SCHOOL OF AUTOMATIC ARMS

40th Division, Camp Kearny, Cal.

NOTES ON MECHANISM OF THE CHAUCHAT MACHINE RIFLE, MODEL 1915

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Machine Gun Instruction and Inspection Division,
Ordnance Depot, 40th Division.

PREFACE

In the following notes it has been attempted to set forth in logical order for purposes of instruction, all available material pertaining to the mechanism of the Chauchat Machine Rifle, Model 1915. Advantage has been taken of the valuable material contained in the French Pamphlet "Le Fusil Mitrailleur" of the Fourth Army School at Chalons-sur-Marne.

PERSONNEL OF THE AUTOMATIC RIFLE TEAM

Each rifle team consists of three men: One gunner, and two carriers. The three men should have the same proficiency in handling the rifle so as to be able to take the place of any one in case he has been put out of action. The man handling the gun must be able to keep the gun in action without the aid of the other two.

Duties of each man:

1. Gunner: He should keep cool, conserve his supply of ammunition, and keep his eye on the objective at all times, in other words, to be master of the situation, in order to produce the greatest effect.
2. First Carrier: Carries the gunner's pouch, takes up his position at the right of the gunner, and watches the functioning of the gun, and aids the gunner to keep the rifle in action. He should be proficient in rapidly handing the full magazine to the gunner after he has taken the empty one from him. It is his duty to reload magazines from his ammunition supply.
3. Second Carrier: Takes up his position to the right of the first carrier and acts as a defense either with his rifle or his bayonet and protects the other two men during stoppages and changes of magazines. He keeps the first carrier supplied with full magazines and when a supply of loaded magazines have been exhausted he gives single rounds to the first carrier from his cartridge belt.

Method of Cleaning During Action:

All the men of the automatic rifle section must be experts in quick cleaning the rifle during a lull in action so as to keep it in good condition and always in use. The platoon leaders supervises the cleaning of the rifles being sure that half the rifles are always in action. Each gunner reports to the platoon leader when his gun needs cleaning. In this way the platoon leader can keep track of his gun and see that they are not all being cleaned at the same time. Each gunner should be trained to follow a correct method of dismounting so as to facilitate rapidity of cleaning.

In training the men in cleaning the rifle, practice should be given them in dismounting and cleaning under different conditions, and at unexpected times and places, so as to familiarize them and simulate as nearly as possible, actual conditions under which they will have to do this work.

The gunner and the first carrier do all the cleaning, while the second carrier armed with a rifle acts as a defense for the rest of the team. The gunner and first carrier obscure themselves from the enemy and protect themselves from rifle fire by means of simple fortifications, if necessary. After having arranged themselves with sufficient protection, they proceed in the following manner.

The gunner unscrews the spring guide cap; the first carrier gets out his cleaning kit, oil can, cleaning rod and patches, and arranges them to be easily accessable, to the gunner or himself. The gunner removes the spring tube, recoil spring bushing, mainspring, recoil spring, feed piece and bolt mechanism and hands them to the first carrier to be cleaned. He then removes the barrel and breech casing from the housing, places them in such a position so as to be cooled. He then cleans the rifle carriage and housing The first carrier having cleaned the parts given to him, now cleans the barrel, it having had time to cool. Experience have shown that this method of the distribution of the parts for cleaning have proven the most efficient, keeping both men busy at all times, and completing their work at the same time.

The first carrier having oiled the parts, returns them to the gunner who assembles the gun in the reverse order in which it was taken down. The first carrier aids the gunner in mounting the housing on the carriage, and flocking the rear assembling bolt and the front assembling bolt. While the first carrier is collecting his cleaning material and replacing them in the pouch the gunner replaces the spring tube and springs.

COMBAT EQUIPMENT OF ONE TEAM

Corporal

Rifle and bayonet, four full magazines in a bag, fifty-six single rounds in cartridge belt (Seven packages of eight cartridges each). Total 136 rounds.

Gunner

Revolver with three full clips, four full magazines in a bag, two pockets on belt containinT two full magazines each, pick shovel. Total 160 rounds.

1st. Carrier

Revolver with three full clips, eight full magazines and a bag, one pack containing eight packages of eight cartridges each and eight full magazines in pack, shovel. Total 384 rounds.

2nd. Carrier

Rifle and bayonet, twelve full magazines in pack, sixty-four single rounds in cartridge belt, shovel. Total 304 rounds.

Total ammunition carried by team 848 rounds, exclusive of the ammunition carried by the corporal.

Note:

The ammunition carried by the corporal is for both teams in his squad, he supplying the team most in need of ammunition.

Nomenclature

The parts of the rifle are divided into two classes, fixed and movable. The movable parts are those which are put into action by the natural recoil of the barrel on the rearward stroke and by the recoil spring and mainspring on the forward stroke. The fixed parts are those which direct and guide the correct functioning of the movable parts. Numbers in parenthesis refer to numbers on plate.

FIXED PARTS

I. Housing (breech housing and radiator casing). (1 and 28)

II. Rifle Carriage.

III. Grip Mechanism.

IV. Bipod.

I. Housing.

1. Flash screen (129)
2. Flash screen coupling (128)
3. Front sight (25)
4. Radiator casing (28)
5. Connector bushing, front (2)
6. Breech housing (1)
7. Rear sight
   - (a) Rear sight base (111)
   - (b) Rear sight base screw (112)
   - (c) Rear sight leaf (113)
   - (d) Rear sight leaf pin (114)
   - (e) Rear sight slide (115)
   - (f) Rear sight slide catch (116)
   - (g) Rear sight slide catch spring (117)
   - (h) Rear sight notch plate (118)
   - (i) Rear sight notch plate screw (119)
   - (j) Rear sight base spring (120)
   - (k) Rear sight base spring screw (121)
8. Connector bushing, rear (3)
9. Spring tube (60)
   - (a) Spring tube plug (61)
   - (b) Spring guide cap (4)
   - (c) Spring tube cap pin (64)

II. Rifle Carriage.

1. Side plate, right (6)
2. Side plate, left (7)

Side plate screws (37)

4. Bipod block (5)
5. Front assembling bolt (8)
   - (a) Front assembling bolt washer (9)
   - (b) Front assembling bolt arm (41)
   - (c) Bolt arm knob (43)
   - (d) Bolt arm stop (42)

6. Sling swivel, front (11a)
   - (a) Sling swivel bolt (11)
   - (b) Sling swivel axis pin (12)
   - (c) Assembling nut (10)
7. Barrel catch (19)
   - (a) Barrel catch block (13),
   - (b) Barrel catch pin (34)
   - (c) Barrel catch spring (20)
   - (d) Magazine stop spring (18)
   - (e) Magazine stop spring screw (17)
8. Cartridge guide (15)
   - (a) Cartridge guide roller (21a)
   - (b) Cartridge guide cam cover (14)
   - (c) Cartridge guide cam cover bolts (6) (16)
9. Handle (40)
   - (a) Handle block (32)
   - (b) Handle stem (38)
   - (c) Handle nut (39)
   - (d) Magazine catch (33)
   - (e) Magazine catch handle (35)
   - (f) Magazine catch spring (36)
   - (g) Magazine catch pin (34)
10. Sling swivel, rear (11a)
    - (a) Sling swivel bolt (11)
    - (b) Sling swivel axis pin (12)
11. Rear assembling bolt (8a)
    - (a) Rear assembling bolt latch (44)
    - (b) Rear assembling bolt latch pin (52)
    - (c) Spring washer (55)
12. Stock (100)
    - (a) Stock plate (101)
    - (b) Sling swivel bolt bushing (80)
    - (c) Rear assembling bolt bushing (102)
    - (d) Stock bolt (104)
    - (e) Grip bolt nut (77)
    - (f) Spring guide latch (90)
      Spring guide latch handle (98)
      Spring guide latch spring (91)

III. Grip Mechanism.

1. Grip plate, right (68)
2. Grip plate, left (69)
3. Bottom plate (69a)
4. Grip block (73)
5. Grip, right (74)
6. Grip, left (75)
7. Grip bolt (76)
8. Grip bolt nut (77)
9. Trigger guard (70)
10. Trigger guard screw (105)
11. Trigger bar spring stud (71)
12. Sear spring (51)
13. Sear spring rivet (82)
14. Sear spring washer (94)
15. Trigger (78)

16. Trigger bar (83)
17. Trigger bar pin (84)
18. Trigger bar spring (85)
19. Sear (81)
20. Sear lever (89)
21. Hand sear (86)
22. Hand sear pin (87)
23. Hand sear spring (88)
24. Sear bushing (80)
25. Sear lever axis bushing (80)
26. Regulator cam (92)
    - (a), Regulator cam nut (93)
    - (b) Assembling nut (10)
    - (c) Bolt arm knob (43)
    - (d) Bolt arm stop (42)

IV. Bipod

1. Bipod head (106)
2. Leg axis screw (108)
3. Leg top (107)
4. Leg tube (110)
5. Leg foot (109)

MOVABLE PARTS

I. Barrel Group

II. Bolt Mechanism

III. Feed Mechanism

I. Barrel Group

1. Barrel (22)
2. Barrel nut (24)
3. Radiator (23)
4. Barrel sleeve bushing (27)
5. Barrel sleeve (26)
6. Breech casing (29)
7. Recoil spring bushing (30)
8. Recoil spring (31)

II. Bolt Mechanism

1. Bolt head (45)
   - (a) Extractor (56)
   - (b) Extractor spring (58)
   - (c) Extractor pin (57)
   - (d) Ejector (59)
   - (e) Ejector spring (79)
   - (f) Ejector screw (59a)
2. Bolt body (46)
   - (a) Bolt stem (62)
   - (b) Bolt stem pin (65)
   - (c) Bolt stem collar (63)
   - (d) Bolt stem collar pin (66)
   - (e) Bolt head stop (50)
   - (f) Firing pin (47)
3. Mainspring (67)

III. Feed Mechanism

1. Feed piece (48)
2. Feed piece assembling stud (49)
3. Operating handle (54)
4. Cartridge guide cam (21)

PARTS OF MAGAZINE

1. Magazine side (male) (122)
2. Magazine side (female) (123)
3. Magazine closing plate (124)
4. Magazine spring (127)
5. Magazine follower (126)

Weights: Magazine, full.. .....852g., or 1 lb. 14 oz.
Magazine, empty.....300g., or 10 6,10 oz.

CONTENTS OF CLEANING KIT

1 Sectional cleaning rod with one brush
1 Cleaning brush for chamber
1 Oil can (Coal oil)
1 Oil can (Lubricating oil)
1 Ruptured cartridge extractor
1 Hand extractor

COMPLETE DISMOUNTING:

To be done by an experienced armorer only.

1. Release trigger letting mechanism forward easily. Never allow the bolt mechanism to snap forward, unless it is seating a cartridge in the chamber.
2. Release spring guide latch.
3. Unscrew spring guide cap, and remove recoil spring and mainspring.
4. Drive in rear assembling bolt on left side plate. Then turn rear assembling bolt latch to a horizontal position and push the bolt out until the shoulder of the front end comes up against the left side plate. This bolt cannot be removed from left side plate. It is so designed to prevent loss of same. The rear end of the breech housing is now free.
5. Turn front assembling bolt down, releasing the radiator casing and breech housing from the rifle carriage.
6. Draw operating handle to the rear and remove housing with its contents.
7. Draw operating handle further to the rear and remove feed piece.
8. Remove bolt mechanism. The parts are stripped in the following order:

Bolt head
Extractor pin
Extractor
Extractor spring
Ejector screw
Ejector
Ejector spring
Bolt body
Bolt stem pin
Bolt stem
Firing pin
Bolt stem collar pin
Bolt stem collar

9. Remove barrel group.

Note: If it ever becomes necessary to rmeove radiator, it will be noticed that the barrel end is upset on the barrel nut. The cylindrical surface of the barrel nut acts as a bearing for the front end of the barrel and must not be burred in the process of removing.

10. Remove bipod by unscrewing bipod from bipod block. Remove leg axis screws.
11. Unscrew assembling nuts on front sling swivel and on front assembling bolt.
12. Remove assembling bolt front, front sling swivel and bipod block. It should be noted that the heads of the cartridge guide cam cover bolts appear to be screw heads. These bolts cannot be turned by the heads, as they contain a stud which positions the cam on the bolt which is used as an adjustment of the cartridge guide cam cover to prevent its binding on the cratridge guide cam.
14. Remove bolts which release:

Cartridge guide cam cover
Barrel catch block
Barrel catch
Barrel catch spring
Cartridge guide roller
Magazine stop spring screws
Magazine stop spring

Note: The cartridge guide cannot be removed until the side plates are free to be separated.

15. Unscrew assembling nut on regulator cam and remove it.
16. Unscrew side plate screws of grip mechanism.
17. Remove grip mechanism which is dismounted in the following order:
    - Sear bushing
    - Sear lever axis bushing
    - Sear
    - Sear lever
    - Trigger bar spring from stud
    - Trigger bar and trigger
    - Hand sear pin
    - Hand sear
    - Hand sear spring
18. Unscrew side plate screw releasing handle block
19. Remove
    - Magazine catch pin
    - Magazine catch
    - Magazine catch spring
20. Remove rear sling swivel and side plates.
21. To remove spring guide latch, unscrew grip bolt nut from stock bolt which releases spring guide latch and spring guide latch spring.

DISMOUNTING FOR CLEANING TO BE DONE BY THE SOLDIER

1. See that the operating handle is in the forward position. Never allow the bolt mechanism to snap forward unless it is seating a cartridge
2. Press down on spring guide latch, unscrew spring guide cap, and remove recoil spring and mainspring.
3. Drive in rear assembling bolt on left side plate; then turn rear assembling bolt latch into a horizontal position, and drive rear assembling bolt from right side until the connector bushing rear is free.
4. Turn front assembling bolt arm straight down.
5. Draw operating handle to the rear and remove housing with its contents.
6. Draw operating handle further to the rear and remove feed piece
7. Remove bolt mechanism, recoil spring bushing and barrel group.
8. Remove bolt head from bolt body.

Note: The parts of the rifle are now accessible and are easily cleaned and oiled.

ASSEMBLING

1. Assemble bolt head to bolt body.
2. Snap bolt head forward so that the bolt head stop may be pressed in, insert bolt mechanism in breech casing.
3. Place barrel group in the housing so the bottom of the bolt body is in the opening in the bottom of the breech housing. In this position the feed piece can be fastened to the bolt.
4. Assemble feed piece to bolt body and move operating handle slightly forward so that the feed piece will not fall out.
5. Assemble housing and its contents to rifle carriage, taking care that cartridge guide cam is properly assembled under cartridge cam cover. Press cartridge guide up so that cartridge guide roller will enter the cam way.
6. Turn front assembling bolt arm to the rear.
7. Drive rear assembling bolt in from the left side and turn latch into a vertical position.
8. Push operating handle forward.

9. Insert recoil spring bushing and assemble recoil spring, mainspring and spring guide cap. Care should be taken to screw spring guide cap into breech housing until the notch engages the spring guide latch.

OUTLINE FOR DEMONSTRATION

I. Short Description of the Gun.
   1. Type and make.
   2. Ammunition.
   3. Cooling System.
   4. Locking Mechanism.
   5. Feed Mechanism.
   6. Forces that operate the gun.
   7. What the adjustments are, and how made.
   8. Precautions to be observed in using the gun.

II. Essential Parts:
   1. Dismount and give the function of the principle parts.

III. Detailed Operation of the Gun.
   1. First Phase
      (a) Recoil of Barrel and Bolt Mechanism
      (b) Cocking of the Piece
      (c) Compression of Mainspring and Recoil Spring.
   2. Second Phase
      (a) Action of Recoil Spring.
      (b) Unlocking of Bolt Head.
      (c) Extraction.
      (d) Ejection.
   3. Third Phase
      (a) Feeding of Cartridge.
      (b) Action of Cartridge Guide.
      (c) Locking of Bolt Head.
      (d) Engaging of Extractor.
      (e) Priming of Cartridge.
      (f) Action of Trigger Mechanism.

DEMONSTRATION

1. The Chauahat Rifle, Model of 1915, is also called "Rifle C. S. R. G." These capital letters are the abbreviations or the names of Inventors and Manufacturer.

C—Col. Chauchat
S—Capt. Suter
R—Mr. Ribeyrolles
G—Gladiator Factory

Weights and Measurements of Rifle

Weight without Gun Cover	19 lbs. 2 oz.
Weight with Gun cover	20 lbs.
Length with Flash Screen	45.7 inches
Length of Barrel	17.¼ inches

2. The Chauchat rifle fires the French Lebel cartridge, Model D. A. M. Cal. 8mm. or .31496 inches.

The Cartridge

Composition of the Bullet	90% brass, 10% zinc,
Weight of Bullet	195 grains
Weight of Cartridge complete	434 grains
Length of Bullet	1.54 inches
Chamber pressure	34,800 lbs. per sq. inch
Initial Velocity	2375 feet per second

The powder charge is of nitrocellulous composition and weighs about 46 grains.

3. The cooling is accomplished by an aluminum radiator which surrounds the barrel. The rapid backward and forward motion of the barrel causes cool air to be drawn in through holes in the radiator casing, thereby aiding the cooling of the barrel.

4. The locking of this rifle is accomplished by two locking lugs on the bolt head rotating into the locking recesses of the breech casing. This is due to the action of the guide lugs on the bolt head against the cam cuts in the bolt body.

5. The cartridges are held in a semi-circular magazine ,and are forced up into the feedway by the action of the magazine spring where they are held by the lips of the magazine. During the forward motion of the bolt mechanism, the feed piece forces the cartridge out of the magazine and the cartridge guide directs the nose of the bullet up into the chamber. The cartridge is then driven home by the bolt head. In case magazines are not available, a feed plate is put into the magazine opening which enables cartridges to be fed by hand at the rate of forty per minute.

6. When the cartridge is fired the natural recoil of the barrel, due to the explosion forces the barrel to the rear compressing the recoil spring, and carries with it the bolt, thereby compressing the mainspring. The recoil spring being compressed forces the barrel forward to its firing position. The recoil of the barrel, which carries the bolt, and the return of the barrel to its firing position accomplishes the re-cocking of the piece and the unlocking of the bolt head.

7. There are no adjustments on the gun, except in case the mainsprngi becomes weak it can be strengthened by shortening the interior of the spring tube by putting a wad of paper, or cloth, in the tube until the spring has sufficient tension to fire the cartridge.

8 (a) When the gun is fired from the shoulder, it is important that the gunner hold the piece securely against the shoulder, and when sighting rest the cheek well upon the breech housing so the spring guide cap will not injure the gunners face.

(b) In firing while marching, it is essential that the gunner hold the butt stock securely under his arm, with the spring guide cap pressed tightly aganst the under part of his shoulder, in order to obtain sufficient resistance so that the barrel may recoil. If the gun is not held tightly the whole gun will move back and the barrel will not recoil far enough to engage the feed piece in the sear.

FIXED PARTS

1. Housing
2. Rifle Carriage
3. Grip Mechanism
4. Bipod

HOUSING

The housing consists of two tubes, the radiatos casing and breech housing.

The radiator casing surrounds the barrel and contains holes through which cool air is drawn by the motion of the barrel. On the front end of the radiator casing is mounted the front sight and flash screen. The flash screen conceals the flash of the powder as it leaves the muzzle and contains the flash screen coupling. This flash screen coupling is cup-shaped, and is designed to trap a portion of powder gas and direct it against the muzzle end of the barrel, thereby aiding the recoil of the barrel group.

The radiator casing is fastened to the breech housing by the front connector bushing. On the breech housing is mounted the rear sight. On the right side is the ejection opening through which the empty cartridge cases are ejected. On the bottom is the opening to allow the feed piece carrying the bolt to move backward and forwarfd.

Into the rear end of the breech housing is screwed the spring guide cap and when in place is held from unscrewing by the spring guide latch en-

gaging a notch cut in the spring guide cap. To the spring guide cap is assembled the following:

Spring tube
Spring tube plug
Spring guide cap pin
Mainspring
Recoil spring

Rifle Carriage

It consists of two lateral side plates fixed on the stock and connected by three blocks. On the right side plate are:

The axis hole for the sling swivel (front)
The axis hole for the assembling bolt (front)
The cartridge guide cam cover
Holes for the passage of the side plate screws
The axis holes for the trigger mechanism
The axis holes for the regulating lever
Axis holes for the sling swivel (rear)
Hole for the rear assembling bolt
On the right side there is also a clearance cut to allow the operating handle to function.
On the left side plate there are similar holes
Between the side plate are three blocks

1. Bipod block, to which is assembled the bipod
2. Barrel catch block, to which is assembled theb arrel catch, cartridge guide and magazine stop spring. The barrel catch engages the groove in the barrel sleeve, and momentarily locks the barrel in its forward position and prevents any rebound. The cartridge guide actuated by the cartridge guide cam directs the cartridge into the chamber. The magazine stop spring holds the front end of the magazine firmly into place.
3. Handle block, to which is assembled the handle and magazine catch. The magazine catch holds the rear end of the magazine into place.

The rifle carriage is assembled to the stock which contains the spring guide latch.

GRIP MECHANISM

The grip is composed of the grip plate, right; grip plate, left; grip block; and bottom plate. To the grip is assembled the following:

The trigger bar spring
Trigger bar spring stud
Trigger connected to the stud by the spring
Trigger, which controls the trigger bar in its engagement with the hand sear.
Sear, which engages the feed piece
Sear lever which acts on the sear to depress it
Sear spring which moves the sear up so it can engage the sear notch in the feed piece.
Grip, right
Grip, Left
Grip bolt (2)
Grip bolt nut (2)

The regulator cam, containing the regular cam nut, bolt arm, bolt arm stop, and bolt arm knob, passes between the trigger bar and sear lever and controls the movement of the trigger bar when set for single shots.

MOVABLE PARTS

1. Barrel group
2. Bolt mechanism
3. Feed mechanism

Barrel group

Starting at the muzzle end of the barrel are the following;

Barrel nut
Radiator which surrounds the barrel
Barrel sleeve bushing
Barrel sleeve, on which is cut the groove to engage the barrel catch.

Breech casing, in which is the locking recess for the bolt head, the ejection opening through which the empty shells are thrown out, and on the bottom is a clearance cut in which the feed piece travels. On the rear end of the breech casing is noticed a ramp which on the forward motion of the barrel acts on the hand sear depressing it, thereby releasing the bolt mechanism.

Recoil spring bushing, which acts as a seat for the recoil spring.

Recoil spring which furnishes the power to drive the barrel forward.

Bolt Mechanism

Bolt head on which is the extractor and extractor spring fastened to it by the extractor pin. On the front end of the bolt head are the locking lugs which fit into the locking recess in the breech casing. Near the rear end of the bolt head are the guide lugs, which act in the cam cuts in the bolt body and direct the rotary motion of the bolt head. At the extreme rear end of the bolt head is a seat into which the bolt head stop drops and prevents any backward or rotary motion of the bolt head.

Bolt body on which is mounted the bolt stem and firing pin. It also contains the cam cuts which control the locking and unlocking of the bolt head. On the bolt stem is the bolt stem collar which acts as a seat for the mainspring.

Feed Mechanism

The feed piece containing grooves to fit the cuts in the bottom of the bolt body and the feed piece assembling stud which fastens the bolt body to the feed piece.

On the rear end of the feed piece is the sear notch which engages the sear and holds the bolt mechanism in its rearward position.

The cartridge guide cams which actuates the cartridge guide by means of the cartridge guide roller.

The operating handle for cocking the piece.

Magazine

Near the rear end of the magazine is a hole through the side plates into which the bullet end of a cartridge can be put to hold back the magazine follower while the magazine is being filled.

On the rear end of the magazine is the notch which holds the magazine in place by means of the magazine catch.

On the top of the rear end of the magazine the sides are turned over forming lips which are so designed to place the cartridge in position to be moved forward out of the magazine into the chamber.

Weight of Magazine, full	1 lb. 15 oz
Weight of Magazine, empty	12 oz
Weight of two pockets, containing two full magazines each	8.73 lbs.
Weight of special bag containing 4 full magazines	8.86 lbs.

DETAILED OPERATION OF THE GUN

Assuming a cartridge has been fired three phases may be considered

1. The recoiling mechanism is thrown to the rear

2. The barrel is moved forward under the tension of the recoil spring to its firing position.

3. The bolt mechanism is moved forward under the tension of the mainspring

1. First Phaze (See Fig. 1)

(a) When the cartridge is fired, the recoil forces the barrel along with the bolt mechanism to the rear, compressing both the mainspring and the recoil spring.

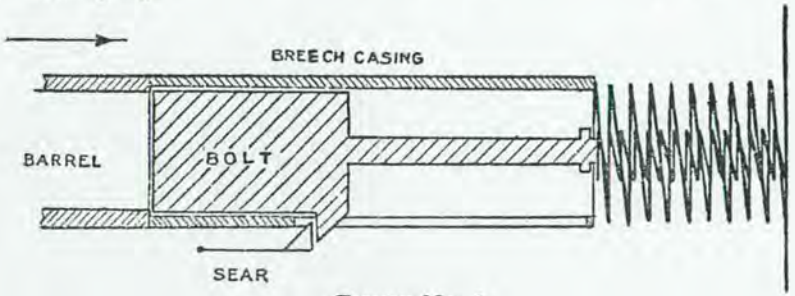

FIGURE NO. 1

(b) The bolt mechanism is caught by the sear and holds the mainspring under compression while the recoil spring is free to force the barrel forward to its firing position. The cartridge guide cam raises the cartridge guide up in front of the chamber to direct the feeding of the cartridge. The result is the cocking of the piece.

2. Second Phase. (See Fig. 2)

(a) As the barrel starts forward under the tension of the recoil spring, which was compressed when the barrel recoiled, it carries with it the bolt until the sear engages the sear notch in the feed piece. The bolt body now remains stationary, and holds the mainspring under compression.

(b) The bolt head being engaged in the locking recess of the breech casing is carried forward by the barrel. The first forward motion of the bolt head withdraws the fiirng pin from the primer, the guide lugs of the bolt head acting in the straight portion of the cam cuts in the boltbody. The guide lugs now come in contact with the curved portion of the cam cuts, and revolve the bolt head clockwise, disengaging the locking lugs on the bolt head from the locking recess in the breech casing. The barrel is now free to move forward. The further forward motion of the bolt head being arrested by the guide lugs reaching the end of the cam cuts in the bolt body. Any rotary motion of the bolt head is prevented by the bolt head stop being forced down on the bevel at the end of the bolt head by the small cam cut at the rear of the ejection opening in the breech casing.

(c) and (d) The extractor having hold of the rim of the cartridge holds the cartridge case firmly against the bolt face until the barrel has traveled the length of the cartridge case when the ejector under the tension of the ejector spring exerts a presure on the base of the cartridge forcing the cartridge case out of the grip of the extractor through the ejection opening in the breech housing. The barrel continues forward until it reaches its extreme forward position where the barrel catch engages the groove in the barrel sleeve.

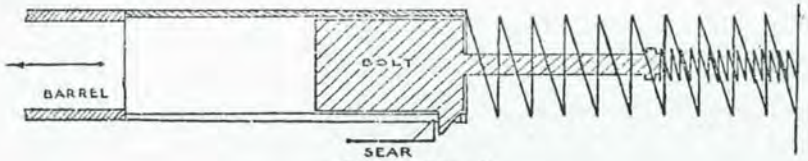

FIGURE No. 2

Fig. 2 shows the position of the mechanism at the end of the second phase. The barrel and breech casing is all the way forward. The recoil spring is extended. The bolt mechanism is held by the sear and the mainspring is held in compression.

3. Third Phase. (See figure 4.)

On pulling the trigger the bolt mechanism is released and starts forward under tension of the mainsrping.

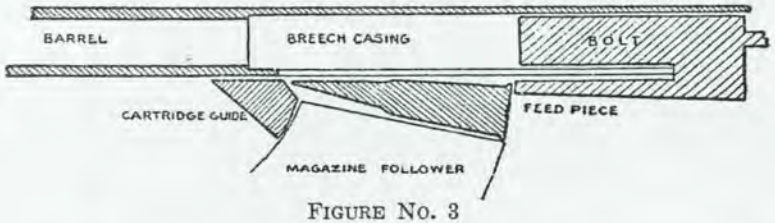

FIGURE No. 3

(a) (See fig 3) As the bolt mechanism moves . :ward the front end of the feed piece strikes the base of the cartridge, which is placed in the feed way by the magazine follower, driving it forward onto the cartridge guide.

Further motion of the cartridge is accomplished by the face of the bo t head which strikes the base of the cartridge and drives it forward into the chamber. The extractor grips the rim of the base of the cartridge and the ejector spring is compressed.

The feed piece passing directly under the cartridge prevents any further feeding of the cartridges by the magazine..

(b) Meanwhile the cartridge guide cam lowers the cartridge guide so the cartridge is free to move into the chamber.

(c) As the cartridge is seated in the chamber the bolt head stop comes out into the ejector opening and is free to raise out of its seat and allow the bolt head to be locked. The continued motion of the bolt body causes the guide lugs on the bolt head to come into action with the curved portion of cam cuts in the bolt body revolving the bolt head counter-clockwise which turns the locking lugs of the bolt head into the locking recess of the breech casing, thereby locking the piece.

(d) As the cartridge is seated in the chamber the extractor snaps over the rim of the cartridge base so that on the forward motion of the barrel the cartridge is withdrawn from the chamber.

(e) At this position the guide lugs on the bolt head are in the horizontal portion of the cam cut in the body bolt, so that the firing pin under the

tension of the mainspring can move forward and prime the cartridge. The feed piece travels forward over the cartridge guide and releases the barrel catch just before the cartridge is primed.

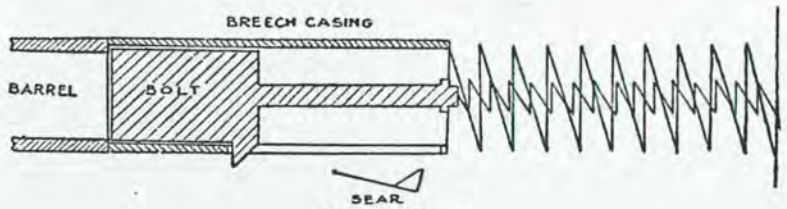

FIGURE No. 4

Figure 4 shows the position of the mechanism at the end of the third phase. The sear is released. The bolt mechanism has moved forward under the tension of the mainspring and the cartridge is primed.

ACTION OF TRIGGER MECHANISM

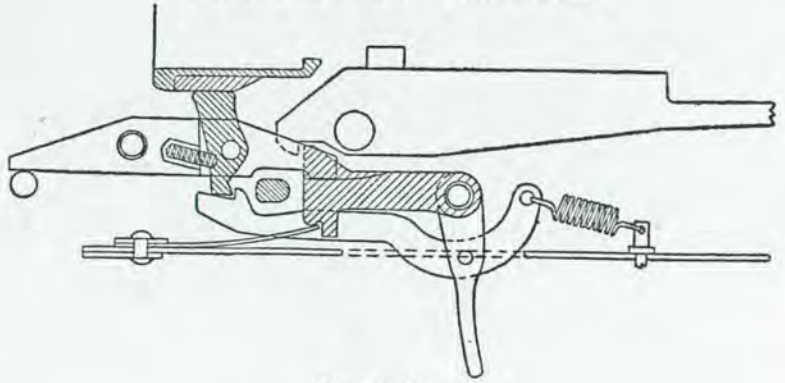

FIGURE No. 5

Figure 5 shows the normal position of the trigger mechanism. The ramp in the breech casing over the hand sear and the feed piece engaged on the sear.

As shown in figure 6 when the trigger is pulled the trigger bar moves the heel of the hand sear up against the ramp in the breech casing, forcing the sear lever down. The downward motion, of the sear lever which acts on the sear forces the sear out of the sear notch, in the feed piece, thereby allowing the bolt mechanism to go forward.

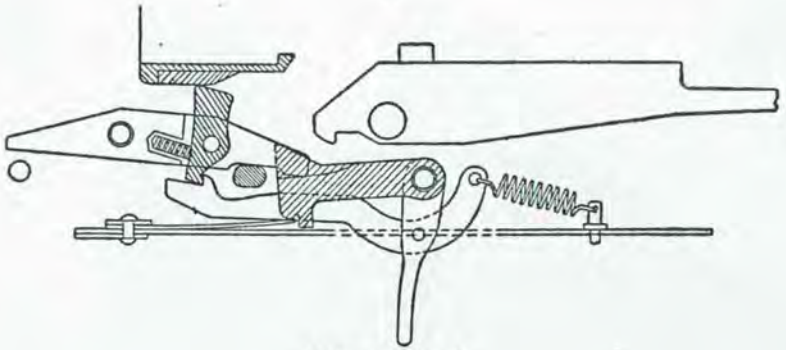

FIGURE No. 6

Automatic Fire
(Regulator cam set on M)

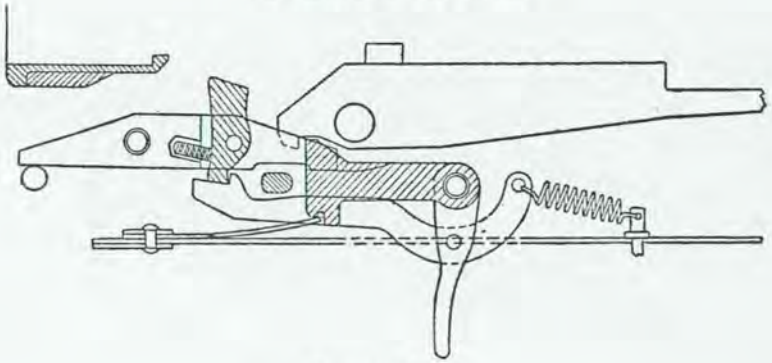

FIGURE No. 7

For automatic fire the regulator cam has no action. If the trigger is held down, the heel of the hand sear is moved up until the rear end is in the way of the ramp on the breech casing, so when the breech casing goes to its forward position it depresses the hand sear by means of the ramp, forcing the sear downward, thereby releasing the bolt. When the trigger is released, the hand sear resumes its normal position so the ramp in the breech casing does not act upon it. The sear being forced up by the sear spring engages the sear notch in the feed piece and holds the bolt mechanism to the rear.

Single Shots
(Regulator Cam set on C)

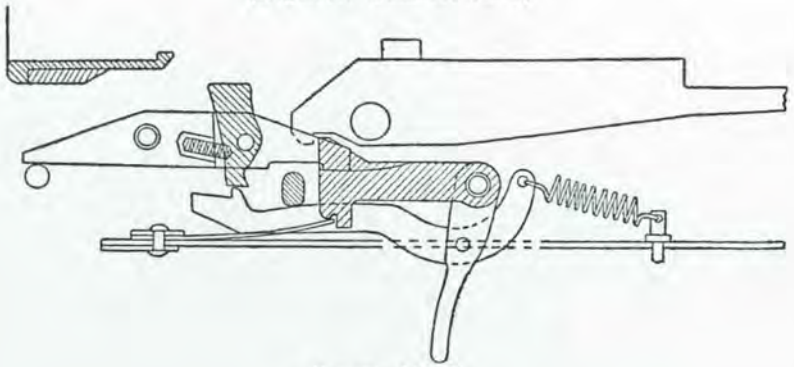

FIGURE No. 8

In firing single shots the action of the trigger mechanism is the same as in automatic fire except that the regulator cam acting on the curved portion of the trigger bar prevents the trigger bar from raising when the hand sear is moved up by the action of the sear spring on the sear. When the cartridge is fired the barrel starts to recoil. When the hand sear comes into the opening in the bottom of the breech casing it is forced up by the action of the sear spring, the trigger bar, being held down by the regulator cam, is released from contact with the hand sear as it rises under action of the sear spring. As the bottom of the hand sear clears the notch in the trigger bar the hand sear spring forces the hand sear back to its normal position. Now when the barrel comes forward again the hand sear is not acted upon by the ramp in the end of the breech casing so that the sear does not release the bolt mechanism until the trigger is again pulled.

Safety

When the regulator cam is turned to S, the cam surface acting on the sear lever prevents any downward motion of the sear lever, so that by pulling the trigger the sear cannot be depressed, and consequently the bolt is held back by the sear notch on the feed piece engaging the sear.

Barrel Catch

When the barrel is all the way forward, the barrel catch engages the groove in the barrel sleeve and prevents any rebound of the barrel. As the bolt mechanism moves forward to fire the cartridge the end of the feed piece strikes the barrel catch, disengaging it from the groove in the barrel so when the cartridge is fired the mechanism is free to recoil.

Bolt Head Stop

When the bolt head stop is held into its seat in the rear end of the bolt head, the bolt head cannot be rotated. But when the bolt head stop has just entered the rear end of the ejection opening it rises out of its seat and the bolt head is free to turn and lock or unlock the mechanism as the case may be. The turning of the bolt head is accomplished by the guide lugs of the bolt head acting on the cam cut in the bolt body. The bolt head stop prevents the closing of the bolt head on the bolt body until the cartridge is seated in the chamber.

Flash Screen Coupling

This coupling is conical in shape in order that a portion of the powder gases leaving the muzzle are trapped so that a pressure is exerted against the muzzle, giving additional recoil to the barrel.

CARE AND PRESERVATION

The stoppages of the gun are not numerous, if proper care is observed and the person using it has a thorough knowledge of the piece. Most of the stoppages are caused by defective ammunition or carelessness or ignorance on the part of the gunner.

To quote from the French Pamphlet, "Offensive Conduct of Small Units,"

"Arms of high efficiency are only effective when in the hands of disciplined and courageous experts with a thorough knowledge of the gun under officers with an accurate understanding of the weapon."

The regiments which used this gun at Verdun and Somme fronts who had well trained rifle teams were enthusiastic in their praise of it. Those who had untrained men operating the guns, due to insufficient instruction, were the ones who complained of it. Furthermore, disciplined and couageous gunners have a true love for the gun. Therefore, the care of this gun is the point on which particular stress should be laid in instructing.

I. GUN

During the Firing:

The gunner should take advantage of a lull in the action to clean the parts of the rifle which do not require dismounting, removing the metal chips from the locking recess and from around the bolt. These chips are from the cartridge case and primer. The chips are best removed by a piece of soft wood conveniently shaped. He also should give special attention to the removal of dirt from the face of the bolt taking care that the ejector and extractor are free to function.

After Firing:

The gunner should dismount the gun and clean with a cloth. Those parts which are very dirty should be cleaned with coal oil. The parts which are cleaned with coal oil should be thoroughly dried before oiling, as the coal oil if left on the gun will cause it to rust. In oiling the gun, the oil should be placed on a soft rag, and the parts wiped with this rag, so as not to leave an excess of oil on the parts. If too much oil is used, and the weather is cold the oil gums and prevents proper functioning. In dry weather the excess oil collects dust and causes excess friction, also preventing the proper working of the gun.

Note: The gun should be oiled after the first two magazines have been fired. Parts requiring special attention in oiling are the parts of the bolt mechanism. The reason for oiling after the gun has been fired is that the gun is heated up so that when the oil is applied, expecially to the cartridge guide cam and the cam ways in the bolt body, the oil will not gum.

Cleaning:

All parts of the bolt mechanism should be thoroughly cleaned, especially the extractor, ejector, guide lugs, cam cuts, bolt headstop, firing pin etc.

II. MAGAZINE

Great care should be used in the handling of the magazines, as they must be in perfect condition, or they won't feed the cartridges correctly. After magazines have been used they should be thoroughly dried and wiped with an oiled rag.

While filling the magazine care should be taken to see that the cartridges

are loaded properly into the magazine and are not forced in thereby injuri ng the lips of the magazine, which would misplace the cartridges so that they would not be fed properly into the chamber.

See that the magazine sides are not bent, which would prevent the free movement of the magazine follower and spring.

See that the spring is not distorted or bent.

When the magazine spring is removed it should make a portoin of a circle with its ends not greater than a distance of four fingers. If this distance is greater than four fingers the spring should be stretched until it has the sufficient space between the ends. In stretching this spring, the angles toward the center are the ones to be enlarged, and not the ones on the exterior circumferance. If this does not give the spring sufficient tension it should be replaced.

MALFUNCTIONS, STOPPAGES AND JAMS

First Phase

1. Failure to Recock:

On account of the lack of recoil, the barrel is not driven back sufficiently to recock the piece. That is, the sear notch on the feed piece does not engage the sear and hold the bolt mechanism back:

Causes:—

Insufficient gas due to defective ammunition or excess friction in the recoiling parts.

If the gunner does not hold the gun securely against his shoulder the barrel will not recoil because a portion of the recoil is taken up by the backward movement of the whole gun.

Result:—

The bolt being locked to the barrel and not being recoiled sufficiently to engage the sear, travels forward with the barrel so the empty cartridge case is not extracted or ejected.

Remedy:—

Cock the gun by hand which will extract and eject the empty cartridge case.

Second Phase

1. The Barrel does not resume its firing position.

Causes:—

Weak Recoil Spring.

Dirt around the barrel or the expansion off the barrel sleeve due to the heat (excess friction between the barrel sleeve and breech housing).

Dirt in and around the chamber which prevents the unlocking of the bolt head.

Result:—

The barrel cannot be separated from the bolt; the barrel has not resumed its firing position and there is an empty cartridge case in the chamber.

Remedies:—

1. Pull the operating handle back releasing it quickly.
2. Gently strike the but with the palm of the hand.
3. Place regulating cam on "S" strike the ground with the heel of the stock(never with the toe).
4. Dismount, clean and oil the parts.

Note: Oil the barrel sleeve through the ejection slot. Strip and clean the rifle if necessary (cleaning during action). As a rule there is an expans- of the sleeve after 300 or 400 rounds have been fired automatically or 700 to 1000 rounds of sinlge shots.

2. Failure to extract:

Causes:—

Defective amunition.
The bottom of the cartridge is defective.
Under or oversized cartridge.
The cartridge case sticks in the chamber
Defective extractor, spring, or pin

Results:—

The case cannot be removed from the chamber. If the cartridge case sticks in the chamber, the extractor will tear off the rim of the cartridge without extracting it.

Remedy:—

Carefully examine ammunition; if necessary change extractor spring, remove defective cartridge case with the hand extractor.

Note: If the cartridge case cannot be removed by the hand extractor, use the ruptured cartridge extractor.

3. Failure to eject:

Causes:—

Weak ejector spring
Ejector failing to function, due to excess friction caused by dirt.

Result:—

The empty cartridge case has not been thrown out of the ejection slot, and remains between the side plates.

The empty cartridge case is either partly or entirely jammed in the ejection opening. The next cartridge cannot be driven into the chamber by the bolt.

Remedies:—

Remove the empty cartridge case by turning the gun on its right side; also take out the new cartridge.

Clean the ejector and its seat; test the ejector spring for tension.

Third Phase

1. Failure to Feed:

Causes:—

Magazine spring weak or broken
Distorted magazine

Results:—

The cartrdges are not moved up into position to be pushed forward by the feed piece.

Remedy:—

Change Magazine

2. Double Feeding:

Cause:

The lips of the magazine are either too wide or out of shape.

Results:

The feed piece has engaged the second cartridge due to the fact that this cartridge is allowed to be raised above its correct position. Two cartridges are in position to be pushed home.

Remedy:—

Change the magazine

Note: This stoppage should never occur as it is the first duty of the men to see that the magazines are in good condition.

The magazine is one of the most delicate parts of the gun and great care should be exercised by both the carrier and gunner to see that the magazine is not mistreated.

3. Incorrect Position of the Cartridge When Ready To Be Pushed Home:

Causes:

Magazine is too wide or has been distorted.

Insufficient compression of the magazine spring, causing lack of pressure on the follower:

The lips on the magazine being too close together do not release the cartridge and the cartridge is made to dive instead of rise.

Lost motion in the rising of the cartridge guide caused by the cartridge guide roller being worn.

Results:—

The bullet end of the cartridge strikes against the upper part of the breech casing so that the bolt head on its forward travel does not strike the base of the cartridge, but strikes against the side of the cartridge.

The cartridge strikes the cartridge guide block and the end of the feed piece on its forward motion strikes the side of the cartridge case.

Remedies:—

Tighten the lips of the magazine or put on a good magazine.

Quickly cock the gun, compress magazine spring with your hand, and remove damaged cartridge. If necessary, remove magazine.

4. Misfire:

Causes:—

Defective ammunition

Weak mainspring

Distorted cartridge guide cam causing excess friction between it and the side plate or cartridge guide cam diver.

Remedies:—

Carefully examine ammunition

Pack the bottom of the spring guide tube with paper, thereby shortening main spring, increasing its tension.

Replace main spring

Straighten cartridge guide cam

Note: Insist upon the necessity of skillful training to the gunner.

EFFECT OF WORN OR BROKEN PARTS ON ACTION OF THE TRIGGER MECHANISM.

1. Fires automatically when set for single shots.

Causes:

The regulator cam is worn, or the curved portion of the trigger bar on which the regulator cam acts is worn.

Lost motion in the regulator cam due to wearing on its bearings.

Results:

The regulator cam does not lower the trigger bar sufficiently to release the hand sear when it is forced up.

The trigger bar raises the regulator cam instead of the regulator cam lowering the trigger bar.

The notch in the end of the trigger bar acts continually on the hand sear producing automatic fire.

Remedy:

Replace worn parts.

2. Regulator cam set for safety the gun fires.

Causes:

The regulator cam is loose

Results:

The regulator cam does not hold up the sear lever

The sear leer is free to move, therefore when the trigger is pulled the sear is released from the sear notch in the feed piece, so the gun will fire.

Remedy:

Replace regulator cam.

3. When set for single shots, the gun does not fire, but works properly when set for automatic fire.

Causes:

The curve portion of the trigger bar on which the regulator cam acts is distorted so that the cam does not function properly. Or the notch which engages the hand sear becomes worn.

Results:

The curved portion of the trigger bar being distorted the trigger bar is moved down too quickly, so that its notch does not engage the hand sear.

When set for automatic fire, the regulator cam does not act on the trigger bar, therefore the gun functions properly.

Remedy:

File the curved position of the trigger bar until it is timed in properly so as to engage and release the hand sear at the proper time.

4. When set for single shots or automatic fire the gun does not fire.

Causes:

The axis on which the parts of the trigger mechanism move are worn producing an excess of lost motion.

Result:

Due to this wear, the movement of the trigger is not sufficient to release the sear as it must take up all the slack in the trigger mechanism.

Remedy:

Replace worn parts

CAUSES OF BROKEN PARTS

A. Excess gas, causing too strong a recoil

B. Premature fire

The breakages occur at the weakest place, and are most always due to flaws in the steel.

A. Excess Gas

Produces one of the following:

1. Broken recoil spring bushing
2. Broken operating handle
3. Broken feed piece
4. Broken feed piece assembling stud

1. As the barrel recoils the recoil spring bushing strikes against the spring guide cap with sufficient force to break it.

2. Or the oberating handle strikes the end of the opening in the side plate which breaks the operating handle.

3. & 4. These breakages can also occur due to too strong a recoil.

Note:

Care should be observed when the operating handle breaks that the bolt is not allowed to go forward and prime the cartridge when the butt is struck

to reduce the jam. In this position the feed piece is separated from the bolt mechanism so that the bolt is free to go forward and prime the cartridge, as the cartridge guide cam does not act on the cartridge guide, hence the cartridge is free to go forward into the chamber. (This accident caused a fatality in the French Army on September 20th 1916).

B. Premature Fire

Due to defective ammunition the locking lug on the bolt, in pushing the cartridge forward will prime the cartridge, if the primer is not securely seated in the cartridge, that is, the primer is protuding beyond the level of the base of the cartridge. This defect causes breakages on the head of the extractor, or will explode the breech casing.

ACTION OF THE POISON GAS ON THE MATERIAL OF THE GUN

There has been some doubt as to the action o the poison gas on the material used in the manufacture of arms and ammunition. The following note is of interest in order that the necessary precautions are taken and the correct remedy applied so as to prevent the slight deterioration which results from the action of the gases on the metal.

Up to the present time the gases used by the enemy in gas attacks have not materially affected the metal on the guns or ammunition.

Effects on the Gun

The chemical action of cholorine gas on the material has a slight oxication effect (rust) on the exposed polished parts. The parts which are covered with a thin coat of oil are not affected by this gas. This oxidation (rusting) cannot be removed by the ordinary method of cleaning.

Effects on the Ammunition

The action of the chlorine gas on the cartridge cases porduces green copper oxide which is in most cases easily removed.

The following precautions should be observed:

Clean thoroughly as soon as possible those parts which have been exposed to the action of the gas.

Lubricating oil is the best protection for the material in the gun and ammunition.

Cartridges which have been exposed to the action of the gas should not be used in the gun; but should be turned in and cleaned and then re-issued.

QUESTIONS COVERING THE CHAUCHAT AUTOMATIC MACHINE RIFLE, MODEL 1915.

1. Give the correct method of dismounting.
2. What type is this gun and make?,
3. How cooled?
4. Why is aluminum used for radiator?
5. What forces operate the gun?
6. How is the magazine loaded?
7. How is bolt mechanism locked?
8. How is the ejection affected?
9. What aids the recoil of the barrel?
10. What is the correct method for placing the magazine in the gun?
11. Describe in detail the precautions necessary for the care of the Magaiznes.
12. If the cartridge is in an incorrect position in the lips of the magazine, how can it be corrected?
13. What precautions are necessary in removing the magazine from the gun?
14. What is accomplished by the recoil of the barrel?
15. What is accomplished by the return of the barrel to its forward position?
16. What is accomplished by the forward motion of the bolt mechanism?
17. What is the function of the feed piece?
18. What is the function of the cartridge guide cam?
19. What is the function of the barrel catch?
20. What is the purpose of the bolt stem collar?
21. What is the function of the bolt head stop?
22. What is the function of the cartridge guide roller?
23. What is the function of the magazine stop spring?
24. What is the function of the spring guide latch?
25. Trace the transmission of power when the trigger is pulled through the trigger mechanism.
26. What is the purpose of the recoil spring bushing?
27. What is the purpose of the barrel nut?
28. Give the action of the trigger mechanism when the regulator cam is set for single shots; when set for automatic fire.
29. On what does the regulator cam act when set on safety?
30. To what are the side plates assembled?
31. Can the bipod be put on incorrectly?
32. What is the purpose of the magazine catch handle?
33. What is assembled on the barrel catch block?
34. Give the correct method of assembling the housing to the rifle carriage.
35. Can the rear assembling bolt be removed from the gun? And if not, why?
36. In what position is the bolt mechanism when it is assembled to the breech casing?
37. In what position is the breech casing and bolt mechanism when the feed piece is assembled to the bolt body?
38. Describe in detail correct method of oiling the gun.
39. What is the result of excess oil?
40. In dismounting for cleaning during action, what are the duties of the gunner; of the first carrier? of the second carrier?
41. After the gun has been fired a considerable time, to what parts should special attention be paid in cleaning?
42. When the magazine is in the gun, what holds the front end in place?

43. Can the cartridge guide cam cover bolts be removed from the right side of the gun?
44. If the cartridge guide cam binds on the cartridge guide cam cover, causing excess friction, can it be remedied, and if so, how?
45. In firing while marching, why should the butt stock be held securely under the arm with the spring guide cap firmily held against the muscle of the shoulder?
46. What is the correct position of the gunner's body while firing in marching?
47. What is the purpose of the flash screen?
48. What causes the hand sear to be depressed when firing automatic?
49. What is the purpose of the barrel sleeve?
50. What is the purpose of the spring washer on the rear assembling bolt?
51. What precaution would you take for your own safety?
52. What are the duties of the members of the rifle team in regard to the functioning of the gun before firing, during the firing and after the firing?
53. What would prevent the barrel and breech casing from recoiling? Give remedies.
54. What would prevent them from resuming their firing position? Give remedies.
55. What is the cause of failure to extract? Give remedies.
56. What are the causes of failure to eject? Give remedies.
57. What are the causes of failure to feed? Give remedies.
58. What causes the incorrect position of the cartridge when it is ready to be pushed home?
59. What are the causes of mis-fire?
60. What are the causes of a hang-fire?
61. What causes the trigger mechanism to fire automatically when set for single shots?
62. What causes the gun to fire when the regulator cam is set on safety?
63. When set for single shots, the gun does not fire, but works properly when set on automatic. What is the cause?
64. What is the trouble if, when set for single shots or automatic, the gun does not fire?
65. What are the causes of broken parts?
66. What would cause a premature fire?
67. What is the weight of the gun?
68. If the mainspring was weak, how would you strengthen it?
69. If the gun is subjected to the action of poison gas, what immediate action would you take?
70. What is the weight of a full magazine?
71. What is the capacity of the magazine?
72. Give a two weeks' schedule of instruction on the mechanism of this gun.
73. Can the bolt head be assembled incorrectly?
74. If the barrel fails to resume its firing position, how would you make it go forward without dismounting the gun?
75. What parts are likely to break due to too strong a recoil?