the same time forcing the safety sear to release the firing pin.

When the shank of the side lever is raised from the horizontal position, it lifts the tail of the tumbler, thus pulling the firing pin to the rear, compressing the main spring, and cocking the lock.

Carrier:

The carrier rides on the front of the lock frame. It is forced down when the ears of the carrier strike the rear cover guides; it is forced up by the lifting levers.

The face of the carrier is slotted to receive the base of the cartridge. The gib is so situated that it holds the cartridge in position while the carrier is moving.

In rear of the gib is the gib spring which is held in position by the gib spring plate, the gib spring thus forces the gib to the front. The upward movement of the carrier is limited by the stud on the front face of the lock frame; the downward movement is limited by the lifting levers.

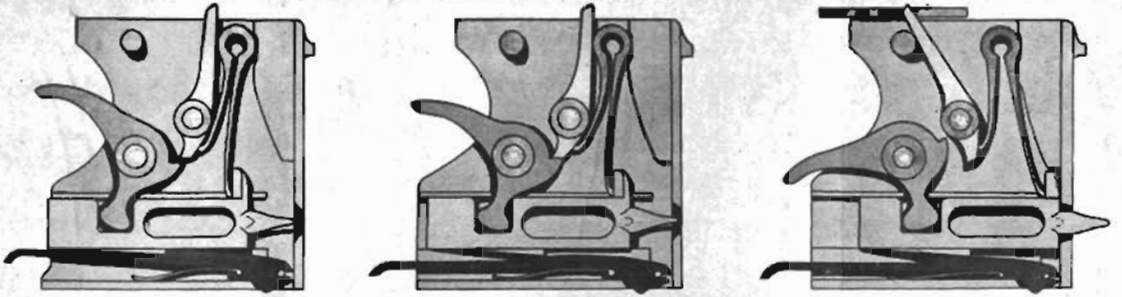
On the sides of the carrier are two shoulders into which the carrier supporting springs engage holding the carrier in its highest position when the mechanism is locked and during the first part of the movement to the rear.

Mainspring:

The long arm of the mainspring rests in rear of the forward shoulder of the firing pin. The short arm of the mainspring presses against the lower end of the hand sear. The shape of this spring keeps it in position. It exerts a pressure forward in the case of the firing pin; rearward in the case of the hand

DRAWN TO EMPHASISE VARIOUS FEATURES BUT NOT TO SCALE

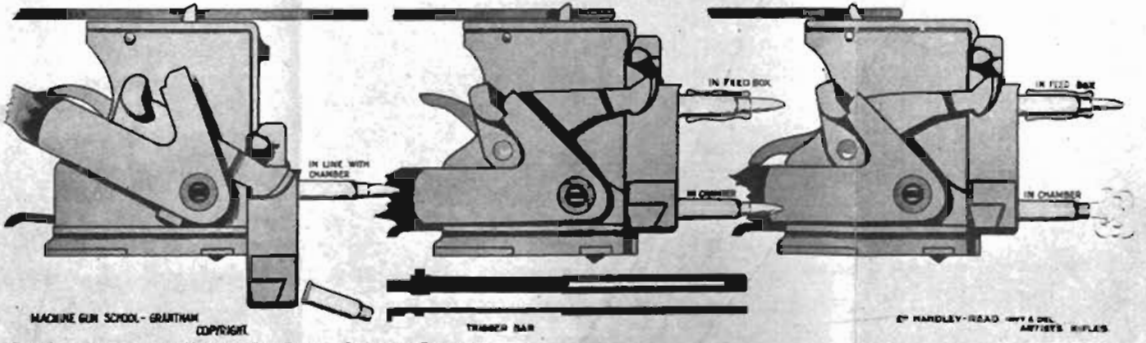
3 Positions of Lock VICKERS·30



COCKED & FULLY BACK

FORWARD READY FOR FIRING

FIRED



MACHINE GUN SCHOOL - GRANTHAM

COPYRIGHT.
REPRINT BY COURTESY OF MACHINE GUN SCHOOL, GRANTHAM, ENGLAND

E^rs HANDLEY-READ

sear. If the mainspring is kept under constant tension, it will soon be weakened; therefore, the mainspring must be released when the lock is not in use.

Tumbler:

The tumbler pivots on the tumbler pin. It is provided with a lower arm which engages an opening in the firing pin by means of which the firing pin is moved to the rear when the tumbler is revolved. It is also provided with a shoulder which engages the lower end of the hand sear when the safety sear has been released.

Firing Pin:

The firing pin is provided on its upper surface with a shoulder against which the long arm of the mainspring rests, and with a recess in which the lower arm of the tumbler fits. On its lower surface is a shoulder which engages the nose of the safety sear.

Safety Sear:

The safety sear is pivoted at its forward end and is kept pressed against the firing pin by the safety sear spring which rests against the bottom of the lock frame. On the upper surface of the safety sear is a nose which engages the shoulder on the lower surface of the firing pin when the firing pin is in its rearmost position and thus prevents the firing pin from going forward until the safety sear is released.

Hand Sear:

The hand sear pivots on the hand sear pin. The nose of the hand sear engages the shoulder on the tumbler when the safety sear is released. When the hand sear is moved to the rear by the trigger bar, the nose on the hand sear is disengaged from the tumbler. This permits the firing pin to move forward under the pressure of the mainspring, the

tumbler revolving with it to its original position. In automatic fire the hand sear is held continuously to the rear and cannot engage the shoulder on the tumbler. The firing pin is held to the rear by the safety sear only. At each release of the safety sear, therefore, the firing pin is free to move forward the full distance instead of being stopped by the nose of the hand sear as would be the case when firing single shots.

Fusee

The fusee has two positioning lugs of different sizes, for this reason the fusee can be inserted in the crank shaft in one way only. The fusee links wind into the groove formed by the two flanges of the fusee, and are connected by the end link pin to the recoil spring hook.

Recoil Spring

The recoil spring is fastened to the spring box by the recoil spring tension screw and is adjusted by the tension screw handle.

Roller Handle

The roller handle is assembled to the crank shaft and is held in position by a screw. Both the roller handle and the tail of the roller handle are beveled. When the recoil commences, the tail of the roller handle strikes the roller, causes the roller handle to rotate, lifts the crank, breaks the straight joint between the crank and crosshead, and unlocks the mechanism.

The ramp on the roller handle proper assists in forcing the barrel forward after the barrel has completed its movement to the rear.

Dead Stop

The dead stop is so pivoted that when the roller handle strikes its lower projection the

dead stop rotates toward the rear, engages the roller handle, and thus prevents the roller handle from rebounding. (The dead stop is assisted in this movement by the plunger and spring).

Tripod

The tripod is the same as that used by the British Army and is called the Mark IV. The principal parts of the tripod are:

1. Socket.
2. Tripod Head.
3. Legs (2).
4. Trail.
5. Elevating screws.
6. Elevating handwheel.
7. Traversing clamp.
8. Elevating pin.
9. Trunnion pin.
10. Leg clamps.
11. Trail clamp.

By means of the leg and trail clamps, the legs and trail may be adjusted in any position. The trunnion pin and elevating pin secure the gun to the tripod. The traversing clamp holds the crosshead in position and when tightened stops the lateral motion of the gun.

The method of mounting the tripod is given under Drill.

Belt Filling Machine

The belt filling machine is used to insert the cartridges into the belt rapidly and evenly. For transportation purposes this machine is carried in the belt filling machine box, constructed similar to the ammunition and tool boxes; it has a red stripe painted around it. The principal parts of the belt filling machine are:

1. Body
2. Bracket
3. Hopper
4. Handle

To Assemble The Belt Filling Machine

Fasten the bracket to the edge of a flat surface by means of the bracket clamp. Connect the body to the bracket and secure it by the body clamp. Slip the handle on the crank and pin it in place. Turn the handle until it is vertical; holding it in that position, insert the lug of the hopper in its seat, the groove facing the machine, and press it down until entirely seated.

To Load The Cartridges In The Belt

Swing the belt cover to the left, uncovering the belt passage. Turn the handle so that it points to the right and slightly downward, 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 separator. Then let down the pawl and swing the belt cover into place over the belt. 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 the inequalities in the belt or the slipping of the pawl, that a loop will not be fed so the separator can enter. In that case the feed pawl should be lifted and the belt adjusted in the proper position. If the separator 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.

To Adjust The Belt Filling Machine

Since cartridges will be fed into old belts as well as new ones, there is provided a means of adjusting the belt filling machine so that the cartridges will be loaded evenly. (In most handbooks the parts, separator and plunger, have been reversed; the separator really being the plunger and the plunger the separator). The machine is adjusted by means of the plunger screw and check nut so that the cartridges will be placed evenly in the belts. The normal adjustment of the machine is such *that the points of the bullets will be on a line with the ends of the long brass strips.*

Tool Box

The Tool Box is distinguished from other boxes by a blue stripe It is of the same general construction and has fastenings similar to the ammunition box. The interior is arranged to carry the following articles:

1 Bottom pawl spring.
1 Bullet guide spring with screw.
2 Front cover catch snib springs.
2 Gib springs.
4 Mainsprings.
1 Recoil spring, complete.
1 Rear cover catch spring.
1 Safety sear spring.
1 Slide catch spring.
1 Trigger lever spring.
1 Trigger bar spring.
1 Upper pawl spring.
1 Front disk cap.
1 Muzzle gland.

1 Feed box, complete.
1 Fusee with links, complete.
1 Firing pin.
1 Hammer.
1 Gib.
1 Handle block pin.
1 Lock, complete.
2 Stems, complete.
3 Adjusting washers, thick (2 small holes).
3 Adjusting washers, thin (1 small hole).
2 Sets asbestos packing.
1 Spare part container.
1 Combined spanner.
2 Steel drifts.
1 Defective cartridge extractor.
1 Filling cup.
1 Monkey wrench.
1 Oil can, pint.
1 Pair pliers.
1 Large screwdriver.
1 Spring balance.

No defective worn or broken parts should ever be permitted in the tool box.

Spare Parts Instruction

Preliminary Remarks

1—The importance of knowing what is and what is not carried as a spare part should be impressed on all machine gunners.

2—It is essential to know where to find any spare part that may be required.

3—All spare parts must be given their proper names, the use of other names is forbidden.

4—A list of deficiencies should be kept inside each box.

5—Spare parts must be kept slightly oiled.

6—The necessity of checking spare parts whenever opportunity offers must be emphasized.

7—Breakages and losses must be reported immediately.

8—Noncommissioned instructors will check their own spare parts at the beginning and end of the instruction, and will render a report showing deficiencies.

How Taught

First Lesson — To teach the correct names of spare parts.

The instructor, having laid out on a table or waterproof sheet the whole of the contents of the tool box, will teach his squad as follows:—

(a)—Holding up each article he will call out the correct name given to it.

(b)—The function of the spare part will be explained.

(c)—When the whole of the spare parts have been described by the instructor, members of the squad will teach the names and uses of the spare parts in a similar manner.

(d)—Instructor will test squad.

Second Lesson — To teach proper method of packing.

The instructor will lay out on the table or sheet the whole of the spare parts as already described.

(a)—The instructor will teach the number of each particular spare part that is issued, explain where they are kept, and the method of packing them into the tool box.

(b)—The whole of the spare parts should again be laid out on a table or sheet as already

described, and members of the squad called upon to teach. Instructor will criticise.

(c)—Instructor will question squad as to where spare parts are carried; number carried; how packed; etc.

Steam Condensing Device

This device consists of a rubber tube bound with wire with an arrangement by which it may be attached to the steam outlet tube. The purpose of this device is to conduct the steam generated in the water jacket through the hose into a water box, and thus prevent the escape of steam which might disclose the position occupied.

The water box should contain at least a half-gallon of water. The steam is condensed in the water box and may be used to refill the water jacket. If no water box is available, the end of the hose may be placed in a hole in the ground and covered with loose dirt.

Detailed Operation Of The Gun In Firing

To Load

With the ammunition belt in the right hand, bullets to the front, insert the brass tag in the feed box from the right side; grasp this tag with the left hand and pull the belt through the feed box as far as possible. Pull the roller handle to the rear. This moves the carrier away from the opening in the feed box; the first cartridge can now be pulled into position for loading. Pull the belt until this cartridge is in position. Release the roller handle. Pull the roller handle to the rear a second time and while holding it in its rear position, pull the belt to the left until the next cartridge is in position for loading. Re-

lease the roller handle and the gun is ready to be fired.

Explanation: When the belt is first inserted in the feed box the first cartridge cannot reach the cartridge stop because the carrier protrudes and prevents it. By moving the lock to the rear, drops down, and when the roller handle is released, moves to the front, rises, and the face of the carrier then engages the first cartridge in the belt. This movement is designated hereafter as the "half-load".

When the roller handle is pulled to the rear the second time, the carrier extracts this first cartridge from the belt, carries it to the rear, and lowers it into position for loading. When the roller handle is released this cartridge is placed in the chamber and when seated, approximately, the carrier rises disengaging the base of this cartridge from the gib, and engaging the next cartridge in the belt on the face of the carrier.

To Fire

Grasp the handles with both hands lifting the safety catch with the middle fingers; press the trigger forward with the two thumbs. This forces the trigger pawl against the lower end of the trigger lever. The trigger lever is pivoted; its upper end is connected to the trigger bar. When the lower end of the trigger lever is forced forward, the upper end moves to the rear and carries the trigger bar to the rear with it. The forward end of the trigger bar being engaged with the tail of the hand sear causes the hand sear to move to the rear, thus disengaging the hand sear from the tumbler. As the mechanism is locked, the side lever is in the horizontal position and the safety sear has been released from the firing pin.

PROPERTY OF U. S. ARMY

When the tumbler is released by the hand sear, the firing pin is forced forward by the mainspring and strikes the primer.

To Unload

Pull the roller handle to the rear twice. Grasp the upper and bottom pawls with the thumb and index finger of the right hand. Press the pawls toward each other and pull the belt out to the right. Pull the roller handle to the rear again and press the thumbpiece.

Explanation: The first time the roller handle is pulled to the rear the loaded cartridges in the chamber and belt, held by the carrier, are pulled to the rear. The cartridge that was in the chamber will ordinarily drop out of the gun when it has cleared the chamber.

When the roller handle is released, the cartridge which was in the belt is now placed in the chamber, and if the lower cartridge has not dropped out of the carrier, it will be forced under the trunnion block. When the carrier rises, this cartridge is stripped from the carrier by the trunnion block.

When the roller handle is pulled to the rear the second time, the loaded cartridge left in the carrier is ejected in a similar manner. Since no recoil of the barrel has taken place during these operations, the belt has not been fed farther into the feed box, for the reason that feeding takes place only during recoil and counter-recoil of the barrel.

Pulling the roller handle to the rear the third time makes certain the fact that the gun is not loaded. The mainspring must always be released after unloading.

Functions Of Moving Parts

In the following description it will be considered that the gun is loaded and cocked.

As the natural position of the mechanism is its forward position, the operations will be taken up from that position and the backward movement considered first.

The limit of the backward movement is reached when the barrel is in its rearmost position.

Backward Movement

The safety catch is released and the trigger pushed forward. This forces the trigger pawl against the lower end of the trigger lever. As the trigger lever is pivoted it causes the top of the trigger to move to the rear, pulling the trigger bar to the rear. The trigger bar being engaged with the tail of the hand sear, the hand sear is pulled to the rear and disengaged from the tumbler. The firing pin is now released, is forced forward by the tension of the mainspring, and strikes the primer. The cartridge is exploded.

Action Of The Gas

When the bullet reaches the front disk, the gas which is in rear of it strikes this disk and is deflected against the barrel disk, thus increasing the natural recoil due to the explosion of the powder charge. This motion of the barrel causes the automatic operation of the mechanism.

Recoil Spring

The recoil of the barrel extends the recoil spring and the rotation of the roller handle causes the fusee links to wind up on the fusee; the recoil spring is in this way more extended. Energy is thus stored up to cause the

forward movement when the backward movement is completed.

Feed Box

The lower feed lever is carried to the rear by the lug on the left recoil plate. This motion is transmitted through the upper feed lever to the slide, which moves to the right, placing the upper pawls to the right of, and in a position ready to feed, the next cartridge in front of the carrier.

Roller Handle

The tail of the roller handle strikes the roller. This causes the roller handle to rotate upward and to the rear, while its axis is moving to the rear with the recoil plates. The fusee links are thus wound on the fusee and extra tension is placed on the recoil spring.

Unlocking Of The Mechanism

The rotation of the roller handle breaks the dead center formed by the crank and crosshead. This unlocks the mechanism; the lock is now free to move to the rear independent of the barrel.

Cocking The Lock

The shank of the side lever lifts the tail of the tumbler and thus pulls the firing pin to the rear, compresses the mainspring, and permits the hand sear and safety sear to engage in the tumbler and firing pin successively.

The Carrier

The carrier extracts the empty shell from the chamber and the loaded cartridge from the belt; it moves to the rear until it clears the side-cams, when it drops due to its own weight,

or is forced down when its ears strike the rear cover guides. When the empty shell in the carrier clears the chamber, it will ordinarily drop out by its own weight.

Forward Movement

There is a short space of time when the barrel is moving forward and the lock backward. This period will be considered before the forward movement. The lock moves to the rear three inches, while the recoil plates and barrel move only one inch. When the recoil plates reach their limit, the lock still has about one inch farther to recoil. This last part of the recoil of the lock is caused by the rotary motion given the roller handle and crank, as well as the inertia of the lock.

Recoil Spring

When the limit of the backward motion is reached, the recoil spring, being extended by the recoil of the barrel and the rotation of the roller handle, furnishes the energy for the forward movement.

Feed Box

The forward movement of the recoil plates is transmitted through the lower feed lever and the upper feed lever to the feed box slide. The slide is made to move to the left and the upper pawls force the next cartridge into position in the feed box. While this is taking place, the lock has continued to move to the rear and has now reached its rearmost position.

Fusee

The fusee commences to unwind causing the roller handle and the lock to move forward.

The Carrier

The carrier having dropped, the live cartridge is now in line with the chamber. The forward movement of the lock and the straightening of the toggle joint places this cartridge in the chamber. When this cartridge is practically seated, the side lever, working on the lifting levers, causes the carrier to rise. As the carrier rises, it engages the next cartridge which is now in position in the feed box.

Locking Of The Mechanism

As the toggle joint straightens the side lever presses down on the tail of the safety sear disengaging the safety sear from the firing pin. When the toggle joint becomes straight, the mechanism is on a dead center.

Roller Handle

As the mechanism becomes locked the roller handle strikes the rear projection of the dead stop causing the dead stop to rotate to the rear. The front of the roller handle is caught by the dead stop and cannot rebound. At this point, if the trigger has been pressed, the firing pin is released, and the cycle of operation is repeated.

Care And Preservation

To insure proper functioning of the mechanism at all times, it is essential that great care be taken to keep the gun in good working order. In some organizations it is a habit to permit the guns to be neglected until they actually stop firing. This should never be allowed. If the gun is in good working order, the greatest possible care must be exercised to insure that it will remain so.

Before Firing:

1—Look through the bore to see that it is clear.

2—Oil the moving parts and bearing surfaces.

3—Weigh the tension of the recoil spring.
4—Test the friction in the recoiling parts.
5—Examine the packing.
6—Fill the water jacket.
7—Fill the oil can and reservoirs.
8—Examine and clean the belts.
9—Examine and oil all spare parts.

During Firing:

1—Keep the water jacket full of water.
2—Watch the belts.
3—Keep the leg and trail clamps tight.

During Cessation Of Firing:

1—Oil the gun.
2—Inspect the belt.
3—Adjust the tripod.
4—Inspect the muzzle attachment.

After Firing:

1—Clean and oil the bore.
2—Clean and oil the mechanism.
3—Release the mainspring.
4—Inspect the gun each day for several succeeding days and clean until all signs of powder are gone.

In Cold Weather:

1—Use ½ sperm oil and ½ paraffin.
2—Use alcohol or glycerin in water.
3—Increase the spring tension and gas pressure.

Care Of The Bore

The bore of a machine gun is subject to two kinds of fouling: 1—powder fouling; 2—metal fouling.

Powder Fouling:

Due to the high pressure that is generated in the bore, powder gas is forced into the pores of the steel. The powder fouling thus caused cannot be removed in one cleaning. In the field where the necessary materials are not at hand and the gunner is limited to the use of sperm oil, it will be necessary to clean the bore each day for 10 days after the gun has been fired.

To Clean Properly The Bore Of A Gun:

The materials necessary are: Caustic soda, hot water, cleaning rod, patches, and cosmoline. With a hot 20% solution of caustic soda the bore should be swabbed out with patches until all evidence of powder residue is removed. The rod should then be dried and a dry patch used to dry the bore. When the bore is thoroughly dried, use enough cosmoline to color a patch passing this through the bore several times. A brass rod should be used.

In order to leave the bore smooth and free from lint, the last time the cosmoline patch is withdrawn the rod should be turned in the grooves while a constant pull is exerted.

The chamber should then be cleaned with the aid of a stick or rod, after which a very thin coat of cosmoline should be applied.

The following day the bore should be cleaned again as just described. Ordinarily, if the work has been properly done, 2 thorough cleanings 24 hours apart will be sufficient to preserve the bore. It should be inspected, however, for a few days thereafter.

If soda is not available the best substitute is hot water. Since the water in the water jacket is invariably hot when firing is completed, hot water can always be obtained.

Metal Fouling:

Metal fouling is caused by the lands stripping from the bullets small particles of cupronickel. Metal fouling usually appears about 4 inches back from the muzzle on the lands. It never collects in such quantities as to affect the accuracy of the machine gun. Ordinarily, after it has collected to a certain amount, continued firing will blow the metal fouling out.

If, however, a gun is to be packed away for a considerable length of time, the metal fouling must be removed. In itself it is not dangerous to the bore, but it covers up powder fouling which will pit the bore.

To remove metal fouling, either the swabbing solution or the standard solution given in the Ordnance Handbook may be used for a temporary or permanent cleaning respectively. A suitable solution may be made as follows:

½ spoonful ammonia persulphate.
½ spoonful ammonia carbonate.
½ pint 28% ammonia.
¼ pint water.

To be certain that this solution will not attack the steel of the bore, ⅛ spoonful potassium bichromate may be added.

The spoon referred to is the one issued by the Ordnance Department with the mess kit. The solution is made by pulverizing the ammonia persulphate and ammonia carbonate, and adding the ammonia and water. If the potassium bichromate is used it is then added to the solution.

To Use The Solution:

Place a cork in the chamber. Stand the barrel on end; pour the solution into the muzzle until the bore is full. Do not permit the solution to remain in the barrel longer than 2 hours. A small quantity of sperm oil may be put on top of the solution to prevent the ammonia

from evaporating and rusting the muzzle. While the solution is acting, small bubbles will rise to the surface and the solution will gradually turn blue. When the bubbles stop rising to the top, it is time to remove the solution. After the solution is removed, the bore should be thoroughly cleaned and oiled.

Packing The Barrel

Asbestos packing is applied at the muzzle and breech ends of the barrel to prevent leakage from the water jacket. The amount of packing must not be excessive, since the friction caused thereby will interfere with the action of the mechanism; the proper amount can only be determined by experience and trial. Packing is issued in cords of several strands one yard in length; one strand should be approximately sufficient to pack either the muzzle or the breech end; it should be well saturated with oil from the oil can before being applied.

To Pack The Breech End

Withdraw the barrel from the water jacket. Start the center of the strand at the center of the groove of the barrel; wind the packing alternately on each side pressing it toward the center with a screw-driver, knife blade or thin piece of wood. When the groove is completely filled, the packing should project just above the surface of the barrel. Fasten the loose ends by inserting them beneath the coils.

To Pack The Muzzle End

With the barrel in the water jacket wind the packing around outer surface of muzzle and at the same time push the coils in with any blunt instrument which may be available. When the seat is filled, screw in the follower or muzzle gland and test friction of the recoiling parts. If there is too much friction, remove one or two coils of packing.

Caution: *If this front packing is too tight, the accuracy of the machine gun will be materially influenced.*

Abbreviated Memory Table Of Points To Be Attended To Before, During, And After Firing

BEFORE FIRING	DURING FIRING	AFTER FIRING	
		In The Field	On Target Range
Oil.	Watch water supply.	Unload; clear belt from feed box.	Unload; clear belt from feed box and release mainspring.
Barrel disk to be screwed on tight.	Belt not pulled.	Release mainspring.	Oil bore and barrel disk.
Test recoiling parts.	Temporary cessation, oil and change belt, etc.	Clean bore.	Run off water.
Weigh recoil spring.	Ammunition box up and in line.	Fill water jacket.	Sort live cartridges from empty cases.
Examine barrel, spare parts, etc.	Belts refilled.	Oil.	**On Return To Shelter** Clean gun thoroughly; remove and oil outside of barrel.
See to water supply and that water jacket is full.	See clamps of trail and legs not loose.	Fill reservoirs, if necessary.	
Oil in reservoirs, etc.	Clean bore, when possible.	Weigh recoil spring.	Clean and repair belts; check spare parts.
Examine belts.	Examine barrel disk.	Full belt.	
Action to be taken in very cold weather.		Half load and press thumb-piece.	Oil.
Examine tripod.		See ammunition is up. See water is up.	Pack gun; write gun report. Clean tripod.

Stripping And Assembling

No time limit will be imposed; ability to teach correctly how a part should be stripped will form the basis of all stripping examinations.

POINTS FOR INSTRUCTORS

1—Before attempting to withdraw screwed axis pins, make certain that threads of screw are fully unscrewed.

2—When replacing screwed axis pins do not use force; the threads will engage without using unnecessary pressure. If this rule is not observed the threads (which are extremely fine) will become so burred that it will be impossible to replace the pin.

3—When raising rear cover do not throw it upwards, but lift it. It is quite easy to strain it on its hinges. Before lowering, see that the lock is correctly in the gun.

4—Before closing front cover, see that feed box is correctly in position, and that front cover catch is raised.

5—When using combination tool to unscrew barrel disk, be careful not to burr threads of screw.

6—Do not jerk the chain when removing parts secured by chains; chains get broken and the part eventually lost.

7—With reasonable care, defects and breakages in machine guns should be of extremely rare occurrence. They are mostly due to neglect of ordinary precautions.

8—Direct hammer blows must never fall on any part of the gun. Wood must always be placed over the part to receive blows from hammer or mallet.

Sequence Of Stripping Gun

1. Sleeve.
2. Barrel disk.
3. Feed box.
4. Lock.
5. Handle block pin.
6. Outside plate filling piece.
7. Roller bracket.
8. Recoil spring and box.
9. Fusee.
10. Recoil plates.
11. Barrel.

Sequence Of Stripping Lock

1—Cock the lock.
2—Side lever pin and pin bushing.
3—Side lever.
4—Lifting levers.
5—Carrier.
6—Release the mainspring.
7—Tumbler pin.
8—Tumbler.
9—Hand sear pin.
10—Hand sear.
11—Mainspring.
12—Firing pin.
13—Safety sear.

Caution: *If the mainspring is to be released when out of the gun, care should be taken:*

To see that the carrier is fully raised.

To keep the fingers away from under the tail of the tumbler.

Detailed Stripping

SLEEVE

Remove locking pin from sleeve with hand or with the assistance of a screwdriver. Turn sleeve to the left one-third of a turn and remove to the front.

Barrel Disk

Unscrew barrel disk with combined spanner.

Feed Box

Release front cover catch, raise front cover, place fingers in feed box and remove it by pulling directly upward.

Caution: In stripping, if the feed box holds, pull the roller handle to the rear; the feed box can then be removed easily.

Lock

Raise rear cover, pull roller handle to the rear, grasp lock between thumb and fingers of the left hand and raise it. Give it one-sixth turn to the right or left and remove from crosshead.

Caution: In stripping, if the lock holds and will not rise, move the roller handle forward or backward until it becomes free.

Handle Block Pin

Unscrew handle block pin and pull it out.

Outside Plate Filling Piece And Roller Bracket

Lower handle block to the rear and remove filling piece and roller bracket.

Recoil Spring And Box

With the heel of the left hand strike the rear of the spring box and drive it forward until it clears the front studs; grasp the recoil spring in the left hand; with the index finger of the right hand separate the recoil spring hook from the fusee link (front).

Caution: In stripping the recoil spring box, keep the box as close to the left side

plate as possible until the recoil spring and fusee link are separated.

Fusee

Turn fusee to the rear until it stops; then pull it out to the left.

Caution: In stripping, if the fusee holds and cannot be removed easily, hold the roller handle down and turn the fusee to the rear.

Recoil Plates

Grasp the roller handle and pull recoil plates, crank, barrel, etc., to the rear until the recoil plates clear the side plates. Take the right recoil plate in the right hand, the left recoil plate in the left hand, and remove them from the barrel trunnions.

Barrel

The barrel is withdrawn straight to the rear, care being taken not to burr the threads on the muzzle of the barrel.

Sequence Of Assembling Gun

1. Barrel.
2. Recoil plates.
3. Outside plate filling piece.
4. Roller bracket.
5. Handle block pin.
6. Fusee.
7. Recoil spring and box.
8. Lock.
9. Feed box.
10. Barrel disk.
11. Sleeve.

Sequence Of Assembling Lock

1—Safety sear.
2—Firing pin. (Until safety sear notch engages).

3—Hand sear and pin.
4—Tumbler and pin.
5—Carrier.
6—Lifting levers.
7—Side lever.
8—Side lever pin bushing and pin.
9—Push shank of side lever down on safety sear, pull hand sear to rear, press tumbler down, and insert mainspring.

Detailed Assembling

Barrel

The barrel is partially inserted in the gun with the trunnions projecting beyond the rear of the side plates.

Recoil Plates

The right recoil plate is assembled to the barrel trunnion; the left recoil plate to both the barrel trunnion and the crank shaft at the same time. The parts thus assembled are moved forward into position in the gun.

Caution: In assembling the barrel, be certain that the rear of the barrel is up against the trunnion block. If it is in rear of this position, the lower feed lever is apt to be assembled in front of the lug on the left recoil plate. To seat fully the barrel, in most cases, it will be necessary to raise the crosshead in order to clear the bottom plate slide.

Outside Plate Filling Piece

The outside plate filling piece is grasped with the left hand, index finger on the spring box stud, and placed in position.

Roller Bracket

The roller bracket is grasped with the right hand, index finger on the roller, and placed in position.

Handle Block Pin

The handle block is raised into position, the handle block pin is inserted with the left hand and screwed home.

Fusee

The fusee is grasped between the thumb and index finger of the left hand, the thumb being on top of the links which are wound around the fusee. The fusee is inserted in the crank shaft, then turned forward into the correct position.

Note: The roller handle must be on the dead stop.

In assembling and stripping avoid a cross strain on the fusee links.

Recoil Spring

The recoil spring box is grasped with the left hand so that the recoil spring hook can be held between the thumb and index finger. The fusee link is grasped between the thumb and index finger of the right hand. The recoil spring hook and fusee link are then connected. The right hand then grasps the rear of the spring box and the left hand the front. The spring box is pulled forward and connected with the spring box studs.

Lock

The crosshead is raised with the left hand; the lock is grasped in the right with the bottom of the lock to the front, placed on the crosshead, and given one-sixth turn. The roller handle is then pulled to the rear and the lock lowered *gently* into position. The roller handle is released, the rear cover fastened, and the trigger pushed.

Feed Box

The feed box is grasped in both hands, the slide being held to the left by the thumb of the left hand. It is then lowered into position and the front cover fastened.

Barrel Disk

The barrel disk is screwed on by hand and then tightened with the combined spanner.

Sleeve

The sleeve held in the right hand is placed over the follower, and given one-sixth turn to the right; the locking pin is inserted.

Changing Worn Or Bulged Barrels

The necessity of saving water in the water jacket entirely depends upon prevailing conditions. In Egypt, Mesopotamia, East Africa, etc., every drop of water is of value. Again, in the heat of battle water may not be readily available; time also may be of the utmost importance. On the other hand, if the gun is being stripped, in barracks or billet, there is no necessity to save the water provided a further supply can be easily obtained.

It has been found necessary, in order that men may realize the importance of saving water, to introduce the following methods of changing a barrel.

To Remove Barrel And At The Same Time Save Water:—

(a)—Unload.

(b)—Remove lock.

(c)—Remove muzzle attachment; remove barrel disk.

(d)—Remove feed box.

(e)—Remove recoil spring, fusee and links.

(f)—Remove handle block pin; lower handle block.

(g)—Remove outside plate filling piece and roller bracket.

(h)—Remove elevating pin and depress muzzle of gun.

(i)—Have an assistant hold a plug, such as a rag, ball of waste, etc., over muzzle of barrel.

(j)—Withdraw recoiling parts. As the barrel is withdrawn the assistant follows the barrel with the plug and holds it over the hole in the water jacket cap through which the barrel has been withdrawn,

To Assemble A Spare Barrel:

Place a plug in muzzle of new barrel. Reverse the above operations. When the muzzle of the new barrel passes through the hole in the water jacket cap, the assistant may remove both plugs.

Alternative Method:

Proceed as for above, except that the water may be drained into the water box from the hole in the front of the water jacket cap. As the water jacket has to be refilled after new barrel is seated, this method will require more time.

Caution:—*Care must be exercised in removing and assembling the barrel in order not to disarrange the front and rear packing; very frequently, in assembling the new barrel, the front packing is carried out by the muzzle; if this occurs remove packing from muzzle and repack.*

Demonstration

One of the most profitable methods of instructing men in the nomenclature and the

functions of the various parts of the gun is by giving demonstrations.

An outline for such demonstration is given below.

1. A short description of the gun covering the following:
   - a—Type.
   - b—Ammunition used.
   - c—Cooling system.
   - d—Locking mechanism.
   - e—Feeding mechanism.
   - f—Forces that operate the mechanism.
   - g—Adjustments.

2. Essential parts.
   - a—Non-recoiling parts.
   - b—Recoiling parts.
   - c—Detailed operation of the gun in firing.
     - (1)—Preliminary.
       - (a)—Loading the gun.
       - (b)—Firing the gun.
       - (c)—Unloading the gun.
     - (2)—Backward movement.
       - (a)—Action of the gas.
       - (b)—Recoil spring.
       - (c)—Feed box.
       - (d)—Roller handle.
       - (e)—Unlocking of the mechanism
       - (f)—Cocking the lock.
       - (g)—Carrier.
     - (3)—Forward movement.
       - (a)—Recoil spring.
       - (b)—Feed box.
       - (c)—Fusee.
       - (d)—Carrier.
       - (e)—Locking of the mechanism.
       - (f)—Roller handle.

These various operations can best be illustrated as follows:

Reduce the spring tension and remove the sleeve.

1—By pushing against the barrel disk the following can be illustrated:

a—The recoil of the barrel.

b—Action in the feed box.

c—The rotation of the roller handle.

d—The unlocking of the mechanism.

e—The relative recoil of the barrel and lock.

f—Why the lock recoils farther than the barrel.

g—The function of the recoil spring.

h—That the inertia of the lock and roller handle is required to complete the backward movement.

2—Strip the gun. Assemble barrel, recoil plates, and lock outside of the gun, and illustrate the following:

a—That when the roller handle is down the toggle joint is on a dead center.

b—That the safety sear is not released until the mechanism is locked.

c—That it is through the recoil plates that the lock is held to the barrel.

d—That the only way in which the mechanism can be unlocked is by the rotation of the roller handle.

e—That the action of the carrier supporting springs is to hold the carrier up when the mechanism is locked and during the first part of the movement to the rear.

f—That when the roller handle is rotated to the rear the shank of the side lever lifts the tail of the tumbler and cocks the lock. (The pressure of the tumbler on the shank of the side lever causes friction when the roller handle is approximately vertical. A small amount of friction or pressure at this point should not be mistaken for excessive friction in the mechanism).

Detailed Outline For Inspection

The following outline for inspecting a Vickers Machine Gun should be kept in mind and followed as closely as possible.*

1—Completely strip the gun and inspect each part for defects.

2—Pack the barrel, assemble the gun correctly, oil all bearing surfaces, and fill the water jacket.

3—Apply tests.

1—Completely Strip The Gun And Inspect Each Part For Defects

Front Sight:

Straight.

Not loose.

Rear Sight:

Half-nut should hold slide in any position.

Elevating screw should work freely.

Aperture disk should not be bent.

Pivot spring should hold aperture disk in position.

Movable base should have no lost motion.

Muzzle Attachment:

Front disk cap should be clean.

Front disk should fit tightly.

Sleeve should not bind.

Locking pin should not pull out easily.

Follower should fit snugly.

Barrel disk should be tight.

**The inspection contemplated in this outline necessitates a thorough knowledge of the sizes and shapes of the various parts. When in doubt, compare the part in question with one that you know is correct.*

Water Jacket, Etc.

Inspect stem.

Inspect water plug (front).

See that front plug screw is in position.

Inspect water plug (rear).

Feed Box:

Slide should work freely.

Test all springs for strength.

There should be no dirt or friction in feed box.

Lock:

Test safety sear by releasing hand sear.

Test hand sear by releasing safety sear.

There should be no friction.

Test firing pin by releasing sears to see how far the point protrudes through the carrier.

Test gib and gib spring with cartridge.

Strip lock and inspect parts.

Rear Cover:

See that catch holds.

Trigger bar should work smoothly.

Handle Block, Etc.

See that oil is in the reservoirs and that the caps are screwed home.

Test trigger lever spring for straightness and strength.

The safety catch should be tested to see that it will hold the trigger.

Threads on handle block pin should be in good condition.

Crosshead And Crank:

Adjusting nut should be screwed down tight.

See that crank pin fastening link is in position.

Recoil Spring And Fusee:

Test the strength of the recoil spring.

See that the spring box fixings are present.

See that the spring box is not bent.

Inspect fusee links for breaks and fusee for burrs.

Recoil Plates, Etc.

Plates should be straight.

Carrier supporting springs should be stiff.

There should be no burrs on the recoil plates.

Side Plates:

Side plates should be straight and free from burrs.

Side cams should be smooth and free from burrs.

Bottom Plate Slide, Etc.

There should be no friction.

Slide should open and close properly.

See that the bottom plate slide catch holds the slide when set.

Barrel:

Should be copper coated.

Should be free from obstruction and clean.

Chamber should be round.

Bore should be inspected for corrosion.

See that the barrel fits close to the trunnion block when it is fully forward.

Tripod:

Tripod head should fit snugly.

Traversing clamp, when tight, should stop lateral motion.

Elevating screws should be in good condition.

Elevating and trunnion pins should be free from burrs.

Leg and trail clamps should be in good condition.

II—Pack The Barrel, Assemble The Gun Correctly, Oil All Bearing Surfaces, And Fill The Water Jacket

1—Pack rear of barrel.

2—Oil and assemble barrel, recoil plates, and crank.

3—Pack front of barrel and screw follower in tight.

4—Screw barrel disk on tight and oil it.

5—Assemble front disk, front disk cap, sleeve, and locking pin. (Oil front disk cap).

6—Test friction of recoiling parts. It should be less than 4 pounds. (Measured by placing the spring balance over the roller handle axis and pulling to the rear with the recoil spring removed).

7—Assemble roller bracket, outside plate filling piece, and handle block pin.

8—Assemble fusee and recoil spring.

9—Oil and assemble lock.

10—Oil and assemble feed box.

11—Oil front and rear cover hinge pin and catches.

12—Oil recoil plates and side cams.

13—Oil tripod where needed.

III. Apply Tests

1—Depress the muzzle of gun to see that outer steam tube slides freely. (It will frequently become necessary during firing, in which the muzzle is elevated or depressed, to tap gently the water jacket in order to cause

the outer steam tube to function properly and prevent loss of water).

2—Weigh recoil spring. It should be from 8 to 10 pounds when the roller handle is 1 inch above the dead stop. (Without muzzle attachment, 6 to 8 pounds).

3—Test lock for excessive head space.

a—Remove recoil spring and box.

b—Remove lock and place washer over crosshead.

c—Replace lock; pull roller handle to the rear.

d—Place dummy on carrier opposite firing pin hole. (Use dummy made from live cartridge that is not distorted; on the range live cartridge may be used).

e—Raise carrier and hold it in its highest position.

f—See that barrel is forward.

g—Push roller handle forward slowly.

h—The roller handle should stop short of the dead stop and a slight tap should be necessary to force it down. (If the roller handle goes onto the dead stop freely, another washer is needed).

i—If a slight check is felt in carrying out (h), the washer is not needed.

4—Inspect belts to see that the points of the cartridges are even with the ends of the brass strips. Turn a few cartridges around in the belt to see if they fit too tightly.

5—With gun properly assembled pull roller handle to rear until ears of carrier drop into notches in side cams. Place thumb against the rear of the roller handle and fingers on the front near the lower end of roller handle; move barrel and recoil plates backward and forward several times to see that the recoiling parts function properly.

PART TWO

GUN DRILL—DISMOUNTED

Drill with a gun has two objects; one is to develop in the men speed in handling the gun and motions that are distinct and accurate, the other is to develop discipline which is the most essential part of a soldier's training. In carrying out the directions given in Part II the instructor must bear these two objects in mind. The members of the gun squad should be watched closely and required to perform every movement with exactness and precision, and should never be permitted to slouch or slur any movement during the drill. It is impossible to develop fast team work within the squad unless every movement is watched and disciplined exactly. When the squads have become proficient in handling the gun in various gun drills and team work has been developed, instruction should be given with the men wearing the gas mask; after which it should be given with the men blindfolded to accustom them to handling the gun by touch rather than by sight.

Only elementary drills are given in this *Handbook*; the more advanced drills leading to proper tactical execution of field orders and the details of markmanship being found elsewhere. The drills are divided into:

1—Elementary Drill.
2—Combined Drill.
3—Rough Ground Drill.

Elementary Drill

1. Elementary Drill consists of:
   - a—Forming the gun squad.
   - b—Posting the gun squad.
   - c—Examining the gun.
   - d—Mounting the gun.
   - e—Dismounting the gun.
   - f—Loading for automatic fire.
   - g—Loading for single shots.
   - h—Laying the gun.
   - i—Firing the gun.
   - j—Suspending fire.
   - k—Unloading the gun.
   - l—Ceasing fire.
   - m—Going into action.
   - n—Coming out of action.
2. Teaching Elementary Drill.
   - a—Equipment required for each squad: gun; tripod; two belts and dummies; two ammunition boxes; tool-box; rectangular target.
   - b—The gun and tripod will be placed in line on the ground about three paces apart and about thirty yards from the target.
   - c—Tripod on the left, clamps tight, strap around trail and buckled, traversing clamp sufficiently tight to prevent the tripod head from coming out of the socket or swinging laterally when the tripod is being carried, legs and trail to the rear, tripod head over trail.
   - d—Gun on the right, muzzle pointing to the front, stem in, bottom plate slide closed, covers locked, handle block pin screwed home, head of

handle block pin vertical, rear sight leaf lowered with slide set at 600, barrel disk tight, sleeve secured with locking pin, trigger pushed and mainspring released, oil reservoir cap screwed home, water jacket filled*, oil reservoirs filled.

e—Tool box or gunner's pouch (if issued) beside the gun.

f—Ammunition boxes about three paces in rear of the interval between gun and tripod.

To Form The Gun Squad

The squad consists of 1 corporal and 8 privates; it is equipped with two carts, one carrying the gun and one the ammunition. The corporal carries a wire cutter; No. 3, a pick; Nos. 4, 5, and 6, shovels; and No. 8, a hand ax. The corporal commands the squad, No. 1 is the gunner, No. 2 is the loader, Nos. 3 and 4 are ammunition men, Nos. 5 and 6 are spare men in charge of the belt filling station, and Nos. 7 and 8 are the drivers.

The instructor indicates the place of formation, about 8 paces in rear of the gun and commands: ***Fall In.*** At this command, the squad assembles, as in the "School of the Squad." (M.G.D.R.) The instructor then commands: ***Call Off.*** Commencing at the right, the men call off alternately, front and rear rank: ***1, 2, 3, 4,*** etc. (Here caution the squad that No. 1 will repeat all subsequent verbal orders; No. 2 will repeat all signaled orders).

**In Elementary Drill water will not be placed in the water jacket; when the stage of combined drill has been reached, the water jacket will be filled.*

To Post The Gun Squad

At the command ***Posts,*** No. 1 will repeat the order; all men move at double time to positions as follows: No. 1 will pass behind the gun and fall in on the left of the tripod; No. 2 will fall in on the right of the gun; No. 3 will fall in on the left of the ammunition boxes; Nos. 4, 5, and 6 will fall in about 5 paces in rear of No. 3, No. 4 on the right.

As soon as No. 1 gets to his position, he will attend to the points mentioned under "c, Teaching Elementary Drill"; and in addition, will see that the elevating and trunnion pins are properly in position, and that both the elevating screws are equally exposed.

No. 2 will attend to the points mentioned under "d, Teaching Elementary Drill", and will inspect the tool box to make certain that the contents are complete. (The inspection of the tool box is made twice only during the drill; once by the first No. 2 and once by the last No. 2).

No. 3 will examine each belt and see that it is correctly placed in the box; he will then close the box. The catch on the ammunition box must be toward the front. He will then report: ***Correct*** to No. 2, who will report: ***Gun And Ammunition Correct*** to No. 1, who in turn will report: ***All Correct*** (or otherwise) to the instructor.

To Examine The Gun

Before proceeding with the drill the instructor commands: ***Examine The Gun.*** Each man then examines the gun and equipment as follows:

No. 2 examines the gun and sees that:

1—The follower is screwed home.

2—The barrel disk is tight.

3—The stem and water plugs are in.
4—The feed box is seated and the front cover catch turned down.
5—The sight is in working order.
6—The lock is seated and the mainspring is released.
7—The bottom plate slide is closed.
8—The oil reservoirs are full.

No. 1 examines the tripod and sees that:
1—The legs are closely folded, strap around trail.
2—The traversing clamp is tight.
3—The pins are in and turned down.
4—The elevating screws are exposed the same amount.

No. 3 examines the belts and sees that:
1—The cartridges are correctly placed and aligned.
2—The belt is packed correctly in the box and that the lid is fastened.

As each man finishes his examination he reports to the instructor.

To Mount The Gun

The instructor will now bring the squad to the left of the spot where the gun is to be mounted, in order that they may see all movements clearly and listen to explanations. He will then act as No. 1 himself giving and repeating the command: ***Mount Gun.*** *He will point out a spot about 30 yards from the target where the gun is to be mounted.*

1. Preliminary Detailed Operation.

At the command ***Mount Gun,*** No. 1 grasps the tripod with his right hand at the balance, steadies it with his left hand, and moves forward at a run to the designated position. He then places the tripod on the ground, unclamps the legs, swings them to

the front and clamps them in such a position that the socket will be upright and at a convenient elevation. He then sits down behind the tripod and withdraws the elevating pin with the right hand and the trunnion pin with the left hand. While adjusting the tripod, the left forearm must be supported by the left thigh and the clamps should, if possible, both be manipulated with the right hand.

As soon as the tripod is nearly in position, No. 2 pushes the bottom plate slide to the rear, grasps the right handle grip with the left hand, passes the right hand over the water jacket, lifts the gun so that the barrel will be pointing to his right under his right arm, moves forward at a run, and takes position on the right of the tripod and facing it.

He must reach the position at the moment No. 1 is removing the elevating and trunnion pins. He places his right foot between the legs of the tripod and kneels on the left knee supporting the weight of the gun on the right knee. With the assistance of No. 1 he places the gun in position, inserts the trunnion pin, and turns it down. He then removes the stem and lies down opposite the feed box of the gun placing the ammunition box in position in line with the feed box.

No. 1 assists No. 2 in adjusting the gun to the tripod and inserts the elevating pin. After inserting the elevating pin, No. 1 will at once level the gun, adjust the traversing clamp to see that it is *moderately* tight* (for the two and one-half mil tap), and take the correct hold†; eyes must be directed toward the target.

**The traversing clamp should be just tight enough to allow the gun to traverse approximately two and one-half mils to the right or the left when the handle block is tapped by the heel of the hand.* *†See note page 51.*

No. 3 takes 2 ammunition boxes and places them in reach of No. 2; he then returns to his original position. The catches of boxes should be to the front; the boxes must not be placed in such a position that No. 2 will knock them over as he lies down. The ammunition must be at hand by the time No. 2 removes the stem.

2. Mounting In Low Position

When the men have made sufficient progress in the previous lessons, they will be taught to mount the gun with the tripod in the low position. It will be explained that the low position may be necessary when only low or no cover at all is available.

The instruction will be divided into three methods.

First Method: When, before mounting, the tripod is adjusted in the usual way, i. e. the trail set at a suitable angle for the normal sitting position.

At the command ***Mount Gun,*** No. 1 will carry the tripod to the position indicated, place it on the ground, lie down on the left of it with his feet to the front, and loosen leg and trail clamps. He will then adjust the legs by rolling the tripod to the left and right, and raise the socket about 1 inch from the ground; keeping it upright he will clamp leg and trail clamps, the trail clamp first. He will remove the elevating and trunnion pins.

No. 2 will open the bottom plate slide and carry the gun to the position in the usual way, but just before he reaches it he will place the

†*The correct method of holding the gun is with the third and little fingers around the grips; middle fingers behind the safety catch; index fingers on top of handle block; and thumbs resting lightly on thumbpiece. When gun is "loaded and laid" the safety catch will be lifted with the middle fingers.* (Note applies to page 50)

right arm under, instead of over, the water jacket. He will then lie down and, assisted by No. 1, will adjust the gun on the tripod. No. 1 will return the trunnion pin; No. 2 will return the elevating pin and pull out the stem.

No. 3 will bring up the ammunition boxes in the usual way. When the gun is mounted, No. 1 will lie with both legs on the left of the tripod, right foot crossed over the left, his head and shoulders being supported by the legs of No. 2. The left leg of No. 2 should be well doubled up to give support to the neck of No. 1.

When the gun is mounted, it should be noted that the feet themselves and not the tubular portions of the trail and legs are resting on the ground; that the bottom of the socket is at least 1 inch clear of the ground; and that the clamp of the trail does not interfere with the elevating handwheel.

Second Method: When, before mounting, the trail of the tripod is set at an angle suitable for the lowest position.

The trail will be clamped at a suitable angle, after which the instruction will follow the same lines as in the first method. It will not be necessary to loosen the clamp of the trail on reaching the position.

Third Method: When, before mounting, the trail of the tripod is set at an angle suitable for the lowest position and when, in addition, the two legs, instead of being alongside the trail, are swung forward, upward, and backward pointing in the air.

The instruction will follow the same lines as in the second method.

3. Critique.

When the gun is mounted and the Nos. 1, 2, and 3 are in position, the following points should be criticized by the instructor:

1—Actions of numbers 1, 2, and 3 until the gun is mounted.
2—Trail pointing to the rear and aligned on the target.
3—Feet of legs and trail on ground (necessary for rough ground drill).
4—Clamps of legs tight.
5—Socket upright.
6—Traversing clamp tight (this must be tested by the instructor in the same way that No. 1 tests it).
7—Pins in properly and turned down.
8—Elevating screws equally exposed.
9—Tripod a suitable height for the firer.
10—Gun level.
11—Stem out.
12—Front cover locked.
13—Bottom plate slide open.
14—Rear sight leaf down, slide at 600 yards.
15—No. 1 sitting or lying and holding the gun correctly.
16—No. 2 lying down with head below the level of the gun, gunner's pouch (if issued) slung across his shoulders.
17—Ammunition box in correct position.
18—No. 3 lying down in rear and to a flank.

When the instructor criticizes, faults should be pointed out in such a manner that all the squad benefits from the criticism.

To Dismount The Gun

1. Preliminary Detailed Operation.

At the command ***Dismount Gun,*** No. 1 removes both pins, carries the tripod at a run back to its original position, replaces both pins, clamps the legs alongside the trail, and lays the tripod on the ground on the left of the gun. In folding the legs he first loosens the clamps allowing the tripod to collapse, next seizes the tripod head with both hands and with a sharp upward, forward, and downward movement folds the legs. He then tightens the clamps, aligns the tripod head over the trail, and lies down on the left of the tripod.

No. 2 passes the ammunition box to No. 3, lifts the gun from the tripod, replaces the stem before leaving the gun position, and runs back to the point designated. Before placing the gun on the ground he will close the bottom plate slide and reset the sight at 600 yards.

No. 3 goes forward at a run to the gun position and brings back both ammunition boxes to the point designated.

At the beginning of this drill it is well to divide the action of dismounting the gun into two parts, the dismounting of the tripod being mastered first by all members of the squad after the instructor has shown how it is dismounted. When all of the men have made reasonable progress with the tripod, the instructor will then continue the instruction in dismounting the gun.

2. Dismounting From Low Position

The gun will be dismounted in the usual way, except that all movements prior to carrying the gun and tripod to the rear will be carried out by crawling.

3. Critique

After the gun and tripod have been completely dismounted, the instructor will hold a critique covering the points mentioned above and following the general form of "3. Critique" under "To Mount The Gun."

To Load The Gun For Automatic Fire

1. Automatic Fire. ***2. Load.***

The instructor first demonstrates the duties of No. 1 and No. 2.

At the command ***Load,*** No. 1 holds the roller handle in its rearmost position with the right hand and advances his left hand to the left of the feed box ready to grip the tag of the belt.

No. 2 opens the ammunition box, holds the end of the belt with his forefinger (right hand recommended) on the brass tag at the point where it joins the fabric and pushes the tag of the belt through the feed box as far as possible.

No. 1 grips the tag, then pulls the belt through the feed box as far as possible and releases the roller handle. He again pulls the roller handle to the rear pulling the belt to the left a second time as far as possible; he again releases the roller handle. The gun is now loaded for automatic fire; No. 1 resumes his hold on the gun.

To Load For Single Shots

1. Single Shots. ***2. Load.***

At the command ***Load,*** No. 1 pulls the roller handle to its rearmost position; No. 2 passes the tag of the belt through the feed box; No. 1 holds the roller handle in its rearmost position with the right hand, grasps the

tag of the belt with the left hand and pulls it straight through the feed box as far as possible. He then releases the roller handle and without pulling the belt, he again pulls the roller handle to its rearmost position and releases it. The gun is now loaded for single shots; by bringing the roller handle to the rear after each shot without pulling the belt, the gun will fire single shots. To change from single shots to automatic fire at any time, it is necessary to pull the roller handle to its rearmost position, pull the belt to the left, and release the roller handle. The gun being loaded for automatic fire, single shots may be fired by first pulling roller handle once without pulling belt.

To Lay The Gun

The command is given: 1. ***Range 800*** (***850 etc.***). **2. *Right*** (***left***) ***2*** (***3 etc.***). (this being the deflection in points of windage to the right or left). 3. ***At*** (***such an object***). At the first command, No. 1 raises the rear sight leaf (unless the range announced is: ***Battle Sight,*** when the battle sight will be used) and moves the slide until it is set at the line on the leaf corresponding to the range given. He then sets the deflection on the wind gauge and taps the gun over until the correct direction is obtained; after which he elevates or depresses the muzzle until the aim is correct. Should a fairly large change in direction be necessary, No. 1 will order No. 2 to loosen the clamp; he will swing approximately on the target, order No. 2 to tighten the clamp, and then lay accurately by tapping. It is most important that, while tapping the gun or manipulating the elevating wheel, the correct hold

Note: *It is an advantage to combine the adjustment of sights with laying the gun; therefore, instruction in aiming should be given prior to instruction in laying the gun.*

be maintained. As soon as the aim is correct, No. 1 grasps both handle grips, places his thumbs on the thumbpiece, releases the safety catch, and by calling: ***Ready***, orders No. 2 to raise his hand. Care must be exercised to hold the gun when No. 1 moves his head to one side to allow the aim to be viewed by the instructor.

To Fire The Gun

The gun being mounted and loaded, or assumed to be loaded, at the command or signal ***Commence Firing,*** No. 2 will tap No. 1 lightly on the back and call: ***Fire.*** No. 1 will instantly press in the trigger. He must press it in as far as possible and must not disturb the aim or hold while doing so. It must be pressed by a quick and even movement of the thumbs. The eyes must be directed at the target; any tendency to look down at the trigger or through the sights must be stopped.

To Suspend Firing

To suspend firing, the instructor blows a long blast of the whistle or commands or signals: ***Suspend Firing.*** No. 2 taps No. 1 lightly on the back and calls: ***Suspend Fire.*** No. 1 releases the pressure on the trigger. The gun is held loaded and in a position of readiness for an instant resumption of fire.

No. 1 should check his aim and correct his laying, if necessary; he continues his observation of the target, the aiming target, the place at which the target disappeared, or at which it is expected to reappear.

To Unload

At the command ***Unload,*** No. 1 will *lower* the sight leaf, if it be raised, with the left

hand; at the same time he will pull the roller handle to its rearmost position and immediately allow it to fly forward, repeating this motion at least three times. He will then press the upper and bottom pawls of the feed box with the right hand, the upper pawls being pressed with the thumb and the bottom pawls with the finger, taking care to keep the hand clear of the entrance to the feed box. No. 2 will withdraw the belt and pack it carefully in the box. No. 1 will then release the mainspring by pressing the thumbpiece.

To Cease Firing

The instructor commands or signals: ***Cease Firing.*** No. 2 will tap No. 1 lightly on the back and call: ***Cease Fire.*** No. 1 releases the pressure on the trigger. Nos. 1 and 2 execute *unload,* except the withdrawal of the belt from the feed box.

To Go Into Action

When the men have made sufficient progress in the foregoing lessons, they will be exercised in combining them and going into action. Three aiming targets will be pointed out on the rectangular target by the instructor, one of which should be a triangle; one, a circle; and one, a square.

The instructor will announce the range and target; he will then command or signal: ***Action.*** The gun will be mounted, loaded, and laid. As soon as No. 2 holds up his hand, the aim and sight setting will be checked; then the various points taught in the earlier lessons will be criticized. No. 2 must not be allowed to adjust the sights. Each man must perform the duties laid down for him in the earlier lessons.

To Take The Gun Out Of Action

Three methods of taking the gun out of action will be explained; the particular method to be employed depends upon circumstances. The gun commander will decide which method to use.

The First Method: When the gun is in action and cover exists which is too far away to permit the gun being dragged the whole way.

In this method the gun is unloaded and dismounted at the position each man carrying his own load*. In the field No. 3 might not be required; Nos. 1 and 2 then carry the ammunition boxes. For instructional purposes in this method, the instructor will give the cautionary words: ***No Cover Available*** before the command: ***Out Of Action.***

The Second Method: When the gun must be moved to cover before it is dismounted. The gun will be unloaded, but the belt will be left in the feed box; then the gun will be dragged back to the cover the men avoiding unnecessary exposure; there the dismounting of the gun will be completed. For instructional purposes the instructor will give the cautionary words: ***Cover Close Behind*** before the command: ***Out Of Action.***

The Third Method: When cover is presumed to exist too far away to permit dragging the gun to cover but close enough to avoid the

**A convenient way to carry the tripod for any distance is with it arranged on the shoulders so that the trail lies flat down the back while the legs are clamped at an angle of about forty-five degrees with the horizontal.*

necessity of dismounting in the open. Two methods are open to the gun commander; the two man load, or the three man load.†

With the two man load the gun will be unloaded by Nos. 1 and 2; No. 1 will rise and seize hold of the trail and left leg; No. 2 will rise and seize hold of the right leg, the right handle grip, and the ammunition box.

If the distance is great, the three man load might be preferable. No. 3 is signaled: ***Assemble.*** No. 1 seizes the trail with his left hand; No. 2 the right leg with his right hand and the ammunition box with the left hand (belt still in the feed box); No. 3 seizes the left leg with his left hand.

Combined Drill

The main purpose of elementary drill is to train Nos. 1 and 2 in their mechanical duties within the squad; practically no mention has been made of the duties of the other members of the squad or the additional equipment; the tool box or gunner's pouch, if issued, is required only as a necessity. In combined drill and subsequent drill, which must be progressive, complete units and the complete equipment are required; the corporal should command the squad; Nos. 3 and 4 should form a short chain of supply; the other members of

†*The procedure laid down for the two and three man loads will be taught, but the squad should be warned that there are variations that may be preferred by individuals. The end to be attained in all cases is speed. For instructional purposes the instructor will give the cautionary words:* ***Two (three) Man Load*** *before the command:* ***Out Of Action.*** *He will point out where the cover is supposed to exist.*

the squad should be held in the immediate rear at the belt filling station to fill belts and replace casualties; the steam condensing device should be used; the water box should be filled with water; two ammunition boxes and the tool box should be with each gun; and in the earlier lessons, the rectangular target should be utilized.

The training of the organization, therefore, must be carried out as prescribed in the Machine Gun Drill Regulations; should these drill regulations or this handbook be silent as to the duties of any particular man in any particular situation, organization commanders will use their own judgment as to the proper procedure to carry out the spirit of these regulations in training their organizations.

Instruction in machine gun signals will have been given before combined drill is commenced; these signals should thereafter be used whenever possible.

Combined drill is best taken up by platoon commanders and best carried out with four or more guns. The drill should foster competition between squads.

Preliminary to this platoon drill the gun squads should be combined to form sections and these sections should be required to go through the exercises given under "Gun Drill". In addition to the regular exercises signals should be used to train the men in their execution, drill of the section being one step farther advanced than that of the squad. Exercises should be progressive in nature. After the section has become proficient, the platoon should take up the following subjects which are taught practically:

1—Execution and delivery of fire orders. The latter is taught by calling on individual members of the organization

to take the place of the platoon commander.

2—The designation and recognition of targets and aiming targets.

3—Combined sights.

4—Distribution.

5—Searching.

6—Stoppages.

7—Replacement of breakages.

8—Replacement of casualties.

Noncommissioned officer instructors should be utilized to take time, correct mistakes, and report on the performance of each detail. During combined drill, out of doors, all men should be in the prone position, whenever this is possible.

First Lesson: The platoon should be drilled in going into action, both in the normal position and in the lowest position. Fire orders, the replacing of casualties, and changes in targets and sight settings should be drilled.

Second Lesson: Orders for distributed fire, searching fire, and combined sights should be introduced in addition to the points mentioned in the first lesson.

Third Lesson: The supply of ammunition and water, replacing breakages and remedying stoppages, as well as the points dealt with in the first two lessons, should be drilled. This drill should also be executed in full field equipment with anti-gas appliances worn by the entire platoon.

Rough Ground Drill

1—Taught in detail to individual gun squads.

2—The equipment required will be the same as used for combined drill, with the exception that rectangular targets are not required.

3—The object of the drill is to train the organization in placing the gun in action on sloping ground. Throughout the drill the gun must be mounted on a steep slope engaging targets in the following locations: (1) down hill; (2) up hill; (3) horizontally to the right; (4) horizontally to the left.

The instructor in selecting ground for this drill must actually choose sloping ground from which service targets at a reasonable range can be seen.

First Lesson:

1—The Instructor will demonstrate the manner in which the tripod is mounted on all kinds of slopes to fire in all directions; he will show how No. 1 and No. 2 should adapt their own positions to the ground.

2—He will then mark positions for the gun and each member of the squad will be trained in mounting the tripod.

The gun will not be mounted until all men have made reasonable progress in mounting the tripod.

3—He will then demonstrate the duties of No. 2 by mounting the gun on the tripod to fire in any direction. All men should be trained in mounting the gun on the tripod.

4—The Instructor will then show how Nos. 3 and 4 should make use of ground formations to obtain cover and conceal the lines of approach.

Second Lesson:

1—The gun, tripod, etc. with Nos. 1, 2, 3, and 4 will be in a position of readiness not more than 10 yards from the selected gun

Note: *It is often more convenient after the tripod has been mounted, but before the tripod head is swung around in the direction of the target, to have the gun mounted and then swung around.*

position. The remaining men will be sent out in the direction of the target from 100 yards to 200 yards from the selected gun position; they will criticize the movements of Nos. 1, 2, 3, and 4 while going into action.

Having marked the position, the instructor will designate a target giving the range and command: ***Action.*** When No. 2 raises his hand to indicate that the gun is in position, the remainder of the squad will be called in and the following points will be criticized:

a—Whether there was any unnecessary exposure while the gun was being brought into action.

b—The mounting of the tripod with the trail down hill.

c—Whether the tripod had to be altered after the gun was mounted.

d—Positions adopted by Nos. 1 and 2 from the view point of fire, execution, exposure, and comfort.

e—Position of the ammunition box to insure correct feed.

f—Position of No. 3 with a view to minimum exposure, facility of supply, and communication with the gun.

g—Position of No. 4 from the same view point.

h—All the usual points which are criticized during elementary drill.

2—When the men have made sufficient progress in the above, they should be trained in adjusting, before mounting, the position of the trail in order that the socket will be upright when the tripod is mounted. When very little alteration of the trail is necessary after the tripod is mounted in the position, the squads may be said to be well on the way toward proficiency.

The Instructor must keep clearly in mind the fact during rough ground drill that no attempt is made to introduce tactical measures; the only object is so to train the men that they will be able to mount the gun quickly, correctly, and without undue exposure on any kind of ground.

PART THREE

STOPPAGES *and* IMMEDIATE ACTION

Stoppages

Stoppages in the automatic action of the gun during firing may be classed under two main headings:

1. *Temporary,* which are due to;
   a—Failure of some part of the gun of which a duplicate is carried.
   b—Faulty ammunition.
   c—Neglect of points before or during firing.
   d—Ignorance on part of gun squad.
2. *Prolonged,* which are due to failure of some part that cannot, as a rule, be remedied by the detachment under fire or without skilled assistance. These necessarily put the gun out of action for a more or less prolonged period.

Upon the knowledge and training of the detachment depends the rapidity with which "temporary" stoppages can be remedied.

Preparation Of Stoppages For Instructional Purposes

In order that the men may obtain a high standard of training in dealing with stoppages and apply the correct immediate action, it is essential that the instructor should prepare the stoppages accurately.

General Instructions:

1—Taught to instructors and their assistants organized as squads.

2—Squad should be seated on right side of the gun to make certain that the roller handle and the actions of the instructor are the more clearly seen by all.

3—Whenever it is necessary to release the mainspring, with the lock out of the gun, the carrier must be held up to its highest point to ensure that the firing pin hole will be opposite the firing pin.

4—The instructor should detail a member of the squad to perform the immediate action for each stoppage when prepared.

5—A target will be designated to the squad at the commencement of instruction; this will remain the target during the drill.

6—The sight leaf will always be raised during stoppage instruction.

Material Necessary For Teaching Purposes

1—Gun and tripod.

2—Belt and dummy cartridges.

3—Bulged dummy.

4—Dummy cartridge with battered rim.

5—Front portions of separated cases. (One that *will* remain in the chamber and one

that is securely telescoped on a dummy cartridge in order to ensure that it will *not* remain in the chamber).

6—Tool box.

7—Covering for roller handle.

How Taught:

1—The instructor, seated at the left of the gun, will prepare the stoppage.

Example—Weak Charge.

a—Perform half loading motions.
b—Draw roller handle back until ears of carrier engage with notches of side cams.
c—Pull belt.
d—Cover roller handle.
e—Alter elevating wheel slightly.
f—Swing gun around to firer and tighten traversing clamp.
g—Remove covering of roller handle. The firer now commences immediate action.
h—After firer has pressed thumbpiece, on completion of immediate action, the instructor verifies the aim.

2—The squad will now prepare this stoppage; instructor will criticise.

3—Instructor will question squad. When proficient, he will proceed to teach the next stoppage in a similar manner.

Summary Of Causes Of Stoppages

Each instructor should have a card on which is printed or written the stoppages indicated below. In testing a man in preparing stoppages he hands the card to him and orders him to prepare, say, No. 11. It is important that the stoppages ordered to be prepared should not be ordered in numerical sequence.

Position	*No.*	*Stoppage*
First	1	Weak charge.
	2	*Too strong recoil spring.
	3	*Lack of oil, frozen oil, or grit in working parts.
	4	*Tight loops in belt.
	5	*Excessive packing.
	6	*Worn barrel.
	7	*Friction (due to cold weather).
Second	8	Damaged cartridge.
	9	Separated case.
Third	10	Cross-fed cartridge.
	11	*Friction of lock.
	12	Bent long brass strip.
	13	Badly-filled belt.
	14	Torn or worn belt.
	15	Loose loops in belt.
	16	Ammunition box not in line with feed box.
	17	Damaged cartridge grooves on carrier.
	18	Broken gib spring.
	19	Broken gib.
	20	Thick-rimmed cartridge.
Fourth	21	Empty loop in belt.
	22	Defective ammunition. (no explosion.)
	23	Broken firing pin.
	24	Broken mainspring.
Sundry	25	Broken barrel disk.
	26	Broken recoil spring or fusee.
	27	Nose of hand sear or shoulder of tumbler worn or broken.

**Recurring Stoppages.*

Stoppages Not Included In Immediate Action Table But Which May Be Indicated By An Unusual Position Or Action Of The Roller Handle

1—*Nose Of Hand Sear Or Shoulder Of Tumbler Worn Or Broken. (Runaway Gun)*

The gun is not controllable through the trigger. It will fire the moment the roller handle touches the dead stop the second time during loading, or, if the defect occurs during firing, it will not stop firing when pressure on the trigger has been released.

To remedy proceed as follows:

a—Throw filled end of belt over feed box; this should result in a bad fault in feed, thereby stopping the firing.

b—Pull roller handle onto roller, return filled end of belt to correct side of feed box, unfasten front cover catch, and raise front cover.

c—No 2 will lift feed box to allow recoiling parts to move forward. He will release pawls and withdraw the belt from feed box until the first cartridge is about in line with the right side of tripod head; he then will replace the feed box.

d—Lower and secure front cover; let the roller handle fly forward so as to fire the cartridge on the face of the carrier (should there be one). The lock can now be changed with safety. Reload, relay, and open fire.

e—If no spare lock is available, group the cartridges in the belt. Half load, lay, pull roller handle onto roller, belt to left, take proper hold, and release roller handle. At end of each group (e) is repeated.

To prepare proceed as follows:

Give command: ***Load.*** As soon as the roller handle touches the dead stop for the second time, call: ***Gun Firing.*** Then command: ***Suspend Firing.*** When firer releases his pressure on the trigger, call: ***Gun Still Firing.***

2—*Broken Recoil Spring Or Fusee:*

The gun will stop firing; the roller handle will be found to be resting on the roller.

To remedy proceed as follows:

a—Return roller handle to dead stop.

b—Remove spring box and spring.

c—Remove spring from tension screw (if fusee, remove it from recoil spring hook).

d—Re-assemble new spring or fusee, replace spring box, relay, and open fire.

To prepare proceed as follows:

a—Half load.

b—Remove spring box and recoil spring.

c—Replace spring box with recoil spring detached from fusee.

d—Pull roller handle onto roller.

e—Pull belt to left.

3. Broken Barrel Disk.

It is most probable that the gun will stop firing with the roller handle in the third position.

If, however, the broken fragments have fallen out of the sleeve, a succession of first positions will probably be the result.

It sometimes happens that the roller handle will stop in the second position; usually the lock cannot be raised until the recoiling

Note: *A broken fusee or spring can be replaced from spare parts.*

parts move forward by the removal of fragments in the sleeve.

To remedy proceed as follows:

a—If feed box slide functions smoothly, pull roller handle onto roller, clear face of carrier, hang the lock, draw back recoiling parts, and call: ***Barrel Disk.***

b—No. 2 will release belt from pawls and withdraw it until cartridges are clear of feed box. He will then remove the sleeve, remove broken fragments, if any, and replace barrel disk and sleeve.*

c—If no spare barrel disk is available, the firer will reduce tension of recoil spring to 5 pounds, load, relay, and commence firing.

To prepare proceed as follows:

a—Half load.

b—Hang lock.

c—Draw back recoiling parts with the right hand and insert a small pad or ball of waste about one inch in thickness between the barrel disk and the front disk.

d—Pull roller handle onto roller and allow it to move slowly forward.

How To Prepare A Belt Of Stoppages For The Range

General Remarks

1—Live cartridges must never be tampered with, except when they are being prepared to give a separated case.

2—Stoppages must be varied.

**To prevent accident great care must be exercised by the firer to hold the roller handle back while No. 2 is working at the muzzle.*

3—Do not prepare too many stoppages; about 16 cartridges should be fired between different stoppages.

4—During preliminary instruction the instructor acts as No. 2.

Suggested Method Of Preparing A Belt Of Stoppages

Cartridges In Belt	*Stoppage*	*Remarks*
1 to 20 (1)	Too strong recoil spring.	(1) The recoil spring tension must be so adjusted before firing that by reducing it about 1 lb. the gun will fire correctly.
30 (2)	Empty loop.	(2) Have an empty loop in the belt.
46 (3)	Misfire.	(3) Place in belt one dummy cartridge.
61 (4)	Damaged cartridge.	(4) Place in belt one bulged dummy cartridge.
76 (5)	Bad fault in feed.	(5) Mark belt in some manner. When this part of the belt is approaching feed box, the instructor pulls a cartridge about a quarter of its length out of the loop.
91 (6)	Separated case.	(6) Place a filed cartridge in the belt.
106 (7)	Broken firing pin.	(7) Place in belt two dummy cartridges.

107	(8) Worn nose of hand sear.	(8)	The spare lock used for the rectification of a broken firing pin should be so prepared that the gun will fire automatically as soon as the roller handle touches the dead stop for the second time when the gun is being loaded.

Immediate Action

General Remarks

1—It is essential that all that is necessary for correct immediate action be available.

2—The immediate action necessary to remedy temporary stoppages is indicated by the position of the roller handle which may stop in one of four positions, known as the first, second, third, and fourth positions.

3—The instructor prepares the stoppage he desires as described in "Preparation Of Stoppages".

4—While the stoppage is being prepared the firer should be seated on the ground behind the gun with head turned aside; when covering is removed from roller handle, he performs the immediate action.

5—Immediate action is not considered complete until the gun has been relayed and fired.

Note: *The above belt of stoppages can be repeated for a second firer. Where many firers are being given instruction, it may be necessary to reduce the number of cartridges between stoppages.*

6—After the immediate action is completed, the instructor checks the aim and explains any errors.

7—The rear cover should never be opened—or closed—with the lock home.

8—If the lock cannot be drawn back, open the front cover and force down the carrier.

9—To afford the best training in immediate action each stoppage should be prepared to simulate a stoppage during actual firing.

10—As proficiency is attained training should be carried out in darkness or with the firer blindfolded.

11—The instructor must not deal with causes of stoppages during the first stages of instruction in immediate action.

12—The rear and front covers must always be correctly fastened when lowered after immediate action.

13—A lock must never be changed with cartridges on the face of the carrier.

14—The instructor must insist on correct reloading and relaying.

15—Fire must be at once opened after immediate action, unless orders to cease fire have been given.

16—Should it ever be necessary to release the mainspring with the lock out of the gun, it should be done with the carrier raised so that the firing pin hole is opposite the firing pin.

17—Whenever a temporary stoppage necessitates the use of the spare lock, feed box, etc., the part which has been replaced should be repaired as soon as possible in order to make it again available as a reserve.

How Taught

See "Preparation Of Stoppages"

1—Instructor should give definition of immediate action. (The automatic and immediate application of a probable remedy for a stoppage, based on the position of the roller handle.)

2—Demonstrate the four positions of the roller handle.

3—Teach thoroughly each position of roller handle as follows:

a—Instructor prepares stoppage and demonstrates immediate action for first position.

b—Explains:

(1) Pull roller handle to rear, pull belt, release roller handle.

(2) Relay on aiming target and open fire.

c—Each member of squad performs immediate action. Instructor criticises.

d—Instructor questions squad.

When all are proficient, the instructor teaches the second phase of the first position in a similar manner. Exactly the same method and sequence must be used when teaching the other positions of the roller handle.

Immediate Action Table

The following table of temporary stoppages affords a clear indication of the method to be employed in teaching the practical side of mechanism. Column 1 shows the four positions of the roller handle when the gun stops firing. The first three positions may vary slightly. These positions, which afford a ready indication of the correct immediate action to

be performed, must be recognized clearly before the instruction proceeds.

At this stage the squad should not be required to know what these four positions indicate. This will be explained later when the probable causes of the stoppages are being taught.

Column 2 deals with a detailed description of the immediate action to be performed by the firer (sometimes with the aid of an assistant, designated hereafter as No. 2) as soon as the position of the roller handle has been noted after the gun has stopped firing.

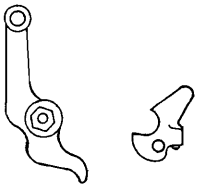
Column 3 deals with the probable causes of these stoppages; it is of utmost importance that the instructor does not proceed to this stage, until he is assured that every immediate action can be correctly and immediately performed without the slightest hesitation.

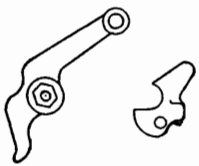
A thorough knowledge of the causes of temporary stoppages will not only afford a practical knowledge of the working of the gun, but will also be an aid in the discovery of the cause of any unusual breakdown which may occur.

In column 4 is explained the method for preventing the recurrence of certain stoppages, the cause of which may be only temporarily cured by the immediate action. It will sometimes be possible to carry out these preventives in two or three minutes; at other times their execution may cause the gun to be out of action for a longer period; but, in either case, no skilled assistance or special appliances, other than those carried with the machine gun organization, will be required.

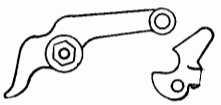
Column 5 explains methods by which the various temporary stoppages can be simulated for instructional purposes. It is unnecessary to teach these methods of preparation to the

machine gunner, but every instructor must have a thorough knowledge of this column in order to teach the machine gunner the correct immediate action for any temporary stoppage.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
 *First Position.*	1. Pull roller handle onto the roller, pull the belt to the left, and release the roller handle.	The carrier has not dropped. This may be due to: 1. Weak charge.	1. Immediate action cures.	1. Perform half the loading motions; pull the roller handle slowly back until the ears of the carrier have engaged with the notches in the side cams. Release the roller handle and pull the belt to the left.
	2. If stoppage recurs, repeat 1 and lighten recoil spring by 3 half-turns.	2 (a) Too heavy recoil spring. (b) Lack of oil in recoiling parts. (c) Grit in recoiling parts. (d) Excessive packing. (e) Worn barrel. (f) Tight loop in belt. (g) Frozen oil.	2. Attend to points before and during firing.	2. To simulate a recurrence of stoppage: Pull handle slowly until the carrier drops into the notches in the side cams. For range purposes: Increase the weight of the recoil spring.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
		(h) Friction due to cold weather.		
 *Second Position.*	1. Pull the roller handle to the rear and call out: *Defective Cartridge Extractor,* open the rear cover, raise lock and examine the cartridge on the face of the carrier. If a damaged cartridge, or an undamaged cartridge with the front portion of a separated case adhering to it, is thereon, call out: *Never mind,* clear the face of the carrier, and reload.	1. (a) Damaged cartridge. (b) Separated case with front portion telescoped on undamaged cartridge.	1. Inspect ammunition in belts before firing. ***Note:*** *If a succession of separated cases occur, extra washers must be placed on crosshead.* *Test with both locks during examination of gun before firing.*	1. (a) Insert a bulged dummy cartridge as the first cartridge in the belt and load. For range purposes: Place a bulged dummy cartridge in the belt. (b) Raise cover and lift out lock. Place a dummy with a separation securely on it between the projections of the gib. Replace lock, close rear cover, and release roller handle. Pull belt to left. ***Note:*** *Use a dummy with the front portion of a separated case soldered on it.*

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
	2. If an undamaged cartridge with a portion of a separated case adhering to it is found on the carrier, clear the face of the carrier and replace the lock keeping the roller handle on the roller. Take the defective cartridge extractor and insert it in the chamber. Push the pin well home. Allow the lock to go forward controlled by hand, keep a firm pressure on the roller handle, give the defective cartridge extractor a rocking motion, withdraw the lock, strike back the handle of the	2. Separated case. Front portion remains in chamber.		2. Perform half loading motions, raise rear cover and lift out lock; place the front portion of a separated case over the bullet of the cartridge on the carrier and allow the lock to go slowly forward. Withdraw lock slightly to see that the portion of case remains in chamber, close rear cover, and pull belt to left. For range purposes: File a cartridge about ½ inch from the base, and insert it in the belt. Care must be taken that the cartridge is not filed too far through; there is danger of the bullet remaining in the barrel.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
	defective cartridge extractor, withdraw it, see that the front portion of the separated case is on the defective cartridge extractor. If portion of case is withdrawn, reload; if not, repeat.			
 *Third Position.*	1. Slightly raise the roller handle, pull the belt to the left, release the roller handle, and then strike it down on the dead stop.	1. A cartridge is fed slightly crosswise.	1. Examine cartridges in belt.	1. Perform half the loading motions, then pull the roller handle onto the roller, and raise the rear cover; pull the belt sufficiently to place a cartridge half way in front of the face of the carrier. Allow roller handle to go slowly forward so that it will remain in the third position; lower the rear cover gently; test roller handle.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
	2. If stoppage recurs, oil lock and recoiling parts.	2. Friction of lock, etc.	2. Attend to points during firing.	2. Proceed to load, but move roller handle slowly forward the second time in order that it will remain in the third position.
	3. If 1 fails, examine feed box slide. If jammed, call out: *Feed Box*, pull the roller handle onto the roller and hold it there. (In order to do this it may be necessary for No. 2 to force down the ears of the carrier). Unfasten front cover catch with left hand, and raise front cover to a vertical position. No. 2 raises the feed box sufficiently to allow the recoiling parts to go home, releases the upper and	3. (a) Bent or damaged long brass strips. (b) Badly filled belt. (c) Worn or loose belt loops. (d) Ammunition box not in line with the feed box.	3. Attend to points before and during firing. ***Note:*** *It is essential to see that the noses of bullets are even with ends of long brass strips.*	3. Pull out the fourth cartridge in the belt about half an inch. Perform half the loading motions, pull the roller handle slowly back until the ears of the carrier have engaged with the notches on the side cams. Draw the recoiling parts to the rear by forcing the knob of the roller handle forward and the tail to the rear; at the same time pull the belt to the left. Bring the roller handle onto the roller and ease forward.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
	bottom pawls, and withdraws the belt until the first cartridge is clear of the feed box. He then pushes the slide to the left, replaces the feed box, and rectifies the belt or cartridges (if necessary), while the firer lowers the front cover and locks it. The firer pulls belt to left, when No. 2 is ready, and releases roller handle.			For range purposes: Fill a belt unevenly, or place the box at an angle to the feed box.

Position Of Roller Handle	Immediate Action	Probable Cause	Preventiou Of Recurrence	Method Of Preparation
	4. If the slide is free, call out: *Carrier* and open the front cover. No. 2 forces down the ears of the carrier, while the firer pulls the roller handle onto the roller. Clear the face of the carrier and change lock. No. 2 depresses the pawls, withdraws the belt, and removes the first cartridge in the belt. Close and lock the front cover and reload.	4. (a) Damaged cartridge grooves on carrier. (b) Broken gib spring. (c) Broken gib. (d) Thick rimmed cartridge. ***Note:*** *The lock removed from the gun should be tested by No. 2 passing an empty case down face of carrier. If it jams, he passes it back to No. 3 for repairs.*	4. Immediate action cures. ***Note:*** *Badly filled belts are the chief cause of stoppages in the 3rd. position.*	4. Damage the rim of the second dummy cartridge in the belt. Proceed to load easing roller handle forward second time. For range purposes: Damage the rim of a dummy cartridge and place it in the belt. ***Note:*** *This stoppage should seldom be practiced on the range, since the thickened rim may damage the grooves of the carrier.*
 *Fourth Position.*	1. Pull the roller handle onto the roller, pull the belt to the left, and release the roller handle.	1. Misfire.	1. Immediate action cures.	1. Fully load with dummy. Press trigger.

Position Of Roller Handle	Immediate Action	Probable Cause	Prevention Of Recurrence	Method Of Preparation
	2. If 1 fails, change lock and reload.	2. (a) Broken or damaged firing pin. (b) broken mainspring.	2. Immediate action cures.	2. As for 1.
	3. If, when performing 1, the firer notices that more belt than usual comes through to the left, he performs the second half of the loading motions.	3. Empty loop in the belt. (No. 2 should inform the firer when he notices belt running back out of feed box).	3. Inspect belts.	3. Press trigger. Insert belt in feed box until first cartridge is in line with shank of bottom pawls. For range purpose: Load with empty loop in belt.

SERIAL LIST OF COMPONENT PARTS

The Gun

4A Trunnion block.
5A Outside plate, right.
5B Outside plate, left.
5C Side cam, left.
5D Side cam, right.
6A Elevating pin seat.
6B Bottom plate slide.
6D Slide catch head.
6E Bottom plate slide catch.
6F Roller bracket.
6G Outside plate filling piece.
7A1 Water jacket cap.
7B Steam outlet tube.*
7C Trunnion block distance piece.
7D Stuffing box.
8A Water jacket.
8B Outer steam tube.
8C Steam tube plug.
8D Inner steam tube.
8E Steam tube socket.
8F Water jacket trough.
9A Barrel.
10A Recoil plate, left hand.
10B Recoil plate, right hand.
11A Crank.
11B Crosshead.
11C Fusee link, rear.
11D Fusee link, front, with link pin.
12A Roller handle.

**Section A-A shows Steam Outlet Tube with its Water Jacket Cap Hose Connection and Water Plug as seen from the rear. The Water Jacket Cap Hose Connection is on the left side of the Water Jacket.*

12B Dead stop plunger. (on some guns).
12C Roller handle knob.
12D Dead stop.
12E Dead stop bracket.
12F Roller.
13A Lock frame.
13B Filling piece.
13C Hand sear.
13D Tumbler.
13E Firing pin.
13F Safety sear.
13G Distance piece for lock frame.
13H Striker point.
14A Side lever.
14B Lifting lever, right hand.
14C Lifting lever, left hand.
14D Carrier.
14E Gib.
14F Gib spring plate.
15A Handle block.
15B Handle grip.
15C Oil reservoir cap.
15D Reservoir cap washer.
15E Handle block oil reservoir.
15F Brush holder.
15G Brush.
16A Trigger lever.
16B Trigger pawl.
16C Safety catch.
16D Thumbpiece.
16E Handle block pin.
16F Trigger.
17A Rear cover.
17B Rear cover catch.
17C Rear cover.
17D Trigger bar.
17E Rear sight stop screw.
18A Front cover.
18E Cover guide, left hand.
18F Front cover catch bracket.
18G Front cover catch.
19A Feed box.

20A Bottom pawl, left hand.
20B Bottom pawl, right hand.
20C Bottom pawl connecting plate.
20D Feed box lever, lower.
20E Feed box slide.
20F Cartridge guide and stop.
20H Upper pawl, left hand.
20J Upper pawl, right hand.
20K Feed box lever, upper.
21A Front sight.
21B Front sight carrier.
21D, 21E } Front sight carrier and cover.
23A Water plug.*
23B Water plug top piece.
23C Stem covering.
23D Water plug fastening link.
23E Water plug fastening ring.
23F Water jacket cap hose connection.*
23G Stem.
23H Eyebolt.
23J Securing S hook.
23K Securing chain (6 links).
23L Securing chain (12 links). (on some guns).
24A Spring box.
24B Spring box fixing, front.
24C Spring box fixing, rear.
24D Fusee.
24E Recoil spring hook.
24F Recoil spring nut.
25A Sleeve.
25B Front disk.
25C Muzzle attachment securing chain.
25D Securing chain ring.
25F Front disk cap.
25G Barrel disk.
25K Follower.

**Section A-A shows Steam Outlet Tube with its Water Jacket Cap Hose Connection and Water Plug as seen from the rear. The Water Jacket Cap Hose Connection is on the left side of the Water Jacket.*

26A Feed box bearing cap.
26B Locking pin.
26C Side lever pin.
26D Trigger pin.
26P Lock frame rivet.
26T Tension screw handle knob.
26U Stem covering washer.
26X Roller washer.
26Y Side lever pin bushing.
27C Dead stop pin.
27E Trigger pawl pin.
27G Crank pin.
27U Tumbler pin.
27V Hand sear pin.
27Z Tension screw handle.
28A Handle block hinge pin.
28B Cover hinge pin.
28C Rear cover catch hinge pin.
28D Front plug screw.
28E Steam tube front plug.
28H Safety catch pin.
28J Recoil spring tension screw.
28K Screw securing roller handle.
28Q Dead stop plunger stop. (on some guns).
28R Adjusting nut.
29C Gib spring.
29J Mainspring.
29K Safety sear spring.
29L Recoil spring.
29N Trigger lever spring.
B1A Trunnion pin (on some guns).
B1C Trunnion pin adjusting nut (on some guns).

Parts Not Numbered On Plate

Bottom plate—*Forms bottom of casing.*
Front cover catch cap—*Part of front cover catch.*
Front cover catch snib—*Part of front cover catch.*

Front cover catch snib spring—*Part of front cover catch.*
Cover guide, right hand—*Opposite cover guide, left hand.*
Muzzle gland—*Used to replace follower when muzzle attachment is not used.*
Adjusting washer (thick)—*On crosshead.*
Adjusting washer (thin)—*On crosshead.*
Slide catch pin—*Part of bottom plate slide catch.*
Slide catch spring—*Part of bottom plate slide catch.*
Bottom plate slide stop—*Part of bottom plate slide catch.*
Crank pin fastening link—*Fastens crank pin to crank.*
Upper pawl pin—*Secures upper pawls.*
Filling piece pin—*Holds filling piece in lock frame.*
Safety sear pin—*Pivot for safety sear in lock frame.*
Spring box rear stud—*On outside plate filling piece.*
Spring box front studs—*On outside plate, left.*
Bottom pawl pin—*Secures bottom pawls.*
Carrier supporting spring, left hand—*On recoil plate, left.*
Carrier supporting spring, right hand—*On recoil plate, right.*
Rear cover catch spring—*Bears on rear cover catch.*
Bottom pawl spring—*Holds bottom pawls against belt.*
Bullet guide spring—*Forms guide for nose of bullet in feed box.*
Upper pawl spring—*Holds upper pawls against belt.*
Dead stop plunger spring (on some guns)—*Depressed by dead stop plunger.*
Trigger bar spring—*On rear cover.*
Trunnion pin collar (on some guns)—*On trunnion pin.*

The Rear Sight

22A Movable base.
22B Half-nut.
22C Windage screw.
22D Windage screw knob.
B2A Slide cap.
B2C Slide.
B2H Drift slide.
B2J Leaf joint pin.
B2K Elevating screw head.
B2M Leaf.

Windage screw collar—*Bears against windage screw.*
Windage screw spring—*Bears against windage screw collar.*
Elevating screw—*Adjusts height of slide.*
Half-nut spring—*Holds half-nut against leaf.*
Pivot—*For aperture disk.*
Pivot spring—*For aperture disk.*
Aperture disk—*On slide.*
Base spring—*Holds leaf up or down.*

ALPHABETICAL LIST OF COMPONENT PARTS OF GUN

Adjusting nut (28R).
Adjusting washer (thick)—*On crosshead.*
Adjusting washer (thin)—*On crosshead.*
Barrel (9A).
Barrel disk (25G).
Bottom pawl, left hand (20A).
Bottom pawl, right hand (20B).
Bottom pawl connecting plate (20C).
Bottom pawl pin—*Connects bottom pawls and spring to feed box.*
Bottom pawl spring—*Presses bottom pawls against belt.*
Bottom plate—*Forms bottom of casing.*
Bottom plate slide (6B).
Bottom plate slide catch (6E).

Bottom plate slide stop—*Part of bottom plate slide catch.*
Brush (15G).
Brush holder (15F).
Bullet guide spring—*Forms guide for nose of bullets in feed box.*
Carrier (14D).
Carrier supporting spring, left hand—*On recoil plate, left.*
Carrier supporting spring, right hand—*On recoil plate, right.*
Cartridge guide and stop (20F).
Cover guide, left hand (18E).
Cover guide, right hand—*Opposite cover guide, left hand.*
Cover hinge pin (28B).
Crank (11A).
Crank pin (27G).
Crank pin fastening link—*Fastens crank pin to crank.*
Crosshead (11B).
Dead stop (12D).
Dead stop bracket (12E).
Dead stop pin (27C).
Dead stop plunger (12B) (on some guns).
Dead stop plunger spring (on some guns)—*Depressed by plunger.*
Dead stop plunger stop (28Q) (on some guns).
Distance piece for lock frame (13G).
Elevating pin seat (6A).
Eyebolt (23H).
Feed box (19A).
Feed box bearing cap (26A).
Feed box lever, lower (20D).
Feed box lever, upper (20K).
Feed box slide (20E).
Filling piece (13B).
Filling piece pin—*Holds filling piece in lock frame.*
Firing pin (13E).
Follower (25K).
Front cover (18A).

Front cover catch (18G).
Front cover catch bracket (18F).
Front cover catch cap—*Part of front cover catch.*
Front cover catch snib—*Part of front cover catch.*
Front cover catch snib spring—*Part of front cover catch.*
Front disk (25B).
Front disk cap (25F).
Front plug screw (28D).
Front sight (21A).
Front sight carrier (21B).
Front sight carrier and cover (21D–21E).
Fusee (24D).
Fusee link, front, with link pin (11D).
Fusee link, rear (11C).
Gib (14E).
Gib spring (29C).
Gib spring plate (14F).
Hand sear (13C).
Hand sear pin (27V).
Handle block (15A).
Handle block hinge pin (28A).
Handle block oil reservoir (15E).
Handle block pin (16E).
Handle grip (15B).
Inner steam tube (8D).
Lifting lever, left hand (14C).
Lifting lever, right hand (14B).
Lock frame (13A).
Lock frame rivet (26P).
Locking pin (26B).
Mainspring (29J).
Muzzle attachment securing chain (25C).
Muzzle gland—*Used to replace follower when muzzle attachment is not used.*
Oil reservoir cap (15C).
Outer steam tube (8B).
Outside plate filling piece (6G).
Outside plate, left (5B).
Outside plate, right (5A).

Rear cover (17A), (17C).
Rear cover catch (17B).
Rear cover catch hinge pin (28C).
Rear cover catch spring—*Bears on rear cover catch.*
Rear sight stop screw (17E).
Recoil plate, left hand (10A).
Recoil plate, right hand (10B).
Recoil spring (29L).
Recoil spring hook (24E).
Recoil spring nut (24F).
Recoil spring tension screw (28J).
Reservoir cap washer (15D).
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—*Pivot for safety sear in lock frame.*
Safety sear spring (29K).
Screw securing roller handle (28K).
Securing chain (6 links) (23K).
Securing chain (12 links) (23L). (on some guns).
Securing chain ring (25D).
Securing S hook (23J).
Side cam, left (5C).
Side cam, right (5D).
Side lever (14A).
Side lever pin (26C).
Side lever pin bushing (26Y).
Sleeve (25A).
Slide catch head (6D).
Slide catch pin—*Part of bottom plate slide catch.*
Slide catch spring—*Part of bottom plate slide catch.*
Spring box (24A).

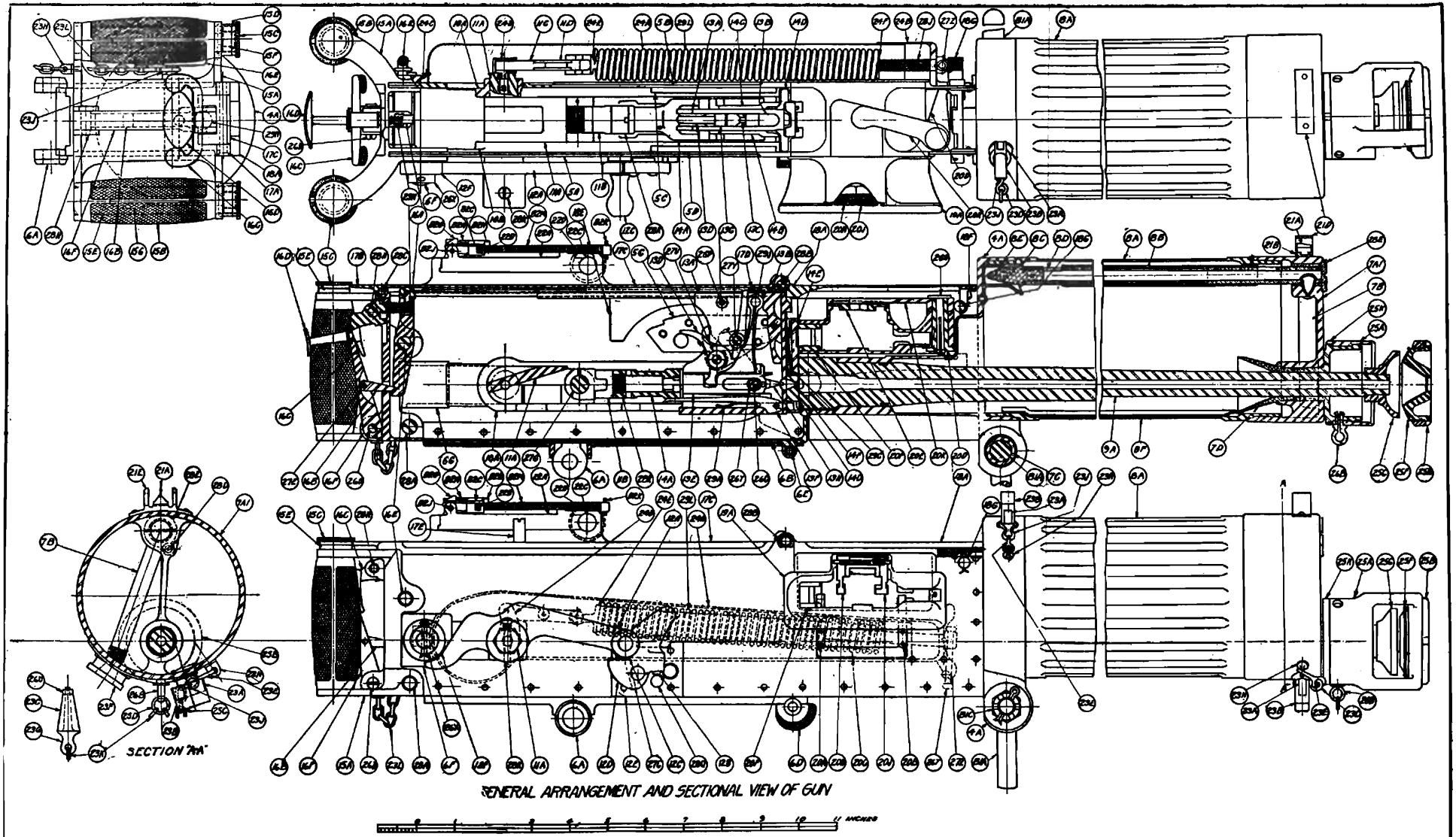
Spring box fixing, front (24B).
Spring box fixing, rear (24C).
Spring box front studs—*On outside plate, left.*
Spring box rear stud—*On outside plate filling piece.*
Steam outlet tube (7B)*.
Steam tube front plug (28E).
Steam tube plug (8C).
Steam tube socket (8E).
Stem (23G).
Stem covering (23C).
Stem covering washer (26U).
Striker point (13H).
Stuffing box (7D).
Tension screw handle (27Z).
Tension screw handle knob (26T).
Thumbpiece (16D).
Trigger (16F).
Trigger bar (17D).
Trigger bar spring—*On rear cover.*
Trigger lever (16A).
Trigger lever spring (29N).
Trigger pawl (16B).
Trigger pawl pin (27E).
Trigger pin (26D).
Trunnion block (4A).
Trunnion block distance piece (7C).
Trunnion pin (B1A) (on some guns).
Trunnion pin adjusting nut (B1C) (on some guns).
Trunnion pin collar (on some guns)—*On trunnion pin.*
Tumbler (13D).
Tumbler pin (27U).
Upper pawl, left hand (20H).
Upper pawl, right hand (20J).
Upper pawl pin—*Secures upper pawls.*

**Section A-A shows Steam Outlet Tube with its Water Jacket Cap Hose Connection and Water Plug as seen from the rear. The Water Jacket Cap Hose Connection is on the left side of the Water Jacket.*

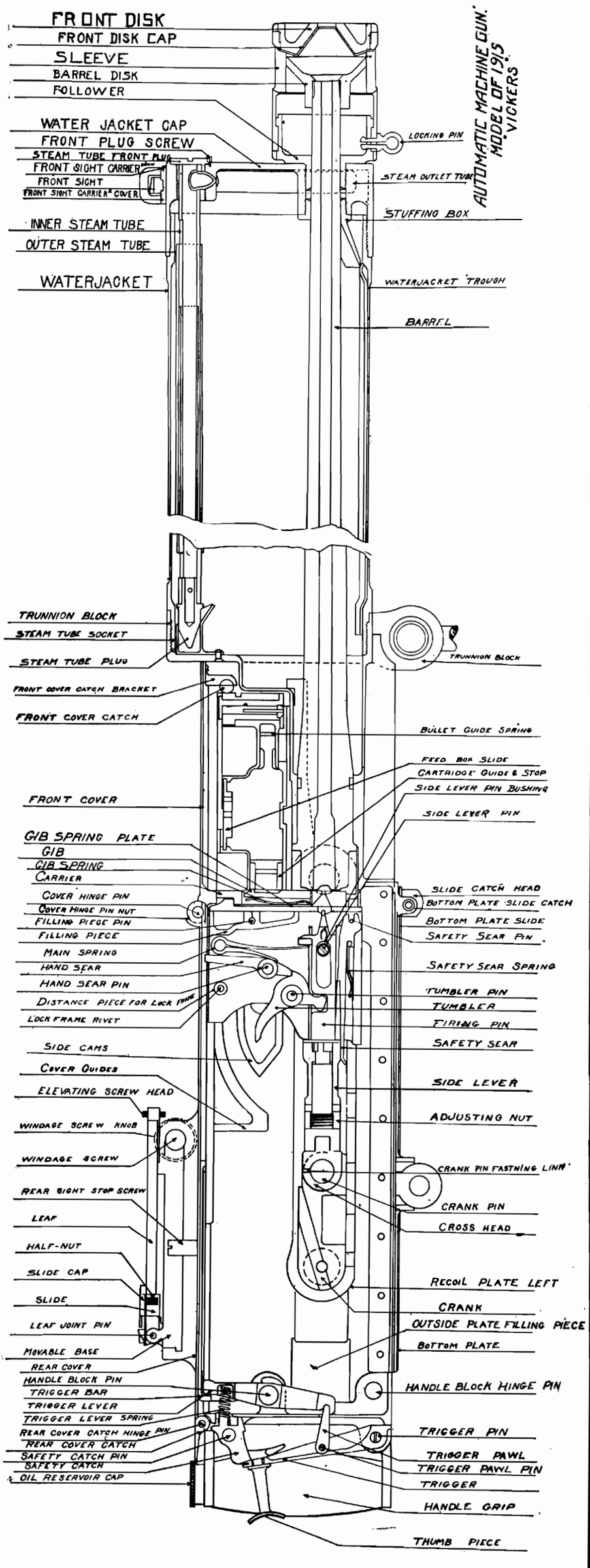
Upper pawl spring—*Holds upper pawls against belt.*
Water jacket (8A).
Water jacket cap (7A1).
Water jacket cap hose connection (23F)*.
Water jacket trough (8F).
Water plug (23A)*.
Water plug fastening link (23D).
Water plug fastening ring (23E).
Water plug top piece (23B).

**Section A-A shows Steam Outlet Tube with its Water Jacket Cap Hose Connection and Water Plug as seen from the rear. The Water Jacket Cap Hose Connection is on the left side of the Water Jacket.*

LIBRARY
THE GENERAL SERVICE SCHOOLS
FORT LEAVENWORTH, KANSAS



GENERAL ARRANGEMENT AND SECTIONAL VIEW OF GUN


AUTOMATIC MACHINE GUN.
MODEL OF 1915
VICKERS.
FRONT DISK
FRONT DISK CAP
SLEEVE
BARREL DISK
FOLLOWER
WATER JACKET CAP
FRONT PLUG SCREW
STEAM TUBE FRONT PLUG
FRONT SIGHT CARRIER
FRONT SIGHT
FRONT SIGHT CARRIER COVER
INNER STEAM TUBE
OUTER STEAM TUBE
WATERJACKET
LOCKING PIN
STEAM OUTLET TUBE
STUFFING BOX
WATERJACKET TROUGH
BARREL
TRUNNION BLOCK
STEAM TUBE SOCKET
STEAM TUBE PLUG
FRONT COVER CATCH BRACKET
FRONT COVER CATCH
TRUNNION BLOCK
BULLET GUIDE SPRING
FEED BOX SLIDE
CARTRIDGE GUIDE & STOP
SIDE LEVER PIN BUSHING
SIDE LEVER PIN
FRONT COVER
GIB SPRING PLATE
GIB
GIB SPRING
CARRIER
COVER HINGE PIN
COVER HINGE PIN NUT
FILLING PIECE PIN
FILLING PIECE
MAIN SPRING
HAND SEAR
HAND SEAR PIN
DISTANCE PIECE FOR LOCK FRAME
LOCK FRAME RIVET
SLIDE CATCH HEAD
BOTTOM PLATE SLIDE CATCH
BOTTOM PLATE SLIDE
SAFETY SEAR PIN
SAFETY SEAR SPRING
TUMBLER PIN
TUMBLER
FIRING PIN
SAFETY SEAR
SIDE CAMS
COVER GUIDES
ELEVATING SCREW HEAD
SIDE LEVER
ADJUSTING NUT
WINDAGE SCREW KNOB
WINDAGE SCREW
CRANK PIN FASTNING LINK
REAR SIGHT STOP SCREW
CRANK PIN
CROSS HEAD
LEAF
HALF-NUT
SLIDE CAP
SLIDE
RECOIL PLATE LEFT
CRANK
LEAF JOINT PIN
OUTSIDE PLATE FILLING PIECE
BOTTOM PLATE
MOVABLE BASE
REAR COVER
HANDLE BLOCK PIN
HANDLE BLOCK HINGE PIN
TRIGGER BAR
TRIGGER LEVER
TRIGGER LEVER SPRING
TRIGGER PIN
REAR COVER CATCH HINGE PIN
REAR COVER CATCH
SAFETY CATCH PIN
TRIGGER PAWL
SAFETY CATCH
TRIGGER PAWL PIN
OIL RESERVOIR CAP
TRIGGER
HANDLE GRIP
THUMB PIECE