

UC-NRLF



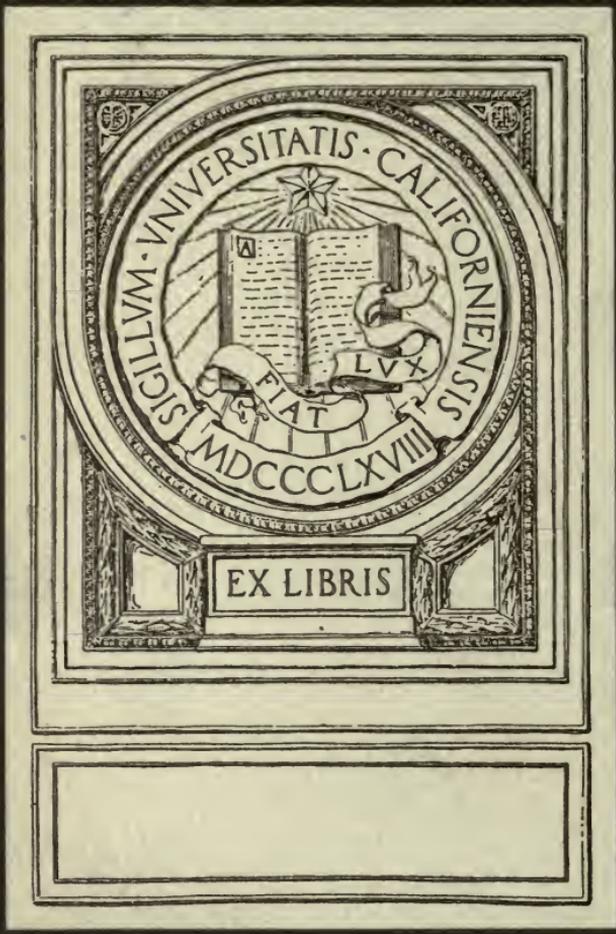
QB 72 688

U D

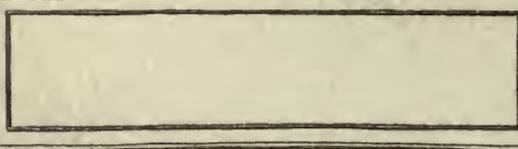
395

B7U2

YC 63153



EX LIBRIS



CONFIDENTIAL

TECHNICAL TRAINING  
HANDBOOK  
OF THE  
BROWNING AUTOMATIC RIFLE  
MODEL OF 1918  
(Air Cooled)

---

PREPARED AT  
THE INFANTRY SCHOOL OF ARMS  
FORT SILL, OKLAHOMA



WAR PLANS DIVISION  
SEPTEMBER, 1918

---

WAR DEPARTMENT  
Document No. 853  
*Office of the Adjutant General*

U. D. 395

57 42



WAR DEPARTMENT  
Document No. 853  
*Office of the Adjutant General.*

---

WAR DEPARTMENT,  
WASHINGTON, *September 7, 1918.*

The following confidential pamphlet, entitled "Technical Training Handbook of the Browning Automatic Rifle, Model of 1918" (technical training series, prepared at the Infantry School of Arms, Fort Sill, Oklahoma), is published for the information and guidance of all concerned.

(062.1 A. G. O.)

BY ORDER OF THE SECRETARY OF WAR:

PEYTON C. MARCH,  
*General, Chief of Staff.*

OFFICIAL:

PETER C. HARRIS,  
*Acting Adjutant General.*

## TABLE OF CONTENTS

---

### PART ONE METHOD OF INSTRUCTION (MECHANISM)

	PAGE
Introduction .....	6
Organization of Class.....	7
Subjects .....	8
Detailed Method of Instruction.....	8
Regulations Concerning Handling the Rifle.....	9

### PART TWO SCHEDULE OF INSTRUCTION (MECHANISM)

General Remarks.....	11
Lesson I.—Nomenclature, Stripping, Assembling.....	11
<i>Notes on Lesson I.</i> .....	12
Name .....	12
Type .....	12
Ammunition .....	13
Cooling System.....	13
General Data.....	13
Sequence of Stripping.....	14
Notes on Stripping.....	14
To Remove Firing Pin Without Stripping Gun.....	15
Sequence of Assembling.....	16
Notes on Assembling.....	16
Lesson II.—Stripping and Assembling Blindfolded.....	17
Lesson III.—Stripping and Assembling Trigger Mechanism...	17
<i>Notes on Trigger Mechanism.</i> .....	17
Sequence of Stripping.....	17
Assembling Trigger Mechanism.....	18
Lesson IV.—Magazines.....	19
<i>Notes on Magazine.</i> .....	19
Lesson V.—Spare Parts.....	20
<i>Notes on Spare Parts.</i> .....	20

	PAGE
Lesson VI.—Functioning.....	20
<i>Notes on Functioning</i> .....	22
General Remarks.....	22
First Phase.....	22
Action of gas.....	22
The slide.....	23
Unlocking .....	23
Withdrawal of firing pin.....	24
Extraction .....	24
Ejection .....	24
Termination of first phase.....	24
Second Phase.....	25
Action of recoil spring.....	25
Feeding .....	25
Locking .....	26
Priming the cartridge.....	26
Termination of second phase.....	26
Action of Buffer.....	27
Lesson VII.—Functioning of Trigger Mechanism.....	27
<i>Notes on Trigger Mechanism</i> .....	28
Lesson VIII.—Immediate Action (Classroom Instruction)....	31
Part II.....	31
Immediate Action Table.....	33
<i>Notes on Immediate Action</i> .....	39
Lesson IX.—Immediate Action (on range).....	39
<i>Notes on Stoppages</i> .....	40
Causes .....	40
Analysis of Various Stoppages (as to cause).....	41
Lesson X.—Care and Preservation.....	43
<i>Points to be Observed</i> .....	43

### PART THREE ELEMENTARY DRILL

General Remarks.....	44
Outline of Training of Automatic Rifle Section.....	44
Instruction of the Individual.....	44
<i>Who Receives It</i> .....	44
<i>Scope of Instruction</i> .....	44
<i>Firing Positions</i> .....	45
<i>Adjustment of the Sling</i> .....	45
<i>Marching Fire</i> .....	46

	PAGE
Training of the Gun Team.....	49
<i>Scope of Training</i> .....	49
<i>Formation of the Team</i> .....	49
<i>Duties of the Members</i> .....	50
<i>Loading</i> .....	51
<i>Firing</i> .....	51
<i>To Lie Down</i> .....	52
<i>Marching Fire</i> .....	52
<i>Field Cleaning</i> .....	52
The Squad.....	53
<i>Posts</i> .....	53
<i>Drill</i> .....	53
<i>Duties of the Corporal</i> .....	53
<i>Deployments</i> .....	53
<i>Continuous Fire</i> .....	54
<i>Advancing</i> .....	55
The Section.....	55

## INTRODUCTION

---

The purpose of this *Handbook* is to give methods of instruction to be used in teaching mechanism of the Browning automatic rifle, model of 1918, and to give an elementary drill of the rifle team and squad in so far as pertains to the handling and operation of the gun in firing.

The method of instruction is that used in the automatic arms section of the Infantry School of Arms, Fort Sill, Oklahoma, and the drill is an adaptation to the Browning of the drill for the Chauchat rifle, as prescribed in the "Manual of the Automatic Rifle," War Department, April, 1918.

It is contemplated that this book shall be used in conjunction with "Ordnance Pamphlet No. 1934," therefore, the construction, mechanism and care of the weapon is not dealt with in full herein. The information on these subjects pertains to methods of instruction, with some additional notes not contained in "Ordnance Pamphlet No. 1934."

The arrangement of subjects is according to sequence of instruction.

It will be borne in mind that only the preliminary instruction of the automatic rifleman is covered here.

## PART ONE.

---

### METHOD OF INSTRUCTION.

#### (MECHANISM).

#### ORGANIZATION OF CLASS.

1. For purposes of instruction the class will be divided into groups of three to four men (hereinafter referred to as teams). Each team will be assigned to a particular rifle and will work on that rifle throughout the remainder of the course. An assistant instructor (a sergeant or corporal hereinafter referred to as sergeant-instructor), will be assigned to not more than two of these teams and will supervise the same men throughout so as to maintain uniformity of instruction. There will be at least two commissioned instructors for each sixty men undergoing instruction. The purpose of such division is to fix the number of men assigned to one rifle so as to obtain maximum efficiency of instruction. More than four men working on one rifle and less than three will not give the best results. A sergeant-instructor cannot efficiently give detailed supervision to more than two teams, nor a commissioned instructor to more than fifty or sixty men. These remarks refer to the thorough instruction of a class in mechanism.

2. In the company the organization will be as follows: The automatic riflemen of the company will be combined in one class under two commissioned instructors. Each sergeant will supervise his own section (as assistant instructor) and each corporal will act as sergeant-instructor for his own squad.

It is contemplated that the sergeants and corporals have had a thorough course of instruction prior to their men.

3. A classroom will be provided with a blackboard, seats for entire class and one rifle table per team, sufficiently large to permit entire team to group around it while working on the rifle.

## SUBJECTS.

4. Mechanism will be taught by subject in the following order:

- (1) Nomenclature, stripping and assembling of rifle, except trigger mechanism.
- (2) Nomenclature, stripping and assembling of trigger mechanism.
- (3) Nomenclature, stripping and assembling of magazine.
- (4) Spare parts.
- (5) Functioning of gun proper (include magazine).
- (6) Functioning of trigger mechanism.
- (7) Stoppages and immediate action in classroom.
- (8) Stoppages and immediate action on range.
- (9) Care and preservation.

## DETAILED METHOD OF INSTRUCTION.

5. No discussion of functioning should be permitted prior to the completion of stripping and assembling. Nomenclature will be taught during the instruction in stripping and assembling and reviewed throughout remainder of course.

In each subject the following procedure will be observed:

**Introduction.**—The instructor will preface his instruction with a brief, general lecture leading up to the specific subject in hand.

**Preparation.**—Instructor must prepare, ahead of time, all parts, etc., needed for day's work.

**Explanation-demonstration.**—The instructor will make a detailed explanation of the subject to be taught, illustrating or demonstrating his explanation as he goes along. This explanation-demonstration will be made to the class as a whole instead of being made by team or squad. This insures uniform instruction for the entire class in the beginning of each subject.

**Imitation.**—The teams will repair to their rifles and each man in turn will imitate the explanation-demonstration of the instructor.

**Introduction will be omitted.**—The other members of the team will stand by with handbooks and notebooks and check up any errors of the man reciting. The sergeant-instructor will supervise this work, correct errors, assist backward men

and give detailed instruction in general. As men deem themselves qualified they will report to their sergeant-instructor for examination. He will require a perfect recitation before reporting a man as qualified to the senior instructor.

**Interrogation.**—Men will be quizzed on work in hand. Questions will be framed with a view to bringing out important points.

6. Care must be taken to see that the sergeant-instructor does not hinder progress by trying to impress the men with how much he knows instead of instructing them. Whenever a sergeant-instructor demonstrates to one of his men the proper way to do a certain thing, he will always require the man actually to imitate him. There is sometimes a tendency for new sergeants to be continually demonstrating, thereby preventing their men from getting a chance at the rifle or the work in hand. This will be avoided.

## REGULATIONS CONCERNING HANDLING THE RIFLE.

7. The following regulations are prescribed regarding the handling of the Browning automatic rifle:

(1) Force will not be used.

(2) This piece will not be stripped nor assembled against time.

(3) The bore and working parts will be thoroughly cleaned and oiled whenever the piece is assembled.

(4) The piece will be thoroughly cleaned and oiled at least once a week in camp or garrison and daily in the field.

(5) The magazine will receive the same care as the rifle. Every effort will be made to prevent bending or denting the magazines, being especially careful of the lips and magazine-catch-notch.

(6) The filing or altering of shape or parts will not be permitted.

8. The rifle is so constructed as to be taken apart and put together easily. Most parts are designed with a view to prevent wrong assembling. Where difficulty arises in stripping and assembling easily it is due to error on the part of the

student and the use of force will only result in damage to the rifle.

The practice of stripping and assembling against time serves no useful purpose and results in burring and damaging parts. Gradual skill develops as men become more familiar with the gun and lost motion is eliminated. Men should be taught in stripping to lay out parts in obvious sequence of assembling and should so thoroughly learn the gun that taking it apart and putting it together is a matter of second nature.

Lubrication is necessary to the operation of the rifle. Dirt and extraneous matter will prevent it from functioning and do it damage. Instruction in care and preservation should be so thorough that cleaning and oiling become a matter of habit.

Unless strict supervision is exercised, inexperienced men and sometimes experienced men, will file or otherwise alter parts which do not need it. This results in damage to the rifle and usually fails to remedy trouble. Filing and altering of parts is sometimes necessary, but should never be done except by an expert, under direction of an officer competent to supervise the work.

The use of rifles for instruction in mechanism is hard on them. This fact should be borne in mind and, in the company, after the completion of the first course in mechanism, only a limited number of rifles should be so used.

## PART TWO.

---

### SCHEDULE OF INSTRUCTION.

#### MECHANISM.

#### GENERAL REMARKS.

9. Mechanism will be taught in the order given in lessons below. It may be necessary to devote several periods to a particular lesson. This will depend on the degree of intelligence of the class and the length of the period allotted. A ten-minute intermission at the end of each hour should be given if periods are longer than two hours. Each lesson will be mastered by the majority of the class prior to proceeding to the next. When subject in hand allows, the preceding lesson should be reviewed with the current one. For instance, nomenclature will be reviewed indefinitely by requiring every man to properly name each part he uses or mentions.

10. It is contemplated that "Ordnance Pamphlet No. 1934" (handbook of the Browning machine rifle, model of 1918) be used in conjunction with this course. The notes following various lessons are intended to give the instructor supplemental information. He will get additional data from independent research. His instruction, however, must not be at variance with "Ordnance Pamphlet No. 1934" and this handbook.

11. Men will be encouraged to ask questions. They will not be permitted, however, to get ahead of the schedule.

#### LESSON I.

#### NOMENCLATURE, STRIPPING AND ASSEMBLING.

12. **Introduction.**—The instructor will give a brief talk, introducing the rifle, wherein he will cover its type, caliber, characteristics and name such other points of general interest as he deems advisable.

13. **Explanation-demonstration.**—The instructor will go over the rifle, pointing out, naming and describing various parts externally visible.

This he will follow by slowly stripping the rifle, exclusive of trigger mechanism, holding up, naming and describing each part as he removes it.

He will **call attention** to all cams, lugs, slots, profiles and springs, but does not at this time describe their function (bearing in mind the prohibition against discussing the functioning of the rifle prior to the completion of nomenclature, stripping and assembling). The instructor will assemble the piece according to the same procedure.

14. After this explanation-demonstration, the teams being assembled at their rifles, the instructor will **describe**, step by step, how to strip and assemble the rifle, naming and describing parts as before. He will require one man at each rifle to imitate him as he finishes describing each step, the remaining members of the team observing. Every man in the class will repeat names as called out by instructor. The instructor will not allow any man to get ahead of his explanation in this stripping and assembling. Assistants will keep backward men up with the explanation (instructor must take care not to proceed too rapidly).

15. **Imitation.**—When this step-by-step explanation-imitation has been completed once the remaining members of the team will strip and assemble the piece, naming and describing each part as it is removed and cleaning and oiling during assembly. The other members of the team will stand by with handbooks and correct errors of nomenclature. Sergeant-instructors will supervise and assist students and will see that mistakes are corrected as they are made. They will examine men whom they believe to be qualified and report to the senior instructor those who make a perfect recitation.

16. **Interrogation.**—The instructor will quiz class.

## NOTES ON LESSON I.

### Name.

17. The Browning automatic rifle, model of 1918 (air cooled), commonly referred to as the light Browning.

### Type.

18. The Browning automatic rifle is a shoulder weapon, gas operated, magazine fed and air cooled. It is an automatic rifle.

### Ammunition.

19. It is chambered for caliber .30, U. S. ammunition, model of 1906. The magazine holds 20 rounds (there are special magazines which hold 40 rounds).

### Cooling System.

20. It has no special cooling system nor device, the barrel merely being exposed to the air and the hand of the firer being protected on the under side of the barrel by a large wooden forearm. Since the barrel soon becomes very hot, care must be taken to avoid touching it during firing or for five or ten minutes thereafter.

### General Data.

21. (1) Weight of rifle, 15 pounds 8 ounces.
- (2) Weight of magazine, empty (20 rounds), 7 ounces (a total of 15 pounds 15 ounces).
- (3) Weight of magazine, filled (20 rounds), 1 pound 7 ounces.
- (4) Length of barrel, 24 inches.
- (5) Sights, graduated up to 1,600 yards.
- (6) Caliber bore, 0.30 inch.
- (7) Gas port from muzzle, 6 inches.
- (8) Rate of fire, 500 shots per minute.
- (9) Weight of bullet, 150 grains.
- (10) Weight of powder, 47 grains.
- (11) Weight of shell, 198.5 grains.
- (12) Weight of cartridge (total), 395.5 grains.
- (13) Chamber pressure, 47,000 to 50,000 pounds per square inch.
- (14) Muzzle velocity, 2,682 feet per second.
- (15) Habitual type of fire, **semi-automatic**.

NOTE.—This rifle has been fired, while marching, 148 shots per minute, semi-automatic, at the infantry school of arms and 110 shots per minute, semi-automatic, from the shoulder, prone. The rates of fire, however, which appeared to give the best results were from 80 to 100 rounds per minute, semi-automatic marching fire and 50 to 60 shots per minute, semi-automatic aimed fire.

### Sequence of Stripping.

22. (1) Cock the piece.
- (2) Gas cylinder tube retaining pin.
- (3) Gas cylinder tube (let down the mechanism easily).
- (4) Trigger guard retaining pin.
- (5) Trigger guard.
- (6) Recoil spring guide.
- (7) Hammer pin to right into hammer pin hole in receiver.
- (8) Operating handle.
- (9) Hammer pin.
- (10) Hammer.
- (11) Slide.
- (12) Bolt guide pushed to left.
- (13) Remove bolt, bolt lock and link.
- (14) Firing pin.
- (15) Extractor.

### Notes on Stripping.

23. Lay the rifle on the table, barrel down, pointing to the left.

The piece must be cocked in order that the gas cylinder tube may clear the gas piston and the gas cylinder bracket, female. After the gas cylinder tube has been removed it is necessary to release the tension of the recoil spring. A natural tendency of the beginner is to snap the piece or to remove the trigger guard before letting slide forward. This will result in damage and a special point must be made of easing the slide forward immediately after removing the gas cylinder tube.

24. In stripping and assembling mechanism it will be noted that, unless tension in springs is released, the work will be more difficult, therefore, in the various steps of the operations herein described, care is taken to avoid working against tension of springs.

25. The recoil spring guide may be removed by placing right thumb on roughened surface of its head and turning it until the ends are clear of its retaining shoulders or it may be removed in a similar manner by using the index finger of the left hand and the middle finger of the right hand. This latter method is better, both in stripping and assembling, for men who have not powerful hands.

26. Hammer pin holes on the receiver and operating handle may be easily lined up by:

(1) Pulling the operating handle a few inches to the rear of the raised shoulders on the operating handle ribs.

(2) Grasping slide with the left hand and pushing on the rear end with the right hand until the plunger pin just rides up on the rear end of the flat surface of the raised shoulders on the operating handle ribs.

Another method is to pull the operating handle to the rear, as described above, insert the point of the recoil spring guide in the hole on the operating handle with the right hand, pressing against the hammer pin and pull the slide forward with the left hand. The recoil spring guide will push hammer pin through its hole in the receiver as the hammer pin registers with latter. Care must be taken that all forward movement of slide comes through pulling slide with the left hand, the right hand being used only to press the hammer pin out.

27. In removing the slide take care to avoid striking gas piston or rings against gas cylinder tube bracket (female) and also to see that the link is swung back so that the slide will clear it.

28. The bolt guide must be forced out enough to allow the bolt and bolt lock to be lifted out of the receiver. If the bolt guide spring is strong the rim of a cartridge may be inserted between the outside of the receiver and the exterior portion of the bolt guide, thus giving a lever with which to hold the bolt guide out.

### **To Remove Firing Pin Without Stripping Gun.**

29. (1) Remove trigger mechanism.

(2) Lock slide in rear position with extra firing pin, head against operating handle, point in hammer pin slot in receiver.

(3) Lock bolt guide out with rim of cartridge.

(4) Incline barrel up at angle of 45 degrees, magazine opening down.

(5) Buckle bolt lock, bolt and link assembly down, firing pin will drop out.

### Sequence of Assembling.

30. (1) Extractor.
- (2) Firing pin.
- (3) Bolt, bolt lock and link.
- (4) Slide.
- (5) Hammer.
- (6) Hammer pin (far enough to register all holes).
- (7) Operating handle.
- (8) Hammer pin, fully seated.
- (9) Recoil spring and guide.
- (10) Trigger guard.
- (11) Trigger guard retaining pin.
- (12) Cock the piece.
- (13) Gas cylinder tube.
- (14) Gas cylinder tube retaining pin.
- (15) Ease the slide forward.
- (16) Oil and test the piece.

### Notes on Assembling.

31. Before inserting slide, see that link is thrown clear back so that slide will clear. Slide is inserted so that the sear notch is visible when looking into the receiver from the trigger side.

The hammer is inserted with its convex surface to the rear and its flat surface toward the trigger mechanism opening in the receiver.

32. To insert the hammer pin, move slide forward and line up hammer pin holes in link, hammer, slide and receiver, by inserting recoil spring guide through slot in side of receiver. The hammer pin is not pushed clear through until the operating handle has been moved all the way home.

33. Be careful to put the operating handle on with the handle end forward. If it is assembled, with the reverse end forward, an expert mechanic will be required to remove it. After the operating handle has been pushed home the hammer pin is then fully seated and the slide pulled forward.

34. In assembling the trigger guard to the piece see that no pins are projecting from its sides. Seat slot, in its rear end, on flange in rear end of opening in receiver, then press back and down on forward end of trigger guard until it hinges into place. See that holes are properly registered before inserting trigger guard retaining pin.

35. Cock the piece by pushing the gas piston to the rear. Take care to register gas cylinder tube and piston on assembling same and avoid burring gas cylinder tube brackets, male and female.

## LESSON II.

### STRIPPING AND ASSEMBLING BLINDFOLDED.

36. **Teams at gun tables.**—Each man in turn, blindfolded, strips and assembles the gun. The sergeant-instructor watches him to prevent wrong assembly or forcing of parts. He may be given assistance in event he cannot proceed otherwise. If he calls for any part, by its right name, same will be handed him.

The other members of the team not blindfolded will have various parts put in their hands while same are behind back and will name parts by feel. Extraneous pieces of metal may be introduced in this latter exercise.

The purpose of this instruction is to so train the soldier as to enable him to replace breakages and reduce stoppages in the dark.

## LESSON III.

### STRIPPING AND ASSEMBLING TRIGGER MECHANISM.

37. Follow procedure, outlined in lesson I, instructing in the trigger mechanism, i.e.:

- (1) Explanation and demonstration by instructor.
- (2) Explanation, step-by-step, by instructor and imitation, step-by-step, by one student in each team.
- (3) Imitation of (1) by each of remaining students, student reciting being checked as described in lesson I.
- (4) Interrogation by instructor.

### NOTES ON TRIGGER MECHANISM.

#### Sequence of Stripping.

38. (Not to be done in the field except to replace breakages).

(1) Sear spring (insert handle of trigger guard retaining pin under sear spring, above connector stop, pry up, pressing against sear spring with thumb and pulling to the rear).

(2) Trigger pin.

(3) Trigger and connector.

(4) Sear pin (release the pressure on sear pin by standing trigger mechanism vertically on flat forward end, levering sear carrier forward with recoil spring guide inserted just in rear of counter-recoil spring. Then push the sear pin out with the point of a cartridge). Pressure on tail of sear causes sear pin to bind between sear carrier and sear.

(5) Sear.

(6) Sear carrier and counter-recoil spring.

NOTE.—Sear carrier must be pried up so as to clear change lever spring.

(7) Change lever spring (change lever spring is removed by prying bent over rear end out of its seat with rounded end of sear spring and moving change lever from front to rear. When it is clear of the change lever it is pushed the rest of the way out by pressing with the thumb against the sear stop).

(8) Change lever.

(9) Ejector (depress ejector lock with point of cartridge, hold thumb in front of magazine catch spring to prevent its loss and slide ejector out).

(10) Magazine catch spring.

(11) Magazine catch pin.

(12) Magazine catch.

(13) Magazine release.

### Assembling Trigger Mechanism.

39. Sequence of assembling is in reverse order of stripping.

### Notes on Assembling Trigger Mechanism.

40. The following points are worthy of note: It is easier to seat the magazine catch spring if the ejector is moved down until it is flush with the magazine catch spring before attempting to compress the latter.

41. In assembling change lever spring first insert the ears in slots in trigger guard and push spring forward a slight distance, then insert the rounded end of sear spring between the rear end of the trigger guard and the change lever spring. By prying up with the sear spring and, at the same time, pressing against sear stop with thumb and ratcheting change lever from rear to front the change lever

spring is easily seated. Sear carrier and counter-recoil spring are assembled to trigger mechanism by inserting counter-recoil spring guide in its seat, then using the recoil spring guide as a lever in sear pin hole, prying the sear carrier forward until its rear end is held by the ears on the change lever spring. The sear is now inserted and the recoil spring guide forced through so as to register the holes in the sear, sear carrier and trigger guard for the sear pin, which is forced in by pressing it against a block of wood, thus forcing the recoil spring guide out.

42. In assembling the connector note that its toe points to the rear and that its head is in rear of the connector stop (rear is the direction away from the ejector toward the sear).

43. Be especially careful to see that the outside prongs of the sear spring rest on their seats on the sear and that the middle prong rides freely in the slot formed by the walls of the sear carrier. If this middle prong rests on one of these walls, instead of riding freely between them, the trigger mechanism will not function when the barrel is inclined below the horizontal.

#### **LESSON IV. MAGAZINES.**

44. Following the procedure outlined in Lessons I and III, the instructor will teach nomenclature, stripping, assembling and loading of the magazines.

##### **Notes on Magazines.**

45. Loading exercise will be conducted with dummy ammunition.

46. The men must be taught that the magazines require the same care and preservation as the rifle. They must not be allowed to become dirty. Dented magazines will cause malfunctions. The greatest possible care should be taken to prevent any damage whatever being done to the lips of the magazine or to the notch for the magazine catch.

##### **Sequence of Stripping.**

(47) (Not to be done in the field).

(1) Magazine base (raise rear end of magazine base until indentations thereon are clear, then slide to the rear).

(2) Magazine spring.

(3) Magazine follower.

48. Assemble in reverse order, viz.: Follower, spring and base. Note that bent-over end of follower and eye of spring work against inside of rear (notched) end of magazine.

## LESSON V.

### SPARE PARTS.

49. The nomenclature of the spare parts kit will be taught according to the principles hereinbefore enunciated. This instruction will include the proper method of packing the spare parts kit. It will also include instruction in the contents of the gun box.

#### Notes on Spare Parts.

50. The importance of knowing what is and what is not carried as a spare part should be impressed on all automatic riflemen.

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

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

A list of deficiencies should be kept inside each gun box. Spare parts must be kept slightly oiled.

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

Breakages and losses must be reported immediately.

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

Worn or defective parts should not be kept in the spare parts box.

Where any rifles are kept in reserve care should be taken to see that they are in the same condition of readiness for action as those to be used in the firing line. They should **not** be utilized as a source for obtaining spare parts.

## LESSON VI.

### FUNCTIONING.

51. **Introduction.**—The instructor will give a brief lecture, explaining the difference between recoil operated and gas operated guns, that most automatic weapons have some sort of a cooling system and the reasons thereof (it will be noted that there is no special device for cooling the Browning

automatic rifle but that the barrel is exposed as much as possible to the air). He will further explain that all automatic weapons must have mechanical means for performing the following functions: Extraction, ejection, feeding, locking breech while there is high pressure in the bore and priming the cartridge. He will define and illustrate any mechanical terms which he uses. For instance "to cam" is to change the direction of motion of a part by means of a cam. Instructor may illustrate this by showing how the bolt supports act on the bolt lock during the operation of locking.

52. The operations of extraction, ejection, etc., are performed by various cams, lugs and springs and the energy necessary to perform this work and overcome friction in the rifle is derived from the explosion of the powder in the chamber.

He will explain that these operations have a certain sequence in the various guns and that some of them are concurrent, that in the Browning the men will be expected to learn and understand thoroughly the various operations separately and then to visualize them as they are actually happening in the rifle during firing. In other words, that the soldier must be able to "see" the relative position of all the parts, at any time, of the operation of the rifle.

53. **Explanation-demonstration.**—This explanation-demonstration will be illustrated with an assembled rifle, parts of rifles and drawings, in the following order:

Operation in general terms (as given on page 9, Ordnance Pamphlet No. 1934).

Definition of the two phases of action (as given below, paragraph 57).

**First Phase.—**

- (1) Action of gas.
- (2) Slide.
- (3) Unlocking.
- (4) Withdrawal of firing pin.
- (5) Extraction.
- (6) Ejection.
- (7) Termination of first phase.

**Second Phase.—**

- (1) Action of recoil spring.
- (2) Feeding.

- (3) Locking.
- (4) Priming.
- (5) Termination of second phase.

#### Action of the Buffer.

- 54. Imitation.—As outlined in lessons I and III.
- 55. Interrogation.—By instructor.

### NOTES ON FUNCTIONING.

#### General Remarks.

56. It is not desired to have the student memorize the distances given below. He must have, however, an approximate idea of these distances; for instance, he should understand that the backward travel of the bolt has been very little when the bolt lock is drawn completely down but, on the other hand, that the slide has moved a considerable distance.

57. The functioning of the Browning automatic rifle is divided into two phases, based on the natural operation of the mechanism when a shot is fired. These two phases are the backward and the forward action. In making this division we assume, as a starting or reference point, the priming of a cartridge in the chamber.

#### FIRST PHASE.

##### Action of Gas.

58. A cartridge having been primed, the bullet, under the pressure of the expanding powder gases, travels through the barrel and when it reaches a point 6 inches from the muzzle it passes a port in the bottom of the barrel. The barrel pressure, which at this instant is still very high, seeks this first natural vent. Registered with the barrel port are other similar ports in the gas cylinder tube bracket, gas cylinder tube and gas cylinder. The port in the gas cylinder is the smallest and serves to throttle the barrel pressure. The ports in the gas cylinder lead radially into a well about .12 of an inch in diameter in the head of the gas cylinder. The throttled barrel pressure is conducted through this well to the gas piston plug. This pressure acts on the piston a very short time, namely, the time it takes the bullet to travel the 6 inch distance from the barrel port to the muzzle. Its effect is that of a sudden severe blow on the piston plug. Under the influence of this blow the gas piston is driven to the rear and

carries with it the slide to which it is assembled. When the piston has travelled about .58 of an inch backward the bearing rings on its head, also the gas piston plug, pass out of the cylinder. The gas expands around the piston head and into the gas cylinder tube and is exhausted through six port holes in the tube just in rear of the gas cylinder tube bracket. The gas is prevented, in a large measure, from travelling back through the gas cylinder tube by two rings on the piston, .62 of an inch apart and 1.25 inches from the piston head. These rings also serve as bearings to hold the front end of the piston in the center of the gas cylinder tube after the piston head has passed out of the gas cylinder.

### The Slide.

59. Having traced out the action of the gas we will now go back and take up the action of the mechanism as it moves to the rear. The first and immediate result of the backward movement of the slide is the beginning of the compression of the recoil spring, thereby storing energy for the forward motion.

### Unlocking.

60. The hammer pin is slightly in advance of the link pin, about .19 of an inch. The center rib of the hammer is against the head of the firing pin. When the slide begins its motion to the rear it imparts no motion whatever to the bolt and bolt lock. The slide moves back .19 of an inch and its only effect during this travel is to carry the hammer from the firing pin and the hammer pin directly under the link pin. At this point the unlocking begins, the link revolves forward about the hammer pin drawing the bolt lock down and to the rear. The motion of the lock and bolt, which is zero at the instant the hammer pin passes under the link pin, accelerates from this point until the slide has travelled 1.19 inches, at which point the lock is drawn completely down out of the locking recess and away from the locking shoulder of the receiver. It is now supported in front on the bolt supports and the front upper shoulder of the link has revolved forward and is against the locking shoulder of the bolt lock. These two influences prevent the bolt lock revolving down below the line of backward travel of the bolt.

### Withdrawal of Firing Pin.

61. As the bolt lock revolves down from its locked position a cam surface in a slot in the rear bottom side of the bolt lock comes in contact with a similar cam surface on the firing pin lug and cams the firing pin from the primer.

### Extraction.

62. The backward motion of the bolt begins when the bolt lock has been drawn down so that the circular cam surface on its under side is operating on the rear shoulders of the bolt supports. This produces a strong lever action which slowly loosens the cartridge case if stuck in the chamber. The backward travel of the bolt has been slight, only .17 of an inch when the firing pin is withdrawn, its travel is .35 of an inch when the bolt lock is drawn completely down. From this point the bolt moves to the rear, drawn by the bolt lock and link, with the same speed as the slide and carries with it the empty cartridge case, which is held firmly in its seat on the face of the bolt by the extractor. The extractor is on the upper righthand side of the bolt next to the ejection opening in the receiver. A slot cut in the left side of the bolt lock near the back end passes over the bolt guide, which supports the bolt lock and bolt when they are in the cocked position.

### Ejection.

63. When the slide reaches a point .22 of an inch from the end of its travel, the base of the cartridge case strikes the ejector, which is on the left side of the feed rib of the bolt and opposite the extractor. This action causes the cartridge case to be pivoted with considerable force about the extractor as a pivot and through the ejection opening in the receiver. The front end of the cartridge case passes first out of the receiver and is pivoted backward so that it strikes the receiver at a point about 1 inch in rear of the ejection opening. It rebounds from the receiver toward the right front.

### Termination of First Phase.

64. The backward motion is terminated by the rear end of slide striking the buffer at the back end of the receiver. The slide moves forward .10 of an inch, after striking the

buffer, under the action of the recoil spring, but if the sear nose is not depressed it engages the sear notch on the slide and the piece is cocked for the next shot.

NOTE.—It was seen that the motion of the bolt and lock and link mechanism began slowly at first and did not attain the speed of the slide until the slide had travelled 1.2 inches backward. This is a very important and good characteristic of the rifle because it relieves the mechanism of the excess strain which it would have if those parts were started suddenly at the instant the gas impinges on the piston. Another very important result of this characteristic of the design is the delaying of the opening of the chamber an instant of time to allow the high barrel pressure to decrease.

## SECOND PHASE.

### Action of Recoil Spring.

65. The sear nose is depressed, disengaging the sear and the slide moves forward under the action of the recoil spring. The link pin is slightly below a line joining the bolt lock pin and the hammer pin, therefore, as the slide starts forward, the joint at the link pin has a tendency to buckle downward. It is prevented from doing this by the tail of the feed rib of the bolt, which extends backward under the bolt lock, also principally by the upper front shoulder of the link being in contact with the locking surface of the bolt lock. Since the joint cannot buckle, the entire mechanism moves forward with the slide. When it has travelled .27 of an inch the front end of the feed rib impinges on the base of the cartridge which the magazine spring and lips are holding up in its path.

### Feeding.

66. The cartridge is carried forward about .27 of an inch, when the nose of the bullet strikes the bullet ramp or guide on the breech of barrel and is deflected upward towards the chamber. This action also guides the front end of the cartridge from under the magazine lips. The base of the cartridge approaches the center of the magazine, where the lips are cut away and the opening enlarged, and at this point is forced out of the magazine by the magazine spring. The base of the cartridge slides across the face of the bolt and under the extractor. Should the cartridge fail to slide

under the extractor the extractor will snap over its head when the bolt is in the forward position. When the cartridge is released by the magazine the nose of the bullet is so far in the chamber that it is guided by the chamber from this point on.

### **Locking.**

67. When the slide is 1.19 inches from its forward position the circular cam surface on the under side of the bolt lock begins to ride over the rear shoulders of the bolt supports and the rear end of the bolt lock is cammed upward. The link pin passes up above a line joining the bolt lock pin and hammer pin. The joint at the link pin now has a tendency to buckle upward and the bolt lock, being opposite the locking recess in the receiver, is free to and does, pivot upward about the bolt lock pin. The link revolves upward about the hammer pin, forcing the bolt lock up and a rounded surface on the bolt lock, just above the locking face, slides over the locking shoulder in the receiver, giving the lock a lever action which forces the bolt home to its final position. The two locking surfaces on the bolt lock and the receiver register as the hammer pin passes under the link pin.

### **Priming the Cartridge.**

68. The lug on the firing pin is buried in the slot in rear of the bolt lock at all times except when the bolt lock is against the locking shoulder of the receiver, therefore the firing pin is locked away from the primer during all the backward and forward motion of the bolt. When the hammer pin passes under the link pin the firing pin has just been released by the bolt lock. The slide and hammer move forward about .11 of an inch further and the center rib of the hammer strikes the head of the firing pin, driving it forward and priming the cartridge.

### **Termination of Second Phase.**

69. The front end of the slide strikes a shoulder at the rear end of the gas cylinder tube, which terminates the forward motion. The forward motion is not terminated by the hammer on the firing pin. This can be seen by examining the head of the firing pin when the gas cylinder tube is assembled to the receiver and the bolt mechanism is in the

forward position. The firing pin has still about .06 of an inch clearance from its extreme forward position.

NOTE.—The locking shoulder of the receiver is inclined forward. Its surface is normal or perpendicular to a line joining it and the bolt lock pin, therefore the shock of the explosion of the cartridge is squarely against it. Attention is also called to the fact that the speed of the bolt mechanism is slowed down gradually from the instant the joint at the link pin is broken upward, until the hammer pin passes under the link pin, when its speed is zero.

### Action of the Buffer.

70. The buffer system consists of a tube in which are placed successively, from front to rear, the buffer head, a brass friction cup with concave interior and split to allow it to spring. A steel cone to fit into the cup; four of these cups and cones are placed one after the other or in series. Next is the buffer spring and finally the buffer nut, which is screwed into the end of the tube and forms a seat for the spring.

### The Action.

71. The buffer head is struck by the rear end of the slide, this forces the cups over the cones and causes them to expand tightly against the tube and consequently produces considerable friction as the cups move back and compress the buffer spring. Thus the rearward motion of the slide is eased up gradually and there is practically no rebound. The spring causes the buffer head and friction cups and cones to return to their original positions.

## LESSON VII.

### FUNCTIONING OF TRIGGER MECHANISM.

72. Preparation.—Instructor and each team have a stripped trigger mechanism before them.

73. Explanation-demonstration.—Instructor describes parts and explains functioning in detail according to method in notes below.

74. Imitation.—Students describe parts and explain functioning as outlined in lesson I.

75. Interrogation.—Instructor quizzes students.

## Notes on Trigger Mechanism.

76. The trigger mechanism has three settings:

(1) Automatic (A). When so set the sear is held depressed as long as the trigger is pulled and the piece will continue firing until the magazine is emptied.

(2) Semi-automatic (F). When so set the sear is depressed, thereby disengaging the sear and sear notch when the trigger is pulled, but the mechanism is so constructed that the sear rises and engages in the sear notch when the slide comes back again and the sear and sear notch will not disengage until the trigger is fully released and then pulled. With this setting the piece fires one shot, ejects the empty cartridge and cocks itself for each pull and release of the trigger.

(3) Safe (S). When so set the sear cannot be released from the sear notch by pulling the trigger.

77. The action of the trigger mechanism is taken up in phases and should be followed through on the mechanism itself as the explanation proceeds. Have the trigger guard stripped completely. Study the shape of the change lever and note the following:

(1) It is a bar about .25 of an inch in diameter.

(2) It has 3 shallow longitudinal slots cut on top of the bar, as the handle is held vertically.

(3) The side of the bar is slotted in such a way as to leave a little tongue of metal in the center and at the lower edge of the slot.

78. To assemble the change lever and spring to the trigger guard.—Note that the toe of the change lever spring is seated in one of the longitudinal slots on the change lever and that as the lever is turned from one position to another it seats in the other slots. The only function of the spring and the longitudinal slots is to hold the change lever in the position in which it is placed.

79. To assemble the trigger and pin to the guard.—Turn the change lever to rear or safe position. Note that in this position the slot is turned slightly upward and that the full surface of the bar is on the bottom. Pull the trigger. Note that the rear top end of the trigger is slotted longitudinally and that the metal on each side of the slot forms two shoulders that come up against the bottom of the change lever bar.

80. Push the change lever over to the vertical position, which is the automatic setting. Pull the trigger just as before and note that the slot in the change lever is turned to the front and that the two shoulders of the trigger, which before engaged the full surface of the change lever bar, now are free to pass up into the slot of the change lever, also that the little tongue of metal on the bottom of the change lever slot passes through the longitudinal slot in the end of the trigger.

81. Push change lever forward or to single-shot position. Note that now the slot is turned partially down and that when the trigger is pulled the front end of the trigger passes up into the change lever slot, also that the little tongue of metal in the bottom of the change lever slot is now turned back and does not pass through the slot in the end of the trigger as it did in the automatic position.

82. Observe the shape of the connector. Its lower end is shaped like a boot with a toe and heel. It has a flat surface that slopes down and toward the front from the head (sear spring ramp). In rear of the head the profile extends straight downward for about .12 of an inch, then slopes slightly to the rear for .12 of an inch (sear carrier ramp). This last slope is used in a cam action to be explained later. Note the narrow flat top surface of connector. Its function is to raise forward end of sear until cammed out from under latter.

83. Place the connector on the connector pin and change lever on the safe position, pull the trigger and note that the connector is not raised for the obvious reason that trigger itself cannot be raised because the change lever bar is in its way. Turn change lever to automatic position, pull the trigger and note that the head of the connector is raised and held in a vertical position and cannot be tipped forward. The tongue on the change lever engages the toe of the connector as the trigger is pulled and holds the connector upright.

84. Turn the change lever to single shot position, pull the trigger and note that the tongue on the change lever does not now engage the toe of the connector and that the head of the connector can now be tipped forward.

85. Observe now the cross pin on the sear carrier, called the connector stop, also that just in rear of the connector

stop and on the under side of the sear carrier is an inclined surface sloping upward in the metal which joins the two sides of the sear carrier. This surface has a cam action with the above mentioned cam surface on the connector.

86. Completely assemble the trigger mechanism. Note that the center leaf of the sear spring presses on the front sloping surface of the connector and tends to press the head of the connector backward. Put change lever on safe and pull trigger. Note the head of connector is not raised above the sear carrier for reasons given previously. Therefore, the sear nose is not depressed and hence the safe position. Change over to the automatic position and pull the trigger, the head of the connector is raised and held in the vertical position, thus depressing the sear nose and holding it in this position, which obviously gives automatic fire as long as there are cartridges in the magazine.

87. The tongue on change lever tends to hold connector vertically and the ramp on sear carrier tends to cam connector forward. The forces on connector exerted by these two parts are opposed, hence trigger mechanism is locked when trigger has been pulled enough to release slide.

88. Put change lever on single shot setting, pull trigger slowly. Note that at first the head of the connector rises and thereby depresses the sear nose which allows the slide to go forward and fire a shot. Continuing the squeeze of the trigger, the previously mentioned cam surface on the connector comes in contact with the cam surface of the sear carrier and the head of the connector is cammed forward against the pressure of the center leaf of the sear spring. The connector disengages the front arm of the sear and the two outside leaves of the sear spring depress it and the sear nose is thereby raised up in the path of the slide and engages the sear notch when the slide moves back, thus allowing only one shot to be fired. When the trigger squeeze is released the center leaf of the sear spring presses the head of the connector downward and forward under the front arm of the sear so that when the trigger is pulled again the action is repeated and single shot is fired.

89. In the semi-automatic position the connector stop prevents the head of the connector being tipped so far forward that the sear spring cannot push it back in place when the trigger is released. The only function of the change lever

in the semi-automatic position is the limiting of the upward travel of the trigger when its upper rear shoulders strike the top of the slot in the change lever, which in this position is turned down.

**LESSON VIII.**  
**IMMEDIATE ACTION.**  
**(Classroom Instruction).**

90. **Introduction.**—The instructor will give definition of immediate action (the automatic and instinctive application of a probable remedy for a stoppage, based on the position of the hammer pin, as determined by pulling back operating handle).

91. **Demonstration-explanation.**—The instructor will demonstrate the four positions of the hammer pin and how to determine its position by pulling back the operating handle until it strikes the hammer pin.

92. Each member of team is required to learn how to determine the position of the hammer pin by setting the slide in the four positions (recoil spring removed and piston held) and then by placing thumb in rear of trigger guard and fingers on operating handle, squeezing operating handle back until it strikes the hammer pin. Students will then be required to state in which position mechanism was stopped.

**Part Two.**

93. (1) Under direction of instructor, sergeant-instructor prepares the various stoppages for the first position of hammer pin.

(2) Explains the immediate action.

(3) Requires each member of team to perform immediate action, criticizing performance.

(4) Quizzes team.

Each phase of the first position is taught until all are proficient before teaching next phase.

LOCATION OF OPERATING HANDLE IN FIRST, SECOND,  
THIRD AND FOURTH POSITION STOPPAGES.

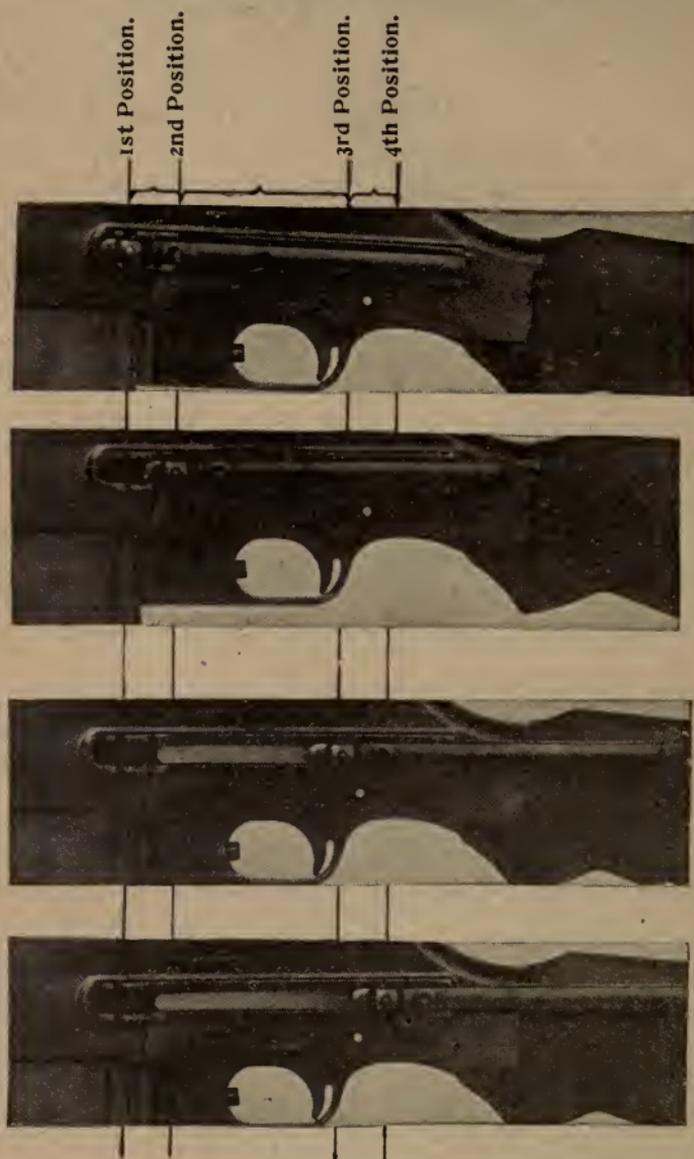


PLATE I.

NOTE.—The operating handle is shown in the rearmost phase in each position. In the first position the movement of the operating handle is zero. Stoppages for the various positions may allow the operating handle to strike the hammer pin anywhere within limits shown by brackets and vertical lines above.

## IMMEDIATE ACTION TABLE.

### Explanatory Notes.

94. The following table will be utilized in teaching immediate action, both in classroom and on the range. In class work stoppages will be set up, not in the student's sight and when he inspects the gun he will find the hammer pin and the rifle in such condition as would result if that stoppage occurred during actual firing. On the range these stoppages will be induced so as to occur during firing.

95. Column 1 describes the four positions of the operating handle (when drawn back until it strikes the hammer pin where same is fixed by stoppage). Plates show rearward position of operating handle for each of the four positions. These positions, which afford a ready indication of the correct immediate action to be performed, must be recognized clearly before instruction proceeds. When this has been accomplished the soldier will be required to learn what these four positions indicate.

96. Column 2 gives a detailed description of the immediate action to be performed by the firer as soon as he has determined the position of the hammer pin by drawing back the operating handle until it strikes the hammer pin. It will be noted that in all four of the positions the first stage of the immediate action is to pull back the operating handle and examine what comes out of the chamber.

97. Column 3 deals with the probable causes of these stoppages. It is of the 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.

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

99. It is not wholly necessary to teach the gunners and carriers the method of "setting-up" stoppages but all instructors and assistant instructors should thoroughly understand this phase.

**Table of Immediate Action for Stoppages, Browning Automatic Rifle, Model of 1918.**

Position of Bolt and Operating Handle	Immediate Action	Probable Cause	Preparation for Instruction In Classroom	On Range
<p>1. Pull back operating handle and examine what comes out of chamber. If loaded cartridge is ejected (failure to fire) examine firing pin for breakage; if firing pin is not broken, oil working parts.</p> <p>2. If empty case is ejected (insufficient gas) examine and regulate gas ports. If stoppage recurs clean gas system.</p> <p>3. If nothing comes out of the chamber (failure to feed) change magazines. Loader will examine magazine for obstruction between top cartridge and lips of magazine and for worn magazine catch notch.</p>	<p>1. Broken firing pin or too much friction, firing pin not carried forward with sufficient force to prime cartridge.</p> <p>2. Gas ports do not register. Gas ports clogged.</p> <p>3. Weak magazine spring or dirty magazine. Obstruction prevents top cartridge from rising up in way of feed ribbon bolt. Worn magazine catch notch drops magazine down so that feed rib misses top cartridge.</p>	<p>1. Insert broken firing pin. Let bolt forward on dummy cartridge.</p> <p>2. Adjust gas ports so they do not register. Let bolt forward on empty cartridge.</p> <p>3. Insert obstruction under lip of magazine so as to hold top cartridge (dummy) down. Let bolt forward on empty chamber. Or insert loaded (dummies) magazine but do not fully seat same and let bolt forward on empty chamber.</p>	<p>1. Insert broken firing pin; attempt to fire.</p> <p>2. Adjust gas ports so they do not register and attempt to fire.</p> <p>3. Same procedure as in classroom except that live rounds are used instead of dummies and the student attempts to fire.</p>	

**Table of Immediate Action for Stoppages, Browning Automatic Rifle, Model of 1918.**

Position of Bolt and Operating Handle	Immediate Action	Probable Cause	Preparation for Instruction	
			In Classroom	On Range
<p><b>2nd Position</b> Operating handle can be moved back until it strikes the hammer pin anywhere between the 1st position and a point where the operating handle plunger has ridden completely over the raised shoulders of the ribs of the operating handle way.</p>	<p>1. Pull back operating handle and remove magazine; examine what comes out of chamber. If loaded cartridge is ejected, examine face of bolt and breech recess for blown primer or other obstruction and remove same.</p> <p>2. If no blown primer or obstruction on face of bolt or in breech recess look for obstruction between top of bolt lock and receiver top plate. Remove.</p>	<p>1. Blown primer sticks on face of bolt or in breech recess, preventing bolt from going clear home and priming cartridge.</p> <p>2. Obstruction between bolt lock and locking recess in receiver give same results.</p>	<p>1. Place small piece of brass about the size of primer in breech recess so as to hold face of bolt away from chamber. Student snaps piece. Dummy cartridge is carried in chamber but obstruction stops piece in 2nd position.</p> <p>2. Same procedure with an obstruction between bolt lock and locking recess in receiver top plate.</p>	<p>1. Same as in classroom using live ammunition instead of dummies.</p>

**Table of Immediate Action for Stoppages, Browning Automatic Rifle, Model of 1918.**

Position of Bolt and Operating Handle	Immediate Action	Probable Cause	Preparation for Instruction	On Range
<p><b>3rd Position</b>                      Operating handle can be moved anywhere from the second position to a point where it is directly over A of the change lever setting before it strikes the hammer pin.</p>	<p>1. Pull back operating handle and examine what comes out of chamber. If unexploded cartridge is ejected, fire again.                      2. If unexploded cartridge bearing forward end of ruptured shell is ejected, remove head of ruptured shell from rifle, clean and oil chamber, and oil cartridges in magazines.                      3. If loaded cartridge comes out showing marks on shoulder where it has been forced into a ruptured case, call for defective cartridge extractor and remove ruptured case from chamber.</p>	<p>1. Damaged cartridge, will not enter chamber.                      2. Excessive headspace. Cartridge case ruptures leaving forward portion in chamber, which sticks on next cartridge.                      3. Same as (2) except that there is so much friction that next cartridge fails to extract ruptured case.</p>	<p>In Classroom</p> <p>1. Load with deformed dummy cartridge in magazine and snap piece on it.                      2. Insert front inch and <math>\frac{3}{4}</math> of cartridge case in chamber, load with dummy in magazine and snap piece.</p>	<p>1. Same as in classroom, using live ammunition.                      2. and 3. File annular groove about <math>\frac{5}{8}</math> of an inch from head of cartridge place in magazine between two good cartridges and fire until stoppage occurs.</p>

**Table of Immediate Action for Stoppages, Browning Automatic Rifle, Model of 1918.**

Position of Bolt and Operating Handle	Immediate Action	Probable Cause	Preparation for Instruction	
			In Classroom	On Range
3rd Position (Continued)	<p>4. If complete cartridge case is in chamber (failure to extract) drive same out with cleaning rod. If rim of empty case has been cut through by extractor, thoroughly clean the bore. Examine extractor.</p> <p>5. If the slide is stuck and the piece will neither cock nor the slide move forward, remove trigger mechanism and inspect for and remove obstruction between one of the bolt supports and the bolt guide. May be removed by tapping rear end of slide.</p>	<p>4. Burr on shoulder of extractor or an obstruction prevents extractor from gripping cartridge. When extractor cuts a piece out of rim of cartridge, dirty chamber causes so much friction that rim of cartridge gives before it will extract.</p> <p>5. Blown primer or other obstruction wedges itself between one of the bolt supports and the curved cam under surface of the bolt lock. Slide cannot be moved except by tapping it forward until bolt lock is forced up into its locking recess.</p>	<p>4. File rim off of empty case, insert in chamber, load with dummy in magazine, snap piece.</p>	<p>4. Do not set up.</p>
			<p>4. Do not set up.</p>	<p>5. Do not set up.</p>

**Table of Immediate Action for Stoppages, Browning Automatic Rifle, Model of 1918.**

Position of Bolt and Operating Handle	Immediate Action	Probable Cause	Preparation for Instruction	
			In Classroom	On Range
<p>4th Position</p> <p>Operating handle anywhere from rear of 3rd position to clear back as far as it will go.</p>	<p>1. Pull back operating handle and remove magazine. Examine for blown primer or other obstruction between face of bolt and ejector. Remove same.</p> <p>2. If gun is in cocked position and will not fire, examine trigger mechanism for trouble.</p>	<p>1. Blown primer or some other obstruction lodging between base of bolt and ejector, preventing bolt mechanism from moving forward farther than the ejector.</p> <p>2. Connector does not disengage sear from sear notch (usually due to broken sear spring or middle prong of sear spring resting on one of the sides of sear carrier instead of riding between them).</p>	<p>1. Place some obstruction between face of bolt and ejector so as to hold bolt back.</p>	<p>1. Do not set up.</p>
			<p>2. Insert sear spring with broken middle prong or assemble sear spring so that middle prong rests on one wall of sear carrier. Best results will be obtained when barrel points considerably below horizontal.</p>	<p>2. Same as in classroom.</p>

## NOTES ON IMMEDIATE ACTION.

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

(1) **Temporary**, which are due to:

(a) Failure of some part of rifle of which a duplicate is carried.

(b) Faulty ammunition.

(c) Neglect of points before or during firing.

(d) Ignorance on part of rifle team.

(2) **Prolonged**, which are due to failure of some part that cannot, as a rule, be remedied by the team 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 automatic riflemen depends the rapidity with which temporary stoppages can be remedied.

It is essential that stoppages be prepared accurately.

## LESSON IX.

### IMMEDIATE ACTION.

(On Range).

101. Stoppages will be set up on range, using prepared magazines, ammunition and parts so as to cause them to occur during firing.

Student will fire. When stoppage occurs he will call **first position**, **third position** or whatever position he thinks it may be. If he calls the correct position the sergeant-instructor will command immediate action, whereupon the student executes the necessary immediate action.

102. When the student has been thoroughly grounded in immediate action the various stoppages will be set up and he will be required to perform the necessary immediate action in each case without naming it and without command, as soon as the stoppage occurs. This in order to acquire speed and accuracy.

## NOTES ON STOPPAGES.

### Causes.

103. Stoppages are caused by the following:

(1) **Dirt** (natural fouling incident to firing and also to careless cleaning).

(2) **Insufficient oil** (from failure to oil and because of oil burning up during firing).

(3) **Extraneous matter in working parts** (due to poor cleaning, brass chipped off from cartridges, breakages, blown primers, etc.).

(4) **Improper assembly of rifle** (gas ports not registered, middle prong of sear spring riding on one wall of sear carrier, etc.).

(5) **Breakages** (due to wrong assembly, oversize or undersize parts, burrs, incorrect heat treatment, overheating of parts incident to firing, etc.).

(6) **Burred parts** (due to use of force, grit, etc., improper assembly, extraneous matter in mechanism).

(7) **Magazine troubles** (due to bent or dented magazines, worn magazine catch notch, extraneous matter as blown primer between lips of magazine and top cartridge).

(8) **Faulty ammunition** (dented cartridges, failure of primer or charge, etc.).

(9) **Excessive play in parts** (due to wear, to stripping parts not supposed to be stripped, as removing barrel from receiver, for instance).

10. **Ruptured cartridges** (due to excessive head space). Headspace is the distance between the face of the bolt and the head of a standard steel test cartridge. If this distance is **excessive**, then when the cartridge case is forced against the walls of the chamber by the high pressure, incident to explosion of charge, the head of the cartridge is driven to the rear since it is not properly supported by the bolt. This results in rupture about  $\frac{1}{2}$  inch from the base of the cartridge. In effect the action is the same as if the chamber gripped the cartridge case and the head of the cartridge for about  $\frac{1}{2}$  inch were free to move; since the chamber pressure is 50,000 pounds per square inch, it can be seen why the case is ruptured. If the chamber is dirty and there is any excessive headspace, ruptured cartridges are sure because the case is "gripped" with more friction. By cleaning the cham-

ber thoroughly and oiling the cartridges this stoppage will be corrected until the headspace becomes very excessive (the case is never pulled apart by extractor).

### Analysis of Various Stoppages (As To Cause).

#### First Position.

104. **Failure to feed.**—Obstruction (usually a blown primer), between lips of magazine and top cartridge, causes failure of presentation of a cartridge to feed rib and the bolt goes home on an empty chamber. Same result occurs when the magazine catch notch becomes so worn as to permit the magazine to drop down slightly and also when magazine catch breaks.

105. **Misfire.**—Faulty primer or charge will cause a misfire as will also a broken or short firing pin. Frequently the beginner will mistake a misfire due to an obstruction between the face of the bolt and the breech for one due to a broken firing pin. He should remember that the latter is a first position stoppage and the former a second position stoppage. A misfire due to a broken firing pin will not show any indentation on the primer. The second position stoppage almost invariably shows a slight indentation.

106. **Failure to extract.**—A stoppage in the first position with an empty case in the chamber is due to insufficient gas. Insufficient gas in turn may be due to the gas ports not being properly registered or being partially clogged, or to excessive friction because of lack of oil and dirty chamber. When there is sufficient gas to properly function the rifle, but the chamber is very dirty, the bolt will be driven back with such force that the extractor will cut through the rim of the cartridge and a third position stoppage will result, because the feed rib goes back and gets a new cartridge and jams it against the head of the one which was left in the chamber.

#### Second Position.

107. **Failure to fire.**—Cause, obstruction lodging between face of bolt and the breech, thus holding firing pin away from primer. Primer will be slightly dented. This stoppage is typical. When the piece stops in the second position always look for an obstruction either on the face of the bolt or in breech recess where bolt and receiver join. Most frequent obstruction is the blown primer. Often it is difficult to see.

Frequently it drops off as the bolt is drawn back. If the stoppage recurs you may be sure that an obstruction is in the rifle between the face of the bolt and the breech or between bolt lock and receiver top-plate.

108. **Mechanism wedged fast in second position or beginning of third position.**—This is a rare stoppage. Slide cannot be moved forward or back. This stoppage happens when any obstruction gets between one of the bolt supports and the bolt lock during the beginning of the first phase. As the slide is driven to the rear by the force of the explosion the bolt lock is wedged by the obstruction. This stoppage has been caused by blown primers and by a piece of metal broken off from the rear slotted end of the firing pin channel wall. To reduce it, (a) remove trigger mechanism, gas cylinder and recoil spring; (b) tap on rear end of slide with piece of wood or a pewter hammer until bolt lock locks. Remove obstruction. Do not hammer with steel or iron.

#### Third Position.

109. **Cartridge jam.**—Due (a) to deformed cartridge; (b) to loaded cartridge being held out of chamber by empty case which was not extracted; (c) to failure to eject properly, empty case remaining in the ejection opening.

Such failure to properly eject is caused by insufficient gas or by failure of extractor to hold cartridge in such position that it will be properly struck by the ejector. Weak extractor spring or burred shoulder of extractor or extraneous matter in seat of shoulder of extractor are the causes of the failure of the extractor to properly hold cartridges for the ejector.

This same stoppage will occur when there is insufficient gas to drive the bolt back with enough force so that the ejector may be struck with sufficient force by the cartridge to cause ejection.

#### Fourth Position.

110. One fourth position stoppage, developed so far, has been in the case of blown primers wedging themselves between the point of the ejector and the face of the bolt, thereby holding the bolt and mechanism back in the fourth position.

111. Another fourth position stoppage is where the piece is cocked and the trigger mechanism will not release the sear when set at (A) or (F). This is due to a broken sear spring,

a broken or lost connector, an improper assembling of the sear spring, or to any cause which has the effect of moving the middle prong of the sear spring too far to the front, with respect to the connector, so that the connector is not cammed under tail of sear.

## LESSON X.

### CARE AND PRESERVATION.

112. **Introduction.**—The instructor will impress on the men the vital necessity for cleaning and caring for the weapon.

113. **Explanation-demonstration.**—He will explain and demonstrate the care and preservation of the bore, as set forth in the Small Arms Firing Manual (care must be taken not to allow any of these solutions to remain in the rifle, particularly in the gas system). The test given below on points to be observed before, during and after firing, will be explained and demonstrated by the instructor and imitated by the students; the latter will be required to memorize same. They will be questioned as in previous lessons.

114. Whenever the pieces are cleaned they will be thoroughly inspected before being assembled.

#### Points to Be Observed.

##### 115. Before firing:

- (1) Test trigger mechanism at safe (A) and (F).
- (2) See that bore is clear and clean.
- (3) Work slide back and forth rapidly several times to see that it moves free! and does not stick.
- (4) Test ejector and extractor with dummy or empty case.
- (5) Verify proper setting of gas port.
- (6) Verify oiling.
- (7) Verify cleaning.
- (8) Examine magazines and eliminate faulty ones.
- (9) See that kit contains oil can full of oil and full complement of spare parts.

##### 116. During firing:

- (1) Keep magazines and chamber protected from dirt.
- (2) Do not allow rifle to become dry.
- (3) Clean bore and gas system frequently.

##### 117. After firing:

- (1) Remove loaded magazine and replace with empty.
- (2) Let bolt forward.
- (3) Wipe out bore and oil rifle.
- (4) Thoroughly clean rifle at first opportunity.

## PART THREE.

### ELEMENTARY DRILL.

#### GENERAL REMARKS.

118. The Browning automatic rifle team consists of a gunner, who is team commander, and two carriers (a loader and a scout).

A squad consists of two teams under a corporal.

A section consists of two squads under a sergeant who is section leader.

#### Outline of Training of Automatic Rifle Section.

(Read paragraphs 1-6 I. D. R.).

119. The training of the automatic rifle section is divided into four phases:

- (1) Instruction of the individual.
- (2) Training of the rifle team.
- (3) Training of the squad.
- (4) Training of the section.

120. All members of the rifle squad should be strong, husky men on account of the very heavy equipment of the automatic rifleman. They should be intelligent men and expert shots, otherwise full advantage will not be taken of the great power of this weapon.

### INSTRUCTION OF THE INDIVIDUAL.

#### Who Receives It.

121. All members of the automatic rifle section should receive such instruction that any one of them will be able to act as gunner and to keep the piece in action should the others be disabled.

#### Scope of Instruction.

122. The instruction of the individual should cover:

- (1) A thorough knowledge of mechanism, stoppages and immediate action.
- (2) Firing positions.
- (3) Marching fire.

- (4) Use of sling.
- (5) Loading.
- (6) Marksmanship (prescribed elsewhere).
- (7) Filling magazines.
- (8) Target designation and preparation of range cards (prescribed elsewhere).
- (9) Ability to recognize and choose the best positions for the automatic rifle (prescribed elsewhere).
- (10) Such technique and theory of fire as applies to the automatic rifle. This includes auxiliary aiming, use of night firing box, etc. (prescribed elsewhere).

### Firing Positions.

#### From the Shoulder.

123. When fired from the shoulder the position with the Browning automatic rifle, prone, sitting, kneeling and standing, is a modification of that used with the service magazine rifle.

124. When firing with automatic setting (exceptional) the soldier will lean into the piece as he would lean into a strong wind. The effect of the recoil is that of a strong, steady push against the firer.

#### Adjustment of Sling for Marching Fire.

125. The gunner having previously adjusted the sling, as to length, grasps same at the middle with his left hand and allows the rifle to hang by the sling with the barrel down, raises rifle with left hand and slips sling over the head and on to the left shoulder, at the same time passing right hand through the sling and grasping receiver at ejection opening. He then turns rifle counter-clockwise and with the right hand passes rear end of sling to rear and under butt so that it extends from rear sling swivel, along right side of stock, behind the back and over the left shoulder, thence to front sling swivel. The gunner having adjusted the sling inserts the butt in the butt support. (See Plate II).

126. The sling should be of such length as to hold the rifle barrel horizontal when the rifle is not supported by the gunners' hand.

127. For close order the sling should be of such length as to allow the rifle to be carried behind the right shoulder, with the sling passing over the right shoulder only. For ex-

tended order, the rifle is always slung as for Marching Fire. The rifle should be so slung at any preparatory command for marching.

128. During the execution of the Manual, the rifle is kept at the order arms.

### Marching Fire.

(See Plate III.)

129. The following position is prescribed for firing while marching. The sling adjusted as described above (paragraph 125), left hand grasps forearm, thumb extended along forearm, sling pulled taut. Right hand just in front of comb of stock with fore-finger in trigger guard. The rifle being firmly supported by the butt support and the sling, directed with the left hand and fired with the right.

130. The above described position should always be used in marching fire when the gunner is provided with a butt support. It has been found, when the butt support is lost or not available, that the gun may be fired while marching by placing the butt of the rifle in the pit of the stomach and supporting the rifle with the sling in a similar manner to that described above. The firer should bend over well at the waist and bend his knees slightly while firing.

131. Firing with the butt of the rifle in the pit of the stomach is an uncomfortable position for some men. The rifle may be fired by adjusting the sling as before, except that it is shortened so as to support the forward end of the rifle when the butt is held under the arm pit. The butt is raised well up under the arm pit and the stock clamped with the right arm. The rifle is pushed forward against the sling until the latter gives it a steady support.

132. Any position but that prescribed in paragraph 129 (from the hip, using butt support), is to be regarded as exceptional and should not be used except when the gunner has no butt support.

133. After the soldier has been thoroughly instructed in the position, while at the halt, he will simulate fire while marching (commands and signals for firing, those prescribed in I. D. R., except as noted hereafter). The gunner advances, firing as either foot strikes the ground and between steps. He keeps his eyes on the target and corrects elevation by observation of impact.



PLATE II.  
The sling adjusted for marching fire.



**PLATE III.**

Position for firing from hip, using butt support.

## TRAINING OF THE GUN TEAM.

### Scope of Training.

134. The rifle team should be so trained as to get maximum efficiency out of the efforts of the individual members. This requires co-ordination of all their activities. The training should include the following:

(1) Drill.—Taking up different formations and the duties of the gunner and ammunition carriers.

(2) Maneuvering through the various formations of close order drill suitable for use with the automatic rifle team and the thorough training of the gunner and carriers in their duties in each of the several formations.

(3) Utilization of natural features as regards cover.

(4) Service of the piece by two members of the team and by one man alone. Exchange of magazines by first and second carriers and loading of magazines while in position.

(5) Advance of the team as a whole.

(6) Advance of the team moving forward one man at a time.

(7) Transmitting of fire orders from a corporal or sergeant to the gunner by the first carrier.

### Formation of the Team.

135. For drill, the team is formed in single rank. The team acting alone maneuvers on the gunner as the base. Post of the first carrier is by the gunner's side and on his right. When the team is deployed, the first carrier (loader), at any command or signal for firing, places his left hand on the gunner's shoulder for the purpose of preserving alignment and interval and transmitting signals. The second carrier (scout) posts himself on a flank five paces to the right or left of the gunner.

136. In action the scout should be on the most exposed flank as a rule. For the purpose of drill, scouts of front rank teams post themselves on the right of the gunner and scouts of rear rank teams on the left of the gunner.

## Duties of the Members of the Rifle Team.

### 137. Gunner:

- (1) To direct his fire on the target.
- (2) To assist the loader in loading.
- (3) To load when firing alone.
- (4) To reduce stoppages.
- (5) To hold his own ammunition as a reserve.
- (6) To clean with loader's assistance.

### 138. First Carrier (loader):

- (1) To watch for signals and transmit same to the gunner.
- (2) To watch for stoppages and assist in reducing same.
- (3) To call **magazine** when the one in use is empty.
- (4) To load.
- (5) To change empty magazines for full ones. This exchange is made by bandolier or a belt with the scout, corporal and sergeant successively.
- (6) To preserve alignment and interval for gunner.
- (7) To assist in cleaning rifle.

### 139. Second Carrier (scout):

- (1) To exchange magazines with loader.
- (2) To fill empty magazines.
- (3) To spot shots for gunner.
- (4) To act as scout and protect the team when the rifle is out of action.

### To Load.

140. **Command.**—1. **MAGAZINE.** At this command the gunner inclines the barrel to the left and releases the magazine catch. He then cocks the piece.

The loader habitually marches, when deployed, with a loaded magazine in his right hand, base in palm of hand, thumb pointing in same direction as cartridges. At the command **MAGAZINE**, he withdraws empty with left hand and, holding it with last two fingers in the palm of the hand, grasps trigger mechanism between thumb and first two fingers, fingers on left hand side (see Plate IV). Thumb and fingers extend slight distance in front of trigger mechanism so as to assist in guiding the magazine. He inserts and pushes home the loaded magazine with right hand. He then returns empty magazine to pocket and draws out a loaded one which he carries as described above.

Magazines are carried in pockets with cartridges down and bullets in one pointing in opposite direction to those in other.

### Loading Exercise.

141. The following drill should be given to perfect the team in loading, the piece being loaded and cocked, empty magazines being used throughout.

Command.—1. *Magazine*, 2. FIRE. At (1) the piece is loaded as prescribed above. At (2) the gunner aims and fires. These commands are repeated as long as the instructor desires.



PLATE IV.

Position of loader's fingers on trigger guard, when loading.

### Firing.

142. Being deployed, to commence firing:

- (1) Range, 300.
- (2) Target, enemy patrol at one o'clock.
- (3) Rate (so many) shots per minute.
- (4) Commence firing.
- (5) Cease firing, or suspend firing.

143. At the first command the team assumes the prone firing position, as already explained, and the gunner sets the sights. At the second command the gunner lays on the target. At the fourth command the gunner begins firing semi-automatically, at rate prescribed, unless a different class of fire has been indicated. During the firing the team performs the duties explained above. At the command cease firing, the rifle is set at safe. Sight leaf is laid down. In other respects the team maintains the prone position. At the command suspend firing fire is stopped. Pieces are held loaded and locked in a position of readiness for an instant resumption of firing.

#### To Lie Down.

##### 144. LIE DOWN:

(1) Gunner assumes the prone firing position, as prescribed in the Infantry Drill Regulations. Adjusts the sling if necessary.

(2) Loader (first carrier) jumps immediately to the side of the gunner and drops to the ground ready to perform his function in firing.

(3) The scout (second carrier) closes at once to five yards from the gun and drops to the prone position on the ground.

#### Marching Fire.

145. The piece is habitually loaded when the team is deployed.

**Command.**—1, *Marching Fire*, 2, COMMENCE FIRING, 3. CEASE FIRING.

At (1) the gunner brings his piece to the marching fire position and cocks it. The loader places his hand on the gunner's right shoulder. At (2) the team takes up the march (if at the halt) and commences firing, semi-automatic fire.

#### Field Cleaning.

146. When necessary to clean the rifle in the field or a shell hole the gunner and loader clean the piece.

**Command.**—1, *Clean* 2, RIFLE. At (2) gunner throws out the cleaning kit and starts stripping the rifle. The first carrier opens kit, strips, cleans and reassembles the gas cylinder tube, gas cylinder, etc. The gunner continues stripping the

piece and cleans the barrel (loader should have finished cleaning the gas cylinder assembly by the time the gunner finishes the bore). Loader then cleans the bolt, bolt lock and hammer and starts on the piston and slide. The gunner thoroughly cleans receiver and reassembles bolt mechanism and slide. While the gunner completes assembling the piece the first carrier oils trigger mechanism and packs up cleaning kit.

The scout refills empty magazines.

## THE SQUAD.

### Posts.

147. The squad is formed in close order as prescribed in Infantry Drill Regulations, with a team in each rank. The front rank team is known as team A and the one in the rear rank as team B.

The posts then in close order are as follows:

**Front Rank.**—No. 1, scout (second carrier), No. 2, loader (first carrier), No. 3, gunner, No. 4 corporal.

**Rear Rank.**—No. 1, loader (first carrier), No. 2, gunner, No. 3, blank file, No. 4, scout (second carrier).

### Drill.

148. The squad drills in close and extended order as prescribed in the I. D. R., except as herein stated.

### Duties of the Corporal.

149. (1) To watch for signals from section or platoon leader and repeat same back.

(2) To assign rifle positions, sectors of fire and to designate targets.

(3) To exercise general supervision over rifle teams.

### Deployments.

150. Being in line, to deploy.—1. *As Skirmishers*, 2. MARCH.

At (1) the corporal places himself in front of his squad, if not already there. At (2) team A, moving at a run, deploys abreast of and on the right of the corporal, with five-pace interval between skirmishers. Team B, moving at a run, de-

plays abreast of and on the left of the corporal, with five paces interval between skirmishers.

This deployment places the corporal between his teams, a scout on both flanks and each loader on the right of his gunner. It must be remembered that the posts of the corporal and scout are fixed only for purposes of drill.

**151. Being deployed, to advance by rushes:**

**Command.**—1. BY TEAM (ONE MAN) RUSH.

The squad leader gives the signal ADVANCE BY RUSHES, as prescribed in the I. D. R. and, in addition, holds up one finger if the advance is to be made one man at a time and three fingers spread if it is to be by team. If the advance is by team, the whole team rushes forward at once, maintaining their normal intervals. If the rush is by one man, the scout is the first to go forward. He advances to the position he wishes to occupy, taking advantage of all cover afforded by the terrain or by intervening shell holes. In general, this advance should not be more than fifty yards. With his intrenching tool he prepares a position for the gun and then signals to the gunner "ready." The gunner then advances in the same manner and opens fire as soon as his gun is in position, the scout serving the rifle until the loader arrives. The loader, after picking up all magazines, advances. If the advance is made from a trench or a shell hole each man should leave from a different point, as a sniper might train his sights upon any fixed point of departure, shooting each member as he appears, successively.

**152. Being in skirmish line:**

**Command.**—1. *Squad columns*, 2. MARCH.

Each squad leader moves to the front, followed in succession by the front and rear ranks in single file.

**Continuous Fire.**

**153. Command.**—1. *Continuous fire*, 2. COMMENCE FIRING, 3. CEASE (SUSPEND) FIRING.

At (2) the A team gunner opens fire. Just before his magazine is exhausted the A team loader signals COMMENCE FIRING to the B team; the rifles thus alternate fire.

They will habitually fire with semi-automatic setting.

### Advancing.

154. When firing from shell holes no fixed regulations can be prescribed. The members of the team conform to the principles laid down above.

155. When advancing by rushes, by team, the advance of one rifle is covered by the fire of the other.

### THE SECTION.

156. The section executes the movements and firings as explained for the team and squad. The section leader normally takes post in rear of the center of his section but he may go wherever his presence is needed.

157. Except in marching fire the section will seldom act as a unit, but rather as two squads whose action will be supervised by the sergeant of the section. The duties of the sergeant will thus usually be those pertaining to fire direction rather than fire control. The sergeant, under the orders of the platoon leader, will be responsible for the training of the section.

158. Being in skirmish line:

Command.—1. *Section column*, 2. MARCH.

The section leader moves forward through the center of the section. The squad to the right of the section leader marches to the left and follows him in file; the squad to the left marches in like manner to the right. Each section leader then conducts the march of his section in double column of files.

159. Being in skirmish line:

Command.—1. *Section column of files*. 2. MARCH.

The section leader moves forward through the center of the section; the squad to the right of the section leader marches to the left and follows him in file; the squad to the left marches to the right and follows the right squad in file.

RETURN TO the circulation desk of any  
University of California Library

or to the

NORTHERN REGIONAL LIBRARY FACILITY  
Bldg. 400, Richmond Field Station  
University of California  
Richmond, CA 94804-4698

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS

- 2-month loans may be renewed by calling  
(510)642-6753
- 1-year loans may be recharged by bringing  
books to NRLF
- Renewals and recharges may be made  
4 days prior to due date

DUE AS STAMPED BELOW

NOV 26 2003

Photomount  
Pamphlet  
Binder  
Laylord Bros.  
Makers  
Stockton, Calif.  
PAT. JAN. 21, 1908

YC 6315

664364

UD345  
B742

UNIVERSITY OF CALIFORNIA LIBRARY

