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# FM 23-15

DEPARTMENT OF THE ARMY FIELD MANUAL

## BROWNING AUTOMATIC RIFLE CALIBER .30 M1918A2

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DEPARTMENT OF THE ARMY • JULY 1951

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FIELD MANUAL  
BROWNING AUTOMATIC RIFLE  
CALIBER .30 M1918A2

FM 23-15 } DEPARTMENT OF THE ARMY  
CHANGES No. 3 } WASHINGTON 25, D. C., 22 May 1957

FM 23-15, 9 July 1951, is changed as follows:

**13. Disassembly of the Trigger Group**

To disassemble the trigger group—

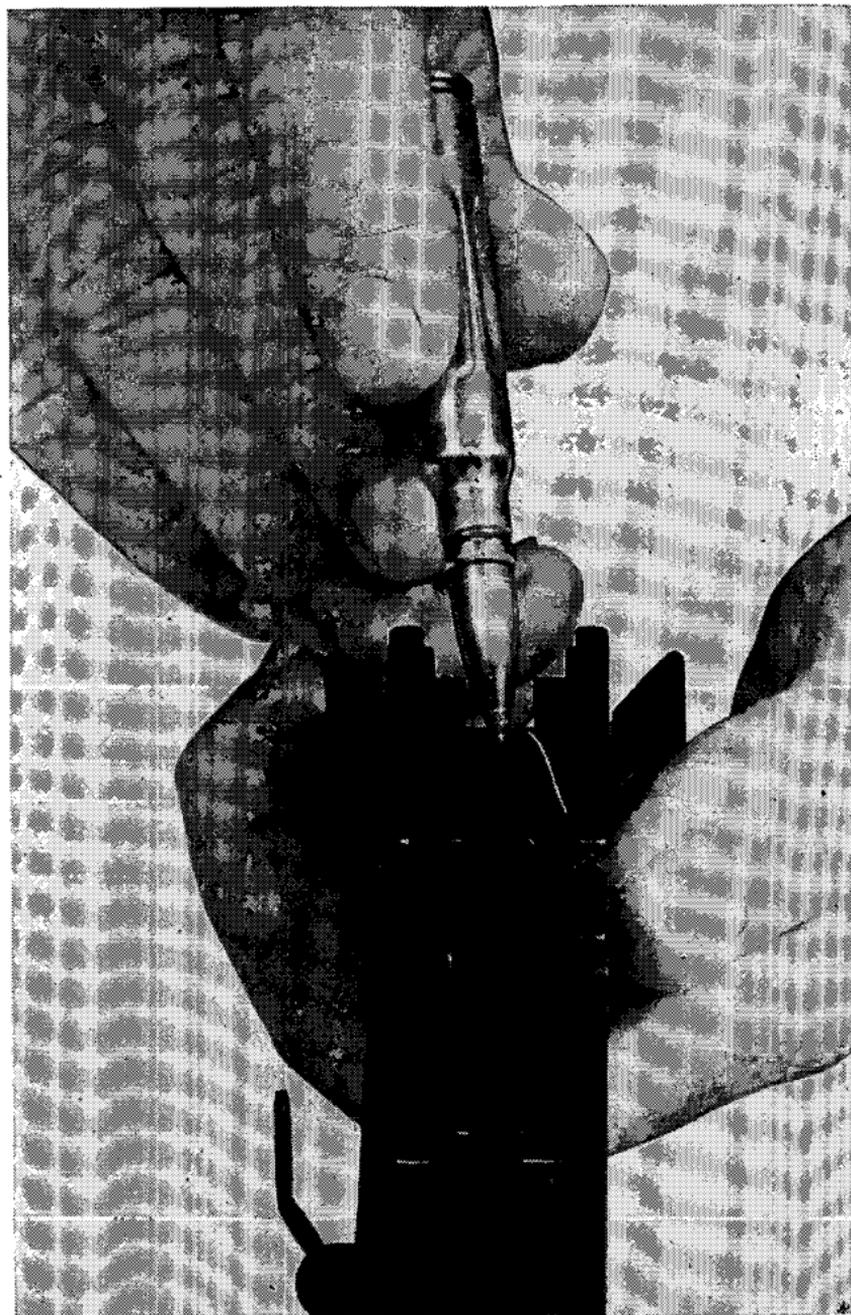
\* \* \* \* \*

c. To remove the \* \* \* the sear spring. **An alternate method of removing the sear spring can be used as follows. Place the trigger group on a flat surface with the magazine guides toward your body. Using a dummy cartridge, insert the point into the notch on the square end of the sear spring, and push forward unseating the sear spring (fig. 38.1). Remove the sear spring.**

**21. General**

(Superseded)

An automatic rifleman is not expected to be a technical expert on the automatic rifle, but must understand functioning, or how and why the automatic rifle operates. With an understanding of functioning, stoppages can be located and reduced quickly.



*Figure 38.1. (Added) Alternate method of removing the sear spring.*

## 22. What Functioning Is

(Superseded)

a. Functioning is the operations of loading, firing, and unloading of a firearm. This is known as the *cycle of operation*. This cycle is similar in all small arms weapons.

b. The cycle of operation is broken down into eight steps—

- (1) Feeding.
- (2) Chambering.
- (3) Locking.
- (4) Firing.
- (5) Unlocking.
- (6) Extracting.
- (7) Ejecting.
- (8) Cocking.

c. As functioning of the operating group is discussed, remember that some of the steps occur at the same time.

### 22.1 Feeding

(Added)

a. Feeding is the action of placing a cartridge in the receiver in back of the barrel ready for chambering.

b. This action is accomplished by the magazine exerting an upward pressure on the bottom of the magazine follower causing the cartridge to be forced up into the path of the feed rib ready for chambering.

c. Feeding starts during the rearward movement of the bolt. As the feed rib clears the top round in the

magazine on the rearward movement, the compressed magazine spring moves the top round up into the path of the feed rib.

## 22.2 Chambering

(Added)

a. Chambering is the action of stripping the round from the magazine and loading it into the chamber ready for firing.

b. As the operating parts move forward, the front of the feed rib contacts the base of the top round in the magazine (fig. 94). As soon as the cartridge moves forward about one-fourth inch, the nose of the cartridge strikes the bullet ramp and is deflected upward toward the chamber. As the cartridge continues forward, its base approaches the center of the magazine

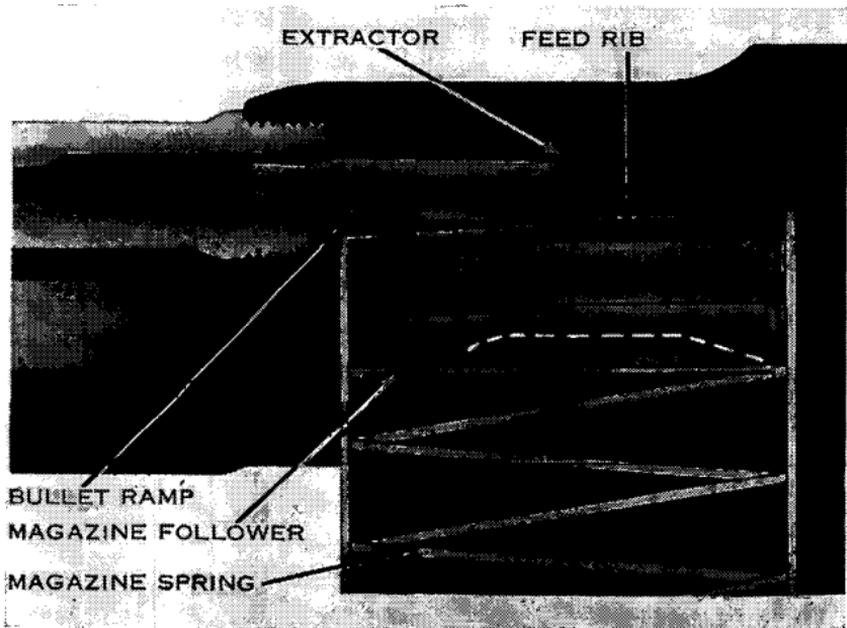


Figure 94. (Superseded) Chambering.

where it is forced out of the magazine by the magazine follower and spring. When the cartridge is released by the magazine, the nose of the bullet is far enough into the chamber so that it is guided by the chamber from this point on. The base of the cartridge slides up the face of the bolt and under the extractor. (The cartridge may fail to slide under the extractor at this time. If it does, the extractor will snap over the base of the cartridge as the bolt reaches its most forward position and the cartridge is seated in the chamber.)

### **22.3 Locking**

(Added)

*a.* Locking is the action of blocking the barrel behind the cartridge so that the cartridge case will not be driven back by the high pressure of the gases, and the gases will not escape and harm the firer.

*b.* For simplicity, locking is broken down into three steps—when locking begins, what takes place during locking, and when locking is completed. Locking begins when the circular cam surfaces on the underside of the bolt lock contact the rounded rear shoulders of the bolt supports (fig. 95C). The bolt continues forward and the bolt link moves upward and to the rear about the hammer pin. As the bolt link moves upward, it forces the bolt lock upward and into the locking recess in the top of the receiver (fig. 95B). In its forward movement, the speed of the bolt assembly decreases gradually from the instant the bolt lock starts to rise until the hammer pin passes under the bolt link pin. This reduces the possibility of damaging the firing pin. Locking is completed when the

hammer pin is directly under the bolt link pin (fig. 95A).

## 22.4 Firing

(Added)

*a.* Firing is the action of igniting the primer, or actually firing the cartridge.

*b.* The tang of the firing pin is buried in the slot on the underside of the bolt lock at all times except when the bolt lock is in the locking recess. This keeps the head of the firing pin locked away from the center rib of the hammer during the rearward and forward motion of the bolt assembly, so that the weapon cannot fire. When locking is completed and the bolt lock is in the locking recess, the tang of the firing pin is no longer buried in the bolt lock, and the head of the firing pin can be struck by the center rib of the hammer. The slide and hammer continue forward another one-tenth inch after the bolt lock is in the locking recess. The center rib of the hammer strikes the head of the firing pin, driving the firing pin forward a short distance through the feed rib. The firing pin striker hits the cartridge primer and fires the cartridge.

*c.* The forward movement of the slide is completed when the forward shoulders of the slide strike the rear shoulders of the gas cylinder tube. This action cushions the shock of the hammer striking the firing pin and reduces breakage of the firing pin.

*d.* When a cartridge is fired, the bullet is driven through the barrel by the pressure from the expanding powder gas. About 6 inches from the muzzle, the bullet passes a small hole in the bottom of the barrel. This hole is called the barrel port (fig. 96).

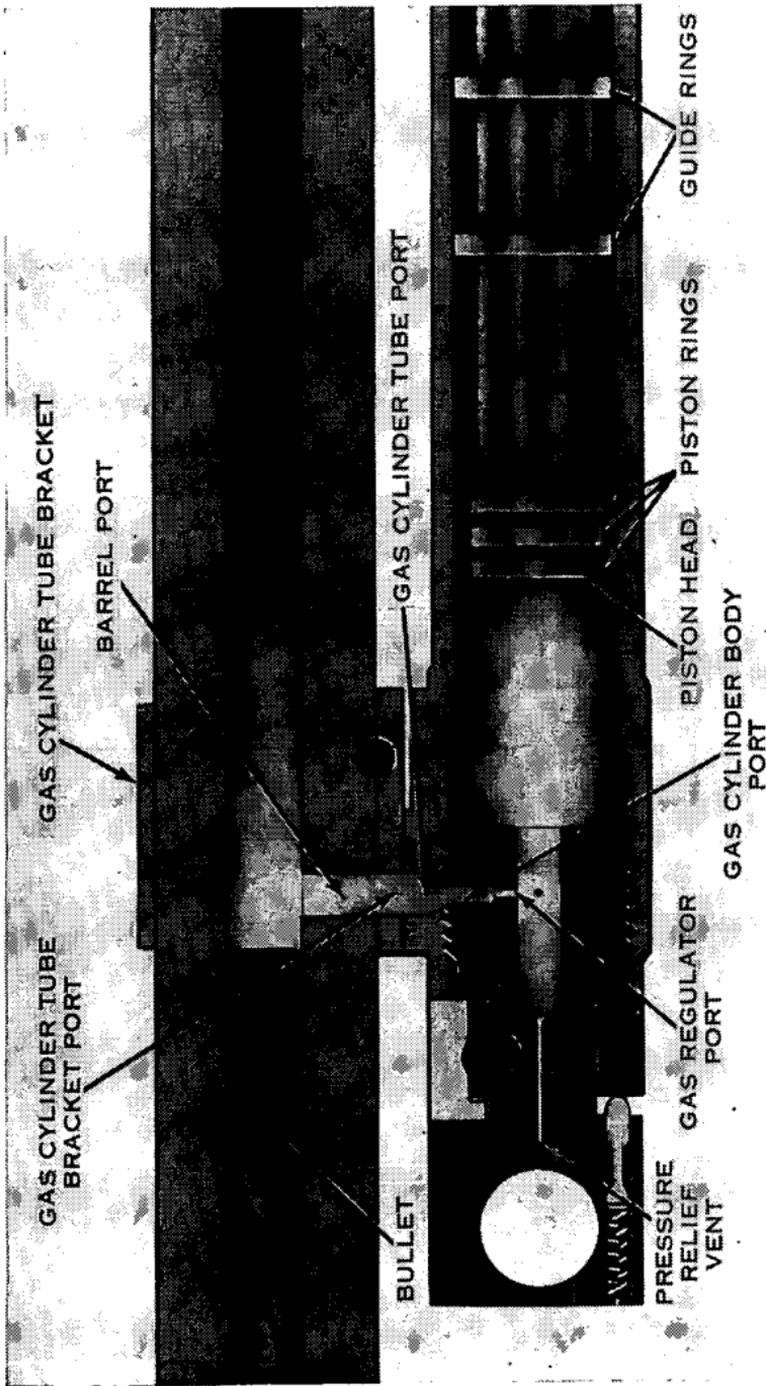


Figure 96. (Superseded) Firing.

*e.* As the bullet passes the barrel port, some of the gas under high pressure passes through it. Gas continues to pass through the gas ports for the short time that it takes the bullet to travel the 6 inches from the barrel port to the muzzle. Figure 96 shows the path taken by the gas. First it goes through the barrel port, then the gas cylinder tube bracket port, the gas cylinder tube port, the gas cylinder body port, the gas regulator port, and then into the gas cylinder well. The gas regulator port is the smallest of the four gas ports. It controls the amount of gas entering the gas cylinder assembly. All of the gas ports are stationary except the gas regulator port. There are three different sized gas regulator ports.

*f.* When the gas rushes into the gas cylinder, it strikes the gas piston head a sharp blow, moving the piston to the rear. Note the three piston rings near the head of the gas piston. When the gas piston has moved approximately nine-sixteenth of an inch, the three piston rings and the gas piston move out of the gas cylinder assembly. The gas then expands around the piston head and escapes from the six gas escape ports in the gas cylinder tube and the pressure relief vent in the gas cylinder assembly. Any gas remaining in the barrel escapes as soon as the bullet leaves the muzzle.

*g.* The two guide or bearing rings on the gas piston serve two purposes. They prevent the escape of gas back into the operating parts, and hold the front end of the gas piston in the center of the gas cylinder tube after the gas piston head has moved out of the gas cylinder assembly.

*h.* Because the slide is attached to the piston, it

moves when the piston moves. As the piston and slide move to the rear, the recoil spring is compressed, storing energy for the forward movement, and the weapon is unlocked. The center rib of the hammer is withdrawn from the head of the firing pin during the initial movement of the slide to the rear.

### **23. The Functioning Cycle**

Rescinded

### **24. Functioning of the Operating Group**

Rescinded

### **25. Action of the Gas**

Rescinded

### **26. Movement of the Slide of the Rear**

Rescinded

### **27. Unlocking**

(Superseded)

a. Unlocking is the action of unblocking the breech end of the rifle. For simplicity, unlocking is studied in three steps—when unlocking begins, what takes place during unlocking, and when unlocking is completed.

b. When the operating parts are completely forward, the hammer pin is 0.19 inch ahead of the bolt link pin. The center rib of the hammer is slightly in rear of the head of the firing pin. During the first 0.19-inch movement of the slide assembly to the rear, the bolt and bolt lock do not move. The gas pressure is being reduced. The unlocking action begins when the

hammer pin is directly under the bolt link pin (A, fig. 95).

c. As the slide continues to the rear, the bolt link moves forward and downward about the hammer pin (B, fig. 95) The bolt lock is drawn downward, to the rear, and out of the locking recess.

d. Unlocking is completed when the bolt lock is completely down and out of the locking recess (C, fig. 95). At this point the slide has moved 1.39 inches to the rear, and the bolt, bolt lock, and slide are moving to the rear at the same speed. The bolt lock is now supported by the bolt supports. The bolt and bolt lock do not attain the speed of the slide until the bolt lock has moved 1.39 inches to the rear. This is very important for two reasons. First, the parts are not subjected to an undue strain because of the sudden start when the cartridge explodes. Second, the slow initial movement delays the opening of the chamber. By the time the chamber opens, the gas pressure has been reduced.

e. As the bolt lock moves downward from the locking recess, the firing pin is withdrawn (B, fig. 95). A cam surface in the slot on the underside of the bolt lock operates on a cam surface on the tang of the firing pin. This action withdraws the striker of the firing pin back into the face of the bolt.

## **28. Withdrawal of the Firing Pin**

Rescinded

## **29. Extraction**

(Superseded)

a. Extraction is the action of removing the cartridge or fired cartridge case from the chamber.

b. The extractor is located on the upper right side of the bolt next to the ejection opening. Keep in mind that the extractor grasps the base of the cartridge. This action holds the base of the cartridge firmly against the face of the bolt. When the automatic rifle is fired, the empty cartridge case expands and binds against the chamber, so there must be some means of loosening the cartridge case before removing it. During their initial movement, the bolt and bolt lock move slowly in comparison with the movement of the slide. As the bolt lock moves downward from the locking recess during unlocking, the circular cam surfaces on the underside of the bolt lock act on the rounded rear shoulders of the bolt supports (B, fig. 95). This contact produces a strong lever action, known as slow initial extraction, that loosens the empty cartridge case. When the bolt lock is down and out of the locking recess, the bolt drawn by the bolt lock and bolt link moves to the rear with the same speed as the slide assembly. The empty case is carried with and held against the face of the bolt by the extractor.

### **30. Ejecting**

(Superseded)

a. Ejecting is the action of removing the cartridge or fired cartridge case from the rifle after it has been extracted from the chamber.

b. The ejector is located on the trigger group. When the slide reaches a point approximately one-fourth inch from the end of its travel, the base of the cartridge case strikes the ejector. The cartridge case pivots about the extractor and passes through the

ejection opening. As the bolt continues to the rear, the cartridge case strikes the side of the receiver to the rear of the ejection opening and is ejected to the right front.

### **30.1 Cocking**

(Added)

a. Cocking is the action of placing the parts in readiness for firing.

b. Cocking begins with the initial movement of the slide to the rear, and is completed when the rear of the slide strikes the sear release and buffer head, and the recoil spring is fully compressed.

c. As the parts move to the rear, the recoil spring is being compressed. This action stores the necessary energy for the forward movement. The operating parts will move forward if the trigger is held or pressed to the rear. If the trigger is released, the sear will engage the sear notch on the underside of the slide, halting the firing cycle. When the trigger is pressed, the sear nose is depressed and is disengaged from the sear notch on the slide. The slide assembly is then free to move forward under the force of the expanding recoil spring. As the slide moves forward, it carries the operating parts with it.

### **32. Action of the Recoil Spring**

Rescinded

### **33. Feeding**

Rescinded

### **34. Locking**

Rescinded

### **35. Firing the Cartridge**

Rescinded

### **36. Termination of the Forward Movement**

Rescinded

### **53. Gas Adjustment**

\* \* \* \* \*

*d.* (Added) A new gas cylinder assembly has been devised and is composed of the following parts: gas cylinder body, body lock key, regulator, and the body lock spring pin (fig. 111). On the face of the regulator there are three circles of different sizes. These circles correspond with similar size gas ports in the body of the regulator. The rifle is normally operated with the regulator on the smallest port and the setting is not varied unless the rifle shows signs of insufficient gas.

*e.* (Added) The disassembly and assembly of the gas cylinder assembly may be facilitated by first removing the gas cylinder tube and wooden forearm from the rifle.

*f.* (Added) To disassemble the gas cylinder assembly, first drift out the body lock spring pin from its recess in the gas cylinder body. This can be accomplished using a drift or nail and tapping lightly with the combination tool (care must be taken to insure that the body lock spring pin is not damaged). Next, remove the gas regulator by pulling it out of its recess in the gas cylinder body. Lift out the body lock key from its locking recess in the gas cylinder body, then unscrew the body from the gas cylinder tube in a counterclockwise manner.

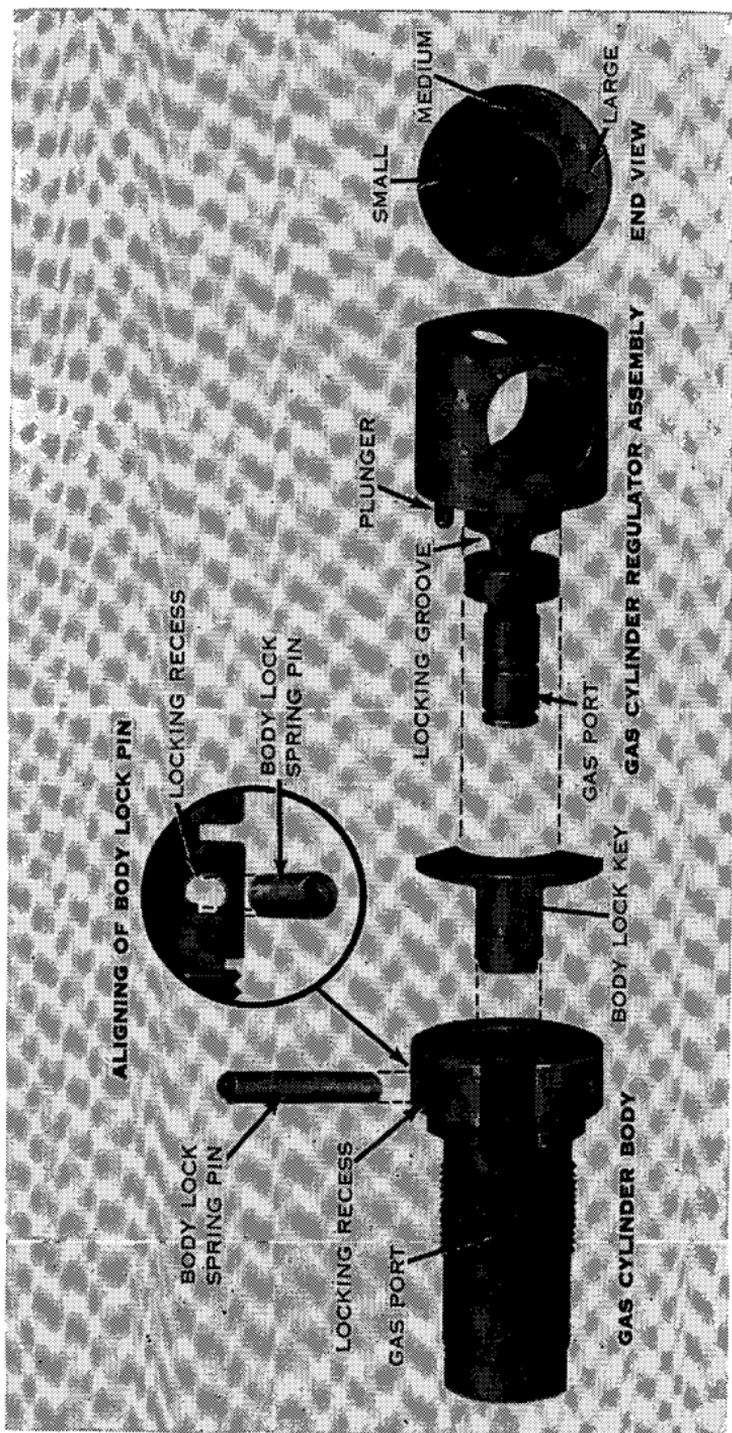


Figure 111. (Superseded) Gas cylinder assembly.

*g.* (Added) To assemble the gas cylinder assembly, screw the gas cylinder body into the gas cylinder tube fingertight, and back off until the gas cylinder body port is perfectly alined with the gas cylinder tube port (this can be accomplished by observing the alinement of the gas ports when held up to the light as viewed from the gas cylinder tube port). If the gas cylinder tube is not disassembled from the rifle, this alinement can be accomplished by screwing the gas cylinder body into the gas cylinder tube fingertight, and backing off until the locking recess on the gas cylinder body is directly under the barrel. If the locking recess is not under the barrel in either case, the alinement of the gas ports has not been completed and the rifle will not function. Next, lock the gas cylinder body in position by inserting the body lock key into its recess. Insert the regulator into the gas cylinder body making sure that the regular plunger does not rest on any portion of the body lock key, and lock it in position with the body lock spring pin (before the body lock spring pin is inserted, push in lightly on the regulator to compress the regulator plunger so the holes in the gas cylinder body are alined with the locking groove on the regulator to receive the body lock spring pin). The body lock spring pin must be so positioned so that the groove in the spring is alined with either edge of the regulator groove. This prevents binding and damaging of the body lock spring pin.

*h.* (Added) In turning the regulator, notice that it turns under pressure. The regulator plunger is constantly exerting pressure on the gas cylinder body when the regulator is assembled and locked in position.

This prevents the regulator from turning during firing. Also, as the regulator moves, notice that it moves in clicks, each click being a gas setting. If the regulator is positioned between ports or clicks, no gas will pass through the regulator as the gas ports are out of alinement.

*i.* (Added) To adjust the gas setting on the smallest port, turn the regulator to the extreme clockwise position. It is prevented from turning further by the regulator plunger contacting the body lock key. To check this, see that the small circle on the face of the regulator is directly under the barrel.

*j.* (Added) If upon firing, the rifle shows signs of insufficient gas, adjust the regulator to the next larger port (medium). This is done by backing the regulator off one click to the left, or counterclockwise, until the medium hole on the face of the regulator is alined under the barrel.

*k.* (Added) If the rifle still shows signs of insufficient gas, adjust the regulator to the large port by turning the regulator to the extreme left or counterclockwise position until the large hole on the face of the regulator is alined under the barrel.

*l.* (Added) The large port is provided for use in case the action of the rifle becomes sluggish through the collection of dirt or the lack of oil under conditions which render prompt corrective action impractical. In the absence of the above conditions, continued use of the regulator adjusted on the large port indicates either a poor alinement of the gas ports, a dirty gas cylinder assembly, or worn parts in the gas system.

## Section V. STOPPAGES AND IMMEDIATE ACTION

(Superseded)

### 55. General

a. A *stoppage* is any unintentional interruption in the cycle of operation. In other words, a stoppage occurs when the rifle stops firing or fails to fire, through no fault of the automatic rifleman. A stoppage may be a failure to feed, chamber, fire, extract, or eject. It is caused by faulty operation of the automatic rifle, magazine, or ammunition.

b. A *malfunction* is a failure of the weapon to function satisfactorily. A malfunction may or may not become evident by actual stoppage of fire. In some cases, for example, when the trigger group does not function satisfactorily, the malfunction may be evidenced by a runaway rifle or one which fires semiautomatic fire when full automatic fire is desired. Malfunctions may also be caused by forces and factors which do not exist at all times. Foreign material, such as dust, mud, or ice, may enter the mechanism and also produce malfunctions. A malfunction may result in a stoppage.

c. *Immediate action* is the prompt action taken by the firer to reduce a stoppage. It is an unhesitating action performed when his rifle fails to fire.

### 56. Common Causes of Stoppages

a. *Stoppages* are caused by worn, weak, broken, or dirty operating parts. An automatic rifleman must train himself to watch for these defects and correct them before they cause a stoppage. The primary

cause of stoppages with the automatic rifle is a defective magazine. For this reason it is particularly important that the magazine be handled carefully. Take proper care of the magazines and the weapon itself, and the automatic rifle can be relied upon to function properly when it is needed. There are five types of stoppages common to the automatic rifle. Their usual causes and the action necessary to reduce them are described below. Examine the automatic rifle before, during, and after firing with these causes in mind. In this manner many stoppages can be prevented.

*b. Five Common Stoppages.*

| Nature of stoppage   | Usual causes   | Corrective action   |
|----------------------|--|---|
| Failure to feed----- | Dirty or dented magazine.<br>Weak or broken magazine spring.<br>Worn magazine notch.                               | Replace the magazine.   |
|                      | Worn or broken magazine catch or spring.<br>Corroded or bent ammunition.   | Replace magazine catch or spring.<br>Replace ammunition.  |
|                      | Failure to chamber---  | Dirty or dented magazine.<br>Weak or broken magazine spring.<br>Worn magazine notch.<br>Ruptured cartridge----- |
| Failure to fire----- | Worn or broken magazine catch or spring.<br>Corroded or bent ammunition.<br>Excessive friction in operating parts. | Replace magazine catch or spring.<br>Replace ammunition.<br>Clean and properly lubricate operating parts.       |
|                      | Excessive friction in operating parts.   | Clean and properly lubricate operating parts.   |
|                      | Weak recoil spring-----<br>Worn or broken firing pin--<br>Faulty ammunition-----                                   | Replace recoil spring.<br>Replace firing pin.<br>Replace ammunition.  |

| Nature of stoppage      | Usual causes   | Corrective action  |
|-------------------------|--|--|
| Failure to extract..... | Dirty chamber.....<br>Broken extractor or extractor spring.  | Clean chamber.<br>Replace broken extractor or extractor spring.  |
| Failure to eject.....   | Insufficient gas.....<br><br>Excessive friction in operating parts.<br><br>Damaged or broken ejector.. | Clean and adjust gas cylinder assembly.<br><br>Clean and properly lubricate operating parts.<br>Replace ejector. |

## 57. Applying Immediate Action

Although many stoppages can be prevented if the weapon, magazines, and ammunition are cared for properly, some stoppages will still occur. Immediate action is taught so that you will be able to immediately and properly reduce these stoppages. Immediate action is taught and performed in two phases.

## 58. First Phase of Immediate Action

The first phase of immediate action is taught as a drill. It is what you do to the weapon to enable you to resume firing immediately. It must be applied quickly and without thought as to the cause of the stoppage. Some stoppages can be eliminated by applying the first phase of immediate action. The five key words that are used to help you learn and remember the first phase of immediate action are—Pull, Push, Tap, Aim and Fire. An explanation of the five key words follows:

a. **PULL** the operating handle all the way to the rear. This action should remove any cartridge or cartridge case remaining in the chamber, providing

the extractor, extractor spring, or the ejector is not broken.

b. **PUSH** the operating handle all the way forward. The weapon is now cocked.

c. **TAP** up firmly on the bottom of the magazine. If the magazine is not fully seated, this should seat it, providing the magazine notch or magazine catch is not worn.

d. **AIM** and **FIRE**.

(Apply the first phase only once. If this fails to reduce the stoppage, apply the second phase.)

### **59. Second Phase of Immediate Action**

If the first phase of immediate action fails to reduce the stoppage, then a more detailed examination of the automatic rifle must be made. The five key words used to help you remember the second phase of immediate action are—Take, Look, Pull, Locate, and Reduce. An explanation of these five words follows:

a. **TAKE** the automatic rifle from the shoulder.

b. **LOOK** at the ejection opening.

c. **PULL** the operating handle slowly to the rear.

d. **LOCATE** the stoppage by observing, as you pull the operating handle to the rear, what is in the ejection opening, what is in the chamber, or what is ejected.

e. **REDUCE** the stoppage and continue to fire.

### **60. Stoppages**

While applying the second phase of immediate action, you will see certain stoppages. You must be able to locate their causes and reduce them. Some of the more common stoppages are—

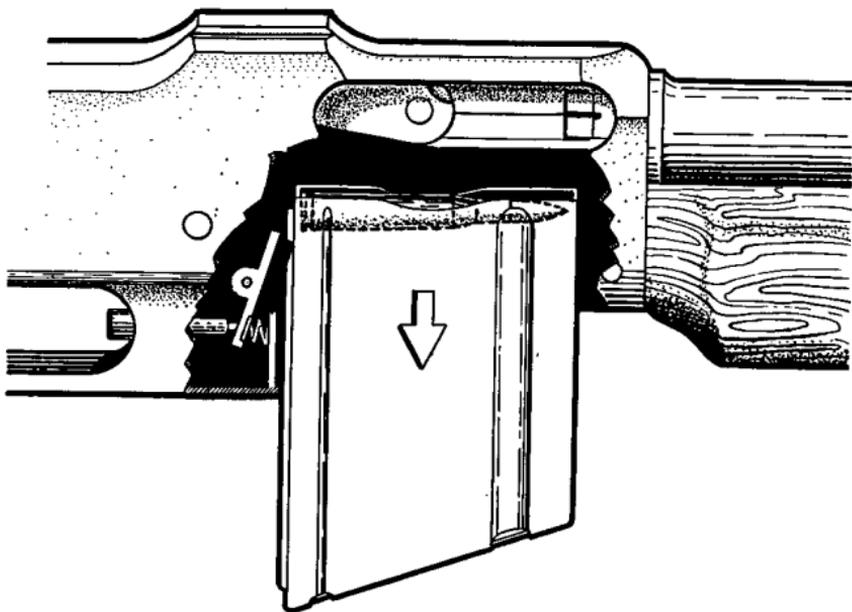
a. *Failure To Feed* (fig. 112).

(1) *Description.* The weapon stops firing or fails to fire after you insert a magazine. The bolt, going forward, fails to contact the top round in the magazine and closes on an empty chamber. This failure to feed is normally caused by a faulty magazine. A worn magazine notch or a damaged magazine catch spring will allow the magazine to drop down in the receiver and the feed rib to pass over the top round as the bolt goes forward. The same thing will occur if you do not tap up on the base of the magazine when loading the magazine into the receiver, or when applying the first phase of immediate action if you do not tap up hard enough to cause the magazine notch to engage the magazine catch. If the magazine is properly seated in the receiver, a dirty or dented magazine or ammunition, or a weak or broken magazine spring may prevent the magazine follower from pushing the top round up into the path of the feed rib as the bolt goes forward.

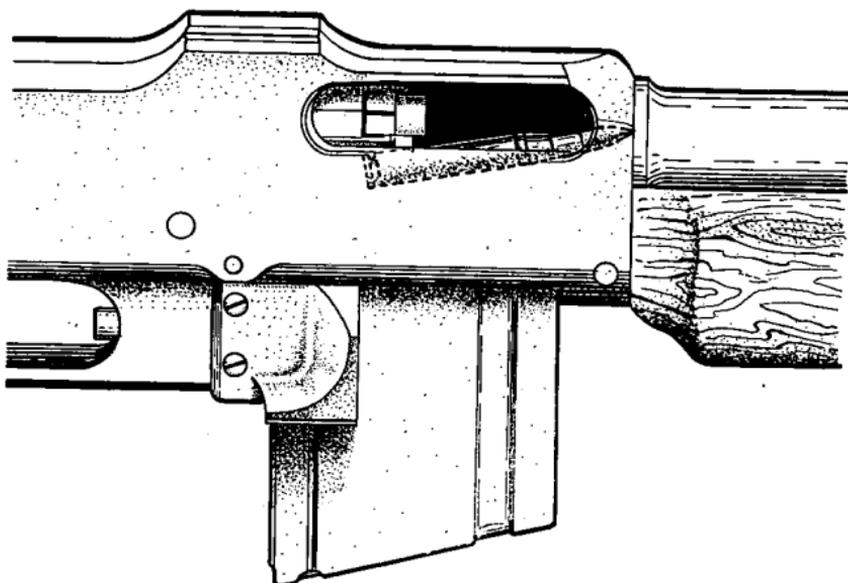
(2) *Remedy.* Replace or clean the magazine or ammunition. Replace magazine catch or spring.

b. *Partial Chambering* (fig. 113).

(1) *Description.* The weapon stops firing with a live cartridge starting into the chamber, at such an angle as to jam the operating parts, keeping the bolt from closing. The feed rib is riding over the base of the cartridge in the magazine, catching it on the top and pushing



*Figure 112. (Superseded) Failure to feed.*



*Figure 113. (Superseded) Partial chambering.*

it part way into the chamber as shown in figure 113. This type of stoppage is caused by a faulty magazine, faulty ammunition, or a worn or damaged magazine catch or catch spring under the same condition as with the failure to feed. The only difference is that the bolt does contact the top round forcing it partially into the chamber.

- (2) *Remedy.* Replace or clean the magazine or ammunition. Replace the magazine catch or spring.

c. *Double Chambering* (fig. 114).

- (1) *Description.* The weapon stops firing when the bolt attempts to chamber two cartridges at the same time. This stoppage may be caused by a faulty magazine. During initial loading, the top cartridge jumps out of the

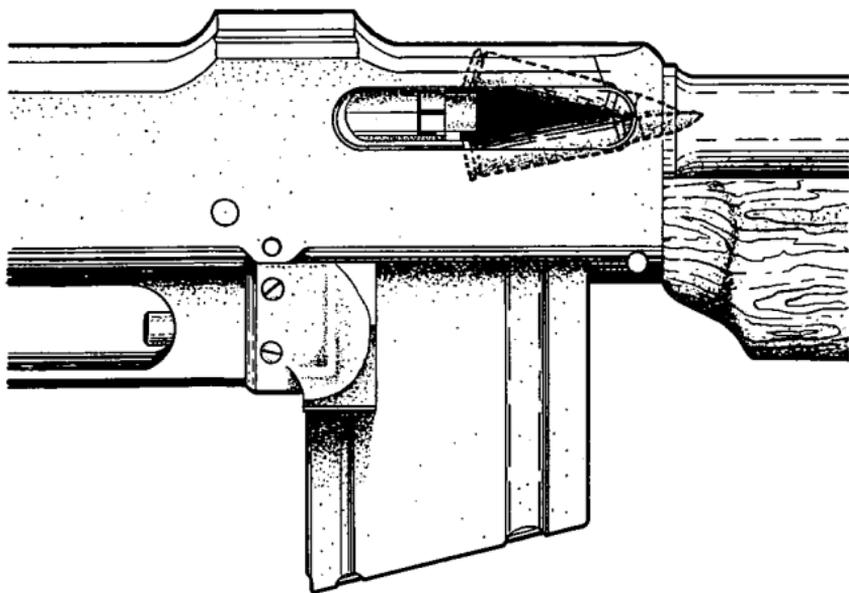


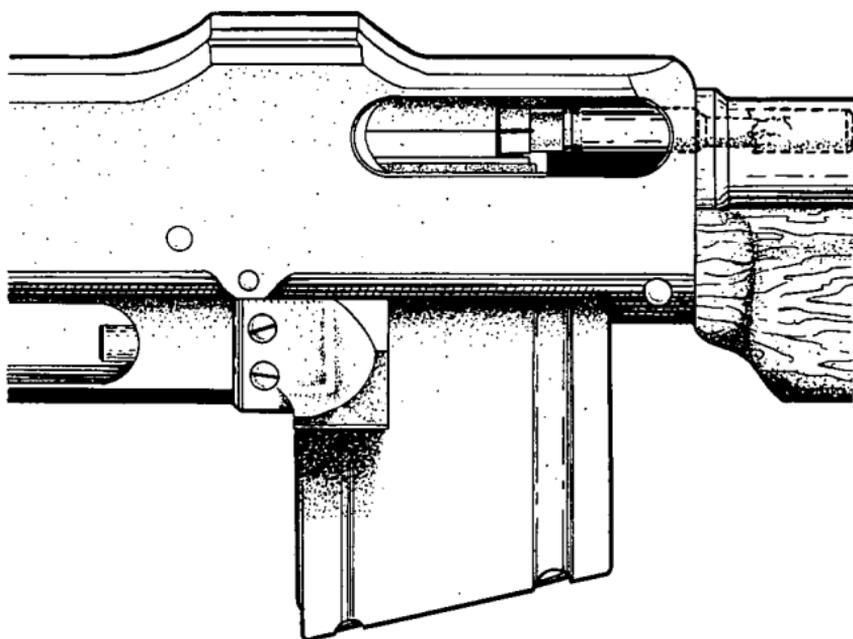
Figure 114. (Superseded) *Double chambering.*

magazine. As the bolt moves forward the feed rib contacts the top round in the magazine, causing two cartridges to move forward for chambering, resulting in a jam. This stoppage may be caused when applying the first phase of immediate action to a partial chambering. In any case, the stoppage is due to magazine trouble.

(2) *Remedy.* Change the magazine.

d. *Failure To Chamber Due to Ruptured Cartridge* (fig. 115).

(1) *Description.* The weapon stops firing when a live cartridge is forced part way into the chamber but is blocked by a ruptured cartridge still in the chamber. The cartridge



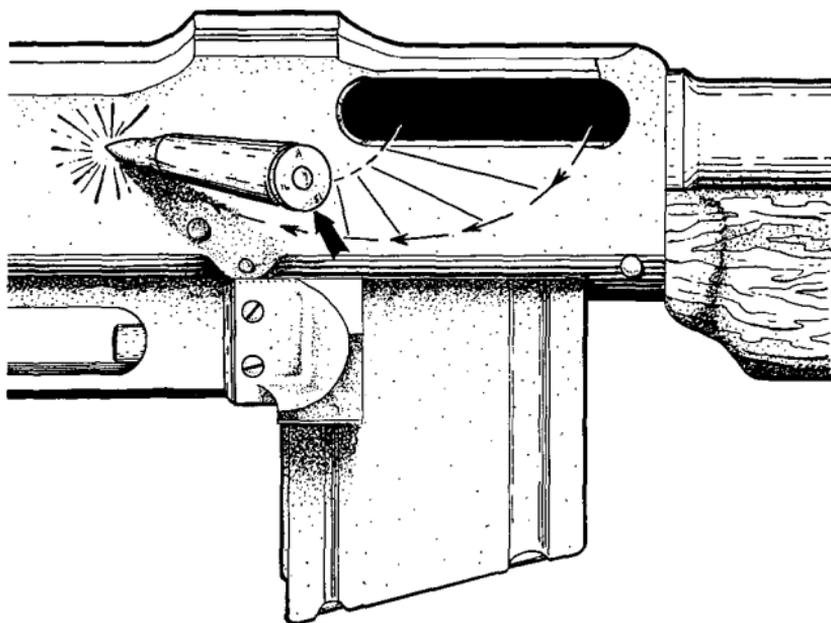
*Figure 115. (Superseded) Failure to chamber due to ruptured cartridge.*

which is in the chamber was ruptured because of a dirty chamber, faulty ammunition, or excessive head space. A stoppage resulting from excessive head space is very rare.

- (2) *Remedy.* Clean the chamber and check or replace faulty ammunition. In rare instances the head space must be adjusted. If the head space needs adjustment, turn the weapon in to ordnance.

*e. Failure To Fire Due to a Broken Firing Pin* (fig. 116).

- (1) *Description.* The weapon fails to fire as the bolt goes forward, loading a live round into the chamber. When applying the second phase of immediate action, a live round is



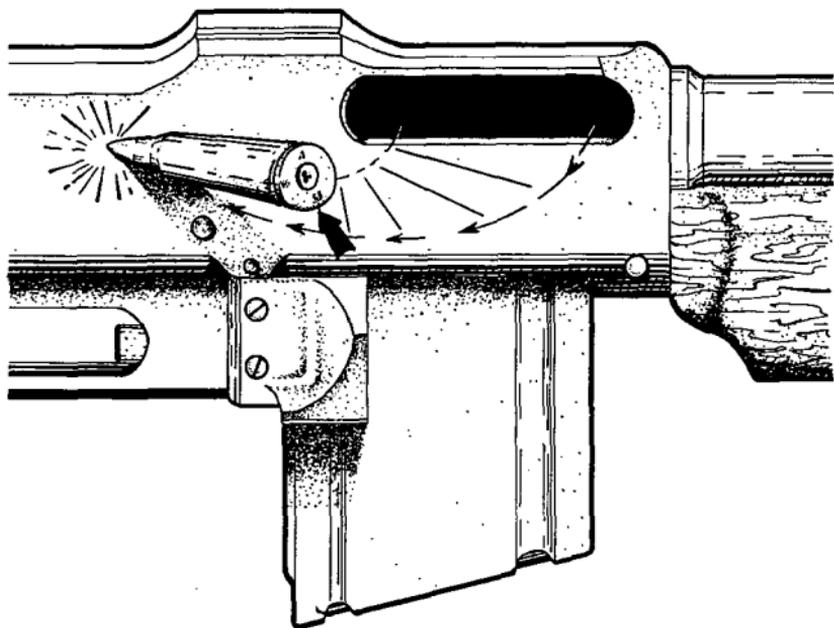
*Figure 116. (Superseded) Failure to fire due to broken firing pin.*

ejected from the receiver with the primer not dented.

(2) *Remedy.* Replace the broken firing pin.

*f. Failure To Fire Due to Excessive Friction, a Weak Recoil Spring, or Faulty Ammunition* (fig. 116.1).

(1) *Description.* The weapon fails to fire as the bolt goes forward, loading a live round into the chamber. When applying the second phase of immediate action, a live round is ejected from the receiver with the primer slightly dented. This stoppage can be caused by excessive friction. If the rifleman is careless about cleaning and oiling his weapon, the operating parts may move forward too

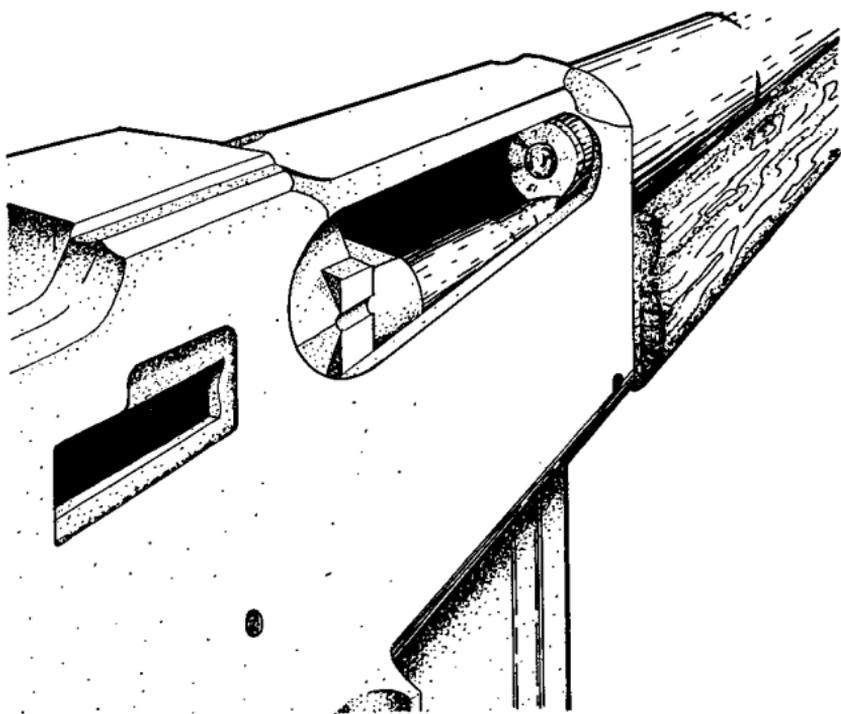


*Figure 116.1. (Added) Failure to fire due to excessive friction, a weak recoil spring, or faulty ammunition.*

slowly for the firing pin to strike the primer with sufficient force to ignite the cartridge. The same result would be obtained if the weapon has a weak recoil spring. If none of the above, the failure to fire will undoubtedly be due to faulty ammunition.

- (2) *Remedy.* Clean and oil the weapon, or replace the weak recoil spring. If repeatedly caused by faulty ammunition, suspend use of that particular lot of ammunition and report to the ammunition officer.

*g. Failure To Extract Due to Broken Extractor or Extractor Spring (fig. 116.2).*

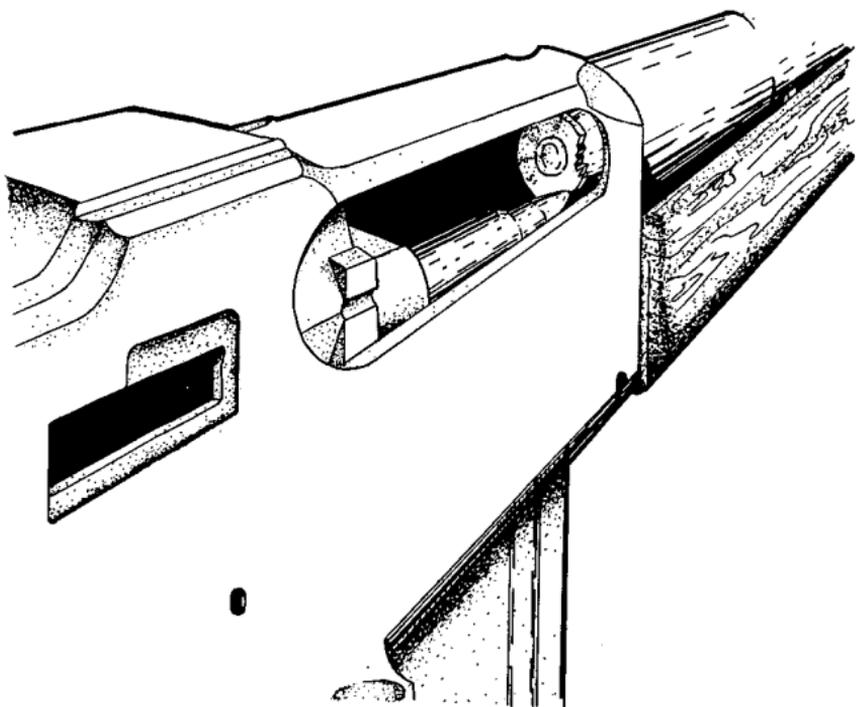


*Figure 116.2. (Added) Failure to extract due to broken extractor spring.*

- (1) *Description.* The weapon stops firing when an empty cartridge case, not extracted, blocks the entry of a live cartridge into the chamber. This type of stoppage is caused by a worn or broken extractor or extractor spring.
- (2) *Remedy.* Replace worn or broken extractor or extractor spring.

*h. Failure To Extract Due to a Dirty or Pitted Chamber or Faulty Ammunition (fig. 116.3).*

- (1) *Description.* The weapon stops firing when an empty cartridge case, not extracted, blocks the entry of a live cartridge into the chamber. This type of stoppage is caused by a dirty or



*Figure 116.3. (Added) Failure to extract due to dirty or pitted chamber, or faulty ammunition.*

pitted chamber or faulty ammunition. The empty cartridge case was wedged so tightly against the walls of the chamber, or was so weak, that it was easier for the extractor to pull off part of the rim of the cartridge case than to extract it from the chamber.

- (2) *Remedy.* Remove empty cartridge case and clean the chamber. Replace faulty ammunition. If the chamber is pitted, turn the weapon in to ordnance.

i. *Failure to Eject* (fig. 116.4).

- (1) *Description.* The weapon stops firing when an empty cartridge case, in the ejection opening, blocks the entrance of a live cartridge into the chamber. The empty cartridge case was not completely ejected during the rearward movement of the operating parts and is

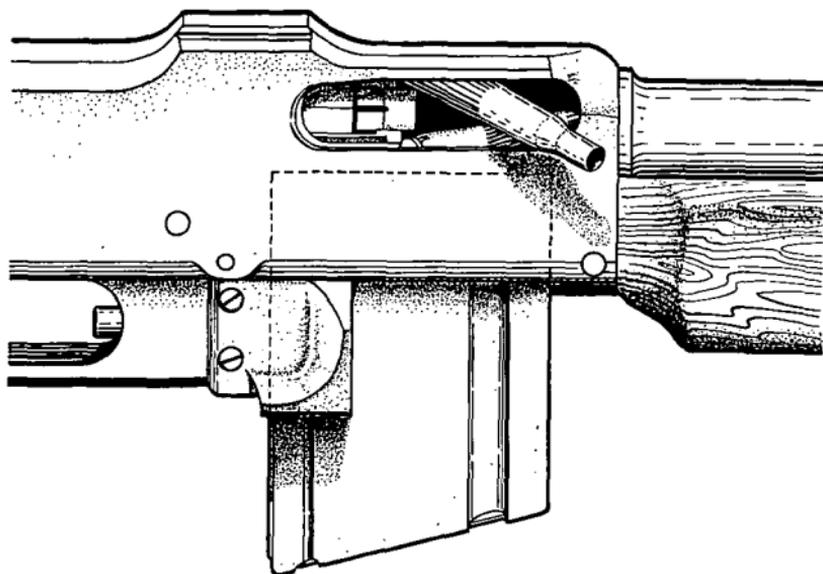


Figure 116.4. (Added) *Failure to eject.*

wedged in the ejection opening as the operating parts came forward. This type of stoppage is caused by insufficient gas, excessive friction, or a broken or worn ejector. Insufficient gas may be the result of a dirty gas system. If the operating parts are dirty, the gas striking the piston may not be sufficient to overcome the resulting friction in the operating parts. In either case, the operating parts do not move to the rear with sufficient force to eject the empty cartridge case from the receiver. The same action will occur with a worn out or broken ejector. Be continually alert for weak ejection by observing the ejecting of the empty cartridge cases. They should eject to the right front approximately 2 to 4 yards. If empty cartridge cases are dropping next to the receiver, this indicates insufficient gas.

- (2) *Remedy.* Clean and adjust gas system. Clean and oil the operating parts. Replace worn or broken ejector.

*j. Failure To Eject Due to Insufficient Gas* (fig. 116.5).

- (1) *Description.* The weapon stops firing, leaving an empty cartridge case in the chamber with the bolt closed. The weapon will fire single shots if the bolt is manually operated. This type of stoppage is often difficult to recognize and is caused by insufficient gas. In this stoppage, the amount of gas that struck the head of the piston was insufficient

to drive the piston far enough to the rear to eject the empty cartridge case completely.

- (2) *Remedy.* Set the gas regulator on the next larger port or clean the gas cylinder assembly. Clean the chamber if dirty.

*Note.* If, after cleaning and adjusting gas cylinder assembly, the stoppage persists, check for worn or damaged part in the gas system.

### 131. Firing Data Card

(Superseded)

a. Accurate firing records are required to be maintained during range firing. This is accomplished by use of the *firing data card* (fig. 151). A properly kept firing data card will enable the instructor, the coach, or the firer to analyze the firing and determine the

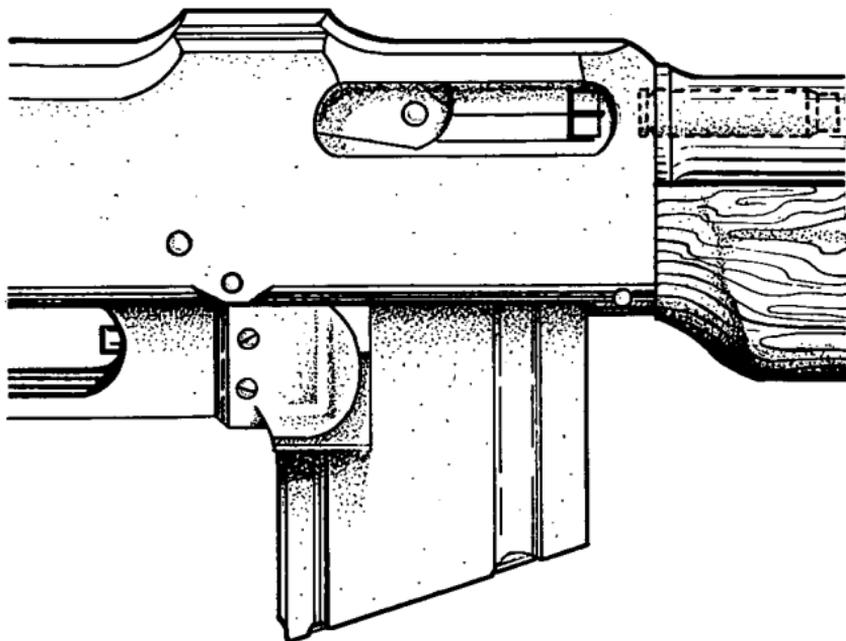


Figure 116.5. (Added) *Failure to eject due to insufficient gas.*

progress being made. By studying the card, they can determine whether or not errors are made in computing for the effect of the wind, or if the zero for each range is correct. By comparing the *call target* with the *hit target*, it can be determined how consistent the firer is in aiming, pressing the trigger, following through, and calling the shots. A properly used firing data card is a valuable aid in learning to shoot the automatic rifle accurately.

b. The firing data card should be kept as neatly as possible. A pencil should always be used to prevent loss of information in the event the card becomes damp. Upon receipt of the card, the firer should be instructed to complete the personal information called for on the front of the card: name, rank, serial number, etc. His rifle number should be entered on the

|                           |    |      |                 |      |                         |  |
|---------------------------|----|------|-----------------|------|-------------------------|--|
| RANGE<br>200              |    |      | HOUR<br>0800    |      | COMPUTATION<br>RV<br>40 |  |
| POSITION<br>PRONE<br>ZERO |    |      | DATE<br>20/9/56 |      |                         |  |
|                           |    |      | WEATHER<br>COOL |      |                         |  |
| NR                        | EL | WIND | LIGHT<br>BRIGHT |      | WIND VELOCITY<br>20 MPH |  |
| 1                         |    |      |                 |      |                         |  |
| 2                         |    |      |                 |      |                         |  |
| 3                         |    |      |                 |      |                         |  |
| 4                         |    |      |                 |      |                         |  |
| 5                         |    |      |                 |      |                         |  |
| 6                         |    |      |                 |      |                         |  |
| 7                         |    |      |                 |      |                         |  |
| 8                         |    |      |                 |      |                         |  |
| 9                         |    |      | ZERO            | WIND | TOTAL SCORE             |  |
| 10                        |    |      |                 |      |                         |  |

①

Figure 152. (Superseded) Firing data card completed for sample problem.

|            |  |  |             |  |  |                      |  |  |
|------------|--|--|-------------|--|--|----------------------|--|--|
| RANGE      |  |  | HOUR        |  |  | COMPUTATION RV<br>80 |  |  |
| POSITION   |  |  | DATE        |  |  | WEATHER              |  |  |
|            |  |  | 9 12 3<br>6 |  |  |                      |  |  |
| NR EL WIND |  |  | LIGHT       |  |  | WIND VELOCITY        |  |  |
| 1          |  |  | CALL TARGET |  |  | HIT TARGET           |  |  |
| 2          |  |  |             |  |  |                      |  |  |
| 3          |  |  |             |  |  |                      |  |  |
| 4          |  |  |             |  |  |                      |  |  |
| 5          |  |  |             |  |  |                      |  |  |
| 6          |  |  |             |  |  |                      |  |  |
| 7          |  |  |             |  |  |                      |  |  |
| 8          |  |  |             |  |  |                      |  |  |
| 9          |  |  | ZERO        |  |  | WIND                 |  |  |
| 10         |  |  |             |  |  | TOTAL SCORE          |  |  |

| FIRING DATA CARD - AUTOMATIC RIFLE |              |           |                   |                                   |                                 |                       |
|------------------------------------|--------------|-----------|-------------------|-----------------------------------|---------------------------------|-----------------------|
| (FM 23-15)                         |              |           |                   |                                   |                                 |                       |
| 1000 INCH RECRD FIRING             |              |           |                   |                                   |                                 |                       |
| NR OF RDS                          | TIME         | FIGURE NR | NR OF TARGETS HIT | SCORE FOR TARGETS HIT (5 x Col 4) | SCORE FOR HITS (1 x NR of Hits) | SCORE (Col 5 + Col 6) |
| 1                                  | 2            | 3         | 4                 | 5                                 | 6                               | 7                     |
| 8                                  | NO LIMIT     | 1         | 1                 | 5                                 | 5                               | 10                    |
| 9                                  | NO LIMIT     | 2         | 1                 | 5                                 | 9                               | 14                    |
| 24                                 | 1 MIN 45 SEC | 8-6       | 8                 | 40                                | 24                              | 64                    |
| 24                                 | 1 MIN        | 7-4       | 8                 | 40                                | 24                              | 64                    |
| 9                                  | NO LIMIT     | 3         | 1                 | 5                                 | 9                               | 14                    |
| 10                                 | 20 SEC       | 4         | 1                 | 5                                 | 15                              | 20                    |
| 1000 INCH TOTAL                    |              |           |                   |                                   |                                 | 186                   |
| PRELIMINARY INSTRUCTION TABLE VI   |              |           |                   |                                   |                                 |                       |

| SCORE CARD - AUTOMATIC RIFLE            |  |       |                             |        |               |  |
|---|--|-------|-----------------------------|--------|---------------|--|
| KNOWN DISTANCE FIRING                   |  |       |                             |        |               |  |
| USE INDELIBLE PENCIL - NO ERASURES      |  |       |                             |        |               |  |
| LAST NAME - FIRST NAME - MIDDLE INITIAL |  |       |                             |        | GRADE         |  |
| DOE, JOHN Q                             |  |       |                             |        | PFC           |  |
| SERVICE NR                              |  |       | UNIT                        |        | COURSE        |  |
| RA 1234567                              |  |       | Co. G, 16 <sup>TH</sup> INF |        | STANDARD      |  |
| SLOW FIRE                               |  |       |                             |        | RANGE (Yards) |  |
| 5 5 5 5 5                               |  |       |                             |        | 200           |  |
| TOTAL                                   |  |       |                             |        | 25            |  |
| ORDER                                   |  |       |                             |        | 1             |  |
| TARGET                                  |  |       |                             |        | 16            |  |
| SLOW FIRE                               |  |       |                             |        | RANGE (Yards) |  |
| 5 5 5 5 5                               |  |       |                             |        | 300           |  |
| TOTAL                                   |  |       |                             |        | 25            |  |
| ORDER                                   |  |       |                             |        | 1             |  |
| TARGET                                  |  |       |                             |        | 16            |  |
| SLOW FIRE                               |  |       |                             |        | RANGE (Yards) |  |
| 5 5 5 5 5                               |  |       |                             |        | 500           |  |
| TOTAL                                   |  |       |                             |        | 56            |  |
| ORDER                                   |  |       |                             |        | 1             |  |
| TARGET                                  |  |       |                             |        | 16            |  |
| AUTOMATIC FIRE                          |  |       |                             |        |               |  |
| NR OF HITS                              |  |       |                             |        | RANGE (Yards) |  |
| 15                                      |  |       |                             |        | 200           |  |
| TOTAL VALUE OF HITS                     |  |       |                             |        | ORDER         |  |
| 75                                      |  |       |                             |        | 1             |  |
| TOTAL                                   |  |       |                             |        | 75            |  |
| TARGET                                  |  |       |                             |        | 16            |  |
| AUTOMATIC FIRE                          |  |       |                             |        |               |  |
| NR OF HITS                              |  |       |                             |        | RANGE (Yards) |  |
| 15                                      |  |       |                             |        | 300           |  |
| TOTAL VALUE OF HITS                     |  |       |                             |        | ORDER         |  |
| 75                                      |  |       |                             |        | 1             |  |
| TOTAL                                   |  |       |                             |        | 75            |  |
| TARGET                                  |  |       |                             |        | 16            |  |
| KD TOTAL                                |  | TRANS |                             | QUAL   |               |  |
| 250                                     |  | 239   |                             | EXPERT |               |  |
| SIGNATURE OF SCORER                     |  |       |                             |        |               |  |
| Herbert Atkins                          |  |       |                             |        |               |  |
| SIGNATURE OF FIRER                      |  |       |                             |        |               |  |
| John Q Doe                              |  |       |                             |        |               |  |
| SIGNATURE OF OFFICER                    |  |       |                             |        |               |  |
| John James 1 <sup>ST</sup> LT.          |  |       |                             |        |               |  |

|            |  |  |             |  |  |                      |  |  |
|------------|--|--|-------------|--|--|----------------------|--|--|
| RANGE      |  |  | HOUR        |  |  | COMPUTATION RV<br>80 |  |  |
| POSITION   |  |  | DATE        |  |  | WEATHER              |  |  |
|            |  |  | 9 12 3<br>6 |  |  |                      |  |  |
| NR EL WIND |  |  | LIGHT       |  |  | WIND VELOCITY        |  |  |
| 1          |  |  | CALL TARGET |  |  | HIT TARGET           |  |  |
| 2          |  |  |             |  |  |                      |  |  |
| 3          |  |  |             |  |  |                      |  |  |
| 4          |  |  |             |  |  |                      |  |  |
| 5          |  |  |             |  |  |                      |  |  |
| 6          |  |  |             |  |  |                      |  |  |
| 7          |  |  |             |  |  |                      |  |  |
| 8          |  |  |             |  |  |                      |  |  |
| 9          |  |  | ZERO        |  |  | WIND                 |  |  |
| 10         |  |  |             |  |  | TOTAL SCORE          |  |  |

| 1. DETERMINATION OF THE BATTLE SIGHT |       |       |     |
|--------------------------------------|-------|-------|-----|
| SIGHT SETTING EACH SHOT GROUP        |       |       |     |
| NR                                   | ELEV  | WIND  |     |
| 1                                    | 300+1 | 1R    |     |
| 2                                    | 300   | 1R    |     |
| BATTLE SIGHT SETTING                 |       |       |     |
| EL                                   | WIND  | (300) |     |
| PLOT EACH SHOT GROUP                 |       |       |     |
| 2. RECORD OF HITS USING BATTLE SIGHT |       |       |     |
|                                      | 300   |       | 200 |
|                                      | 400   |       |     |

| 1000 INCH INSTRUCTION FIRING |              |                            |                   |                                   |                                 |                       |
|------------------------------|--------------|----------------------------|-------------------|-----------------------------------|---------------------------------|-----------------------|
| NR OF RDS                    | TIME         | FIGURE NR                  | NR OF TARGETS HIT | SCORE FOR TARGETS HIT (5 x Col 4) | SCORE FOR HITS (1 x NR of Hits) | SCORE (Col 5 + Col 6) |
| 1                            | 2            | 3                          | 4                 | 5                                 | 6                               | 7                     |
| 8                            | NO LIMIT     | 1                          |                   |                                   |                                 |                       |
| 24                           | 1 MIN 45 SEC | 8-6                        |                   |                                   |                                 |                       |
| 24                           | 1 MIN        | 7-4                        |                   |                                   |                                 |                       |
| 16                           | 20 SEC       | 4                          |                   |                                   |                                 |                       |
| 8                            | NO LIMIT     | 2                          |                   |                                   |                                 |                       |
| 8                            | NO LIMIT     | 3                          |                   |                                   |                                 |                       |
| 1000 INCH TOTAL              |              |                            |                   |                                   |                                 |                       |
| NAME OF FIRER                |              | GRADE                      |                   | RIFLE NR                          |                                 |                       |
| DOE, JOHN Q                  |              | PFC                        |                   | 54321                             |                                 |                       |
| SERVICE NR                   |              | ORGANIZATION               |                   | RANGE                             |                                 |                       |
| RA 1234567                   |              | Co G, 16 <sup>TH</sup> INF |                   | ELEV                              |                                 |                       |
|                              |              |                            |                   | WIND                              |                                 |                       |
|                              |              |                            |                   | SEC                               |                                 |                       |
|                              |              |                            |                   | SIGHT                             |                                 |                       |
|                              |              |                            |                   | R                                 |                                 |                       |

| TRANSITION FIRING TABLE VII  |                                 |   |                                 |                               |
|------------------------------|---------------------------------|---|---------------------------------|-------------------------------|
| LANE NR                      | NUMBER OF TARGETS HIT           | SCORE FOR TARGETS HIT (5 x Col 2)         | SCORE FOR HITS (1 x NR of Hits) | SCORE (Col 3 + Col 4)         |
| 1                            | 2                               | 3   | 4                               | 5                             |
| 2                            |                                 |   |                                 |                               |
| 3                            |                                 |   |                                 |                               |
| TOTAL SCORE                  |                                 |   |                                 |                               |
| TRANSITION FIRING TABLE VIII |                                 |   |                                 |                               |
| PHASE NUMBER                 | SCORE FOR HITS (1 x NR of Hits) | SCORE FOR SAVED RDS (2 x NR of saved RDS) | NR REACTION TARGETS HIT X 5     | SCORE (Col 2 + Col 3 + Col 4) |
| 1                            | 2                               | 3   | 4                               | 5                             |
| PHASE I                      |                                 |   |                                 |                               |
| PHASE II                     |                                 |   |                                 |                               |
| PHASE III                    |                                 |   |                                 |                               |
| PHASE IV                     |                                 |   |                                 |                               |
| TOTAL SCORE                  |                                 |   |                                 |                               |

DA FORM 84

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

DETACHED FROM DA FORM 84, 1 MAY 57

Figure 151. (Superseded) Portion of firing data card.

| TRANSITION FIRING   |                                 |   |                                 |                               |                   |
|---|---------------------------------|---|---------------------------------|-------------------------------|-------------------|
| ORDER NR<br>1   |                                 |   |                                 |                               |                   |
| TRANSITION FIRING TABLE VII   |                                 |   |                                 |                               |                   |
| LANE NR   | NR OF TARGETS HIT               | SCORE FOR TARGETS HIT (5 x Col 2)         | SCORE FOR HITS (1 x NR of Hits) | SCORE (Col 3 + Col 4)         | SCORER'S INITIALS |
| 1   | 4                               | 20  | 20                              | 40                            | NA                |
| 2   | 6                               | 30  | 36                              | 66                            | NA                |
| 3   | 3                               | 15  | 18                              | 33                            | NA                |
| TOTAL   |                                 |   |                                 | 139                           |                   |
| TRANSITION FIRING TABLE VIII  |                                 |   |                                 |                               |                   |
| PHASE NR  | SCORE FOR HITS (1 x NR of Hits) | SCORE FOR SAVED RDS (2 x NR of saved RDS) | NR OF REACTION TARGETS HIT X 5  | SCORE (Col 2 + Col 3 + Col 4) | SCORER'S INITIALS |
| I   | 15                              | 10  | NONE                            | 25                            | NA                |
| II  | 15                              | 10  | NONE                            | 25                            | NA                |
| III   | 15                              | 10  | NONE                            | 25                            | NA                |
| IV  | 15                              | 10  | NONE                            | 25                            | NA                |
| TOTAL   |                                 |   |                                 | 100                           | NA                |
| COMBINED TOTAL  |                                 |   |                                 | 239                           | NA                |
| SIGNATURE OF SCORER<br><i>Herbert Atkin</i>   |                                 |   |                                 |                               |                   |
| SIGNATURE OF FIRER<br><i>John G. Roe</i>  |                                 |   |                                 |                               |                   |
| DATE<br>20/9/56   |                                 |   |                                 |                               |                   |
| THE INFORMATION CONTAINED IN THIS SCORE CARD (Known Distance and Transition Firing) IS CORRECT: |                                 |   |                                 |                               |                   |
| SIGNATURE OF OFFICER<br><i>John Jones 1st Lt.</i>   |                                 |   |                                 |                               |                   |

One (1) click of elevation or windage moves the strike of bullet 4 inches for each 100 yards of range.

| RANGE    |     | HOUR    |             | COMPUTATION RV |  |
|----------|-----|---------|-------------|----------------|--|
| 200      |     | 0800    |             | 200 = 1R       |  |
| POSITION |     | DATE    |             | DATE           |  |
| PRONE SF |     | 20/9/56 |             | 12 3 6         |  |
|          |     | WEATHER |             | WEATHER        |  |
|          |     | COOL    |             | COOL           |  |
| NR       | EL  | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1        | 200 | 2R      | BRIGHT      | 20 MPH         |  |
|          |     |         | CALL TARGET | HIT TARGET     |  |
| 2        | "   | "       |             |                |  |
| 3        | "   | "       |             |                |  |
| 4        | "   | "       |             |                |  |
| 5        | "   | "       |             |                |  |
| 6        | "   | "       |             |                |  |
| 7        | "   | "       |             |                |  |
| 8        | "   | "       |             |                |  |
| 9        | "   | "       |             |                |  |
| 10       | "   | "       |             |                |  |
| ZERO     |     | WIND    |             | TOTAL SCORE    |  |
| 200      |     | 1R      |             | 23             |  |

| RANGE    |    | HOUR    |             | COMPUTATION RV |  |
|----------|----|---------|-------------|----------------|--|
|          |    |         |             | RV 40          |  |
| POSITION |    | DATE    |             | DATE           |  |
|          |    |         |             | 12 3 6         |  |
|          |    | WEATHER |             | WEATHER        |  |
|          |    |         |             |                |  |
| NR       | EL | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1        |    |         | CALL TARGET | HIT TARGET     |  |
| 2        |    |         |             |                |  |
| 3        |    |         |             |                |  |
| 4        |    |         |             |                |  |
| 5        |    |         |             |                |  |
| 6        |    |         |             |                |  |
| 7        |    |         |             |                |  |
| 8        |    |         |             |                |  |
| 9        |    |         |             |                |  |
| 10       |    |         |             |                |  |
| ZERO     |    | WIND    |             | TOTAL SCORE    |  |
|          |    |         |             |                |  |

| RANGE     |       | HOUR    |             | COMPUTATION RV |  |
|-----------|-------|---------|-------------|----------------|--|
| 300       |       | 1000    |             | 300 = 1R       |  |
| POSITION  |       | DATE    |             | DATE           |  |
| PRONE     |       | 20/9/56 |             | 12 3 6         |  |
| AUTO FIRE |       | WEATHER |             | WEATHER        |  |
|           |       | COOL    |             | COOL           |  |
| NR        | EL    | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1         | 300+1 | 2 1/2 R | BRIGHT      | 20 MPH         |  |
|           |       |         | CALL TARGET | HIT TARGET     |  |
| 2         | "     | "       |             |                |  |
| 3         | "     | "       |             |                |  |
| 4         | "     | "       |             |                |  |
| 5         | "     | "       |             |                |  |
| 6         | "     | "       |             |                |  |
| 7         | "     | "       |             |                |  |
| 8         | "     | "       |             |                |  |
| 9         | "     | "       |             |                |  |
| 10        | "     | "       |             |                |  |
| ZERO      |       | WIND    |             | TOTAL SCORE    |  |
| 300+1     |       | 1R      |             | 65             |  |

| RANGE    |    | HOUR    |             | COMPUTATION RV |  |
|----------|----|---------|-------------|----------------|--|
|          |    |         |             | RV 40          |  |
| POSITION |    | DATE    |             | DATE           |  |
|          |    |         |             | 12 3 6         |  |
|          |    | WEATHER |             | WEATHER        |  |
|          |    |         |             |                |  |
| NR       | EL | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1        |    |         | CALL TARGET | HIT TARGET     |  |
| 2        |    |         |             |                |  |
| 3        |    |         |             |                |  |
| 4        |    |         |             |                |  |
| 5        |    |         |             |                |  |
| 6        |    |         |             |                |  |
| 7        |    |         |             |                |  |
| 8        |    |         |             |                |  |
| 9        |    |         |             |                |  |
| 10       |    |         |             |                |  |
| ZERO     |    | WIND    |             | TOTAL SCORE    |  |
|          |    |         |             |                |  |

| RANGE    |    | HOUR    |             | COMPUTATION RV |  |
|----------|----|---------|-------------|----------------|--|
|          |    |         |             | RV 40          |  |
| POSITION |    | DATE    |             | DATE           |  |
|          |    |         |             | 12 3 6         |  |
|          |    | WEATHER |             | WEATHER        |  |
|          |    |         |             |                |  |
| NR       | EL | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1        |    |         | CALL TARGET | HIT TARGET     |  |
| 2        |    |         |             |                |  |
| 3        |    |         |             |                |  |
| 4        |    |         |             |                |  |
| 5        |    |         |             |                |  |
| 6        |    |         |             |                |  |
| 7        |    |         |             |                |  |
| 8        |    |         |             |                |  |
| 9        |    |         |             |                |  |
| 10       |    |         |             |                |  |
| ZERO     |    | WIND    |             | TOTAL SCORE    |  |
|          |    |         |             |                |  |

| RANGE    |    | HOUR    |             | COMPUTATION RV |  |
|----------|----|---------|-------------|----------------|--|
|          |    |         |             | RV 40          |  |
| POSITION |    | DATE    |             | DATE           |  |
|          |    |         |             | 12 3 6         |  |
|          |    | WEATHER |             | WEATHER        |  |
|          |    |         |             |                |  |
| NR       | EL | WIND    | LIGHT       | WIND VELOCITY  |  |
| 1        |    |         | CALL TARGET | HIT TARGET     |  |
| 2        |    |         |             |                |  |
| 3        |    |         |             |                |  |
| 4        |    |         |             |                |  |
| 5        |    |         |             |                |  |
| 6        |    |         |             |                |  |
| 7        |    |         |             |                |  |
| 8        |    |         |             |                |  |
| 9        |    |         |             |                |  |
| 10       |    |         |             |                |  |
| ZERO     |    | WIND    |             | TOTAL SCORE    |  |
|          |    |         |             |                |  |

Figure 151—(continued).

zero record card (fig. 151 ①). Notice the recording block in figure 152 ①. This shows the information that should be placed on the card just prior to firing. The range and position are entered. The weather and light are entered by using words of the firer's own choosing. For example, the weather may be described as cold, rainy, or clear; the light may be described as bright, dull, or hazy. The direction of the wind is indicated by an arrow drawn through the clock, showing the direction from which the wind is blowing. The type wind is entered and the necessary computation is made to correct for the wind. If there is no wind or if the wind is of no value, the computation space should be checked to indicate that it has been considered.

### **132. Use of the Firing Data Card**

(Superseded)

*a. Keeping the Firing Data Card for Zeroing.* The automatic rifle is zeroed by firing three shot groups of three rounds each. Look at figure 152 ②. This figure shows a block of firing data card filled out properly for zeroing. Notice all information to include the computation for the wind is present. The initial sight setting is entered opposite the first three shots since three round groups are fired before sight changes are made. After each shot is fired, the firer plots his call by placing the number of the shot on the call target. The target is marked after the three rounds have been fired. The exact location of the three shots are plotted by using the corresponding numbers and entering them on the hit target. A sight change is then made to move the shot group into the center of the bull's-eye. The change is figured from the center of the shot

group. Once the change has been figured, the new sight setting is entered opposite the next three rounds and the process is completed until three shot groups have been fired. Notice that the call for shot number 5 is plotted in a corner of the call target with a question mark beside it. This indicates that the firer has flinched on the shot and could not call it. Also notice that when the target was marked, shot number 5 was a considerable distance from the other two shots of that group. For this reason, he ignored shot number 5 and computed his sight change based on the location of the other two shots of that group. After the third group has been fired, the firer then decides what his zero is, and enters this setting in the space provided. *The zero of the automatic rifle for each range is that sight setting in elevation and windage which will cause the strike of the bullet to hit the center of the bull's-eye on a day when there is no wind.* The last sight setting was 200 + 2 clicks elevation and 4 clicks right windage. Since 1 click of right windage was placed on the rear sight to correct for the wind, it must be taken off to determine the true zero of the automatic rifle. Therefore, the zero of the automatic rifle is 200 + 2 clicks elevation and 3 clicks right windage. The score is not totaled for zeroing so that block is crossed out.

b. *Keeping the Firing Data Card for Slow Fire.* In figure 152 ③ you see an example of how the firing data card is kept for slow fire. The sight setting in elevation and windage is entered opposite the first round and need not be entered for the remaining rounds providing no change is necessary. After each round is fired, the firer plots his call by entering the

number of that shot on the call target at the location he thought it should strike. When the target is marked, he plots the exact location of the shot on the hit target using the corresponding number. After the second shot, the firer noted a slight change was necessary so he made the correction and entered this correction opposite the third shot. Shot number four was a double and the firer could not call it accurately so he entered number four in the corner with a notation that it was a double. When all shots have been fired, he totals up the score from the hit target, and enters it in the space provided. His zero for that range is also entered in the space provided.

c. *Keeping the Firing Data Card for Automatic Fire.* In the recording block of figure 152 (4), you see an example of how the firing data card is kept for

|                                  |           |             |                        |                    |                                |  |
|----------------------------------|-----------|-------------|------------------------|--------------------|--------------------------------|--|
| <b>RANGE</b><br>200              |           |             | <b>HOUR</b><br>0800    |                    | <b>COMPUTATION</b><br>RV<br>40 |  |
| <b>POSITION</b><br>PRONE<br>ZERO |           |             | <b>DATE</b><br>20/9/56 |                    |                                |  |
|                                  |           |             | <b>WEATHER</b><br>COOL |                    |                                |  |
| <b>NR</b>                        | <b>EL</b> | <b>WIND</b> | <b>LIGHT</b><br>BRIGHT |                    | <b>WIND VELOCITY</b><br>20 MPH |  |
| 1                                | 200       | 1 R         | <b>CALL TARGET</b><br> |                    | <b>HIT TARGET</b><br>          |  |
| 2                                | 200       | 1 R         |                        |                    |                                |  |
| 3                                | 200       | 1 R         |                        |                    |                                |  |
| 4                                | 200+2     | 3 R         |                        |                    |                                |  |
| 5                                | 200+2     | 3 R         |                        |                    |                                |  |
| 6                                | 200+2     | 3 R         |                        |                    |                                |  |
| 7                                | 200+2     | 4 R         |                        |                    |                                |  |
| 8                                | 200+2     | 4 R         |                        |                    |                                |  |
| 9                                | 200+2     | 4 R         |                        |                    |                                |  |
| <b>TO</b>                        |           |             | <b>ZERO</b><br>200+2   | <b>WIND</b><br>3 R | <b>TOTAL SCORE</b><br>_____    |  |

(4)  
Figure 152—Continued.

automatic fire. The sight setting is recorded only once since all rounds are fired with the same setting. After the exercise has been fired, the firer indicates where he thinks his group should be by drawing a circle on the call target. When the target is marked, he plots each shot on the hit target by using dots inside of a corresponding circle where his group hit the target. He then totals up his score from the hit target and enters it in the appropriate space on the firing data card.

*d. Zero Record Card.* The zero record card can be seen in the lower left hand corner of figure 151 ①. When the firer has completed zeroing his automatic rifle, he enters the sight settings in elevation and windage for each range on this card. The card is then torn off at the perforation and pasted, glued, or shellacked onto the automatic rifle. The firer then has a ready reference to the zero sight settings for each range.

## **142. Firing Data Card**

(Superseded)

The firing data card DA AGO Form 84 shown in figure 151 is recommended for use when firing any one of the five courses for record and practice. The firing data card is so designed as to carry the firer through his 1,000-inch instruction and record firing; through known distance instruction and record firing; and through transition zeroing, instruction and record firing. A record score card is provided which is detachable. Sample blocks are filled out to show you how the firing data card is filled out for the various courses of fire. Remember, the firing data card is not only a record of the firer, but also of the weapon.

|                         |       |         |                 |         |                         |  |
|-------------------------|-------|---------|-----------------|---------|-------------------------|--|
| RANGE<br>200            |       |         | HOUR<br>0800    |         | COMPUTATION<br>RV<br>40 |  |
| POSITION<br>PRONE<br>SF |       |         | DATE<br>20/9/56 |         |                         |  |
|                         |       |         | WEATHER<br>COOL |         |                         |  |
| NR                      | EL    | WIND    | LIGHT<br>BRIGHT |         | WIND VELOCITY<br>20 MPH |  |
| 1                       | 200+2 | 4R      | CALL TARGET     |         | HIT TARGET              |  |
| 2                       | "     | "       |                 |         |                         |  |
| 3                       | 200+2 | 4 1/2 R |                 |         |                         |  |
| 4                       | "     | "       |                 |         |                         |  |
| 5                       | "     | "       |                 |         |                         |  |
| 6                       |       |         |                 |         |                         |  |
| 7                       |       |         |                 |         |                         |  |
| 8                       |       |         |                 |         |                         |  |
| 9                       |       |         | ZERO            | WIND    | TOTAL SCORE             |  |
| 10                      |       |         | 200+2           | 3 1/2 R | 23                      |  |

③  
Figure 152—Continued.

|                                |       |         |                 |         |                         |  |
|--------------------------------|-------|---------|-----------------|---------|-------------------------|--|
| RANGE<br>200                   |       |         | HOUR<br>0800    |         | COMPUTATION<br>RV<br>40 |  |
| POSITION<br>PRONE<br>AUTO FIRE |       |         | DATE<br>20/9/56 |         |                         |  |
|                                |       |         | WEATHER<br>COOL |         |                         |  |
| NR                             | EL    | WIND    | LIGHT<br>BRIGHT |         | WIND VELOCITY<br>20 MPH |  |
| 1                              | 200+2 | 4 1/2 R | CALL TARGET     |         | HIT TARGET              |  |
| 2                              |       |         |                 |         |                         |  |
| 3                              |       |         |                 |         |                         |  |
| 4                              |       |         |                 |         |                         |  |
| 5                              |       |         |                 |         |                         |  |
| 6                              |       |         |                 |         |                         |  |
| 7                              |       |         |                 |         |                         |  |
| 8                              |       |         |                 |         |                         |  |
| 9                              |       |         | ZERO            | WIND    | TOTAL SCORE             |  |
| 10                             |       |         | 200+2           | 3 1/2 R | 67                      |  |

④  
Figure 152—Continued.

Keep it accurately and completely. For detailed instructions on keeping the firing data card, see paragraphs 131 and 132.

## 196. Functioning of the Operating Group

The introductory portion of this paragraph is rescinded.

\* \* \* \* \*

b. Discuss the action \* \* \* cartridge is fired. A chart on the gas system similar to figure 96 is very helpful in this instruction.

\* \* \* \* \*

g. Explain that the ejector is stationary. During **ejecting**, the empty cartridge case strikes the receiver to the rear of the ejection opening and then rebounds to the right front.

\* \* \* \* \*

j. A chart similar to figure 94 is helpful in discussing chambering. Each instructional group discusses chambering using the automatic rifle, a magazine, and several dummy cartridges.

\* \* \* \* \*

## 202. Set-Ups for Stoppages

\* \* \* \* \*

c. *Procedure.* To present stoppages, demonstrate each stoppage as outlined below. Require various soldiers \* \* \* for each stoppage.

- (1) *Partial chambering* (fig. 113). Cock the automatic \* \* \* in figure 112. This stoppage is known as partial **chambering**.
- (2) *Double chambering* (fig. 114). Cock the automatic \* \* \* producing a shortage.
- (3) *Failure to chamber due to ruptured cartridge* (fig. 115). Cock the weapon \* \* \* to remove it.
- (4) *Failure to eject due to insufficient gas* (fig. 116.5). Load a dummy \* \* \* parts move forward.
- (5) *Failure to extract due to a broken extractor or extractor spring* (fig. 116.2). Cock the automatic \* \* \* empty cartridge case.
- (6) *Failure to fire due to excessive friction* (fig. 116.1). Cock the automatic \* \* \* of the parts.

#### 214. **B Targets, Sight Changes, Clock System, Effect of Wind, Firing Data Card, Zeroing, Range Regulations, and Safety Precautions**

a. *General.* This portion of \* \* \* of inclement weather. Emphasize the importance of keeping the **firing data card** accurately posted at all times.

b. *Procedure.*

\* \* \* \* \*

- (6) Using a chart of the enlarged **firing data card** (fig. 151), or a blackboard, and the B target, explain and illustrate the correct procedure to be followed in making entries on the **firing data card**. Tell the class \* \* \* in

the target. Have each soldier solve several **firing data card** problems. Solve each problem using the **firing data card** chart. The stated velocity \* \* \* of each problem. Include in this discussion how to obtain the correct zero of the automatic rifle from the **firing data card**.

\* \* \* \* \*

## 216. Range Orientation

\* \* \* \* \*

b. Range firing is \* \* \* the following subjects:

\* \* \* \* \*

(6) The importance of keeping the **firing data card** accurately posted.

\* \* \* \* \*

By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,  
*General, United States Army,*  
*Chief of Staff.*

Official:

HERBERT M. JONES,  
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Inf Regt  
Armor Regt  
Inf Bn

Armor Bn  
Ft & Cp  
USMA  
Gen & Br Svc Sch  
PMST Sr Div Inf Unit  
Mil Dist  
Mil Msn  
ARMA  
Units org under fol TOE:  
7-2, Hq Co, Inf Div  
7-17, Inf R Co  
7-27, R Co, Armd Inf Bn  
7-37, Abn Inf R Co  
17-57, Recon Co  
57-57, Recon Co, Abn Div

*NG:* State AG; units—div; Inf Regt; Armor Regt; Inf Bn; Armor Bn.

*USAR:* Div; Inf Regt; Armor Regt; Inf Bn; Armor Bn.

For explanation of abbreviations used, see SR 320-50-1

DEPARTMENT OF THE ARMY FIELD MANUAL  
FM 23-15

*This field manual supersedes FM 23-15, 30 June 1943; including C 1, 24 December 1943; C 2, 6 March 1944; paragraph 10, Training Circular 10, Department of the Army, 20 July 1949; and Training Circular 7, Department of the Army, 21 April 1950.*

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BROWNING  
AUTOMATIC RIFLE  
CALIBER .30  
M1918A2

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DEPARTMENT OF THE ARMY • JULY 1951

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OFFICIAL:

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*Major General, USA  
Acting The Adjutant  
General*

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*Chief of Staff,  
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For explanation of distribution formula, see SR 310-90-1.

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## RESTRICTED

*This field manual supersedes FM 23-15, 30 June 1943; including C 1, 24 December 1943; C 2, 6 March 1944; paragraph 10, Training Circular 10, Department of the Army, 20 July 1949; and Training Circular 7, Department of the Army, 21 April 1950.*

## CHAPTER 1

### INTRODUCTION

---

#### 1. PURPOSE

The purpose of this manual is to teach you how to fire your automatic rifle correctly and how to take care of it, both in the field and in garrison. By mastering the material in this manual you can help yourself to become a good automatic rifleman and a better member of an automatic rifle team.

#### 2. SCOPE

This manual covers mechanical training; marksmanship training, including firing at moving ground and aerial targets; and technique of fire. It contains advice to instructors, safety precautions, subject schedules, training aids, and information on the score card.

# CHAPTER 2

## MECHANICAL TRAINING

---

### Section I. GENERAL

#### 3. PURPOSE OF MECHANICAL TRAINING

This chapter teaches you how to disassemble and assemble the four main groups of working parts that make up your automatic rifle. It also tells you how each group of moving parts works and how you can keep your automatic rifle in good firing condition. You must have a thorough knowledge of the mechanical parts of your automatic rifle. You will need this knowledge on the firing range and on the battlefield. When you learn how to disassemble and assemble your automatic rifle, you will be able to clean it and care for it properly. The importance of care and cleaning cannot be overstressed; proper care and cleaning will prevent many stoppages. When you learn the mechanical parts of your automatic rifle and understand how they work, you can locate quickly the cause of any trouble your rifle may develop and you will know how to correct it.

#### 4. GENERAL DESCRIPTION OF THE RIFLE

*a.* The Browning Automatic Rifle, Caliber .30, M1918A2, is one of the world's best automatic rifles. Treat it with the care and respect it de-

serves and it will produce for you the desired combat results. It is an air cooled, gas operated, magazine fed, shoulder type weapon with a bipod (fig. 1). The magazine is box type and holds 20 rounds.

b. The automatic rifle is equipped with front and rear sights. The front sight is stationary but the rear sight can be moved up or down and to the left or right. You turn the elevating knob to raise or lower the sight when you want the bullet to strike higher or lower on the target. The elevation scale on the rear sight of most automatic rifles can be set as low as 100 yards. On some older models, however, the elevation scale can be lowered only to 300 yards. When the wind is strong enough to blow a bullet off its course, you turn the windage knob to move the rear sight to the right or left. Changing the windage adjustment causes the strike of succeeding bullets on the target to be moved in the same direction (right or left) that the sight was moved.

c. Examine your automatic rifle to make sure that it is not loaded. Look down the barrel and you will see spiral grooves cut in the bore. The ribs that stand out between the grooves are called the lands. The grooves and lands make one complete turn in 10 inches of barrel length. The grooves and lands are called rifling. The rifling makes the bullet rotate and keeps it from tumbling in flight. This causes it to follow a uniform course to the target.



d. Some of the information regarding your automatic rifle is listed below.

|  |  |
|--|--|
| Weight, complete with bipod and magazine . . . . . | 19.4 lb.   |
| Weight, bipod . . . . .                            | 2.38 lb.   |
| Weight, magazine . . . . .                         | 0.44 lb.   |
| Weight, barrel . . . . .                           | 3.65 lb.   |
| Length . . . . .                                   | 47.8 in.   |
| Length, barrel . . . . .                           | 24.07 in.  |
| Rifling:   |  |
| Number of grooves . . . . .                        | 4  |
| Right hand twist: 1 turn<br>in . . . . .           | 10.00 in.  |
| Depth of grooves . . . . .                         | 0.0040 in.   |
| Sight radius . . . . .                             | 31.125 in.   |
| Trigger pull . . . . .                             | 10 lb. max;<br>6 lb. min.  |
| Ammunition types . . . . .                         | Ball, AP,<br>Tracer,<br>API, In-<br>cendiary,<br>Blank,<br>and<br>Dummy. |

Range:

|  |             |
|--|-------------|
| Maximum effective (M2<br>ammo) . . . . . | 500 yards   |
| Maximum . . . . .                        | 3,000 yards |

## 5. FIRE POWER

a. The term *cyclic rate* is used to describe the rate at which successive rounds can be fired in an

automatic weapon. The automatic rifle has two cyclic rates. The fast cyclic rate is about 550 rounds per minute and the slow cyclic rate is about 350 rounds per minute. The 1918A2 Browning Automatic Rifle has no setting for semi-automatic fire. However, you can fire single shots if you release the trigger quickly.

b. *The maximum effective rate of fire* is the maximum number of rounds the average soldier can fire per minute and still get a reasonable number of hits on the target. The maximum effective rate of fire for the automatic rifle is 120 to 150 rounds per minute. This rate of fire depends, in part, on the firer's ability to change magazines quickly.

c. *The sustained rate of fire* is that rate at which the weapon will fire for long periods of time without overheating and damaging the barrel. The sustained rate of fire for your automatic rifle is 40 to 60 rounds per minute.

## SECTION II. DISASSEMBLY AND ASSEMBLY

### 6. TRAINING

You receive instruction in mechanical training as soon as possible after the weapon is issued and before you go on the range to fire. Training with the automatic rifle, as with any weapon, is progressive. Each step of instruction must be taken in its proper order.

## 7. USE OF DUMMY CARTRIDGES

Dummy cartridges will be helpful during your instruction in mechanical training. Be careful to keep dirt and grit out of the weapon while you are using the dummy cartridge.

## 8. ORGANIZATION

The members of your unit who are to receive training with the automatic rifle are organized into groups of approximately six men per group. Instruction will be given by selected and trained officers and noncommissioned officers. If you have questions concerning any portion of the instruction, be sure to ask your instructor to answer them for you.

## 9. GUIDES TO BE OBSERVED

When you disassemble or assemble the automatic rifle, you must follow certain rules or guides. Although the automatic rifle is a rugged weapon, you can damage it if you do not handle it carefully. Careless handling can damage the weapon even during such portions of training as the disassembly and assembly of the various groups. Observe these rules to help keep your weapon in firing condition:

a. You may disassemble without supervision four groups: the operating group, trigger group, buffer and rate reducing group, and the bipod group. You may also disassemble the magazine assembly and remove the gas cylinder assembly from the gas cylinder tube without supervision.

Further disassembly may be done only under the supervision of an officer or by ordnance personnel.

*b.* The use of force should not be necessary in disassembly and assembly. There are a few parts, such as the sear pin in the trigger group, that may offer resistance during disassembly and assembly. If force is necessary, apply it cautiously.

*c.* Do not hurry. Years of experience have shown that when weapons are disassembled and assembled against time, parts are often damaged.

*d.* The operating group is the group that must be disassembled and assembled most often. You may find it necessary to disassemble and assemble it for care and cleaning purposes under unfavorable conditions such as darkness. For this reason, you may, during the advanced stages of training, be trained to disassemble and assemble the operating group while blindfolded.

*e.* As you disassemble the groups, lay the parts out on the disassembly training mat or on a clean surface in the order of disassembly from left to right. This will help in assembling the weapon.

## 10. NOMENCLATURE

Nomenclature is not taught as a separate subject. The names of the parts are learned as you disassemble and assemble the groups and learn their functions. The names of the more important visible parts of the weapon are shown in figure 1. Become familiar with these names. You

will hear them often during your work with the automatic rifle. By the time you have finished your course in mechanical training, you will know the names of all important parts.

## 11. DISASSEMBLY OF THE OPERATING GROUP

To disassemble the operating group—

*a.* Place the automatic rifle on a flat surface with the sights down and the muzzle pointing to your left. Remove the sling from the upper sling swivel. Cock the weapon. To do this, pull the operating handle all the way to the rear and then push it forward (fig. 2). This is done so that the gas cylinder tube will clear the gas piston and the gas cylinder tube bracket.

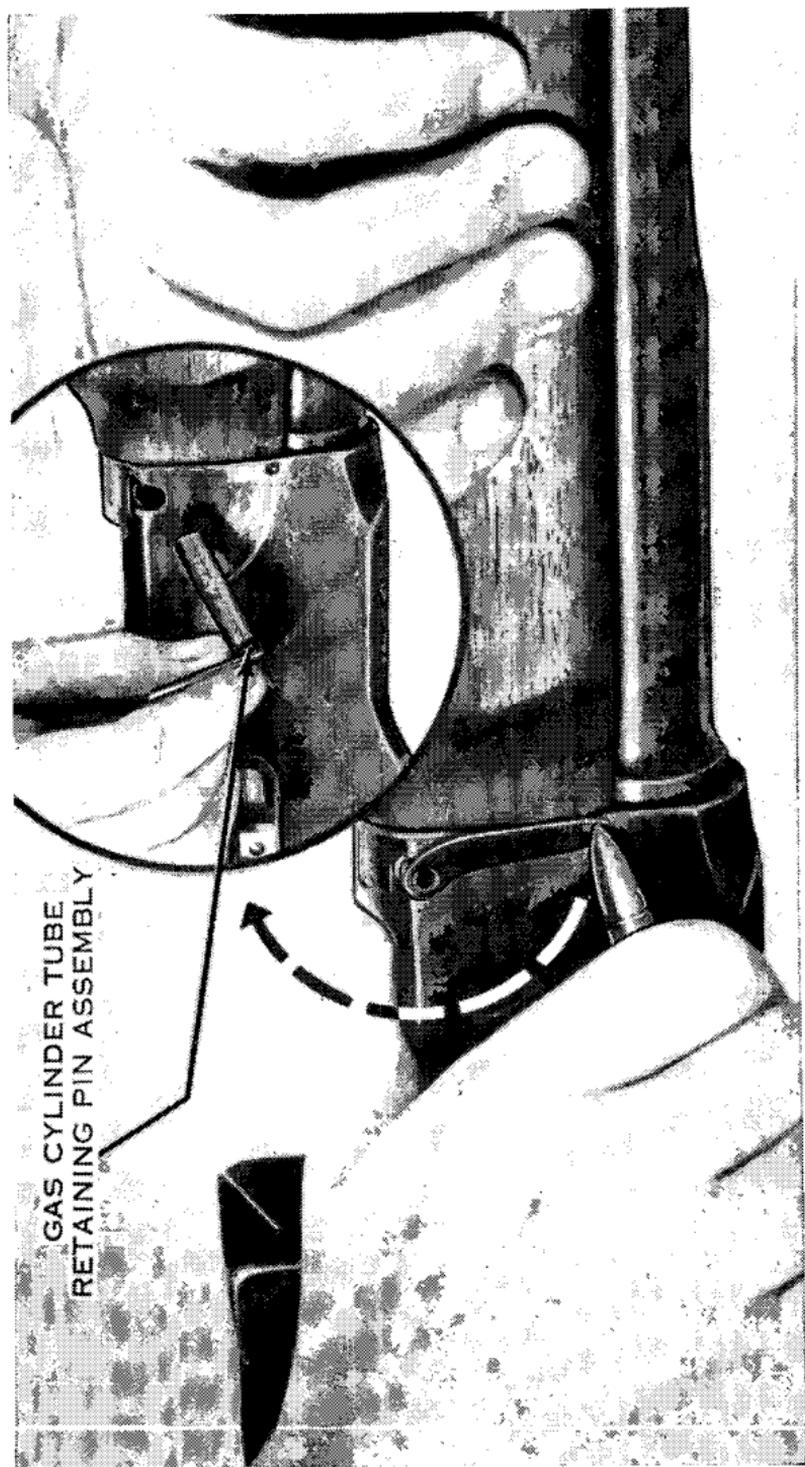
*b.* Using the point of a dummy cartridge, turn the gas-cylinder tube retaining pin assembly  $180^\circ$  in a clockwise direction. Remove the gas cylinder tube retaining pin assembly from the receiver (fig. 3).

*c.* Remove the gas cylinder tube and forearm by sliding them toward the muzzle end of the weapon (fig. 4). It may be necessary to unseat these parts by striking the wooden forearm a sharp blow with the left hand while holding the receiver with the right hand.

*d.* Remember the guides to follow in mechanical training. As the parts are disassembled, place them on a clean, smooth surface in the order of their removal, from left to right as shown in figure 5.



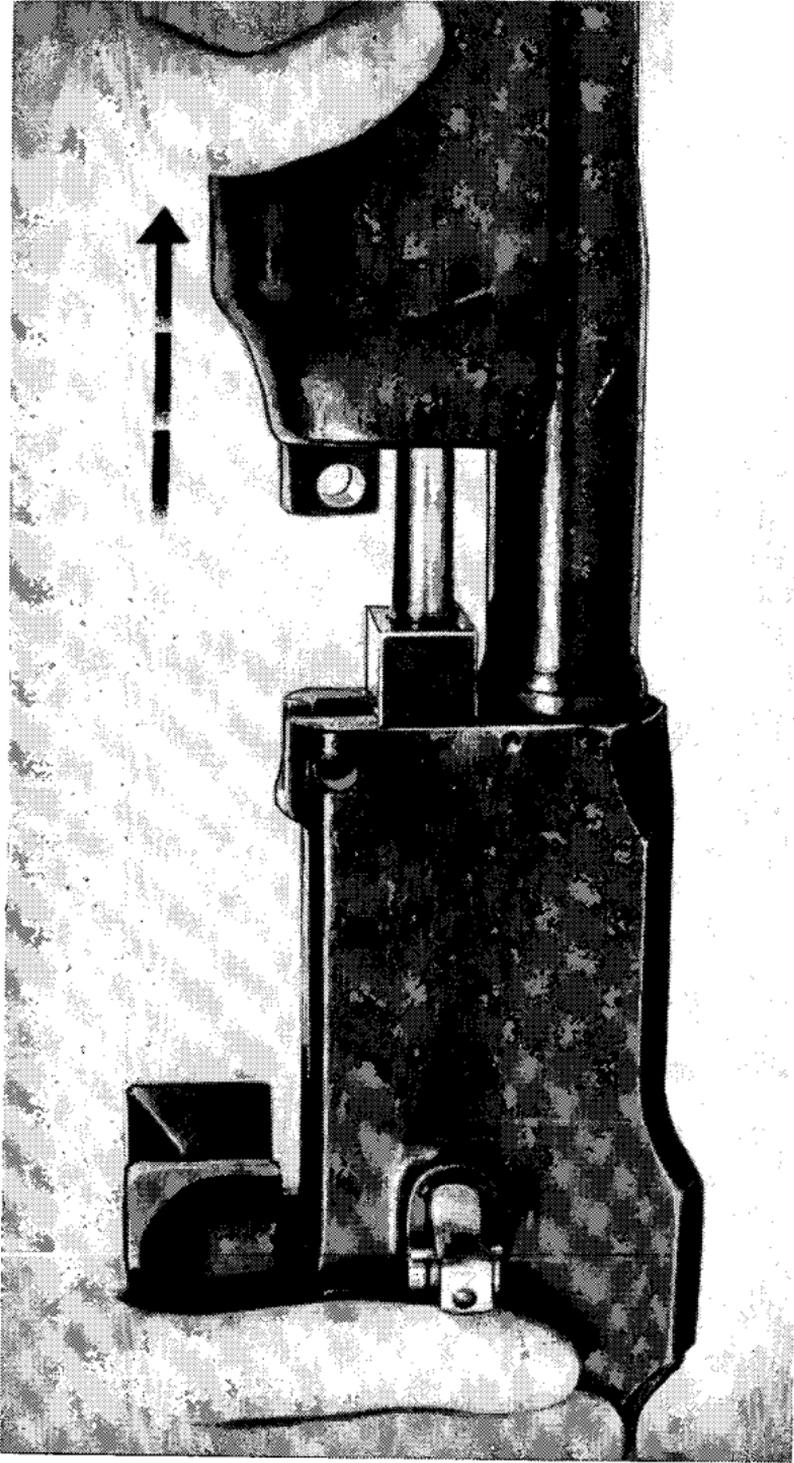
*Figure 2. Cocking the automatic rifle.*

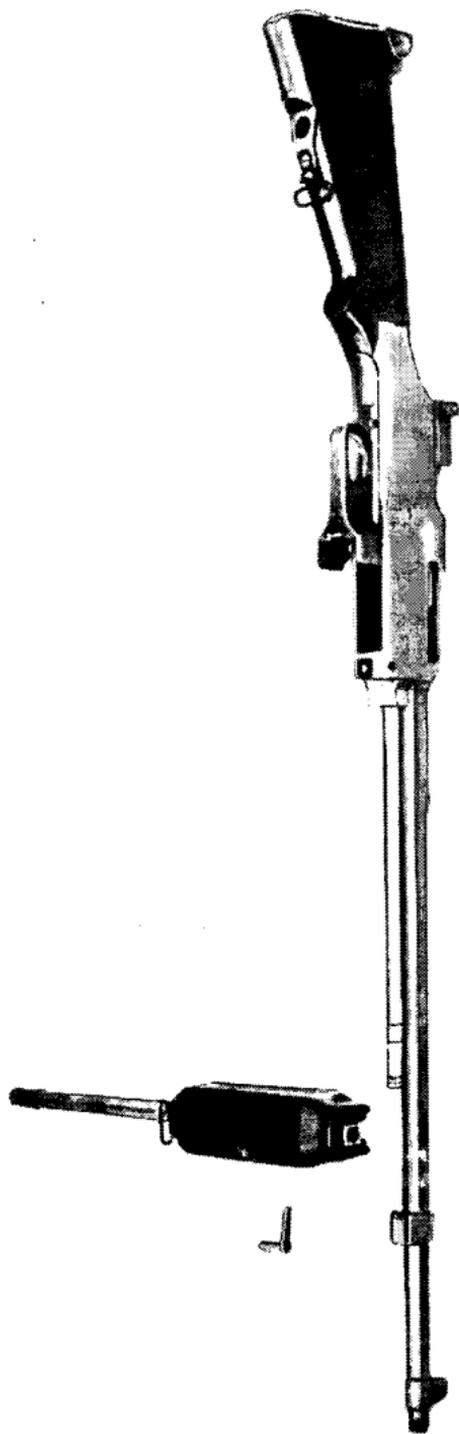


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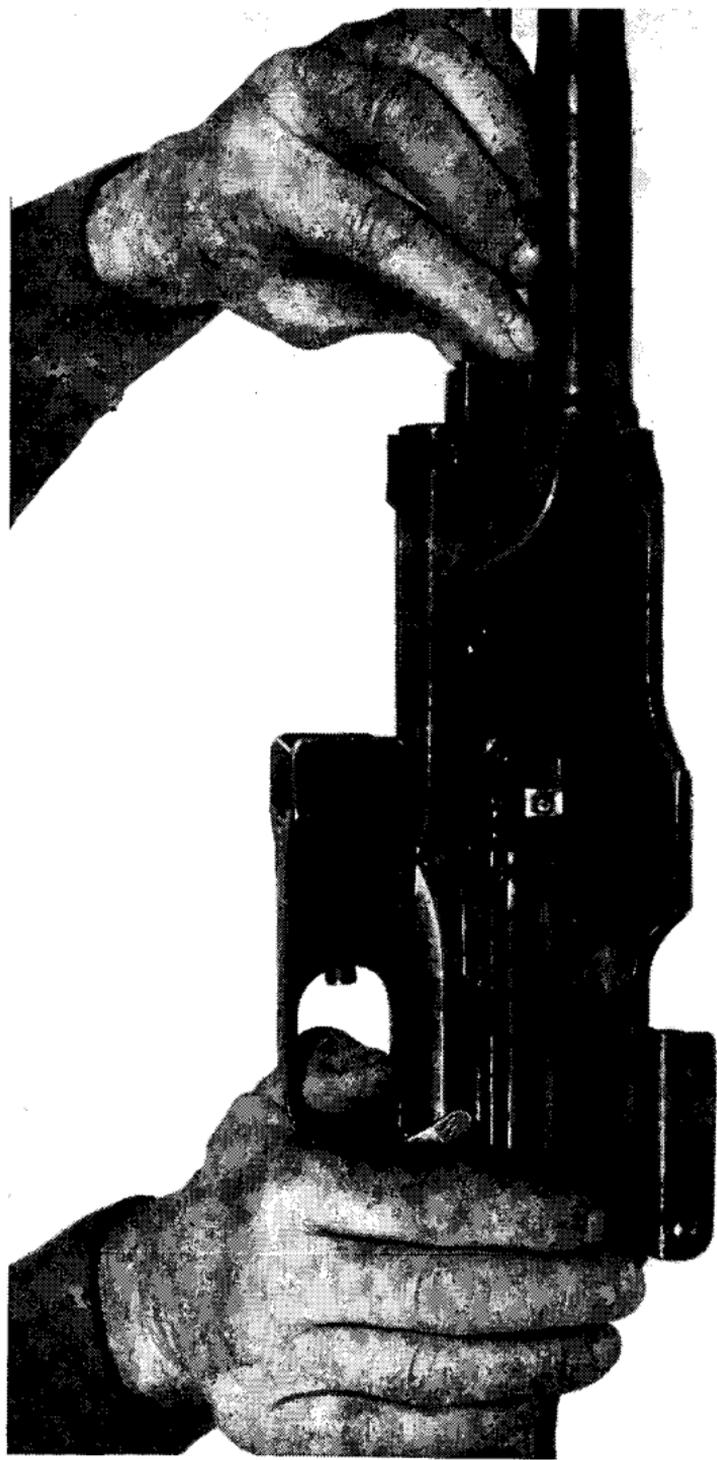
*Figure 3. Removing the gas cylinder tube retaining pin assembly.*

*Figure 4. Removing the gas cylinder tube and forearm.*

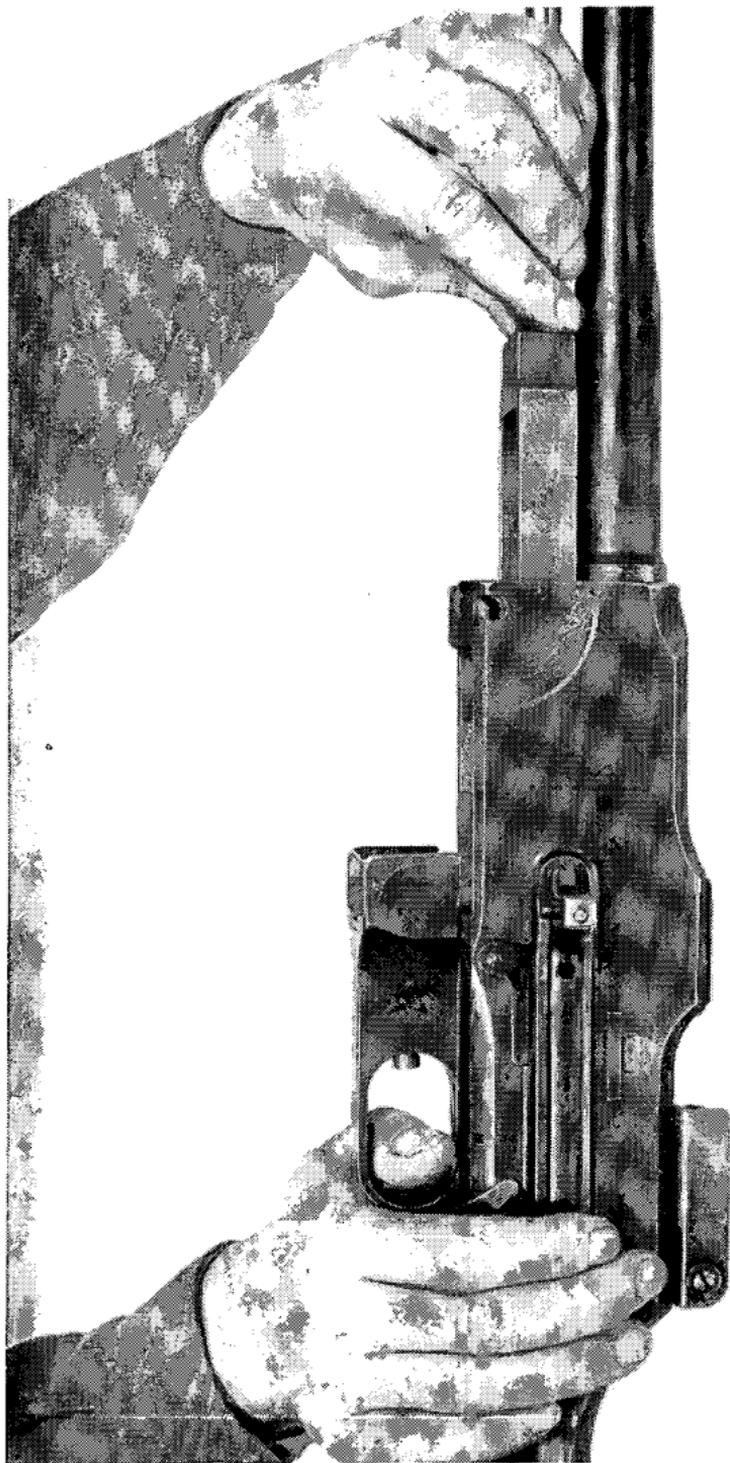




*Figure 5. Layout of the parts.*



A



*Figure 6. Allowing the operating parts to go forward.*

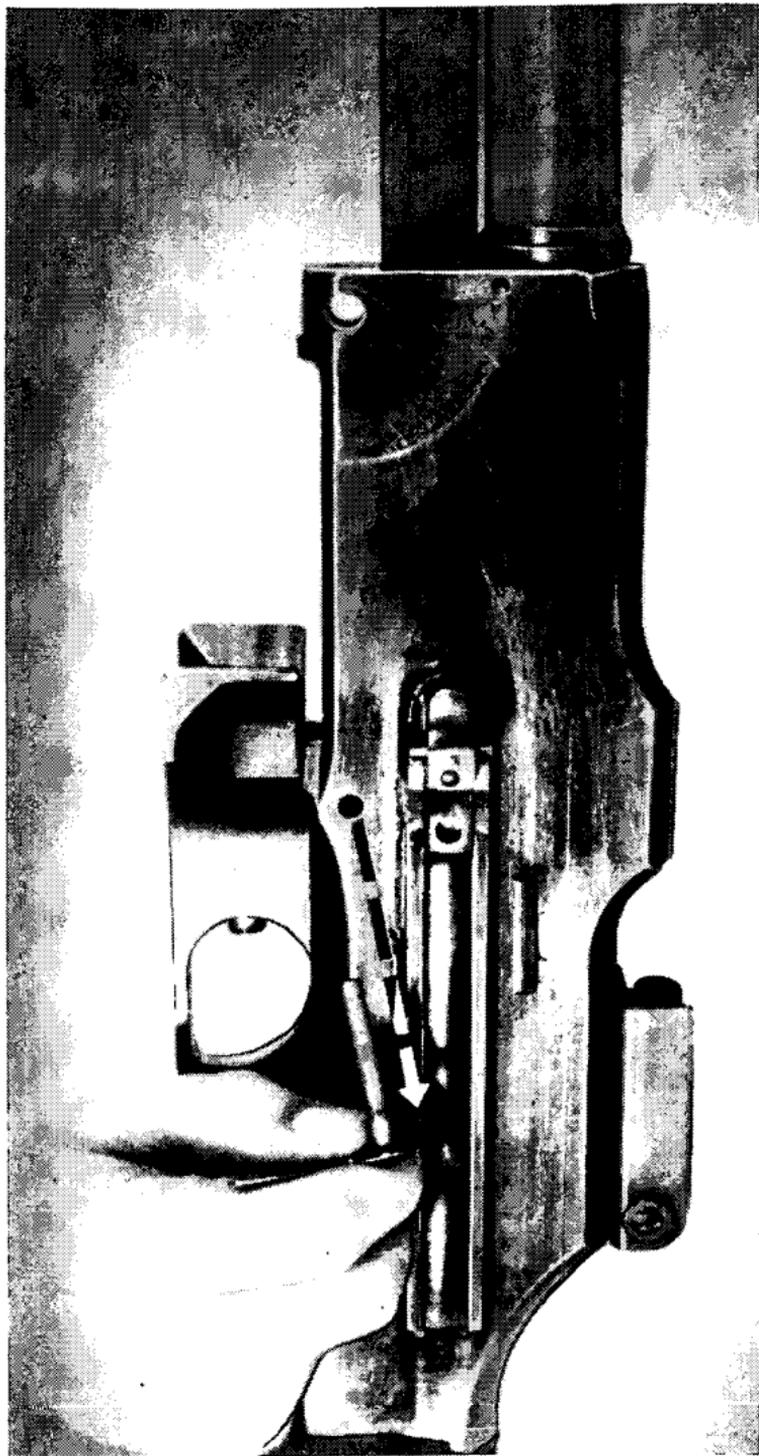
*e.* Before further disassembly, the operating parts must be moved forward. Grasp the slide between the fingers of the left hand (A of fig. 6). Press the trigger with the right thumb and allow the operating parts to move forward slowly (B of fig. 6). Be careful that the piston rings are not burred by striking the gas cylinder tube bracket as the parts go forward.

*f.* Using the point of a dummy cartridge, rotate the trigger guard retaining pin assembly 90° clockwise. Remove the trigger guard retaining pin assembly. (fig. 7).

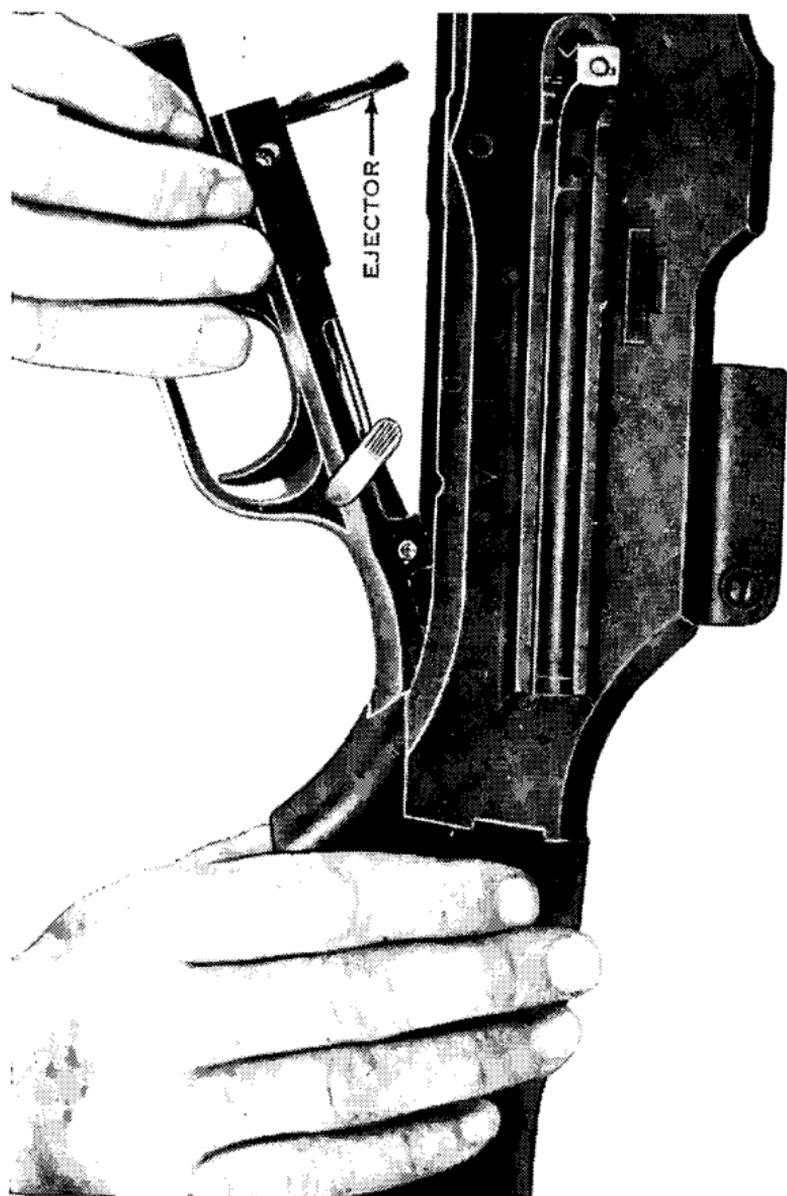
*g.* Lift out the trigger group (fig. 8). Place it on the table with the ejector pointing upward. The trigger group is placed on the table this way so that the trigger pin will not fall out.

*h.* The next parts to be removed are the recoil spring and recoil spring guide. Grasp the slide with the left hand, palm down. Press on the checkered surface of the recoil spring guide with the right index finger (fig. 9). Turn the recoil spring guide until its ends are clear of the retaining shoulders in the forward end of the receiver. Allow the recoil spring to expand slowly. Remove the recoil spring and recoil spring guide to the rear (fig. 10). Separate the two parts.

*i.* Before removing the operating handle, partially remove the hammer pin. To do this, grasp the receiver with the left hand, palm down, with the left forefinger placed against the knob of the operating handle (fig. 11). With the slide fully forward, insert the point of the recoil spring guide in the hole of the operating handle and



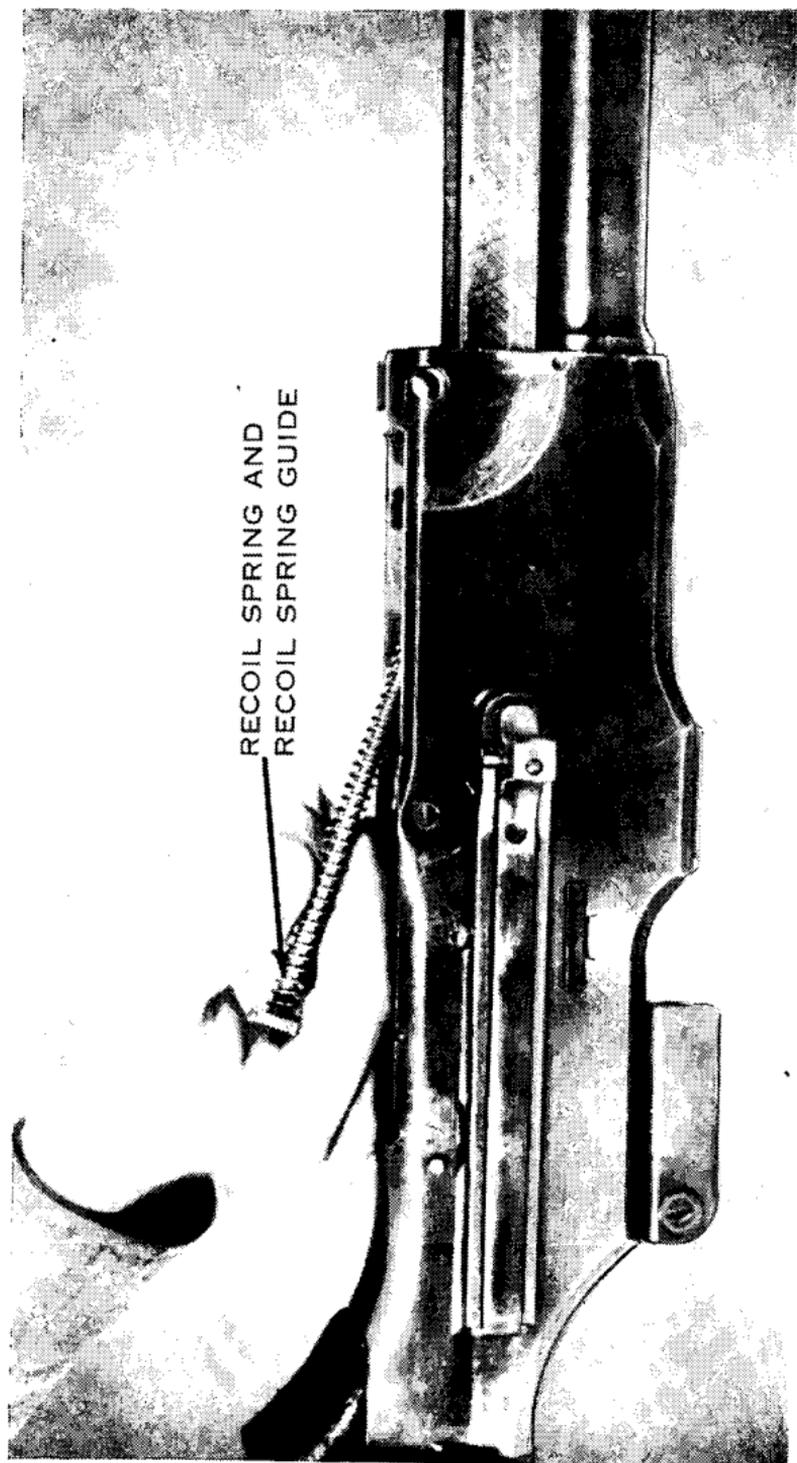
*Figure 7. Removing the trigger guard retaining pin assembly.*



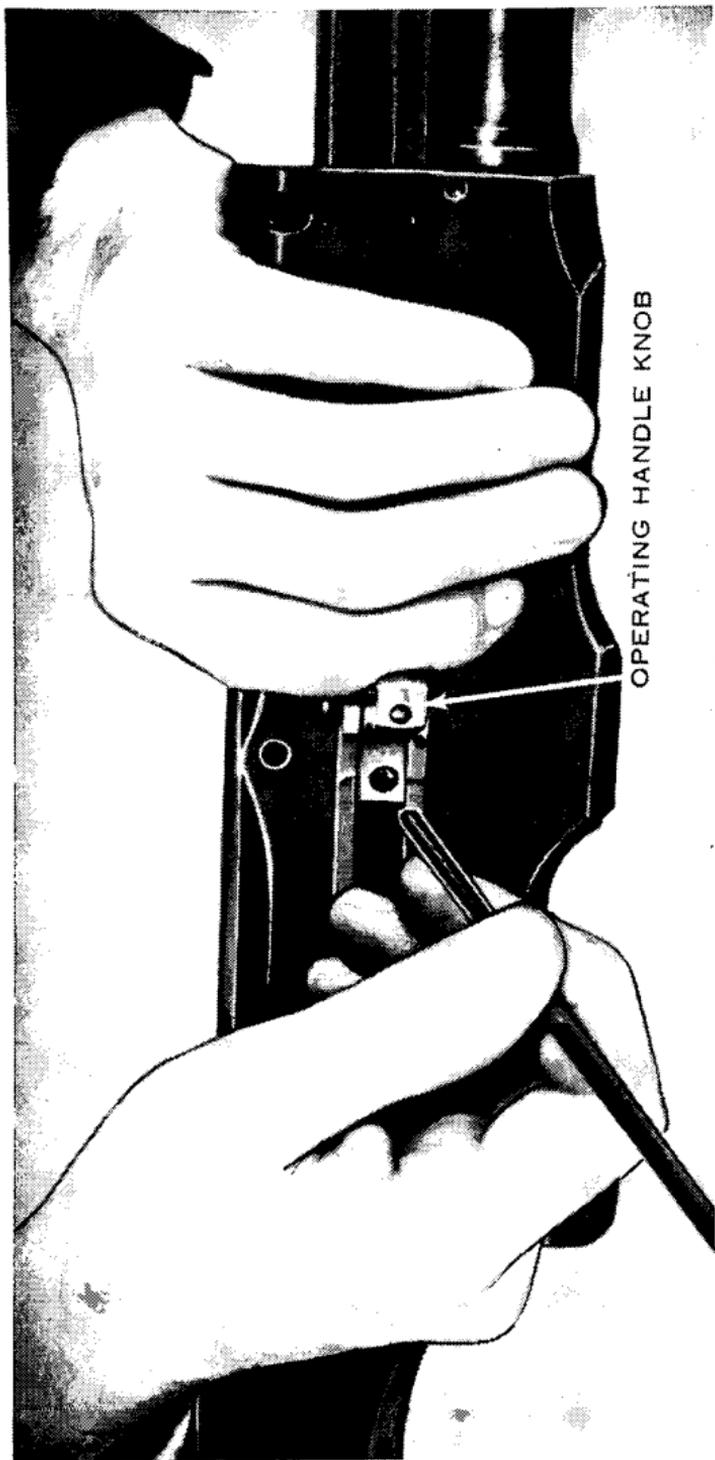
*Figure 8. Removing the trigger group.*



*Figure 9. Unseating the recoil spring guide.*



*Figure 10. Removing the recoil spring and guide.*



*Figure 11. Partially removing the hammer pin, first step.*

press against the hammer pin with the recoil guide. At the same time, push the operating handle slowly to the rear (fig. 12). Partially push the hammer pin through its hole in the receiver (fig. 13).

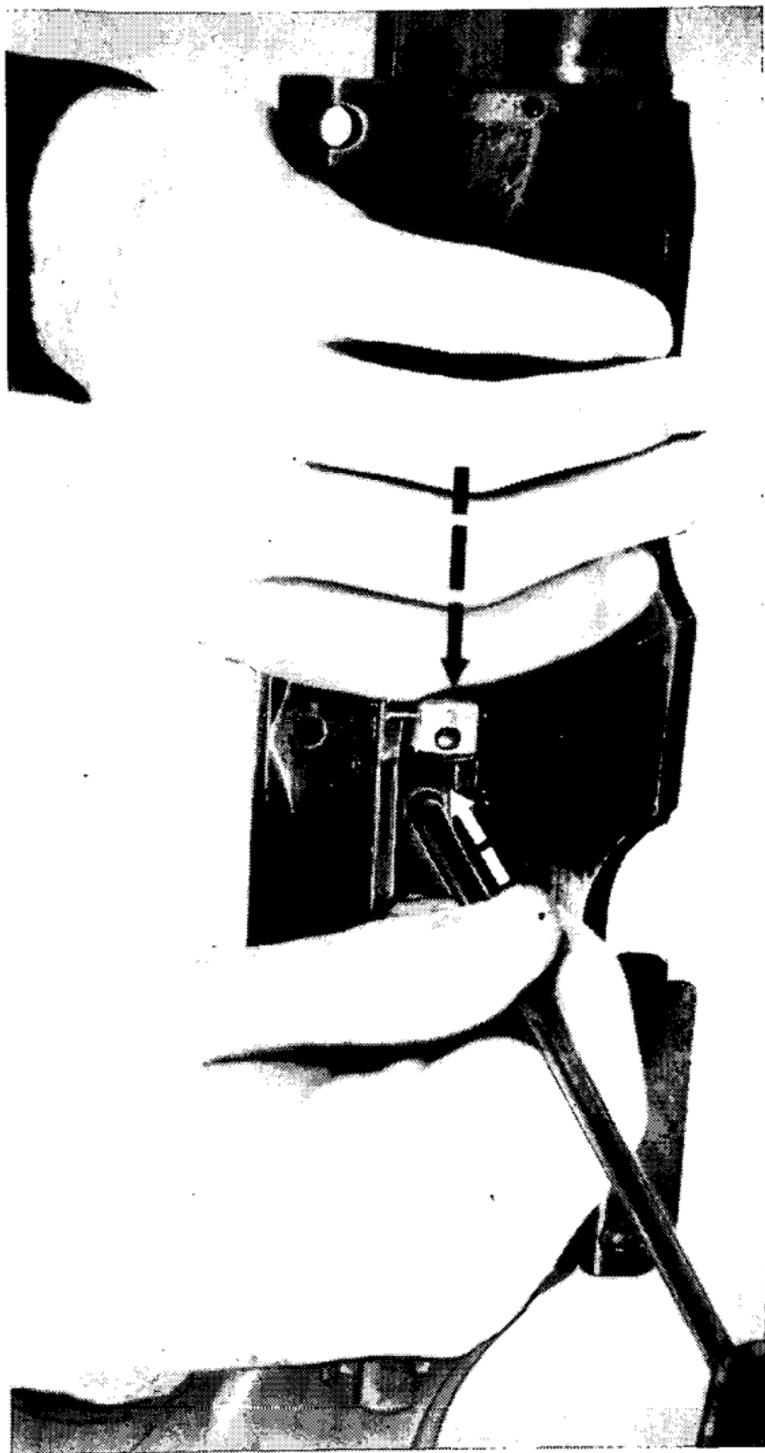
*j.* Remove the operating handle by pulling it straight to the rear (fig. 14). Now remove the hammer pin. The hammer pin is removed after the operating handle so that the parts will be placed in the correct order for assembly. During assembly the hammer pin is replaced before the operating handle.

*k.* To remove the hammer, move the slide abruptly a short distance to the rear (fig. 15). The hammer will fall from its seat in the rear of the slide. Lift the hammer from the receiver.

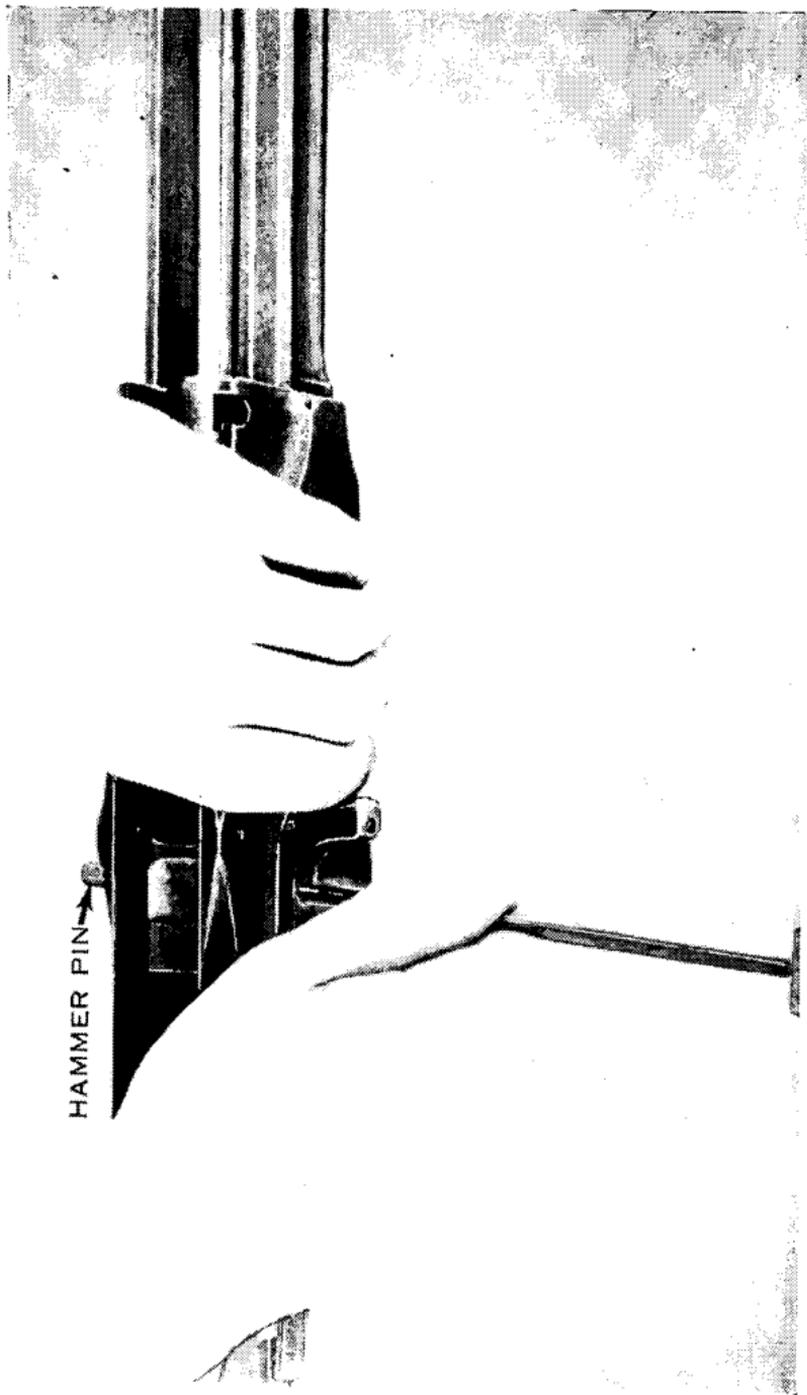
*l.* Before removing the slide, push the bolt link down so that the slide can clear it. Remove the slide toward the muzzle end of the weapon (fig. 16). Be careful that the piston rings are not burred by striking the gas cylinder tube bracket.

*m.* To remove the bolt assembly, proceed as shown in figure 17. Pry outward on the bolt guide with the base of a dummy cartridge. At the same time, grasp the bolt link and pull upward and to the rear on the bolt assembly. Remove the bolt assembly by lifting it out of the receiver.

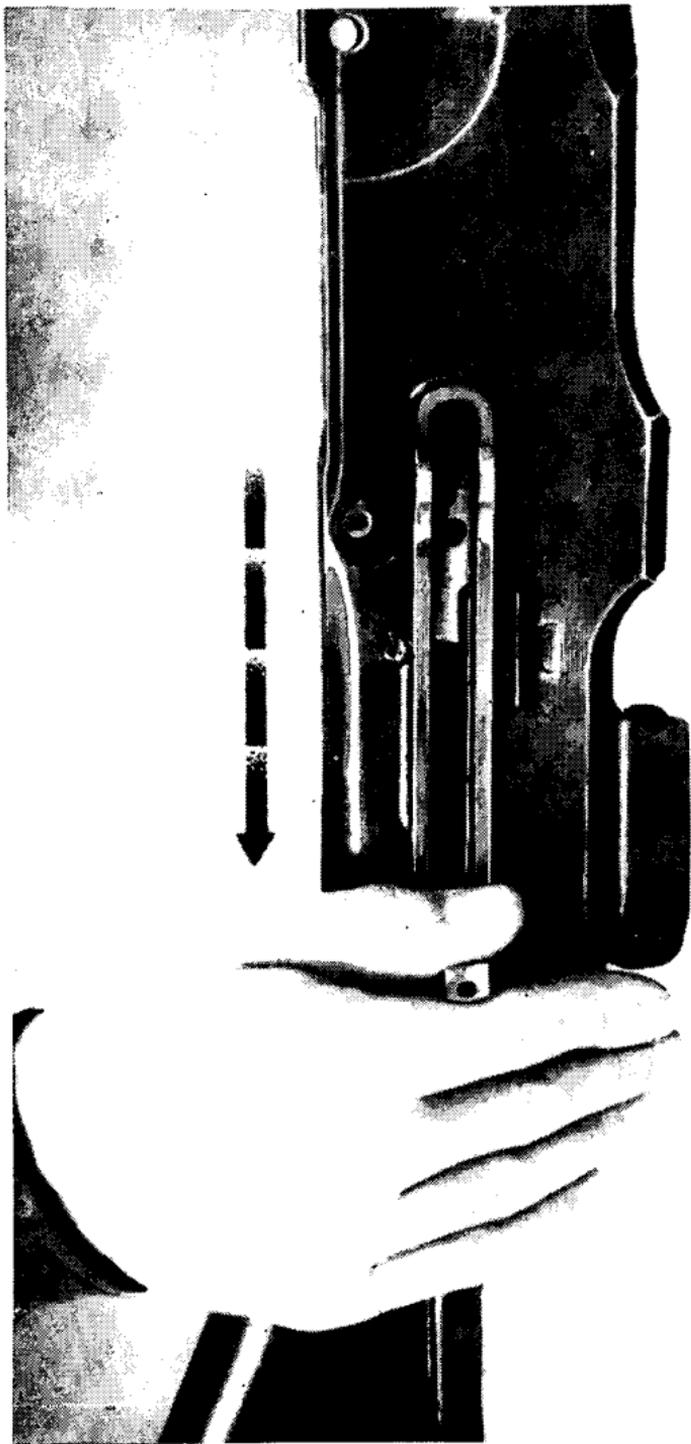
*n.* Holding the bolt in the left hand with the feed rib up and with the face of the bolt (front end) to the left, allow the bolt lock to swing downward, exposing the firing pin. Remove the firing pin from the feed rib (fig. 18).



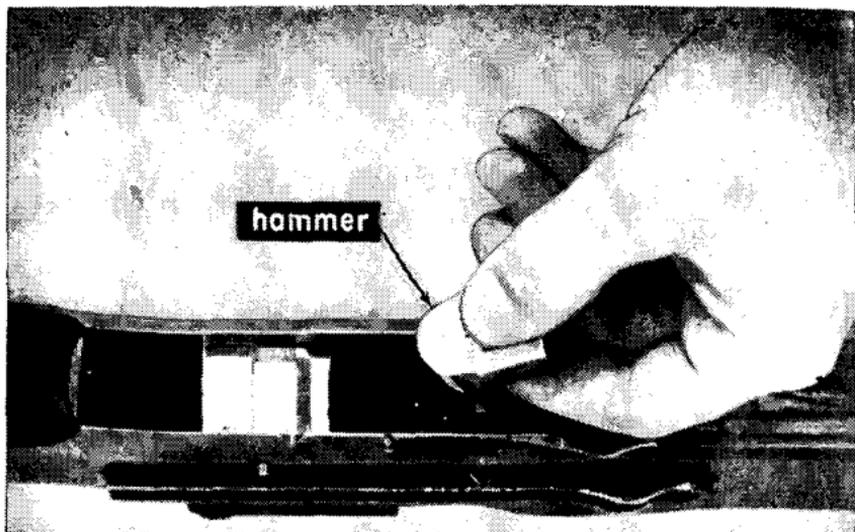
*Figure 12. Partially removing the hammer pin, second step.*



*Figure 13. Partially removing the hammer pin, third step.*



*Figure 14. Removing the operating handle.*

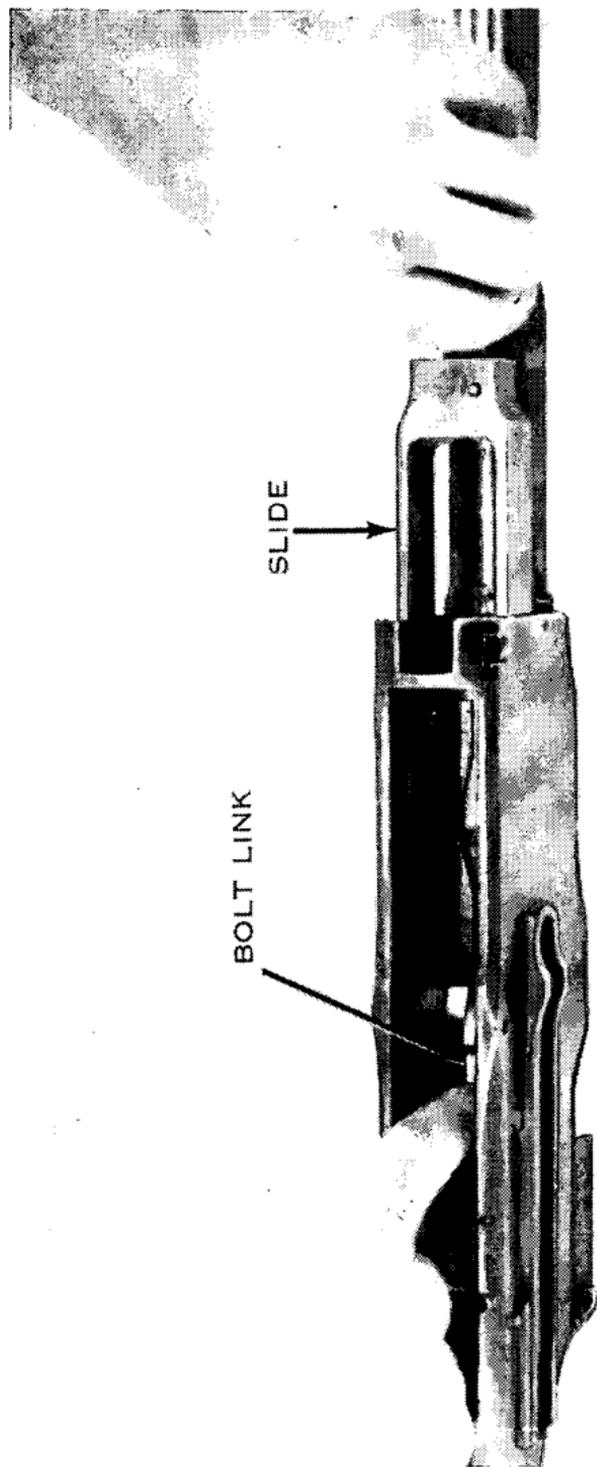


*Figure 15. Removing the hammer.*

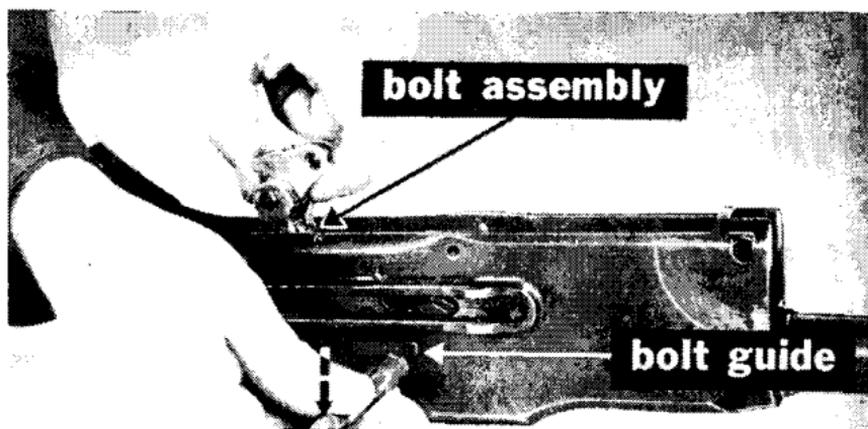
*o.* Use the firing pin to push out the bolt link pin (fig. 19). Remove the bolt link.

*p.* To remove the extractor and the extractor spring, hold the bolt and bolt lock in the left hand with the face of the bolt up and the claw of the extractor to your right. Place the point of a dummy cartridge under the claw of the extractor. Press outward, then pry upward, unseating the extractor. Remove the extractor and extractor spring (fig. 20):

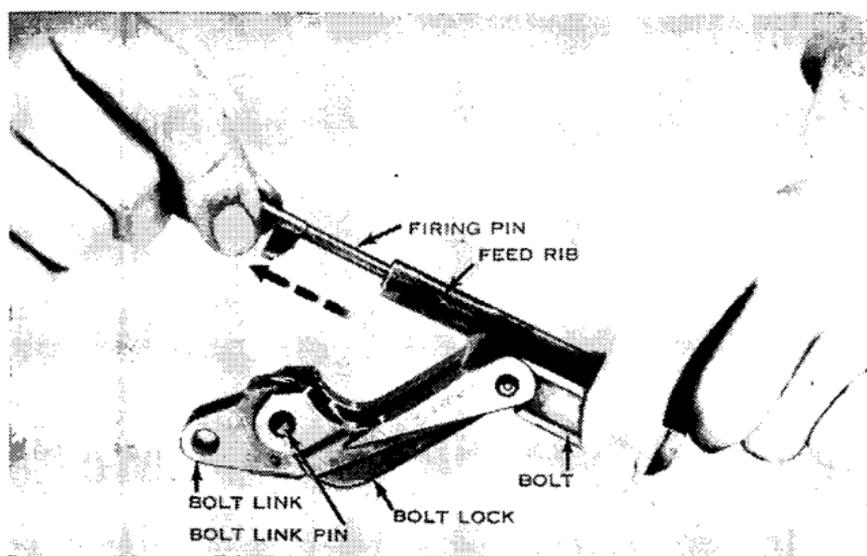
*q.* Check the parts that have been laid out. Make sure that they are laid out in the proper order for assembly shown in figure 21.



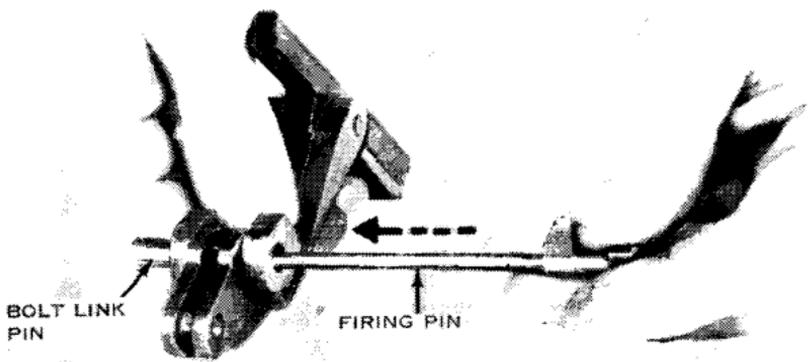
*Figure 16. Removing the slide.*



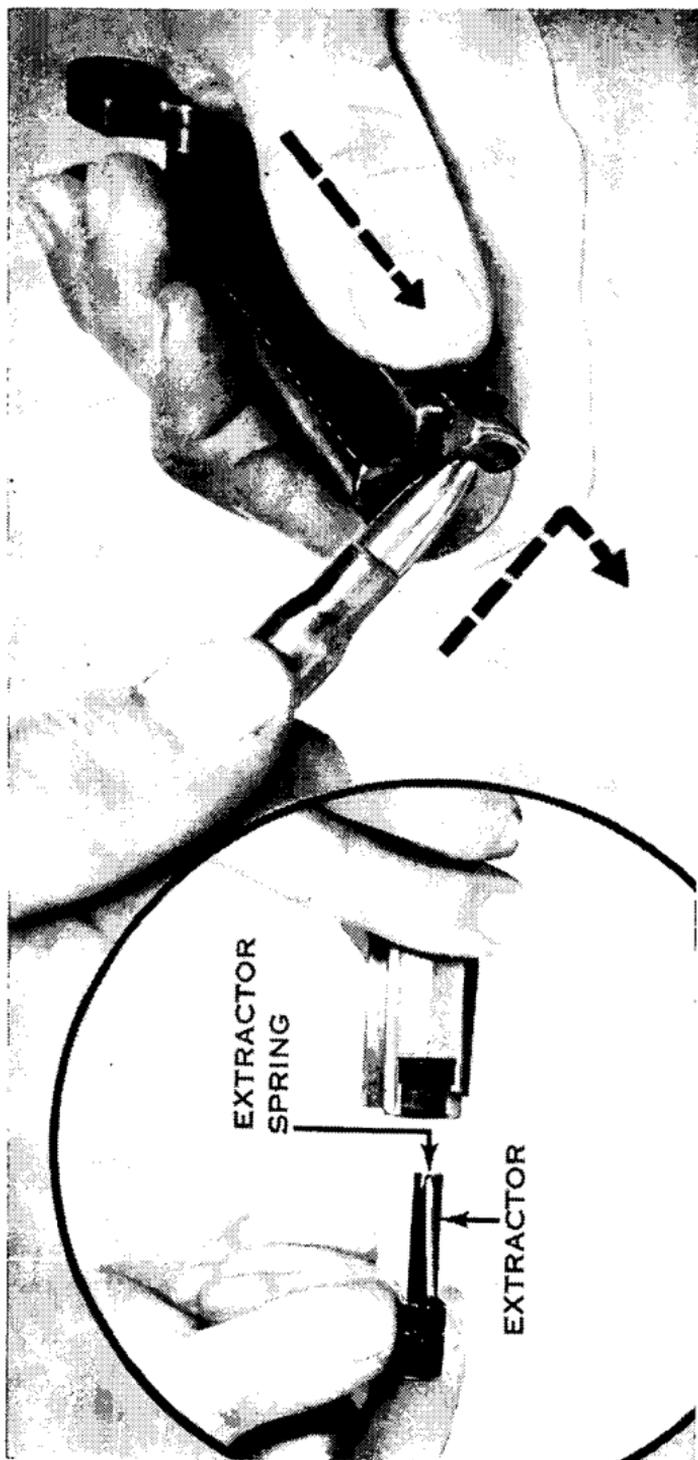
*Figure 17. Removing the bolt assembly.*



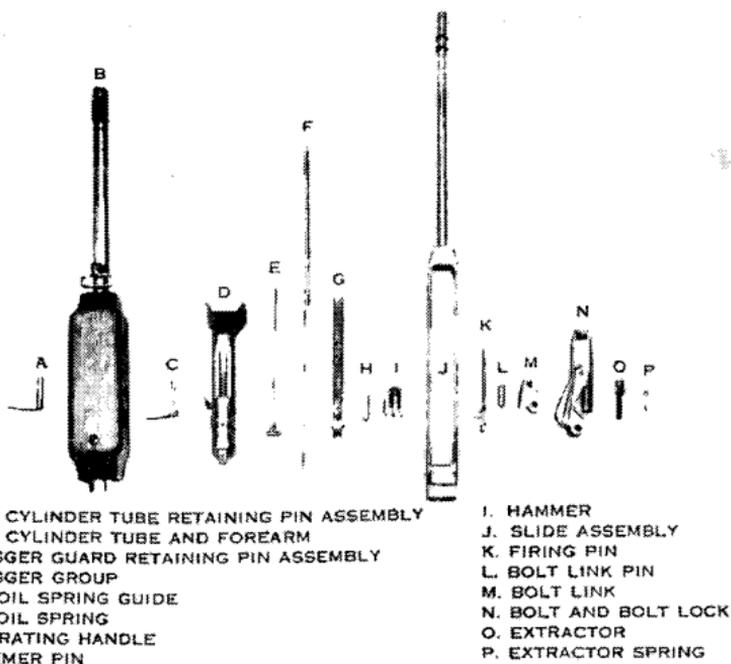
*Figure 18. Removing the firing pin.*



*Figure 19. Removing the bolt link pin.*



*Figure 20. Removing the extractor.*



*Figure 21. Layout of parts of the operating group.*

## 12. ASSEMBLY OF THE OPERATING GROUP

To assemble the operating group—

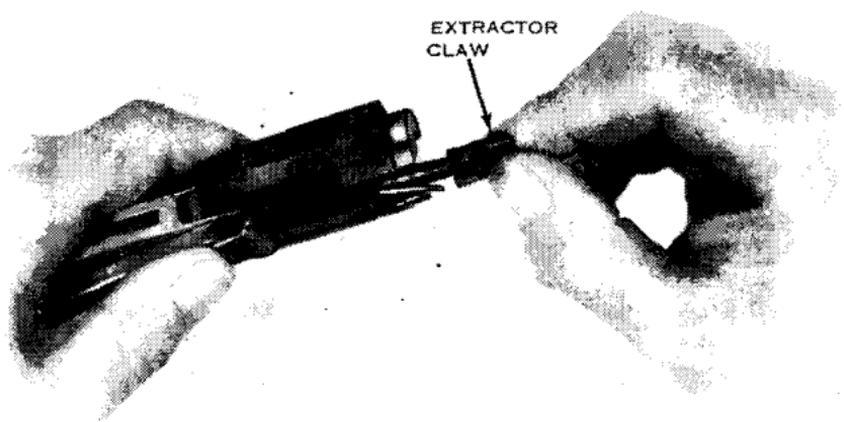
a. Place the automatic rifle on a flat surface, sights down and with the muzzle pointing to your left. Replace the short portion of the extractor spring in the hole of the extractor (fig. 22). The long portion of the spring fits along the groove on the outside of the extractor.

b. Replace the extractor and extractor spring in their seat in the face of the bolt (fig. 23). The claw of the extractor faces the center of the bolt.

c. To assemble the bolt lock and the bolt link, hold the bolt and bolt lock in the left hand with the feed rib to the front and the face of the bolt

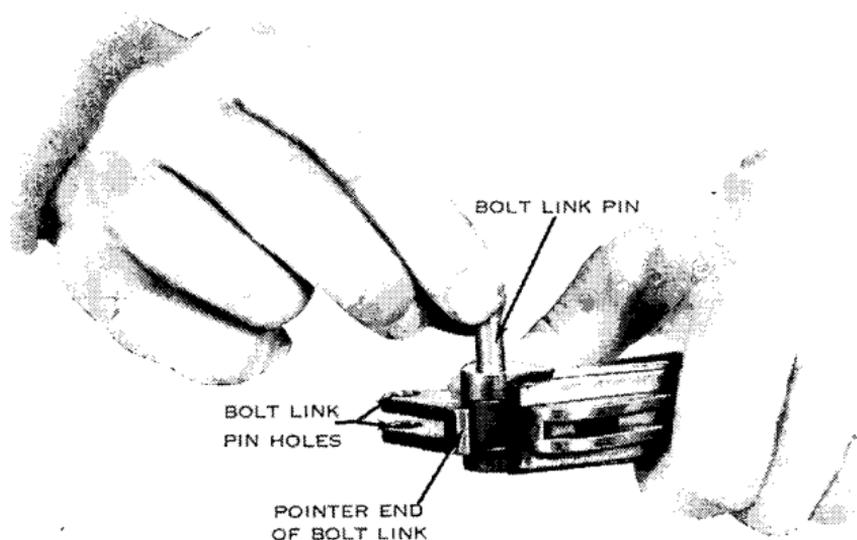


*Figure. 22. Replacing the extractor spring.*



*Figure 23. Replacing the extractor and extractor spring.*

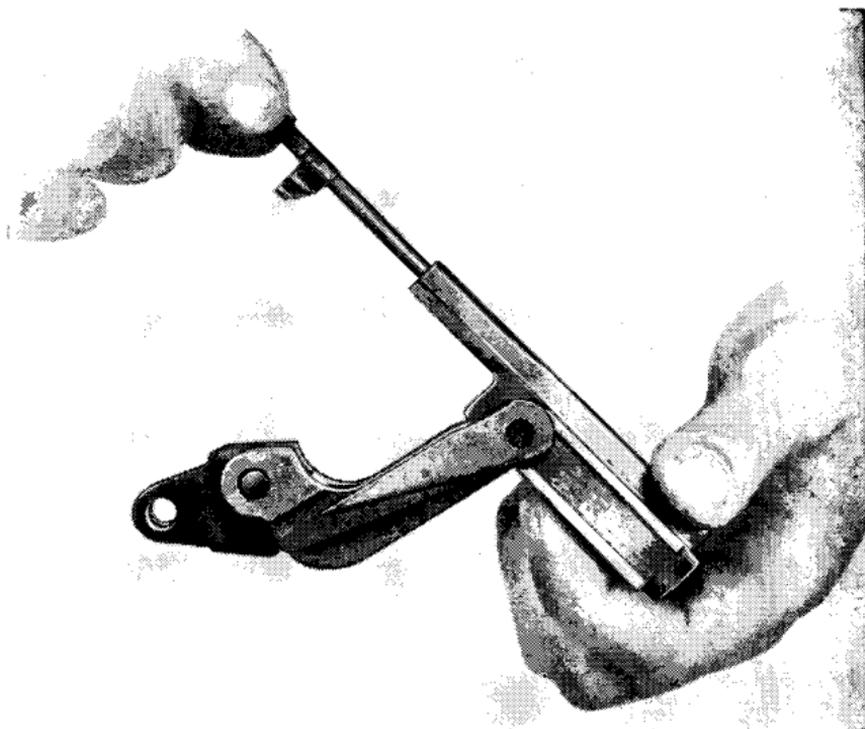
to the left. Pick the bolt link up in the right hand. Note that one side is pointed. Hold the bolt link with the pointed side up and the hole for the bolt link pin to the left. Assemble the two parts and lock them in place with the bolt link pin (fig. 24).



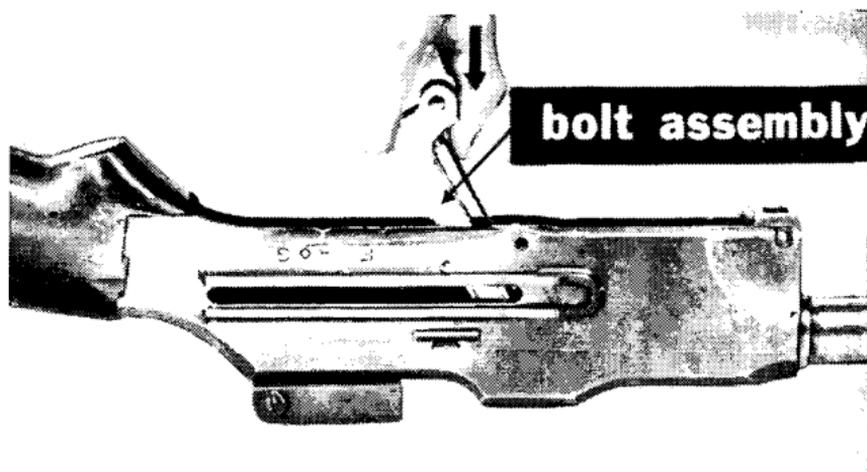
*Figure 24. Replacing the bolt link and bolt link pin.*

*d.* Holding the bolt assembly in the left hand with the feed rib up, allow the bolt lock to swing downward. Replace the firing pin in the feed rib (fig. 25).

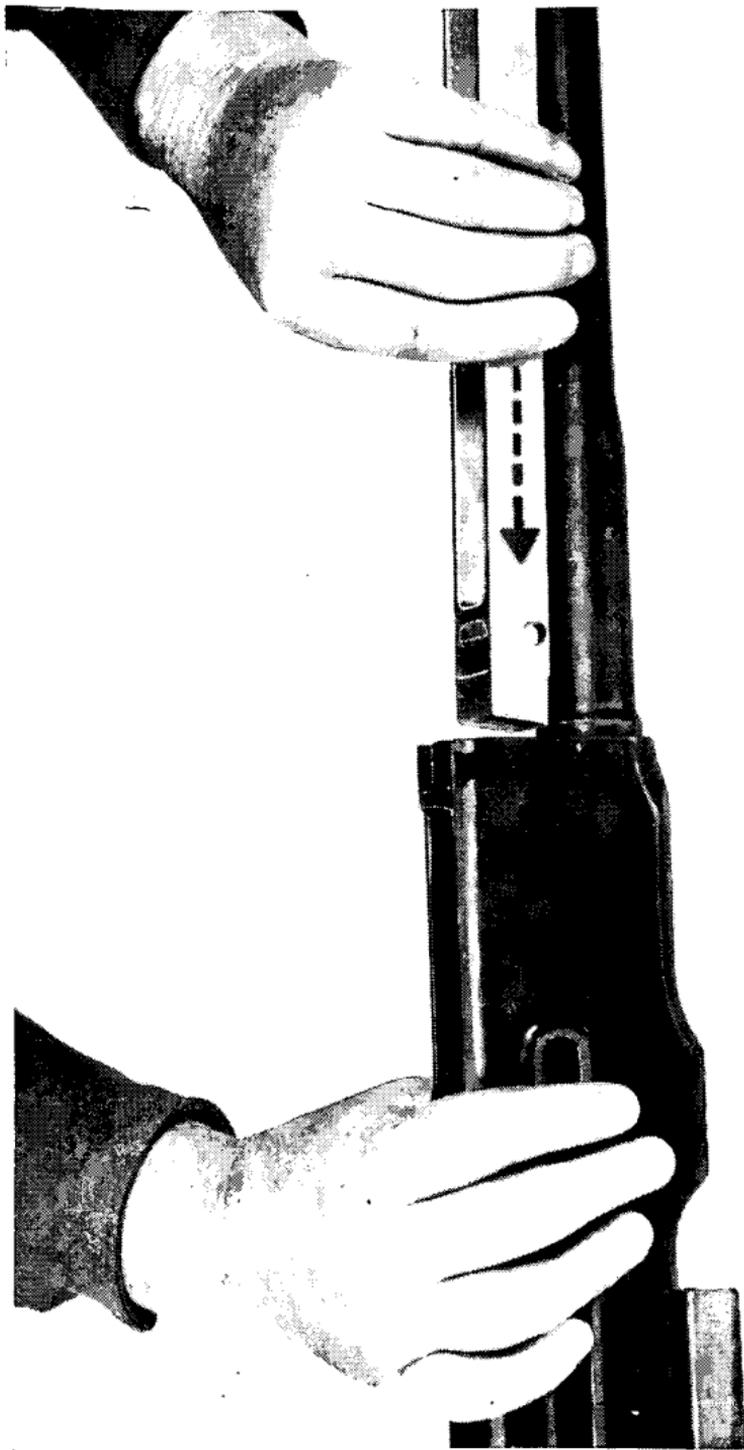
*e.* Before replacing the bolt assembly, look down in the receiver. You will see the rounded rear shoulders of the bolt supports on either side of the receiver. To replace the bolt assembly, hold it by the bolt link and the rear of the bolt lock with the face of the bolt down and the feed rib toward the muzzle (fig. 26). Lower the bolt



*Figure 25. Replacing the firing pin.*



*Figure 26. Replacing the bolt assembly.*

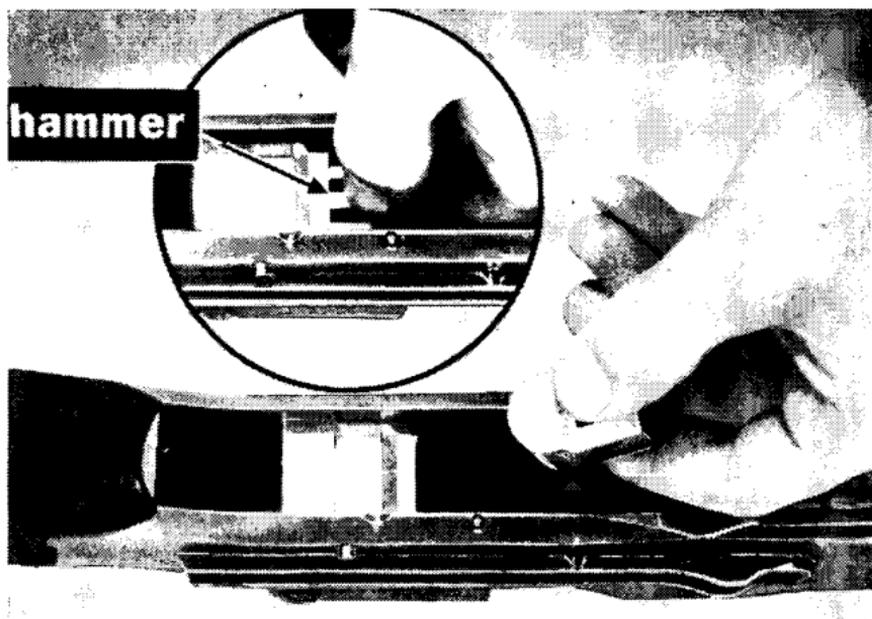


*Figure 27. Replacing the slide.*

assembly into the receiver so that the feed rib passes directly to the rear of the bolt supports. Allow the bolt lock and bolt link to drop down into the receiver. Push down and to the rear on the feed rib. The bolt assembly will snap into place under the bolt guide. Push the bolt assembly completely forward.

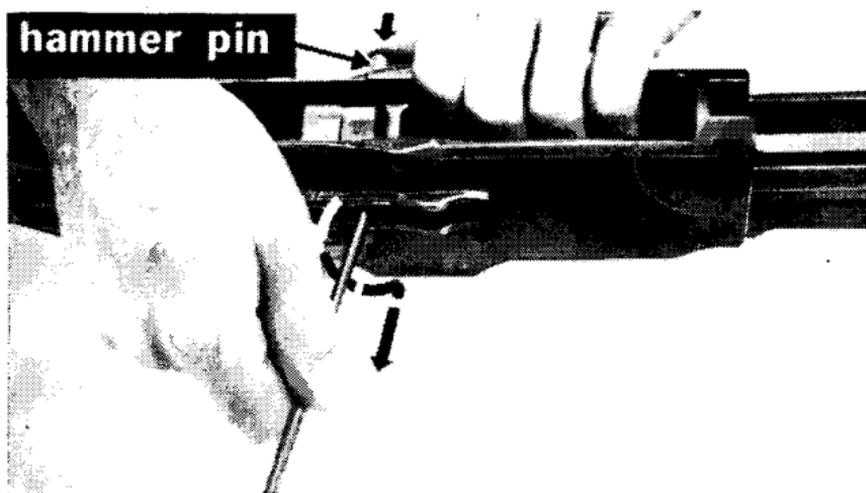
f. Push the bolt link down. Replace the slide with the hammer recess down (fig. 27). Be careful not to burr the piston rings by letting them strike against the gas cylinder tube bracket as the slide is replaced.

g. To replace the hammer, grasp it in the left hand with the thumb on the large flat surface and forefinger on the center rib as shown in figure 28. Slide the hammer into the recess, inserting the rounded portion of the hammer first.

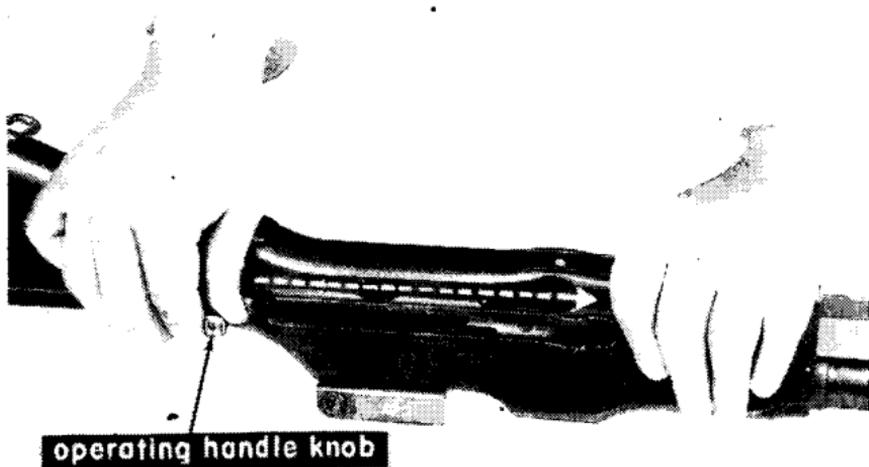


*Figure 28. Replacing the hammer.*

*h.* Use the recoil spring guide to align the hammer pin holes in the hammer, bolt link, and slide. Insert the recoil spring guide through the hammer pin holes from the far side of the receiver. To replace the hammer pin (fig. 29), place one end of it against the end of the recoil spring guide.



*Figure 29. Replacing the hammer pin.*



*Figure 30. Replacing the operating handle.*

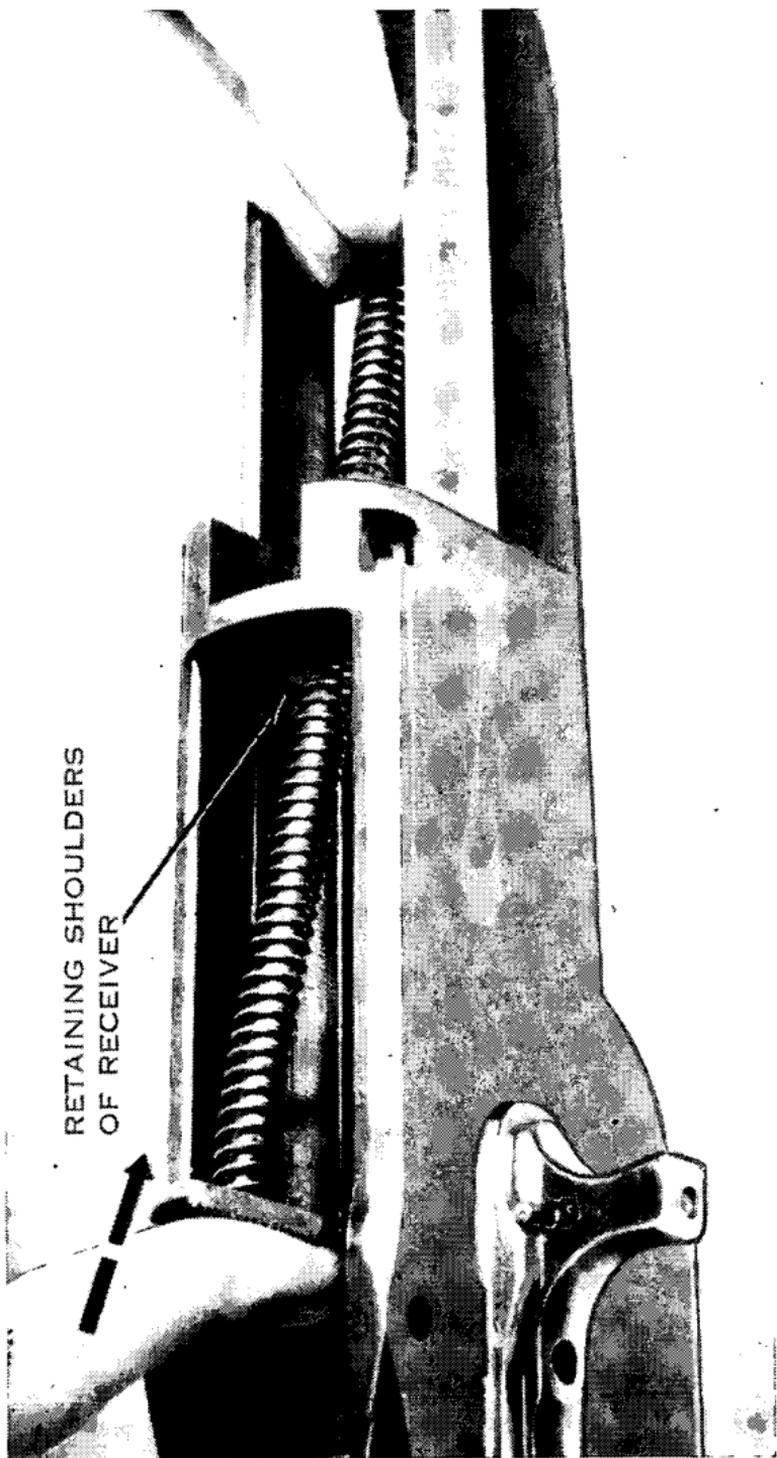
Push in on the hammer pin and at the same time remove the recoil spring guide with a slow circular motion. This action will keep the hammer pin holes alined as the hammer pin is inserted. Do not replace the hammer pin completely.

*i.* Replace the operating handle (fig. 30). The operating handle knob must be toward the muzzle end of the weapon. As soon as the operating handle is replaced, push in the hammer pin all the way.

*j.* Assemble the recoil spring and recoil spring guide. The recoil spring guide may be inserted into either end of the recoil spring. Thread the loose end of the recoil spring through the forward end of the receiver and into the gas piston. Place the fingers of the left hand inside the slide as shown in figure 31. Your two fingers of the left hand guide the recoil spring and the recoil spring guide and prevent buckling. Push in on the checkered surface of the recoil spring guide. Rotate the recoil spring guide and engage its ends in the retaining shoulders of the receiver.

*k.* Holding the trigger group as shown in figure 8, engage the rear of the trigger group in the rear of the receiver. Lock the trigger group in place with the trigger guard retaining pin assembly (fig. 32).

*l.* Before replacing the gas cylinder tube and forearm, cock the weapon. This is done so that the gas cylinder tube and forearm can fit over the gas piston. Slide the gas cylinder tube and forearm over the gas piston. As the gas cylinder tube and forearm are replaced, be careful that the pis-

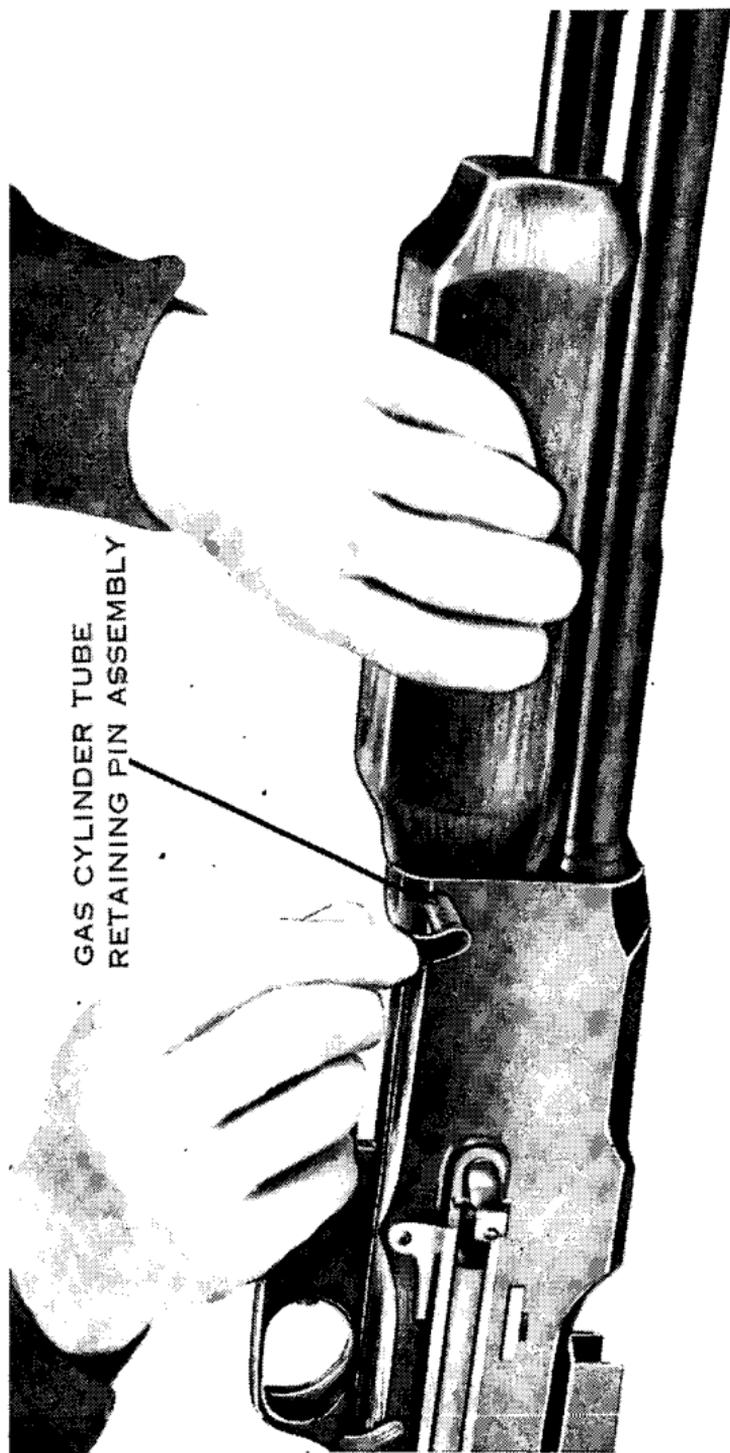


*Figure 31. Replacing the recoil spring and recoil spring guide.*



TRIGGER GUARD RETAINING  
PIN ASSEMBLY

*Figure 32. Replacing the trigger guard and retaining pin assembly.*



GAS CYLINDER TUBE  
RETAINING PIN ASSEMBLY

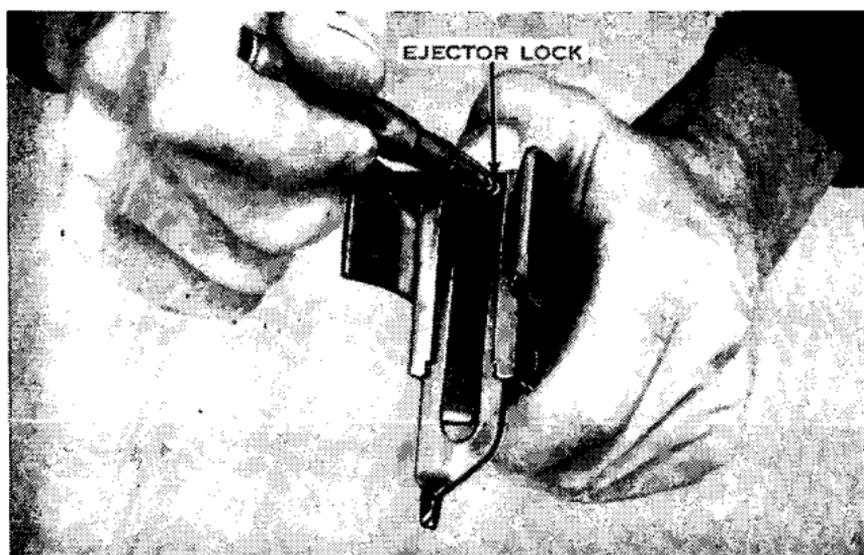
*Figure 33. Replacing the gas cylinder tube retaining pin assembly.*

ton rings on the gas piston are not burred. Lock the gas cylinder tube and forearm in place with the gas cylinder tube retaining pin assembly (fig. 33).

### 13. DISASSEMBLY OF THE TRIGGER GROUP

To disassemble the trigger group—

a. Push in the ejector lock with the point of a dummy cartridge and unseat the ejector (fig. 34). If the ejector sticks, insert the recoil spring guide through the ejector and unseat it. In every case, the ejector lock must be pushed down while unseating the ejector. Hold a finger over the magazine catch spring so that it will not fly out as the ejector is removed. Remove the ejector (fig. 35) and lift out the magazine catch spring (fig. 36).



*Figure 34. Unseating the ejector.*



*Figure 35. Removing the ejector.*



*Figure 36. Removing the magazine catch spring.*

b. Place the trigger group on a flat surface with the magazine guides pointing away from you. With the point of a dummy cartridge, unseat the magazine catch pin (fig. 37). Remove the magazine catch pin and the magazine catch. Turn the trigger guard on end with the magazine guides down and shake out the magazine release.

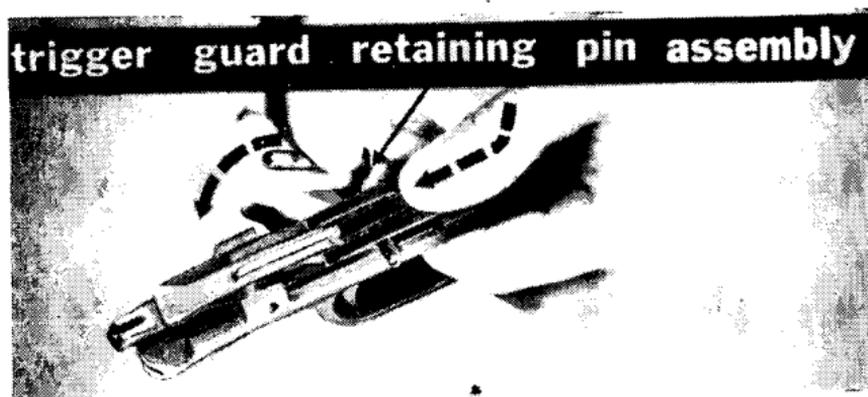


*Figure 37. Removing the magazine catch pin.*

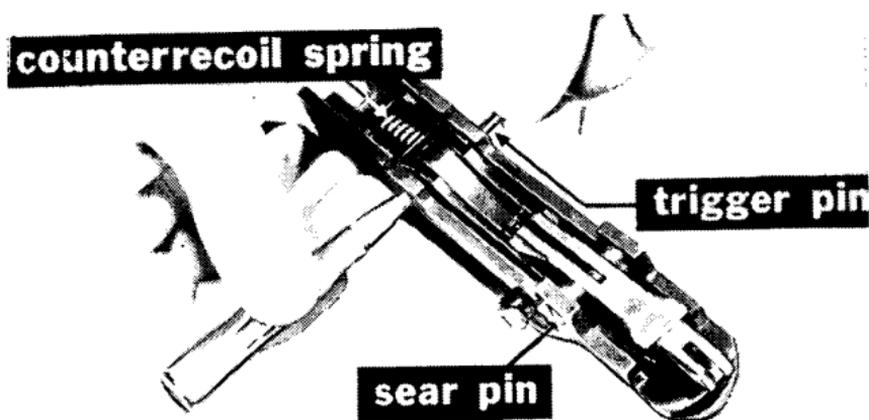
c. To remove the sear spring, use the trigger guard retaining pin assembly as a tool. Place the trigger group on a flat surface with the magazine guides toward your body. Insert the spring portion of the trigger guard retaining pin assembly under all three leaves of the sear spring. Rotate the trigger guard retaining pin assembly forward. At the same time, push downward and forward on the rear of the sear spring with the left thumb (fig. 38). The nose of the sear spring will be

unseated from the recess in the trigger guard ledge. Remove the sear spring.

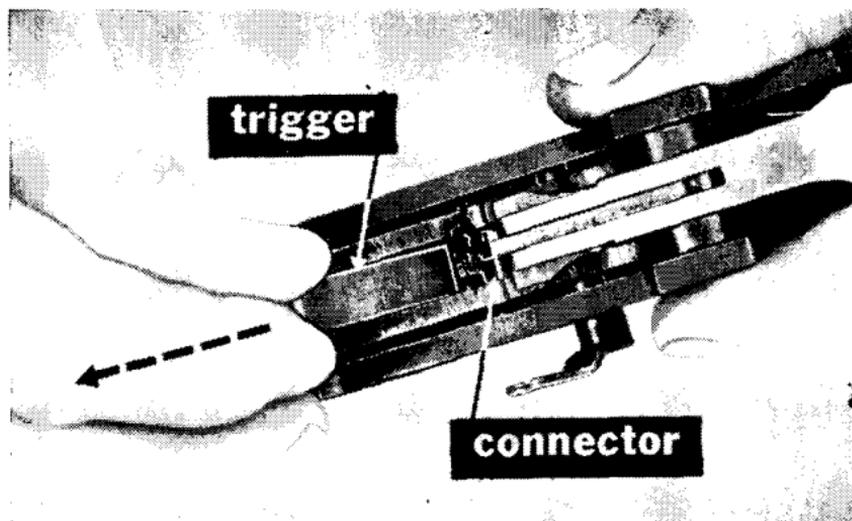
d. With the point of a dummy cartridge push out the trigger pin (fig. 39). Never remove the sear pin before removing the trigger pin. If you remove the sear pin first, you will release the counterrecoil spring which may strike the trigger pin with enough force to damage it. Also, it will be difficult for you to disassemble the rest of the trigger group. Remove the trigger and connector



*Figure 38. Removing the sear spring.*



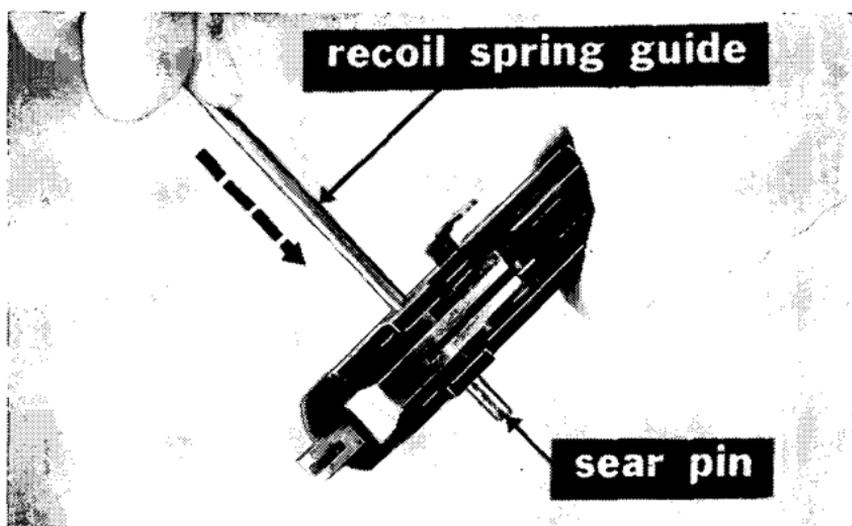
*Figure 39. Removing the trigger pin.*



*Figure 40. Removing the trigger and connector.*

(fig. 40). Separate the two parts. Notice that both parts are shaped like a boot.

e. Rest the rear of the trigger group on a flat surface. Using the recoil spring guide as a



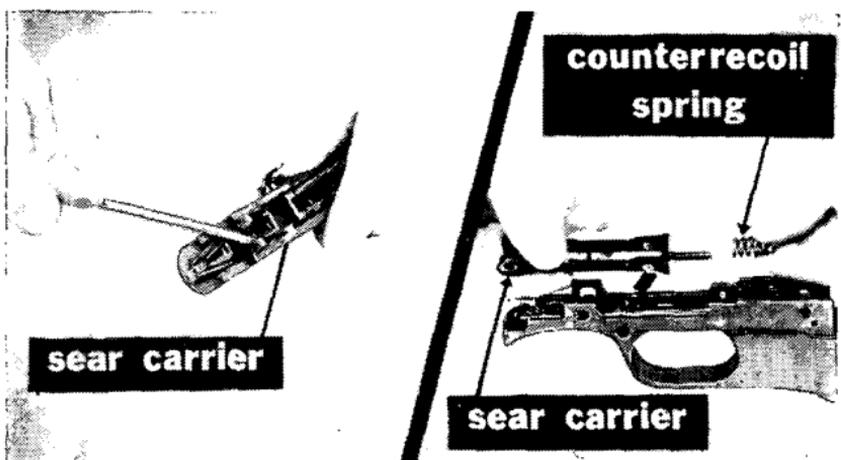
*Figure 41. Removing the sear pin.*

tool, push out the sear pin (fig. 41). Keep your fingers out of the path of the recoil spring guide. You may have to use some force to remove the sear pin. Apply this force carefully.

f. Remove the sear and sear release stop lever (fig. 42). Notice how the two parts are assembled—short arm to short arm and with the sear nose



*Figure 42. Removing and separating the sear and sear release stop lever.*

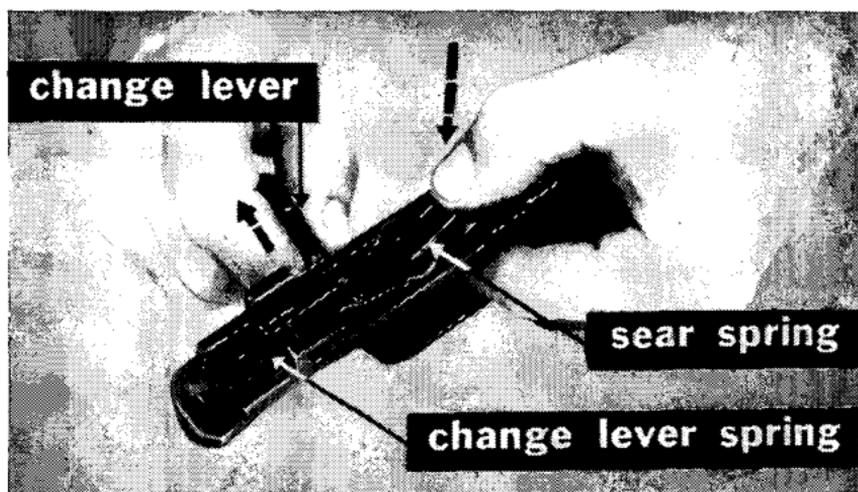


*Figure 43. Unscating the sear carrier and removing the counterrecoil spring.*

up and to the rear. Separate the sear and the sear release stop lever.

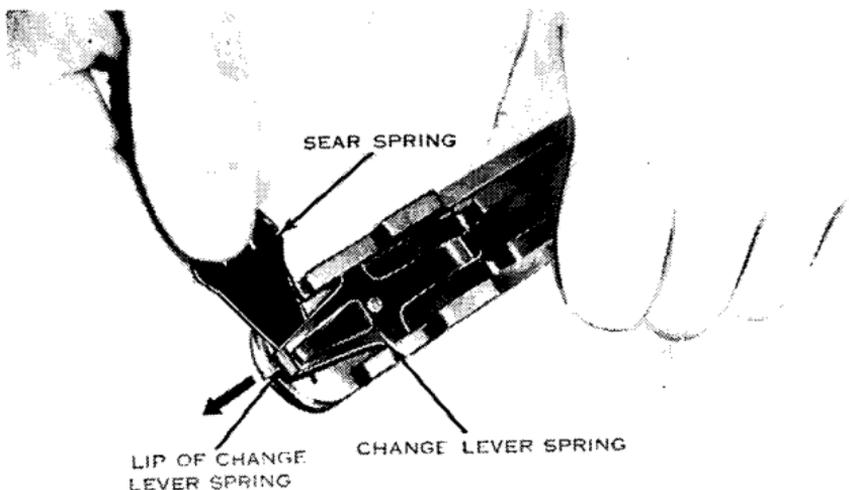
*g.* To unseat the sear carrier, insert the point of the recoil spring guide into one of the sear pin holes in the sear carrier. Pry upward, unseating the sear carrier. Separate the sear carrier and counterrecoil spring (fig. 43).

*h.* Place the square end of the sear spring under the forward end of the change lever spring. The shoulders of the sear spring rest on the trigger guard as shown in figure 44. Pry upward on the forward end of the change lever spring, reducing its tension on the change lever. Remove the change lever.



*Figure 44. Removing the change lever.*

*i.* Using the square end (nose) of the sear spring, pry upward and backward on the rear of the change lever spring. This unseats the lip of the change lever spring from its seat on

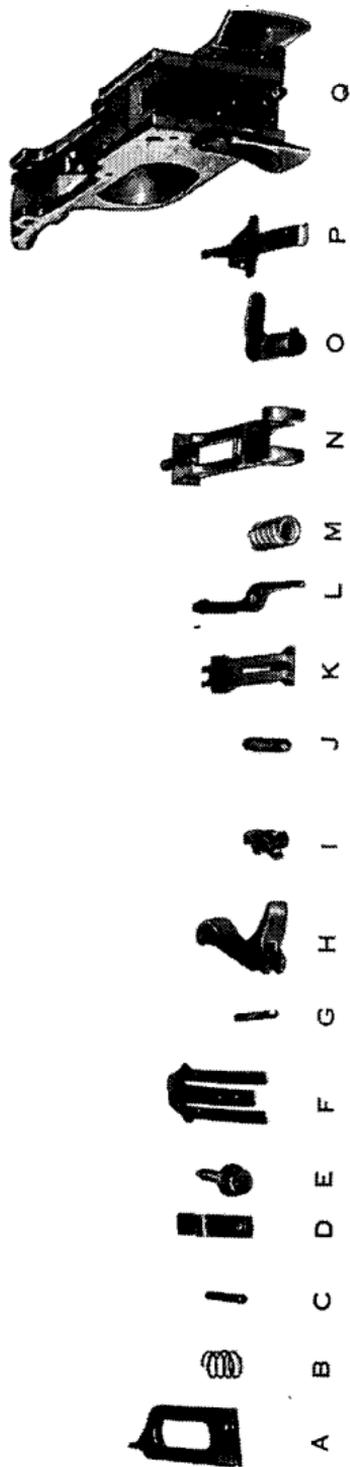


*Figure 45. Unseating the change lever spring.*

the trigger guard (fig. 45). Push downward and to the rear on the change lever spring and remove the change and stop lever spring assembly (fig. 46). Be careful not to damage the sear re-



*Figure 46. Removing the change and stop lever spring assembly.*



A EJECTOR  
 B MAGAZINE CATCH SPRING  
 C MAGAZINE CATCH PIN  
 D MAGAZINE CATCH  
 E MAGAZINE RELEASE  
 F SEAR SPRING

G TRIGGER PIN  
 H TRIGGER  
 I CONNECTOR  
 J SEAR PIN  
 K SEAR  
 L SEAR RELEASE STOP  
 LEVER

M COUNTERCOIL SPRING  
 N SEAR CARRIER  
 O CHANGE LEVER  
 P CHANGE AND STOP LEVER  
 SPRING ASSEMBLY  
 Q TRIGGER GUARD BODY

Figure 47. Layout of the trigger group parts.

lease stop lever spring during this step. Apply pressure to the rear of the stud connecting the change lever spring and sear release stop lever spring.

j. Check the parts that have been laid out. Make sure that they are laid out in the proper order for assembly shown in figure 47.

#### 14. ASSEMBLY OF THE TRIGGER GROUP

To assemble the trigger group—

a. Start the two flanges on the change lever spring into their grooves on the rear of the trigger guard. The sear release stop lever spring points up and to the rear. Pry up on the rear of the change lever spring with the square end of the sear spring. At the same time push downward and forward with the left thumb (fig. 48). Be careful not to damage the sear release stop lever spring. When the change lever spring is

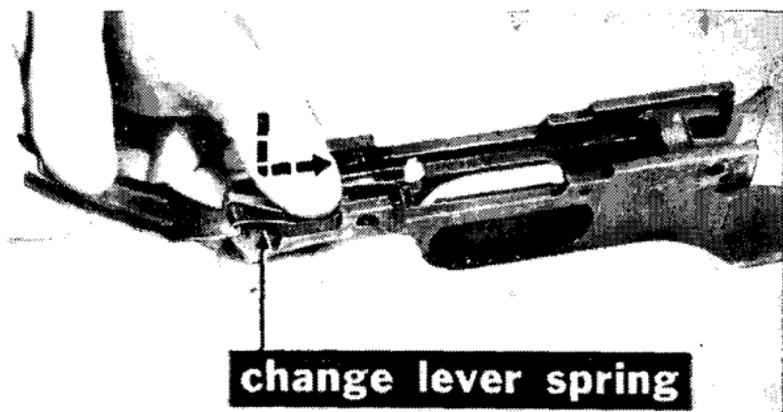
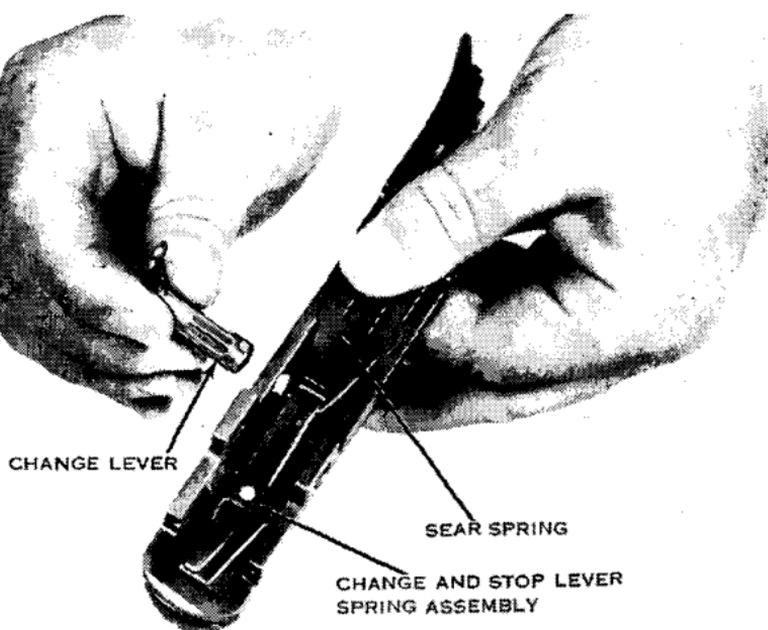


Figure 48. Replacing the change and stop lever spring assembly.

properly seated, the two flanges of this spring will be engaged in their grooves and the lip of the change lever spring will be engaged with the recess on the rear of the trigger guard.

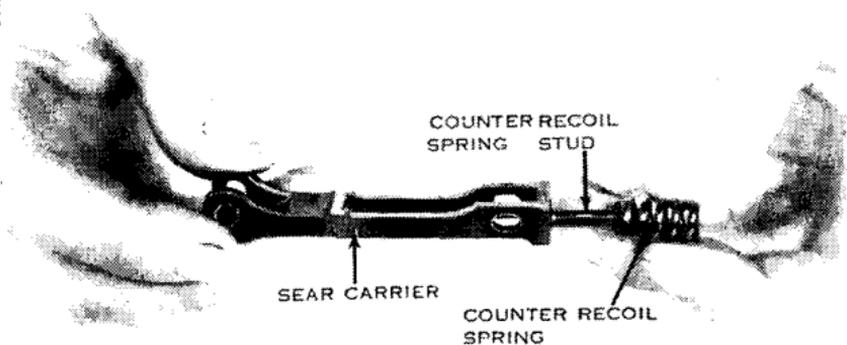
b. Pry up on the forward end of the change lever spring with the square end (nose) of the sear spring. Slide the change lever into its recess (fig. 49). The sear spring is used in this step in the same way that it was used during disassembly.



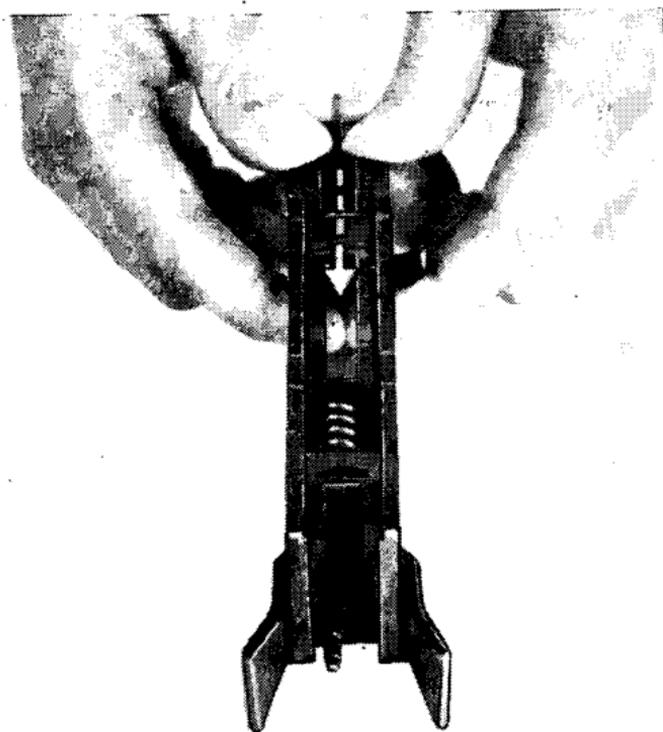
*Figure 49. Replacing the change lever.*

c. Place the counterrecoil spring on its stud on the forward end of the sear carrier (fig. 50).

d. You may find it hard to seat the sear carrier. As you replace this part, remember that the rear of the sear carrier is seated in front of

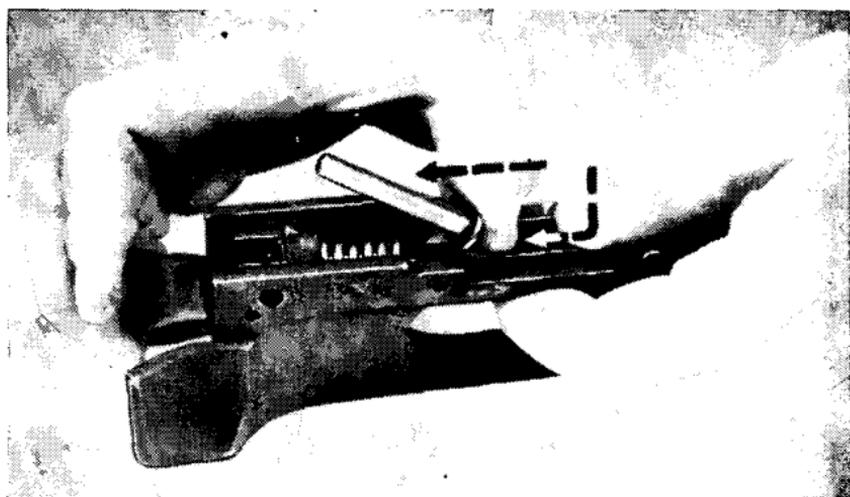


*Figure 50. Assembling the sear carrier and counter-recoil spring.*



*Figure 51. Replacing the sear carrier (first method).*

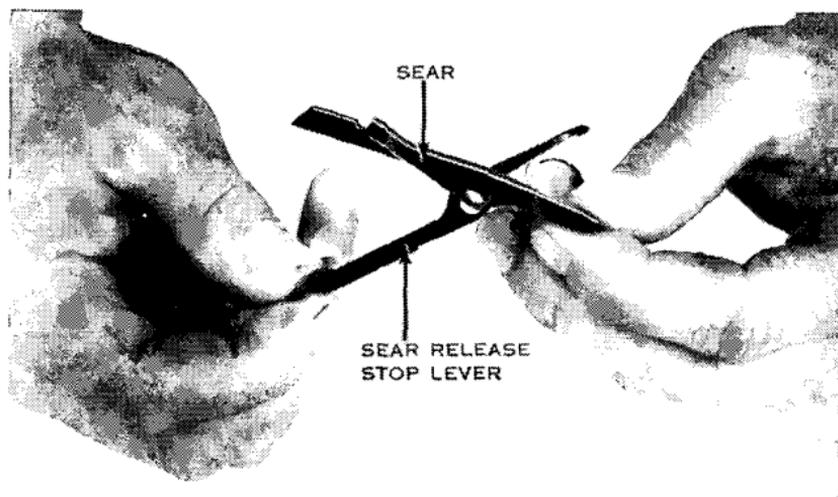
the shoulders of the sear spring. To replace this part, grasp the sear carrier and trigger guard as shown in figure 51. Insert your forefingers through the trigger guard and place your thumbs on the rear of the sear carrier. Pull back with the forefingers and push forward and down with the thumbs. While replacing the sear carrier, the forward end must not rise. If it does, the counterrecoil spring stud will rise above its recess in the trigger guard.



*Figure 52. Replacing the sear carrier (second method).*

e. If the sear carrier cannot be seated as described above, there is another method (fig. 52). However, because you may damage parts of the weapon by this second method, use it only after the first one has been tried and has failed. Insert the spring portion of the trigger guard retaining pin assembly downward into the sear carrier. The spring portion is placed in front

of the connector stop. Rotate the trigger guard retaining pin assembly forward. To help prevent damage to the trigger guard retaining pin assembly, be sure to press on it with the right thumb in the manner shown in figure 52. At the same time push downward and forward on the rear of the sear carrier. The rear of the sear carrier will snap into place in front of the sear spring shoulders.



*Figure 53. Assembling the sear and sear release stop lever.*

f. Assemble the sear and sear release stop lever, short arm to short arm (fig. 53). Replace these parts in the sear carrier with the sear nose up and to the rear. Using the recoil spring guide as a tool, align the sear pin holes in the trigger guard, sear carrier, sear, and sear release stop lever. To do this, push the guide through the sear pin holes. Grasp the trigger group as shown

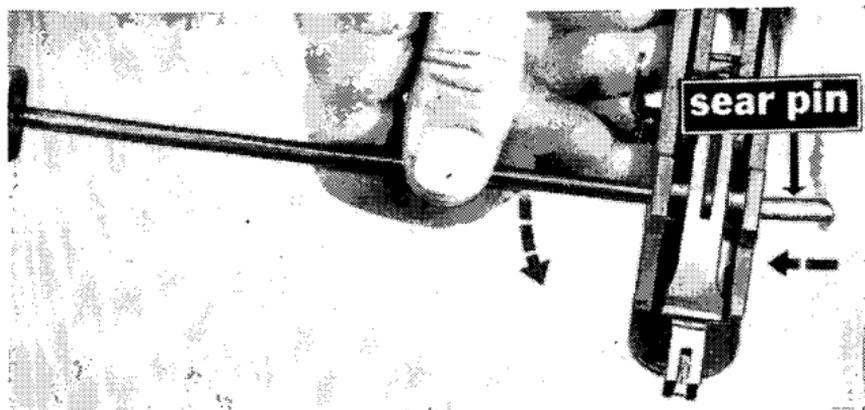
in figure 54. Keep the fingers out of the path of the recoil spring guide. Force must be applied carefully.

g. Because you may find it difficult to replace the sear pin, follow these instructions closely.



*Figure 54. Alining the sear pin holes.*

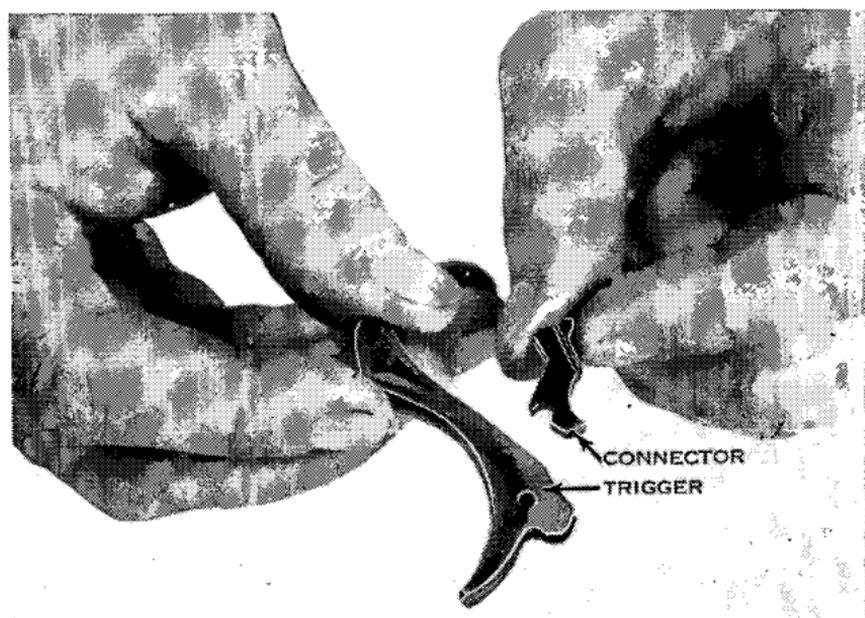
Withdraw the recoil spring guide into the trigger guard about one-fourth of an inch. Place one end of the sear pin against the point of the recoil spring guide. Withdraw the recoil spring guide, another fourth of an inch. Pry forward on the recoil spring guide, alining the sear pin holes, and at the same time push in on the sear pin, seating it against the end of the recoil spring guide. Repeat this procedure until the sear pin



*Figure 55. Replacing the sear pin.*

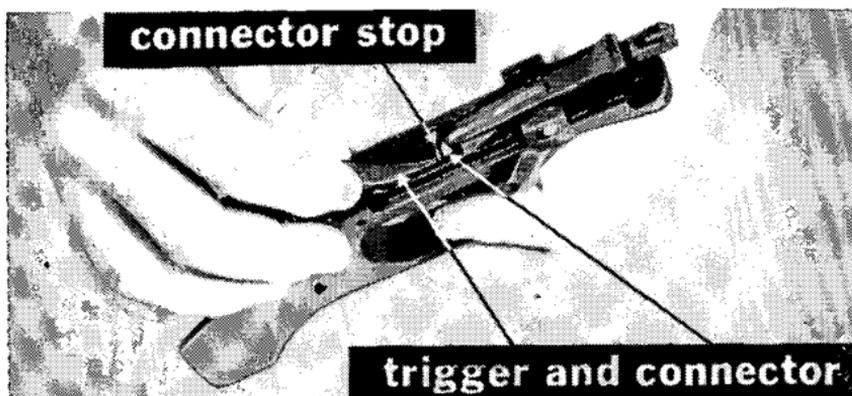
is nearly seated (fig. 55). Seat the sear pin the rest of the way by pushing the protruding end against a firm surface such as a table top.

*h.* Both the trigger and connector are shaped like a boot. Assemble the two parts, heel to heel, as shown in figure 56.



*Figure 56. Assembling the trigger and connector.*

i. With the magazine guides to the right, raise the rear end of the trigger group as shown in figure 57. Lower the trigger and connector into the trigger guard. The connector passes down, under, and to the rear of the connector stop.



*Figure 57. Replacing the trigger and connector.*

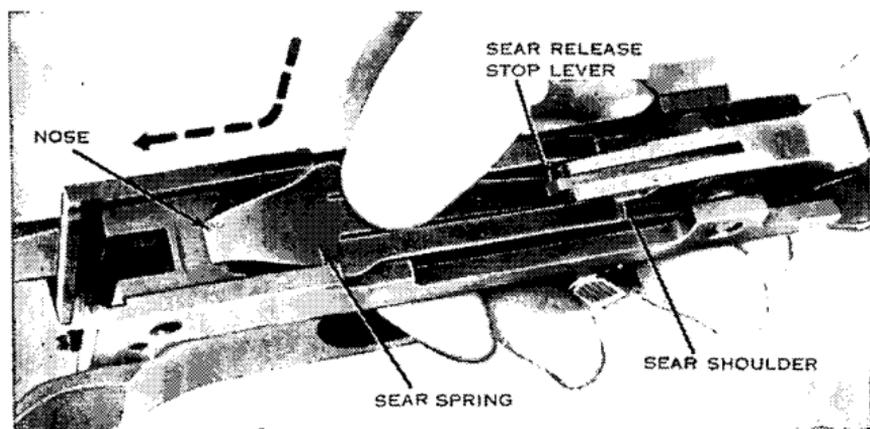
j. Lock the trigger in place with the trigger pin (fig. 58).

k. Place the outer leaves of the sear spring on the sear shoulders. The center leaf of the sear spring is placed under the forward end of the sear release stop lever. Place the nose of the sear spring so that it just rests on the trigger guard housing. Push downward and forward on the sear spring. The sear spring shoulders will slide under the grooves in the trigger guard. The nose of the sear spring will snap into place in the trigger guard ledge (fig. 59).

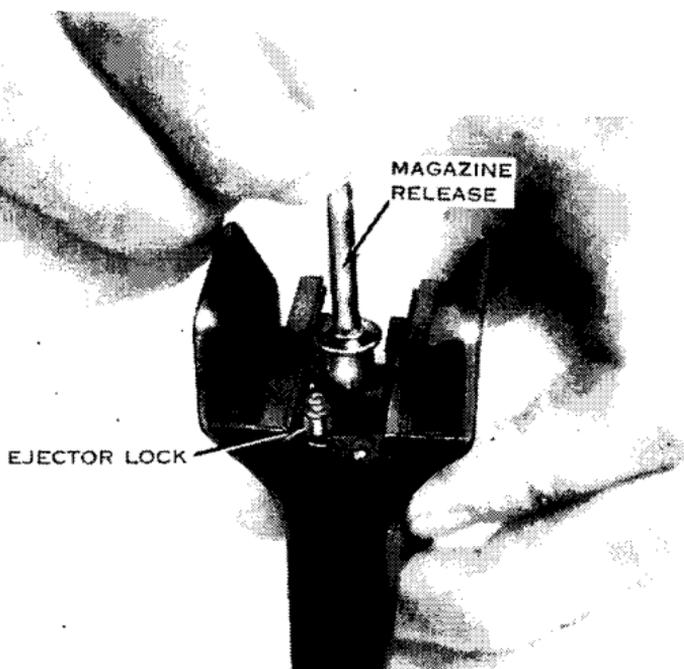
l. Place the trigger guard on the flat surface with the magazine guides up. Replace the magazine release (fig. 60). The heavy portion of the magazine release is inserted first.



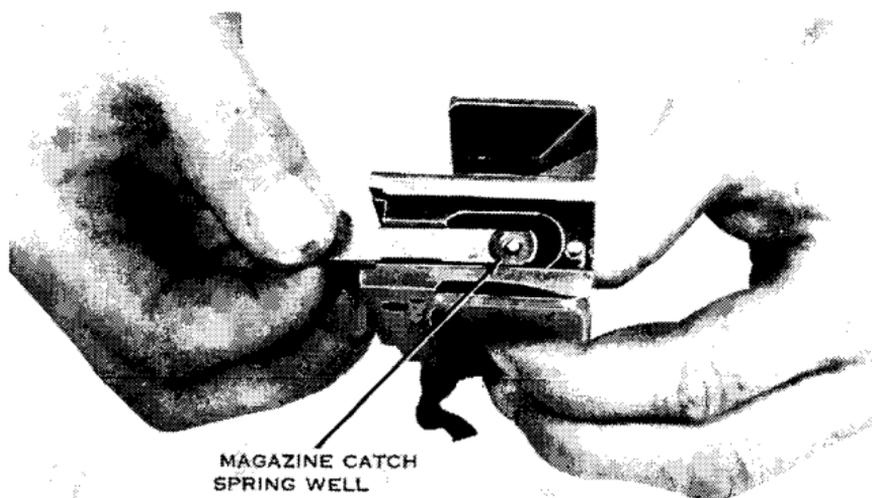
*Figure 58. Replacing the trigger pin.*



*Figure 59. Replacing the sear spring.*



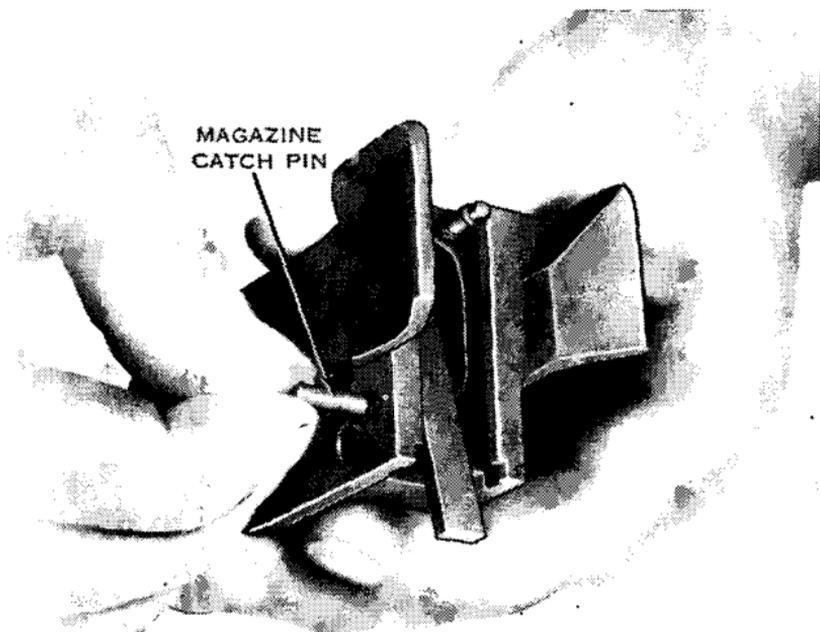
*Figure 60. Replacing the magazine release.*



*Figure 61. Replacing the magazine catch.*

*m.* Replace the magazine catch with the magazine catch spring well facing you (fig. 61).

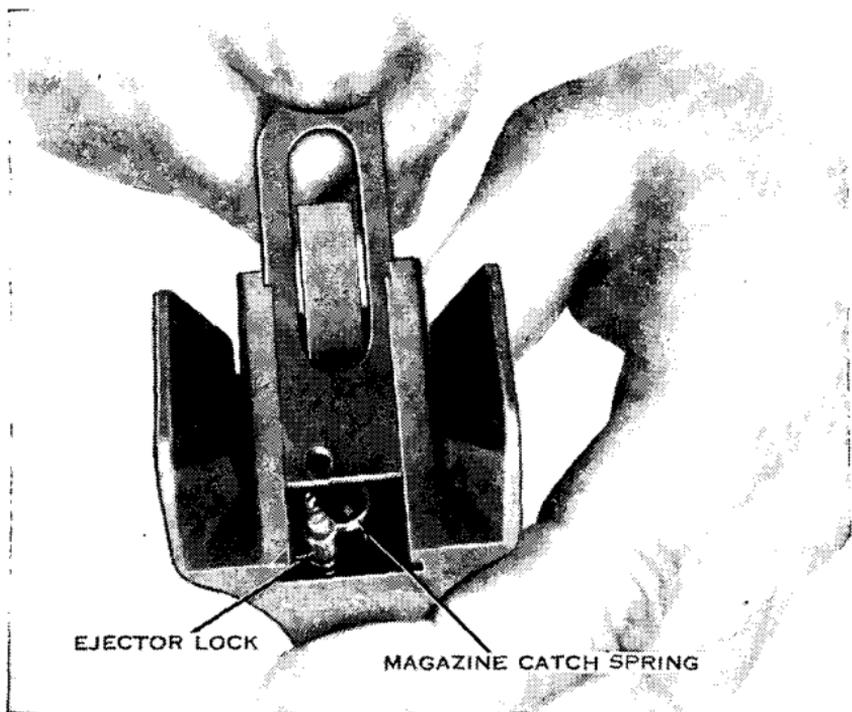
*n.* Lock the magazine catch in place with the magazine catch pin (fig. 62).



*Figure 62. Replacing the magazine catch pin.*

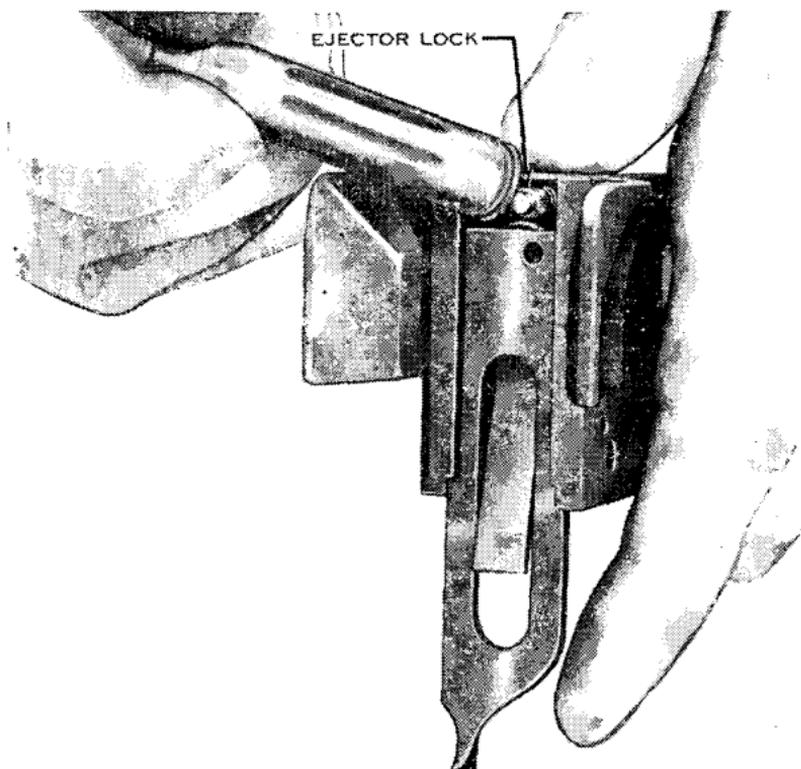
*o.* Replace the ejector so that the recess for the ejector lock is alined with the ejector lock. Replace the magazine catch spring. Slide the ejector downward against the ejector lock (fig. 63).

*p.* Holding the trigger group in the left hand, rest the tip of the ejector against a firm surface such as a table. Push downward on the ejector



*Figure 63. Replacing the ejector and magazine catch spring.*

and at the same time push inward on the ejector lock with the base of a dummy cartridge. This will seat the ejector (fig. 64). The ejector is held in the assembled position by the ejector lock.



*Figure 64. Seating the ejector.*

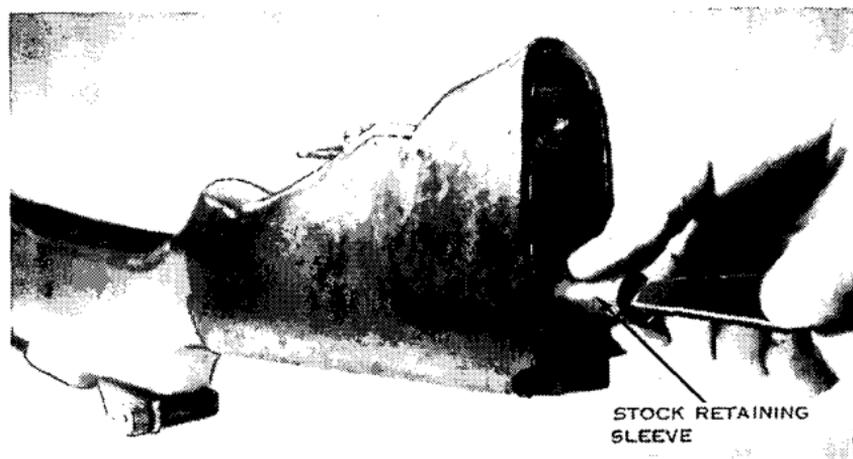
## 15. DISASSEMBLY OF THE BUFFER AND RATE REDUCING GROUP

To disassemble the buffer and rate reducing group, place the weapon on a flat surface, sights down and the muzzle pointing away from your body. Remove the sling from the lower sling swivel. Remove the trigger guard retaining pin assembly and the trigger group.

*a.* Using the screwdriver blade of the combination tool, unscrew and remove the large butt plate screw. Now remove the small butt plate screw from the lug on top of the hinged butt plate as-

sembly. On some automatic rifles, the small screw has been replaced with a stud riveted in place. Lift off the hinged butt plate assembly.

b. Remove the stock retaining sleeve (fig. 65) by unscrewing it from the actuator tube.

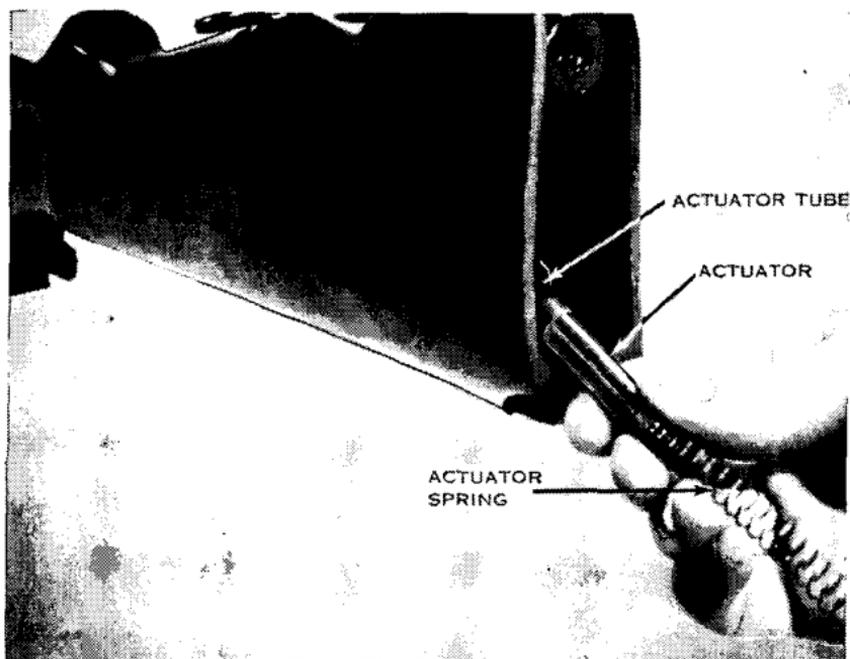


*Figure 65. Removing the stock retaining sleeve.*

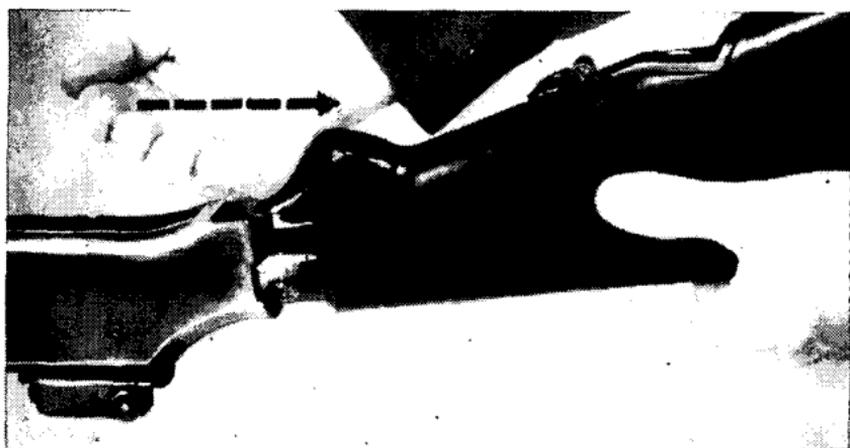
c. Remove the actuator spring and actuator from the actuator tube (fig. 66). Separate the two parts. If the actuator does not come out with the spring, leave the actuator in the actuator tube and remove it when the actuator tube and buffer cap assembly is removed.

d. Remove the stock (fig. 67). It may be necessary to strike the stock a sharp blow to the rear to unseat it. Remove the lock washer by turning the stock on end. The lock washer will drop out.

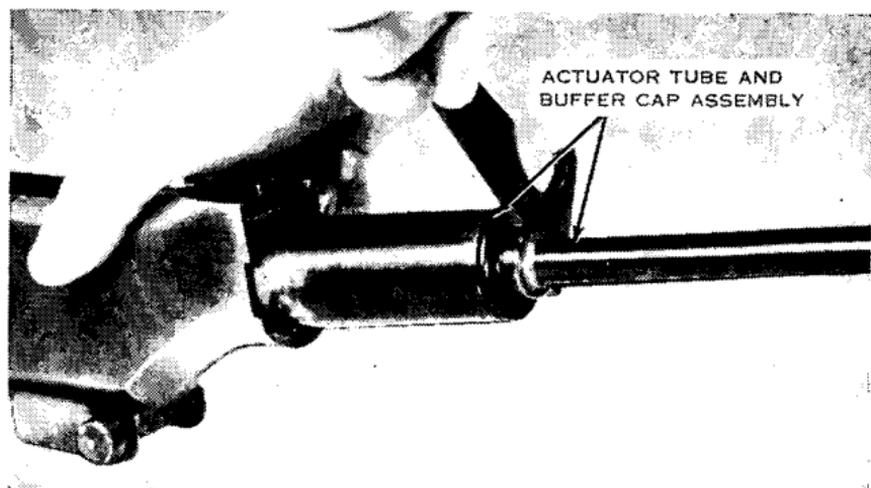
e. Using the small spanner of the combination tool, unscrew the actuator tube and buffer



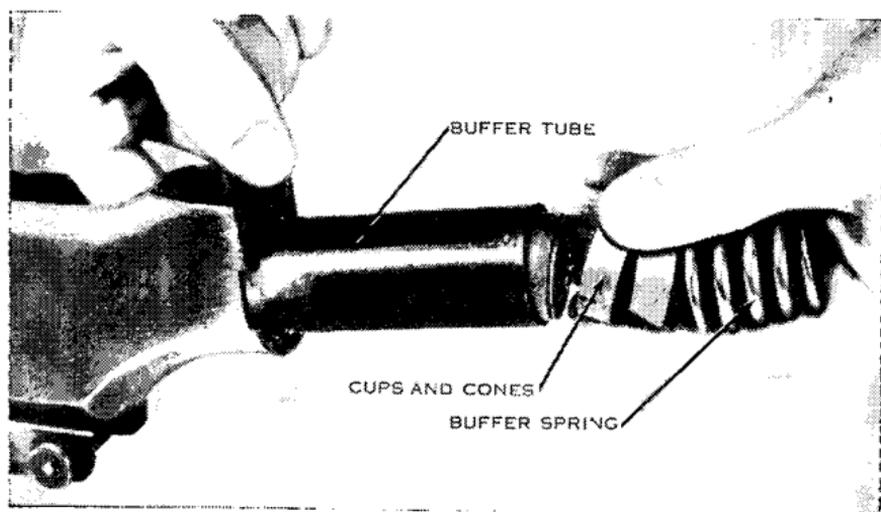
*Figure 66. Removing the actuator and actuator spring.*



*Figure 67. Removing the stock.*



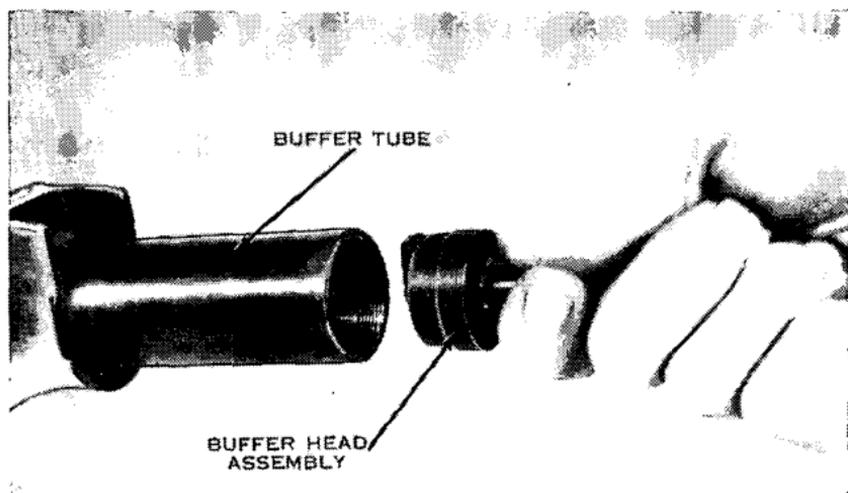
*Figure 68. Removing the actuator tube and buffer cap assembly.*



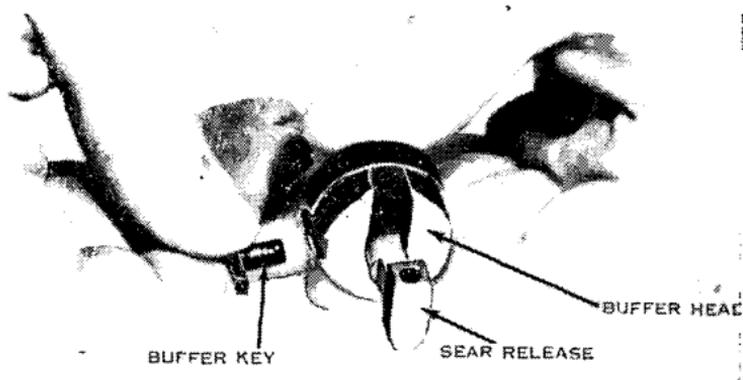
*Figure 69. Removing the buffer spring and the four sets of brass buffer friction cups and steel buffer friction cones.*

cap assembly (fig. 68). Push rearward on the buffer head and sear release. This forces out the buffer spring and the four sets of brass buffer friction cups and steel buffer friction cones (fig. 69).

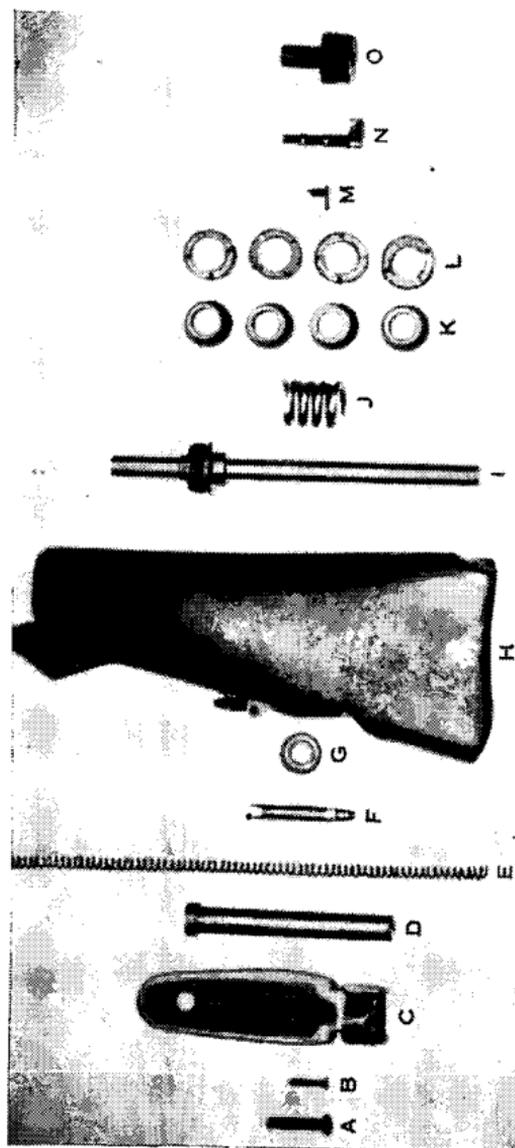
f. Remove the buffer head assembly (buffer head, sear release, and buffer key) (fig. 70).



*Figure 70. Removing the buffer assembly.*



*Figure 71. Removing the buffer key.*



- A. LARGE BUTT PLATE SCREW  
 B. SMALL BUTT PLATE SCREW  
 C. HINGED BUTT PLATE ASSEMBLY  
 D. STOCK RETAINING SLEEVE  
 E. ACTUATOR SPRING  
 F. ACTUATOR  
 G. LOCK WASHER  
 H. STOCK  
 I. ACTUATOR TUBE AND BUFFER CAP ASSEMBLY  
 J. BUFFER SPRING  
 K. STEEL BUFFER FRICTION CONES  
 L. BRASS BUFFER FRICTION CUPS  
 M. BUFFER KEY  
 N. SEAR RELEASE  
 O. BUFFER HEAD

Figure 72. Layout of parts of the buffer and rate reducing group.

*g.* Remove the buffer key from the buffer head and sear release (fig. 71). Separate the buffer head and the sear release. The buffer tube is removed by ordnance personnel only.

*h.* Check the parts that have been laid out. Make sure that they are laid out in the proper order for assembly shown in figure 72.

## 16. ASSEMBLY OF THE BUFFER AND RATE REDUCING GROUP

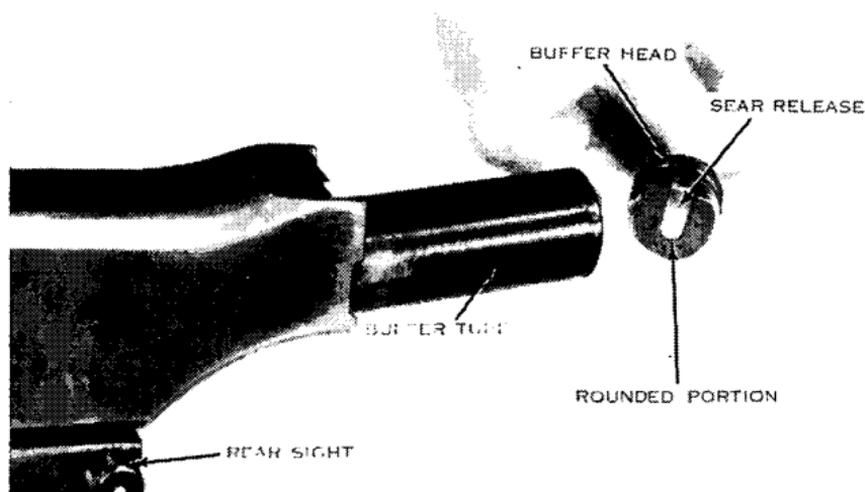
To assemble the buffer and rate reducing group, place the automatic rifle on a flat surface, sights down and the muzzle pointing away from your body.



*Figure 73. Assembling the buffer head assembly.*

a. Assemble the buffer head and the sear release. Lock the two parts together with the buffer key (fig. 73).

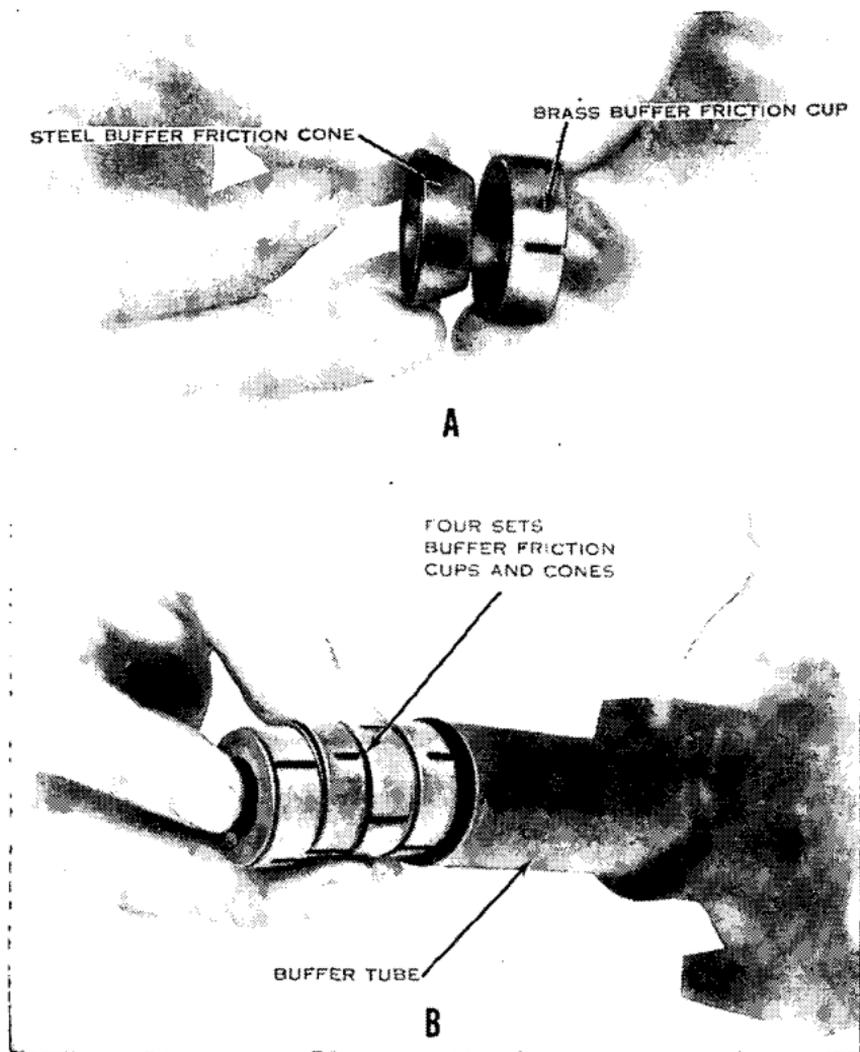
b. Replace the buffer head assembly into the buffer tube. These parts are replaced so that the rounded portion of the sear release points toward the rear sight (fig. 74). There are eight grooves inside the forward end of the buffer tube. The purpose of these grooves is to assist in seating the buffer head assembly correctly.



*Figure 74. Replacing the buffer head assembly.*

c. Place the brass buffer friction cups over the steel buffer friction cones (A of fig. 75). Insert the brass buffer friction cups and the steel buffer friction cones into the buffer tube (B of fig. 75). These parts are replaced with a cup first and then a cone and so on in that order.

d. Replace the buffer spring in the buffer tube. If any portion of the buffer spring extends from



*Figure 75. Replacing the four sets of brass buffer friction cups and steel buffer friction cones.*

the end of the buffer tube, check the buffer head assembly. This group of parts may have been replaced incorrectly.

e. Screw the actuator tube and buffer cap assembly into the buffer tube. Use the small spanner of the combination tool to tighten the actuator

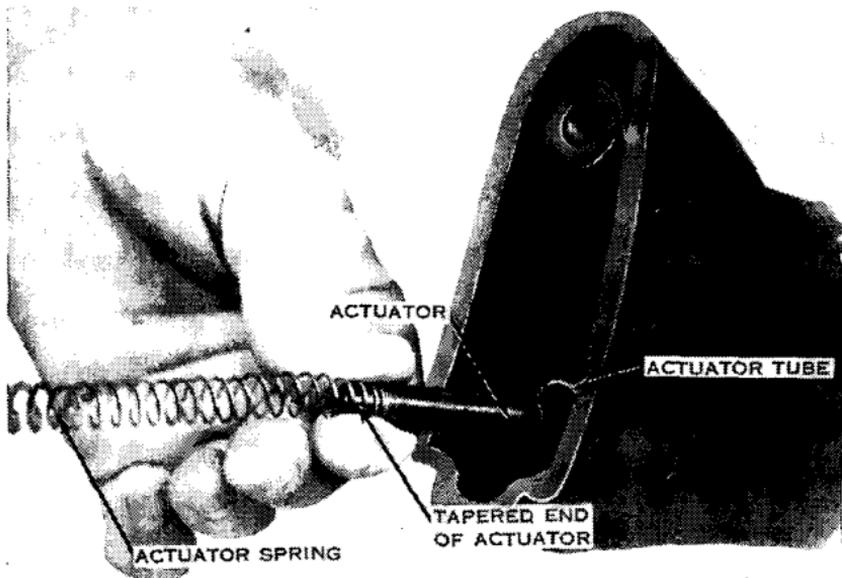
tube and buffer cap assembly. Replace the stock over the actuator tube. It may be necessary to strike the stock with a sharp blow toward the barrel to seat it.

f. Replace the lock washer over the actuator tube (fig. 76).



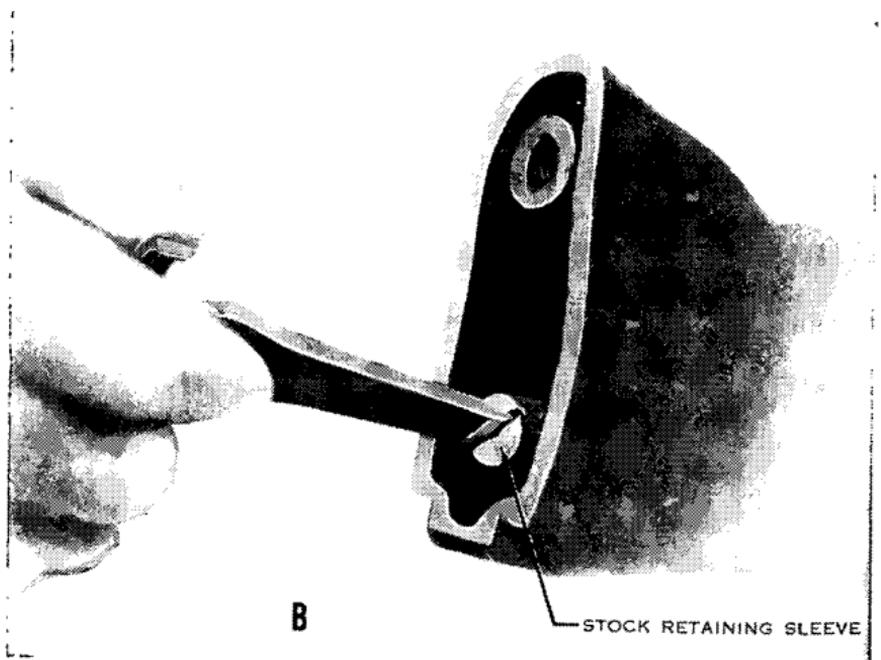
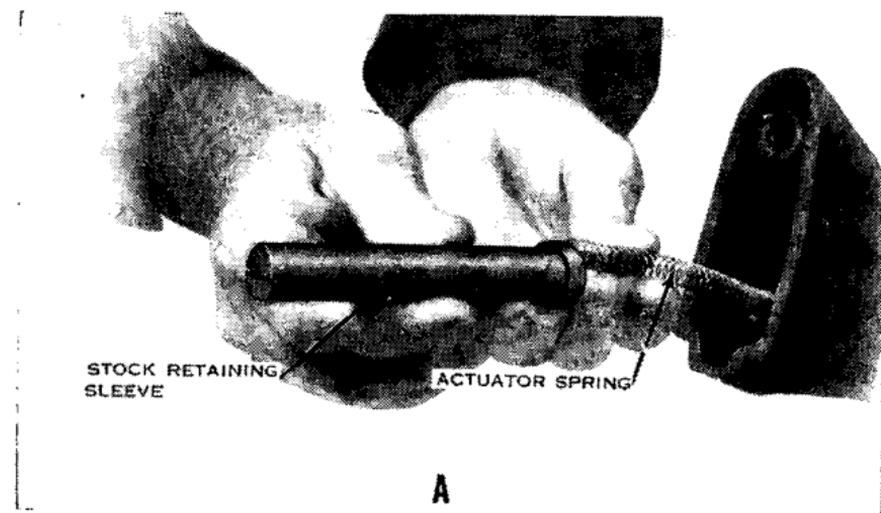
*Figure 76. Replacing the lock washer.*

g. Insert the actuator (tapered end to the rear) into the actuator tube and follow it with the actuator spring (fig. 77). The loose end of the actuator spring protrudes from the actuator tube.



*Figure 77. Replacing the actuator and actuator spring.*

*h.* Replace the stock retaining sleeve over the actuator spring (A of fig. 78). Screw the stock retaining sleeve into the actuator tube (B of fig. 78). Replace the hinged butt plate assembly and large and small butt plate screws.

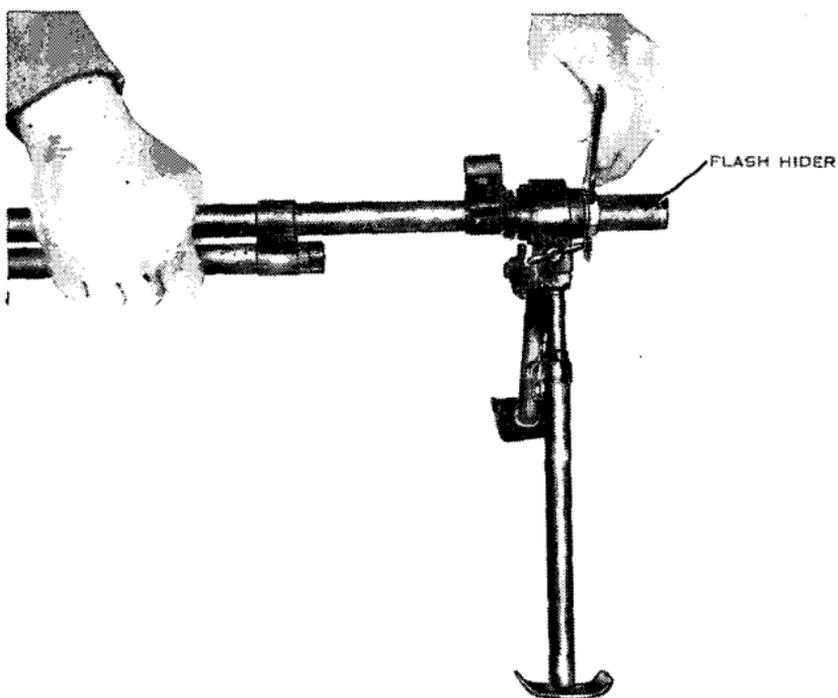


*Figure 78. Replacing the stock retaining sleeve.*

## 17. DISASSEMBLY OF THE BIPOD GROUP

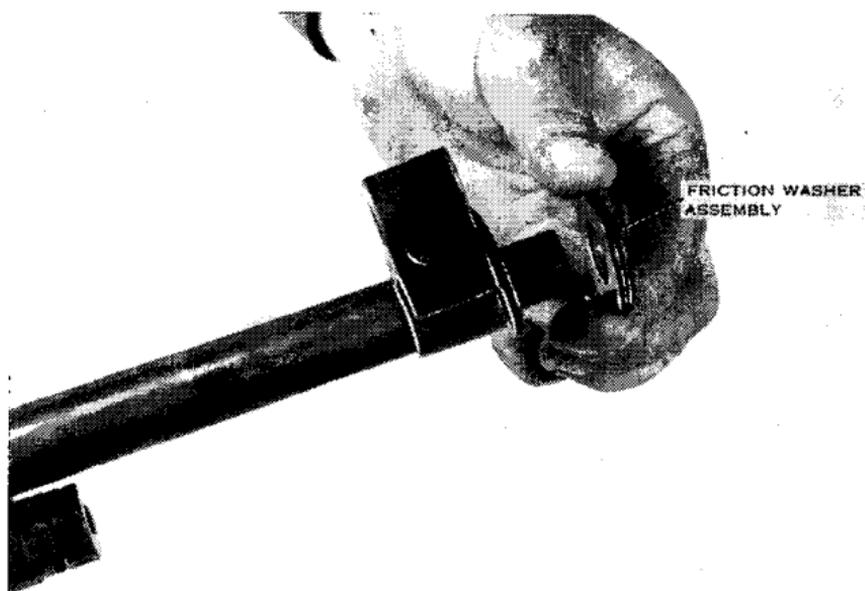
To disassemble the bipod group, place the automatic rifle on a flat surface, sights up and the muzzle pointing to the left.

a. Unscrew the flash hider from the barrel with the combination tool (fig. 79). Next remove the bipod group by sliding it from the end of the barrel.



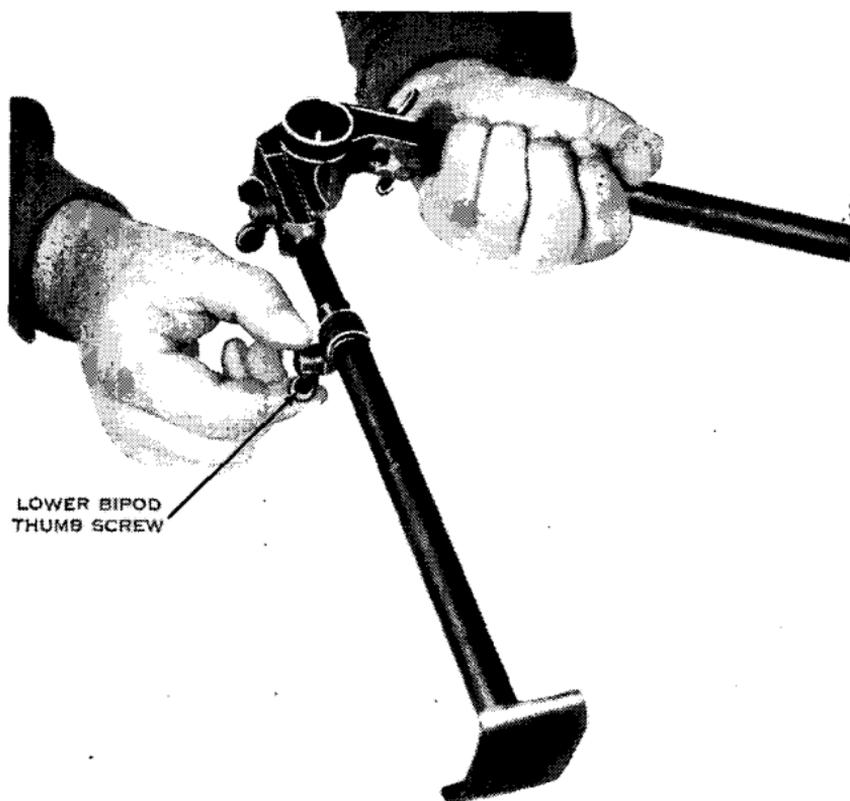
*Figure 79. Removing the flash hider.*

b. Remove the friction washer assembly from the end of the barrel (fig. 80).



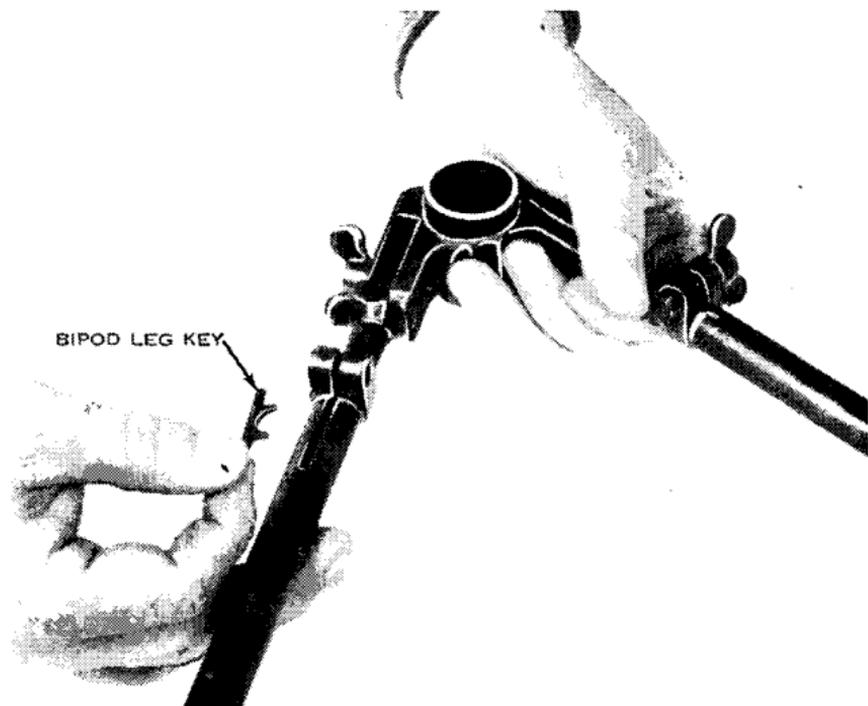
*Figure 80. Removing the friction washer assembly.*

c. Unscrew the lower bipod thumb screw (wing nut) on one of the bipod legs (fig. 81). Do not remove the other lower bipod thumb screw at this time.



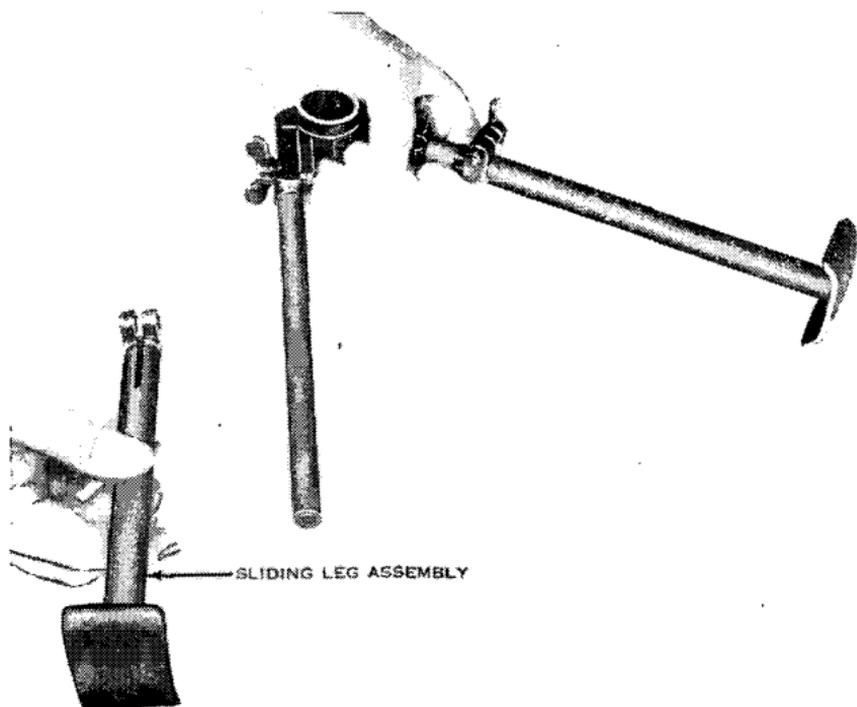
*Figure 81. Removing the lower bipod thumb screw (wing nut).*

d. Remove the bipod leg key from its recess in the bipod tube (fig. 82).



*Figure 82. Removing the bipod leg key.*

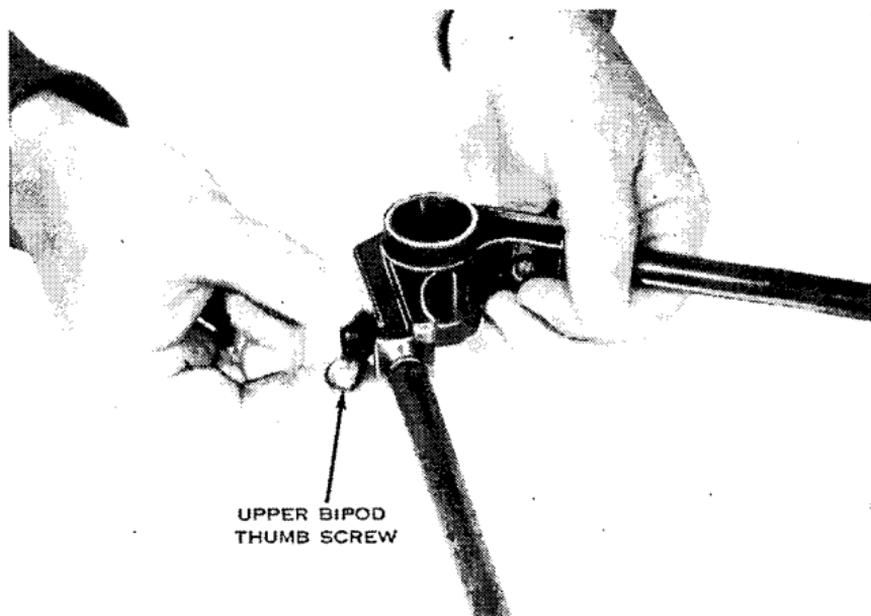
e. Remove the sliding leg assembly from its bipod leg (fig. 83).



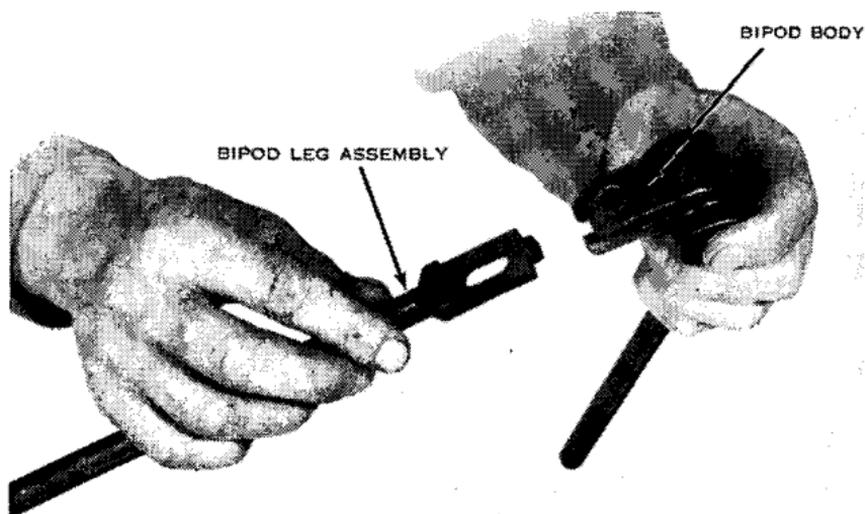
*Figure 83. Removing the sliding leg assembly.*

f. Now remove the lower bipod thumb screws (wing nut), bipod leg key, and sliding leg assembly from the other bipod leg assembly. Proceed as in c through e above.

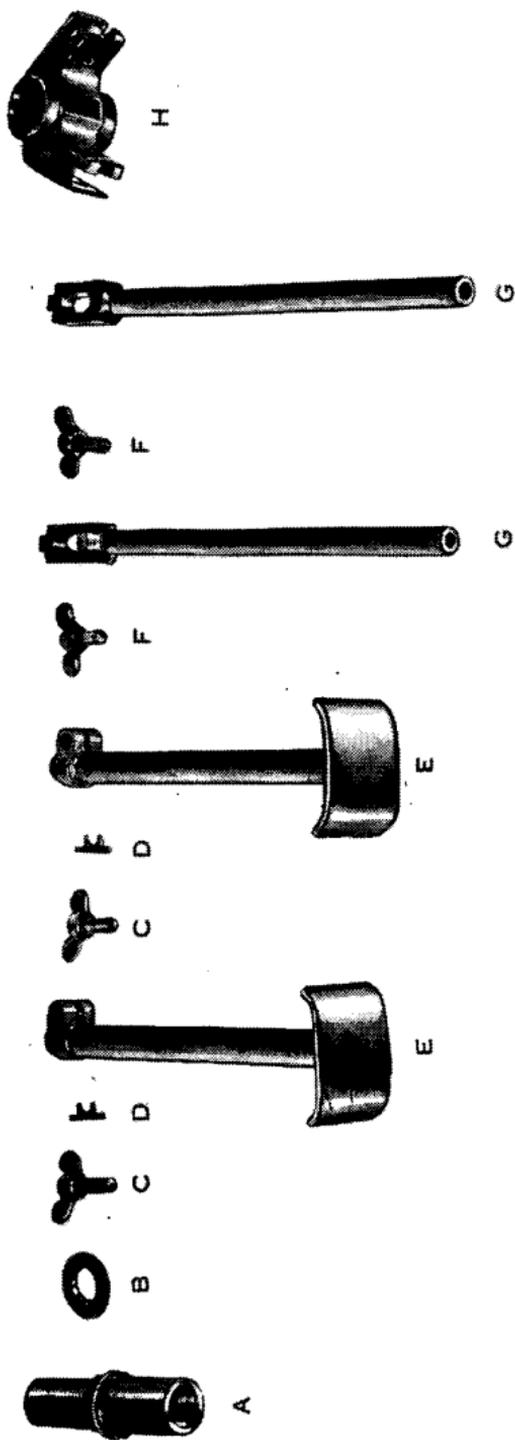
g. Unscrew the upper bipod thumb screw (wing nut) on one of the bipod legs (fig. 84). Remove the bipod leg assembly from the bipod body (fig. 85).



*Figure 84. Removing the upper bipod thumb screw (wing nut).*



*Figure 85. Removing the bipod leg assembly.*



- A FLASH HIDER
- B FRICTION WASHER ASSEMBLY
- C LOWER BIPOD THUMB SCREW
- D BIPOD LEG KEY

- E SLIDING LEG ASSEMBLY
- F UPPER BIPOD THUMB SCREW
- G BIPOD LEG ASSEMBLY
- H BIPOD BODY

Figure 86. Layout of parts of the bipod group.

*h.* Now remove the remaining upper bipod thumb screw and remaining bipod leg assembly from the bipod body.

*i.* Place the bipod body on a flat surface.

*j.* Check the parts that have been laid out. Make sure that they are in the proper order for assembly shown in figure 86.

## **18. ASSEMBLY OF THE BIPOD GROUP**

To assemble the bipod group, proceed in the reverse order of disassembly.

## **19. DISASSEMBLY AND ASSEMBLY OF THE MAGAZINE**

To disassemble the magazine—

*a.* Use the point of a dummy cartridge to raise the rear end of the magazine base until the indentions are clear of the magazine body and unseat the magazine base. Slide the magazine base to the rear and remove it (fig. 87).

*b.* Remove the magazine spring, then turn the magazine on end to allow the magazine follower to drop out.

*c.* Check the parts that have been laid out. Make sure that they are in the proper order for assembly shown in figure 88.

*d.* To assemble the magazine, proceed in the reverse order of disassembly. In replacing the magazine spring, be sure that the loops of the magazine spring point toward the long portion (back) of the magazine.

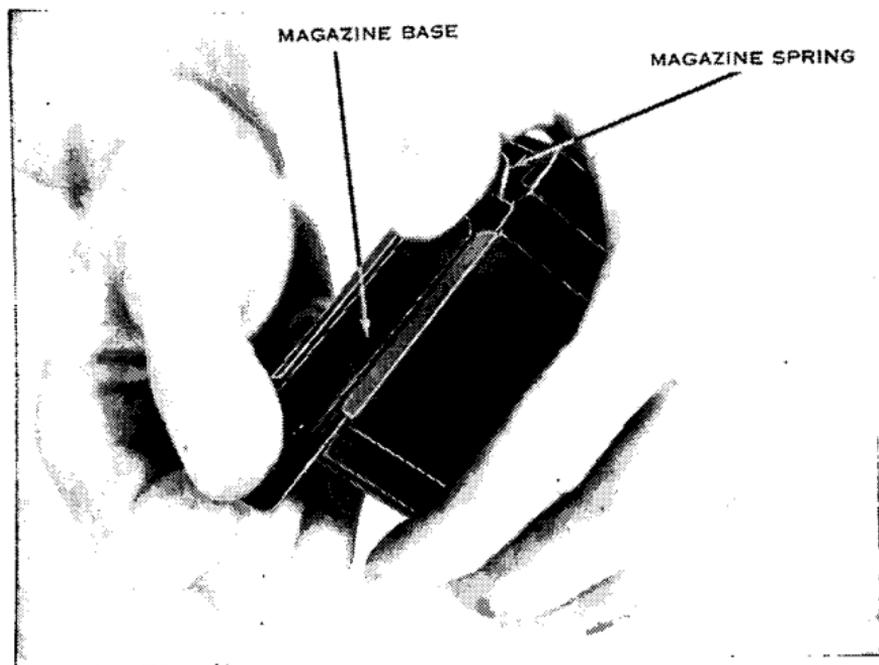


Figure 87. Removing the magazine base.

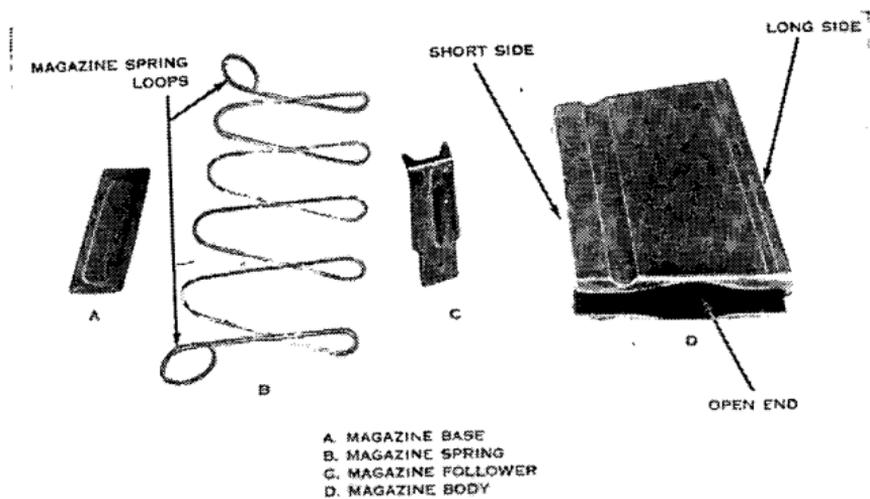


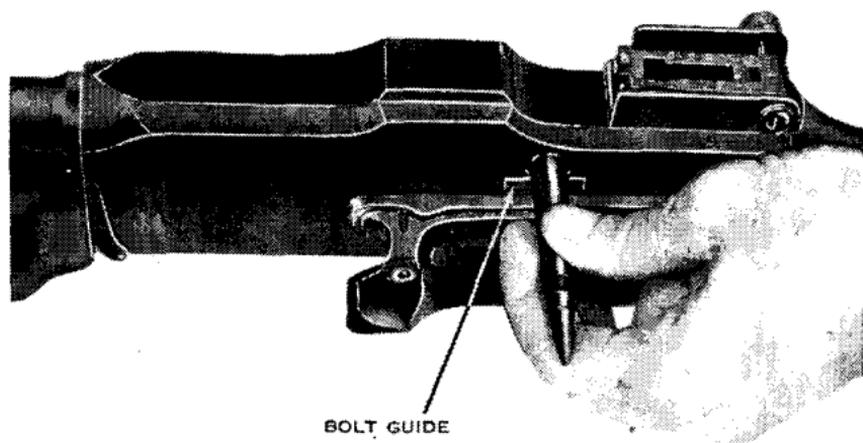
Figure 88. Layout of parts of the magazine group.

## 20. FIELD EXPEDIENTS

Field expedients are measures used by soldiers in the field to replace a broken or missing firing pin, extractor, or extractor spring without removing the bolt.

a. To replace a damaged firing pin without disassembling the operating group—

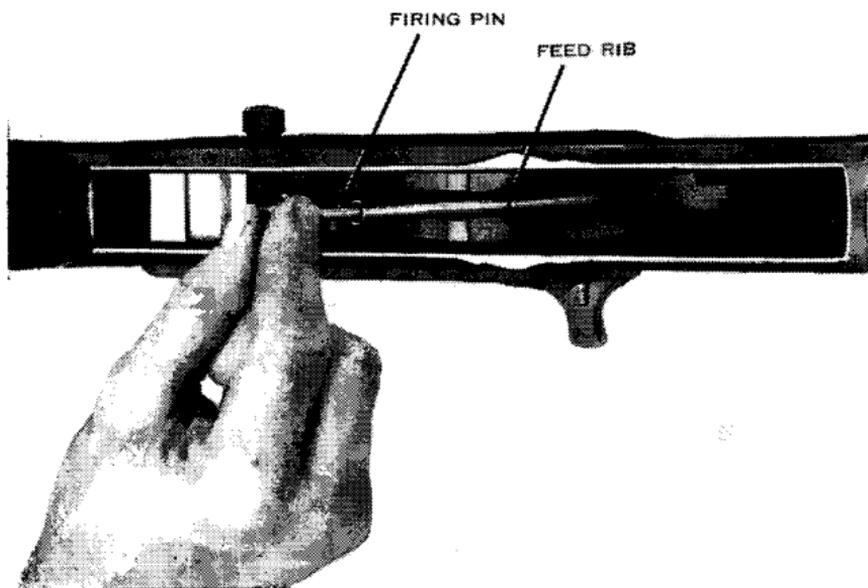
- (1) Place the weapon on a flat surface with the sights up. Cock the weapon. Place the base of a dummy cartridge under, and pry outward on, the bolt guide. You will hear the bolt assembly buckle (fig. 89).



*Figure 89. Allowing the bolt assembly to buckle.*

- (2) Turn the automatic rifle over so that the sights are down. Remove the trigger guard retaining pin assembly. Lift out the trigger group. Note that the

bolt assembly is buckled. The feed rib of the bolt and the firing pin are exposed. Replace the broken firing pin (fig. 90).



*Figure 90. Replacing the firing pin.*

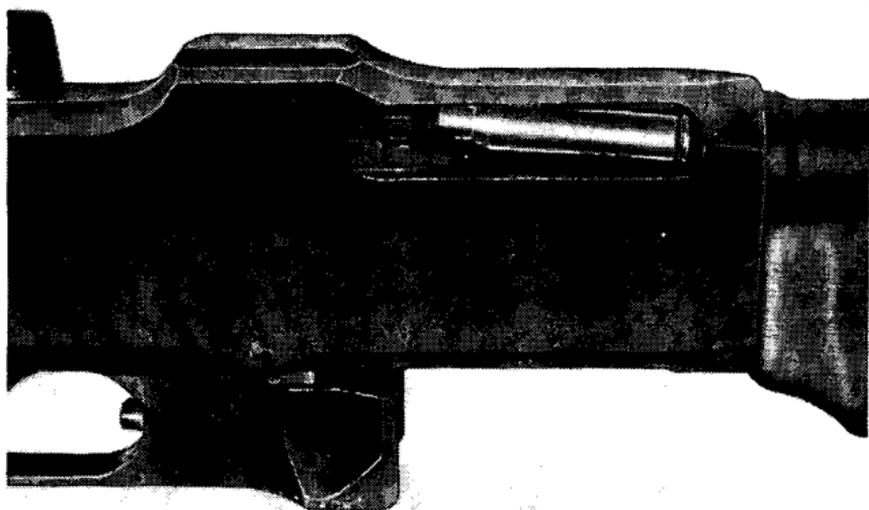
- (3) Pull back on the operating handle and push down on the feed rib. Allow the operating parts to move forward. Replace the trigger group and lock it in place with trigger guard retaining pin assembly.

*b.* To replace a damaged extractor or extractor spring without disassembling the operating group—

- (1) Place the automatic rifle on a flat surface with the ejection opening up. Cock the automatic rifle and place an empty

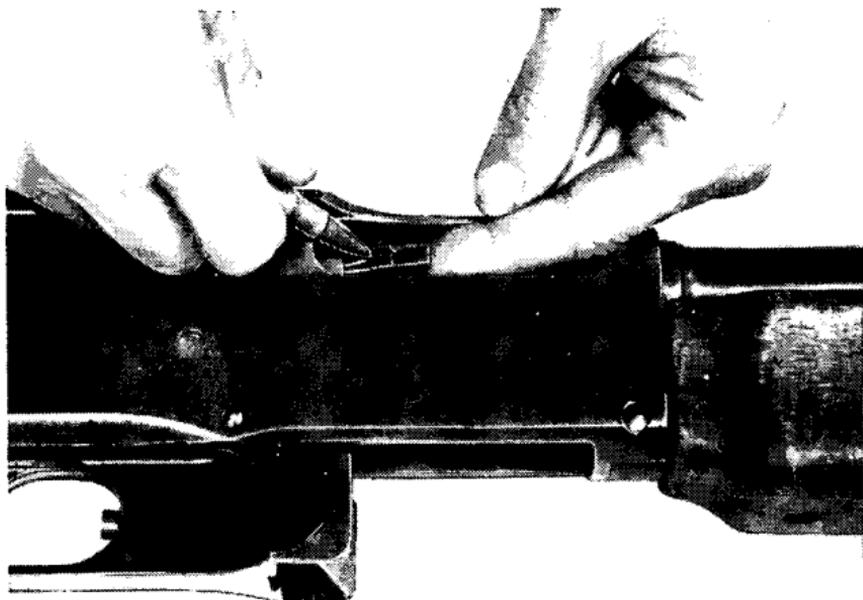
cartridge case into the receiver through the ejection opening. The cartridge case is inserted with the base toward the muzzle end.

- (2) Press the trigger allowing the operating parts to move as far forward as possible (fig. 91).



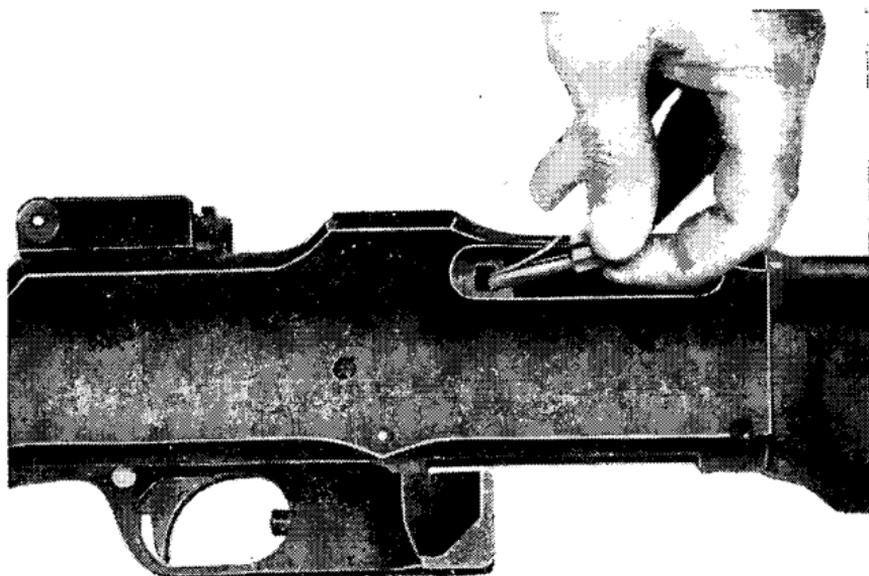
*Figure 91. The operating parts held in place by the empty cartridge case.*

- (3) Reach into the ejection opening with the left forefinger and pull out on the extractor claw. With the other hand place the point of a dummy cartridge behind the shoulder of the extractor. Pry forward with the cartridge and unseat the extractor (fig. 92).



*Figure 92. Unseating the extractor.*

- (4) Remove the damaged extractor and replace the broken parts (fig. 93).



*Figure 93. Replacing the extractor.*

- (5) Pull the operating handle all the way to the rear and remove the empty cartridge case. Allow the parts to move forward.

## SECTION III. FUNCTIONING

### 21. GENERAL

*a.* The automatic rifleman must understand functioning, or how and why his automatic rifle operates. Stoppages will occur with the automatic rifle as with any other automatic weapon. When you understand how your weapon functions you will be able to locate and reduce stoppages quickly.

*b.* You are not expected to be a technical expert on the functioning of the automatic rifle. This section is designed to provide only a simple explanation of each function as it occurs.

### 22. WHAT FUNCTIONING IS

All automatic weapons must have some mechanical means of unlocking, extracting, ejecting, cocking, feeding, locking, and firing each round. These functions are performed by various cams, lugs, and springs located on your weapon.

### 23. THE FUNCTIONING CYCLE

Functioning of the automatic rifle may be divided into two movements—the rearward movement of the operating parts and then the forward movement. These two movements together

make up one functioning cycle. In the automatic rifle, the energy for the rearward movement of the operating parts comes from the gas developed by the exploding cartridge. This gas expands rapidly and develops enough pressure to move operating parts to the rear. As the parts move to the rear, the recoil spring is compressed, storing up energy for the forward movement. The rearward movement stops when the slide strikes the sear release and buffer head. The forward movement starts shortly thereafter.

## 24. FUNCTIONING OF THE OPERATING GROUP

*a.* In paragraphs 11 and 12, you became familiar with the name of the parts contained in the operating group. Now you will see what these parts do as the operating group functions. The movement of the operating parts to the rear and their return comprises one firing or functioning cycle. Each phase may be divided into separate steps.

### (1) Rearward movement—

- (*a*) Action of the gas.
- (*b*) Movement of the slide to the rear.
- (*c*) Unlocking.
- (*d*) Withdrawal of the firing pin.
- (*e*) Extraction.
- (*f*) Ejection.
- (*g*) Termination of the rearward movement.

## (2) Forward movement—

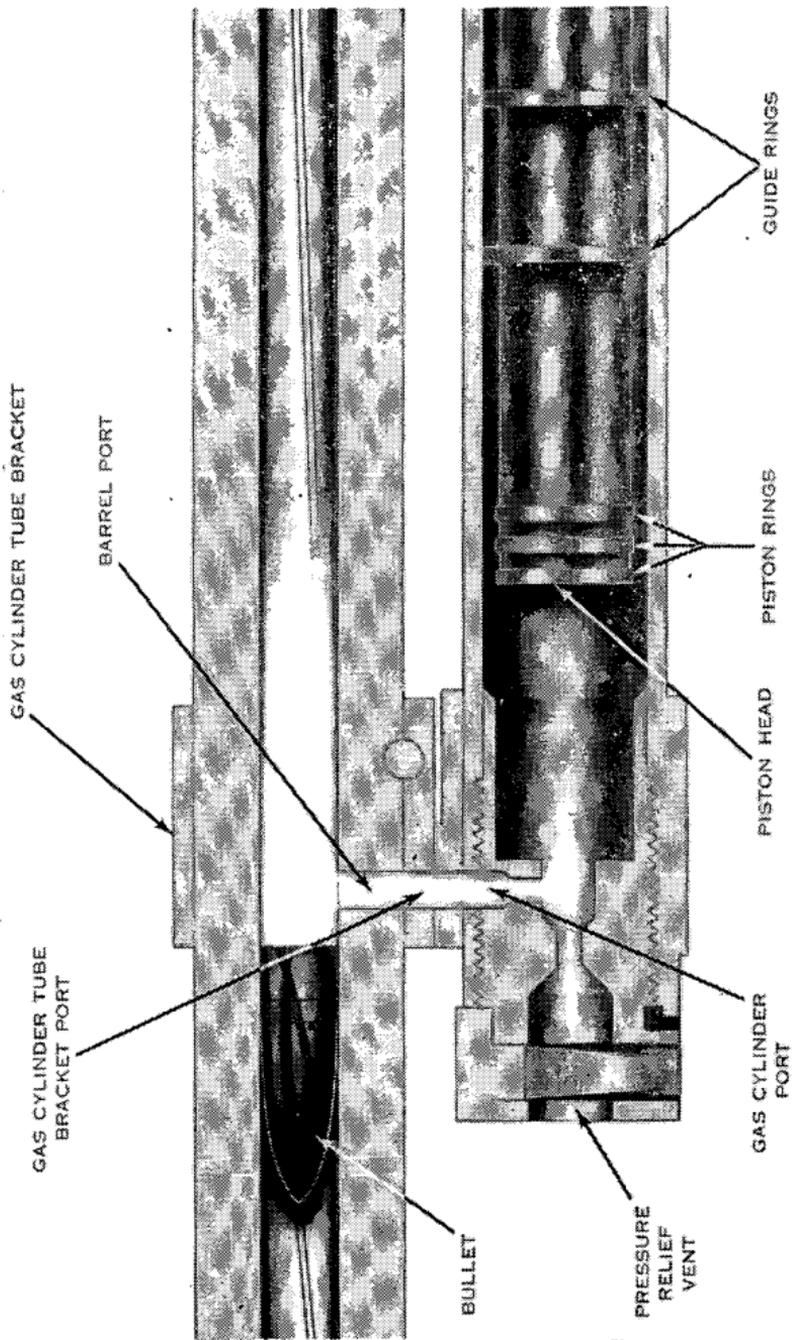
- (a) Action of the recoil spring.
- (b) Loading.
- (c) Locking.
- (d) Firing the cartridge.
- (e) Termination of the forward movement.

*b.* As functioning of the operating group is discussed, remember that some of the steps in each phase occur at the same time, or nearly the same time. The steps listed start in the order as given.

## 25. ACTION OF THE GAS

*a.* When a cartridge is fired, the bullet is driven through the barrel by the pressure from the expanding powder gas. About 6 inches from the muzzle, the bullet passes a small hole in the bottom of the barrel. This hole is called the barrel port (fig. 94).

*b.* As the bullet passes this barrel port, some of the gas under high pressure escapes through it. Gas continues to pass through the gas port for the very short time that it takes the bullet to travel the 6 inches from the barrel port to the muzzle. Figure 94 shows you the path taken by the gas. First it goes through the barrel port, then the gas cylinder tube bracket port, gas cylinder tube port, gas cylinder port, and then into the gas cylinder well. The gas cylinder port is the smallest of the four gas ports. It controls the amount of gas entering the gas cylinder assembly. All of the gas ports are stationary except



*Figure 94. Action of the gas.*

the gas cylinder port. There are three different sized gas cylinder ports.

c. When the gas rushes into the gas cylinder, it strikes the gas piston head a sharp blow, moving the piston to the rear. Note the three piston rings near the head of the gas piston. When the gas piston has moved approximately 9/16 of an inch, the three gas piston rings and the gas piston plug move out of the gas cylinder assembly. The gas then expands around the piston head and escapes from the six gas escape ports in the gas cylinder tube and the pressure relief vent in the gas cylinder assembly. Any gas remaining in the barrel escapes as soon as the bullet leaves the muzzle.

d. The two guide or bearing rings on the gas piston serve two purposes. They prevent the escape of gas back into the operating parts. This feature prevents a blowback in the firer's face. They also hold the front end of the gas piston in the center of the gas cylinder tube after the gas piston head has moved out of the gas cylinder assembly.

## 26. MOVEMENT OF THE SLIDE TO THE REAR

Because the slide is locked to the piston, it moves whenever the piston moves. As the piston and slide move to the rear, the recoil spring is compressed, storing energy for the forward movement, and the weapon is unlocked. Also, the center rib of the hammer is withdrawn from the head of the firing pin during the initial movement of the slide to the rear.

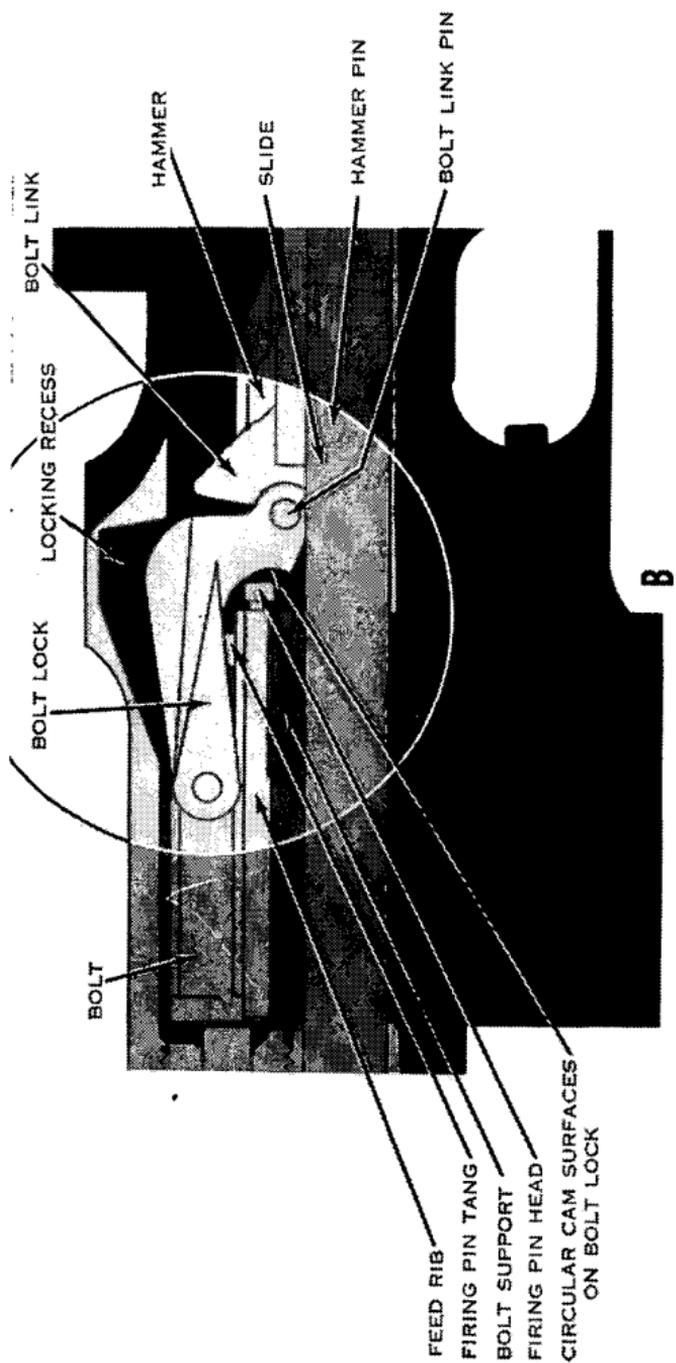
## 27. UNLOCKING

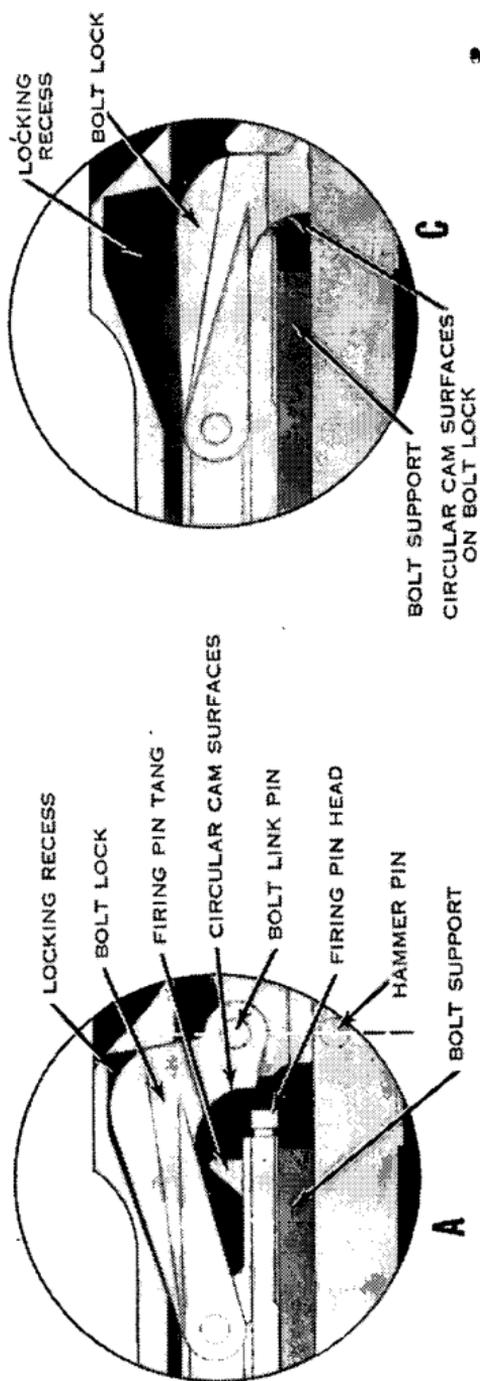
For simplicity, unlocking is studied in three steps—when unlocking begins, what takes place during unlocking, and when unlocking is completed.

*a.* When the operating parts are completely forward, the hammer pin is about 0.19 inch ahead of the bolt link pin. The center rib of the hammer is slightly in rear of the head of the firing pin. During the first 0.19 inch movement of the slide assembly to the rear, the bolt and bolt lock do not move. The unlocking action begins when the hammer pin is directly under the bolt link pin (A of fig. 95).

*b.* As the slide continues to the rear, the bolt link revolves forward and downward about the hammer pin (B of fig. 95). The bolt lock is drawn downward, to the rear, and out of the locking recess.

*c.* Unlocking is completed when the bolt lock is completely down and out of the locking recess (C of fig. 95). At this point the slide has moved 1.39 inches to the rear, and the bolt, bolt lock, and slide are moving at the same speed. The bolt lock is now supported by the bolt supports. The bolt and bolt lock did not attain the speed of the slide until the bolt lock had moved 1.39 inches to the rear. This is very important for two reasons. First, the parts are not subjected to an undue strain because of the sudden start when the cartridge explodes. Second, the slow initial movement delays the opening of the chamber. By the





*Figure 95. . Functioning of the operating group.*

time the chamber opens, the gas pressure has been greatly reduced. This action prevents powder gases from blowing back into the firer's face.

## 28. WITHDRAWAL OF THE FIRING PIN

As the bolt lock moves downward from the locking recess, the firing pin is withdrawn (fig. 95). A cam surface in the slot on the underside of the bolt lock operates on a cam surface on the tang of the firing pin. This action forces the striker of the firing pin back into the face of the bolt.

## 29. EXTRACTION

The extractor is located on the upper right side of the bolt next to the ejection opening. Keep in mind that the extractor grasps the rim of the cartridge. This action holds the base of the cartridge firmly against the face of the bolt. When the automatic rifle is fired, the empty cartridge case expands and binds against the chamber, so there must be some means of loosening the cartridge case before removing it. During their initial movement, the bolt and bolt lock move slowly in comparison with the movement of the slide. As the bolt lock moves downward from the locking recess during unlocking, the circular cam surfaces on the undersides of the bolt lock act on the rear shoulders of the bolt supports (fig. 95). This contact produces a strong lever action, known as slow initial extraction, that loosens the empty cartridge case. When the bolt lock is down and out of the locking recess, the bolt, drawn by the bolt lock and bolt link, moves

to the rear with the same speed as the slide assembly. The empty case is carried with and held against the face of the bolt by the extractor.

### **30. EJECTION**

The ejector is located in the trigger group. When the slide reaches a point approximately  $\frac{1}{4}$  inch from the end of its travel, the base of the cartridge case strikes the ejector. The cartridge case pivots about the extractor and passes through the ejection opening. As the bolt continues to the rear, the side of the cartridge case strikes the side of the receiver to the rear of the ejection opening and is ejected to the right front.

### **1. TERMINATION OF THE REARWARD MOVEMENT**

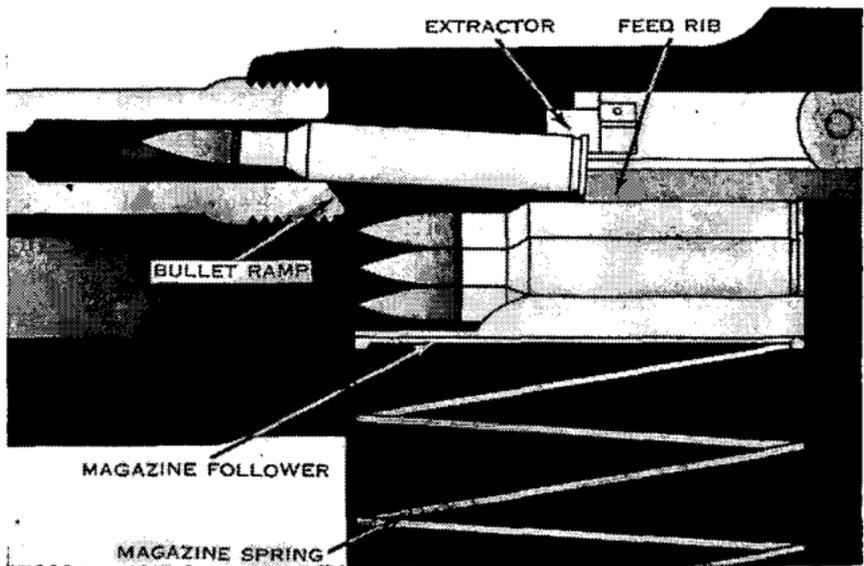
The rearward movement of the operating parts stops when the rear of the slide strikes the sear release and then the buffer head.

### **32. ACTION OF THE RECOIL SPRING**

As the parts move to the rear, the recoil spring is compressed. This action stores the necessary energy for the forward movement. The parts will move forward if the trigger is held or pressed to the rear. When the trigger is pressed, the sear nose is depressed and is disengaged from the sear notch on the slide. The slide assembly is then free to move forward under the force of the expanding recoil spring. As the slide moves forward, it carries the operating parts with it.

### 33. LOADING

As the operating parts move forward, the front end of the feed rib contacts the base of the top round in the magazine (fig. 96). As soon as the cartridge moves forward about  $\frac{1}{4}$  inch, the nose of the cartridge strikes the bullet ramp and is deflected upward toward the chamber. As the cartridge continues forward, its base approaches the center of the magazine where it is forced out of the magazine by the magazine follower and spring. When the cartridge is released by the magazine, the nose of the bullet is far enough into the chamber so that it is guided by the chamber from this point on. The base of the cartridge slides up the face of the bolt and under the extractor. (The cartridge may fail to slide under the extractor at this time. If it does, the extractor will snap over the rim of the cartridge as the bolt reaches its most forward position.)



*Figure 96. Loading.*

## 34. LOCKING

Locking begins when the slide is about two inches from its most forward position. At this point the circular cam surfaces on the underside of the bolt lock contact the rounded rear shoulders of the bolt supports (C of fig. 95). The bolt continues forward and the bolt link moves upward and to the rear about the hammer pin. As the bolt link moves upward, it forces the bolt lock upward and into the locking recess in the top of the receiver (B of fig. 95). In its forward movement, the speed of the bolt assembly decreases gradually from the instant the bolt lock starts to rise until the hammer pin passes under the bolt link pin. This reduces the possibility of damaging the firing pin. Locking is completed when the hammer pin is directly under the bolt link pin (A of fig. 95).

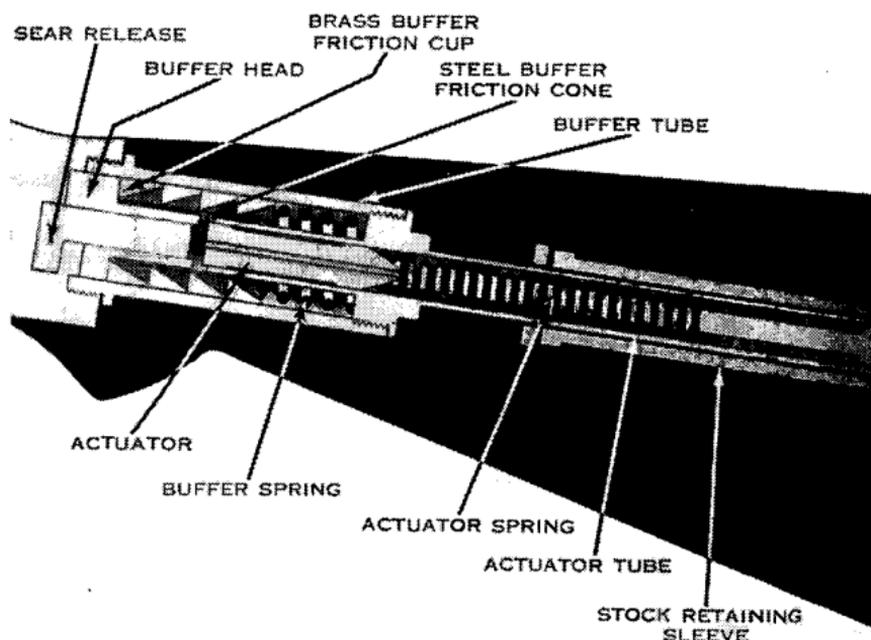
## 35. FIRING THE CARTRIDGE

The tang of the firing pin is buried in the slot on the underside of the bolt lock at all times except when the bolt lock is in the locking recess. This keeps the head of the firing pin locked away from the center rib of the hammer during the rearward and forward motion of the bolt assembly, so that the weapon cannot fire. When locking is completed, the bolt lock is in the locking recess, the tang of the firing pin is no longer buried in the bolt lock, and the head of the firing pin can be struck by the center rib of the hammer. The slide and hammer continue forward another 1/10 inch after the bolt lock is in the locking recess.

The center rib of the hammer strikes the head of the firing pin, driving the firing pin forward a short distance through the feed rib. The firing pin striker hits the cartridge primer and fires the cartridge.

### 36. TERMINATION OF THE FORWARD MOVEMENT

The forward movement is stopped when the forward shoulders of the slide strike the rear shoulders of the gas cylinder tube. (The forward movement is not completed by the hammer striking the firing pin.)



*Figure 97. The buffer and rate reducing group.*

## 37. FUNCTIONING OF THE BUFFER AND RATE REDUCING GROUP

*a.* The buffer and rate reducing group is located in the stock of the automatic rifle (fig. 97). This group serves two purposes. First, it absorbs most of the recoil of the operating parts in their rearward movement. Second, it enables the automatic rifle to be fired at a cyclic rate of 350 to 550 rounds per minute (par. 5). The buffer and rate reducing group consists of two mechanisms, the buffer mechanism and the rate reducing mechanism.

*b.* The rate reducing portion of this group operates in conjunction with the trigger group. For this reason its functioning is explained with the functioning of the trigger group (par. 39).

## 38. FUNCTIONING OF THE BUFFER MECHANISM

*a.* The following parts are involved in the functioning of the buffer portion of the buffer and rate reducing groups: the buffer head, four brass buffer friction cups, four steel buffer friction cones, the buffer tube, and the buffer spring.

*b.* While the automatic rifle is firing, the movement of the operating parts to the rear stops when the rear of the slide strikes the sear release and then the buffer head. When this occurs, the sear release and buffer head move to the rear a short distance.

*c.* The buffer head strikes the first buffer friction cup. This cup expands over its buffer friction cone and against the inner wall of the buffer tube. This movement is continued through

each set of buffer friction cups and buffer friction cones. As the cups and cones move to the rear, the buffer spring is compressed. Friction is developed when the brass cups expand over their cones. Friction is also produced when the cups expand against the inner wall of the buffer tube. This friction absorbs most of the recoil of the operating parts.

*d.* A small part of the recoil is absorbed by the buffer spring as it is compressed. The primary purpose of the buffer spring, however, is to return the four sets of buffer friction cups and buffer friction cones to their proper position. The buffer head is returned to its proper position as the buffer friction cups and buffer friction cones are forced forward.

### 39. FUNCTIONING OF THE TRIGGER GROUP

*a.* The trigger group controls the automatic rifle's rate of fire. The desired rate is obtained by adjusting the change lever on the trigger group.

*b.* The change lever has three settings—S (safe), A (fast cyclic rate of approximately 550 rounds per minute), and F (slow cyclic rate of approximately 350 rounds per minute).

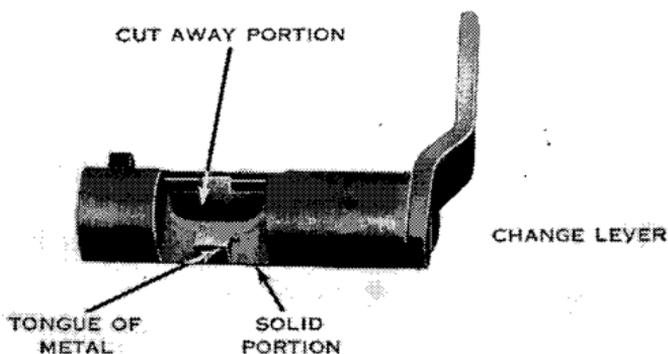
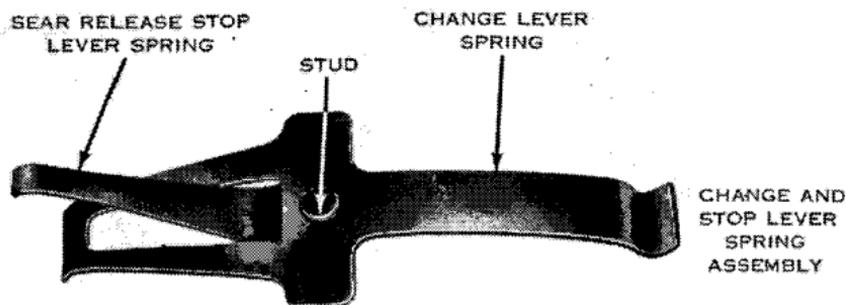
*c.* The change lever is held on the desired setting by the action of the change lever spring. Move the change lever on your trigger group to the various settings. You can feel the action of the change lever spring.

*d.* To understand the functions of the trigger group, a knowledge of the names of the parts in-

volved and their purpose is necessary. First disassemble the trigger group, following the instructions in paragraph 13. Now look at figures 98① through 98④ that illustrate some of the more important parts and surfaces involved in functioning of the trigger group. Study the following paragraphs that explain how they work.

*e.* Assemble the change and stop lever spring assembly and the change lever to the trigger guard. Move the change lever to each of its three settings. Note the position of the cut away portion of the change lever on all three settings. Also note the position of the metal tongue and the solid portion in the change lever bar for each of the settings. The only function of the change lever spring is to hold the change lever at the desired setting (fig. 98①).

*f.* Assemble the trigger and trigger pin in the trigger guard. Set the change lever on the S setting and press the trigger. Note that the shoulders of the trigger contact the solid portion of the change lever bar. Place the change lever on the A setting and press the trigger. Note that the shoulders of the trigger rise into the cut away portion of the change lever bar. The metal tongue in the cut away portion of the change lever bar is between the shoulders of the trigger. Place the change lever on the F setting and press the trigger. Note that the shoulders of the trigger again rise into the cut away portion of the change lever bar. The metal tongue has now been withdrawn from between the shoulders of the trigger.



①

Figure 98. Trigger group parts.

g. Remember that both the trigger and connector are shaped like a boot (fig. 98②). Place the connector down and into the trigger, heel to heel. Move the change lever to the A setting. Hold the connector vertical and press the trigger. The shoulders of the trigger rise into the cut away portion of the change lever bar. The toe of the connector comes in contact with the metal tongue in the cut away portion of the change lever bar. This contact holds the connector in an upright, stationary position. The purpose of the connector is to transmit the pressure on the trigger to the sear so the weapon can fire.

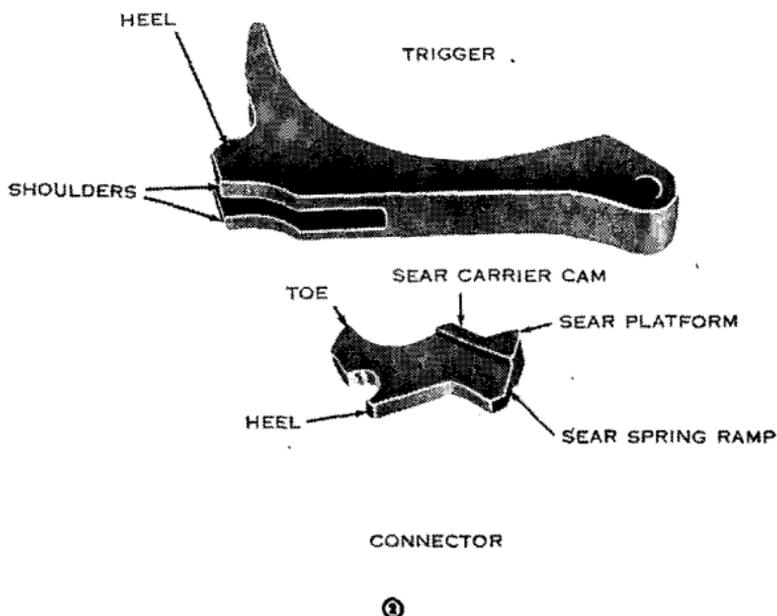
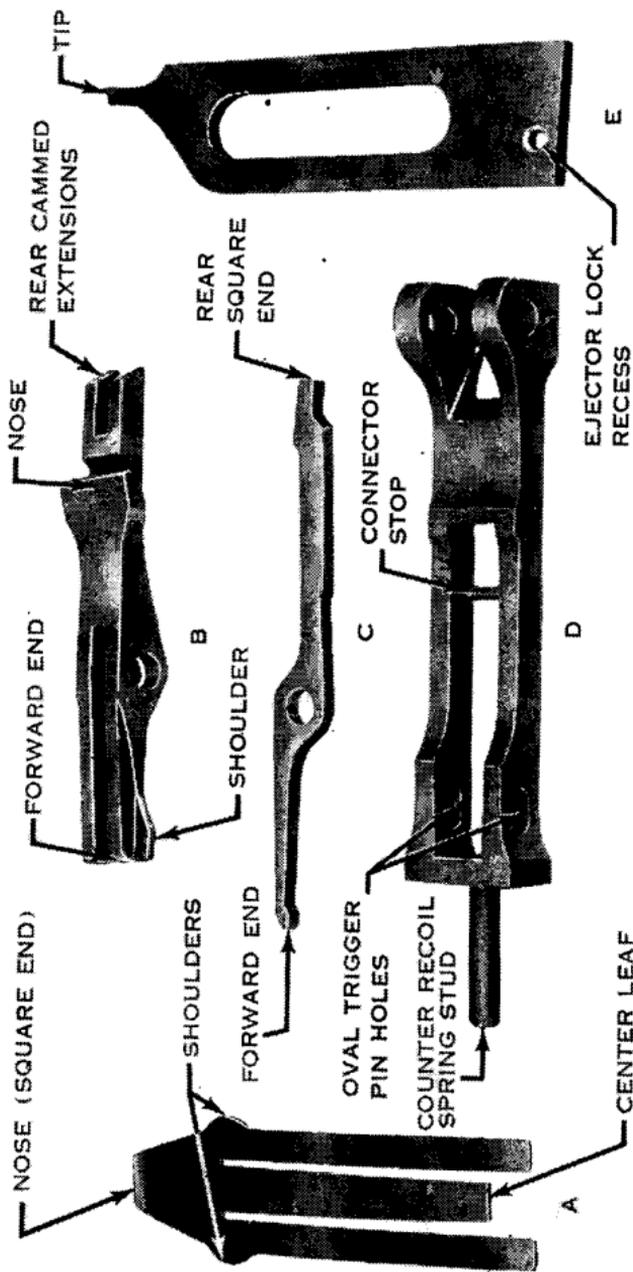


Figure 98.—Continued.

#### 40. TRIGGER GROUP FUNCTIONING ON THE S SETTING

*a.* When the change lever is set at the S setting, the automatic rifle cannot fire and is safe. When the trigger is pressed, the shoulders of the trigger contact the solid portion of the change lever bar (fig. 98① ②). The trigger cannot move. Because the trigger cannot move, the connector cannot move, or function (fig. 99). The sear and sear release stop lever do not move. The sear nose remains engaged with the sear notch in the slide. The parts remain to the rear and the weapon will not fire.

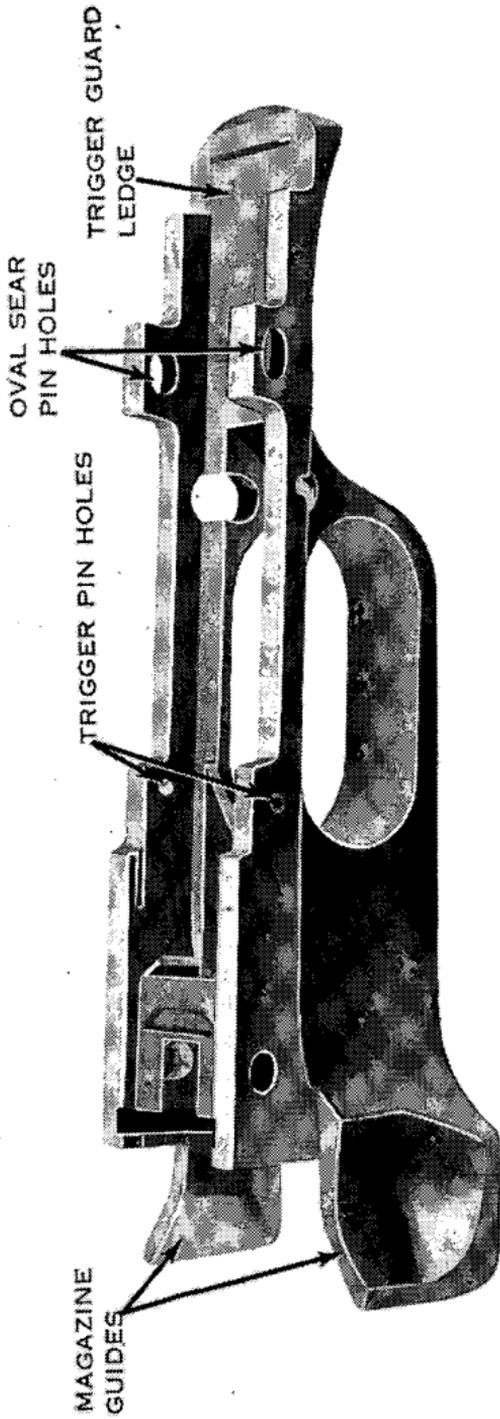
*b.* To understand functioning on the S setting, assemble the sear, sear release stop lever, sear pin, trigger, connector, trigger pin, change lever,



- A. SEAR SPRING
- B. SEAR
- C. SEAR RELEASE STOP LEVER
- D. SEAR CARRIER
- E. EJECTOR

⑥

Figure 98.—Continued.



## TRIGGER GUARD BODY

①

Figure 98.—Continued.

and the change and stop lever spring assembly (fig. 98①, ③) to the trigger guard body (fig. 98④). Move the change lever to the S setting. As the trigger is pressed to the rear, this action can be followed easily on the trigger group.

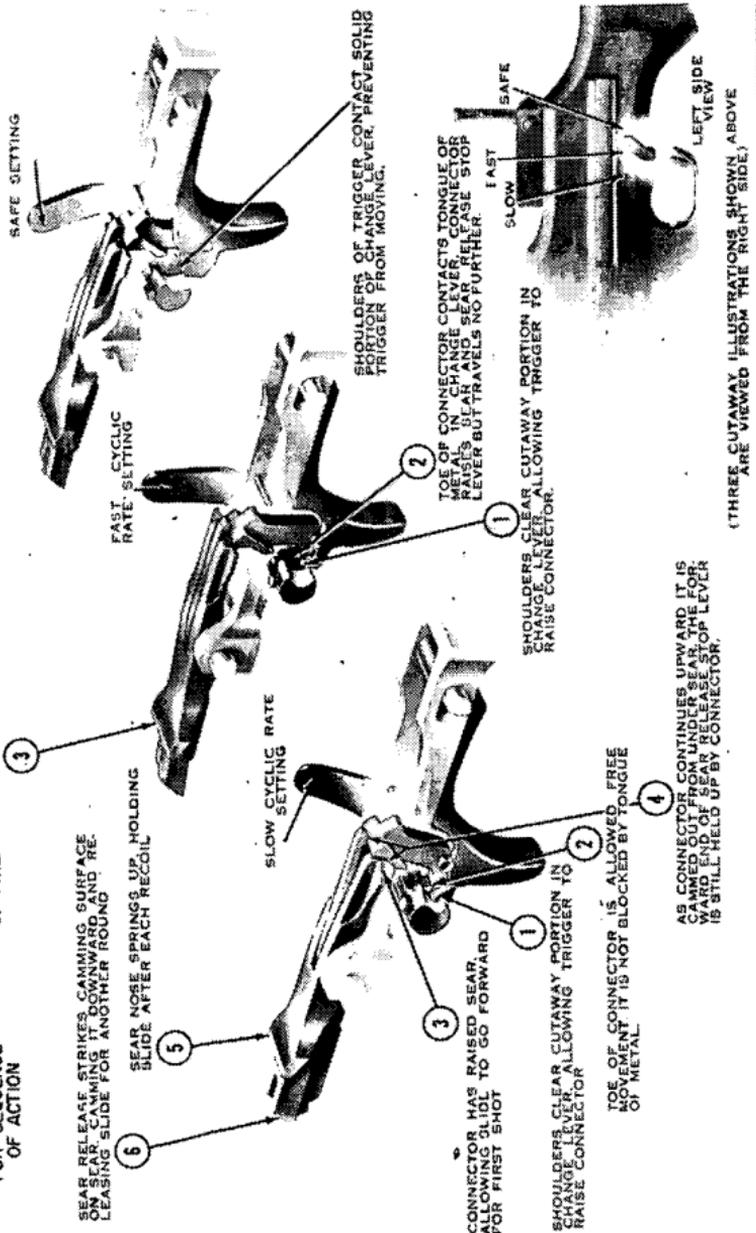
#### 41. TRIGGER GROUP FUNCTIONING ON THE A SETTING

*a.* As the change lever is rotated from the S to the A or fast cyclic rate setting, the solid portion of the change lever bar rotates to the rear and out of the path of the trigger shoulders. The cutaway portion rotates into the path of the trigger shoulders. The metal tongue in the cutaway portion of the change lever bar moves into the path of the toe of the connector. When the trigger is pressed, the trigger shoulders move into the cutaway portion of the change lever bar and the connector is carried toward the sear by the trigger. The toe of the connector contacts the metal tongue in the cutaway portion. Because the connector contacts the metal tongue, the connector is held upright and in a stationary position (fig. 99).

*b.* As the connector moves up, it raises the forward ends of the sear and sear release stop lever. The connector continues to hold up the forward ends of these parts as long as the trigger is held to the rear. The sear and sear release stop lever pivot on the sear pin. When the forward ends of these two parts are forced up, the rear ends pivot downward. Until this time the slide has

FOLLOW NUMERALS FOR SEQUENCE OF ACTION

SEAR NOSE IS DEPRESSED, DISENGAGING FOLLOWING FAST CYCLIC RATE



(THREE CUTAWAY ILLUSTRATIONS SHOWN ABOVE ARE VIEWED FROM THE RIGHT SIDE.)

Figure 99. Change lever settings.

been engaged and held to the rear by the sear nose.

c. As the sear pivots about the sear pin, the sear nose is lowered and disengaged from the sear notch. This permits the slide assembly to move forward. The slide moves forward under action of the recoil spring which was compressed during the rearward movement of the operating parts.

d. When a round is fired, the slide moves to the rear and strikes the sear release and then the buffer head. If the trigger is held to the rear or is pressed again, the rear ends of the sear and sear release stop lever will be depressed. That is, the sear nose is down and out of the path of the sear notch on the slide. There is nothing to hold the slide to the rear. The operating parts move forward again and fire another round. The weapon continues to operate in this manner, firing at a rate of approximately 550 rounds per minute.

e. When the pressure on the trigger is released, the trigger is returned to its normal position by the connector which is returned to its normal position by the center leaf of the sear spring. As the connector moves down, pressure against the forward ends of the sear and sear release stop lever is removed. The two outer leaves of the sear spring, which are resting on the shoulders of the sear, force the sear back into position. The sear release stop lever is repositioned by its spring. The rear ends of the sear and sear release stop lever pivot upward. The

sear nose is now up and in the path of the sear notch on the slide. The square end of the sear release stop lever is up and in the path of the sear release. The rear end of the sear release stop lever extends past the rear end of the sear.

*f.* At this time the rate reducing portion of the buffer and rate reducing group starts to function. When the operating parts return to the rear, the rear of the slide strikes the sear release and then the buffer head. The slide then moves forward a short distance and the sear nose engages the sear notch on the slide. The sear release moves to the rear, strikes the actuator, and drives it to the rear through the actuator tube, compressing the actuator spring. When the actuator spring expands, it drives the actuator forward against the sear release. The sear release moves forward and strikes the blunt end of the sear release stop lever. As the blunt end of the sear release stop lever extends past the rear end of the sear, the sear release cannot contact the rear end of the sear. The sear nose remains engaged with the sear notch and firing stops. When the trigger is held to the rear during firing, the rate reducing parts perform no function because the rear ends of the sear and sear release stop lever are forced down and the sear release passes over the rear ends of both parts.

*g.* Notice the oval-shaped sear pin holes in the trigger guard body and the sear carrier (fig. 98③, ④). When the slide is stopped by the sear nose engaging the sear notch on the slide, the sear nose is subjected to considerable shock.

To eliminate some of the wear on the sear nose caused by this shock as well as to eliminate the possibility of damaging the sear pin and trigger pin, the oval sear pin and trigger pin holes and the counterrecoil spring are provided. When the slide assembly strikes the sear nose, the sear carrier moves forward a short distance. The sear pin moves in the oval shaped sear pin holes in the trigger guard body. This movement is made against the action of the counterrecoil spring. The shock and wear on the sear nose is reduced by this slight movement. The sear carrier is forced back to its original position as the counterrecoil spring expands.

## 42. TRIGGER GROUP FUNCTIONING ON THE F SETTING

*a.* Note what happens when the change lever is rotated from the A setting to the F or slow cyclic rate setting. The cutaway portion of the change lever bar moves further to the rear; however, it is still exposed to the shoulder of the trigger. The metal tongue in the cutaway portion moves out of the path of the connector. When the trigger is pressed, the shoulders of the trigger move up and into the cutaway portion of the change lever bar. As the trigger moves up, the connector is carried up. The connector at first raises the forward ends of both the sear and the sear release stop lever. These two parts pivot about the sear pin; their rear ends move downward. As the rear end of the sear moves downward, the sear nose is disengaged from the sear

notch on the slide. The operating parts then move forward under action of the compressed recoil spring as explained in paragraph 32.

b. On the F setting, the toe of the connector does not contact the metal tongue in the change lever bar. Therefore, there is nothing to hold the connector in an upright and stationary position. Note the cam surface (sear carrier ramp) on the connector (fig. 98②). Note also the cam surface just in the rear of the connector stop on the underside of the sear carrier (fig. 98③). When the connector moves up, these two surfaces contact each other and produce a camming action. This action forces the connector forward. The top of the connector is forced out from under the forward end of the sear and the connector falls forward against the connector stop (fig. 99). The connector continues to hold the forward end of the sear release stop lever in the *up* position. The sear is repositioned by the two outer leaves of the sear spring.

c. As the operating parts move to the rear under the action of the gas, the slide passes over the sear and strikes the sear release and then the buffer head. The slide then rebounds forward a short distance. The sear nose engages the sear notch on the slide, holding the operating parts to the rear. Meanwhile, the sear release of the buffer and rate reducing group moves to the rear a short distance and strikes the actuator. The actuator moves to the rear through the actuator tube and compresses the actuator spring. As the actuator spring expands, it drives the actuator forward.

The actuator strikes the sear release and forces the sear release forward. Remember that the rear end of the sear is up and in the path of the sear release. The sear release stop lever is down and out of the path of the sear release. As the sear release moves forward, it contacts the rear cammed extensions of the sear. This action forces the rear end of the sear down. The sear nose is disengaged from the sear notch. The operating parts again move forward as before. This temporary pause in firing reduces the cyclic rate of fire of the automatic rifle from 550 rounds per minute to 350 rounds per minute.

*d.* When the pressure on the trigger is removed, the connector, as well as the trigger, is repositioned by the center leaf of the sear spring. As the connector moves down, pressure against the sear and sear release stop lever is removed. The two outer leaves of the sear spring, which are resting on the shoulders of the sear, reposition the sear. The sear release stop lever spring repositions the sear release stop lever. As the forward ends of the sear and sear release stop lever move down, their rear ends pivot up. Now the sear nose is up and in the path of the sear notch on the slide. The square end of the sear release stop lever is up and in the path of the sear release. After striking the sear release and the buffer head, the slide moves forward a short distance. The sear nose engages the sear notch and the slide is held to the rear. The operating parts cannot move forward. Meanwhile, the sear release, which was hit by the slide during the rear-

ward movement, has hit the actuator. The actuator moves to the rear and compresses the actuator spring. As the actuator spring expands, the actuator is driven forward and strikes the sear release. Remember, the rear end of the sear release stop lever is up and extends past the rear cammed extensions of the sear. The sear release strikes the blunt end of the sear release stop lever and not the rear cammed extensions of the sear. The sear nose remains engaged with the sear notch. Firing stops.

## Section IV. OPERATION

### 43. GENERAL

Without proper instruction you could not learn to drive a car. Similarly, without proper instruction you would find it very difficult to learn how to operate your automatic rifle. This section tells you the approved methods for operating that weapon.

### 44. AUTOMATIC RIFLE SLINGS

Two slings are authorized for use with the automatic rifle—the gun sling, M1907 (leather, modified) and the gun sling, M1 (improved webbing). The web sling is designed to replace the modified leather sling as the supply of leather slings is exhausted. Because the web sling cannot be extended to as full a length as the leather sling, it may not be possible to use it in the crouch position. In the following paragraphs, only the pro-

cedure for assembling the sling to the weapon is covered. Sling adjustments for the firing position are covered in paragraphs 98-101 and 114.

#### 45. ATTACHING THE LEATHER SLING TO THE AUTOMATIC RIFLE .

To place the modified leather sling on the automatic rifle:

*a.* Place your weapon on a flat surface with the muzzle pointing to the left and with the sights down. Place the sling on the automatic rifle as shown in figure 100.

*b.* Engage the feed end hook in the last pair of holes of the inside strap. Slide the upper keeper over the feed end hook (fig. 101) and against the upper sling swivel.

*c.* Place the upper hook in the pair of holes which are nearest the feed end hook of the long strap (fig. 102). (This adjustment may be different on an old sling that has stretched.)

*d.* Grasp the lower hook in the right hand and pull the short strap through the lower sling swivel. Place the lower hook in the pair of holes closest to the upper hook of the long strap as shown in figure 103. The upper keeper should be against the upper sling swivel. Move the lower keeper down against the D ring.

*e.* To tighten the sling, disengage the upper hook from the pair of holes nearest the feed end hook and place it in the pair of holes nearest the upper keeper. Before proceeding with the adjustment be sure that the upper keeper is against the upper sling swivel (fig. 104).

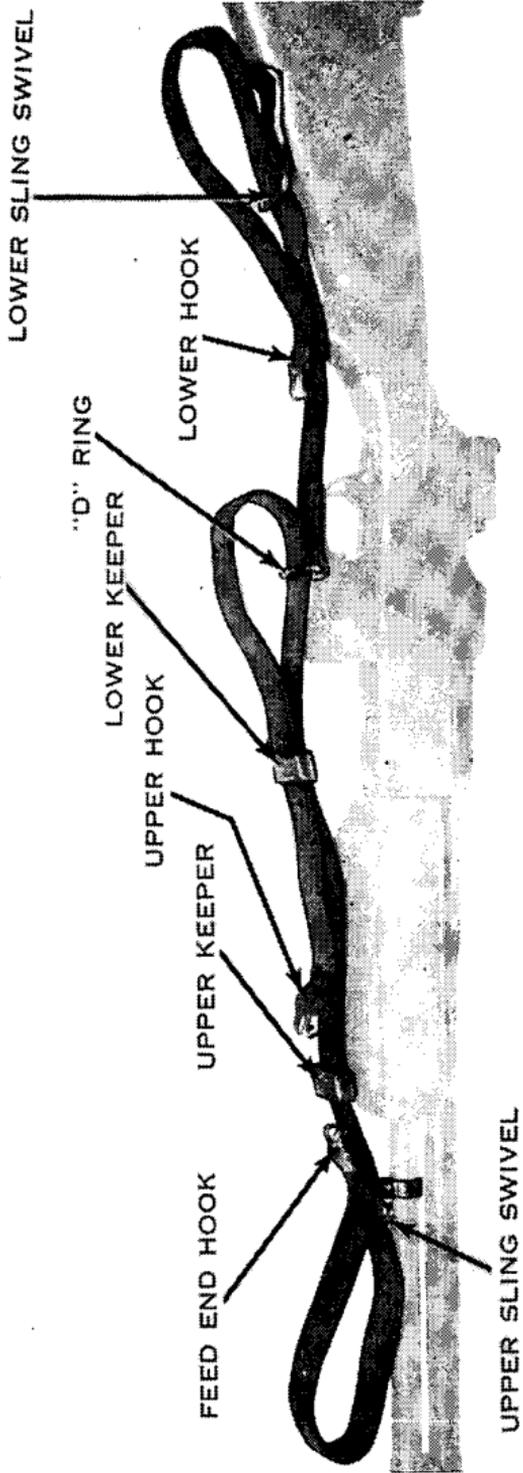
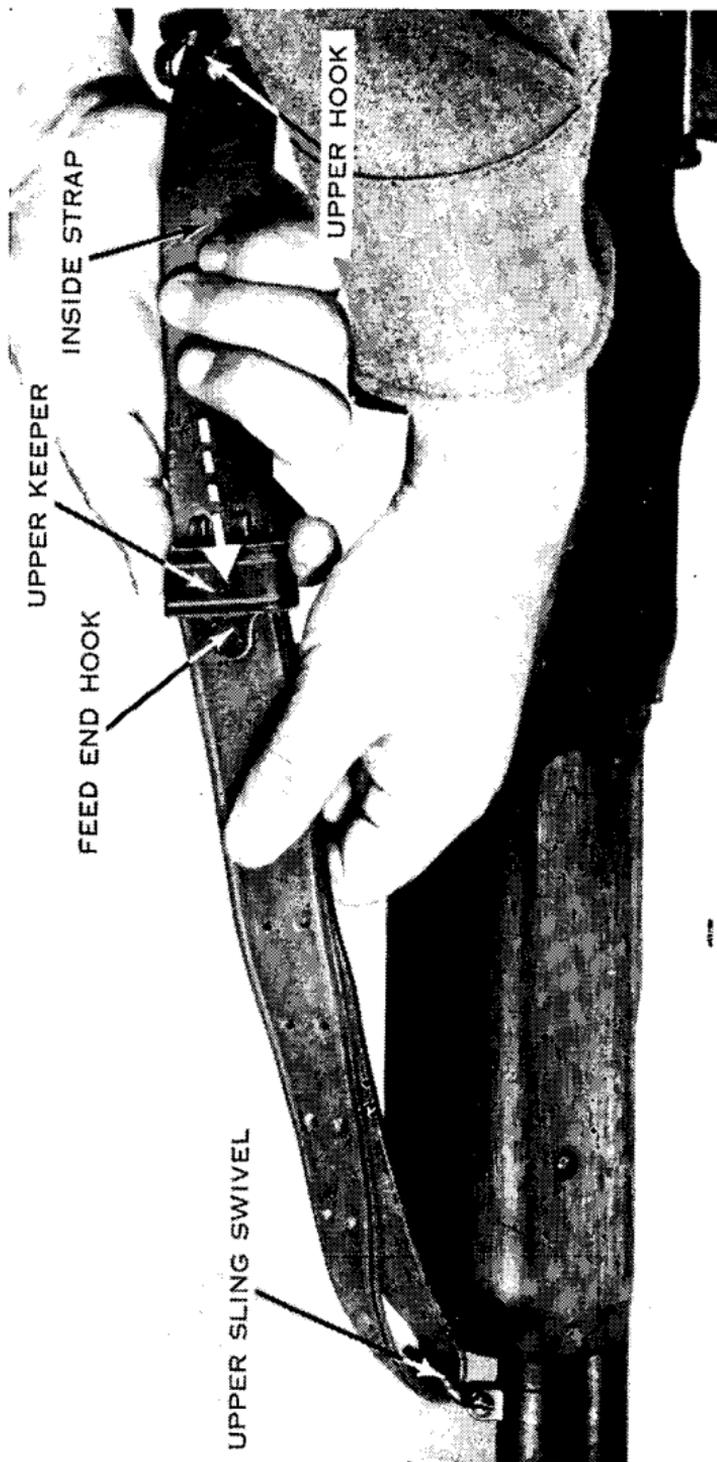


Figure 100. Placing the leather sling on the automatic rifle.



*Figure 101. Moving the upper keeper over the feed end hook.*

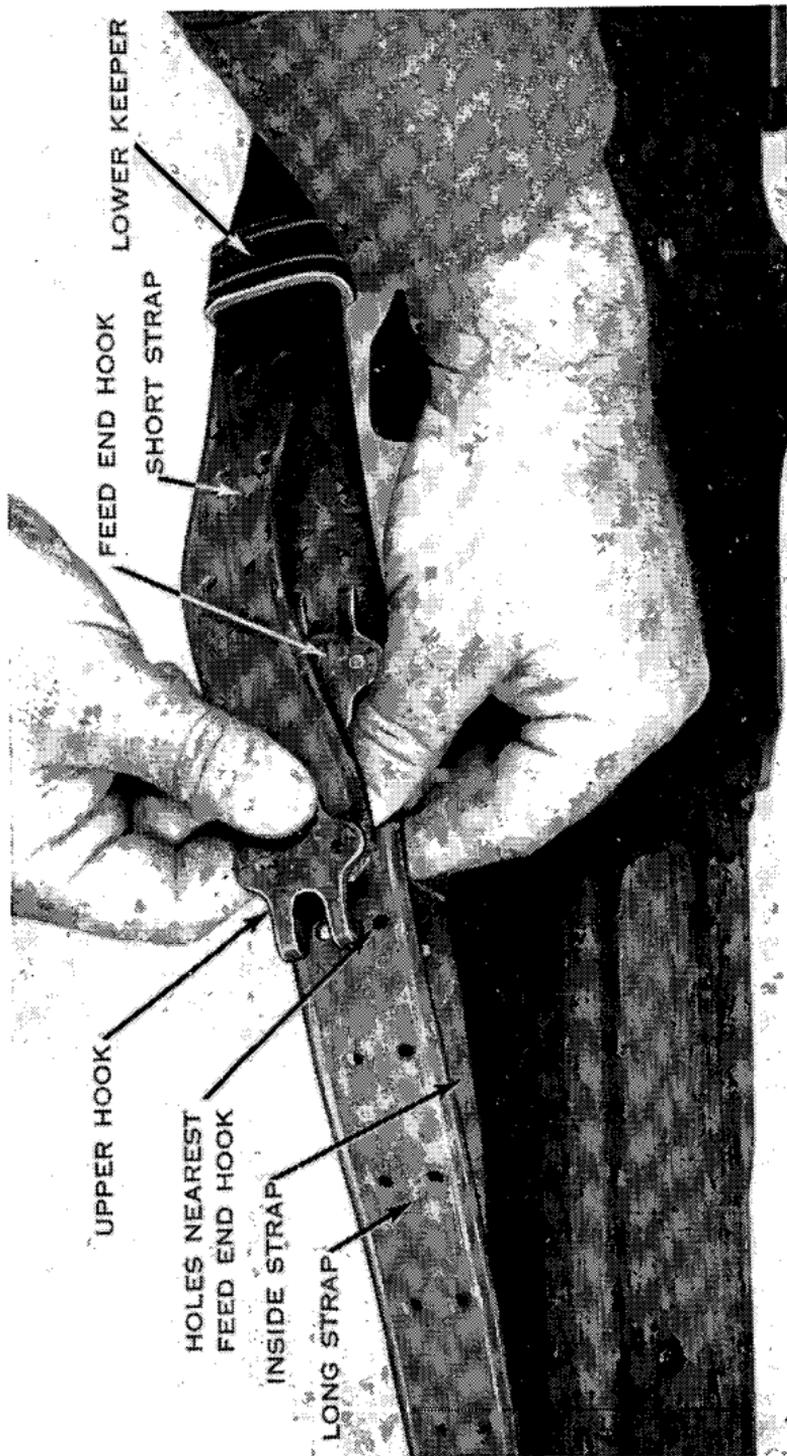


Figure 102. Engaging the upper hook to the feed end of the long strap.

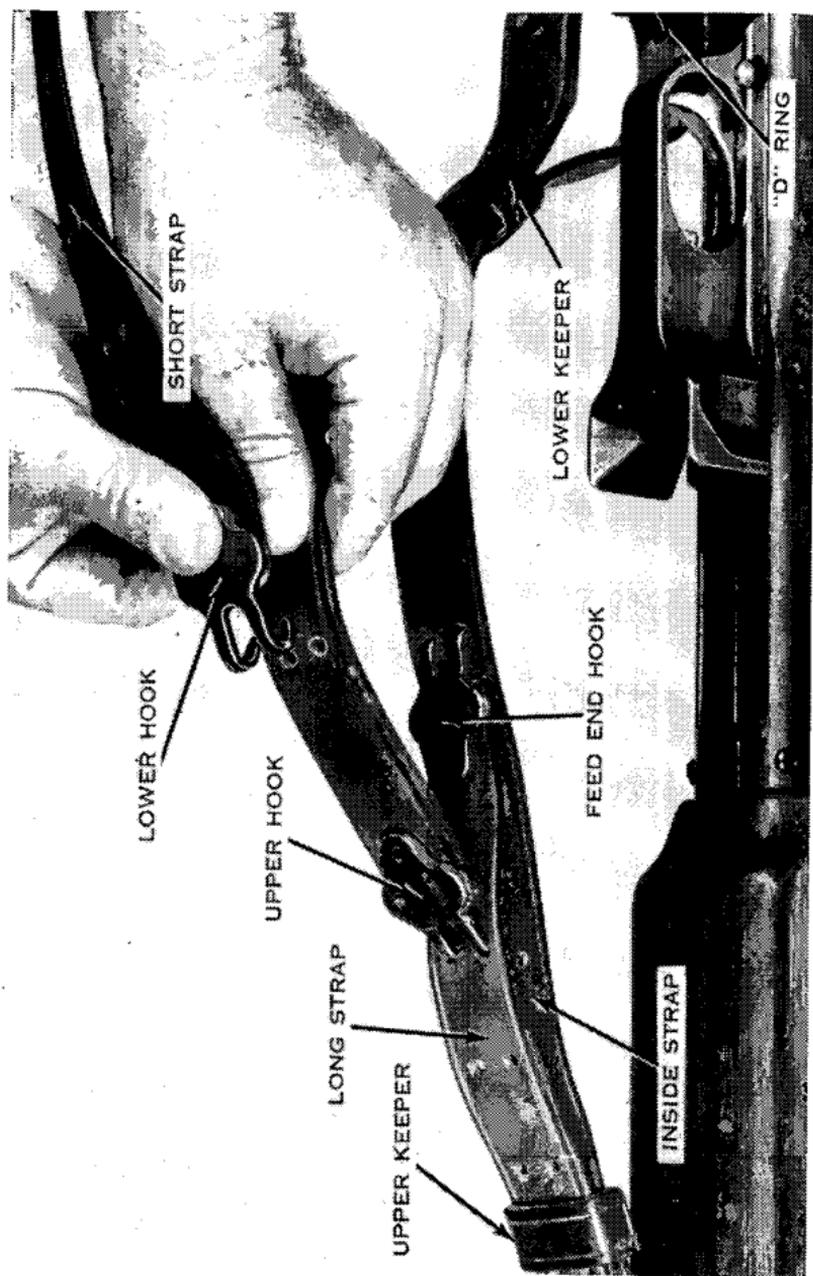
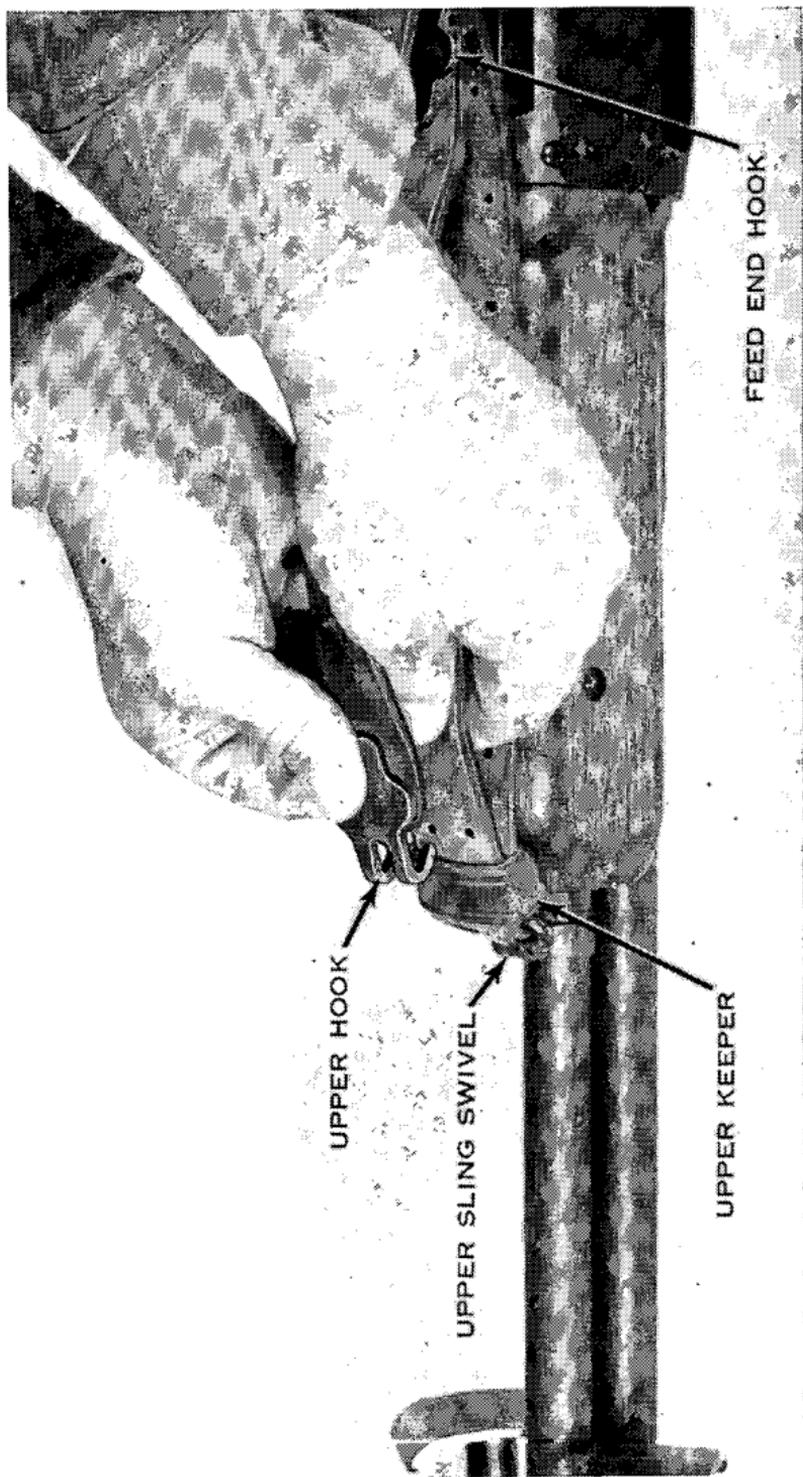


Figure 108. Engaging the lower hook to the long strap.



*Figure 104. Tightening the sling.*

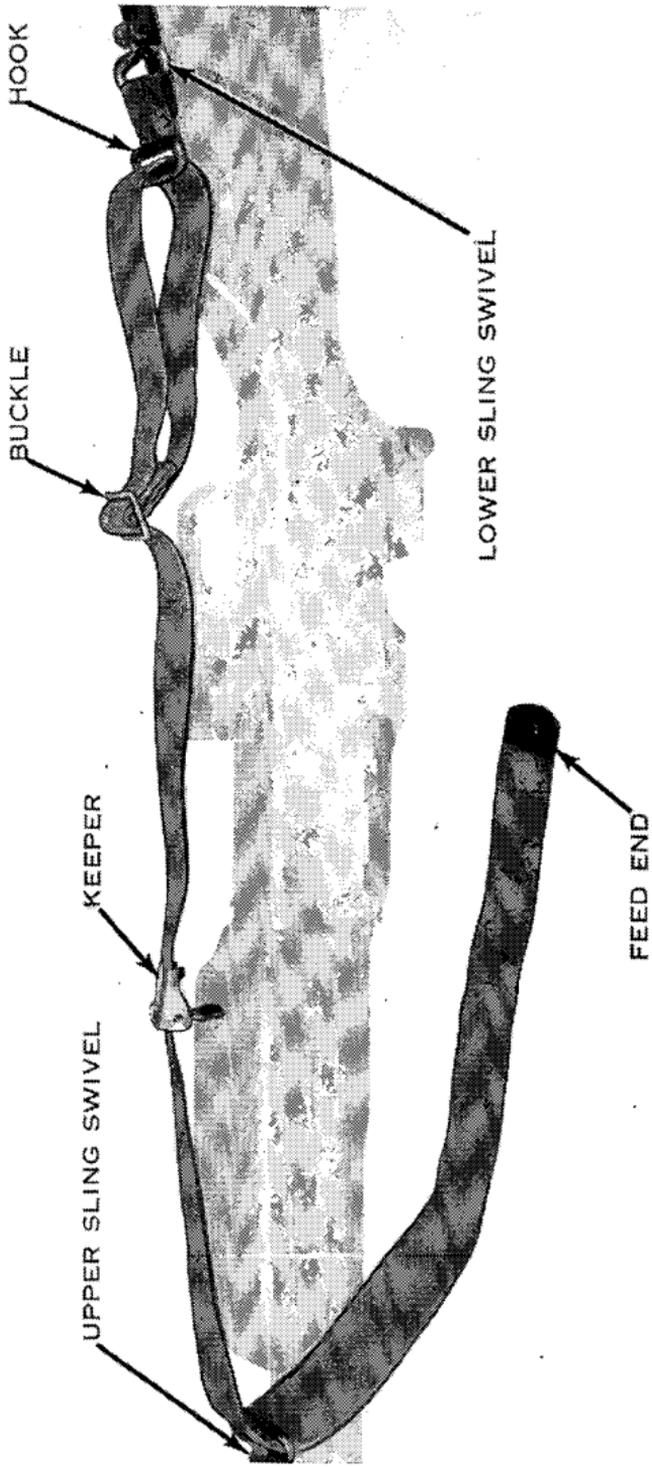
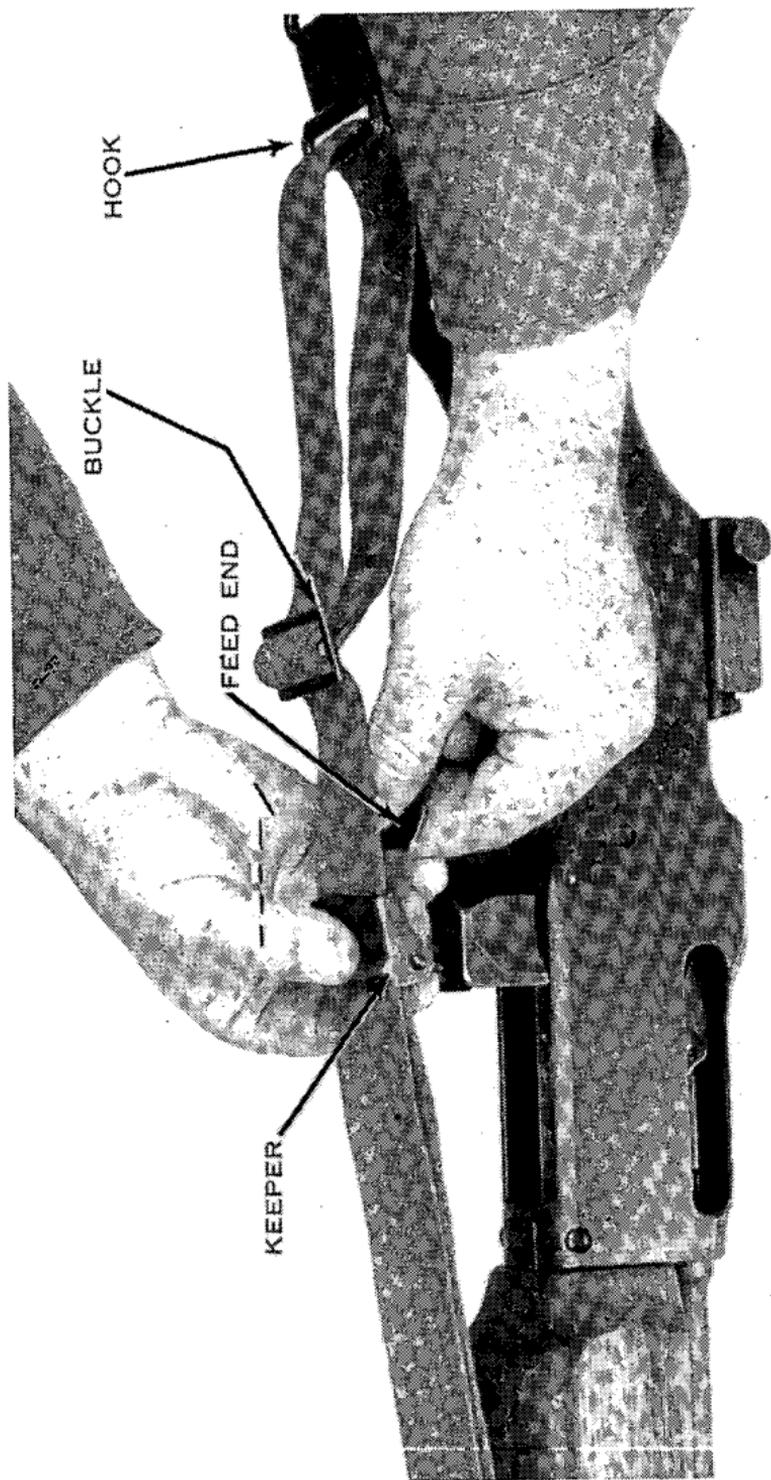


Figure 105. Placing the web sling on the automatic rifle.



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*Figure 106. Threading the feed end of the sling.*

## 46. ATTACHING THE WEB SLING TO THE AUTOMATIC RIFLE

The improved web gun sling M1 used with the automatic rifle is the same as the web sling used with the M1 rifle.

a. To place the web sling on the automatic rifle, proceed as shown in figure 105.

b. Thread the feed end of the sling through the keeper and pull the keeper and feed end of the sling toward the butt of the automatic rifle until the sling is as tight as desired (fig. 106). Close the keeper.

## 47. SLING ARMS ADJUSTMENT

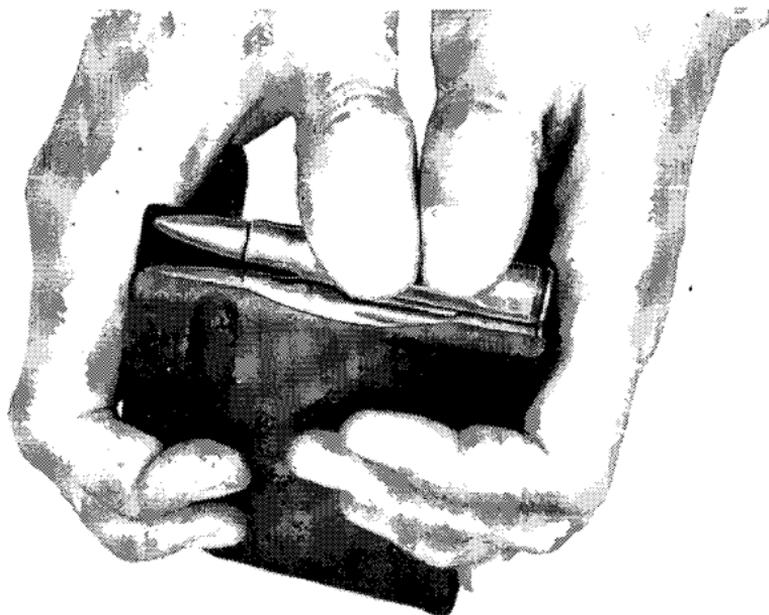
After placing the sling on your automatic rifle, you must know how to adjust it so that the weapon can be carried comfortably from the shoulder in the sling arms position.

a. To loosen the gun sling M1907 (modified leather) for carrying, disengage the upper hook from the pair of holes nearest the upper keeper. Place the upper hook in the pair of holes nearest the feed end hook. (If the sling has been stretched, it may be necessary to place the upper hook in another pair of holes.)

b. To adjust the web sling M1 for carrying, open the keeper and loosen the sling by sliding the keeper and feed end of the sling toward the muzzle. Loosen the sling until there is slack enough to sling the automatic rifle comfortably on your shoulder. Close the keeper.

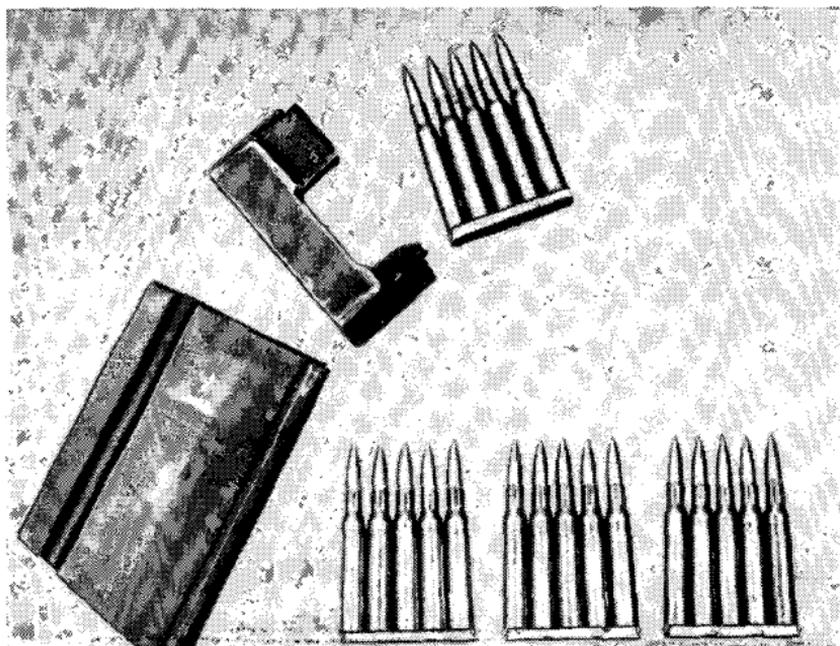
## 48. LOADING THE MAGAZINE

a. The magazine used in the Browning automatic rifle holds 20 rounds. Figure 107 shows the proper method of loading single rounds into the magazine. Note that the point of the bullet points toward the short portion of the magazine.



*Figure 107. Loading single rounds into the magazine.*

b. Two magazine fillers are authorized for each automatic rifle. These fillers assist you in loading magazines rapidly. They are used only when ammunition is issued in five round clips. The proper method for loading the magazine using the magazine filler is shown in figure 108. The filler is placed over the open end of the magazine.



*Figure 108. Loading the magazine with the magazine filler.*

## 49. LOADING THE AUTOMATIC RIFLE

You may load your weapon with either hand. Hold the magazine with its base in the palm of the hand. The points of the cartridges point toward the muzzle of the weapon. Using the magazine guides, insert the magazine into the magazine feedway. Tap up on the magazine base. The magazine can be inserted with the operating parts to the rear (cocked) or forward. Usually, the weapon is cocked before loading a magazine.

## 50. UNLOADING THE AUTOMATIC RIFLE

Press the magazine release and allow the magazine to drop out. If the magazine does not drop

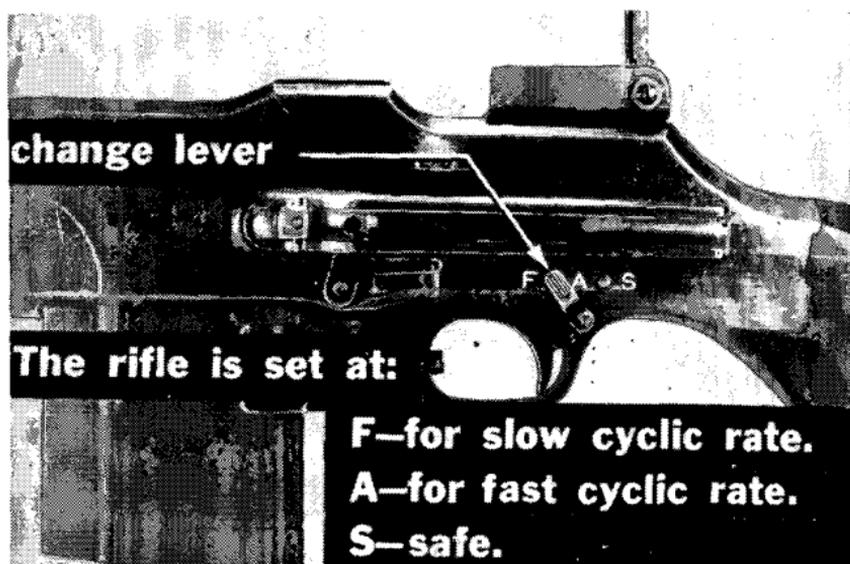
out, remove it with your hand. At the same time, cock the weapon by pulling the operating handle to the rear and pushing it forward. As soon as the magazine drops out and the weapon is cocked, press the trigger and let the operating parts move forward. The automatic rifle is clear only when the magazine has been removed and the trigger has been pressed allowing the operating parts to move forward. Always replace the empty magazine in the belt.

## 51. SETTING THE CHANGE LEVER

*a.* To set the automatic rifle on S (safe), depress the change lever stop and rotate the change lever until it covers the change lever stop. As the change lever stop must first be depressed, the change lever cannot be accidentally set on safe. At the same time it allows a quick change from the safe setting to either the slow or normal cyclic rate setting.

*b.* To set the change lever on A setting (the fast cyclic rate of 550 rounds per minute), rotate the change lever until it strikes against the change lever stop.

*c.* To set the change lever on F setting (the slow cyclic rate 350 rounds per minute), rotate the change lever to the forward position marked F (fig. 109).



*Figure 109. Change lever settings.*

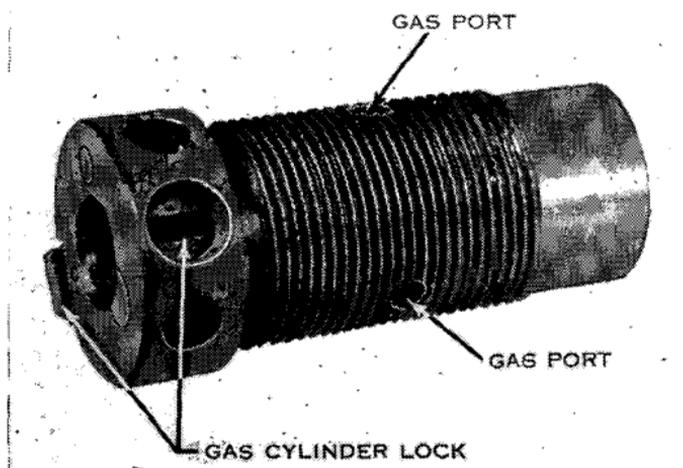
## 52. FIRING THE AUTOMATIC RIFLE

Rotate the change lever to the desired setting. Press the trigger to the rear. Hold the trigger to the rear until the desired number of rounds has been fired, then release the trigger. To fire single shots, set the change lever on the F (slow cyclic rate) setting. Press the trigger all the way to the rear and release it immediately. Firing single shots with the change lever on the A (fast cyclic rate) setting requires extensive practice.

## 53. GAS ADJUSTMENT

*a.* There are three different sized gas ports in the gas cylinder assembly (fig. 110). On the face of the gas cylinder there are three circles of

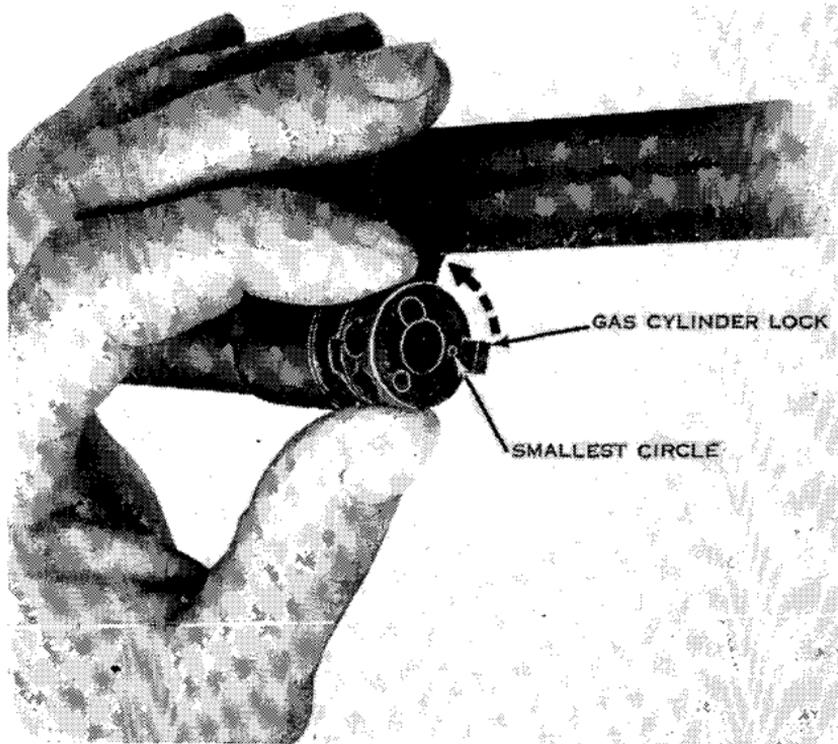
different size. These circles correspond to the size of the three gas ports inside the gas cylinder assembly. The circles are to assist you in adjusting the gas cylinder assembly at the desired setting. The adjustment should never be changed unless the automatic rifle shows signs of insufficient gas. Keep in mind that the gas cylinder port is the only gas port to be adjusted. The others were properly aligned when the weapon was made.



*Figure 110. Gas cylinder assembly.*

b. To make the gas adjustment on the small port, first unlock the gas cylinder assembly. This is done by partially forcing out the gas cylinder lock with the combination tool or with the point of a dummy cartridge. Screw the gas cylinder assembly all the way in until it is finger tight. Back the gas cylinder assembly off one complete turn. Now turn the gas cylinder assembly so that the

smallest circle (look at the face of the gas cylinder assembly) passes through the shortest distance to a position directly under the barrel (fig. 111). Lock the gas cylinder assembly by pushing in the gas cylinder lock. If, upon firing, the automatic rifle shows signs of insufficient gas, do not change immediately to a larger setting. The port in the gas cylinder may not be properly aligned with the other gas ports. Attempt to obtain a better adjustment on the small port. To do this, unlock the gas cylinder assembly. Try to screw it in one complete turn. Lock the gas cylinder assembly and attempt to fire. If there is still



*Figure 111. Adjustment of gas cylinder on small port.*

insufficient gas, unlock the gas cylinder assembly and unscrew it two complete turns. Lock the gas cylinder assembly and attempt to fire. If the weapon is still receiving insufficient gas, adjust the gas cylinder on the next larger port.

*c.* Adjust the gas cylinder assembly on the medium and large ports in the same manner as on the small port. If, upon adjusting the gas cylinder assembly on the medium or the large port, the weapon still does not receive sufficient gas, attempt to obtain a better alinement of the gas ports. The method to be followed is the same as was followed for the small port.

## 54. SAFETY PRECAUTIONS

*a. General.* You must constantly be on the alert when working with any weapon.

*b. Precautions.* Several basic ground rules are observed in handling the automatic rifle. These rules are not intended to replace other existing safety regulations. Additional safety precautions are listed in paragraphs 231-235.

- (1) Never place any obstruction in the muzzle or bore.
- (2) Always assume the automatic rifle to be loaded when a magazine is in the receiver or the operating parts are to the rear.
- (3) While on the range, carry the weapon with the muzzle up and pointing down range at all times.

- (4) Never carry the weapon when loaded except in combat or during combat exercises. In combat exercises your officers will tell you when to load.
- (5) While on the range, clear your automatic rifle before leaving the firing lines.
- (6) Carry the rifle with the bolt forward at all times except when in the presence of the enemy.
- (7) Before all periods of mechanical and preparatory marksmanship training, check each weapon and magazine for the presence of live rounds.

## Section V. STOPPAGES AND IMMEDIATE ACTION

### 55. GENERAL

*a.* A *stoppage* is any unintentional or accidental failure to fire. In other words, a stoppage occurs when the weapon stops firing through no fault of the automatic rifleman. A stoppage may be a failure to feed, eject, fire, or function freely. It is caused by faulty operation of the automatic rifle, magazine, or ammunition.

*b.* A *malfunction* is the faulty action of some part of a weapon resulting in a stoppage.

*c.* *Immediate action* is the unhesitating application of a probable remedy without considering the cause of the stoppage. It is that action which the automatic rifleman performs immediately on his weapon when it fails to fire.

## 56. COMMON CAUSES OF STOPPAGES

*a.* Most of the mechanical failures of the automatic rifle are caused by worn, weak, broken, or dirty operating parts. You must train yourself to watch for these defects and correct them before they cause a stoppage. The primary cause of stoppages is a defective magazine. For this reason it is particularly important that you handle the magazines carefully. Take proper care of the magazines and the weapon itself, and you can rely on your automatic rifle to function properly when you need it. Four types of common stoppages, their usual causes, and the action to take to correct them are described below. You should examine your automatic rifle before, during, and after firing with these causes in mind. In this manner, many stoppages can be prevented.

## b. Four common stoppages—

| Nature of stoppage             | Usual causes  | Corrective action  |
|--------------------------------|---|--|
| Failure to feed.....           | Dirty or dented magazine.<br>Weak or broken magazine spring.<br>Worn magazine notch.<br>Worn or broken magazine catch.<br>Corroded or bent ammunition.<br>Excessive friction in operating parts.<br>Dirty or clogged gas ports. | }<br>} Replace the magazine.<br>}<br>} Replace the magazine catch.<br>} Replace the ammunition.<br>} Clean and properly lubricate operating parts.                       |
| Failure to eject.....          | Improper adjustment of gas cylinder assembly.<br>Excessive friction in operating parts.<br>Damaged or missing extractor (and spring) or ejector.  | } Clean and properly adjust gas cylinder assembly.<br>} Clean and properly lubricate operating parts.<br>}   |
| Failure to fire.....           | Dirty parts.<br>Lack of oil.<br>Oil too heavy for the weather.<br>Weak recoil spring.<br>Worn or broken firing pin.<br>Defective ammunition.  | } Replace damaged or missing parts.<br>}<br>} Clean and properly oil operating parts.<br>}<br>} Replace recoil spring.<br>} Replace firing pin.<br>} Replace ammunition. |
| Failure to function freely.... | Damaged or worn parts.<br>Improper or incomplete assembly.<br>Excessive friction in operating parts.  | } Replace defective parts.<br>} Assemble parts correctly or completely.<br>} Clean and properly lubricate operating parts.   |

## 57. APPLYING IMMEDIATE ACTION

Although many stoppages can be prevented before they occur if the weapon, magazines, and ammunition are cared for properly, some stoppages may still occur. Immediate action is taught so that you will be able to take the necessary steps to reduce those stoppages. Immediate action is taught and performed in two phases.

## 58. FIRST PHASE OF IMMEDIATE ACTION

The first phase of immediate action is taught as a drill. It must be applied quickly and without thought as to the cause of the stoppage. Most stoppages can be eliminated by applying the first phase of immediate action. The five key words that are used to help you learn and remember the first phase of immediate action are—Pull, Push, Tap, Aim, and Fire. An explanation of the five key words follows:

a. *PULL* the operating handle all the way to the rear. This action should eject any empty rounds remaining in the chamber, providing the extractor, extractor spring, or the ejector is not broken.

b. *PUSH* the operating handle all the way forward. The weapon is now cocked.

c. *TAP* up firmly on the bottom of the magazine. If the magazine is not fully seated, this should seat it, providing the magazine notch or magazine catch is not worn.

d. *AIM* and attempt to *FIRE*.

## 59. SECOND PHASE OF IMMEDIATE ACTION

If the first phase of immediate action does not reduce the stoppage, then a more detailed examination of the automatic rifle must be made. The five key words used to help you remember the second phase of immediate action are—Take, Look, Pull, Locate, and Reduce. An explanation of these five words follows:

- a. *TAKE* the automatic rifle from the shoulder.
- b. *LOOK* at the ejection opening.
- c. *PULL* the operating handle to the rear slowly.
- d. *LOCATE* the stoppage by observing, as you pull the operating handle to the rear, what is in the ejection opening, what is in the chamber, or what is ejected.
- e. *REDUCE* the stoppage and attempt to fire the weapon.

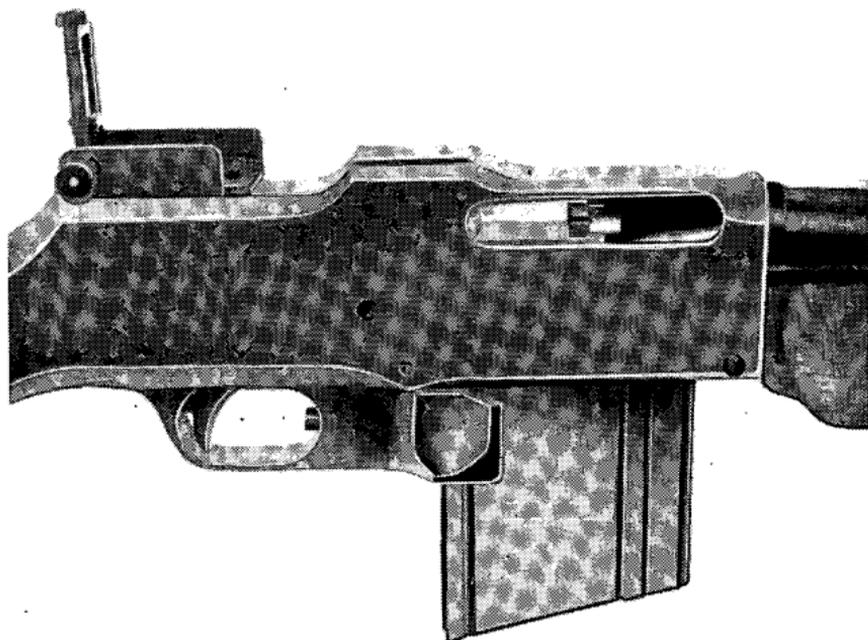
## 60. SECOND PHASE STOPPAGES

While applying the second phase of immediate action, you will see certain stoppages. You must be able to locate their cause and eliminate them. Six of the more common stoppages are—

### a. *Partial Feeding (fig. 112).*

- (1) *Description.* The weapon stops firing with a live cartridge fed part way into the chamber. The feed rib is riding over the cartridge. The base of the cartridge is still in the magazine. This type of stoppage is known as partial feeding and is caused by a faulty magazine. The

magazine may have a weak spring, it may be dented or dirty, or the magazine notch may be worn. Also, the magazine catch on the automatic rifle may be damaged or worn. In any case the magazine is not all the way up in the magazine feedway or the cartridges are not all the way up in the magazine. The feed rib cannot contact the base of the top cartridge in the magazine. Instead, the feed rib slides over the base of the top cartridge and catches it on top, pushing it part way into the chamber as shown in figure 112.



*Figure 112. Partial feeding.*

(2) *Remedy.* Replace or clean the magazine or replace the magazine catch on the weapon.

b. *Double Feeding (fig. 113).*

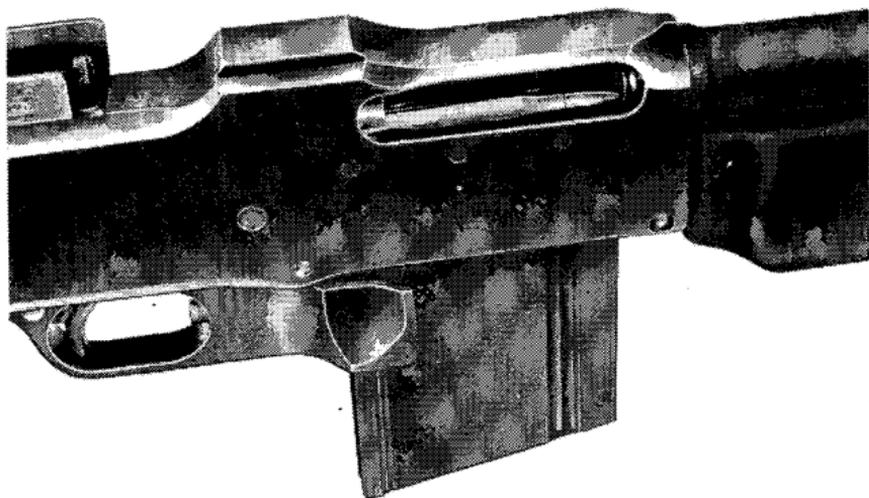
(1) *Description.* The weapon stops firing when the bolt attempts to feed two cartridges into the chamber at the same time. This stoppage is caused by a faulty magazine; the magazine lips are spread. During initial loading or firing, the top cartridge jumps out of the magazine. Then, as the operating parts move forward, the feed rib contacts the next cartridge. This causes two cartridges to be fed forward at the same time. Double feeding may also be caused



*Figure 113. Double feeding.*

when the first phase of immediate action is applied to a stoppage caused by partial feeding. In any case the stoppage is due to magazine trouble.

- (2) *Remedy.* Change the magazine.

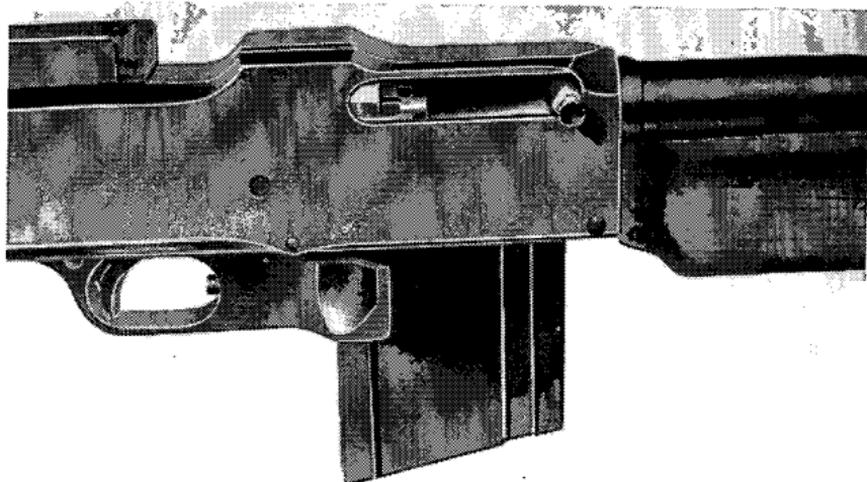


*Figure 114. Broken extractor.*

*c. Broken Extractor (fig. 114).*

- (1) *Description.* The weapon stops firing when an empty cartridge case that was not extracted blocks the entry of a live cartridge into the chamber. This type of stoppage is caused by a worn or broken extractor or extractor spring. If the rim of the empty cartridge case is ripped off, the stoppage is due to a dirty chamber.

- (2) *Remedy.* Replace either the extractor or extractor spring (par. 20). If the stoppage is due to a dirty chamber, remove the ruptured cartridge case and clean the chamber.



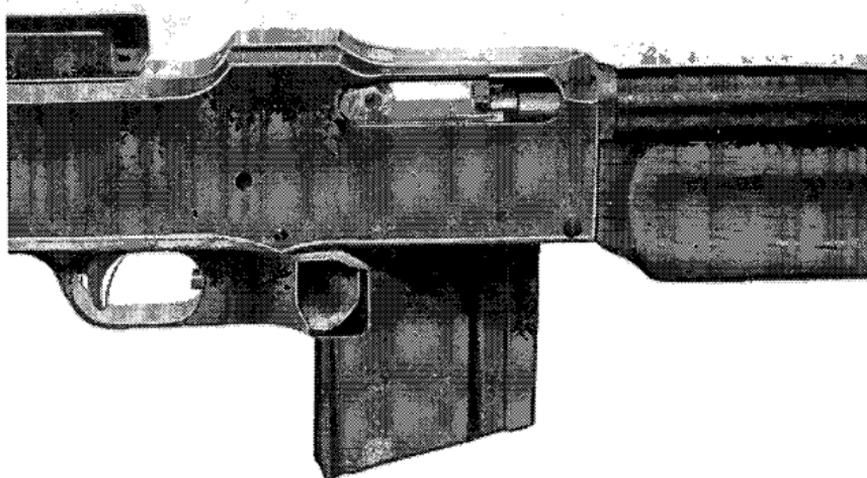
*Figure 115. Insufficient gas.*

*d. Insufficient Gas (fig. 115).*

- (1) *Description.* The weapon stops firing when an empty cartridge case in the ejection opening blocks a live cartridge attempting to feed into the chamber. The empty cartridge case was not completely ejected during the rearward movement of the operating parts; consequently, it was wedged in the ejection opening as the operating parts came forward. This type of stoppage is caused by either insufficient gas or dirty operating parts. Insufficient gas is a result of

improperly alined gas ports or dirty gas ports. If the *operating parts* are dirty, the gas pressure may not be sufficient to overcome the resulting sluggish operation of the parts. In any case the operating parts do not move to the rear with sufficient force to eject the empty cartridge case from the receiver.

- (2) *Remedy.* Either correct the alinement of the gas ports, clean the gas ports, or clean the operating parts.



*Figure 116. Ruptured cartridge.*

*e. Ruptured Cartridge (fig. 116).*

- (1) *Description.* The weapon stops firing when a live cartridge is forced part way into the chamber but is blocked by a ruptured cartridge which is still in the chamber. The cartridge which is in the chamber was ruptured because

of a dirty chamber, faulty ammunition, or excessive head space. A stoppage resulting from excessive head space is very rare.

- (2) *Remedy.* Clean the chamber and check all ammunition carefully before firing. In very rare instances, the head space must be adjusted. You are not permitted to adjust for head space; if this correction is necessary, notify your commander.

*f. Sluggish Operation of the Parts.*

- (1) *Description.* The weapon fails to fire when the operating parts move forward. An unfired cartridge is ejected from the chamber with the application of the second phase of immediate action. The primer is found to be slightly dented. This stoppage is caused by dirty and sluggish operating parts. There is too much friction for the recoil spring to overcome as it drives the operating parts forward. The operating parts do not move forward with enough force or speed to fire the cartridge. A weak recoil spring can also produce the same stoppage. If the primer of the ejected cartridge has not been dented, you would know that the firing pin was broken.

- (2) *Remedy.* Clean and oil the operating parts. If this does not reduce the stop-

page, replace the recoil spring. If the firing pin is damaged, it must be replaced.

## Section VI. CARE AND CLEANING

### 61. GENERAL

This section tells you the proper steps for the care and cleaning necessary to keep your weapon in good condition. To insure proper condition and cleanliness, weapons in the hands of troops are inspected daily.

### 62. CLEANING AND PRESERVING MATERIALS

Only the materials discussed in this manual should be used to care for and clean your weapon. The use of unauthorized materials such as abrasives is prohibited. Abrasives include sand, sandpaper, and other similar materials.

*a. Cleaner, Rifle Bore* is used to clean the automatic rifle bore after firing. It has rust preventive properties and provides temporary protection against rust. You may put it in the bore immediately after firing and leave it there until you return to your barracks where you will clean your weapon. Rifle bore cleaner freezes at temperatures below minus 20° F. If thawed rifle bore cleaner is used, shake it well before using. If rifle bore cleaner is not available, use water. Warm water is good, but warm soapy water is better. It is used to clean only the bore and gas system.

b. *Oil, Preservative, Lubricating, (special)* is a thin oil used for lubricating at normal and low temperatures and for temporary protection against rusting. Use this oil for preserving the bore between times that the automatic rifle is fired. Apply it after the automatic rifle has been cleaned and make frequent inspections to be sure that there is always a good protective oil film. Special preservative lubricating oil fulfills all lubrication requirements for which the light grade oil has been prescribed. When present stocks of light preservative lubricating oil are exhausted, requisitions will be filled automatically with special preservative lubricating oil.

c. *Oil, Preservative, Lubricating, (medium)* is superior to special preservative lubricating oil for small arms exposed to salt water atmosphere. The oil is heavier and possesses better preservative characteristics for such conditions. It prevents rusting and forms a fairly heavy film of oil that resists the direct action of salt spray. It should be used in preference to special preservative lubricating oil for coating all parts of the weapons before landing operations.

d. *Oil, Engine, SAE 10* may be used when the oils mentioned above cannot be obtained. In cold weather any oil as heavy as this causes sluggish operation and may prevent the automatic rifle from working. This alternate oil does not possess the rust preventive properties of preservative lubricating oils. When engine oil is used, the weapons must be examined, cleaned, and re-oiled frequently.

e. *Compound, Rust Preventive, medium*, protects metal parts for long periods of time while automatic rifles are in storage. It should be warmed before application. When you have no way to heat it, brush it onto the parts when the temperature is above 80° F. At temperatures below 80° F, light rust preventive compound becomes thick and sluggish and it is not economical to use it without preheating.

f. *Solvent, Dry Cleaning*, is an inflammable fluid. Do not smoke where it is being used. It is used for removing grease, oil, or rust preventive compound. Metal surfaces are bathed in the solvent with rag swabs. After bathing, thoroughly wipe the solvent off all metal surfaces with clean rags. After cleaning with solvent, metal parts rust very quickly from finger marks. Wipe off all finger marks. Cleaning solvent also harms and discolors rubber.

g. *Oil, Linseed, Raw*, is applied to the wooden parts of the automatic rifle to preserve the wood and to keep out moisture.

h. *Oil, Neat's-Foot*, is used for cleaning and softening the leather sling. Use it sparingly, rub it in well, and wipe it off carefully to prevent soiling your clothes.

## 63. GENERAL INSTRUCTIONS FOR CARE AND CLEANING

a. Automatic rifles are disassembled only to the extent necessary for proper cleaning. When necessary, magazines are disassembled for cleaning and light lubrication. Magazines that are

handled carefully and kept clean will function properly.

b. Proper oiling is second in importance only to correct and frequent cleaning. The working parts must be oiled, but the oil should be used sparingly. A good way to apply the oil is to wipe the parts with a well oiled rag.

c. The buffer and rate reducing group and the trigger group are normally not disassembled each time the automatic rifle is cleaned. These two groups must be disassembled and cleaned after long periods of firing. Frequent cleaning of all parts is required if the weapon is fired in sandy terrain or near salt water.

#### **64. CARE AND CLEANING WHEN THE AUTOMATIC RIFLE IS NOT USED**

When no firing is being done, the automatic rifle and the magazines need only the care necessary to preserve their condition and appearance.

a. To clean the automatic rifle bore, attach a dry patch to the cleaning rod and pass it through the bore. Insert the cleaning rod through the muzzle end of the weapon. Repeat this procedure with dry patches. If the bore is unusually dry, use an oily patch to loosen the dry film. Do this until several patches come out clean. Then push an oily patch through the bore. (See paragraph 62 for proper lubricants.) This light coat of oil protects the bore. Brush all screw heads and crevices with a small cleaning brush or wood splinter. Wipe all metal surfaces with a dry cloth to remove moisture, perspiration, and dirt. Wipe

the outer surfaces of the automatic rifle, including the forearm, with a lightly oiled cloth. This protective film must be maintained on all metal parts at all times. At least once a month, rub a little linseed oil into the forearm with the palm of the hand. If the forearm ever becomes wet, dry it and rub in linseed oil as soon as possible. Rub the oil in until the forearm is dry. Use neat's foot oil moderately for cleaning and softening the leather sling.

b. It is important to give magazines the best of care and to keep them in perfect condition. Keep them free from dirt and rust and handle them carefully to avoid dents or abrasions. To clean the magazine, disassemble it, wipe it clean and dry, and place a thin coat of oil on the parts.

## 65. CARE AND CLEANING AFTER FIRING

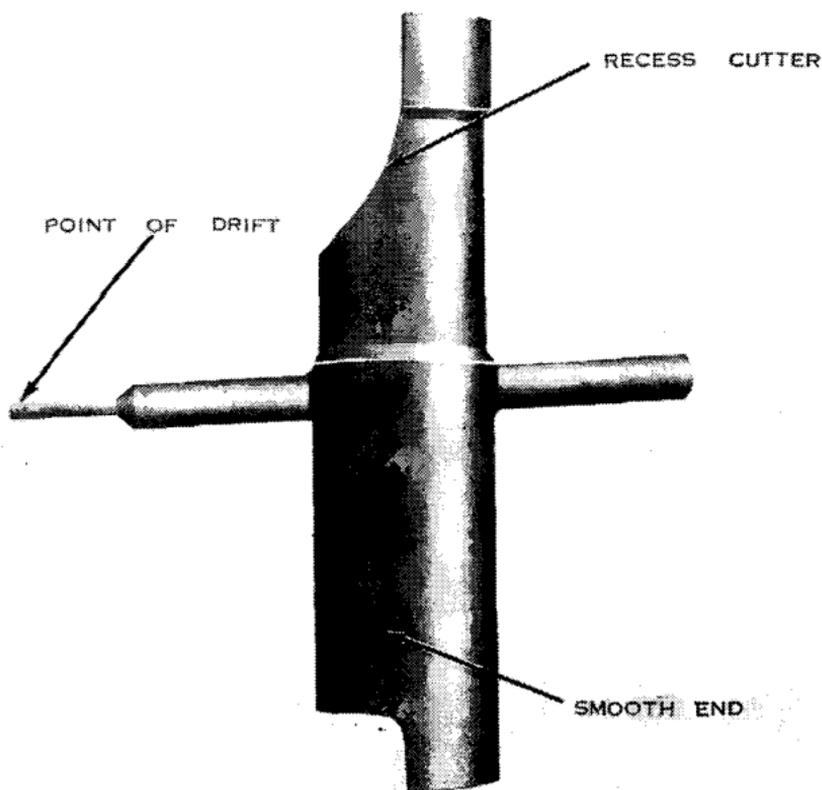
a. Thoroughly clean the bore of the automatic rifle by evening of the day on which it is fired. Repeat this cleaning for three successive days.

b. Clean the bore by swabbing it with a patch saturated with rifle bore cleaner. Repeat with several additional patches saturated with rifle bore cleaner. If rifle bore cleaner is not available, use warm, soapy water. While swabbing the bore with water, rest the automatic rifle on the toe of the butt with the muzzle elevated slightly. The water will drip out of the receiver and will not get into the buffer and rate reducing group and the locking recess. While the bore is still wet, run the metal brush through it several times. Remove the brush and swab the bore again with a patch

saturated with rifle bore cleaner or warm, soapy water. Follow this with dry, clean patches until several patches come out clean and dry. When the bore is clean and dry, push an oily patch through it to protect the surface of the bore.

c. Clean the chamber with the chamber cleaning brush. Wipe the chamber clean with a cloth and oil it lightly.

d. To clean the gas system, remove the gas cylinder assembly from the gas cylinder tube. Insert the smooth end of the body of the gas cylinder cleaning tool (fig. 117) into the gas cylinder



*Figure 117. Gas cylinder cleaning tool.*

assembly. Turn it to the right as you gradually scrape into the gas cylinder head. As it reaches the head, apply additional pressure to the tool. Give it a few turns to cut the carbon from the bottom, inside surface of the gas cylinder. Withdraw and reverse the tool. Using the recess cutter, remove the carbon from the recesses at the forward end of the interior of the gas cylinder assembly. With the point of the drift, clean the gas ports in the barrel, gas cylinder tube, and gas cylinder assembly. Scrape the carbon from the face of the gas piston with the front cutting edge. Remove the carbon deposit between the piston rings with the point of the drift. Wipe thoroughly with a rag saturated with rifle bore cleaner, if available. Otherwise, wash with warm, soapy water. If soap is not available, use plain water and dry thoroughly. Inspect for cleanliness. When the gas piston is clean and dry, oil it lightly. Clean the gas cylinder tube with rifle bore cleaner or warm soapy water. If soap is not available, use plain warm or cold water. The gas cylinder tube may be cleaned easily by tying a cloth lightly in the center part of a length of string. Pull the cloth back and forth inside the gas cylinder tube. Dry thoroughly and inspect. When clean, oil lightly.

*e.* Wipe the remaining parts of the operating group clean and dry. Apply a thin film of oil.

*f.* Wipe the trigger group dry and oil lightly. It is disassembled periodically, or when necessary, for cleaning.

*g.* Wipe the outer metal parts of the automatic rifle dry. Apply a thin film of oil.

*h.* Clean the stock and forearm of the automatic rifle. Wipe the sling with a clean, dry cloth.

*i.* Inspect the interior of the magazine assembly by depressing the follower with the thumb. If the interior is dirty, disassemble and clean and then lightly oil the magazine assembly. Otherwise, merely wipe the magazine assembly clean and dry and then oil it.

## **66. POINTS TO BE OBSERVED BEFORE, DURING, AND AFTER FIRING**

The points listed below are preventive steps to be observed before, during, and after firing. These steps will eliminate many conditions that may cause a stoppage.

| Item              | Before firing  | During (including temporary cessations) firing   | After firing (par. 65)         |
|-------------------|--|--|--------------------------------|
| Bore.....         | Remove oil.....  | Keep free from dirt, mud, water and snow; clean during pauses in firing.                                     | Clean and oil.                 |
| Chamber.....      | Clean thoroughly with chamber cleaning brush and patches.                    | Clean frequently. Use chamber cleaning brush during pauses while automatic rifle is hot. Keep free from oil. | Clean thoroughly; oil lightly. |
| Operating parts.. | Work slide back and forth to insure free movement. Oil lightly if necessary. | Oil periodically. Keep out dirt and dust..   | Clean and oil.                 |
| Gas system.....   | Verify proper setting of gas port.....                                       | Place 3 or 4 drops of oil in end of gas cylinder periodically during pauses.<br>.....                        | Clean and oil.                 |
| Trigger group...  | Test at safe, slow, and normal cyclic rate settings.                         | .....  | Clean and oil.                 |
| Magazines.....    | Clean, see that springs function properly and that notches are not worn.     | Handle carefully, keep out dirt and grit; avoid dropping in dirt or sand.                                    | Disassemble, clean and oil.    |

## 67. CARE AND CLEANING IN COLD CLIMATES

*a.* In temperatures below freezing, keep the moving parts of the automatic rifle absolutely free from moisture. In low temperatures excess oil on the working parts will thicken, causing sluggish operation or complete failure to function. Apply oil very sparingly. To do this, wet a cloth with special preservative lubricating oil, then wring it out and wipe all metal parts with the cloth.

*b.* Before using the automatic rifle in temperatures below  $+32^{\circ}\text{F}$ , disassemble it and completely clean the working parts with dry cleaning solvent or its equivalent. Lubricate the working surfaces of parts which show signs of wear by rubbing them with a cloth slightly dampened with special preservative lubricating oil. The cloth is prepared as described in *a* above. At temperatures above  $32^{\circ}\text{F}$ ., lightly oil all metal surfaces after cleaning the weapon. Use medium preservative lubricating oil.

*c.* When the automatic rifle is brought indoors, first allow it to warm to room temperature. Then disassemble it, wipe it completely dry of the moisture which will have condensed on the cold metal surfaces, and thoroughly oil it with special preservative lubricating oil. Do this every time a weapon is carried into a warm room after exposure to low temperature. If possible, avoid this condensation by providing a cold place in which to keep automatic rifles when not in use. A separate cold room with racks may be used. In the field, racks under proper cover may be set up.

d. If the automatic rifle has been fired, clean and oil it thoroughly. The bore may be swabbed out with an oily patch. When the weapon reaches room temperature, thoroughly clean and oil it as described in paragraph 65.

e. Before firing, clean the automatic rifle and remove the oil as described in *b* above. The bore and chamber should be entirely free of oil before firing. In cold climates, the medium gas port is usually the most satisfactory initial setting of the gas cylinder.

## 68. CARE AND CLEANING IN HOT CLIMATES

### a. *Tropical Climates.*

- (1) Use medium preservative lubricating oil for lubrication. If the automatic rifle is to be exposed to salt water atmosphere, use medium preservative lubricating oil.
- (2) In tropical climates where temperatures and humidity are high, or where salt air is present and also during rainy seasons in the less tropical climates, thoroughly inspect the automatic rifle daily. Keep it lightly oiled when not in use. Dismount the groups at regular intervals and, if necessary, disassemble them enough to dry and to oil the parts.
- (3) Keep unexposed parts and surfaces clean and oiled.
- (4) Inspect wooden parts to see that swelling due to moisture does not bind working parts. If this condition exists, shave

off only enough wood to relieve binding. A light coat of raw linseed oil applied at intervals and rubbed in well with the heel of the hand will help to keep moisture out. Allow the oil to soak in for a few hours and then wipe and polish the wood with a clean, dry rag.

*Note.* Care should be taken that linseed oil does not get into the mechanism or on metal parts. Linseed oil becomes gummy when dry.

*b. Hot, Dry Climates.*

- (1) In hot, dry climates where sand and dust are likely to get into the mechanism and bore, wipe the automatic rifle clean daily or more often if necessary. Dismount and disassemble the groups as far as necessary to give them a thorough cleaning.
- (2) When the automatic rifle is used under sandy conditions, wipe it completely dry of all lubricant. This will prevent sand from sticking to the lubricant. Sand and oil form an abrasive compound which is harmful to the mechanism. On leaving sandy terrain, wipe the automatic rifle clean at once and relubricate it with light preservative lubricating oil.
- (3) In hot, dry climates, the wood parts are likely to dry out and shrink. A light application of linseed oil will help to keep the wood in good condition. Apply it as directed in *a* (4) above.

- (4) Perspiration from the hands contains salt which will cause rust. All metal parts must be wiped dry frequently.
- (5) During sand or dust storms, keep the breech and muzzle covered when practicable.

## 69. CARE WHEN SUBJECT TO CHEMICAL ATTACK

*a.* It is important to prevent chemical agents from coming into contact with the automatic rifle, ammunition, spare parts, and accessories. If a chemical attack is anticipated, or chemical contaminations are encountered, oil all the spare parts, accessories, and the outer metal surfaces of the automatic rifle, but do not oil the ammunition. If the automatic rifle is not to be used, cover it, the spare parts, accessories, and ammunition with protective tarpaulins. The equipment may be dispersed under natural cover. Keep ammunition in its original containers as long as possible.

*b.* After a chemical attack, check all matériel to determine if it has been contaminated. Test for toxic gas vapors with a detector crayon and test for liquid toxic chemicals with detector paper. If not contaminated, clean the matériel with rifle bore cleaner. Prepare the automatic rifle and its equipment for use as required.

## 70. DECONTAMINATION

*a.* To decontaminate automatic rifles, their spare parts, and accessories, you must wear a complete set of protective clothing (permeable or

impermeable), impermeable gloves, and a service gas mask.

b. Matériel contaminated with chemicals other than the blister agents or G-series agents can be decontaminated by airing. For faster decontamination of these agents and to protect against corrosion, clean the automatic rifle and its equipment with rifle bore cleaner, denatured alcohol or soap and water.

c. To decontaminate matériel contaminated by blister agents—

- (1) Remove dirt, dust, grease, and oil.
- (2) Allow surfaces to air.
- (3) Decontaminate all metal surfaces except the bore with noncorrosive decontaminating agent (DANC). Hot soapy water or repeated applications with gasoline soaked swabs are also effective for this decontamination.
- (4) For emergency decontamination, use protective ointment M5, which is carried in the gas mask carrier.
- (5) Test the equipment with detector paper or the detector kit to see if decontamination is complete.
- (6) After decontamination and subsequent tests have been completed, clean, dry, oil, and prepare the automatic rifle and its equipment for use as required.
- (7) Bury all rags or wiping materials used during decontamination. If you cannot bury them, burn them. Be careful to protect yourself against vapors created by burning the cleaning materials.

d. Detailed information on decontamination is contained in FM 21-40 and TM 3-220.

e. In general, use the same methods outlined above to decontaminate automatic rifles and their equipment contaminated by biological or radiological attack. If contamination is too great, it may be necessary to discard the contaminated items.

## 71. STORAGE

a. *Preparation for Storage.* Prepare automatic rifles for storage with care. Thoroughly clean and then completely dry the bore, all parts of the mechanism, including the buffer and rate reducing group, and the exterior of the weapon. In damp climates, make sure that the rags used are dry. After a metal part has been dried, be careful not to touch it with bare hands. Take special care in cleaning the gas system to include the gas ports. Then coat all metal parts with either medium preservative lubricating oil or medium rust preventive compound. The type used depends on the length of storage. Before placing the automatic rifle in the packing chest, paint the wooden supports for the butt and muzzle with rust preventive compound. Never store an automatic rifle in a cloth or similar cover and never plug the bore. Such articles collect moisture that causes the automatic rifle to rust.

b. *Cleaning When Received From Long Term Storage.* Automatic rifles received from storage are coated with either preservative lubricating oil or with rust preventive compound. Weapons re-

ceived from ordnance storage usually have a coat of rust preventive compound. Use dry cleaning solvent or volatile mineral spirits paint thinner to remove all traces of the compound or oil. After using the cleaning solvent, make sure it is completely removed from all parts. Do this by wiping with a dry cloth. Take particular care to clean thoroughly the gas system, gas ports, firing pin, and all recesses in which springs or plungers operate. Failure to clean the gas system, the firing pin, and the recesses of the bolt in which the firing pin operates may result in a stoppage at normal temperatures, and, at low temperatures, is almost certain to cause a serious malfunction. Rust preventive compound and other foreign matter cause lubricating oil to congeal on the mechanism. This results in sluggish movement of the operating parts.

## Section VII. SPARE PARTS AND ACCESSORIES

### 72. SPARE PARTS

Certain parts of the automatic rifle, in time, become unserviceable through breakage or wear. For this reason spare parts are provided for those parts of the weapon that are most likely to fail. Keep your set of spare parts as complete as possible. Keep the parts clean and covered with a light coat of oil to prevent rust. When one of your spare parts must be used to replace a defective part in the automatic rifle, replace it as soon as possible. With the exception of replac-

ing the authorized spare parts, you are not permitted to make any repairs or alterations. (See Ord 7 SNL A-4 for spare parts allowance.)

### 73. EQUIPMENT

a. Organizational equipment includes the tools required for disassembling and assembling and for cleaning and preserving the automatic rifle. (See Ord 7 SNL A-4 for organizational equipment allowance.)

b. Those items of equipment having special features or having special uses are described as follows:

- (1) *Brush and thong, caliber .30, complete.*  
This consists of a brush, tip, weight, and thong. The weight and tip are made of brass. They are provided with holes in which the thong is knotted. The tip is provided with a cleaning patch slot. It is threaded on the end to receive the fiber bristle brush.
- (2) *Brush, cleaning, caliber .30, M2 (wire).*  
This brush consists of a brass wire core with brass bristles and tip. The core is twisted in a spiral and holds the bristles in place. This brush is distinguished from the one that is a part of the brush and thong by the type of bristles and the length of the threads on the tip. The cleaning brush is used with the cleaning rod. It is difficult to use this brush with the thong because of its stiff bristles.

- (3) *Brush, chamber, cleaning, caliber .30, M1 (bristle and wire).* The chamber cleaning brush consists of a curved flat steel handle with a chamber cleaning brush hinged at one end and a small dusting brush hinged at the other end.
- (4) *Bag, spare parts, M1918.* This is a canvas case  $9\frac{3}{4}$  inches long and  $5\frac{1}{4}$  inches wide. In combat, it should always be carried with the weapon. It is recommended that the following spare parts and small accessories be carried in the bag at all times:
- (a) Connector.
  - (b) Cylinder, gas, assembly.
  - (c) Extractor.
  - (d) Pin, firing.
  - (e) Pin, retaining, gas cylinder tube, assembly.
  - (f) Pin, retaining, trigger guard, assembly.
  - (g) Pin, trigger.
  - (h) Spring, change and stop lever, assembly.
  - (i) Spring, extractor.
  - (j) Spring, magazine catch.
  - (k) Spring, recoil.
  - (l) Spring, sear.
  - (m) Brush, cleaning chamber, M1.
  - (n) Brush, thong, complete.
  - (o) Envelope, fabric, 3 by 3 inches, one button.

- (p) Extractor, ruptured cartridge, MK II.
  - (q) Oiler, oval, 3-ounce with cap and chain (full of oil).
  - (r) Tool, combination.
  - (s) Cleaning tool, gas cylinder.
- (5) *Case, cleaning rod M1.* This fabric case has five pockets. Four of the pockets hold the sections of the cleaning rod M1. The fifth pocket holds the clean-brush, caliber .30, M2. The contents are secured in their pockets by a web flap and buckle.
- (6) *Rod, cleaning, jointed, M1.* This steel cleaning rod consists of three sections. A slot is provided on one section to attach the cleaning patch. On the same section a threaded hole is also provided for holding the cleaning brush. Another section is provided with a tubular steel handle which turns on the rod. This cleaning rod may be used to clean the automatic rifle in garrison or bivouac. The cleaning rod M1, or the brush and thong complete, are the most practical cleaning accessories in the field or in combat.
- (7) *Filler, magazine.* The magazine filler is an adapter which is fitted over the top of an empty magazine to facilitate filling it with ammunition. The filler is used when filling magazines with cartridges issued in five-round clips.

- (8) *Extractor, ruptured cartridge MK II.* The ruptured cartridge extractor has the general form of a caliber .30 cartridge. It consists of three parts—the spindle, head, and sleeve. To use the ruptured cartridge extractor, remove all live cartridges from the automatic rifle. Then insert the ruptured cartridge extractor into the chamber. Let the bolt move forward without shock so that the extractor of the rifle engages the ruptured cartridge extractor. Pull the operating handle back, and the ruptured cartridge extractor, holding the ruptured cartridge on its sleeve, will be extracted.
- (9) *Tool, combination.* This tool consists of a steel body with two wrenches and a screwdriver blade.
- (10) *Tool, cleaning, gas cylinder.* This is a special tool used in cleaning the gas system. For further discussion of this tool, see paragraph 65.
- (11) *Carrying handle.* This handle loosely encases the barrel at a point over the forward part of the forearm. The carrying handle rotates to clear the line of sight when the weapon is being fired. It is designed for ease in carrying the automatic rifle during marches, and at other times when the barrel is hot from continued firing. The carrying handle assembly consists of a handle grip, a carrying handle body (in two parts), and

three screws. To disassemble the carrying handle, remove the two body screws and the grip screw. Pull both left- and right-hand carrying handle bodies from the carrying handle grip assembly. To install the handle on the automatic rifle, encase the barrel of the weapon with the left- and right-hand carrying handle bodies so the lug located on the gas cylinder tube fits in the slotted section of the handle bodies. Slide the carrying handle grip assembly over the shanks of both left- and right-hand carrying handle bodies and fasten the three screws.

## Section VIII. AMMUNITION

### 74. GENERAL

Several types of ammunition may be fired in the automatic rifle. It is essential that you be able to identify each type and that you understand the use for which each type is intended.

a. In most types of small arms ammunition, a cartridge consists of a cartridge case, primer, propelling charge, and a bullet. Construction of a typical cartridge is illustrated in figure 118.

b. The term *bullet* refers only to a small arms projectile. The term *ball* was originally used to describe the actual ball shaped bullet of early small arms ammunition. The term *ball ammunition* now refers to a cartridge having a bullet which has a metallic jacket filled only with lead.

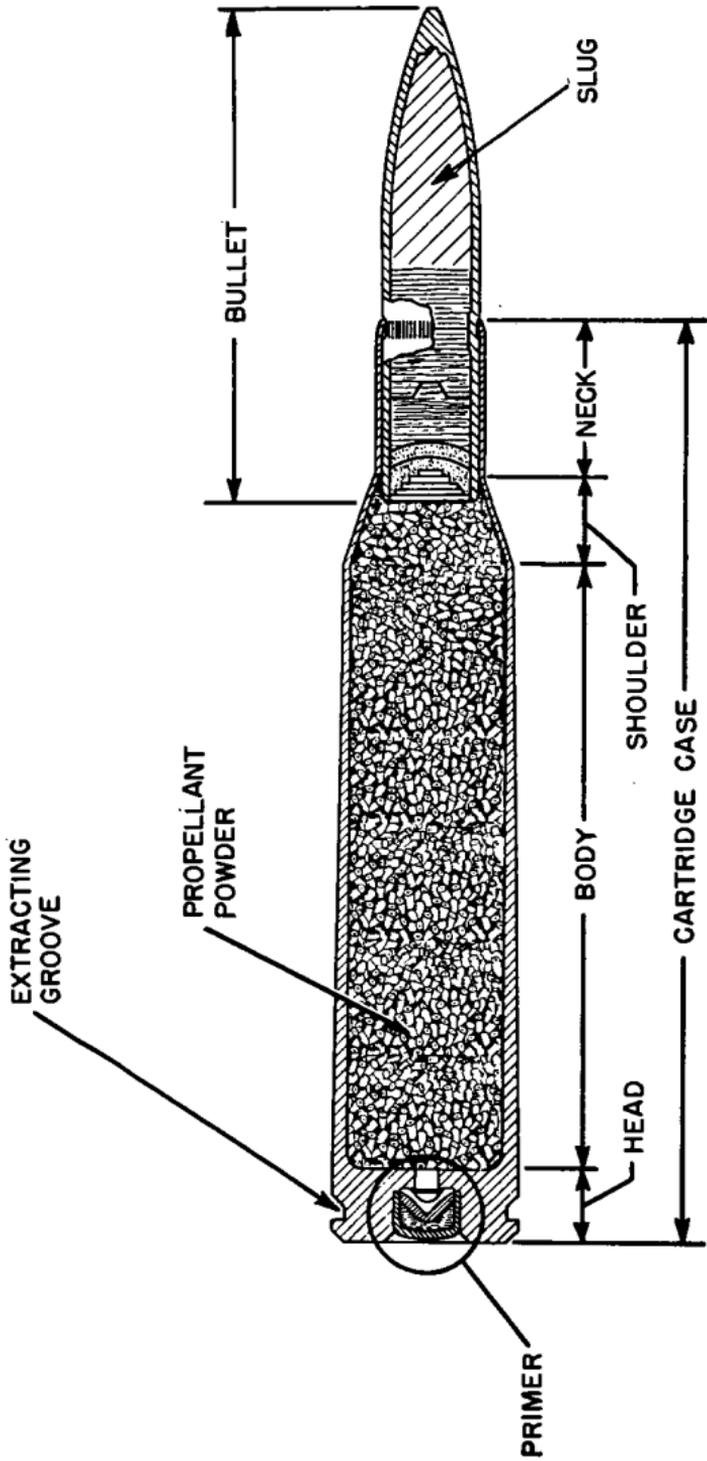


Figure 118. Parts of the cartridge.

c. The following types and models of caliber .30 cartridges are authorized for use in the automatic rifle:

Ball, M2

Tracer, M1

Armor piercing, M2

Incendiary, M1

Armor piercing incendiary, M14

Blank, M1909

Dummy

## 75. CLASSIFICATION

Based on use, the principal classifications of the several types of ammunition used with your automatic rifle are—

a. *Ball M2*—for use in marksmanship training and field firing problems.

b. *Tracer M1*—for designating targets and for incendiary and signaling purposes.

c. *Armor Piercing M2*—for use against lightly armored vehicles, protective shelters, and personnel.

d. *Incendiary M1*—for use against inflammable material.

e. *Armor Piercing Incendiary M14*—for use in place of either the armor piercing or incendiary cartridges.

f. *Blank M1909*—for simulated fire.

g. *Dummy*—for training.

## 76. LOT NUMBER

*a.* When ammunition is manufactured, it is given an ammunition lot number. This lot number is marked on all packing containers and placed on the identification card inclosed in the packing box. The lot number is used for all ammunition records and reports, including reports of ammunition malfunction or accidents.

*b.* It is impractical to mark the ammunition lot number on each individual cartridge. Therefore, every effort must be made to maintain the identity of the ammunition once the cartridges have been removed from their original container. Cartridges that have been removed from their original packing and for which the ammunition lot number has been lost are automatically placed in grade 3 and cannot be fired.

## 77. IDENTIFICATION

*a. Markings.* The contents of original boxes may be readily identified by the markings on the box. Similar markings on the label of the cardboard carton identify the contents of each carton. The markings appearing on the box and carton are complete information necessary for identification, shipping, care, handling, and use.

*b. Identification of Ammunition Types.* All types of caliber .30 automatic rifle ammunition are of the same shape and size. For easy recognition, all ammunition types, except ball ammunition, bear certain identifying marks. Ball am-

munition is identified by the fact that there are no marks of any sort on the bullets. Other types are identified as follows:

| <i>Cartridge Type</i>       | <i>Identification</i>  |
|-----------------------------|--|
| Tracer.....                 | Point of bullet is painted red.  |
| Incendiary.....             | Point of the bullet is painted light blue.   |
| Armor piercing.....         | Point of the bullet is painted black.  |
| Armor piercing incendiary.. | Point of the bullet is painted aluminum.   |
| Blank.....                  | The cartridge has no bullet and is sealed at the mouth with a paper cup, disk, or wad. The blank cartridge must not be confused with the rifle grenade cartridge. (The mouth of the grenade cartridge has a rose petal crimp.) |
| Dummy.....                  | Has holes in the case and an empty primer hole. The corrugated dummy round is standard. This round has six indentations on the side and a hole in the primer.  |

## 78. CARE, HANDLING, AND PRESERVATION

The following precautionary steps will assist you in handling ammunition:

*a.* Handle ammunition boxes carefully. Repair broken boxes immediately. Transfer all original markings to the new parts of the box. If serviceable, use ammunition from broken containers at the earliest opportunity; otherwise, return the broken case to ordnance for inspection and resealing.

*b.* Do not open ammunition boxes until the ammunition is to be used. Ammunition removed from the airtight container, particularly in damp climates, is likely to corrode and become unserviceable.

*c.* Be especially careful not to strike the primer. A sharp blow on the primer may explode the cartridge.

*d.* Protect ammunition from mud, sand, and water. If the ammunition gets wet or dirty, wipe it off at once with a clean, dry cloth. Light corrosion should be wiped off as soon as it is discovered. Heavily corroded cartridges must be turned in.

*e.* During training, do not fire any caliber .30 ammunition until it has been identified by an ammunition lot number and grade to determine if that particular lot and grade of ammunition is safe for firing.

*f.* Do not expose ammunition to the direct rays of the sun. If the powder is heated, excessive pressure may be developed when the weapon is fired. Do not store ammunition near radiators, hot water pipes, or other sources of heat. Heat not only deteriorates ammunition but also creates a fire hazard.

*g.* Do not oil or grease ammunition. Oil or grease collects dust, dirt, or other abrasives that are harmful.

*h.* Do not attempt to fire cartridges that are corroded or have bad dents, scratches, or loose bullets. If you think a cartridge is defective, turn it in. Do not attempt to destroy or throw away defective ammunition yourself.

## 79. STORAGE

Whenever practicable, store small arms ammunition under cover. If it is necessary to leave

this ammunition in the open, raise it at least six inches from the ground and cover it with a double thickness of tarpaulin. The tarpaulin should be in such a position as to offer maximum protection and yet allow free circulation of air. Dig trenches to prevent water from flowing under the ammunition pile.

## 80. BALLISTIC DATA

The approximate maximum range and average muzzle velocity of the different types of caliber .30 ammunition authorized for use in the automatic rifle are—

| <i>Cartridge</i>                    | <i>Maximum range<br/>(yards)</i> | <i>Average muzzle<br/>velocities<br/>(feet per second)</i> |
|-------------------------------------|----------------------------------|--|
| Ball, M2.....                       | 3,500                            | 2,800  |
| Tracer, M1.....                     | 3,350                            | 2,750  |
| Incendiary, M1.....                 | 2,875                            | 3,020  |
| Armor piercing, M2.....             | 3,160                            | 2,770  |
| Armor piercing incendiary, M14..... | 3,300                            | 2,830  |

## 81. PRECAUTIONS IN FIRING BLANK AMMUNITION

Never fire blank cartridges at men less than 20 yards away. Misfires in which the primer explodes but fails to ignite the powder charge may prove dangerous when blank ammunition is being fired. In this type of misfire, some of the unburned powder may be left in the bore of the weapon. A series of such rounds in which the powder fails to ignite (because of moisture or other causes) may result in serious damage when

the accumulated powder is ignited by a subsequent cartridge. When misfires in excess of 5 percent are encountered in blank ammunition, the lot is withdrawn and reported to the ordnance officer.

## 82. PRECAUTIONS IN FIRING SERVICE AMMUNITION

The general precautions concerning the firing and handling of ammunition in the field, as prescribed in SR 385-310-1 and TM 9-1900, are observed. Precautions that apply particularly to small arms ammunition are—

*a.* Do not fire any small arms ammunition (other than blank ammunition) until it has been positively identified by ammunition lot number and grade. Under no circumstances will small arms ammunition graded and marked "For training use only" be fired over the heads of troops.

*b.* Do not use armor piercing cartridges in demonstrations in which tanks are used. In using armor piercing ammunition, remember that the cores of bullets that fail to penetrate the target may rebound. The radius of rebound for caliber .30 armor piercing ammunition depends on several factors but may safely be assumed to be a maximum of 100 yards.

*c.* Before firing, make sure that the bore of your weapon is free from any foreign matter like cleaning patches, mud, sand, snow, and the like. A weapon fired with any obstruction in the bore may be damaged and may injure the automatic rifleman. If a bullet lodges in the bore of an automatic rifle, remove it by applying pressure

from the muzzle end of the weapon. To attempt to force the bullet out by firing another cartridge is dangerous and is prohibited.

### **83. HANGFIRES**

Sometimes a cartridge will not fire as soon as the primer is struck by the firing pin. This is known as a hangfire. When a hangfire occurs, do not use any more ammunition from that lot. Your commanding officer is required to report the lot number of the ammunition involved to the post ordnance officer.

## CHAPTER 3

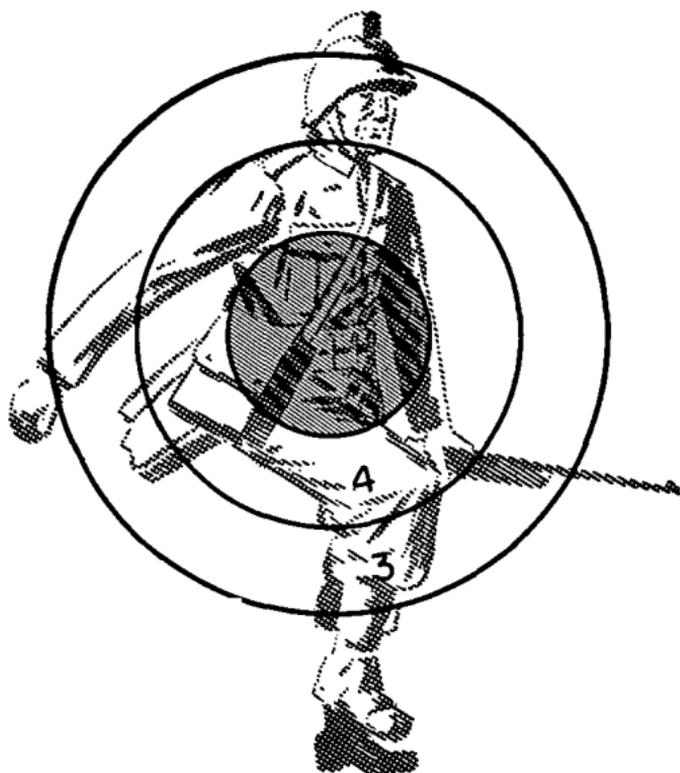
# MARKSMANSHIP TRAINING

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### Section I. GENERAL

#### 84. INTRODUCTION

The enemy trains and fights to kill (fig 119). The best way for you to meet his challenge is with deadly and accurate fire from the weapon in your hands. Today you may shoot at a bull's eye on



*Figure 119. Could you hit him?*

the known distance range. Tomorrow the target may be a fanatical aggressor attempting to kill you. Either you shoot him or he will shoot you. You must be prepared to fire quickly and accurately at ranges that will vary from a few feet to several hundred yards. Your automatic rifle forms the base of fire for the rifle squad. Let it do its job properly. The man who is calm, collected, and not excited or under tension is the best shot.

## 85. FUNDAMENTALS

*a.* Learning to shoot is interesting; it is also a challenge to your ability. Gain confidence in your weapon and you will gain confidence in yourself. You must accept the methods of becoming a good marksman as taught by those who have had years of experience. No special ability or aptitude is necessary to learn how to shoot well. Good shots are not born with the ability to shoot well. They become good shots only after they have been given the fundamentals and have worked hard learning them. The only requirement is the desire to learn and the drive to accomplish that desire.

*b.* Good shooting is nothing but the simple and complete mastery of five important principles. These principles are—

- (1) Correct aiming.
- (2) Correct position.
- (3) Correct sight setting and trigger manipulation.
- (4) Correct magazine changing.
- (5) Correct sight adjustments.

c. The five principles are listed in the order in which they are taught. Much stress is placed on that order. Just as you learned to crawl before you walked and walked before you ran, so must you learn the principles of marksmanship step by step. Each succeeding step depends on material covered in the preceding steps.

## 86. PHASES OF TRAINING

a. Marksmanship training is divided into a preparatory marksmanship training phase and a range firing phase.

b. Preparatory marksmanship is subdivided into separate instructional steps. Range firing includes all firing, whether on the 1,000-inch range, the larger known distance range, the transition range, or others. One very important thing to remember during *all* phases of marksmanship training is that training is progressive. Each phase involves material covered in earlier phases.

c. Several guides are observed while teaching marksmanship training. These guides are—

- (1) You must become skillful in mechanical training before you receive instruction in preparatory marksmanship training.
- (2) Before firing on the range, you must have a thorough course in preparatory marksmanship training. This applies to all individuals, regardless of their previous qualification.

## Section II. PREPARATORY MARKSMANSHIP TRAINING

### 87. PURPOSE OF PREPARATORY MARKSMANSHIP TRAINING

Preparatory marksmanship training teaches you good shooting habits and conditions you physically and mentally for accurate firing on the range. In combat, there are many factors that affect your shooting. Your target will be firing back at you just as intently as you are firing at it. The target probably will be hard to see. To hit it, you must estimate its range to know where to aim or how to set your sights. Sometimes your shots will be fired hastily. By learning and practicing good shooting habits until they become second nature, you will give yourself an advantage when it comes to the showdown.

### 88. STEPS IN TRAINING

*a.* Preparatory marksmanship training is divided into these six instructional steps—

- (1) Sighting and aiming exercises.
- (2) Position exercises.
- (3) Sight setting and trigger manipulation exercises.
- (4) Automatic fire exercises.
- (5) Sight changes, battle sight, effect of the wind, and score card.
- (6) Examination.

*b.* The material covered in each step is based on all that was learned in preceding steps. All

steps, except the fifth one, must be presented in the order listed above. The fifth step may be taught any time between the first step and the last one. It may be taught either indoors or outdoors and it is, therefore, an excellent subject for indoor training during bad weather.

## 89. DUTIES OF THE COACH

*a.* Throughout all of your preparatory marksmanship training you will be coached. If enough trained men are available, your coach will be an experienced noncommissioned officer. Otherwise, you and the other men in your group receiving the training will be divided into four-man instructional groups. In this group, each man will at different times be a firer and a coach.

*b.* When serving as a coach, you are expected to supervise your firer carefully, for his success depends largely on how well you do your job. Remember that a good coach requires his firer to be perfect. You can see the mistakes your firer is making better than he can, so do not be easy on him. The success of your squad or platoon may very well depend on how well you train him.

*c.* These are some of the duties of a coach. Make sure that the firer—

- (1) Blackens his sights.
- (2) Properly adjusts his gun sling.
- (3) Takes his position correctly.
- (4) Holds his breath while aiming and pressing the trigger.
- (5) Takes careful aim.
- (6) Takes up trigger slack promptly.

- (7) Presses the trigger properly.
- (8) Follows through and does not flinch.
- (9) Calls his shots.
- (10) Observes safety precautions.

## 90. SIGHTING AND AIMING EXERCISES

*a. General.* Sighting and aiming is taught in three exercises. Each of these three exercises prepares you for good shooting.

- (1) *First exercise*—Learning correct sight alinement and correct sight picture by using the sighting and aiming bar.
- (2) *Second exercise*—Learning correct sight alinement and correct sight picture by using the automatic rifle.
- (3) *Third exercise*—Checking your ability to make the correct sight alinement and correct sight picture by making and marking three sight pictures giving you a shot group.

*b. Equipment.* The following equipment is used by each instructional group (4 men) in sighting and aiming exercises:

- (1) Sighting bar.
- (2) Automatic rifle.
- (3) Automatic rifle rest (ammunition box).
- (4) Aiming box (ammunition box).
- (5) 3-inch diameter aiming disk.
- (6) Pencil and paper.

*Note.* For details on constructing the equipment listed in *b* (1) (5) above, see paragraphs 223-230.

## 91. CORRECT SIGHT ALINEMENT AND THE CORRECT SIGHT PICTURE

Before starting the exercises, you must know what is meant by the terms *correct sight alinement* and *correct sight picture*.

a. Sight alinement is the relationship of the front and rear sights. To obtain the correct sight alinement, the front and rear sights should be alined as shown in figure 120. An imaginary horizontal line passing through the center of the peep sight just touches the top of the front sight blade. An imaginary vertical line passing through the center of the peep sight divides the front sight blade in half.

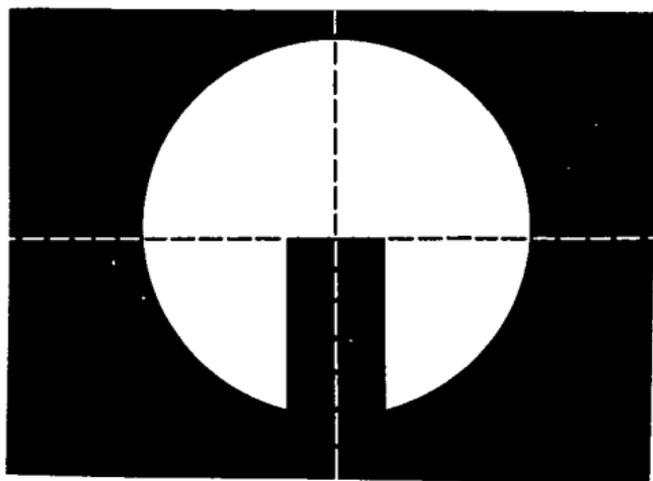
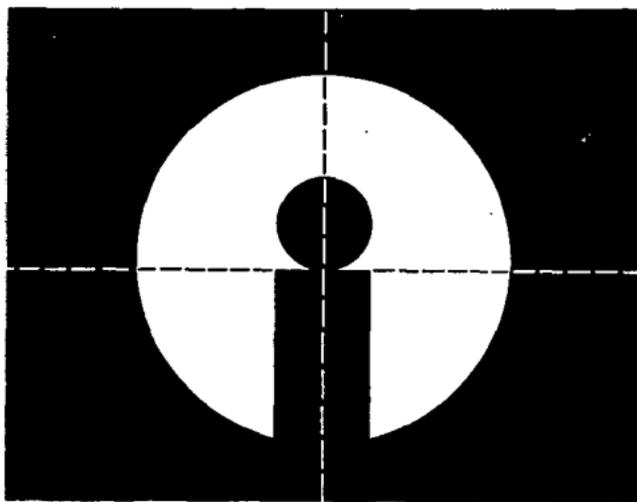


Figure 120. *Correct sight alinement.*

b. To obtain the correct sight picture, add the bull's eye to the correct sight alinement as shown in figure 121. The bull's eye rests (just touches) on top of and is centered on the front sight blade.

Although the correct sight alinement and the correct sight picture are both very important, the correct sight alinement is the more important of the two. This is true because, if at any range, your sight alinement is correct but you have an error in your sight picture, you will miss your bull's eye only by the extent of the error in your sight picture, (other things being correct—such as position and trigger manipulation.) You will not get a bad shot even with small errors in sight picture. No matter how perfect your sight picture may be, you will not get a good shot unless your sight alinement is correct. The effect of an error in sight alinement increases as the range to the target increases. You must strive for perfection in sight alinement each time you fire. Only when you are satisfied that your sight alinement is correct should you strive for perfection in sight picture.



*Figure 121. Correct sight picture.*



*Figure 122. Blackening the sights.*

## 92. BLACKENING THE SIGHTS

*a.* To see your automatic rifle sights and the bull's eye clearly, you must first clean and then blacken your sights. Remove all traces of oil and dirt. With dirty and improperly blackened sights, you are unable to take the correct sight alinement and the correct sight picture. Dirty

sights cause you to aim low, because the bull's eye rests on top of the dirt rather than squarely on top of the front sight. Clean and blackened sights stand out clearly and are easy to see. Sights that are clean but not blackened are shiny and difficult to see. Figure 122 shows an automatic rifleman blackening his front and rear sights with a carbide lamp. Hold the point of the flame for a few seconds against the front and rear sights and against the barrel near the front sight. Place a uniform coating of blacking on the metal.

b. The best way to blacken the sights is to use a carbide lamp. If this lamp is not available, you can use a kerosene lamp, candle, small pine stick, smudge pot, or even matches.

c. An effective sight blacking preparation may be mixed by adding powdered lamp black to diluted white shellac. The quantity of lamp black used is small in proportion to the total quantity of shellac and is best determined by experiment. This black shellac is applied to the sights with a small varnish brush. The preparation dries rapidly.

### 93. FIRST SIGHTING AND AIMING EXERCISE

a. *The Sighting and Aiming Bar.* The sighting and aiming bar is used in this exercise. The front and rear sights on the sighting and aiming bar represent the front sight post and the rear peep sight of your automatic rifle. The rear sight on the sighting bar is movable. This allows you to make various adjustments in sight alinement. There is no part on the automatic

rifle that corresponds to the eyepiece on the sighting and aiming bar. The eyepiece represents the position of your eye as you adjust the sights, and anyone who looks through the eyepiece sees the same sight alinement and sight picture that you see. The sighting and aiming bar is valuable in that its large size magnifies any errors in your sight alinement and sight picture.

*b. Setting Up the Correct Sight Alinement.*

In the first sighting and aiming exercise, you learn and practice correct sight alinement and correct sight picture. Using the sighting and aiming bar, the coach sets up the correct sight alinement and hands the bar to the members of his group for examination. The coach points out the correct position of the front sight within the rear peep sight. Then each group member demonstrates his ability to set up the correct sight alinement on the sighting and aiming bar. The coach closely checks each setting made and requires the pupil to correct any errors discovered. As soon as all members of the group have demonstrated their ability to make the correct sight alinement, the coach sets up slight errors in sight alinement on the sighting and aiming bar. Then each member of the group locates and corrects the errors in sight alinement. The coach checks to see that everyone has made the necessary corrections.

*c. Setting Up the Correct Sight Picture.*

When all members of the group are thoroughly familiar with the correct sight alinement, the correct sight picture is studied. The coach sets

up the correct sight picture on the sighting and aiming bar and passes it to each member of the group for examination. Then each group member sets up the correct sight picture on the sighting and aiming bar (fig. 123). The coach critiques each sight setting. The coach then sets up slight errors in the sight picture. Each member of your group in turn locates the error, tells the coach what is wrong with the sight picture, and then corrects the existing errors. The coach checks to make sure that your changes are correct.

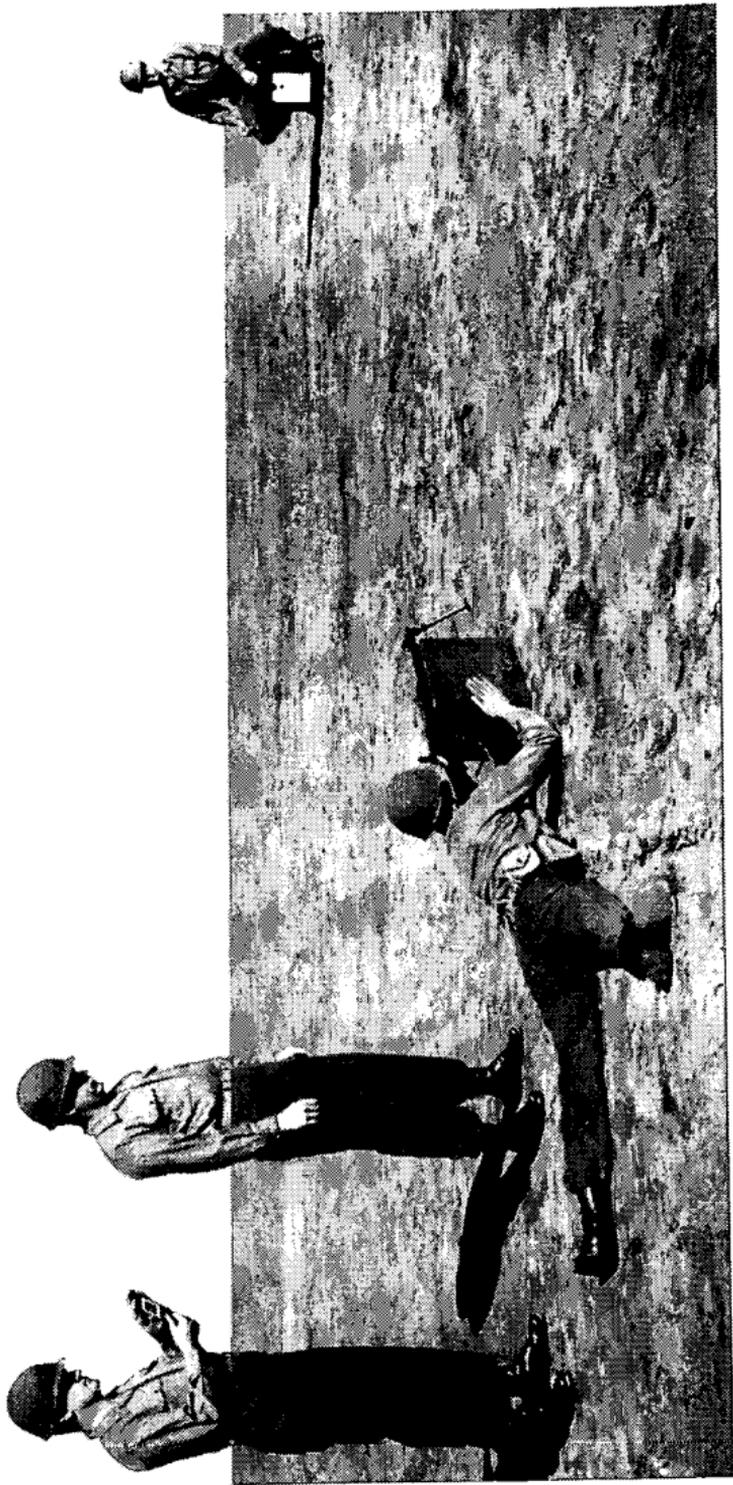


*Figure 123. Coach and pupil, first sighting and aiming exercise.*

## 94. SECOND AND THIRD SIGHTING AND AIMING EXERCISE

*a. General.* In figure 124 you see the layout for the second and third sighting and aiming exercise. The automatic rifle, automatic rifle rest, aiming box, 3-inch aiming disk, pencil, and a blank sheet of paper are used in conducting these exercises for each group. The aiming box is located 50 feet from the position of the automatic rifle. One member of your group is stationed at the aiming box as a marker. The front and rear sights and barrel of the weapon are blackened. The rear sight is set at 200 yards elevation. The automatic rifle is placed in the slots cut into the rifle rest. The weapon may be wedged in by using the sling. As you take your position, be careful not to move the automatic rifle or the automatic rifle rest. This position is similar to the prone position used in firing. Your body is directly to the rear of the weapon. Your legs are spread a comfortable distance apart and, if possible, the heels should rest on the ground. Both elbows are on the ground. Your chin rests in the palm of the left hand. The right hand is free for signaling to the marker to move the spotter up or down and to the right or left. The right cheek rests lightly against the automatic rifle stock at a point where the eye is approximately the same distance from the peep sight as it is in actual firing. Hold your breath while checking the sight alinement and sight picture.

*b. How to Conduct the Second Sighting and aiming exercise.* The second sighting and aiming



*Figure 124. Second and third sighting and aiming exercises.*

exercise starts with your coach setting up the correct sight picture. He assumes the correct position and, using his right hand, signals the marker (one member of the instructional group) to move the spotter up or down and to the right or left until the correct sight picture is obtained. The coach then commands HOLD to the marker and rises to his feet. He directs each member of his group to assume the correct position and to examine the sight picture. Next, each of you, in turn, demonstrates your ability to set up the correct sight picture. The coach checks the sight pictures. If there are any errors, he has them corrected. The marker offsets the spotter as soon as each of you completes the exercise. In the final phase of the second sighting and aiming exercise, the coach sets up a slight error in the sight pictures. You are required to locate and correct the error. The coach checks to make sure that your changes are correct.

## 95. THIRD SIGHTING AND AIMING EXERCISE

*a. General.* The third sighting and aiming exercise is similar to the second exercise with the exception that three sight pictures are plotted by each group member. The purpose of this exercise is to test your ability in setting-up the correct sight picture as well as to continue your instruction on sighting and aiming.

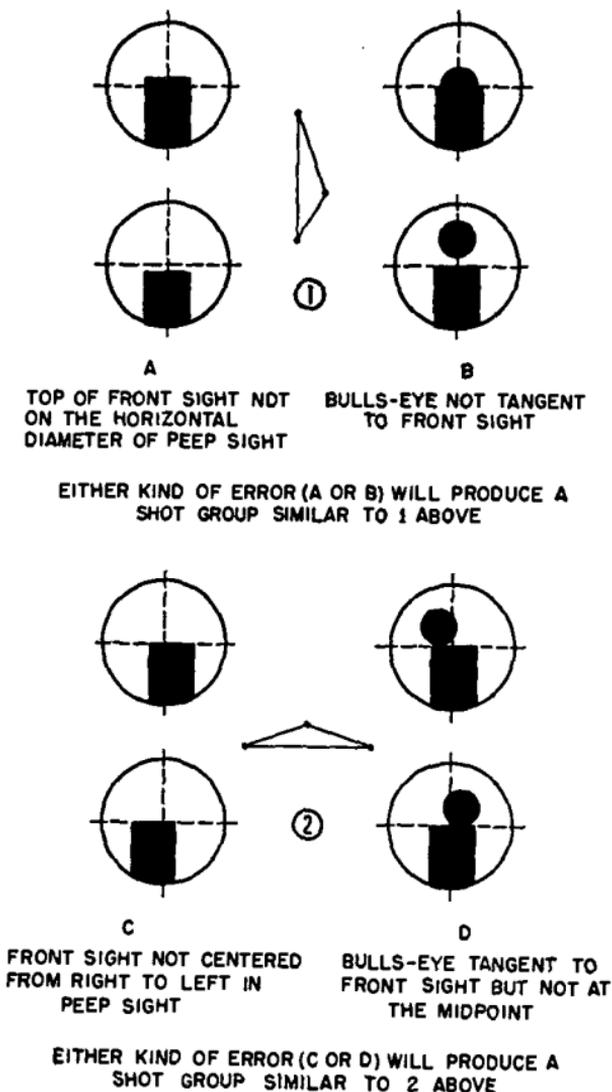
*b. How to Conduct the Third Sighting and Aiming Exercise.* Assume your position behind the weapon and direct the marker to move the spotter to set up the correct sight picture as you

did during the second exercise. Now, command HOLD and rise. Your coach assumes his position behind the weapon, checks the sight picture, and makes a *mental* note of any error which exists. He does not comment on any error or require any corrections to be made at this time. The coach calls MARK. The marker then places a dot on the paper by inserting the point of a pencil through the hole in the center of the aiming disk. He then removes the disk and places a small number 1 above the dot to indicate the first sight picture. The exercise is repeated until three sight pictures have been plotted and numbered. The marker then connects the three dots with straight lines to mark the shot group and writes the group member's name under the shot group. The entire group then moves to the aiming box where the coach critiques the group member's performance. He comments on the size and shape of the shot group and, at this time, discusses the errors that he detected when he checked the sight pictures. A satisfactory shot group made from fifty feet is one that can be covered with the eraser end of a pencil. Each member of the group repeats the exercise until he becomes skilled.

*c. Errors Causing Unsatisfactory Shot Groups.* You will notice that unsatisfactory shot groups are either too wide or too high (fig. 125).

- (1) High and narrow shot groups are caused by inaccurate vertical alinement of the sights or by placing the bull's eye above or below the top of the front sight (fig. 125①).

- (2) Flat and wide shot groups are caused by inaccurate horizontal alinement of the sights with each other or of the sights with the bull's eye (fig. 125②).



*Figure 125. Errors causing unsatisfactory shot groups.*

- (3) A shot group both high and wide is caused by a combination of the errors listed above.

## 96. POSITION EXERCISES

*a. General.* Position exercises are the most important phase of automatic rifle preparatory marksmanship training. After the first shot of a burst, you are unable to keep the correct sight alinement and sight picture. Therefore, so that you can continue hitting your target with all the shots in a burst, you must be in a proper firing position. The automatic rifle is fired from the prone, kneeling, sitting, aerial target, and crouch positions. As the prone position is the most stable position, use it whenever possible. You must be taught the use of the gun sling, the hinged butt plate, proper breathing, and the adjustment of the bipod legs before you practice the different positions.

*b. Equipment.* For position exercises it is desirable that one automatic rifle be available for every two men and one aiming stake for every 12 men.

## 97. USE OF THE SLING

You use the gun sling in the sitting, kneeling, and crouch positions to help you support the automatic rifle. Do not use it in the prone and aerial target positions. Adjust the sling to give you firm support without discomfort. The three authorized sling adjustments are the loop sling, the hasty sling, and a special adjustment for the

crouch position. The hasty sling can be adjusted more quickly than the loop sling, but it does not give as much support. The loop and hasty sling adjustments for the modified leather sling and the loop and hasty sling adjustments for the web sling are different. The special adjustment of the leather sling for the crouch position is covered in paragraph 114. The web sling is considerably shorter than the leather sling. Therefore, when the automatic rifle is equipped with the web sling, the weapon is carried higher in the crouch position, than shown in figure 141. Some men may have difficulty in assuming the crouch position using the web sling and may find it advantageous to fire the automatic rifle from this position without using the sling.

## **98. LOOP SLING ADJUSTMENT WITH MODIFIED LEATHER SLING**

To make the loop sling adjustment with the modified leather sling—

*a.* Place the butt of the automatic rifle on your right thigh and cradle the weapon against the inside of your right forearm, sights to the right. Both of your hands are now free to adjust the sling. Loosen the lower loop by unhooking the lower hook and rehooking it near the lower sling swivel. This increases the length of the sling so that it does not interfere while you are assuming the fire position (fig. 126Ⓞ).

*b.* Disengage the feed end hook and allow this portion of the sling to hang free. Unhook the



①

*Figure 126. Leather loop sling adjustment.*

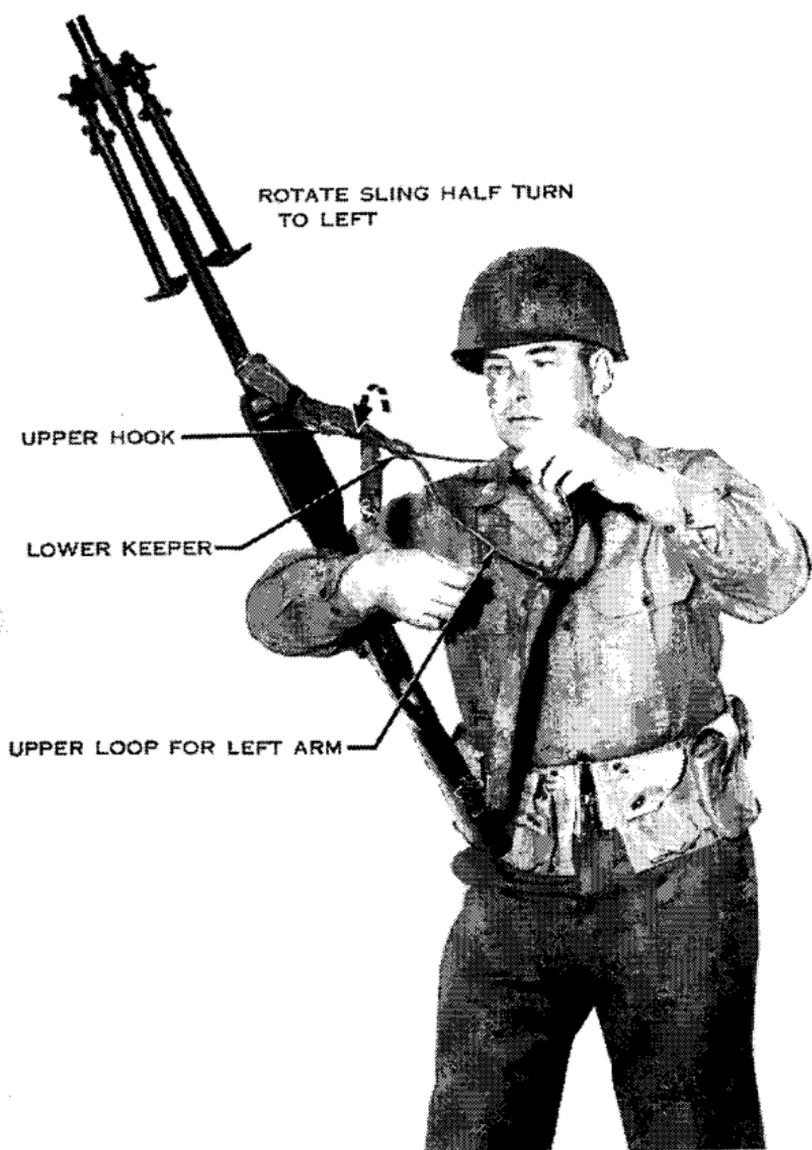
upper hook from the pair of holes nearest the feed end hook and rehook it in a pair of holes nearer the upper sling swivel. For the average person, engage the upper hook in the sixth pair of holes from the feed end hook. This adjustment varies with the conformation of your body and, to some extent, with the age of the sling (fig. 126②).



②

*Figure 126—Continued.*

c. Move the lower keeper toward the upper hook. This forms a loop for your left arm. Give the sling a half turn to the left (fig. 126③).



③

*Figure 126—Continued.*

*d.* Insert your left arm through the upper loop (fig. 126④). Work your left arm through the sling so that the upper loop is high on your arm and near your shoulder.

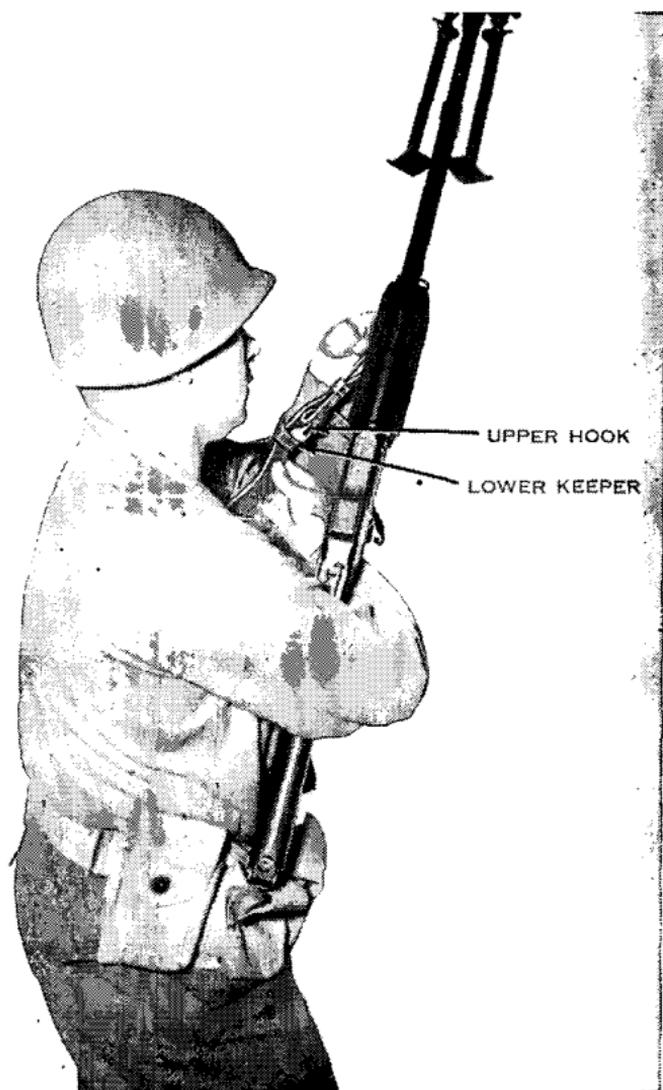


Figure 126—Continued.

e. To tighten the upper loop on your arm, grasp the sling near your upper arm with the right thumb and forefinger. With your left thumb and forefinger grasp the sling near the upper sling swivel. Rotate the sling until the lower

keeper and upper hook are firmly against your upper arm (fig. 126⑤).

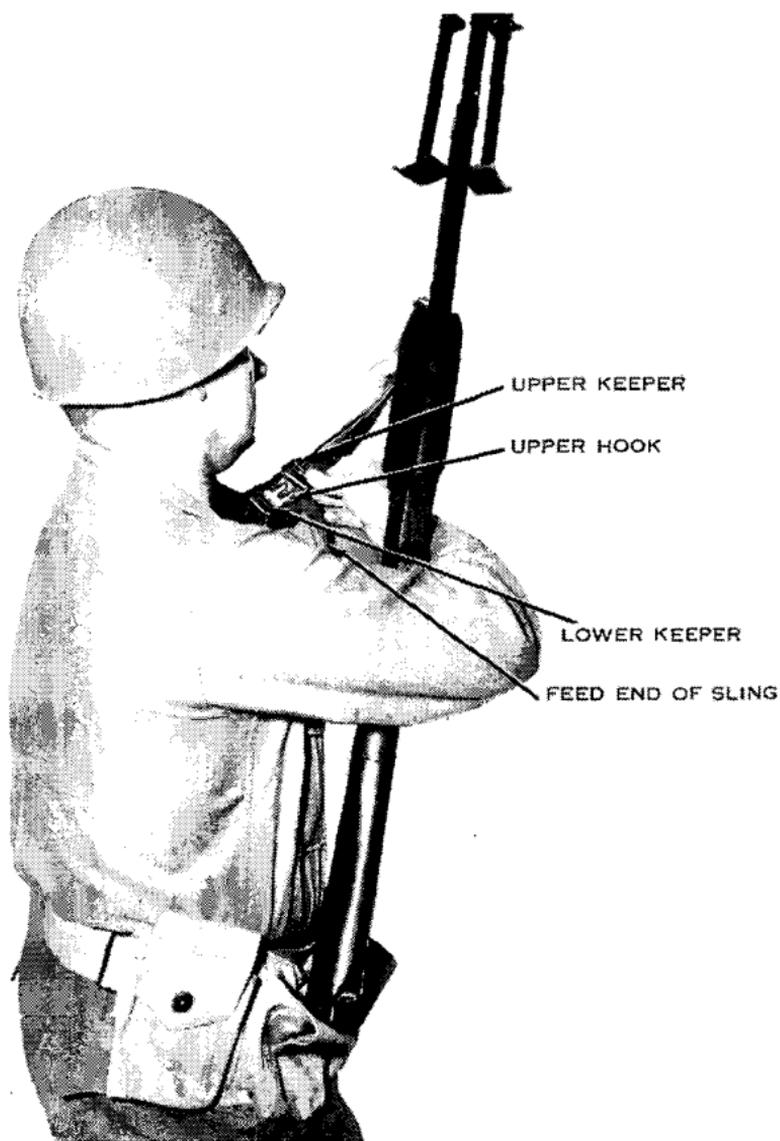
f. Allow the feed end of the sling to hang free at the bottom between the two keepers. Pull the upper keeper down firmly against the upper hook. When the sling is adjusted properly, there will be



⑤

*Figure 126—Continued.*

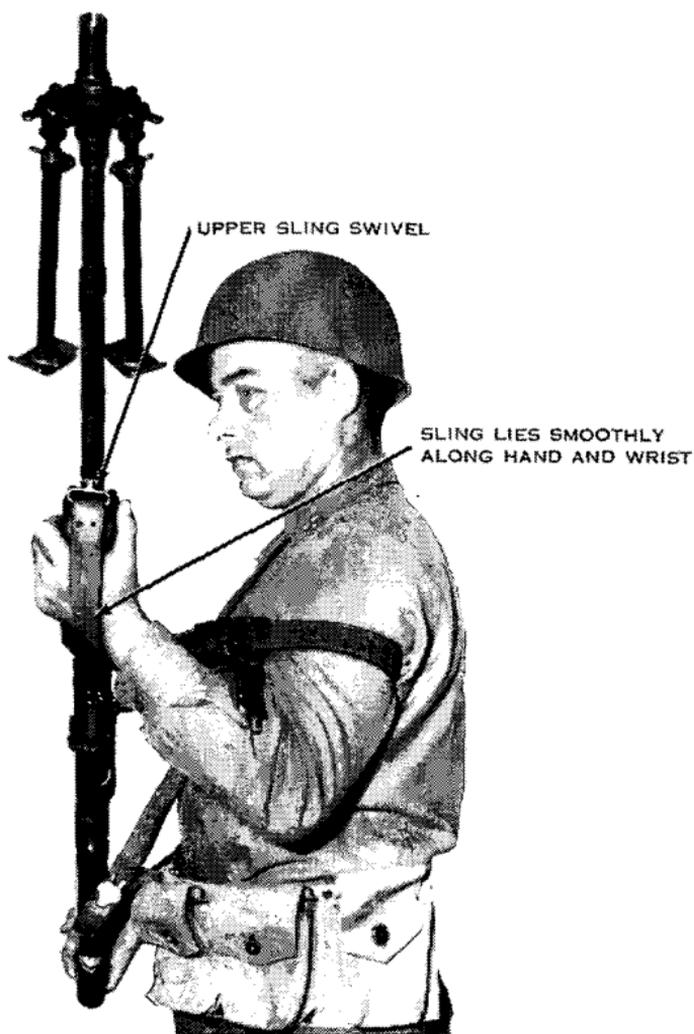
a keeper, hook, and keeper in that order next to your upper arm. The hook is always visible from your right. Move the D ring to the inside of your left arm so that it does not cut off circulation (fig. 126©).



©

*Figure 126—Continued.*

g. Move your left hand over the top of the sling and grasp the wooden forearm. Your left hand should be near the upper sling swivel. The sling should lie smoothly along your left hand and wrist (fig. 126Ⓞ).



Ⓞ

*Figure 126—Continued.*

## 99. LOOP SLING ADJUSTMENT WITH THE WEB SLING

To make the loop sling adjustment with the web sling—

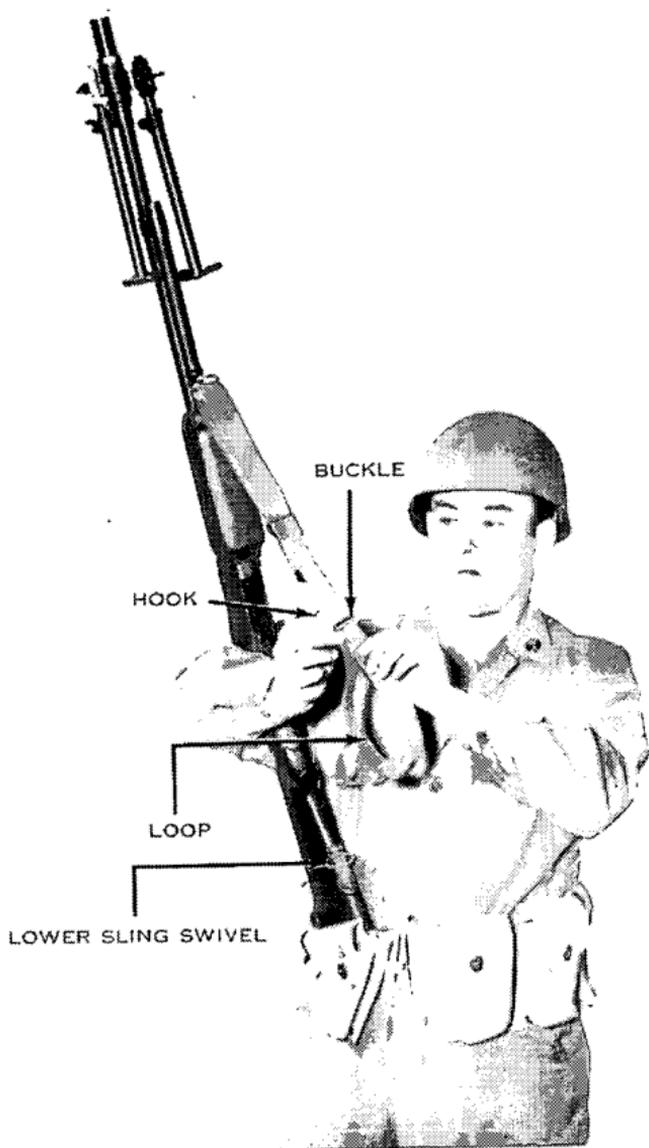
*a.* Place the butt of the automatic rifle on your right thigh and cradle the weapon against the inside of your right forearm, sights to the right. Both of your hands are now free to adjust the sling. Unsnap the hook from the lower sling swivel. The loop to be used is formed by pulling the strap through the two slots of the buckle until it is large enough for your left arm. To do this, proceed as shown in figure 127①. Hold the buckle in your right hand and with your left hand grasp the sling between the buckle. Pull the sling out until a loop of the desired size is formed.

*b.* Hold the loop in your left hand and give the sling a half turn to the left.

*c.* Holding the buckle in your right hand, pass your left hand through the loop. The loop must be high and tight on your left arm. To tighten the loop on your arm, hold the automatic rifle with the right hand and move the left arm away from the weapon (fig. 127②).

*d.* With your left hand grasp the feed end of the sling and open the keeper. Pull the feed end of the sling toward the butt of the weapon until the proper sling adjustment is obtained (fig. 127③).

*e.* Move the keeper toward the butt of the automatic rifle until the keeper is out of the way of your left hand. Close the keeper. Pass the



①

*Figure 127. Web loop sling adjustment.*

left hand over the sling and grasp the wooden forearm near the upper sling swivel. The sling should lie smoothly along your left hand and wrist as shown in figure 126⑦ with the leather sling.



⑧

*Figure 127—Continued.*



③

*Figure 127—Continued.*

## 100. HASTY SLING ADJUSTMENT WITH MODIFIED LEATHER SLING

To make the hasty sling adjustment with the modified leather sling—

*a.* Place the butt of the automatic rifle on your right thigh and cradle the weapon against the

inside of your right forearm, sights to the right. Both of your hands are now free to adjust the sling. Loosen the lower loop until it is adjusted to a convenient length by unhooking the lower hook and rehooking it in a pair of holes nearer the lower sling swivel. For the average man the



①

*Figure 128. Leather hasty sling adjustment.*

sling, when pulled down, should extend to the toe of the butt.

b. Rotate the sling one-half turn to the left (fig. 128①).



SLING HIGH ON ARM

②

*Figure 128—Continued.*

c. Insert your left arm between the sling and the weapon, with the sling high up on your left arm (fig. 128©). It may be necessary to grasp the automatic rifle at the small of the stock while you do this.



©

*Figure 128—Continued.*

*d.* Pass your left hand under and then over the sling. Grasp the weapon at the wooden forearm near the upper sling swivel. The sling should lie smoothly along your left hand and wrist (fig. 128③).

## 101. HASTY SLING ADJUSTMENT WITH THE WEB SLING

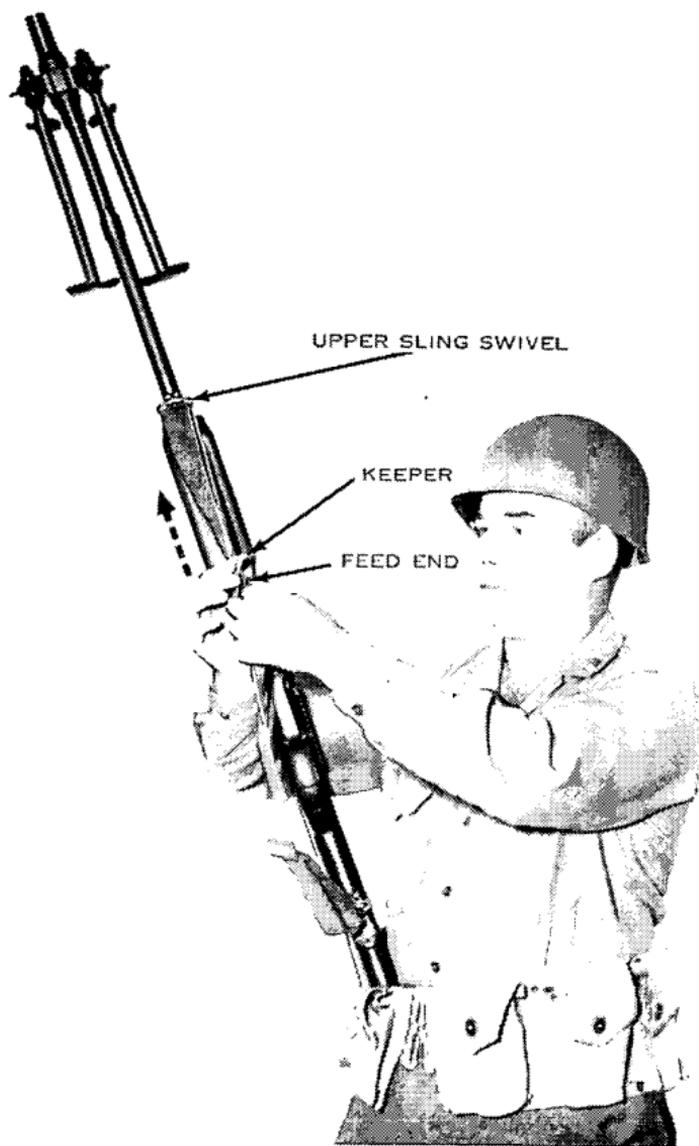
To make the hasty sling adjustment with the web sling—

*a.* Place the butt of the automatic rifle on your right thigh and cradle the weapon against the inside of the right forearm, sights to the right. Both of your hands are now free to adjust the sling. Open the keeper and move the keeper and feed end of the sling toward the upper sling swivel until sufficient slack is obtained in the sling for the hasty sling adjustment (fig. 129①). Close the keeper.

*b.* With your left hand give the sling a half turn to the left (fig. 129②).

*c.* Insert your left arm between the sling and the weapon with the sling high up on your left arm (fig. 129③). It may be necessary to grasp the automatic rifle at the small of the stock while you do this.

*d.* Pass your left hand under and then over the sling. Grasp the weapon at the wooden forearm near the upper sling swivel. The sling should lie smoothly along your left hand and wrist (fig. 129④).



*Figure 129. Web hasty sling adjustment.*



②

*Figure 129—Continued.*



⑤

*Figure 129—Continued.*



④

*Figure 129—Continued.*

## 102. HINGED BUTT PLATE

The hinged butt plate is always used in the prone position. It should also be used in the sitting and kneeling positions as it provides additional support. The hinged butt plate is placed on your shoulder and as near as possible to the junction of your neck and shoulder.

## 103. BIPOD ADJUSTMENTS

*a.* Use the bipod only when firing from the prone position. During preparatory marksmanship training, your coach adjusts the bipod legs to fit your size and position. To adjust the bipod—

- (1) Lock the bipod legs into the bipod body, square shoulder to square shoulder, by tightening the upper bipod thumb screws. When the bipod legs are not adjusted square shoulder to square shoulder, the bipod group will collapse.
- (2) Raise or lower the bipod legs so that the weapon points at the target. Tighten the lower bipod thumb screws to prevent the legs from shortening. Because the bipod is attached to the barrel with a swivel, it is not necessary normally to compensate for ground slope by making one leg longer than the other.

*b.* Before assuming the kneeling, sitting or aerial target positions, lock the bipod legs back against the barrel, square shoulder to square

shoulder. This prevents the bipod group from swinging back and forth and interfering with your aim while you fire.

## 104. BREATHING

Holding your breath while aiming and pressing off each shot is very important. You hold your breath to keep your weapon steady. The correct method for holding your breath is to take an ordinary breath, let out a little, and hold the rest by closing the throat. When sighting, do not hold your breath so long that you become unsteady.

## 105. PROCEDURE FOR CONDUCTING POSITION EXERCISES

After explaining and demonstrating sling adjustments, breathing, and the firing positions, the instructor divides your group into pairs. One member of the pair acts as a coach, the other performs the exercise. These positions are alternated. Small bull's eyes painted at different heights on aiming stakes are used as aiming points.

## 106. PRONE POSITION

a. Before assuming the prone position, make the following checks:

- (1) *The sling.* Make sure that it is loose and out of the way of the magazine feed way. (The sling is not used in the prone position.)

- (2) *The gas cylinder assembly.* It should be adjusted initially on the small gas port, and the gas cylinder lock should be pushed in. Learn here not to touch the barrel. It becomes very hot during firing.
- (3) *The bipod legs.* They should be locked into the bipod body, square shoulder to square shoulder. During preparatory marksmanship training and the first part of range practice, the coach adjusts the bipod legs for the automatic rifleman.
- (4) *The flash hider.* It should be tight. A loose flash hider causes a scattered shot group.

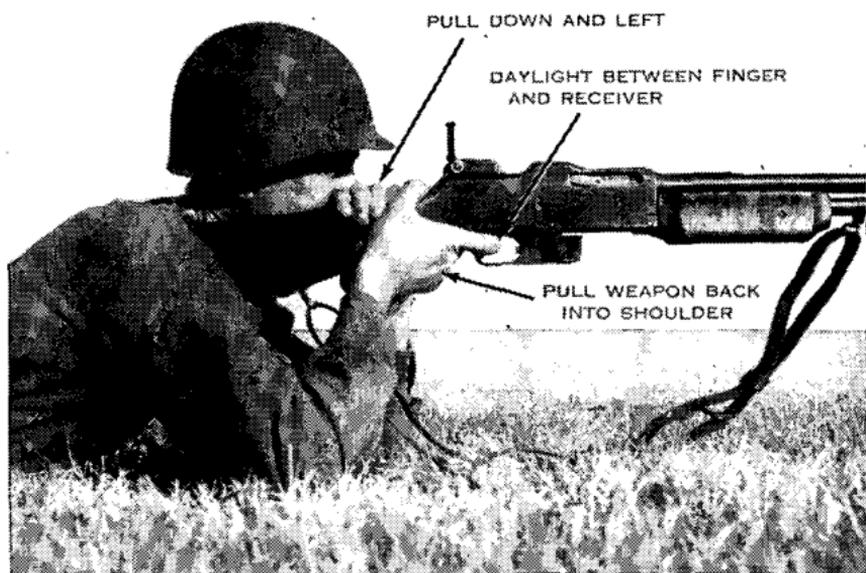
b. To assume the prone position, place the automatic rifle on the ground with the sights up and the muzzle pointing to your front. Aline your body directly to the rear of the weapon by standing at the butt end of your automatic rifle and facing down range. Take two steps directly to the rear. Sink down to your knees and into the prone position. Raise the hinged butt plate and place the butt end of the weapon to your shoulder (fig. 130). Spread your legs a comfortable distance apart keeping the heels down if possible. Raise the rear sight leaf.

c. Take the proper grip. Your right hand is in front of your left hand (fig. 131). In this position, place your right thumb over the small of the stock. Your right forefinger—any part of the finger from the tip to the second joint—is placed

PLACE BUTT OF WEAPON  
TO SHOULDER. USE  
HINGED BUTT PLATE



*Figure 130. Placing the weapon on the shoulder.*

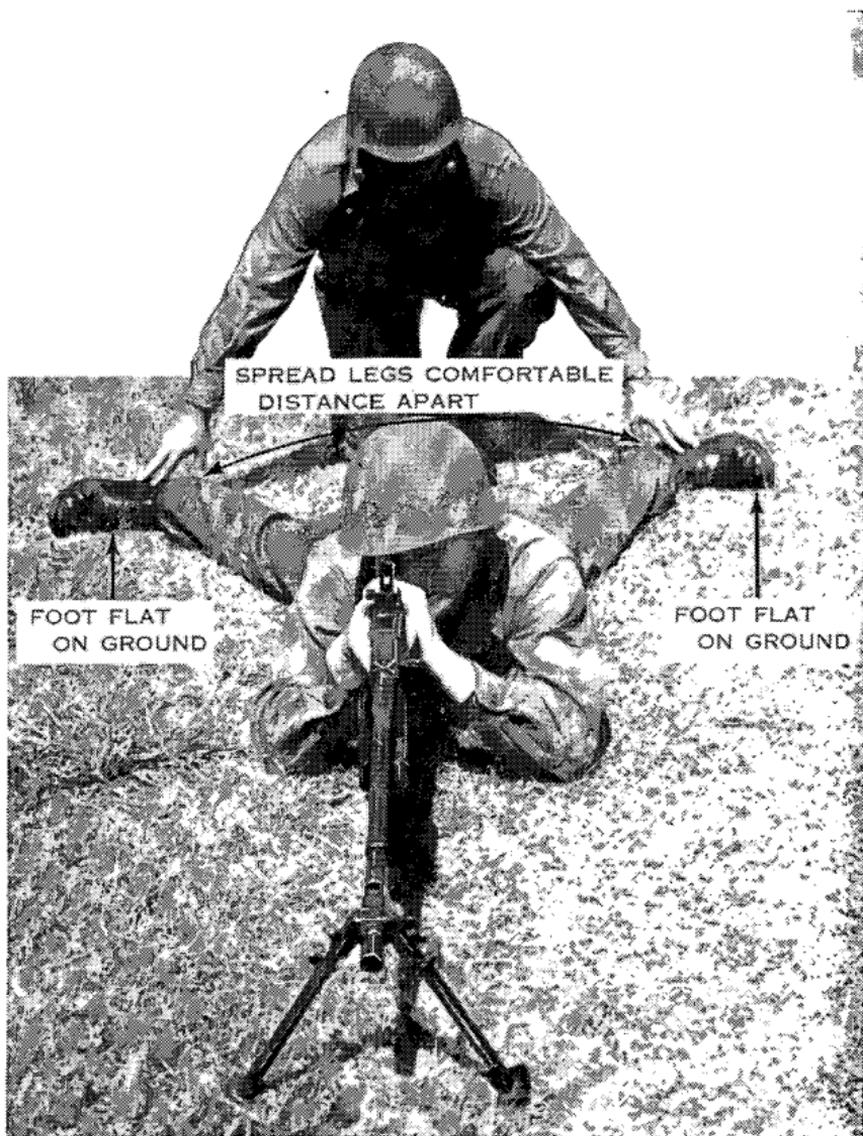


*Figure 131. The grip.*

on the trigger. The trigger finger should not touch the receiver. The remaining three fingers of your right hand are curled under the stock. With your right hand, pull the weapon back into the shoulder. Grasp the weapon with your left hand, the thumb under the small of the stock and the remaining fingers curled over the top of the stock. Pull the weapon down and to the left with your left hand. You pull down to pull the hinged butt plate into the shoulder, and to the left to counteract the pressure of the cheek against the stock. You must have a firm grip. A correctly held weapon does not kick.

*d.* In the meantime, the coach takes his position five paces to the rear of the weapon. From here he tells you which way to move to place your body directly in rear of the automatic rifle. An imaginary line passing to the rear through the

weapon must pass through your right shoulder and right hip. The coach moves forward and checks your feet and legs. Your feet should be placed as flat on the ground as possible. The legs are spread a comfortable distance apart (fig. 132).



*Figure 132. The coach checks the automatic rifleman's legs and feet.*

e. The coach now checks your shoulders. They should be level (fig. 133). The most common error is a low right shoulder.

f. The coach now checks your grip on the weapon. He also checks to see that your fore-



*Figure 133. The coach checks the automatic rifleman's shoulders.*

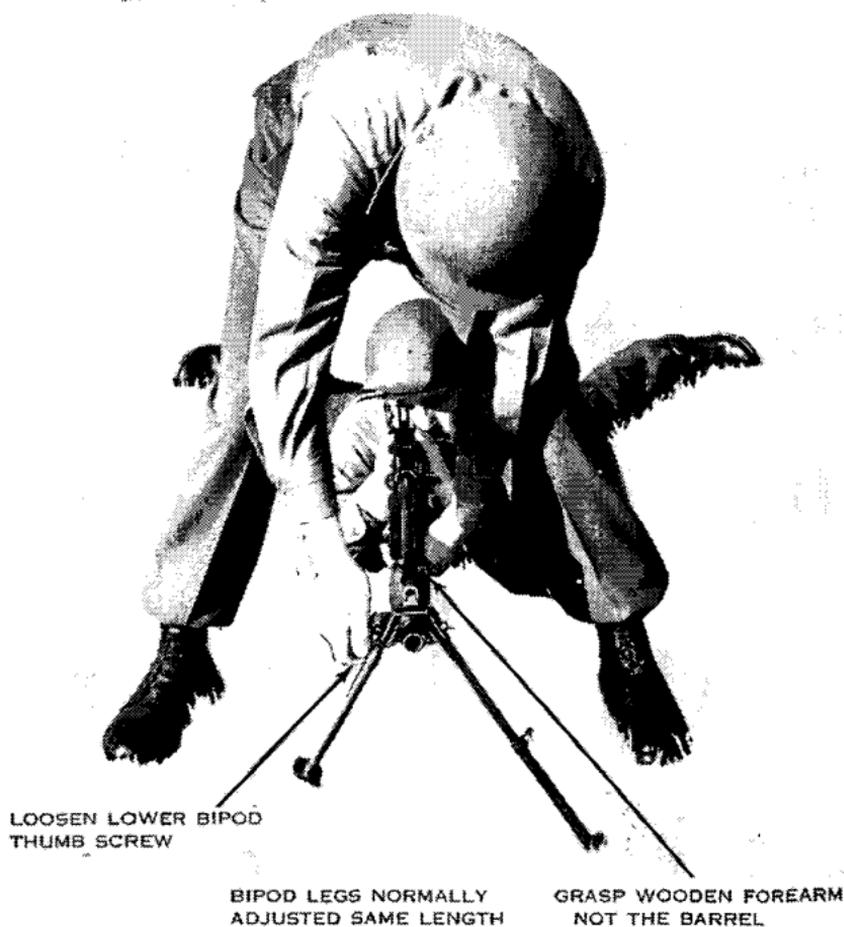
arms form approximately the same angle with the ground as the bipod legs do and that your chest is up and off the ground (fig. 134).



*Figure 134. The coach checks the automatic rifleman's grip.*

*g.* The coach rechecks to see that the sling is loose and out of the way of the magazine feedway, that the gas cylinder assembly is adjusted properly and locked in place, and that the flash hider is tight. To adjust the bipod legs, the coach

grasps the weapon by the forearm and raises the muzzle to the height you desire. With the other hand, he loosens the lower bipod thumb screw and allows the bipod leg to drop down to the desired length. The coach then changes hands on the forearm and in the same manner adjusts the opposite bipod leg to the same length (fig. 135). Under certain conditions it may be necessary to adjust the bipod legs unevenly.



*Figure 135. The coach adjusts the bipod legs.*

COACH FAR ENOUGH FORWARD  
TO CHECK FLINCHING. TRIGGER  
MANIPULATION AND BREATHING



*Figure 136. The coach in position.*

*h.* The coach moves to the rear and rechecks your position. He then assumes the coaching position. In this position, he is on your left far enough forward so that he can see your face. The coach rests on his left hip and left elbow (fig. 136).

## 107. ERRORS IN THE PRONE POSITION

Because you will serve as a coach many times during marksmanship training, you must be able to recognize and correct errors. Some of the more common errors found in the prone position are—

*a. Body Not Directly to the Rear of the Weapon.* This error is easily detected by standing directly to the rear of the automatic rifleman and observing the relationship of his body and the line of fire. To correct this error tell the automatic rifleman to move his body to the right or left as necessary.

*b. Right Shoulder Too Low.* To correct the error, move the right elbow in towards his body or the left elbow out and forward. It may be necessary to do both.

*c. Chest on the Ground.* This error results from the automatic rifleman's elbows being out too far. To correct this error he must move his elbows in until they form approximately the same angles with the group as the bipod legs.

## 108. KNEELING POSITION

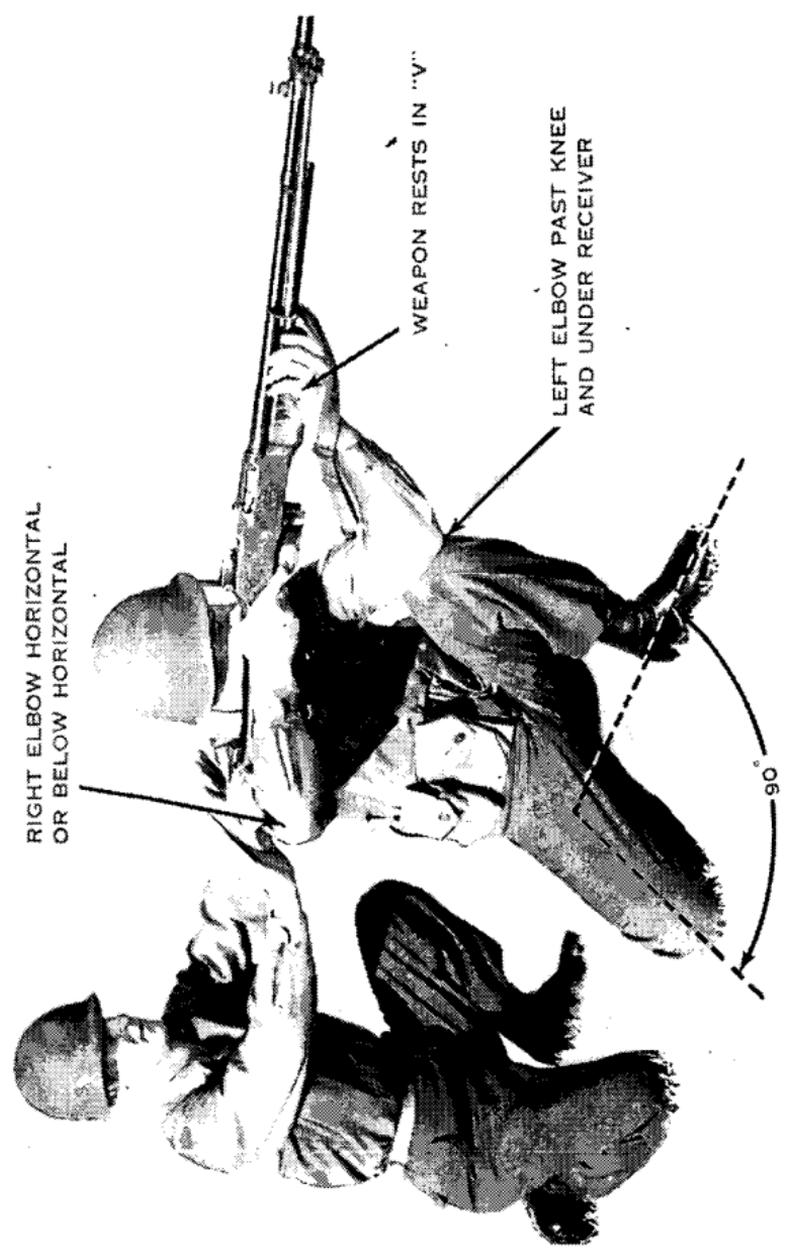
*a.* The kneeling position is used frequently on level ground or ground that slopes upward. It is a steady position and a good one when you do not

have time to assume the prone position. In this position, use the hinged butt plate and the loop or hasty sling. In practicing this exercise, have your coach lock the bipod legs back along the barrel, square shoulder to square shoulder.

b. To assume the kneeling position, stand facing the target. Do a right face and kneel on the right knee. As you go down in position, you should rotate over the right toe. Next, place the butt of the weapon to your shoulder and aim at the target (fig. 137① and ②).

c. The following features must be observed in the kneeling position:

- (1) Sit on the right heel so that there is solid contact between your right heel and right buttock. If at first this puts too much strain on the instep, dig a small hole for your toe. Practice in this position eliminates the need for this hole.
- (2) Keep the lower left leg vertical as viewed from the front.
- (3) Point the toes of the left foot in the general direction of the target. Many expert automatic riflemen prefer to draw the left foot back and relax the body weight forward so that there is solid contact made between the calf of the left leg and the left thigh.
- (4) Place the right knee so the right thigh forms an angle of approximately  $90^\circ$  to the line of aim. The entire surface of the right lower leg, from the knee to the toe, is in contact with the ground.



RIGHT ELBOW HORIZONTAL  
OR BELOW HORIZONTAL

WEAPON RESTS IN "V"

LEFT ELBOW PAST KNEE  
AND UNDER RECEIVER

90°

①

Figure 137. The kneeling position.



②

Figure 137—Continued.

- (5) Place the left elbow forward of the left knee by several inches. This moves the weight of the body forward and avoids point-to-point contact with the elbow and knee cap.
- (6) Place the left elbow directly under the receiver *for bone support*. The magazine will not interfere.

- (7) Rest the automatic rifle in the V formed by the thumb and first finger and on the heel of the left hand.
- (8) Keep the left wrist straight.
- (9) Keep the sling up high on the arm so that daylight can be seen between the sling and the crook of the elbow.
- (10) Relax the weight of the body forward over the left leg. This takes most of the weight off the right leg and puts it on the left leg.
- (11) Place your cheek against the stock and your right thumb.
- (12) After checking your position, your coach assumes his position, which is kneeling to your rear with his hands up ready to brace you in case of a runaway gun.

## 109. ERRORS IN THE KNEELING POSITION

The errors found most frequently in the kneeling position and the ways to correct them are—

*a. Left Elbow Not Under the Automatic Rifle.* Here the muscles and not the bones are supporting the automatic rifle. To correct this error, take the butt of the automatic rifle from your shoulder, move your left foot to the right, and then assume the correct position.

*b. Elbow and Knee Placed So As to Make Point-To-Point Contact.* When the left elbow rides directly on the kneecap, it makes a very unsteady position. To correct this error, extend the left elbow beyond the left kneecap. This cor-

rection shifts your weight forward and avoids point-to-point contact between the left elbow and left kneecap.

*c. Right Thigh Not At a Right Angle to the Line of Aim.* This position is very unstable as the three point base is reduced. To correct this error, move your right knee until an angle of approximately  $90^\circ$  is made with the line of aim.

*d. Improper grip.* To correct this error, place the weapon on your left hand so that it rests in the V formed by the thumb and forefinger and on the heel of the left hand.

## 110. ALTERNATE KNEELING POSITIONS

*a. If you have long legs,* place your left foot forward of the left knee. This lowers the knee. It is necessary to experiment to determine how far to move your left foot forward to bring the line of aim down on the bull's eye. Otherwise, the position is the same as the standard kneeling position.

*b. If you have short legs,* place your left foot directly under the left elbow. In this position, the left leg is vertical as viewed from the side as well as from the front and the line of aim is raised to the highest position possible. Otherwise, your position and the position of your coach are the same as in the standard kneeling position.

## 111. SITTING POSITION

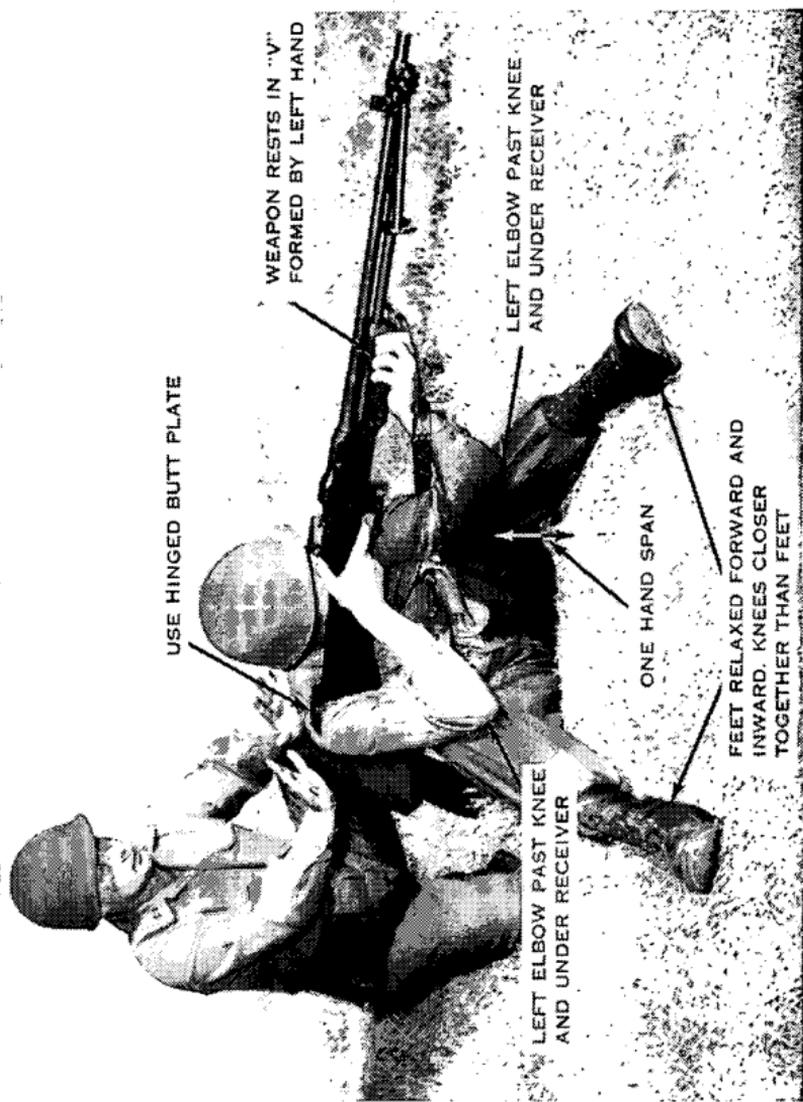
*a.* The sitting position is one of the easiest of the firing positions to assume. It is suitable wherever the grass is high or where there is anything

else that might obstruct the vision in the prone position. It is also suitable for firing downhill. With the exception of the prone position, the sitting position is the steadiest one because you have a rest for both elbows. In this position, use the hinged butt plate and the loop or hasty sling. In practicing this exercise, have your coach lock the bipod legs back along the barrel, square shoulder to square shoulder.

*b.* To assume the sitting position, half face to the right, spread your feet a comfortable distance apart, and sit down. Break your fall by using the right hand and then move your buttocks to the rear until the under sides of the knees are about a hand's span off the ground. Bend forward from the waist and place the left upper arm on the flat portion of the shin bone of the left leg. There should be several inches of contact between the upper arm and the shin bone. Place the automatic rifle butt to your shoulder, take the correct grip on your weapon, and block your right elbow in front of the right knee. Relax your body into the sling (fig. 138① and ②).

*c.* The following features must be observed in the sitting position :

- (1) Spread the legs a comfortable distance apart. The feet must be farther apart than the knees. Relax the feet forward and inward.
- (2) Place the left upper arm so that there is contact for several inches between the flat part of the left shin and the left upper arm.



①

Figure 138. The sitting position.



②

Figure 138—Continued.

- (3) Place your left elbow under the receiver. Be sure that the left wrist is straight.
- (4) Rest the automatic rifle in the V of the left hand the same as for the kneeling position.
- (5) Lean forward from the waist so that the weight of the upper part of the body is on both legs. Again, strive for bone support instead of muscle support to hold the weight of the upper part of your body.
- (6) Place the right upper arm against the right shin. The right arm is placed slightly on the inside of the right leg to serve as a brace during firing.
- (7) Keep the sling up high on the arm so that daylight can be seen between the sling and the crook of the elbow.
- (8) Your grip is the same as in the kneeling position.
- (9) Place your cheek against the stock and your right thumb.
- (10) After checking your position, your coach assumes his position which is kneeling to your rear and with his hands up ready to brace you in case of a runaway gun.

## 112. ERRORS IN THE SITTING POSITION

The errors found most frequently in the sitting position and the ways to correct them are—

a. *Left Elbow Not Under the Automatic Rifle.* Here the muscles and not the bones are supporting the automatic rifle. To correct this error, take the butt of the automatic rifle from your shoulder and move your feet to the right.

b. *Elbows and Knees Placed So As to Make Point-To-Point Contact.* This error results in an unstable support for the automatic rifle and it places your body in a position which is too erect and unstable. To correct this error, lower your knees, bend your body well forward from the waist, and place the left upper arm well past the left knee and against the left shin. Block the right elbow in front of the right knee.

c. *Knees Farther Apart Than Feet.* This error may be caused by placing the feet too close together; by turning the toes outward which throws the knees outward; and by pushing out, rather than down, against the shins with the elbows. This error causes muscular support rather than bone support. To correct this error, remove the weapon from your shoulder and stretch both legs out on the ground. The feet are separated from 20 to 30 inches depending on the length of your legs. Raise the left knee about one hand's span off the ground. Place the left upper arm along the top of the left shin. Place the hinged butt plate on the right shoulder. Assume the correct grip with the right hand. Lower the right elbow and raise the right knee until solid contact is

made between the right upper arm and right shin. The right knee should be about one hand's span off the ground.

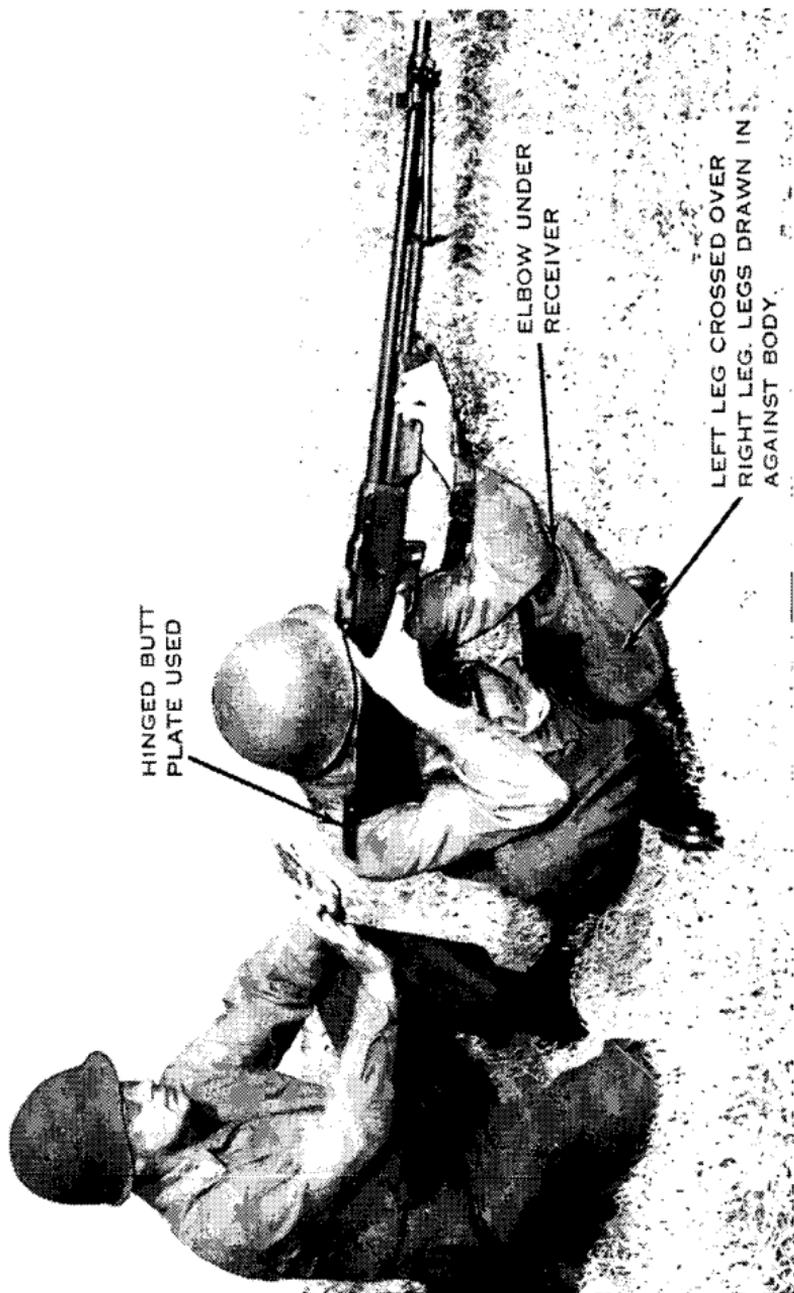
*d. Toes Pointing Up.* This error usually indicates muscular tension in the legs and feet. To correct the error, relax the muscles in your legs and feet so that your toes point forward and inward.

### 113. ALTERNATE SITTING POSITIONS

If you have unusually long legs or a short body and short arms, you may find it difficult to assume the standard sitting position. You may have difficulty in placing your arms in the correct position on the shins. In such cases, the instructor may authorize you to use one of two modified positions. Neither modified position will be used until you have been closely checked by the instructor.

*a. In the Cross-Legged Modified Sitting Position,* sit with your left leg crossed over your right leg. Draw your feet up under you so that the outer part of the calf of each leg rests on the inside of the opposite foot. Support the back of the upper arms against the shin bones and very nearly at right angles to them. Otherwise your position and the position of your coach are the same as in the standard sitting position (fig. 139).

*b. In the Cross-Ankled Modified Sitting Position,* sit with the left ankle crossed over the right ankle. The distance you extend your feet to the front depends upon the length of your legs. Take care to relax your legs; do not hold your knees up



*Figure 139. The cross-legged modified sitting position.*



*Figure 140. The cross-ankled position.*

by sheer muscular effort. Support the upper arms against the shins as in the cross-legged position. The cross-ankled position provides only a two-point base of support. Therefore it is much less stable than either the standard sitting position or the cross-legged position which have a three-point base. If you weigh less than 170 pounds avoid this position. Otherwise your position and the position of your coach are the same as in the standard sitting position (fig. 140).

## 114. CROUCH POSITION

*a.* The crouch position is used for assault fire and, in an emergency, to engage targets at close range.

*b.* To make the special sling adjustment for the crouch position—

- (1) Lengthen the sling to approximately its fullest length. This adjustment depends upon your height and the proper length for you can only be found by experimenting.
- (2) Pick the weapon up by the sling and place the sling over your head and on your left shoulder (fig. 141).
- (3) Pass your left hand over the sling and grasp the forearm near the upper sling swivel, turning the weapon over, sights up.
- (4) Place the rear end of the sling around the outside of the stock.

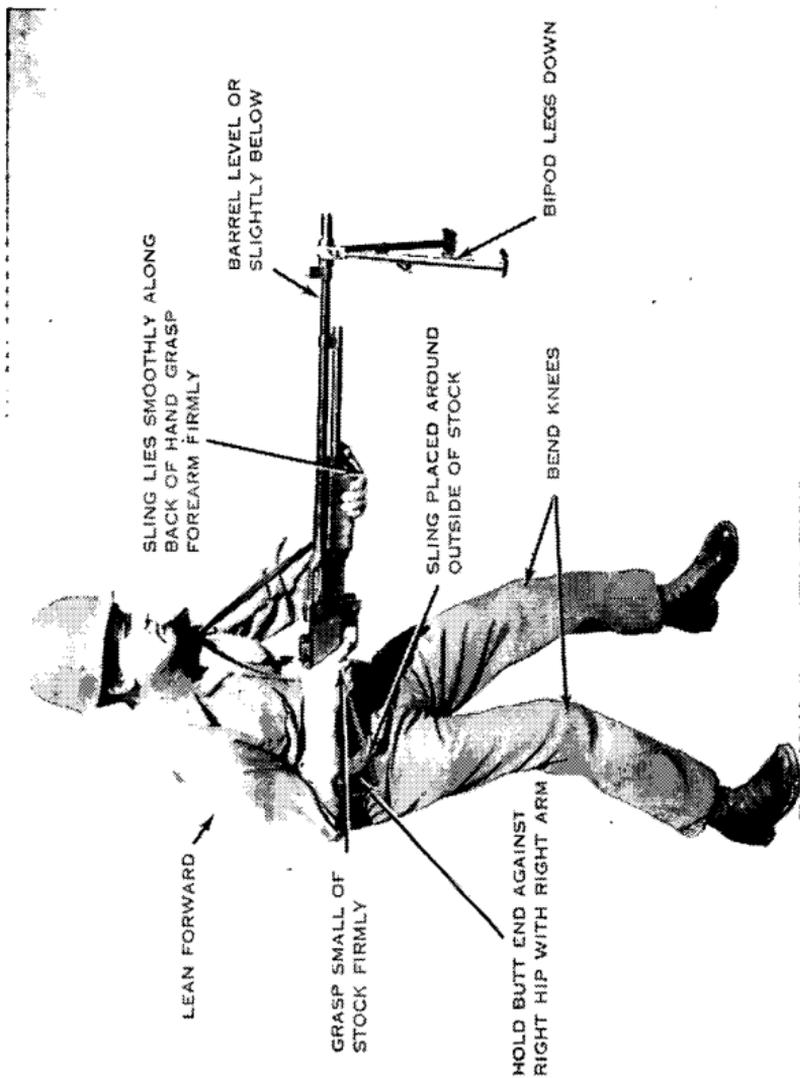


Figure 141. The crouch position.

*c.* The crouch position using the leather sling is shown in figure 141. To assume this position—

- (1) Face the target with your feet spread 12 to 15 inches apart. The left foot is ahead of the right foot with your weight equally balanced on both feet as in a boxer's stance.
- (2) Grasp the small of the stock firmly with the right hand. Grasp the wooden forearm firmly with the left hand. The sling lies smoothly along the back of the left hand.
- (3) Bend your legs at the knees and lean forward from the waist to give a crouch appearance.
- (4) Hold the butt of the automatic rifle against the right hip with the lower right arm.
- (5) To obtain a hit on the target, hold the barrel level, or with the muzzle slightly below the level. Adjust your aim by observing the strike of the bullets on the ground.
- (6) Leave the bipod legs down so that you will be prepared to assume the prone position in case a target appears at a greater range.

*d.* To engage a target that appears on either flank or to your rear, whirl to face the target by pivoting on the ball of your left foot.

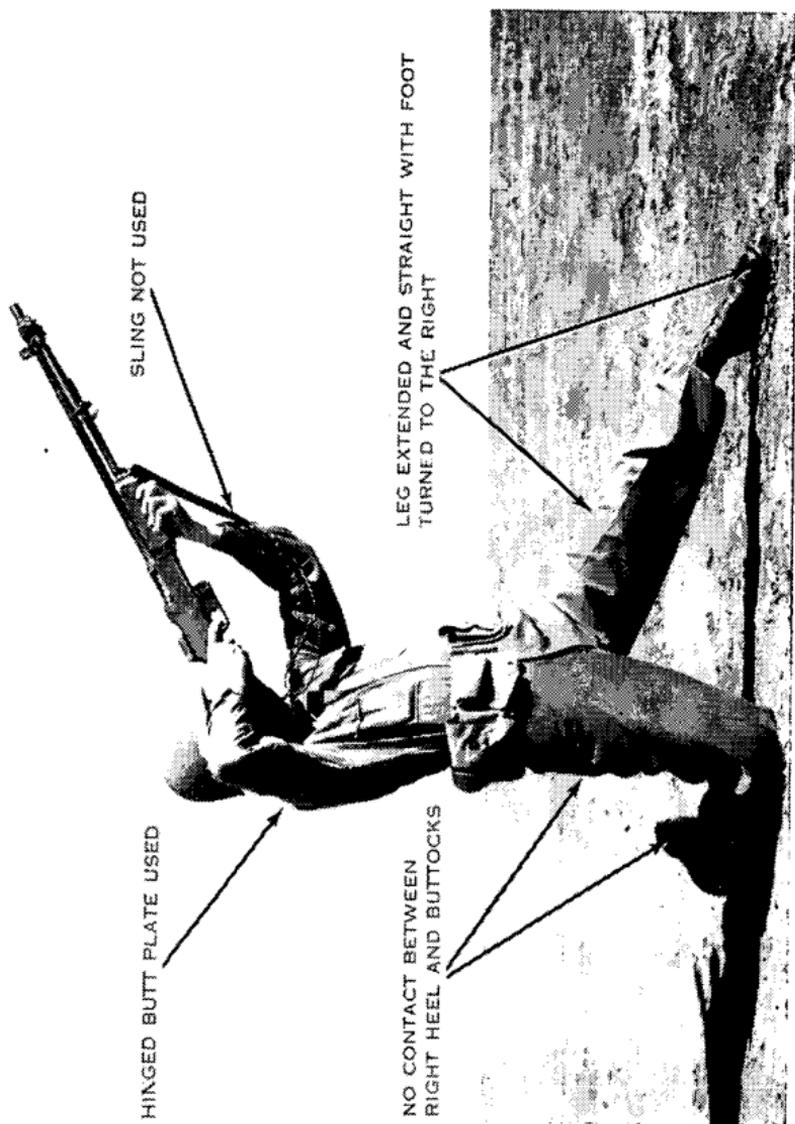
## 115. AERIAL TARGET POSITION

a. The aerial target position (a modified kneeling position) is used to engage parachutists and slow-moving liaison and troop carrier aircraft. In this position, use the hinged butt plate but *not* the sling. In practicing this position lock the bipod legs back along the barrel.

b. To assume this position, kneel on your right knee and raise the weapon to your shoulder. Keep your body erect with the left leg extended, without stiffness, well to the left front (fig. 142).

c. The following features must be observed in this position:

- (1) Do not sit on your right heel.
- (2) Turn your left foot slightly to the right at the ankle.
- (3) Hold the automatic rifle with your right hand grasping the small of the stock firmly and with your left hand grasping the forearm.
- (4) Keep your left elbow as nearly under the receiver as possible, and do not rest it against the left knee as in the kneeling position.
- (5) Hold the right elbow on a level with or higher than the right shoulder.



*Figure 142. The aerial target position.*

## 116. SIGHT SETTING AND TRIGGER MANIPULATION EXERCISES

*a. General.* Sight setting and trigger manipulation are taught in three exercises. Each of these three exercises prepares you for good shooting—

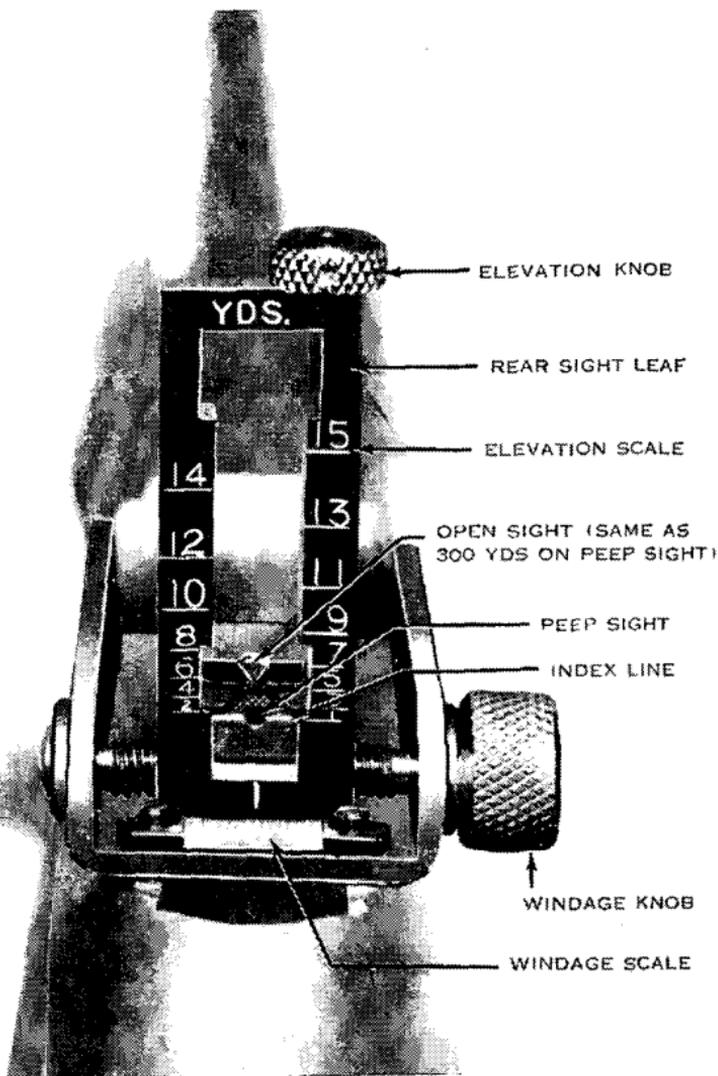
- (1) *First exercise*—Training in sight setting.
- (2) *Second exercise*—Training in trigger manipulation.
- (3) *Third exercise*—Timed training in sight setting, aiming, and manipulating the trigger.

*b. Equipment.* In these exercises it is desirable to have one automatic rifle for every two men and one 1,000-inch target, rifle, caliber .30 M1 for every four men.

## 117. THE REAR SIGHT

To learn sight setting, you must understand the rear sight. On the rear sight assembly (fig. 143) there are two sights, an open or battle sight and a peep sight.

*a.* The open or battle sight is used when the sight leaf is down. This sight corresponds to the peep sight set at a range of 300 yards. The peep sight can be adjusted for different ranges (elevations) by moving the elevation gage until the peep sight index line is opposite the desired range graduation on the rear sight leaf. As you turn the elevation knob, you hear and feel it click. Sometimes the final adjustment click brings the



*Figure 143. The rear sight.*

index line a little above or below the desired range setting. Should this happen, do not attempt to place the index line exactly on the desired setting by using a part of a click. If a part of an elevation click is taken, the peep sight will drop to the next lowest setting while firing. On the newer

sights, the elevation scale can be set from 100 yards to 1,500 yards.

b. The windage scale, by which adjustments are made to compensate for a wind blowing across the line of fire, is set by moving the rear sight the necessary number of clicks either to the right or left by turning the windage nob. You can take partial clicks of windage. Figures 144 and 145 show in which direction the elevation and windage knobs are turned to move the peep sight up or down or to the right or left.

## 118. NEED FOR TRIGGER MANIPULATION TRAINING

a. Early in preliminary marksmanship training you must learn to press the trigger so that you fire the first shot without disturbing the sight picture. There are two ways in which the sight picture may be disturbed after the trigger is pressed—

(1) As soon as the trigger is pressed, the moving parts start forward and continue moving until just before the round is fired. This movement of the operating parts may disturb you and cause the aim to be shifted. You can correct this tendency by continuing to sight and aim after you have pressed the trigger. This is called *follow through*.

(2) You may have a tendency to flinch or throw your shoulder forward in anticipation of the recoil or kick that comes with the firing of the weapon. You can

correct this tendency, also, by relaxing and following through with the sight alignment and sight picture.

*b.* There is no setting for firing single shots with the automatic rifle. To fire a single shot, you must release the trigger before the operating parts have moved all the way forward. This is a technique that must be practiced. Single shots are easier to fire with the change lever moved to the F setting. To fire a burst, however, simply press the trigger all the way to the rear and hold it to the rear until the desired number of rounds has been fired.

## **119. FIRST EXERCISE—TRAINING IN SIGHT SETTING**

*a.* Sight setting exercises train you to set your rear sight accurately as well as quickly. Begin these exercises with the rear sight set at 500 yards elevation, zero windage, and with the rear sight leaf down. This allows sight adjustments either up or down and to the left or right. You and your coach, being in the prone position, may receive a command such as this—300, RIGHT THREE CLICKS. On this command—

- (1) Raise the rear sight leaf. Set the elevation scale at 300 yards and the windage scale at right three clicks; resume the firing position and call UP.
- (2) Your coach checks to see if you have placed the correct setting on the rear sight. If an error exists, he requires you to make the necessary corrections.

- (3) Your coach then resets the rear sight at 500 yards elevation, zero windage, and lowers the rear sight leaf. He raises his hand to signify that you are ready to receive another command from the instructor.

*b.* All members of the instructional group rotate until each one has demonstrated that he is proficient in setting his sights quickly and accurately.

## 120. SECOND EXERCISE—TRAINING IN TRIGGER MANIPULATION

*a.* For trigger manipulation training, your instructional group is again divided into coach and pupil pairs. The prone position is used initially. The object of the training is to teach you how to press the trigger properly. The automatic rifle has slack or play in the trigger. This slack is first taken up and then the trigger is pressed all the way to the rear. To fire a burst of shots is easy. To fire a single shot is more difficult. Therefore, one purpose of this exercise is to train you to fire single shots. Follow these six key phrases during trigger manipulation—

- (1) HOLD the weapon tightly. With your right hand pull the weapon back into your shoulder. With your left hand pull down and to the left.
- (2) BREATHE naturally, taking in a normal breath, let part of it out, and hold the remainder by closing the throat.

- (3) AIM, alining the sights and obtaining the correct sight picture.
- (4) PRESS the trigger all the way to the rear. To obtain a single shot, release the trigger immediately before the operating parts snap forward. To fire a burst, hold the trigger to the rear until the desired number of rounds has been fired. Attempt to fire single shots during this exercise.
- (5) FOLLOW THROUGH, keeping the correct sight alinement and correct sight picture, as the operating parts move forward. Following through provides that steadying influence which good shooting demands.
- (6) CALL YOUR SHOT, that is, announce what the sight picture was at the time the parts went forward. If you cannot call your shot, it means you did not know where the sights were pointing when the weapon fired.

*b.* Your instructor will talk the group through the steps of the exercise, explaining the six key phrases. Next, your coach will take over, talk you through the exercise, and critique your work. Your coach will call "single" or "burst" for each shot. He will credit you with a single shot if your finger is off the trigger when the operating parts snap forward; a burst if your finger is on the trigger. As soon as you have shown proficiency

in trigger manipulation in the prone position, you may practice this exercise in the sitting or kneeling positions.

### 121. THIRD EXERCISE—TIMED TRAINING IN SETTING THE SIGHT, AIMING, AND MANIPULATING THE TRIGGER

*a.* This is a timed exercise which combines practice in sight setting, aiming, and trigger manipulation in one continuous process. It is practiced only in the prone position. As with the sight setting exercise (par. 119), this one begins with the rear sight set at 500 yards elevation, zero windage, with the rear sight leaf down, and with the operating parts to the rear. The 1,000-inch target, United States rifle caliber .30, M1 (fig. 154) is used in this exercise. You are allowed 10 seconds to complete the exercise. Here is a sample exercise—

300

RIGHT, TWO CLICKS

FIGURE NUMBER 4

*b.* The 10-second time limit begins with the target designation, FIGURE NUMBER 4, and ends 10 seconds later on the instructor's command, TIME. As soon as the target designation element of the command has been given—

- (1) Raise the rear sight leaf and set the announced elevation.
- (2) Set the windage as announced.
- (3) Aline your sights on the target, press the trigger and follow through.

- (4) Your coach calls out "single" or "burst."
- (5) Your coach checks the sight setting and requires you to make corrections if there are any errors.
- (6) Your coach resets the rear sight at 500 yards elevation, zero windage, and lowers the rear sight leaf.
- (7) Your coach raises his hand to indicate that you have completed the exercise.

## 122. AUTOMATIC FIRE EXERCISES

*a. General.* Training for automatic fire includes preliminary training and two magazine changing exercises. The preliminary training and each of the two exercises prepare you for good shooting.

- (1) *Preliminary training*—training in loading the initial magazine, changing magazines, and clearing your automatic rifle.
- (2) *First exercise*—training in an 8-magazine exercise.
- (3) *Second exercise*—training in a 3-magazine exercise.

*b. Equipment:* For these exercises it is desirable to have one automatic rifle and two magazines for every two men, and one 1,000-inch target, rifle, caliber .30, M1, for every four men.

## 123. PREPARATORY TRAINING FOR AUTOMATIC FIRE EXERCISES

### a. *General.*

- (1) The number of rounds you can fire in a given time depends largely on your ability to change magazines quickly. In preliminary training you practice the best method of changing magazines quickly. The automatic fire exercises are conducted at 1,000 inches using the 1,000-inch target, rifle, caliber .30 M1.
- (2) Each automatic rifleman changes his own magazines. A well-trained automatic rifleman can change a magazine in 2 to 4 seconds from any firing position. You should test all magazines to see that they fall out under their own weight when empty. If a magazine sticks, the coach may assist you in removing it.
- (3) During preparatory work the magazines are replaced in the belt after they are removed from the weapon. During firing exercises, the magazines are replaced in the belt immediately upon completion of firing.
- (4) Time can be saved in loading the weapon if magazines are inserted in the automatic rifle belt correctly. Place the magazine in the belt pocket with the open end down and the long portion to the rear. To remove the magazine from the belt, grasp it with the thumb on the

side nearest your body and the remaining fingers on the other side of the magazine. Remove the magazine from its pocket in the belt and insert it, open end up, into the feedway of the receiver.

*b. Loading the Initial Magazine, Changing Magazines, and Clearing the Automatic Rifle.* Before automatic fire exercises are conducted, you will practice loading the initial magazine, changing magazines, and clearing the automatic rifle.

- (1) Before loading the initial magazine, must cock the weapon. To do this, pull the operating handle all the way to the rear with the left hand and then push it forward. Take a magazine from the belt as explained in (4) above and insert it into the magazine feedway. Tap up firmly on the magazine base to seat the magazine.
- (2) After firing one magazine, you must replace it with another magazine from the belt. To do this, press in on the magazine release allowing the empty magazine to drop out. At the same time, cock the weapon with the left hand. Replace the magazine in the belt. Now take another magazine from the belt, place it into the weapon and tap up on the magazine base.
- (3) To clear the automatic rifle, push in on the magazine release with the right

thumb and allow the empty magazine to drop out. At the same time cock the weapon with the left hand. Now press the trigger and allow the operating parts to move forward. Your automatic rifle is clear only when the magazine is out of the weapon and the operating parts are forward.

## 124. FIRST AND SECOND AUTOMATIC FIRE EXERCISES

*a.* There are two automatic fire exercises. One is conducted in 2½ minutes and consists of loading and simulating firing 8 magazines of 5 rounds each. The other is conducted in 40 seconds and consists of loading and simulating firing 3 magazines of 5 rounds each. The first exercise is designed to prepare you for the 1,000-inch range course. The second exercise prepares you for automatic fire on the known distance range. The correct fire commands for these exercises are—

- (1) *Eight magazine exercise*—ONE MAGAZINE OF FIVE ROUNDS, SIMULATE LOAD; FIGURE NUMBER FIVE TO FIGURE NUMBER SIX; FIVE ROUNDS PER FIGURE IN SHORT BURSTS; READY ON THE RIGHT? READY ON THE LEFT? READY ON THE FIRING LINE. COMMENCE FIRING.
- (2) *Three magazine exercise*—ONE MAGAZINE OF FIVE ROUNDS, SIMULATE LOAD; IN SHORT BURSTS;

**READY ON THE RIGHT? READY  
ON THE LEFT? READY ON THE  
FIRING LINE. COMMENCE FIR-  
ING.**

*b.* In both exercises you simulate pressing off each burst in the magazine. The empty magazines are actually changed. Each magazine is replaced in the belt as soon as a new magazine is inserted in the weapon. In the 8-magazine exercise, shift your body as necessary to engage each scoring space.

*c.* In addition to the duties listed in paragraphs 89 and 106, the coach makes sure that you—

- (1) Simulate firing each burst in the magazine.
- (2) Traverse from left to right during the 8-magazine exercise engaging each figure.
- (3) Reload quickly and without fumbling and keep the weapon to the shoulder during reloading.
- (4) Clear your weapon after the last burst has been fired.
- (5) Replace the empty magazine in your belt after loading a new magazine.

## **125. THE FIFTH STEP OF PREPARATORY MARKSMANSHIP**

The fifth step of preparatory marksmanship training consists of instruction covering sight changes, the effect of wind, targets, and the use

of the score card. This step can be taught indoors or outdoors and may be taught any time between the first and last (sixth) steps of preparatory marksmanship training.

## 126. SIGHT CHANGES

You have learned how to aline your sights correctly, how to assume good firing positions, how to press the trigger so that the bullet starts on its way while you have the correct sight alinement and sight picture, and how to change magazines quickly. This information is of little value if you do not know how to adjust your sight so the bullet will strike the target where you aim. There are basic rules for making sight adjustments. The fundamental rule is—*move the rear sight in the direction you want to move the hits on the target.* If your shots are low, you must move the shots higher to hit the bull's eye, so you move the rear sight up. When the rear sight is raised higher, the front sight must also be raised to bring it back into the straight line running from your eye through the rear sight to the target. Similarly, when you move the rear sight down, or to the right or left, you will have to move the muzzle end of your weapon in the same direction to bring the front sight again into line with the target. You move the rear sight in clicks, both for elevation and windage. The number of clicks you must use to place your shots where you want them is explained later. Raising and lowering the rear sight is often referred to as *putting on elevation* or *taking off elevation.* Moving the rear sight to the

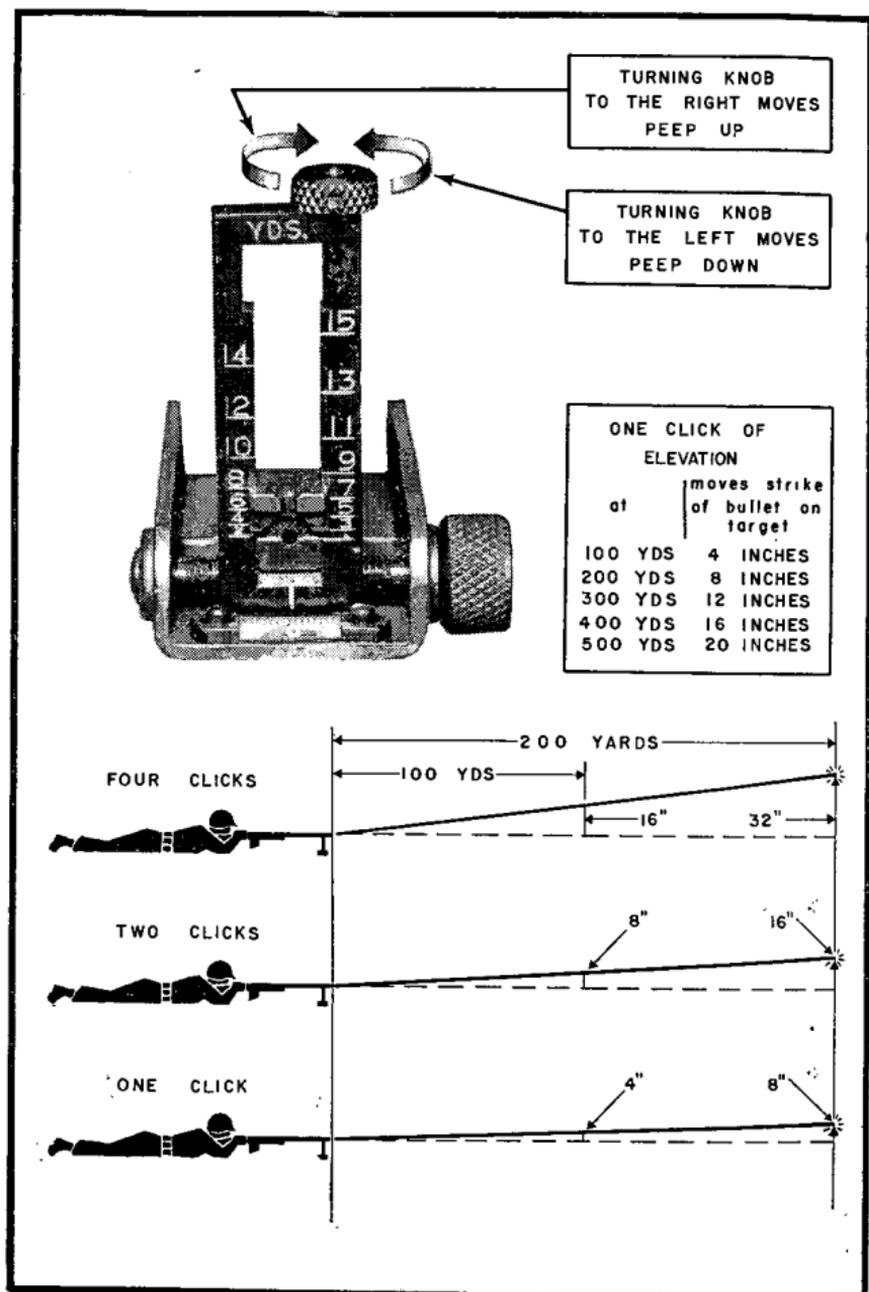


Figure 144. Elevation rule.

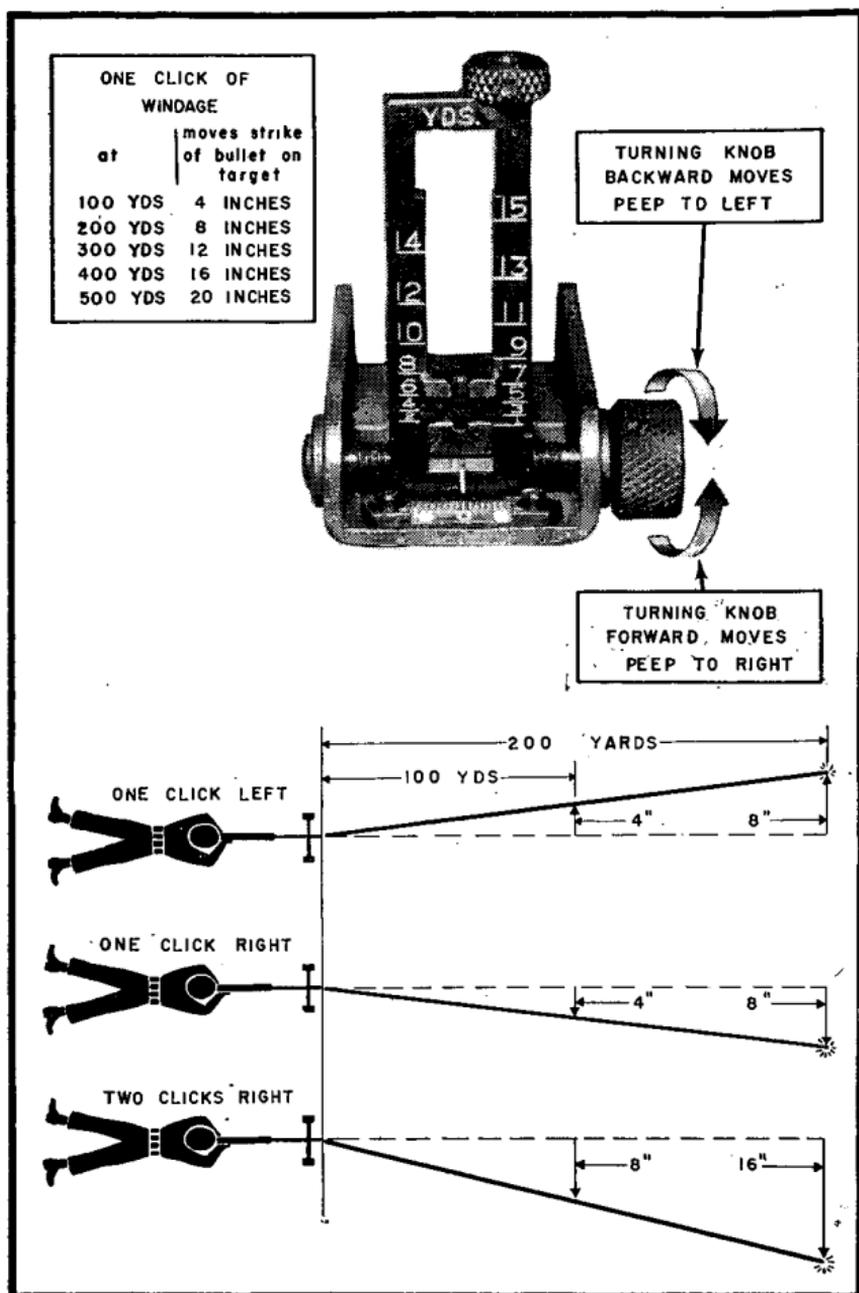


Figure 145. Deflection rule.

right or left is known as *taking right windage* or *taking left windage*.

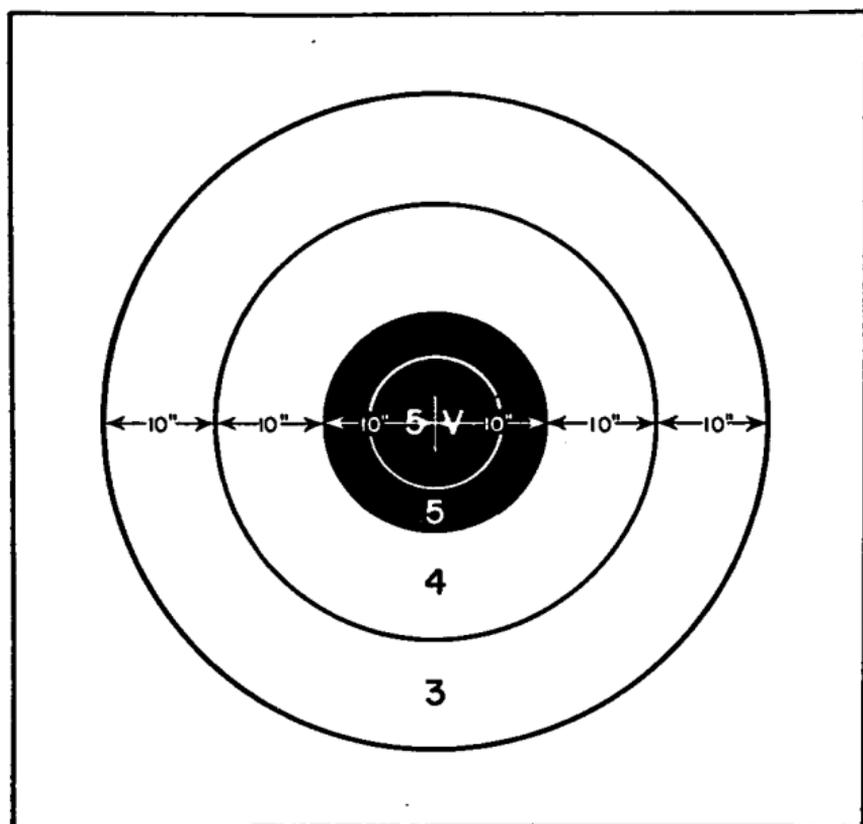
a. *Elevation Rule.* A change of one click of elevation moves the strike of the bullet up or down 1 inch on the target at 1,000 inches. At other ranges, a change of one click of elevation up or down moves the strike of the bullet 4 inches on the target for each 100 yards of range. That is, 4 inches at 100 yards, 8 inches at 200 yards, 12 inches at 300 yards, 16 inches at 400 yards, and 20 inches at 500 yards. Only whole clicks in elevation may be taken (fig. 144).

b. *Deflection Rule.* A change of one click of windage moves the strike of the bullet left or right 1 inch on the target at 1,000 inches. For other ranges, one click of windage left or right moves the strike of the bullet 4 inches on the target for each 100 yards of range. That is, 4 inches at 100 yards, 8 inches at 200 yards, 12 inches at 300 yards, 16 inches at 400 yards, and 20 inches at 500 yards. Partial clicks of windage may be taken, if necessary (fig. 145).

## 127. B TARGET

You will use the rifle B target on the known distance range for slow and automatic fire at all ranges. No doubt you will find it necessary to make adjustments on the rear sight of your automatic rifle to move your shots into the center of the bull's eye of this target. Having a knowledge of the dimensions of the target will enable you to make precision adjustments on the rear sight.

Figure 146 shows the rifle B target with the dimensions indicated for each scoring space. Memorize the number of inches from the edge of the bull's eye to the center of the bull's eye and the width of the four ring and the three ring.

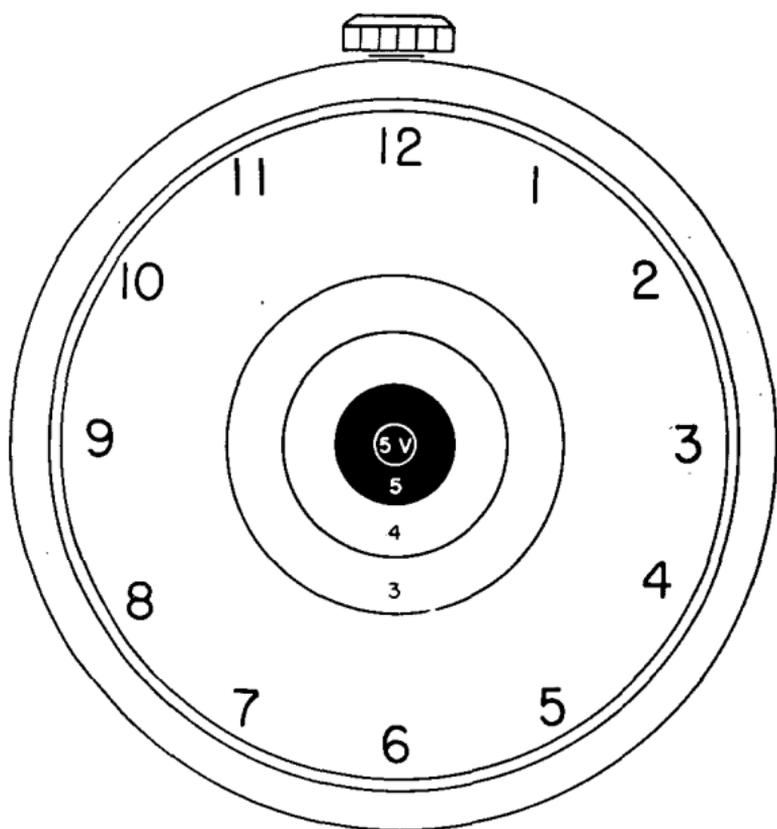


*Figure 146. The rifle B target.*

## 128. CLOCK SYSTEM

Let us assume you have fired one shot and have hit the target in the four ring. How would you tell your coach where the shot hit the target? True, it did hit in the four ring but where in the

four ring? The clock system is used to indicate the bullet's location with respect to the center of the target (center of the bull's eye). Imagine the face of a clock placed over the target as shown in figure 147. Visualizing the target as the face of a clock, you can call your shots with respect to the scoring space where the bullet hit and the hour on the clock. For example, a hit in the four ring to the right of the bull's eye and approximately in line with the center of the bull's eye would be called a "four at 3:00 o'clock."



*Figure 147. The clock system.*

## 129. EFFECT OF THE WIND

a. *Effect of the wind.* With the exception of the wind, weather conditions have little or no effect on the flight of the bullet up to ranges of 500 yards. But the wind has considerable effect on the bullet as it travels toward the target. It actually blows the bullet out of its path to the target. The stronger the wind and the longer the range, the greater its effect on the bullet. The direction of the wind is announced through the use of the clock system as shown in figure 148. Imagine yourself standing in the center of the clock's face as it lies flat on the ground with the target located to your front at 12 o'clock.

b. *Determining the Wind Velocity.* There are several ways you can determine the speed of the wind. In the most common method, you use the position of the range flag. If there is a wind blowing, the flag will be flying out from the flag staff. Estimate the number of degrees in the angle formed by the flag and its staff. Divide the number of degrees in the angle by four. The result is the approximate velocity of the wind in miles per hour. Look at figure 149. Determine the velocity of the wind in each of the examples. When you cannot see the range flag, take a piece of grass, fuzz, or paper and stand with your back to the wind. With either hand, place the grass at the tip of your shoulder and allow it to fall and be blown by the wind. Remain where you are and point with the same hand at the spot where the grass struck the ground. Estimate the number of degrees in the angle formed by your arm and body

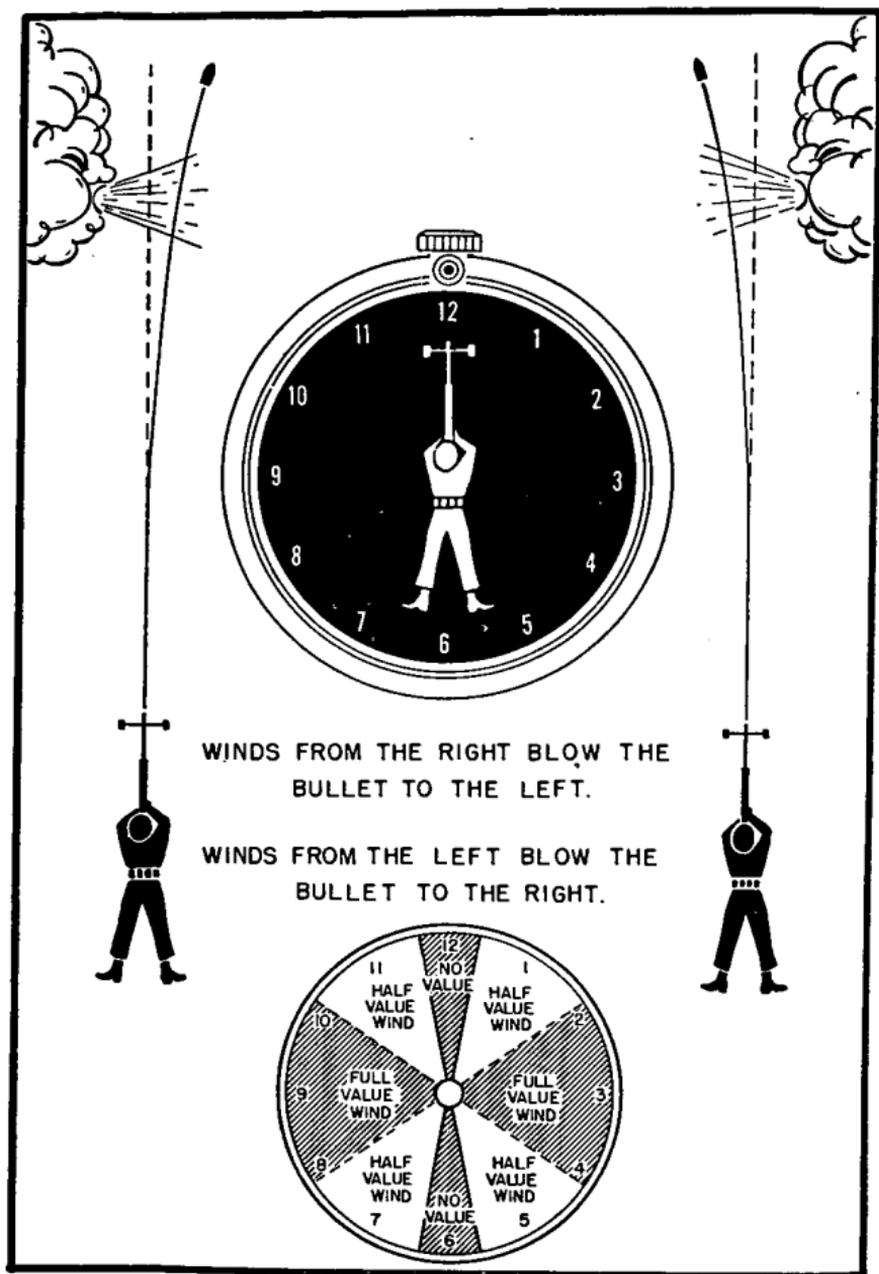
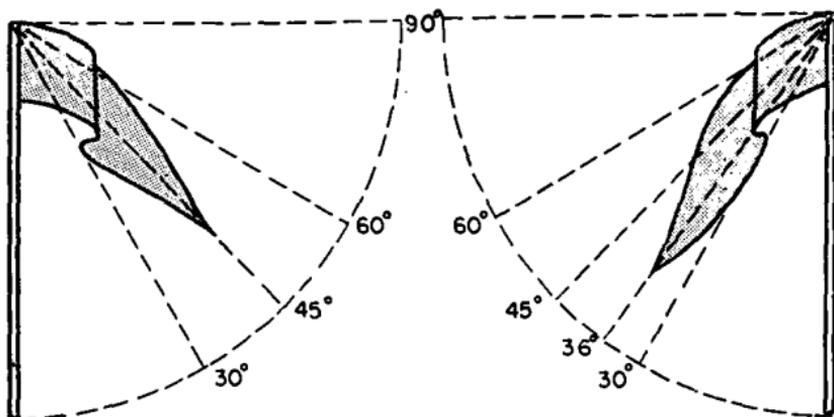


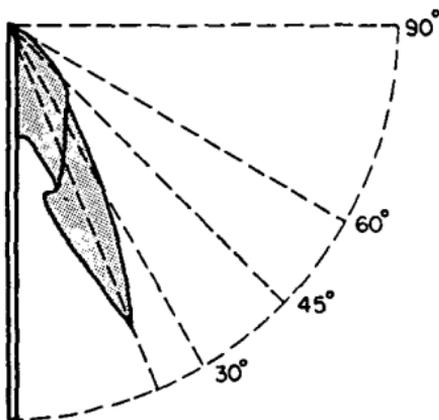
Figure 148. Wind direction by the clock system.

and divide this figure by four. The result is the approximate velocity of the wind in miles per hour.

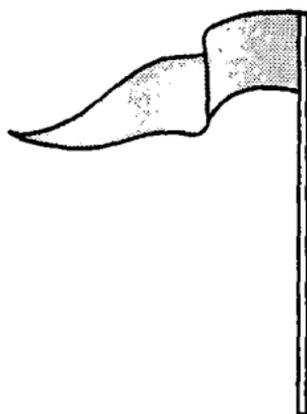


$$\text{ANS} = \frac{45^\circ}{4} = 11 \text{ mph}$$

$$\text{ANS} = \frac{36^\circ}{4} = 9 \text{ mph}$$



$$\text{ANS} = \frac{\quad}{4} = ?$$



$$\text{ANS} = \quad ?$$

Figure 149. Determining wind velocity by the range flag.

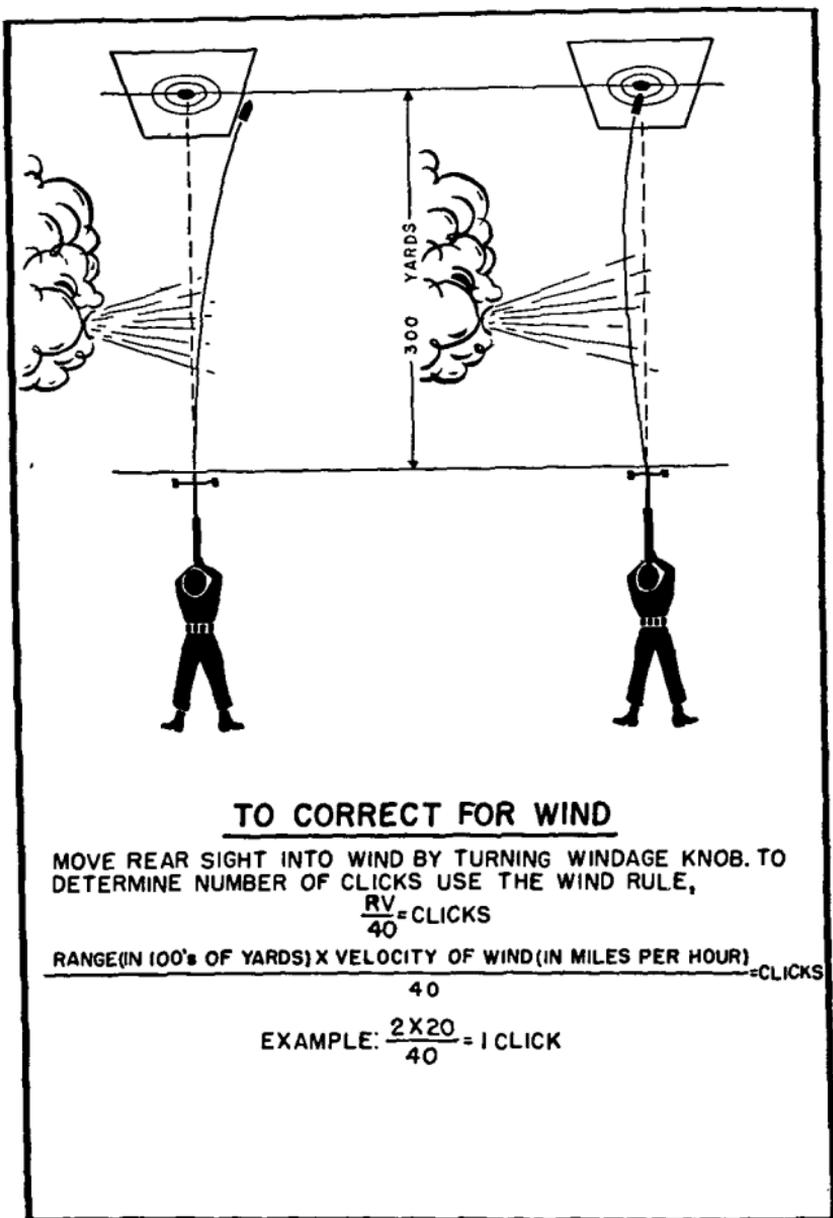


Figure 150. The wind rule.

c. *Wind rule.* The effect that a wind has on the bullet varies with the velocity of the wind, the distance the bullet travels, and the direction in which the wind is blowing. A wind blowing directly from 12 or 6 o'clock does not noticeably affect the flight of the bullet and no sight adjustment is necessary. You must compensate for winds blowing from other directions. Winds from 2, 3, or 4 and 8, 9, or 10 o'clock are called full-value winds because they have the most effect upon the bullet. Winds blowing from 1, 5, 7, and 11 o'clock have only about half as much effect on the bullet and are called half-value winds. To compensate for a wind, the rear sight must be moved to the left or right. Move the sight as shown in figure 150. Here is a step by step explanation of the formula:

- (1) Take the range at which you are firing (200, 300, or 500 yards) and express it in hundreds of yards (2, 3 or 5).
- (2) Determine the velocity of the wind in *miles per hour*.
- (3) Multiply the above two elements and divide the results by the constant number 40.
- (4) The result is the number of clicks of windage for a *full* value wind.
- (5) Here is a typical problem and its solution:
  - (a) Assume that you are firing at 200 yards. A 20 mile per hour wind is blowing from 3 o'clock. How much

do you correct for the wind? (As the wind is blowing from 3 o'clock, it is a full value wind.)

- (b) Range expressed in hundreds of yards = 2.
- (c) Velocity of the wind in miles per hour = 20.
- (d)  $\frac{R \times V}{40} = \frac{2 \times 20}{40} = \frac{40}{40} = 1$  click
- (e) The correction for the wind is 1 click right windage—into the wind. (If the were blowing from 1 or 5 o'clock, a half-value wind, you would move the rear sight just half as many clicks or  $\frac{1}{2}$  click.)

### 130. ZEROING THE AUTOMATIC RIFLE

*a. General.* Each automatic rifle has certain individual characteristics like shooting a little low or high and perhaps to the left or right at different ranges. You must make sight changes to correct for these characteristics of your weapon. Adjusting the rear sight to allow for these characteristics is known as *zeroing your automatic rifle*. To zero your automatic rifle you must make elevation and windage corrections until your weapon shoots where it is aimed. The zero that you obtain with these corrections usually differs from the manufacturer's zero. *The zero of your automatic rifle, for each range, is the sight setting in elevation and windage that enables you to hit the center of the bull's eye on a normal day when no wind is blowing.*

b. *To Zero the Automatic rifle.* There are two ways to zero your automatic rifle.

- (1) The first way is by firing three groups of three rounds each. For a detailed discussion of this procedure, see paragraph 150.
- (2) A second way to zero the automatic rifle is to fire a single shot. Have the target marked (when firing the 1,000-inch course the shot can be seen from the firing line). Make the necessary sight change to move the next shot into the center of the bull's eye. Fire another round. Continue this until the shots are hitting in the center of the bull's eye. The final setting that you have on the rear sight is the zero of your automatic rifle for that range. Record this zero on your score card. After you are able to call your shots correctly, use the second method for zeroing. For men who are learning to shoot, the first method is better.

### 131. SCORE CARD

a. To help you learn something from each shot and to help you determine the automatic rifle's zero for each range, you are given a score card. The proper use of the score card enables you to zero your automatic rifle quickly and accurately. It serves not only as a record of the score you shoot but also tells the complete story of every shot you fire. A study of the entries you make

on the score card enable you or your officers or noncommissioned officers to analyze your shooting to determine what you did wrong for each shot that was not a good one. Learning what is wrong is the first step toward corrective action.

b. To obtain the maximum use of your score card, you and only you must make the entries. Make these entries immediately after you fire each shot. Do not let your coach or anyone else plot your *call* or shot for you because he will not know what your sight picture really looked like at the time the weapon fired. Do not fool yourself by calling each shot a center bull's eye. Concentrate on your sight picture, hold your breath, press the trigger smoothly, and follow through and you will be able to call your shots correctly. The best marksmen in the world call every shot and they call very few of them center bull's eyes. Another important thing is to plot your shots accurately on the miniature target on the score card. Study the spotters on your target and plot each shot in its exact location. You will only hurt yourself if you plot a wide 3 as one that is almost a 4. And if it is a 7 o'clock shot on the target do not plot it at 6 o'clock just to make your score card look better.

c. Each time you go to the range you are given time in which to fill out the headings of your score card. Print your name, grade, army service number, organization, date and place of firing, the course that you are to fire, and indicate whether you are firing instruction or record practice. Check the weather conditions, particularly the

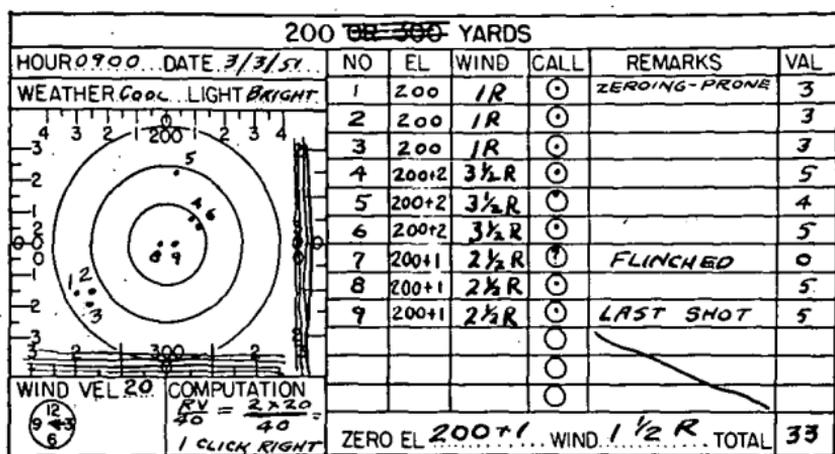


a. In this assumed situation, you are firing at a range of 200 yards with an automatic rifle you have never fired before. After reaching the firing point, you take the correct position and place your score card and pencil where you can easily use them without moving from your position. Use the first 200 or 300 yard slow fire recording portion of your card. Strike out the figure 300 and draw lines through the 300 yard elevation and windage marks on the bottom and right edge of the plotting space. Your first firing is to determine the zero of the automatic rifle at 200 yards (par. 150). To do this, fire three groups of three rounds each. The target is pulled and marked after the third shot of each group (par. 159) on the command of the officer in charge of the firing line.

b. Set your elevation scale at 200 yards and your windage scale at zero and record the 200 in the first three spaces in the elevation column on the score card. As there is a wind blowing in this sample problem, you must determine the number of clicks of windage necessary to compensate for the wind before you fire. Assume that a 20 mile-per-hour wind is blowing from 3 o'clock. Using the wind rule ( $\frac{RV}{40}$ ) you find that you need 1 click of right windage. Set your sights accordingly and record 1R in the first three spaces in the column head WIND as shown in figure 151 ②. In the first space under the column headed REMARKS write *zeroing—prone* (fig. 151 ②).

c. As you fire the shots of your first group, call each shot at the moment of firing (par. 120).

The call is the sight picture you saw as your weapon fired, not what you intended to fire. Record each call by placing a dot in the square with the circle representing the bull's eye in the CALL column. After the third shot, clear your automatic rifle and wait for the target to be marked. Look at your target and notice the exact location of the three spotters. Plot these shots on the recording target of your score card in the exact location as they appear on the target (fig. 151 ②).



②

Figure 151—Continued.

d. Examine your shot group and determine how far you must move the center of the shot group for it to be in the center of the bull's eye. By using the dimensions of the target (par. 163) or the elevation and windage lines on the score card, determine how many clicks of elevation and windage you need. In this assumed situation, you determine that you need 2 more clicks of elevation, and 2½ more clicks of right windage making

a total of  $3\frac{1}{2}$  clicks of right windage. Enter this on the score card in the space provided for the next three shots as shown in figure 151 ② (Elevation  $200 + 2$  and Wind  $3\frac{1}{2}R$ ).

e. While you were making and recording these sight changes, the target was pulled, pasted and run back up for you to fire the next shot group. After you have fired this shot group and called and marked each shot on your score card (as shown in figure 151 ②) again determine what sight changes you need to make to hit the center of the bull's eye (*d* above). Subtract or add these changes to the elevation and windage of your automatic rifle. Record the new change on the score card as shown in figure 151 ②. Assume you flinched on your seventh shot, therefore enter *flinched* under the remarks column (fig. 151 ②).

f. The target has again been pulled, pasted, and run back up for you to fire your third and last shot group. Call and enter each shot on your score card (fig. 151 ②). When you have fired your ninth and last shot, write *last shot* under the REMARKS column in the space provided for the last shot as shown in figure 151 ②.

g. Clear your automatic rifle. The target is again marked and you enter the values of these shots on your score card. Total the score and enter it in the space provided as shown in figure 151 ②.

h. You should now have the zero of your automatic rifle when a 20 mile-per-hour wind is blowing from 3 o'clock. To get the zero of the automatic rifle when no wind is blowing, subtract one

click of right windage from  $2\frac{1}{2}$ R, which is the total windage you now have. One click of right windage was the change that you made when you determined the velocity and direction of the wind (par. 129). What you have left,  $1\frac{1}{2}$ R, is the zero windage of your automatic rifle. The zero elevation of your weapon for 200 yards is 200 yards + 1. Record the zero windage and zero elevation as shown in figure 151 ②.

*i.* Record information for other known distance firing and for 1,000-inch firing in the same way as described for 200 yards. The only exception is that the effect of a change in elevation or windage varies for different ranges (par. 126).

### 133. EXAMINATION

*a. General.* You will be tested when you complete the five steps of preparatory marksmanship training. This test will indicate how much you have learned. If you do not pass this preparatory marksmanship test, you should not proceed to the range for firing until you receive additional instruction in those steps of training in which the examination shows you are weak. The examination is given well before range firing to allow for additional instruction if needed and includes questions on each of the first five steps. Some questions may be answered in a few simple words. For other questions, a demonstrator may perform an exercise and you will be required to critique certain parts of his performance. For still other questions you may be told to demonstrate a posi-

tion or perhaps some of the exercises that you learned in preparatory marksmanship training.

*b. Sample Questions.* The following list of questions covers the instruction presented in training. You should be able to answer all of these questions.

Q. What is the name of your weapon?

A. The Browning automatic rifle, caliber .30, M1918A2.

Q. What type weapon is it?

A. A shoulder weapon, gas operated, air cooled, magazine fed, fully automatic, and equipped with an adjustable bipod.

Q. How is the barrel cooled?

A. The barrel is cooled by being exposed to the air. There is no special cooling device.

Q. What is meant by "gas operated"?

A. All the functions of the automatic rifle, such as extraction and ejection, are accomplished by a small portion of the gas escaping through a gas port in the barrel. The powder gases strike the piston which forces the parts to the rear causing the weapon to function.

Q. What is the maximum number of rounds the magazine will hold?

A. Twenty.

Q. What care must be taken of the magazines?

A. They must be kept clean and oiled. To prevent oil getting on the ammunition, only a very light film of oil should be kept on the inside of the magazine. The magazines must not be damaged in any way.

Q. How are the magazines filled?

A. By using the magazine filler or by hand. Normally they are loaded by hand.

Q. Why should the spare parts kit be carried complete at all times?

A. Because it contains equipment which is necessary to keep the automatic rifle in action.

Q. What is the first thing to do in case of a stoppage?

A. Apply the first phase of immediate action.

Q. What is the next thing to do in case you have tried to fire again and the automatic rifle still fails to fire.

A. Apply the second phase of immediate action.

Q. What are the two main causes of the automatic rifle firing a single shot after the first phase of immediate action has been applied?

A. Insufficient gas and magazine trouble.

Q. What usually causes a failure to feed?

A. Magazine trouble.

Q. How can you tell when the automatic rifle is receiving insufficient gas?

A. The automatic rifle will fire but the bolt will not go all the way to the rear. Usually the empty cartridge case is not ejected and is wedged in the ejection opening as the operating parts move forward.

Q. What is meant by sight alinement?

A. The proper positioning of the front sight post in relation to the peep or notch of the rear sight.

Q. Explain correct sight alinement.

A. You have correct sight alinement when the top of the front sight blade touches an imaginary horizontal line through the center of the peep sight and when an imaginary vertical line through the center of the peep sight divides the front sight in half.

Q. How do you obtain the correct sight picture?

A. Add the bull's eye to the correct sight alinement so that the bottom of the bull's eye just touches the center of the top of the front sight.

Q. What is the purpose of the sighting and aiming bar?

A. To teach the automatic rifleman how to aim.

Q. Why is the sighting and aiming bar better than an automatic rifle for this purpose?

A. Because the sights on it are much larger and slight errors can be easily seen and pointed out.

Q. What is the purpose of the eyepiece?

A. To cause the automatic rifleman to place his eye in such a position that he will see the sights in the same way that the coach sees them.

Q. Where is the last focus of the eye when aiming the automatic rifle?

A. On the front sight.

Q. Demonstrate the proper sight picture by using the sighting bar.

A. (The man being examined adjusts the movable rear sight and bull's eye so that the sights are correctly alined on the target and then hands it to the instructor to be checked.)

Q. How do you hold the breath while aiming and firing?

A. Take in an ordinary breath, let out a little; and then, by closing the throat, hold the remainder while aiming and pressing the trigger.

Q. What is the best position from which to fire the automatic rifle?

A. The prone position, using the hinged butt plate and the bipod.

Q. Why is the sling used with the automatic rifle in the sitting and kneeling positions?

A. To assist the automatic rifleman in holding the rifle steady.

Q. How do you press the trigger in firing bursts at the slow cyclic rate?

A. Press the trigger rapidly but uniformly all the way to the rear. Hold the trigger to the rear for the desired length of burst.

Q. In firing, what care must be taken with reference to your sight alinement?

A. You must be careful to keep your sights alined correctly on the target from the time you start to press the trigger until the cartridge is fired, being particularly careful to do this while the bolt is going forward.

Q. How do you insure that each shot, after the first shot of the burst, hits the target?

A. To insure that succeeding shots of the burst will hit the target, take correct position and hold the rifle steady throughout the burst.

Q. Is it necessary to take a long time in pressing the trigger?

A. No; necessary speed is developed by practice in trigger manipulation.

Q. How do you press the trigger in firing single shots?

A. Press it quickly but uniformly all the way to the rear and then release it immediately.

Q. In firing several bursts, how do you gain time so as not to be compelled to hurry in aiming?

A. By changing magazines rapidly and by keeping your eye on the target while firing.

Q. How does keeping your eye on the target help you to gain time?

A. A man who looks away loses time in finding his target again.

Q. Is it important to always get into the correct position before beginning to shoot?

A. Yes; even though it takes more time, you should always get into the correct position before beginning to shoot. Your shots will be more accurate if your position is correct.

Q. What is meant by calling the shot?

A. The automatic rifleman announces where he thinks the bullets hit when firing single shots and where the first round hit when firing bursts.

Q. How can you do this?

A. By concentrating your attention on the sight alinement and sight picture as you press the trigger.

Q. What effect does moving the rear sight have on the shot?

A. It moves the shot in the same direction that the rear sight has been moved.

Q. If you want to make a shot hit higher, what do you do?

A. Increase (raise) the setting on the rear sight.

Q. If you want to make your shots hit to the right, what do you do?

A. Move the rear sight to the right.

Q. If you move your rear sight one click of windage, how much will it move the strike of the bullet?

A. Four inches for each 100 yards of range.

Q. What are the three principal uses of the score card?

A. To keep an accurate record of where each of the shots hit the target, to indicate how much change in the sight is necessary to move a shot or group of shots to the center of the target, and to make a record of the sight settings of the automatic rifle for the different ranges under various conditions so that you will know the zero of your automatic rifle.

Q. In firing at ranges up to and including 500 yards, what is the only weather condition for which you make sight corrections?

A. Wind.

Q. What four things do you do in cleaning an automatic rifle bore after it has been fired?

A. First, remove the powder fouling from the bore. Second, dry the bore thoroughly of the liquid used to remove the fouling. Third, inspect the bore, repeating the cleaning if necessary. Fourth, oil the bore.

Q. How do you remove powder fouling from the bore?

A. By swabbing it thoroughly with patches saturated with bore cleaner. In the absence of bore cleaner, use warm soapy water.

Q. How do you dry the bore?

A. By running clean patches through the bore until one comes out dry.

Q. How do you protect the bore from rust?

A. By swabbing it thoroughly with a cleaning patch dampened with oil.

Q. How should the metal parts of the automatic rifle be oiled?

A. By using an oily cloth to place a thin film of oil over all metal parts.

In addition to answering questions similar to those already given, you may be required to demonstrate your ability to assume the correct firing positions, change magazine, manipulate the trigger, and to make sight changes.

*c. Scoring Sheet.* A scoring sheet like the one shown below can be used as a guide in examining and grading practical work questions. Notice that a space is provided for a reexamination.

| Subject                    | Examination  |                | Reexamination |                |
|----------------------------|--------------|----------------|---------------|----------------|
|                            | Satisfactory | Unsatisfactory | Satisfactory  | Unsatisfactory |
| 1 Mechanical training      |              |                |               |                |
| 2 Functioning              |              |                |               |                |
| 3 Care and cleaning        |              |                |               |                |
| 4 Sighting bar             |              |                |               |                |
| 5 Shot group exercises     |              |                |               |                |
| 6 Loop and hasty sling     |              |                |               |                |
| 7 Positions                |              |                |               |                |
| 8 Trigger manipulation     |              |                |               |                |
| 9 Loading magazine in belt |              |                |               |                |

| Subject                             | Examination  |                | Reexamination |                |
|-------------------------------------|--------------|----------------|---------------|----------------|
|                                     | Satisfactory | Unsatisfactory | Satisfactory  | Unsatisfactory |
| 10 Loading initial magazine         |              |                |               |                |
| 11 Changing magazines               |              |                |               |                |
| 12 Clearing the rifle               |              |                |               |                |
| 13 Stoppages                        |              |                |               |                |
| 14 Immediate action, first phase    |              |                |               |                |
| 15 Immediate action, second phase   |              |                |               |                |
| 16 Sight changes and effect of wind |              |                |               |                |
| 17 Score card                       |              |                |               |                |

## Section III. COURSES AND SCORE CARDS

### 134. GENERAL

*a.* Current regulations authorize each officer, warrant officer, and enlisted man in the army to fire a qualification course with his basic weapon and a familiarization course with other weapons. There are five automatic rifle qualification courses—a standard course and four shorter courses. The different courses are set up so that the special marksmanship training needs of men in all kinds and types of units can be taken care of.

*b.* Each complete course is made up of a series of numbered tables that you fire in order. Each table is a concise statement of conditions (range, rate of fire, time allowance, and targets) under which you fire a prescribed number of the rounds authorized for the course.

*c.* The amount of instruction firing is not limited to that prescribed in the tables. Additional practice may be given when time and ammunition allowances permit. No automatic rifleman is permitted to fire automatic fire until he has demonstrated proficiency in slow fire.

*d.* Although the 1,000-inch range does not appear in the tables for the A, B, and C courses, it can be used to advantage during instruction firing. When time or men for target operation is limited, the 1,000-inch range should be used for the initial phase of instruction practice. At this range, you become accustomed to the noise and recoil of the automatic rifle as you perfect your positions, trigger manipulation, aiming, and ability to change magazines quickly. Having zeroed your

automatic rifle at 1,000-inches, you can use this zero as a basis for zeroing your automatic rifle at the longer ranges. You can learn all basic elements of marksmanship by firing on the 1,000-inch range. Pit details and telephone operators are not needed, as each hit is visible to the firer. The 1,000-inch target (par. 163) is used for all firing conducted on the 1,000-inch range. The rifle B target (par. 163) is used for all known distance range firing.

*e.* In all courses where single shots are to be fired *for zeroing purposes*, the cartridges are loaded into the weapon one at a time. In all other cases where single shots are to be fired, the specified number of cartridges is loaded into the magazine and you attempt to fire single shots.

### 135. STANDARD COURSE

*a. General.* The standard course consists of eight tables. It is designed to teach you the fundamentals of precision firing with the automatic rifle and the use of the battle sight setting (zero on your automatic rifle at 300 yards) in firing at field targets at various, unannounced ranges. When you complete the standard course you are qualified to advance to the team phase of automatic rifle training. The standard course includes known distance firing and transition firing. This course is designed to more adequately prepare you for combat type firing.

*b. Known Distance Firing.* The known distance portion of the standard course consists of five tables. These tables are designed to teach you how to fire your automatic rifle accurately

from known distances at a target. All principles of automatic rifle marksmanship as taught during preparatory marksmanship training are applied during this firing. Instruction practice consists of firing tables I, II, and III at least once. Record firing consists of firing tables IV and V only once.

*c. Transition Firing.* The transition firing part of the course includes firing at field targets from combat type positions (from roof tops and through windows) as well as firing from the crouch position at surprise targets from short ranges. It is preceded by preliminary marksmanship training in the theory and use of the battle sight at ranges up to 400 yards. Instruction is also given in the use of the aiming point and in range estimation. While firing table VI, you become familiar with the appearance of targets and the distance to them at various ranges. Before you fire table VII, you receive instruction in firing from combat positions without using the sling (FM 23-5), and you are not permitted to fire tables VII and VIII until after you have demonstrated your ability in firing table VI. Instruction firing consists of firing tables VI, VII, and VIII at least once. Record practice consists of firing tables VII and VIII only once.

*d. Qualification Scores.* The total of your record firing scores for tables IV, V, VII and VIII determines your classification as an automatic rifleman. The minimum standard course qualifying scores for the three classifications are:

- (1) Expert automatic rifleman 350 points.
- (2) Automatic rifle sharpshooter 310 points.
- (3) Automatic rifle marksman 270 points.

Table I. Standard course, instruction firing, 1000-inch

| Range<br>(in.) | Time             | Rounds | Target<br>1,000-inch | Position          | Remarks  |
|----------------|------------------|--------|----------------------|-------------------|--|
| 1,000          | No time limit..  | 9      | Fig. 1.....          | Prone, bipod..... | Single shot for zero.  |
| 1,000          | 2 min., 15 sec.. | 40     | Fig. 5 to fig. 6.... | .....do.....      | Search and traverse, 8 magazines of 5 rounds<br>each, in bursts of 2 or 3 rounds.  |
| 1,000          | 1 min., 25 sec.. | 40     | Fig. 7 to fig. 8.... | .....do.....      | Search and traverse, 2 magazines of 20 rounds<br>each, in bursts of 2 or 3 rounds. |
| 1,000          | 20 sec.....      | 15     | Fig. 4.....          | .....do.....      | 1 magazine of 15 rounds in bursts of 4 or 5 rounds.                                |
| 1,000          | No time limit..  | 5      | Fig. 2.....          | Kneeling.....     | Loop or hasty sling. Single shot.  |
| 1,000          | do.....          | 5      | Fig. 3.....          | Sitting.....      | Do.  |

## Scoring Notes.

1. 5 points for hitting each figure within the outer ring.
2. 1 point for each hit within the outer ring of each figure within these maximum limits: 9 hits for figure 1; 15 hits for figure 4; 5 hits for each other figure.

Table II. Standard course, instruction firing, known distance slow fire

| Range (yd.) | Time           | Rounds | Target       | Position               | Remarks               |
|-------------|----------------|--------|--------------|------------------------|-----------------------|
| 200         | No time limit. | 9      | B.....       | Prone, with bipod..... | Single shot for zero. |
| 300         | .....do.....   | 9      | .....do..... | .....do.....           | Do.                   |
| 500         | .....do.....   | 9      | .....do..... | .....do.....           | Do.                   |

Table III. Standard course, instruction firing, known distance, automatic fire

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks  |
|-------------|-------------|--------|--------------|------------------------|--|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.  |
| 500         | 25 sec..... | 10     | .....do..... | .....do.....           | 1 magazine of 10 rounds in bursts of 2 or 3 rounds.      |

Table IV. Standard course, record firing, known distance slow fire

| Range (yd.) | Time           | Rounds | Target       | Position               | Remarks      |
|-------------|----------------|--------|--------------|------------------------|--------------|
| 200         | No time limit. | 5      | B.....       | Prone, with bipod..... | Single shot. |
| 500         | .....do.....   | 5      | .....do..... | .....do.....           | Do.          |

Table V. Standard course, record firing, known distance, automatic fire

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks  |
|-------------|-------------|--------|--------------|------------------------|--|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.  |
| 500         | 25 sec..... | 10     | .....do..... | .....do.....           | 1 magazine of 10 rounds in bursts of 2 or 3 rounds.      |

Table VI. Standard course, preliminary instruction for transition firing

| Range (yd.) | Time            | Rounds | Position           | Silhouette target | Remarks   |
|-------------|-----------------|--------|--------------------|-------------------|---|
| 300         | No time limit.. | 6      | Prone with bipod.. | No. 1.....        | Single shot.  |
| 300         | ...do.....      | 10     | ...do.....         | No. 2.....        | 1 magazine of 10 rounds in bursts of 2 or 3 rounds. |
| 200         | ...do.....      | 6      | ...do.....         | No. 1.....        | Single shot.  |
| 200         | ...do.....      | 10     | ...do.....         | No. 2.....        | 1 magazine of 10 rounds in bursts of 2 or 3 rounds. |
| 400         | ...do.....      | 6      | ...do.....         | No. 1.....        | Single shot.  |
| 400         | ...do.....      | 10     | ...do.....         | No. 2.....        | 1 magazine of 10 rounds in bursts of 2 or 3 rounds. |

Notes.

1. Two 3-round shot groups are fired single shot on silhouette No. 1. Firing at silhouette No. 2 is done in short bursts of 2 or 3 rounds. The target is pulled and marked after each burst. See paragraphs 140 and 218 for a detailed discussion of table VI.
2. For target arrangement see figure 164.
3. Table VI is not scored.

Table VII. Standard course, instruction and record firing, transition firing

| Lane | Range (yd.)           | Time   | Total rounds | Targets  | Remarks   |
|------|-----------------------|--|--------------|--|---|
| 1    | 150 to 400.....       | 7 seconds per silhouette..                             | 20           | 4 type E silhouettes.....                                  | 1 magazine of 20 rounds in bursts of 2 or 3 rounds.       |
| 2    | 200 to 300 and 400..  | 20 seconds per target.....                             | 40           | 2 targets, each target consisting of 3 machine gun panels. | 2 magazines of 20 rounds each in bursts of 2 or 3 rounds. |
| 3    | 150, 250, and 500.... | 8 seconds each moving target; 10 seconds for B target. | 20           | 2 moving targets (E silhouettes) and one B target.         | 1 magazine of 20 rounds in bursts of 2 or 3 rounds.       |

Notes.

1. See paragraphs 140 and 219 for the arrangement of lanes and targets and the procedure for firing table VII.
2. The two moving targets in lane 3 move in opposite directions.
3. This table is fired at least once for instruction, but once only for record.

|             |  |
|-------------|--|
| 4. Scoring— |  |
| a.          | Lane No. 1:  |
|             | Each silhouette hit . . . . .                                    |
|             | Each hit up to 5 in each silhouette . . . . .                    |
|             | Total possible score, lane 1 . . . . .                           |
|             | 5 points   |
|             | 1 point  |
|             | 40 points  |
| b.          | Lane No. 2:  |
|             | Each panel hit in a target . . . . .                             |
|             | Each hit up to 6 in each panel . . . . .                         |
|             | Total possible score, lane 2 . . . . .                           |
|             | 5 points   |
|             | 1 point  |
|             | 66 points  |
| c.          | Lane No. 3:  |
|             | Each moving target hit . . . . .                                 |
|             | Each hit up to six (maximum) on moving target . . . . .          |
|             | Hitting B target within 3 ring . . . . .                         |
|             | Each hit up to six (maximum) on B target within 3 ring . . . . . |
|             | Total possible score, lane 3 . . . . .                           |
|             | 5 points   |
|             | 1 point  |
|             | 5 points   |
|             | 1 point  |
|             | 33 points  |
| d.          | Ricochets are counted as hits in all lanes.                      |
| e.          | Points are not given for unexpended rounds in any lane.          |
| f.          | Total possible score, table VII . . . . .                        |
|             | 139 points   |

Table VIII. Standard course, instruction and record firing, quick fire

| Phase line | Range (yd.)    | Time  | Total rounds | Targets                           | Remarks   |
|------------|----------------|---|--------------|-----------------------------------|---|
| 1          | 30 to 60.....  | 3 seconds per double silhouette.                            | 20           | 4 sets of double E silhouettes... | 1 magazine of 20 rounds in bursts of 2 or 3 rounds. |
| 2          | 30 to 70.....  | 4 seconds per triple silhouette..                           | 20           | 3 sets of triple E silhouettes... | Do.   |
| 3          | 40 to 340..... | 6 seconds per targets 8 and 9.<br>20 seconds for target 10. | 20           | .....do.....                      | Do.   |

## Notes.

1. See paragraphs 140 and 220 for the arrangement of lanes and targets and the procedure for firing table VIII.
2. The number of lanes used is covered by local terrain and safety considerations.
3. This table is fired at least once for instruction, but once only for record.
4. Scoring.
 

|    |  |            |
|----|--|------------|
| a. | Each target hit .....  | 5 points   |
| b. | Each hit up to five hits in targets 1, 2, 3, and 4 .....       | 1 point    |
| c. | Each hit up to six hits in targets 5, 6, 7, 8, 9, and 10 ..... | 1 point    |
| d. | Total possible score, table VIII .....                         | 106 points |
- e. Ricochets are counted as hits.
- f. Points are not given for unexpended rounds.

## 136. COURSE A

a. *General.* Course A consists of four tables and is fired when the range facilities required for the standard course are not available. The instruction firing outlined in tables I and II is advisory only.

b. *Qualification Scores.* The total of your table III and table IV record scores determines your classification as an automatic rifleman. The minimum course A qualifying scores for the three classifications are:

- (1) Expert automatic rifleman 200 points
- (2) Automatic rifle sharp-shooter . . . . . 175 points
- (3) Automatic rifle marksman 140 points

Table I. Course A, instruction firing, known distance slow fire

| Range (yd.) | Time               | Rounds | Target  | Position               | Remarks                           |
|-------------|--------------------|--------|---------|------------------------|-----------------------------------|
| 200         | No time limit..... | 9      | B.....  | Prone, with bipod..... | Single shot for zero.             |
| 200         | do.....            | 5      | do..... | Kneeling.....          | Single shot, loop or hasty sling. |
| 200         | do.....            | 5      | do..... | Sitting.....           | Do.                               |
| 300         | do.....            | 9      | do..... | Prone, with bipod..... | Single shot for zero.             |
| 500         | do.....            | 9      | do..... | do.....                | Do.                               |

Table II. Course A, instruction firing, known distance, automatic fire

| Range (yd.) | Time        | Rounds | Target  | Position               | Remarks  |
|-------------|-------------|--------|---------|------------------------|--|
| 200         | 40 sec..... | 15     | B.....  | Prone, with bipod..... | 3 magazines of 5 rounds each in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | do..... | do.....                | Do.  |
| 500         | 25 sec..... | 10     | do..... | do.....                | 1 magazine of 10 rounds, in bursts of 2 or 3 rounds.     |

Table III. Course A, record firing, known distance, slow fire

| Range (yd.) | Time               | Rounds | Target       | Position               | Remarks      |
|-------------|--------------------|--------|--------------|------------------------|--------------|
| 200         | No time limit..... | 5      | B.....       | Prone, with bipod..... | Single shot. |
| 500         | .....do.....       | 5      | .....do..... | .....do.....           | Do.          |

Table IV. Course A, record firing, known distance, automatic fire

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks   |
|-------------|-------------|--------|--------------|------------------------|---|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each, in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.   |
| 500         | 25 sec..... | 10     | .....do..... | .....do.....           | 1 magazine of 10 rounds in bursts of 2 or 3 rounds.       |

## 137. COURSE B

*a. General.* Course B consists of four tables and is fired when the range facilities for the standard course and course A are not available. The firing outlined in tables I and II is advisory only.

*b. Qualification Scores.* The total of your table III and table IV record scores determines your qualification as an automatic rifleman. The minimum course B qualifying scores for the three classifications are:

- (1) Expert automatic rifleman 145 points
- (2) Automatic rifle sharp-shooter . . . . . 125 points
- (3) Automatic rifle marksman 96 points

Table I. Course B, instruction firing known distance slow fire

| Range (yd.) | Time               | Rounds | Target       | Position               | Remarks                           |
|-------------|--------------------|--------|--------------|------------------------|-----------------------------------|
| 200         | No time limit..... | 9      | B.....       | Prone, with bipod..... | Single shot for zero.             |
| 200         | .....do.....       | 5      | .....do..... | Kneeling.....          | Single shot. Loop or hasty sling. |
| 200         | .....do.....       | 5      | .....do..... | Sitting.....           | Do                                |
| 300         | .....do.....       | 9      | .....do..... | Prone, with bipod..... | Single shot for zero.             |

Table II. Course B, instruction firing known distance automatic fire

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks  |
|-------------|-------------|--------|--------------|------------------------|--|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.  |

*Table III. Course B, record firing known distance slow fire*

| Range (yd.) | Time               | Rounds | Target | Position               | Remarks      |
|-------------|--------------------|--------|--------|------------------------|--------------|
| 200         | No time limit..... | 5      | B..... | Prone, with bipod..... | Single shot. |

*Table IV. Course B, record firing known distance automatic fire*

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks   |
|-------------|-------------|--------|--------------|------------------------|---|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each, in bursts of 2 or 3 rounds. |
| 300         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.   |

## 138. COURSE C

a. *General.* Course C consists of four tables and is fired when the range facilities are not adequate for the standard or the A or B courses. The instruction firing outlined in tables I and II is advisory only.

b. *Qualification Scores.* The total of your table III and IV record scores determines your qualification as an automatic rifleman. The minimum course C qualifying scores for the three classifications are:

- (1) Expert automatic rifleman 175 points
- (2) Automatic rifle sharp-shooter ..... 150 points
- (3) Automatic rifle marksman 125 points

*Table I. Course C, instruction firing known distance slow fire*

| Range (yd.) | Time               | Rounds | Target  | Position               | Remarks                           |
|-------------|--------------------|--------|---------|------------------------|-----------------------------------|
| 200         | No time limit..... | 9      | B.....  | Prone, with bipod..... | Single shot for zero.             |
| 200         | do.....            | 5      | do..... | Kneeling.....          | Single shot, loop or hasty sling. |
| 200         | do.....            | 5      | do..... | Sitting.....           | Do.                               |

*Table II. Course C, instruction firing known distance automatic fire*

| Range (yd.) | Time        | Rounds | Target | Position               | Remarks   |
|-------------|-------------|--------|--------|------------------------|---|
| 200         | 40 sec..... | 15     | B..... | Prone, with bipod..... | 3 magazines of 5 rounds each, in bursts of 2 or 3 rounds. |

Table III. Course C, record firing, known distance slow fire

| Range (yd.) | Time               | Rounds | Target       | Position               | Remarks                           |
|-------------|--------------------|--------|--------------|------------------------|-----------------------------------|
| 200         | No time limit..... | 5      | B.....       | Prone, with bipod..... | Single shot.                      |
| 200         | .....do.....       | 5      | .....do..... | Kneeling.....          | Single shot. Loop or hasty sling. |

Table IV. Course C, record firing, known distance automatic fire

| Range (yd.) | Time        | Rounds | Target | Position               | Remarks   |
|-------------|-------------|--------|--------|------------------------|---|
| 200         | 40 sec..... | 15     | B..... | Prone, with bipod..... | 3 magazines of 5 rounds each, in bursts of 2 or 3 rounds. |

## 139. COURSE D

a. *General.* Course D consists of two tables and is fired when range facilities required for the standard or the A, B, or C courses are not available or when training time and the availability of ammunition permit 1000-inch firing before instruction firing of the A, B, or C courses. The instruction firing outlined in table I is advisory only.

b. *Qualification Scores.* Your table II record practice score determines your qualification as an automatic rifleman. The minimum qualifying scores for the three classifications are:

- (1) Expert automatic rifleman 165 points
- (2) Automatic rifle sharp  
shooter . . . . . 155 points
- (3) Automatic rifle marksman 120 points

Table I. Course D, instruction firing, 1000-inch slow and automatic fire

| Range (inches) | Time                | Rounds | Target (1,000-inch)  | Position               | Remarks   |
|----------------|---------------------|--------|----------------------|------------------------|---|
| 1,000          | No time limit.....  | 9      | Fig. 1.....          | Prone, with bipod..... | Single shot for zero.   |
| 1,000          | 2 min., 15 sec..... | 40     | Fig. 5 to fig. 6.... | .....do.....           | Search and traverse, 8 magazines of 5 rounds each, in bursts of 2 or 3 rounds.  |
| 1,000          | 1 min., 25 sec..... | 40     | Fig. 7 to fig. 8.... | .....do.....           | Search and traverse, 2 magazines of 20 rounds each, in bursts of 2 or 3 rounds. |
| 1,000          | 20 sec.....         | 15     | Fig. 4.....          | .....do.....           | One magazine of 15 rounds in bursts of 4 or 5 rounds.                           |
| 1,000          | No time limit.....  | 5      | Fig. 2.....          | Sitting.....           | Single shot. Loop or hasty sling.   |
| 1,000          | .....do.....        | 5      | Fig. 3.....          | Kneeling.....          | Do.   |

Table II. Course D, record firing, 1000-inch slow and automatic fire

| Range<br>(inches) | Time                 | Rounds | Target<br>(1,000-inch) | Position                | Remarks   |
|-------------------|----------------------|--------|------------------------|-------------------------|---|
| 1,000             | No time limit. ....  | 5      | Fig. 1. ....           | Prone, with bipod. .... | Single shot.  |
| 1,000             | 2 min., 15 sec. .... | 40     | Fig. 4 to fig. 5. .... | do. ....                | Search and traverse, 8 magazines of 5 rounds each, in bursts of 2 or 3 rounds.  |
| 1,000             | 1 min., 25 sec. .... | 40     | Fig. 7 to fig. 8. .... | do. ....                | Search and traverse, 2 magazines of 20 rounds each, in bursts of 2 or 3 rounds. |
| 1,000             | 20 sec. ....         | 15     | Fig. 4. ....           | do. ....                | 1 magazine of 15 rounds, in bursts of 4 or 5 rounds.                            |
| 1,000             | No time limit. ....  | 5      | Fig. 2. ....           | Sitting. ....           | Loop or hasty sling. Single shot.   |
| 1,000             | do. ....             | 5      | Fig. 3. ....           | Kneeling. ....          | Do.   |

## 140. TRANSITION FIRING—COURSES A, B, C, AND D

*a.* Transition tables VII and VIII of the standard course may be fired in courses A, B, C, and D. Where range facilities are not available, two alternate transition tables may be fired in lieu of tables VII and VIII. Table VI of the standard course should be fired in all courses if range facilities are available.

*b.* While alternate tables I and II are not fired for qualification, the automatic rifleman should attain a satisfactory score as indicated for each table. Those men not attaining a satisfactory score should be required to fire until they do, providing time and ammunition allowances permit.

*c.* Alternate transition firing is conducted on the known distance range and transition firing ranges according to the procedure explained in FM 23-5. The alternate transition tables are fired after known distance record practice and before firing combat exercises. The exercises are preceded by instruction in range estimation and aiming point.

Table I. Alternate transition firing

| Range<br>(yds.) | Time<br>(secs.) | Rounds | Target*         | Position          | Remarks             |
|-----------------|-----------------|--------|-----------------|-------------------|---------------------|
| 200             | 60              | 10     | 3 E silhouettes | Prone, with bipod | Bursts of 2 rounds. |
| 300             | 60              | 10     | do.             | do.               | Do.                 |
| 500             | 60              | 10     | do.             | do.               | Do.                 |

\*Targets should be approximately 5 yards apart and as near the prescribed range as the terrain permits.

#### Scoring notes.

For each target hit . . . . . 1 point  
 For each two unexpended rounds not exceeding four rounds, if all targets are hit  
 (at each range) . . . . . 1 point  
 Total possible score for table I . . . . . 15 points  
 Satisfactory score for table I . . . . . 8 points  
 If an odd number of unexpended rounds remain in tables I and II, the next lower  
 (even) number is used in computing the score.

Table II. Alternate transition firing

| Range (yds.) | Time (secs.) | Rounds | Target*              | Position               | Remarks            |
|--------------|--------------|--------|----------------------|------------------------|--------------------|
| .....        | 120          | 20     | 6 E silhouettes..... | Prone, with bipod..... | Burst of 2 rounds. |

\*Two targets between ranges of 200 and 300 yards, two targets between 300 and 400 yards, and two between 400 and 500 yards. Each pair of targets will be staggered and separated in depth from 25 to 50 yards.

Scoring notes.

- Each target hit between 200 and 300 yards ..... 1 point
- Each target hit between 300 and 400 yards ..... 2 points
- Each target hit between 400 and 500 yards ..... 3 points
- Each two unexpended rounds, not exceeding eight rounds, if all targets are hit ..... 3 points
- Total possible score, alternate table II ..... 24 points
- Satisfactory score, alternate table II ..... 12 points

If an odd number of unexpended rounds remain in alternate tables I and II, the next lower (even) number is used in computing the score.

## 141. FAMILIARIZATION COURSE

Five hours of preliminary instruction are prescribed for those men (other than automatic riflemen) who are required to familiarize themselves with the automatic rifle. The familiarization course is fired on the 200-yard known distance range. The course score is the total value of all target hits.

*Table I. Familiarization course, known distance slow fire*

| Range (yd.) | Time               | Rounds | Target       | Position               | Remarks      |
|-------------|--------------------|--------|--------------|------------------------|--------------|
| 200         | No time limit..... | 5      | Rifle B..... | Prone, with bipod..... | Single shot. |

*Table II. Familiarization course, known distance automatic fire*

| Range (yd.) | Time        | Rounds | Target       | Position               | Remarks   |
|-------------|-------------|--------|--------------|------------------------|---|
| 200         | 40 sec..... | 15     | B.....       | Prone, with bipod..... | 3 magazines of 5 rounds each, in bursts of 2 or 3 rounds. |
| 200         | 40 sec..... | 15     | .....do..... | .....do.....           | Do.   |



| 200 YARDS                 |         |    |      |      |      |           |                           |  |  |
|---------------------------|---------|----|------|------|------|-----------|---------------------------|--|--|
| HOUR                      | DATE    | NO | EL   | WIND | CALL | REMARKS   | VAL                       |  |  |
| 0800                      | 7/17/57 | 1  | 2000 | Z R  | 0    | PRONE     | 5                         |  |  |
| 2                         |         | 2  | 2000 | Z R  | 0    |           | 5                         |  |  |
| 3                         |         | 3  | 2000 | Z R  | 0    | CALLED    | 5                         |  |  |
| 4                         |         | 4  | 2000 | Z R  | 0    |           | 5                         |  |  |
| 5                         |         | 5  | 2000 | Z R  | 0    | LAST SHOT | 5                         |  |  |
| WIND VEL 20 COMPUTATION   |         |    |      |      |      |           | TOTAL 24                  |  |  |
| WEATHER COOL LIGHT BREEZY |         |    |      |      |      |           |                           |  |  |
| COMPUTATION 20 * 20 = 400 |         |    |      |      |      |           |                           |  |  |
| CLICK RIGHT 20            |         |    |      |      |      |           |                           |  |  |
| ZERO EL 2000 WIND 1 R     |         |    |      |      |      |           | TOTAL 24                  |  |  |
| 200 OR 300 YARDS          |         |    |      |      |      |           |                           |  |  |
| HOUR                      | DATE    | NO | EL   | WIND | CALL | REMARKS   | VAL                       |  |  |
| 3                         |         | 1  | 2000 | Z R  | 0    |           |                           |  |  |
| 4                         |         | 2  | 2000 | Z R  | 0    |           |                           |  |  |
| 5                         |         | 3  | 2000 | Z R  | 0    |           |                           |  |  |
| 6                         |         | 4  | 2000 | Z R  | 0    |           |                           |  |  |
| 7                         |         | 5  | 2000 | Z R  | 0    |           |                           |  |  |
| WIND VEL 20 COMPUTATION   |         |    |      |      |      |           | TOTAL                     |  |  |
| WEATHER COOL LIGHT BREEZY |         |    |      |      |      |           |                           |  |  |
| COMPUTATION 20 * 20 = 400 |         |    |      |      |      |           |                           |  |  |
| CLICK RIGHT 20            |         |    |      |      |      |           |                           |  |  |
| ZERO EL 2000 WIND 1 R     |         |    |      |      |      |           | TOTAL                     |  |  |
| 500 YARDS                 |         |    |      |      |      |           |                           |  |  |
| HOUR                      | DATE    | NO | EL   | WIND | CALL | REMARKS   | VAL <td colspan="2"></td> |  |  |
| 1000                      | 7/17/57 | 1  | 5000 | Z R  | 0    | PRONE     | 5                         |  |  |
| 2                         |         | 2  | 5000 | Z R  | 0    |           | 5                         |  |  |
| 3                         |         | 3  | 5000 | Z R  | 0    | FINISHED  | 3                         |  |  |
| 4                         |         | 4  | 5000 | Z R  | 0    | CALLED    | 4                         |  |  |
| 5                         |         | 5  | 5000 | Z R  | 0    | LAST SHOT | 5                         |  |  |
| WIND VEL 20 COMPUTATION   |         |    |      |      |      |           | TOTAL 22                  |  |  |
| WEATHER COOL LIGHT BREEZY |         |    |      |      |      |           |                           |  |  |
| COMPUTATION 20 * 20 = 400 |         |    |      |      |      |           |                           |  |  |
| CLICK RIGHT 20            |         |    |      |      |      |           |                           |  |  |
| ZERO EL 5000 WIND 1 R     |         |    |      |      |      |           | TOTAL 22                  |  |  |
| 300 YARDS                 |         |    |      |      |      |           |                           |  |  |
| HOUR                      | DATE    | NO | EL   | WIND | CALL | REMARKS   | VAL <td colspan="2"></td> |  |  |
| 1115                      | 7/17/57 | 1  | 3000 | Z R  | 0    | PRONE     | 5                         |  |  |
| 2                         |         | 2  | 3000 | Z R  | 0    |           | 5                         |  |  |
| 3                         |         | 3  | 3000 | Z R  | 0    |           | 5                         |  |  |
| 4                         |         | 4  | 3000 | Z R  | 0    |           | 5                         |  |  |
| 5                         |         | 5  | 3000 | Z R  | 0    |           | 5                         |  |  |
| WIND VEL 20 COMPUTATION   |         |    |      |      |      |           | TOTAL 69                  |  |  |
| WEATHER COOL LIGHT BREEZY |         |    |      |      |      |           |                           |  |  |
| COMPUTATION 20 * 20 = 400 |         |    |      |      |      |           |                           |  |  |
| CLICK RIGHT 20            |         |    |      |      |      |           |                           |  |  |
| ZERO EL 3000 WIND 1 R     |         |    |      |      |      |           | TOTAL 69                  |  |  |

Figure 152—Continued.

## 142. RECORD SCORES

The score card DA AGO Form 84 shown in figure 152 is recommended for use in all fire courses when firing any one of the five courses for record. The score card is used for all instruction and familiarization firing (par. 131).

### Section IV. RANGE FIRING

## 143. GENERAL

*a.* You start range firing as soon as you complete preparatory marksmanship training. Range firing consists of :

- (1) Instruction firing which is the application of the principles of marksmanship with live ammunition.
- (2) Record firing which is the firing of a record course for qualification.
- (3) Familiarization firing which is fired by those individuals not authorized to fire a record course for qualification.

*b.* Range firing begins with instruction firing which each automatic rifleman must complete before he begins record firing. Once record firing begins, it must be completed before you are permitted to take any additional instruction firing. As a rule, no automatic rifleman fires for record on the same day that he does any instruction firing. However, when the time allotted to range firing is limited, the unit commander may authorize record firing on the same day.

## 144. RANGE PERSONNEL

a. *General.* Officers and noncommissioned officer assistants should be thoroughly oriented and assigned specific duties before going on the range.

b. *Range Officer.* The commanding officer usually designates a range officer at large installations and wherever the ranges are used frequently. The range officer is responsible for assigning ranges, designating danger areas, and closing roads leading into danger areas. He makes arrangements for material and labor to maintain the ranges and directs and supervises all necessary repairs to shelters, butts, targets, firing points, and telephone lines. He provides for the safety of the target detail and, when necessary, he provides range guards and instructs them in the methods to be used for the protection of life and property within the danger area.

c. *Range Noncommissioned Officer.* Noncommissioned officers and any other assistants that the commanding officer may deem necessary are detailed permanently during the range season to assist the range officer. These men are responsible to the range officer for seeing that the equipment in the target pits is in serviceable condition, that the desired number of targets is ready for use at the appointed time, and that all target and pit details are provided with proper flags, marking disks, pasters, and spotters.

## 145. UNIT RANGE PERSONNEL

a. *Unit Range Officer.* If there is no regularly assigned range officer, the commanding officer of

the unit firing on the range may appoint a unit range officer. The duties of the unit range officer are similar to those duties listed in paragraph 144.

*b. Officer in Charge of Firing and Safety.* An officer in charge of firing is designated by the commanding officer of the unit firing on the range. It is desirable that the officer in charge of firing be the senior officer of the unit on the range. This officer, or his assistant, will be present during all firing. He is responsible for the proper and safe conduct of range firing.

*c. Pit Officer.* An officer is placed in charge of the pit detail and pit operation. This officer is responsible to the officer in charge of firing for the discipline, efficiency, and safety of the pit detail. The pit officer makes sure that targets and other equipment used in the operation of the pit are on hand and are serviceable.

*d. Pit Detail.* Enough enlisted men are assigned to the pit detail to operate the targets and the telephones.

## 146. ORGANIZATION OF THE FIRING LINE

*a. General.* The firing line is organized for the safe and orderly conduct of range practice and for the supervision of the entire firing line by the officer in charge of firing. The distances shown in figure 153 may be modified by the officer in charge to meet local conditions.

*b. Line of Scorers.* These men are stationed to the rear of the automatic rifleman being scored. The line of scorers is usually on the slope or at the top of the slope of the firing line. Scorers are generally used only during record firing.

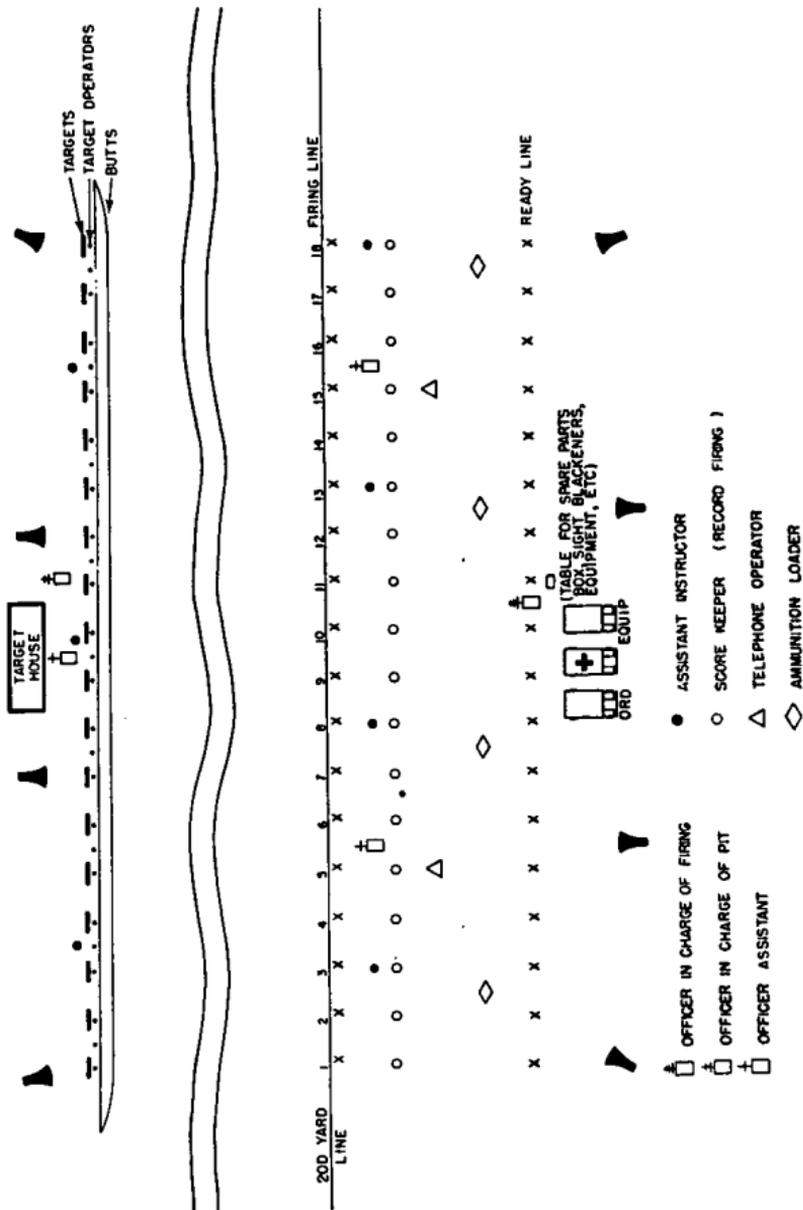


Figure 153. Organization of a known distance range.

c. *Line of Telephone Operators.* These men are stationed ten yards in rear of the firing line. There should be one telephone operator to every ten firing points.

d. *Line of Ammunition Tables.* This line is located by the officer in charge of firing at his discretion with regards to safety. A good location is between the ready line and the telephone line. There should be one ammunition table for every five firing points.

e. *Ready Line.* This line is located ten yards in rear of the line of telephone operators. The ready line is the line where the next firing order for each target is awaiting its turn to fire.

f. *Line of Automatic Rifle Rests and Cleaning Racks.* This line is five yards in rear of the ready line.

g. *Control Stand.* The control stand for the officer in charge of firing is located ten yards to the rear of the center of the firing line. It must be so located that the officer in charge of firing can observe and control the operation of the range.

h. *Ordnance and Aid Men.* The ordnance men and medical corps men are located in rear of the center of the ready line.

i. *Public Address System.* If a public address system is available, it is set up near the officer in charge of firing. Loud-speakers are placed at intervals to the rear of the ready line so that all troops can hear the fire commands and other directions from the officer in charge of firing.

## 147. SUBJECTS COMMON TO INSTRUCTION AND RECORD FIRING

### a. *Uniform.*

- (1) *General.* The uniform that is worn during firing is prescribed by the unit or higher commander. Normally, fatigue clothes are worn. The automatic rifle belt is worn by the firer during all firing.
- (2) *Use of pads and gloves.* You are encouraged to use pads for the protection of your shoulder, elbows, and arms during known distance firing. The pads ease the shock of recoil and provide comfort so that you can concentrate on shooting. Shooting coats are permitted. If these items are not available, other padding may be used if they are of moderate size and thickness. You may not use pads of such size, thickness, or construction that form an artificial support for the weapon. You are not allowed to use a hook or any other device on the sleeve to keep the sling in place. Gloves may be worn provided they are not padded so as to form a support for the automatic rifle.

b. *Use of Instruments.* Binoculars and spotting scopes are authorized. Instruments may not be used for determining the velocity and direction of the wind during record firing.

c. *Restrictions on the Use of the Automatic Rifle.* You will use the automatic rifle as issued

by the Ordnance Department. No additional appliances or devices like shades for the sights may be used. The sights should be blackened during all range firing. Weapons and appliances which may have been issued for test purposes will not be used when firing for classification.

*d. Trigger Pull.* The trigger pull of the automatic rifle must be at least 6 pounds and not more than 10 pounds. The trigger pull should be tested before range firing.

*e. Ammunition.* Only ammunition issued by the Ordnance Department will be used. No one will be issued more than the prescribed number of rounds during record firing.

*f. Use of the Sling.* Additional holes may be punched in the sling. The sling is used only to support the arm when firing from the sitting and kneeling positions. The sling is not used in the prone position. When firing from the crouch position, a special adjustment of the sling is used.

*g. Range Precautions.* The safety regulations that must be observed when handling and firing the automatic rifle are covered in paragraphs 231-235.

*h. Action in Case of a Damaged Automatic Rifle.* Should a breakage occur, the automatic rifle will be repaired or replaced. If repairs involve the sights or if a different automatic rifle is used, you will be allowed to rezero the repaired automatic rifle or zero the new weapon before firing the exercise.

*i. Loading the Automatic Rifles.* Initially, automatic rifles are loaded only on command. There-

after, they are loaded at will as long as the automatic rifleman is in the firing position and until the command CEASE FIRING is given.

*j. Use of Telephones.*

(1) *General.* Telephones for the firing line and pit are used only for official communications. Only the officer in charge of firing, or one of his assistants, may ask for information over the telephone concerning the name or organization of a target operator on any particular target. Pit personnel may not inquire the name of any particular firer.

(2) *Expressions used over the telephones.* The following expressions should be used over the telephone:

(a) When a shot has been fired and the target has not been withdrawn for marking—MARK TARGET . . . . .

(b) When a spotter has been placed in the target but the target has not been disked—DISK TARGET . . . . .

(c) When the target has been marked but the value of the shot was not understood—REDISK TARGET . . . . .

(d) When fewer shots were marked than were fired—CHECK TARGET . . . . .  
FOR . . . . . SHOTS. (Ask that a check be made for the total number of rounds fired.)

(e) Fire commands as given by the officer in charge of firing. An example of

these commands is: **READY ON THE RIGHT? READY ON THE LEFT? READY ON THE FIRING LINE.**

*k. Coaching.* During instruction firing, your coach will be able to help you in many ways; you must strive to follow his advice. During record firing there are certain limitations imposed on the coach. These restrictions are explained in paragraph 156. If enough experienced men are available, you will be assigned a well-trained noncommissioned officer to serve as your coach. Otherwise, one of your buddies will be your coach and you in turn will act as his coach. Most organizations assign especially qualified coaches to several extra targets on one end of the firing line. Firers who are having difficulty may be sent to these experts for additional instruction. During range firing, the coach performs those duties he was assigned in preparatory marksmanship training as well as making sure that—

- (1) Your sights are blackened properly and set for the correct elevation and windage.
- (2) Your ammunition is free from dirt.
- (3) Your magazines are clean, operate correctly, are placed into your belt in the prescribed manner.
- (4) You load the initial (first) magazine and change subsequent magazines correctly.
- (5) You replace the magazines in the automatic rifle belt as soon as the firing exercise is complete.

- (6) You plot your shots and enter your score on your score card.
- (7) You observe all safety precautions. Your coach must be alert that you keep your weapon pointed down range in the event the weapon continues to fire after the trigger is released (a runaway gun). This malfunction is rare.

*l. Score Card.* You will maintain the score card during all of your firing. The score card serves as a history of your weapon. You must keep your own score card.

## 148. INSTRUCTION FIRING

Instruction firing involves the use of live ammunition in applying the principles taught during preparatory marksmanship training. Instruction firing is part of each of the five courses. Within the ammunition allowances of each unit, the number of shots to be fired at each range for instruction firing is determined by the organizational commander.

*a. Slow Fire.* The first few rounds fired during instruction firing on the range should be fired single shot and from the prone position. At first, you should be interested in developing your ability to fire a small shot group and not in obtaining high scores.

*b. Automatic Fire.* No firer should be allowed to fire automatic fire until he has fired a satisfactory shot group at slow fire. During automatic fire you must fire in short bursts of two or three

rounds each except where specifically indicated otherwise. Here again the importance of a good position and a tight grip on the automatic rifle cannot be overemphasized.

*c. Method of Conducting Instruction Firing.* Instruction firing is conducted in a manner similar to record firing (pars. 153 and 154).

#### 149. USE OF DUMMY CARTRIDGES IN INSTRUCTION FIRING

Dummy cartridges may be used during instruction firing. The use of the dummy cartridge is an excellent means for detecting flinching and failure to follow through. To use the dummy cartridge during slow fire, the coach tells the firer to turn his head away from the automatic rifle. Then the coach may load a dummy cartridge, a live cartridge, or no cartridge at all into the chamber. In this way, the firer does not know if his weapon is loaded and the coach can check the firer for flinching and follow through. Dummy cartridges may be used in instruction firing during automatic fire. Additional time must be allowed if they are used. This training is needed to develop correct trigger manipulation and follow through. *The importance of using dummy cartridges cannot be overemphasized.*

#### 150. ZEROING

*a. Obtaining the zero of your weapon* is one of the objects of instruction firing. The automatic rifle is zeroed at each range and the zero is recorded on your score card. The position of

the bullet hole on the 1,000-inch target or the position of the spotter on targets at greater ranges enables you to compute necessary corrections in elevation and windage using the deflection and elevation rule.

*b. To zero the automatic rifle for the 1,000-inch Range*, set the rear sight at zero windage and 400 yards elevation. Corrections are made in clicks by the elevation and windage knobs to bring the subsequent shots into the center of the bull's eye. As soon as you have fired three rounds for a shot group and the firing line has been cleared, the officer in charge of firing directs you to move down to your target to examine the shot group. You then determine what corrections, if any, are necessary and place the elevation and windage corrections on the rear sight. The remaining six shots are fired in two groups of three rounds each. Each of these groups is fired in the same manner as the first group. One click of windage or elevation moves the strike of the bullet one inch on the target at 1,000 inches. Part clicks of windage can be taken; only full clicks of elevation can be taken.

*c. To zero the automatic rifle at 200 yards*, raise the elevation scale so that the index line is as near as possible to the two hundred yard setting. Assuming that the day is normal and there is no wind blowing, proceed as follows:

- (1) Assume the proper position, load a single round into the chamber, take the correct sight picture, and fire the round.

- (2) Call the shot and enter your call on the score card.
- (3) Fire two more rounds following the same procedure.
- (4) When the target is marked, enter the location of the three shots on the target on your score card.
- (5) Determine how far the center of this shot group is from the center of the bull's eye.
- (6) Using the elevation and deflection rules, make a sight change on the rear sight for elevation and windage to bring the center of your next shot group into the center of the bull's eye.
- (7) Fire three more rounds following the same procedure used for the first group.
- (8) Plot the location of the second shot group. Make a sight change, if necessary, to move the center of this group into the center of the bull's eye.
- (9) Fire the third group. This group should be in the center of the bull's eye.
- (10) The setting that you have on the rear sight is the zero of your automatic rifle at 200 yards (if it is a normal day with no wind blowing). Record this setting as your 200 yard zero on your score card.

*d. To zero the automatic rifle at 300 yards, place the 200-yard zero sight setting on your automatic rifle and add one click of elevation. Fire*

nine rounds in groups of three rounds each, following the procedure used for zeroing at two hundred yards.

*e. To zero the automatic rifle at 500 yards, place the 300-yard zero sight setting on your automatic rifle and add one click of elevation. Proceed in the same manner as for zeroing at 200 and 300 yards.*

*f. To zero the automatic rifle on a day when the wind is blowing, you must make the necessary changes in your sight setting until the center of your shot group is in the center of the bull's eye. Then determine the value of the wind, in clicks, by using the wind formula  $\frac{RxV}{40}$ ; subtract the result of this formula from the windage setting. The sight setting you have left on the rear sight, both in elevation and windage, is the zero setting for that range on a day when no wind is blowing. You will very seldom fire on the range when a wind is not blowing.*

## 151. RECORD FIRING

The purpose of record firing is to test the soldier's skill and to determine his qualifications as an automatic rifleman. The qualification courses are outlined in each automatic rifle course. The qualification course to be fired by the individual is as directed by army regulations or training programs.

## 152. RECORD FIRING SCORE CARDS

The scorer keeps a score card for each automatic rifleman. The scorers generally operate from a position directly to the rear of each firing point. Men selected to serve as scorers must be thoroughly oriented concerning their duties and responsibilities. When record firing is completed, the officer in charge of firing has all score cards collected, checked, signed, and turned over to the organization commander.

## 153. METHOD OF CONDUCTING RECORD SLOW FIRE ON KNOWN DISTANCE RANGES

One automatic rifleman in each order is assigned to a target. When all firers in an order are in position and ready to fire, the officer in charge of firing gives the command: ONE ROUND (or ONE MAGAZINE OF FIVE ROUNDS) LOAD, COMMENCE FIRING. Because the automatic rifle is a team weapon, the firer repeats the fire command. If you are firing a magazine of five rounds, attempt to fire single shots. When the value of each shot is marked in the pits, your scorer announces, in a tone loud enough for you to hear, your name, the number of the shot, and the value of the hit. If a miss was signaled and you have any doubts concerning the shot, you should challenge the value of the shot at this time. In this case, the officer in charge of firing will direct the pit officer to check the target in question. The scorer records the score as soon as your target has been rechecked.

At the end of firing, the officer in charge of firing commands: **CEASE FIRING, CLEAR WEAPONS.**

#### **154. METHOD OF CONDUCTING RECORD AUTOMATIC FIRE ON KNOWN DISTANCE RANGES**

*a.* One automatic rifleman in each order is assigned to a target. All automatic fire is conducted from the prone position. If more than one magazine is used during an automatic fire exercise, all magazines (other than the initial magazine) that are to be loaded into the weapon are placed in the automatic rifle belt. All firers are given an opportunity to check their position and to sight in on the target before the exercise begins. When all firers have checked their position, the targets are withdrawn and a red flag is displayed from the center of the pits. The firers and coaches remain down and in position.

*b.* The fire command is now given by the officer in charge of firing: **ONE MAGAZINE OF FIVE ROUNDS, LOAD; IN SHORT BURSTS; READY ON THE RIGHT? READY ON THE LEFT? READY ON THE FIRING LINE.** At the command **READY ON THE FIRING LINE**, the red flag in the pit is waved for 5 seconds and then lowered. Five seconds after the flag is lowered, the targets are raised and remain exposed for the prescribed length of time. This time element starts when the targets reach their highest point. At the end of the time limit, all targets are lowered and the officer in charge of

firing commands: CEASE FIRING. All targets are again raised to allow the firing of alibis. You are only allowed to fire those rounds which are left because of a stoppage that is not your fault. A representative of the officer in charge of firing must examine each stoppage and supervise the firing of all alibis. As soon as all alibis are fired, the officer in charge of firing commands CEASE FIRING, CLEAR WEAPONS.

*c.* All targets are marked. As the targets are disked, the scorer announces each shot as follows:

- (1) Target number (number of the target).
- (2) 1 five, 2 fives, 3 fives, 4 fives, 5 fives, 6 fives, 7 fives, 8 fives.
- (3) 1 four, 2 fours, 3 fours, 4 fours, 5 fours, 6 fours.
- (4) 1 three.

*d.* As soon as the target has been marked, your scorer counts the number of shots disked. If there are more hits than the prescribed number of rounds you fired, your scorer requests that the target be redisked. Should you have more than the prescribed number of hits, you must re-fire the exercise unless all shots on your target are of the same value. Generally, the targets are left up for approximately 1 minute after marking. This gives each firer time to plot the shot group on the score card. The score card is kept during all firing. The targets may remain up longer if directed by the officer in charge of firing.

## 155. METHOD OF CONDUCTING SLOW AND AUTOMATIC FIRE ON THE 1000-INCH RANGE

Firing at this range is conducted like known distance range firing with the following exceptions:

*a.* During automatic fire the commands **COMMENCE FIRING** and **CEASE FIRING** are used because the targets remain exposed at all times.

*b.* The target is marked only after all slow fire and automatic fire is completed.

## 156. REGULATIONS REGARDING RECORD FIRING

The record course is normally fired for qualification and, for this reason, additional regulations are imposed on firing. Some of these regulations are:

*a.* Members of the pit detail should not know who is firing on any particular target and they should make no attempt to obtain this information. Personnel on or in rear of the firing line will not transmit this information to members of the pit detail.

*b.* Coaching is permitted. The coach may not touch any part of your body or weapon while you are firing.

*c.* Warming or fouling shots are not permitted.

*d.* Cleaning is permitted only between firing exercises.

e. When a slow fire exercise is interrupted through no fault of your own, you will be allowed to complete the exercise at the first opportunity.

f. You may challenge all signals of misses.

(1) Before a miss is signaled during slow fire, the target operator must withdraw your target from the raised position and carefully examine it. If the pit officer or one of his assistants is available, he will examine the target. Should your target be raised and a miss signaled, it is presumed that the target has been checked by the target operator. If you challenge the miss, the target will be withdrawn and rechecked, preferably by an officer. After being checked, the target is raised and the result is disked.

(2) As you are firing a fully automatic weapon, it is possible that a short burst may be fired unintentionally during slow fire. All such shots are marked, disked, and scored. If more than one shot is fired in slow fire and all shots are not marked and disked, have the telephone operator request that your target be checked for the total number of shots fired.

(3) If you challenge after your target is marked during automatic fire, the target may be withdrawn again and reexamined for the purpose of determining possible corrections in the original marking.

After a challenge, the target may be examined for misses (preferably by an officer) before the target is raised for disking.

*g.* All shots that you fire after taking your place on the firing line are considered a part of your record score. This applies regardless of whether your weapon is directed toward the target or is fired accidentally.

*h.* If you fire on the wrong target, each shot fired on it is entered as a miss on your score card regardless of what the value of the shots may be. You receive credit only for those hits which you fire on your own target.

*i.* During slow fire, if more than one shot strikes the target at nearly the same time, all shots are marked. When more shots than you actually fire are disked on your target, you receive credit for the hits having the highest value. No record is made of the other hits.

*j.* When you have more hits on your target than the number of rounds you fire in an automatic fire exercise, you are required to refire the exercise. However, if all hits are of the same value, the target is marked and you are given credit for each round you fire.

*k.* If the target is withdrawn just as you fire a shot during slow fire, report this fact at once to the officer in charge of firing or to one of his assistants. The complaint will be checked and, if the case is as represented, you will be allowed to fire again. Your scorekeeper will be directed to

disregard your last shot. During automatic fire exercises, you are allowed to refire the exercise if your target is withdrawn too soon.

*l.* In case of a stoppage during automatic fire, you must apply the first phase of immediate action and attempt to finish the exercise. If this action does not eliminate the stoppage, raise your hand and call STOPPAGE. The officer in charge of firing or one of his assistants will investigate the cause of the stoppage. If it is determined that the stoppage was caused through some fault or neglect on your part, you will not be allowed to complete the exercise. You receive credit only for the score made from the number of rounds fired. If it is determined that the stoppage was caused through no fault of your own, and if time and the ammunition allowance permit, you may be allowed to refire the entire exercise. If time and ammunition are not available, you will be allowed to complete the exercise on the basis of two seconds for each round that remains to be fired. If a change of magazines is required, four additional seconds are allowed for each magazine that must be changed. In no case will you be given any information regarding the previous hits on the target until the exercise is completed.

*m.* Each cartridge that is not fired is recorded as a miss. In case the number of hits marked is more than the number of rounds fired, you receive credit for the hits of the highest value, but only for the number of rounds that you fired.

*n.* If, through no fault of your own, your weapon is damaged while firing, your last shots

are disregarded and the target is not marked. You re-fire the exercise after your automatic rifle is repaired.

*o.* Any shot cutting the edge of the bull's eye is signaled and recorded as a hit in the bull's eye. A shot touching a line separating two scoring spaces is scored as a hit in the higher scoring space.

## 157. FIRE COMMANDS

*a. General.* Each fire command you receive on the range follows a set form. Sample fire commands for slow and automatic firing on the 1000-inch and known distance ranges are listed below. Alternate words for parts of these commands are shown in parentheses.

*b. Fire Commands for the 1000-inch Range.*

(1) *For zeroing.*

ONE ROUND, LOAD;  
FIGURE NUMBER ONE;  
COMMENCE FIRING;  
CEASE FIRING.

(2) *For slow fire.*

ONE MAGAZINE OF FIVE ROUNDS,  
LOAD;  
FIGURE NUMBER ONE (TWO or  
THREE);  
SINGLE SHOT;  
COMMENCE FIRING;  
CEASE FIRING.

- (3) *For automatic fire.*

ONE MAGAZINE OF FIVE (FIFTEEN or TWENTY) ROUNDS,  
LOAD;

FIGURE NUMBER FIVE TO FIGURE  
NUMBER SIX (FIGURE NUMBER  
FOUR or FIGURE NUMBER  
SEVEN to FIGURE NUMBER  
EIGHT);

IN SHORT BURSTS; (LONG BURSTS  
in the fifteen round exercises);

READY ON THE RIGHT? READY  
ON THE LEFT? READY ON THE  
FIRING LINE;

COMMENCE FIRING;  
CEASE FIRING.

*c. Fire Commands for the Known Distance  
Range.*

- (1) *For zeroing*

ONE ROUND, LOAD;  
COMMENCE FIRING;  
CEASE FIRING.

- (2) *For slow fire.*

ONE MAGAZINE OF FIVE ROUNDS,  
LOAD;  
SINGLE SHOT;  
COMMENCE FIRING;  
CEASE FIRING.

- (3) *For automatic fire.*

ONE MAGAZINE OF FIVE (TEN)  
ROUNDS, LOAD;  
IN SHORT BURSTS;

READY ON THE RIGHT? READY ON THE LEFT? READY ON THE FIRING LINE;  
CEASE FIRING.

*d. Explanation of Fire Commands.*

- (1) **READY ON THE RIGHT (LEFT).** This command is used to determine whether all firers on the right (left) portion of the firing line are prepared for the firing exercise. If you are not ready, your coach raises his hand and calls **NOT READY ON TARGET . . . . .**
- (2) **READY ON THE FIRING LINE.** This command means that all men on the firing line are prepared for the firing exercise. To the officer in charge of the pit detail, this command is a signal to wave the red flag from the center of the line of target frames.
- (3) **COMMENCE FIRING.** This command grants permission to start firing. In known distance firing, it is used only for slow fire exercises. This command is used in all 1000-inch range fire commands.
- (4) **CEASE FIRING.** This command is given at the conclusion of an exercise or at any time that an unsafe condition arises. On the command **CEASE FIRING**, you must stop firing immediately. Anyone may give this command.

- (5) **CLEAR WEAPONS.** This command is also given at the conclusion of a firing exercise and in all other cases when it is necessary for safety reasons. On this command you cock your weapon and at the same time remove the magazine; then press the trigger allowing the operating parts to move forward. The assistant instructors personally check to see that each automatic rifle is clear on those firing points that they control.

## **158. PIT OPERATION AND ORGANIZATION**

One of the basic contributions to good shooting is efficient operation of the targets by the pit detail. At one time or another, you will assist in the operation of the pits. You may be a target operator, a telephone operator, or a noncommissioned officer assisting the pit officer. Whatever your job may be, it is important for efficient pit operation.

*a.* If possible, the pit detail is provided by a unit other than the one firing. This is especially desirable for record firing. Although it is desirable to have three target operators for each two targets, the pit can be run efficiently with only one operator per target. In addition to target operators, an operator must be provided for each pit telephone. Normally, there is one telephone in the pits for each ten targets. Officers and non-commissioned officers are assigned to supervise the pit detail. For efficient pit operation, one officer should be assigned to every twenty-four

targets and one noncommissioned officer to every six targets.

b. The officer in charge of the pit is responsible for the safety of the pit detail and for the efficient operation of the targets. He arrives in advance of the pit detail and the firing unit to see that the range equipment is in working order and ready to be used. He knows the number of men firing, the number of targets needed, and the number of men he has to operate the targets and telephones.

c. As soon as the pit detail arrives at the pits, the officer in charge explains and demonstrates the operation of the target frame and the use of the three- and five-inch spotters and the marking disks. The short-range disk is used for 200- and 300-yard firing, and the midrange disk is used for 500-yard firing. The midrange disk as well as the five inch spotters may be used at the 200 and 300 ranges during periods of poor visibility.

## 159. TARGET MARKING

a. *Use of the Spotter.* In known distance firing, the firer cannot see where the shots hit the target. To indicate the exact location of the hit, place a spotter in the bullet hole. Use the 3-inch spotters when firing is conducted at 200 and 300 yards. Use the 5-inch spotters when the firing is conducted at 500 yards. When the shot hits target outside of the bull's eye, place the spotter in the bullet hole with the black side of the spotter exposed to the firer. When the shot hits or cuts

the edge of the bull's eye, place the spotter in the bullet hole with the white side of the spotter exposed to the firer.

*b. Signaling the Value of a Shot.* The value of a shot on the target is indicated as follows:

- (1) A five (bull's eye) by a white disk.
- (2) A four by a red disk.
- (3) A three by a white disk with a black cross.
- (4) A miss by a red flag.
- (5) A ricochet is not counted as a hit and is indicated as a miss.

*c. Use of the Disk and the Red Flag to Mark a Shot.* To mark:

- (1) A five or four—raise the disk to the upper right hand corner of the target and then lower it over the center of the spotter.
- (2) A three—raise the disk to the upper left hand corner of the target and then lower it over the center of the spotter.
- (3) A miss—move the flag slowly across the front of the target once for each miss. During instruction practice, it is advisable to place a spotter in the bullet hole on the target even though the shot may be a miss outside of the three ring yet on the target.

*d. Operating and Marking the Targets While Zeroing.* While zeroing, the automatic rifleman fires three rounds to form a group. The target

is left up until the officer in charge of the pit orders it withdrawn. After withdrawing the target, place spotters in the three holes. Then raise the target and disk each hit. Mark the hits of the highest value first, being careful to expose the correct side of the disk. Mark the hits slowly to avoid confusing the firer and his scorer. When one spotter is used to cover more than one hit, place the disk over the spotter the required number of times. After disking one hit, raise the disk to the upper right (or left) corner before marking the next shot. If the shot is a miss, indicate it by waving the red flag as explained in *c* above. As soon as the three shots have been disked, lower the target. Remove the three spotters, paste the bullet holes, and raise the target so the next shot group may be fired.

*e. Operating and Marking the Target During Slow Fire.* Withdraw and mark the target for each shot. To give good pit operation you must remain alert. Watch and listen for the bullet to strike the target. When your target is hit, pull it down and place a spotter in the hole. Always check the target for more than one hit, because several shots may have been fired. If there is more than one hit, place a spotter in each bullet hole and disk the hits as required. The spotters are left in the target until the next shot is fired. Each time the target is lowered, place the spotter in the new hole, and paste the old hole. If the hit is in the bull's eye and the spotter interferes with the automatic rifleman's sight picture,

the firer may request that the spotter be removed and the bullet hole pasted.

*f. Operating and Marking the Targets During Automatic Fire.* During an automatic fire exercise, you must stand by your target at all times, as the time allowed for the exercise is short. Before the exercise starts, you are told to raise your targets. This allows the automatic rifleman time to check his aim and position. Later, the pit officer will tell you to withdraw the target and stand by for the next command. That command will be to raise all targets. A whistle may be used for giving this command. All targets should be raised at the same time. The pit officer times the exercise, starting when the targets reach their highest point. Several seconds before the end of the exercise, the pit officer instructs **STAND BY YOUR TARGETS**. The command, **TARGETS DOWN**, is given so that the targets are lowered just when the time is up. All targets should be lowered at the same time. Normally, the targets are raised again before marking so that those firers who had stoppages may fire their alibis. When marking the target for an automatic fire exercise, you only need to place enough spotters in the target to indicate the location of the shot group to the firer. When disking the target, disk every hit. Write the number of fives, fours, threes, and misses at the bottom of the target. This is helpful in case the firer requests a redisking of the target. If there are more than the authorized number of hits on your target, have the target checked by the

officer in charge of your section of the pits. After checking, he will tell the officer in charge of the firing line the number of hits on the target. Generally, you will be directed to paste the bullet holes and raise the target again so that the firer may refire the exercise.

## 160. PIT EQUIPMENT

a. All *equipment* necessary for marking and pasting the targets is found in the target house. For a list of the equipment to be used in the operation of the pit, see paragraph 162.

b. The *target* is pasted on target cloth which is mounted on a wooden target frame 6 feet square. This frame is easily broken and the target is easily punctured, therefore, it is advisable that two men carry the target and place it in the target carrier.

c. A movable wooden or steel *target carrier* supports the target frame. A carrier counterweight balances the target. This counterweight may be another target or a solid weight. In all cases, the carrier must be tied to the frame when emplacing or removing a target. Some target carriers have a rope tied to the bottom to aid in raising and lowering the target. This rope can be used to tie the carrier down when removing the target from the carrier. If this is not done, the counterweight may drop and injure the men or damage the target equipment. If another target is used as a counterweight, the blank side is faced toward the firing line.

## 161. PIT SAFETY PRECAUTIONS

The following safety precautions must be observed while you are working in the pit:

*a.* Stay between the line of targets and the butts.

*b.* Do not expose any part of your body above the butts.

*c.* Be careful that you do not injure yourself when operating the targets.

*d.* Be careful when handling the disk that you do not strike other target operators nearby. When the disk is not in use, be sure that it is secure so that it will not fall and strike anyone. Be sure that no part of the disk is above the butts during firing.

*e.* Do not leave the pit until the firing line is clear. Only the officer in charge of the pits may authorize you to leave. He does this only after he has received a clearance from the officer in charge of firing.

## Section V. EQUIPMENT, TARGETS, AND RANGES

### 162. EQUIPMENT LIST

The equipment needed for preparatory marksmanship and known distance range firing is listed below. Some known distance range equipment is used on the firing line and some is used in the target pits. The equipment required for transition firing is listed in paragraph 185.

a. *Preparatory Marksmanship Equipment.*

- (1) One numbered stake per four soldiers.
- (2) One automatic rifle rack per 24 soldiers (rack holding 12 automatic rifles).
- (3) One 1000-inch target, United States rifle, caliber .30, M1, per 4 soldiers.
- (4) One aiming stake (with 1000-inch bull's eyes painted or tacked on) per 8 soldiers.
- (5) One automatic rifle rest (box) per 4 soldiers.
- (6) One sighting and aiming bar, complete, for every 2 soldiers.
- (7) One M15 sighting device per 4 soldiers.
- (8) One box with white paper, tacked on, per 4 soldiers.
- (9) One bull's eye disk per 4 soldiers.
- (10) One pencil per 4 soldiers.
- (11) One table.
- (12) Five cleaning rods.
- (13) One first aid box.
- (14) One spare parts box.
- (15) One progress chart to record the progress of all soldiers individually.
- (16) Trash containers (one per 40 points).
- (17) Carbide lamps, with carbide and water. Other sight blackening equipment may be used if lamps are not available.

- (18) Waste for cleaning purposes.
- (19) Blackboards, chalk, and erasers.
- (20) Instructional charts.
- (21) Public address system (if available).

b. *Range Equipment at the Firing Line.*

- (1) Ammunition.
- (2) Carbide lamps, with carbide and water. Other sight blackening equipment may be used if lamps are not available.
- (3) Tables (one per ammunition loader).
- (4) Chairs or stools (one per firing point, telephone operator, and ammunition loader).
- (5) Binoculars (one per point for use by the coach or scorer at the 500-yard line).
- (6) Score cards (one per automatic rifleman).
- (7) Cleaning and preserving materials.
- (8) Indelible pencils (one per point for use during record scoring).
- (9) Brass containers (one per 10 points).
- (10) Trash containers (one per 20 points).
- (11) One spare parts box.
- (12) Telephones (one per 10 points).
- (13) Ambulance and first aid box.
- (14) Cleaning racks (these may be located in the company area).
- (15) Dummy cartridges (for use in detecting flinching during instruction practice).

- (16) Whistle for officer in charge of firing.
  - (17) Stop watch for officer in charge of firing and officer assistants on the firing line.
  - (18) Public address system (if available).
- c. Range Equipment in the Pits.*
- (1) B target (one per target point).
  - (2) Three inch spotters (nine spotters per target).
  - (3) Five inch spotters (six spotters per target).
  - (4) Marking disk (one short range and one midrange per target).
  - (5) Buff and black pasters and paste for each target point.
  - (6) Red flag (one per target).
  - (7) Red flag attached to long staff for use by pit officer.
  - (8) Telephone (one per 10 targets).
  - (9) One first aid box.
  - (10) Stop watch and whistle for officer in charge of the pit.
  - (11) Public address system (if available).

## 163. TARGETS

*a.* The 1,000-inch target U. S. rifle caliber .30, M1, is used for all preparatory marksmanship training and firing on the 1,000-inch range (fig. 154). This target represents the bull's eye and three ring of the rifle B target as it would appear

at 500 yards. The reduced, black circular bull's eye is  $1\frac{1}{8}$  inches in diameter and the outer ring is  $3\frac{3}{5}$  inches in diameter.

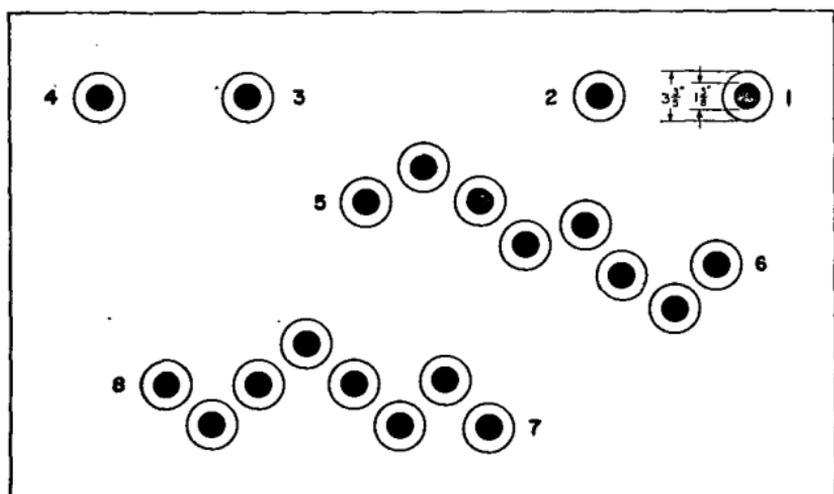


Figure 154. 1,000-inch target U. S. rifle caliber .30, M1.

b. The rifle B target is used for all known distance range firing with the automatic rifle. It is six feet square. It has a black circular bull's eye 20 inches in diameter, an inner (four) ring 40 inches in diameter, and an outer (three) ring 60 inches in diameter (fig. 146). No value is given for hits striking the target outside the three ring.

c. E and F targets are used for firing at unknown distances and represent a figure about the height of an enemy soldier in the kneeling and prone positions, respectively. They are used by tacking the E or F pasteboard target to a target stake.

## 164. RANGES

*a.* Ranges suitable for range firing with the rifle caliber .30, M1, are equally suitable for range firing with the automatic rifle.

*b.* The installation and construction of target ranges for small arms firing is governed by TM 9-855.

## CHAPTER 4

# MARKSMANSHIP, MOVING GROUND AND AERIAL TARGETS

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### Section I. GENERAL

#### 165. INTRODUCTION

*a. General.* This chapter covers the fundamentals of firing at moving targets. You will be trained to fire at moving men, vehicles, and appropriate aerial targets within the effective range of the automatic rifle. Automatic rifle fire may be used against lightly armored vehicles and motorized troops. It causes more heavily armored vehicles, like tanks, to button up, which restricts the vision of the crew.

*b. Effective Range.* Under normal conditions, moving ground targets may be engaged effectively at ranges up to 400 yards. Effective results beyond 400 yards are considered exceptional. Therefore, training in the technique of fire at moving ground targets is normally limited to ranges up to 400 yards. Against parachutists and slow flying aircraft, the maximum effective range is 500 and 600 yards, respectively.

*c. Battle Sights.* Under combat conditions, moving targets are seldom exposed for long periods of time. You can also expect the targets to move quickly while they are exposed. Under

these conditions, you may not have time to make sight settings. Therefore, instruction in the technique of firing at moving targets is based on the use of the battle sight and adjustment of the point of aim on the target.

## **166. WHEN TO CONDUCT TRAINING**

Instruction in the technique of firing at moving targets follows instruction on known distance firing and precedes combat type firing. You will be trained to estimate the range and speed of moving vehicles before you practice firing at moving targets. Instruction in the technique of firing at aerial targets is limited to training in the aerial target firing position and in the leads to be taken for slow-moving aerial targets.

## **167. SAFETY PRECAUTIONS**

For applicable safety precautions, see SR 385-310-1; paragraphs 54, 161, and 231-235 of this manual; and local regulations.

### **Section II. MOVING PERSONNEL**

## **168. TECHNIQUE OF ENGAGING MOVING TROOPS**

In combat, moving enemy soldiers present small, fast moving targets. This increases the importance of an accurate sight setting and an accurate lead. When targets appear suddenly, allowing no time for sight adjustment, you will have to use the battle sight and select a proper aiming point, with respect to the center of the target, so that the moving target and bullet meet.

## 169. METHOD OF AIMING

a. *Aiming Point.* In FM 23-5 it is explained that when you use your battle sight setting (300 yards zero on the open sight), the flight of the bullet is relatively flat up to a range of 400 yards. It is further explained that, when firing at a standing man, you should aim at the center of his body about belt level. Therefore, if the enemy soldier is moving directly toward or away from you, use this same aiming point, his belt. Should you find it necessary to engage an enemy soldier at a range greater than 400 yards, effective results can best be obtained by setting your sight at the proper range but continue to use the same aiming point (fig. 155).

### AIMING POINT USING BATTLE SIGHT (300 YDS) AGAINST PERSONNEL



Figure 155. Aiming point.

b. *Leads.* To get the proper lead for firing at a man walking across your line of fire, aim the automatic rifle as shown in figure 156. If the man is running, double the lead. Accuracy in this type of firing depends largely on the amount of time you spend practicing leading the target, aiming, pressing the trigger, following through, and the correct battle sight setting. As a basis for taking the proper leads, use the following aiming points:

- (1) At ranges less than 300 yards, aim at the forward edge of the body.
- (2) At ranges of 300 yards or more, lead your target by the width of the body.

**LEADS**  
(MAN WALKING)  
USING BATTLE SIGHT (300 YDS)  
AGAINST PERSONNEL

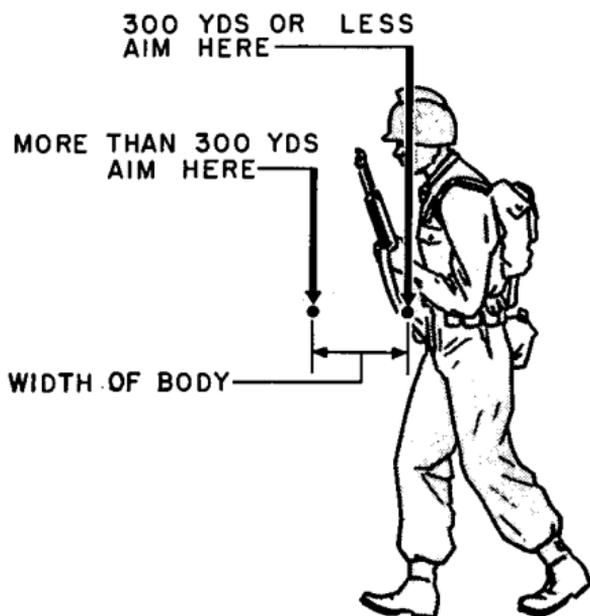


Figure 156. Leads.

### Section III. MOVING VEHICLES

#### 170. HOW TO DETERMINE THE POINT OF AIM AND TO APPLY LEADS

a. The lead in terms of apparent target length necessary to hit a moving vehicle will depend on the size and speed of the vehicle and on its range. Vehicles moving across country rarely exceed a speed of 7 miles per hour. Vehicles moving on roads near the battle position will move much faster but as a general rule they will seldom be able to exceed a speed of 20 miles per hour.

b. Therefore, it is possible to establish a rule which will enable riflemen to hit most moving vehicles encountered on the battlefield.

(1) Normally, aim and fire at the leading edge of the target.

(2) If the speed of the target is greater than 15 miles per hour and the range is greater than 300 yards, aim and fire at a point one half the apparent length of the vehicle ahead of the target. ( $\frac{1}{2}$  length lead.)

c. Using the *apparent* target length in establishing the amount of lead makes it unnecessary to correct for the angle at which the target crosses the line of sight. For example, two identical vehicles, A and B, are crossing your sector of fire. Each vehicle is at the same range and is traveling at the same speed. A is moving approximately straight across your front. B is crossing your front at an angle. As you look at the vehicles, A

will appear to be moving faster. B will appear shorter and seem to be moving slower. Any vehicle crossing your front at an angle will require less lead than a vehicle moving straight across your front. The correct amount of lead will be taken automatically when the apparent length of the target is used as a unit of measure.

## 171. TECHNIQUE OF ENGAGING MOVING VEHICLES

The following technique is suggested for firing at moving vehicles, using the battle sight:

a. For approaching or receding targets, hold your aim on the center of the target and press off each burst of shots.

b. For targets crossing your front at any angle, aline your sights on the *front edge of the target*; then swing the automatic rifle laterally in the direction the target is moving (if necessary, take and hold the estimated lead), and press off the burst. Swing the automatic rifle with a smooth, uniform motion.

c. Fire as rapidly as accurate aiming and leading will permit.

## Section IV. AERIAL TARGETS

### 172. AIRCRAFT AND PARACHUTISTS

a. A volume of rifle and automatic rifle fire is effective against low flying troop carrier and slow flying observation aircraft, provided that shots are aimed well ahead of the target. Be-

cause of their speed, armor, and tactics, other types of aircraft are not considered suitable targets for rifle and automatic rifle fire.

*b.* Descending parachutists are also targets against which a volume of rifle and automatic rifle fire is effective. Remember that airborne troops are particularly vulnerable to collective small arms fire at the moment of landing and for a short period thereafter while they are securing their equipment and attempting to reorganize.

*c.* The maximum effective range of rifle and automatic rifle fire against slow moving aircraft is approximately 600 yards; against parachutists it is 500 yards.

### 173. TECHNIQUE OF ENGAGING AERIAL TARGETS

*a.* For aircraft targets descending directly toward or climbing directly from your firing position, aim directly at the target and press off your burst.

*b.* For aerial targets flying across your line of fire, rifle or automatic rifle fire, within its effective range, must be distributed *along the path of flight* and aimed ahead of the target so that the target and bullet will meet. When the range to the aircraft exceeds 400 yards, the automatic rifle should be aimed above as well as in front of the target. The unit of measure you will use to estimate the lead is the length of the target as it appears to you. A lead of two lengths is recommended for slow flying observation planes, and a

lead of one length is suggested for troop carrier aircraft. Aim at the feet of a descending parachutist at a range of 300 yards or less. At ranges over 300 yards lead him by one length.

*c.* After having completed a course of training in automatic rifle marksmanship and thereby acquiring the fundamentals of good shooting, you need only to have practice in swing and follow through to enable you to fire on appropriate aerial targets. Steps to follow in firing at aerial targets are:

- (1) Estimate the required lead, using the length of the target as a unit of measure.
- (2) Aline the sights of the automatic rifle on the target, then rapidly swing ahead to the required lead.
- (3) Swing the automatic rifle with a smooth, uniform motion to maintain the aim along the path of flight and at the required lead.
- (4) Correctly press the trigger to fire the most rounds possible without disturbing the aim.

*d.* Infantrymen should be prepared to fire as soon as possible after receiving warning of the approach of hostile aircraft. You should begin tracking the target before it comes within effective range. This will enable you to track it smoothly and to fire the maximum number of rounds while it is within effective range.

## CHAPTER 5

# TECHNIQUE OF FIRE AND DESTRUCTION OF MATERIEL

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### Section I. TECHNIQUE OF FIRE

#### 174. GENERAL

a. *Technique of fire* covers all the means used to bring the *collective fire* of a *fire unit* on the target.

b. *Collective fire* is the combined and coordinated fire by a group of men.

c. A *fire unit* is one whose fire in battle is under the direct control of a single leader. The usual unit of rifle and automatic rifle fire is the rifle squad.

#### 175. IMPORTANCE OF EFFECTIVE COLLECTIVE FIRE

In battle, as in competitive sports, teamwork pays off. A good football team, or a good squad, is more than 11 or 9 well-trained individuals. It is a team that knows how to combine the strength and offensive power of its members and achieve a common goal. A rifle squad achieves its goals through combining and coordinating the fires of its rifles and automatic rifle, its grenades and other weapons, under the control of its leader.

## 176. WHEN TECHNIQUE OF FIRE IS STUDIED

Training in teamwork with the rifle and automatic rifle is taken up after both the riflemen and automatic rifle team members in your squad have learned how to care for and shoot their individual weapons. Because it is team training, you will all be trained together. The details of the training in technique of fire for both riflemen and automatic riflemen are given in the M1 rifle manual, FM 23-5.

### Section II. DESTRUCTION OF ORDINANCE MATERIEL IN EVENT OF IMMINENT CAPTURE

## 177. GENERAL PRINCIPLES

Tactical situations may arise when, owing to limitations of time or transportation, it becomes impossible to evacuate all equipment. In such situations, division or higher commanders may order the destruction of all matériel that cannot be evacuated to prevent its capture intact and its subsequent use by the enemy. When thorough destruction of all parts cannot be completed, destroy those parts essential for using the automatic rifle. Ruin or remove the other parts that cannot be duplicated easily by the enemy. Destroy the same essential parts on all like units to prevent the enemy from constructing one complete unit from the several damaged ones by consolidating the serviceable parts. All units should be

trained to destroy the matériel issued to them. This training does not include the actual destruction of matériel.

## 178. DESTRUCTION METHODS

Two methods for destroying the automatic rifle are:

*a. Method No. 1.* Remove the bolt and slide. Grasp the butt with both hands and smash the barrel against a tree, rock, or firm ground until it is bent. Remove and distort the recoil spring. Remove the firing pin, insert its point into the hole in the face of the bolt, and break it off. Break the slide by inserting the piston end into the front end of the receiver and pulling up on the other end of the slide. Time required for this method—1 minute.

*b. Method No. 2.* Insert the bullet end of a live round into the slot in either side of the bipod body and bend the case slightly, expanding the mouth of the case so that you can pull out the bullet. Pour out the powder, leaving enough to cover the bottom of the cartridge case to a depth of approximately  $\frac{1}{8}$  inch. Reinsert the bullet in the cartridge case, *point first*. Chamber and fire this round with the reduced charge. The bullet will stick in the bore. Chamber one complete round, lay the automatic rifle on the ground, and fire it using a 30-foot lanyard. Use the best available cover, as this means of destruction may be dangerous to the person destroying the weapon. Time required for this method—2 or 3 minutes.

*Warning:* Do not attempt to destroy the automatic rifle by firing it with the muzzle stuck in the ground. This is dangerous and does not always destroy the weapon.

## 179. DESTRUCTION OF AMMUNITION

When time and materials are available, ammunition may be destroyed as follows. Break out all packed ammunition from boxes or cartons. Stack the ammunition in a pile. Stock or pile wood or available gasoline and oil in cans or drums around the ammunition. Throw onto the pile all available inflammable material such as scrap wood and brush. Pour any remaining gasoline or oil over the pile. Use enough inflammable material to make a very hot fire. Ignite the materials and take cover. Thirty to sixty minutes are required to destroy the ammunition carried by small combat units.

# CHAPTER 6

## ADVICE TO INSTRUCTORS

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### Section I. GENERAL

#### 180. PURPOSE

The purpose of this chapter is to assist you, the instructor, in preparing and conducting automatic rifle instruction. This chapter applies particularly to the training of large groups of automatic riflemen in time of an emergency. The provisions of this chapter should be accepted as a guide only. Do not consider them as having the force of regulations.

#### 181. SUBJECT SCHEDULES

The two subject schedules listed in this chapter include a recommended breakdown of time for teaching a standard marksmanship course and for teaching a familiarization course. Both subject schedules include mechanical and preparatory marksmanship training and range firing with the automatic rifle. In addition to these subjects, the longer course includes transition firing and field target firing. The total time allotted for the standard course is 56 hours; for the familiarization course, 9 hours. For training purposes, an hour is considered to be 50 minutes for mechanical and preparatory marksmanship training, and

60 minutes for all range work. Use these schedules as a guide in preparing lesson plans. Local conditions may require a longer or shorter period in which to complete the training. When the suggested references, equipment, and training aids are not available, improvise or substitute the best that are available. All references in the subject schedules and subject schedule notes may be found in this manual unless otherwise indicated.

## **182. TRAINING NOTES**

To supplement the two subject schedules given in paragraphs 185 and 189 and to provide the detailed procedure to be followed for each period, training notes are included in paragraphs 186-188 and 190-192. During training, include demonstrations with all lectures. Do not attempt to teach rapidly or slowly; teach at a speed that best enables the men to grasp clearly the material presented. Allot the majority of the training time to application of the principles brought out in the lectures and demonstrations. For practical work, organize the class into small groups and place an assistant instructor in charge of each group.

## **183. TRAINING PROGRAM**

*a.* To aid in the individual training phase, a subject schedule for a course in BAR marksmanship training is shown in the paragraphs which follow. This schedule is based on the desirable number of hours to train each man quickly in the basic essentials so that he may be able to take

his place in combat without further automatic rifle training. Use it as a guide in preparing lesson plans. Conditions may require a longer or shorter period to complete the training.

b. Suggested allotment of training hours in the subject schedule for the standard course:

- (1) Mechanical training . . . . . 10 hours
- (2) Preparatory marksmanship  
training . . . . . 10 hours
- (3) 1000-inch firing, table I . . . . . 4 hours
- (4) Known distance instruction  
firing tables II and III . . . . . 8 hours
- (5) Known distance record firing  
tables IV and V . . . . . 8 hours
- (6) Preparation for transition  
firing, table VI . . . . . 4 hours
- (7) Transition firing for instruc-  
tion, tables VII and VIII . . . . . 6 hours
- (8) Transition firing for record,  
tables VII and VIII . . . . . 6 hours

c. Allotment of training hours in the subject schedule for the familiarization course:

- (1) Mechanical training . . . . . 2 hours
- (2) Preparatory marksmanship  
training . . . . . 3 hours
- (3) Familiarization course, tables  
I and II . . . . . 4 hours

## 184. ASSISTANT INSTRUCTORS

An experienced and well-trained assistant instructor is invaluable to both the instructor and the class. Noncommissioned officers or selected privates are chosen to serve as assistant instructors. They must be well rehearsed before class time to become familiar with the subject matter. During the course of teaching, the instruction is often decentralized for periods of practical work under the direct supervision of the assistant instructors. Train them to demonstrate the exercise while the exercise is being explained. Carefully rehearse the assistant instructors in the duties they are to perform so that when they present a demonstration it is correct in every detail and is a clear picture of the work being explained.

## Section II. SUBJECT SCHEDULE, AUTOMATIC RIFLE MARKSMANSHIP COURSE

### 185. AUTOMATIC RIFLE MARKSMANSHIP COURSE

#### *a. Mechanical Training (10 hours).*

| P <sup>1</sup> | H <sup>2</sup> | Lessons   | Text references                    | Area   | Training aids and equipment  |
|----------------|----------------|---|------------------------------------|--|--|
| 1              | 2              | Description, characteristics, dis-assembly and assembly of the operating group. | Pars. 4-12, 194....                | Classroom or suitable training area equipped with tables and chairs. | <p>For instructor:<br/>Automatic rifle, dummy cartridges, magazine, spare parts, kit, table, GTA 9-6, GTA 9-56 (1).</p> <p>For each soldier:<br/>Automatic rifle, dummy cartridge, magazine, spare parts kit.</p> <p>For every 2 soldiers:<br/>GTA 9-56 (1).</p>                 |
| 2              | 1              | Functioning of the operating group.   | Pars. 24-36, 196....do.....do..... |  | <p>For instructor:<br/>Same as for period 1, plus enlarged wooden working model, small group training aid, and charts of the gas system and feeding.</p> <p>For each soldier:<br/>Same as for period 1.</p> <p>For each instructional group:<br/>1 small group training aid.</p> |

|   |   |   |  |   |   |
|---|---|---|--|---|---|
| 3 | 2 | Disassembly, assembly, and functioning of the buffer and rate reducing group; gas adjustment. | Pars. 15-16, 37-38, 53, 194-195, 197, 200. | .....do.....  | For instructor:<br>Same as for period 1, plus enlarged wooden working model.<br><br>For soldiers:<br>Same as for period 1.  |
| 4 | 2 | Disassembly and assembly of the trigger group.  | Pars. 13-14, 194.....                      | .....do.....  | For instructor:<br>Same as for period 1.<br><br>For soldiers:<br>Same as for period 1.  |
| 5 | 1 | Functioning of trigger group, review of functioning of the automatic rifle.                   | Pars. 24-37, 39-42, 195, 198.              | Classroom equipped with tables and chairs and suitable for showing a training film. | For instructor:<br>Same as for period 1, plus enlarged wooden working models and TF 9-1205<br><br>For soldiers:<br>Same as for period 1, less GTA 9-56 (1).   |
| 6 | 1 | Stoppages and immediate action, field expedients, care and cleaning.                          | Pars. 20, 55-60, 61-71, 199-203.           | Same as for period 1.   | For instructor:<br>Same as for period 1, plus care and cleaning equipment and charts on immediate action and second phase stoppages.<br><br>For soldiers:<br>Same as for period 1, less GTA 9-56 (1). |

Pl—period.  
H2—hours.

| P <sup>1</sup> | H <sup>2</sup> | Lessons   | Text references          | Area                  | Training aids and equipment  |
|----------------|----------------|---|--------------------------|-----------------------|--|
| 7              | 1              | Review of all material covered in preceding six periods followed by an examination. | All previous references. | Same as for period 1. | For instructor:<br>All training aids and equipment used for preceding periods, less TF 9-1205.<br>For soldiers:<br>Same as for period 1. |

### *b. Preparatory Marksmanship Training (10 hours)*

|   |   |   |                        |   |   |
|---|---|---|------------------------|---|---|
| 8 | 2 | Introduction to preparatory marksmanship—sighting and aiming exercises. | Pars. 87-95, 205, 210. | 1,000-inch range or other training area suitable for preparatory marksmanship training. | For instructor:<br>Automatic rifle, automatic rifle belt, sighting and aiming bar, aiming stake, automatic rifle rest (box), M15 sighting device, box with sheet of white paper attached, bull's eye disk, pencil, spare parts box, progress charts, sight blackening equipment, sight picture model, first aid box, public address system (if available), and a table. |
|---|---|---|------------------------|---|---|

|   |   |   |                               |  |
|---|---|---|-------------------------------|--|
| 9 | 2 | Preparatory marksmanship —<br>position exercises. |                               |  |
|   |   |   | Pars. 96-115, 211.....do..... | <p>For every 4 soldiers:<br/>Automatic rifle, automatic rifle belt, sighting and aiming bar, automatic rifle rest, box with sheet of white paper attached, bull's eye disk, pencil, and M15 sighting device.</p> <p>For every 12 soldiers:<br/>Sight blackening equipment.</p>   |
|   |   |   |                               | <p>For instructor:<br/>Automatic rifle, automatic rifle belt, aiming stake, table, spare parts box, sight blackening equipment, first aid box, progress charts, public address system (if available).</p> <p>For every 2 soldiers:<br/>Automatic rifle, automatic rifle belt.</p> <p>For every 12 soldiers:<br/>Aiming stake and sight blackening equipment.</p> |

P<sup>1</sup>—period.  
H<sup>2</sup>—hours.

| P <sup>1</sup> | H <sup>2</sup> | Lessons  | Text references     | Area  | Training aids and equipment •  |
|----------------|----------------|--|---------------------|---|--|
| 10             | 1              | Preparatory marksmanship — sight setting and trigger manipulation exercises. | Pars. 116-121, 212. | 1,000-inch range or other training area suitable for preparatory marksmanship training. | <p>For instructor:<br/>Automatic rifle, automatic rifle belt, magazine, charts on trigger manipulation and rear sight, 1,000-inch target U. S. rifle caliber .30, M1, table, first aid box, spare parts box, sight blackening equipment, progress charts, and a public address system (if available).</p> <p>For every 2 soldiers:<br/>Automatic rifle, automatic rifle belt, magazine.</p> <p>For every 4 soldiers:<br/>1,000-inch target U. S. rifle caliber .30 M1.</p> |
| 11             | 2              | Preparatory marksmanship — automatic fire exercises.                         | Pars. 122-124, 213. | .....do.....  | <p>For instructor:<br/>Same as for period 10, plus 1 magazine.</p> <p>For every 2 soldiers:<br/>Same as for period 10, plus 1 magazine.</p>  |

|    |  |   |              |  |
|----|--|---|--------------|--|
| 12 | 2 Preparatory marksmanship — sight changes, effect of the wind, score card, range procedure, safety precautions. | Pars. 126-132, 146, 214.                    | .....do..... | For instructor:<br>Enlarged charts of sight changes, score card and clock system; pencil; table; blackboard with chalk and eraser; progress charts; public address system (if available.<br>For each soldier:<br>Pencil, score card.     |
| 13 | 1 Examination.....   | All previous references and pars. 133, 215. | .....do..... | For instructor:<br>Sighting and aiming device, 8 automatic rifles, 9 automatic rifle belts, 2 tables, sight picture device, 4 aiming stakes, 4 1,000-inch targets U. S. rifle caliber .30 M1, and 1 chair.<br>For each soldier:<br>None. |

P1—period.  
H2—hours.

*c. Range Firing (36 hours).*

| P <sup>1</sup> | H <sup>2</sup> | Lessons   | Text references               | Area                           | Training aids and equipment   |
|----------------|----------------|---|-------------------------------|--------------------------------|---|
| 14             | 4              | Marksmanship training—range procedure; safety regulations; 1,000-inch instruction firing, table I, standard course. | Pars. 135, 146, 147, 231-235. | 1,000-inch range complete.     | For instructor:<br>Instructor stand, sight blackening equipment, ammunition, score card, cleaning and preserving materials, dummy cartridges, cleaning rod, whistles, stop watches, spare parts box, public address system (if available).<br>For each soldier:<br>Automatic rifle, automatic rifle belt, 8 magazines, spare parts kit, cleaning rod, score card. |
| 15             | 8              | Marksmanship training—range procedure; safety regulations; instruction firing, tables II and III, standard course.  | Pars. 135, 146; 147, 231-235. | Known-distance range complete. | For instructor:<br>Same as for period 14, plus binoculars and telephones.<br>For each soldier:<br>Automatic rifle, automatic rifle belt, 3 magazines, cleaning rod, score card, pencil.   |

|    |   |   |   |   |  |
|----|---|---|---|---|--|
| 16 | 8 | Marksmanship training—range procedure; safety regulations; record firing, tables IV and V, standard course.   | Pars. 135, 146, 147, 231-235.           | .....do.....  | For instructor:<br>Same as for period 15, plus indelible pencils.<br>For each soldier:<br>Same as for period 15.   |
| 17 | 4 | Marksmanship training—range procedure; safety regulations; preliminary instruction in the use of the battle sight and using aiming point; instructional firing, table VI. | Pars. 135, 146, 147, 165-171.           | Known-distance range complete.<br><i>Note.</i> Special target preparation, FM 23-5. | For instructor:<br>Same as for period 16, plus chart to show aiming point with battle sight.<br>For each soldier:<br>Same as for period 15.  |
| 18 | 6 | Marksmanship training—range procedure; safety regulations; instruction firing, tables VII and VIII.   | Pars. 135, 146, 167, 219, 220, 231-235. | Field target ranges, FM 23-5.   | For instructor:<br>Instructor stand, sight blackening equipment, ammunition, cleaning and preserving equipment, cleaning rod, whistles, stop watches, spare parts box, first aid kit, public address system (if available).<br>For each soldier:<br>Automatic rifle, 4 magazines, spare parts kit, cleaning rod, score card, pencil. |

P1—period.  
H2—hours.

| P1 | H2 | Lessons                             | Text references      | Area                          | Training aids and equipment  |
|----|----|-------------------------------------|----------------------|-------------------------------|--|
| 19 | 6  | Record firing, tables VII and VIII. | Pars. 135, 219, 220. | Field target ranges, FM 23-5. | For instructor:<br>Same as for period 18.<br>For each soldier:<br>Same as for period 18. |

P1—period.  
H2—hours.

## 186. TRAINING NOTES, MECHANICAL TRAINING—10 HOURS

### *a. General.*

- (1) Mechanical training is best given by organizing the class into small groups, not to exceed six men, with an assistant instructor in charge of each group. If there are not enough assistant instructors to organize the class in this way, seat the groups so that the assistant instructors can move freely among the soldiers.
- (2) Enlarged charts and wooden working models facilitate this training. For a detailed discussion of recommended training aids, see paragraphs 223-230.
- (3) Teach nomenclature concurrently during mechanical training.
- (4) Emphasize and closely supervise practical work.
- (5) Before each period—
  - (a) Completely orient and rehearse all assistant instructors and demonstrators.
  - (b) Install all instruction material.
- (6) For a detailed discussion of recommended methods for conducting mechanical training with the automatic rifle, see paragraphs 193-204.

b. *First Period (2 hrs.).*

- (1) The purpose of this lesson is to teach the disassembly and assembly of the operating group and the characteristics and description of the automatic rifle.
- (2) Introduce mechanical training to include the characteristics and a description of the automatic rifle (pars. 4, 5, and 193) (15 min.).
- (3) Explain, demonstrate, and supervise practical work on the disassembly of the operating group (pars. 11 and 194) (45 min.).
- (4) Explain, demonstrate, and supervise practical work on the assembly of the operating group (pars. 12 and 194) (40 min.).

c. *Second Period (1 hr.).*

- (1) The purpose of this lesson is to teach the functioning of the operating group.
- (2) Explain the functioning of the operating group during the rearward movement (pars. 24-31 and 196) (30 min.).
- (3) Explain the functioning of the operating group during the forward movement (pars. 24-36 and 196) (20 min.).

d. *Third Period (2 hrs.).*

- (1) The purpose of this lesson is to teach the disassembly and assembly of the buffer and rate reducing group, the func-

tioning of the buffer mechanism, and gas adjustment.

- (2) Explain, demonstrate, and supervise practical work on the disassembly of the buffer and rate reducing group (pars. 15 and 194) (30 min.).
- (3) Explain the functioning of the buffer portion of the buffer and rate reducing group (pars. 38 and 197) (20 min.).
- (4) Explain, demonstrate, and supervise practical work on the assembly of the buffer and rate reducing group (pars. 16 and 194) (30 min.).
- (5) Explain and supervise practical work on gas adjustment (pars. 53 and 200) (20 min.).

*e. Fourth Period (2 hrs.).*

- (1) The purpose of this lesson is to teach the disassembly and assembly of the trigger group.
- (2) Explain, demonstrate, and supervise practical work on the disassembly of the trigger group (pars. 13 and 194) (50 min.).
- (3) Explain, demonstrate, and supervise practical work on the assembly of the trigger group (pars. 14 and 194) (50 min.).

*f. Fifth Period (1 hr.).*

- (1) The purpose of this lesson is to teach the functioning of the trigger group and

the rate reducing portion of the buffer and rate reducing group as well as to review all functioning taught in the preceding periods.

- (2) Explain the functioning of the trigger group and the rate reducing portion of the buffer and rate reducing group (pars. 39-42 and 198) (30 min.)
- (3) Review all functioning covered in the preceding periods by showing TF 9-1205 (20 min.).

*g. Sixth Period (1 hr.).*

- (1) The purpose of this lesson is to teach stoppages, immediate action, field expedients, and care and cleaning of the automatic rifle.
- (2) Introduce and explain stoppages (pars. 55, 56, and 202) (10 min.).
- (3) Explain, demonstrate, and supervise practical work on immediate action (pars. 57-59 and 201) (10 min.).
- (4) Explain, demonstrate, and supervise practical work on the second phase stoppages (pars. 60 and 202) (10 min.).
- (5) Explain, demonstrate, and supervise practical work on field expedients (pars. 20 and 199) (10 min.).
- (6) Explain and demonstrate care and cleaning (pars. 63-66 and 203) (10 min.).

*h. Seventh Period (1 hr.).*

- (1) In this period give an examination to determine if the men have retained the instructional material covered during mechanical training.
- (2) Explain the procedures to be followed in the examination (par. 133) (5 min.).
- (3) Give the examination, including questions over all material covered during the preceding six periods (40 min.).
- (4) Critique the examination. Answer all examination questions as well as any questions that members of the class may ask (par. 133) (5 min.).

**187. TRAINING NOTES, PREPARATORY MARKSMANSHIP—10 HOURS**

*a. General.*

- (1) Preparatory marksmanship training is best given by organizing the class into four-man groups with an assistant instructor in charge of every two or three groups. The quality of the instruction varies with the amount of trained supervision. When the ratio of one assistant instructor for each two groups cannot be met, make every effort to keep the ratio as small as possible. In organizing the group, attempt to place an inexperienced soldier with one who is familiar with the automatic rifle.

- (2) Use the coach and pupil method of instruction whenever possible.
- (3) Enlarged charts and other training aids facilitate this training. For a detailed discussion of training aids used during preparatory marksmanship, see paragraphs 223-230.
- (4) Emphasize and closely supervise practical work. Follow each short conference period with practical work.
- (5) Before each period:
  - (a) Completely rehearse and orient all assistant instructors and demonstrators.
  - (b) Install all instruction material.
  - (c) Organize the class into four-man groups and announce these groups at least the day before preparatory marksmanship training is conducted. This action will help avoid confusion and loss of time during preparatory marksmanship training.
- (6) For a detailed explanation of recommended methods for conducting instruction in preparatory marksmanship training with the automatic rifle, see paragraphs 86, 88, and 205-209.

b. *Eighth Period (2 hrs.).*

- (1) The purpose of this lesson is to introduce preparatory marksmanship and to teach correct sight alinement, correct

sight picture, and the three sighting and aiming exercises.

- (2) Introduce preparatory marksmanship (pars. 85-88 and 205) (10 min.).
- (3) Explain and demonstrate correct sight alinement, correct sight picture, and the three sighting and aiming exercises (pars. 90, 91, 93-95, and 210) (20 min.).
- (4) Conduct and supervise practical work on the first sighting and aiming exercise (20 min.).
- (5) Conduct and supervise practical work on the second sighting and aiming exercise (20 min.).
- (6) Conduct and supervise practical work on the third sighting and aiming exercise. (30 min.).

c. *Ninth Period (2 hrs.).*

- (1) The purpose of this lesson is to teach automatic rifle positions.
- (2) Review all pertinent instruction material covered in the previous period. (10 min.).
- (3) Explain and demonstrate the prone, sitting, kneeling, crouch, and aerial target positions with the automatic rifle (pars. 106-115 and 211) (20 min.).
- (4) Conduct and supervise practical work on the prone position with the automatic rifle (20 min.).

- (5) Conduct and supervise practical work in the adjustments of the loop and hasty slings (pars. 98-101) (10 min.).
- (6) Conduct and supervise practical work on the sitting position with the automatic rifle (15 min.).
- (7) Conduct and supervise practical work on the kneeling position with the automatic rifle (15 min.).
- (8) Conduct and supervise practical work on the crouch position and the special sling adjustment for the crouch position (10 min.).

d. *Tenth Period (1 hr.).*

- (1) The purpose of this lesson is to teach sight setting and trigger manipulation exercises with the automatic rifle.
- (2) Review all pertinent material covered in the previous periods (10 min.).
- (3) Explain and demonstrate sight setting and trigger manipulation exercises to include sight setting exercises, trigger manipulation exercises, and a timed exercise combining the first two exercises (pars. 119-121 and 202) (15 min.).
- (4) Conduct and supervise practical work on sight setting and trigger manipulation exercises (25 min.).

e. *Eleventh Period (2 hrs.).*

- (1) The purpose of this lesson is to teach automatic fire exercises with the automatic rifle.

- (2) Review all pertinent material covered in the previous periods (10 min.).
- (3) Explain and demonstrate the correct method for placing magazines in the belt and the automatic fire exercises (pars. 122-124 and 213) (20 min.).
- (4) Conduct and supervise practical work on the correct method of placing magazines in the automatic rifle belt (10 min.).
- (5) Conduct and supervise practical work on loading the initial magazine, changing magazines, and clearing the automatic rifle (25 min.).
- (6) Conduct and supervise practical work on the three and eight magazine automatic fire exercises (35 min.).

*f. Twelfth Period (2 hrs.).*

- (1) The purpose of this lesson is to teach sight changes, effect of the wind, zeroing, use of the score card, range procedures, and safety precautions.
- (2) Review all pertinent material covered in the previous periods (10 min.).
- (3) Explain and demonstrate sight changes (pars. 126 and 214) (30 min.).
- (4) Explain and demonstrate the methods for determining the velocity of the wind, the effect of the wind, and the wind formula (pars. 129 and 214) (15 min.).

- (5) Explain and demonstrate the use of the score card (pars. 131 and 132) (10 min.).
- (6) Explain and demonstrate the correct procedure for zeroing and using the score card (pars. 130 and 132) (15 min.).
- (7) Explain range procedures and safety precautions (pars. 146, 147, and 231-235) (20 min.).

*g. Thirteenth Period (1 hr.).*

- (1) In this period give an examination to determine if the men have retained the material covered during preparatory marksmanship training.
- (2) Explain the procedures to be followed in the examination (par. 215) (5 min.).
- (3) Give the examination, including questions over all material covered during the preceding six periods (par. 133) (45 min.).

## 188. TRAINING NOTES, RANGE FIRING—36 HOURS

*a. General.*

- (1) Range firing training is best given by organizing the class into three orders per firing point for instruction firing and four orders per firing point for record firing. These figures may be varied to comply with range facilities and the number of available weapons. If enough

trained men are available, one assistant instructor should be assigned to each firing point to serve as a coach. However, if this is not possible, assign one trained man to every four or five firing points. Insofar as possible, assistant instructors should be assigned to the same students that they supervised during preparatory marksmanship training.

- (2) Use the coach and pupil method of instruction on firing points where experienced assistant instructors are not available to act as coaches.
- (3) Before each period—
  - (a) Completely orient all assistant instructors.
  - (b) Install all instruction material.
  - (c) Clear with the installation range officer if one is assigned; otherwise, clear with the designated unit range officer for the use of the range and range equipment.
  - (d) Check pertinent safety precautions and regulations to include those peculiar to the range to be used.
  - (e) Organize the class into three or four man groups and announce these groups at least the day before firing is conducted. This action will help avoid confusion and loss of time on the range. Whenever possible, use the

group assignments that were made during preparatory marksmanship training.

- (4) For a detailed discussion of recommended methods for conducting instruction in range firing with the automatic rifle see paragraphs 153-155.

*b. Fourteenth Period (4 hrs.).*

- (1) The purposes of this lesson are—
  - (a) To continue the instruction presented during preparatory marksmanship training through firing exercises on the 1000-inch range.
  - (b) To give the soldier an opportunity to acquaint himself with the automatic rifle before firing on the known distance range.
- (2) Review range procedures and safety precautions (pars. 146, 147, and 231-235) (10 min.).
- (3) Conduct and supervise the instruction firing of table I of the standard course (pars. 135 and 155) (230 min.).

*c. Fifteenth Period (8 hrs.).*

- (1) The purpose of this lesson is to permit the soldier to obtain and verify the zero of his automatic rifle and to familiarize himself with known distance firing procedures. This prepares him for the qualification course.

- (2) Explain the importance of marksmanship training and discuss the course to be fired as well as the regulations governing instruction firing (pars. 135, 143-150, and 216) (10 min.).
- (3) Review range procedures and safety precautions (pars. 146, 147, and 231-235) (10 min.).
- (4) Conduct and supervise the instruction firing of tables II and III of the standard course (pars. 135, 148, 153, and 154) (460 min.).

*d. Sixteenth Period (8 hrs.).*

- (1) The purpose of this lesson is to determine the soldier's ability to fire the automatic rifle and to provide him an opportunity to fire the known distance portion of the record course.
- (2) Discuss the record course and regulations for record firing (pars. 135 and 156) (10 min.).
- (3) Review range procedures and safety precautions (pars. 146, 147, and 231-235) (10 min.).
- (4) Conduct and supervise the record firing of tables IV and V of the standard course (pars. 135, 153, and 154) (460 min.).

*e. Seventeenth Period (4 hrs.).*

- (1) The purpose of this lesson is to give training in the use of the battle sight

and aiming point and the method of engaging field type (silhouette) targets.

- (2) Discuss the theory and use of the battle sight in the application of fire on targets within 400 yards (pars. 117, 165, 169, and 217) (20 min.).
- (3) Review range procedure and safety precautions (pars. 146, 147, and 231-235) (10 min.).
- (4) Conduct the firing of table VI of the standard course in preparation for transition firing (pars. 135, 218, and FM 23-5) (210 min.).

*f. Eighteenth Period (6 hrs.).*

- (1) The purpose of this lesson is to permit the soldier to practice the use of the battle sight and aiming point and to familiarize himself with the transition course.
- (2) Review the theory and use of the battle sight and the method of engaging field type (silhouette) targets (pars. 165-169) (10 min.).
- (3) Review range procedures and safety precautions (pars. 146, 147, and 231-235) (10 min.).
- (4) Conduct and supervise the instruction firing of tables VII and VIII of the standard course (pars. 135, 219, and FM 23-5) (340 min.).

*g. Nineteenth Period (6 hrs.).*

- (1) The purpose of this lesson is to provide the soldier an opportunity to fire the transition portion of the record course.
- (2) Review range procedures and safety precautions (pars. 146, 147, and 231-235) (*10 min.*).
- (3) Conduct and supervise the firing of tables VII and VIII of the standard course for record (*350 min.*).

### Section III. SUBJECT SCHEDULE, AUTOMATIC RIFLE FAMILIARIZATION COURSE

#### 189. AUTOMATIC RIFLE FAMILIARIZATION COURSE

##### a. Mechanical training (2 hrs.).

| Pi | H <sup>2</sup> | Lessons   | Text references               | Area  | Training aids and equipment  |
|----|----------------|---|-------------------------------|---|--|
| 1  | 1              | Description; characteristics; capabilities; limitations; disassembly, assembly, and functioning of the automatic rifle. | Pars. 4-36, 194-198.          | Classroom or suitable training area equipped with tables and chairs and suitable for showing a training film. | For instructor:<br>Automatic rifle, dummy cartridge, magazine, spare parts kit, table, GTA 9-6, GTA 9-56 (1), charts of the gas system and feeding, enlarged wooden working model, and TF 9-1205.<br>For every 2 soldiers:<br>Automatic rifle, dummy cartridge, magazine, spare parts kit, GTA 9-56 (1). |
| 2  | 1              | Stoppages and immediate action, gas adjustment, field expedients.   | Pars. 20, 53, 55-60, 199-202. | Classroom or suitable training area equipped with tables and chairs.  | For instructor:<br>Automatic rifle; dummy cartridges; magazine; charts on immediate action, gas adjustment, and second phase stoppages.<br>For every 2 soldiers:<br>Automatic rifle, dummy cartridges, magazine.   |

## b. Preparatory Marksmanship Training (3 hrs.)

|   |  |   |   |   |
|---|--|---|---|---|
| 3 | <p>1 Introduction to preparatory marksmanship—correct sight alignment, correct sight picture use of sighting and aiming bar, position exercises.</p> | <p>Pars. 91, 93, 105-115, 210, and 211.</p> | <p>1,000-inch range or other training area suitable for preparatory marksmanship.</p> | <p>For instructor:<br/>Automatic rifle, automatic rifle belt, sight blackening equipment, sighting and aiming bar, M15 sighting device, aiming stake, spare parts box, sight picture model, table, first aid box, progress charts, public address system (if available).<br/>For every 2 soldiers:<br/>Automatic rifle, automatic rifle belt.<br/>For every 12 soldiers:<br/>Aiming stake, sight blackening equipment.</p>                                  |
| 4 | <p>1 Preparatory marksmanship—sight setting and trigger manipulation exercises, automatic fire exercises.</p>  | <p>Pars. 116-124, 212, and 213.</p>         | <p>.....do.....</p>   | <p>For instructor:<br/>Automatic rifle; automatic rifle belt; 2 magazines; charts on trigger manipulation, rear sight, and automatic fire exercises; spare parts box; 1,000-inch target, U. S. rifle caliber .30 M1; first aid box; sight blackening equipment; progress charts; public address system (if available).<br/>For every 4 soldiers:<br/>Automatic rifle; automatic rifle belt, 4 magazines; 1,000-inch target, U. S. rifle caliber .30 M1.</p> |

P1—period. H2—hours.

| P <sup>1</sup> | H <sup>2</sup> | Lessons  | Text references                                | Area   | Training aids and equipment   |
|----------------|----------------|--|--|--|---|
| 5              | 1              | Preparatory marksmanship—sight changes, effect of the wind, zeroing, score card, range procedure, range regulations. | Pars. 126, 129, 130 - 132, 146, 150, 214, 216. | 1,000-inch range or other training area suitable for preparatory marksmanship. | For instructor:<br>Automatic rifle; charts of sight changes, score card, and clock system; pencil; blackboard with chalk and eraser; progress charts, public address system (if available).<br><br>For each soldier:<br>Pencil, score card. |

### c. Familiarization Firing (4 hrs.).

|   |   |   |                              |                       |   |
|---|---|---|------------------------------|-----------------------|---|
| 6 | 4 | Range procedure, safety precautions and marksmanship; firing of familiarization course. | Pars. 146, 147, and 231-235. | Known distance range. | For instructor:<br>First aid box, instructor's stand, sight blackening equipment, cleaning rod, spare parts box, score card, cleaning and preserving materials, dummy cartridges, whistles, stop watches, public address system (if available). |
|---|---|---|------------------------------|-----------------------|---|

For every 3 soldiers:

Automatic rifle, automatic rifle belt, 3  
magazines, cleaning rod, spare parts kit.

For each soldier:

Scorecard, pencil.

<sup>1</sup>P—period.

<sup>2</sup>H—hours.

## 190. TRAINING NOTES, MECHANICAL TRAINING—2 HOURS

a. *General.* See paragraph 186a.

b. *First Period (1 hr.).*

- (1) The purpose of this lesson is to teach the characteristics, description, capabilities, and limitations of the automatic rifle; to demonstrate how to disassemble and assemble the operating group; and to teach the functioning of the automatic rifle.
- (2) Introduce mechanical training to include the characteristics, capabilities, limitations, and a description of the automatic rifle (pars. 4, 5, and 193) (10 min.).
- (3) Explain and demonstrate disassembly of the operating group (pars. 11 and 194) (10 min.).
- (4) Explain and demonstrate the assembly of the operating group (pars. 12 and 194) (10 min.).
- (5) Show TF 9-1205 (20 min.).

c. *Second Period (1 hr.).*

- (1) The purpose of this lesson is to teach stoppages, immediate action, gas adjustment, and field expedients with the automatic rifle.
- (2) Explain, demonstrate, and supervise practical work on stoppages and immedi-

ate action (pars. 55-60 and 202) (25 min.).

(3) Explain, demonstrate, and supervise practical work on field expedients (pars. 20 and 199) (10 min.).

(4) Explain and demonstrate gas adjustment (par. 53) (15 min.).

## 191. TRAINING NOTES, PREPARATORY MARKSMANSHIP TRAINING—3 HOURS

a. *General.* See paragraph 187a.

b. *Third Period (1 hr.).*

(1) The purpose of this lesson is to introduce preparatory marksmanship; and to teach correct sight alinement, correct sight picture, the three sighting and aiming exercises, and position exercises.

(2) Introduce the subject of preparatory marksmanship (pars. 87-90, and 205-209) (5 min.).

(3) Explain and demonstrate correct sight alinement, correct sight picture, and the use of sighting and aiming bar (pars. 91, 93, and 210) (10 min.).

(4) Explain and demonstrate the prone, sitting, kneeling, crouch and aerial target positions (pars. 106-115 and 211) (10 min.).

(5) Conduct and supervise practical work on setting up the correct sight alinement and correct sight picture through the

use of the sighting and aiming bar (10 min.).

- (6) Conduct and supervise practical work on the prone position with the automatic rifle (15 min.).

c. *Fourth Period (1 hr.)*

- (1) The purpose of this lesson is to teach the soldier how to set the sights, manipulate the trigger, and fire single shots and bursts with the automatic rifle.
- (2) Explain and demonstrate sight setting and trigger manipulation exercises to include sight setting exercises, trigger manipulation exercises, and a timed exercise combining the first two exercises (pars. 119-121 and 212) (10 min.).
- (3) Conduct and supervise practical work on sight setting and trigger manipulation exercises (15 min.).
- (4) Explain and demonstrate the correct method for placing magazines in the belt and the automatic fire exercises (pars. 122-124 and 213) (5 min.).
- (5) Conduct and supervise practical work on placing magazines in the belt and automatic fire exercises (20 min.).

d. *Fifth Period (1 hr.)*

- (1) The purpose of this lesson is to teach sight changes, effect of the wind, zeroing, use of the score card, range procedure, and safety precautions.

- (2) Explain and demonstrate sight changes, effect of the wind, zeroing, and use of the score card (pars. 126, 129-132, and 214) (20 min.).
- (3) Conduct and supervise practical work on the use of the score card (10 min.).
- (4) Explain range procedure (pars. 146 and 147) (10 min.).
- (5) Explain safety precautions (pars. 231-235) (10 min.).

## 192. TRAINING NOTES, RANGE FIRING—4 HOURS

a. *General.* See paragraph 188a.

b. *Sixth Period (4 hrs.).*

- (1) The purpose of this lesson is to continue the instruction in marksmanship training by permitting the soldier to fire a familiarization course with the automatic rifle.
- (2) Review range procedure and safety precautions (pars. 146, 147, 231-235) (10 min.).
- (3) Conduct and supervise the firing of tables I and II of the familiarization course (230 min.).

## Section IV. ADVICE TO INSTRUCTORS— MECHANICAL TRAINING

### 193. GENERAL

a. Instruction in nomenclature, disassembly, assembly, functioning, stoppages, care and cleaning, and immediate action should be presented by explanation, demonstration, and application.

b. Organize the class into groups of six men or less. Assign a trained and previously rehearsed enlisted assistant instructor to each group. The smaller the group, the better the instruction. Assigning two automatic rifle teams to each group results in an excellent organization of the class.

c. In this section the recommendations concerning equipment are based on the assumption that the automatic rifles and other equipment of a unit are pooled for the training. In some situations it may be necessary to modify these recommendations. Whenever possible, use chairs or stools and tables in the class room or instructional area.

d. Check all automatic rifles before each period of instruction to make sure that the weapons are clear. Check magazines, dummy cartridges, and spare part kits to make sure that no live cartridges are present.

e. Instruction in each step of mechanical training is conducted as follows:

- (1) *Explanation.* Name the part of the automatic rifle, explain how to remove

or replace it, or how it functions — whichever is appropriate to the step of mechanical training in progress.

- (2) *Demonstration.* As you, the unit instructor, refer to any particular part of the weapon or describe how it works, have your assistant instructors point to that part or demonstrate how it works, using an appropriate training aid or an automatic rifle.
- (3) *Application.* Decentralize the instruction to you assistant instructors. They will supervise the class in performing the practical work assigned by you. Practical exercises give the group members an opportunity to ask questions and to discuss the previous instruction with the assistant instructor.
- (4) *Evaluation.* After the men have completed their practical work and have held their group discussions, ask selected members of the class several questions. Their answers will help you to evaluate the effectiveness of your instruction.
- (5) *Continuation.* After your questions have been answered, go on to the next step of mechanical training using the explanation, demonstration, and application method.

## 194. DISASSEMBLY AND ASSEMBLY OF THE AUTOMATIC RIFLE

### *a. General.*

- (1) For equipment required, see paragraphs 185 and 189.
- (2) Assign one of the best trained and best rehearsed assistant instructors to the group nearest you. By observing this man, you may time your explanation of nomenclature and your description of the functioning of working parts with the progress of the class.
- (3) Before taking up disassembly and assembly of the various groups of working parts, orient all men on the names of the parts. As the parts are named, each assistant instructor points them out to the members of his group.
- (4) When you begin your instructions on disassembly, the assistant instructors remove each part from the automatic rifle as you describe it. They place the parts on the disassembly mat if mats have been issued. Disassemble the operating group first. As soon as the operating group is disassembled and laid out in order from left to right, call on members of the class to name the parts in the order that they were disassembled. As the men name the parts, repeat each name for emphasis. Teach assembly in

the same manner that you teach disassembly.

- (5) Teach disassembly and assembly of the buffer and rate reducing group, trigger group, bipod group, and magazine in the same manner as that described above for the operating group. If it seems desirable, you may explain the functioning of each group following the practical work on its disassembly and assembly.

*b. Guide for Discussing the Operating Group.*

- (1) Explain the need for cocking the weapon before removing and replacing the gas cylinder tube and forearm.
- (2) Caution the class not to burr the gas piston rings.
- (3) Caution the class that the operating handle is replaced with the knob pointing toward the muzzle.

*c. Guide for Discussing the Buffer and Rate Reducing Group.*

- (1) Replace the sear release and buffer head with the sear release vertical and with the rounded nose pointing toward the rear sight. Explain the importance of seating the parts correctly and the purpose of the eight, splined grooves in the buffer tube.
- (2) In replacing the brass buffer friction cups and steel buffer friction cones, emphasize that the buffer friction cup is replaced before its buffer friction cone.

*d. Guide for Discussing the Trigger Group.*

- (1) Emphasize the care to be taken in removing and replacing the change and stop lever spring assembly. Care must be taken that the sear release stop lever spring is not damaged.
- (2) Caution the members of the class to be careful not to injure their fingers while using the recoil spring guide in pushing out the sear pin and in alining the sear pin holes.

## 195. FUNCTIONING OF THE AUTOMATIC RIFLE

*a. General.*

- (1) Instruction in the functioning of the automatic rifle may be given after instruction in disassembly and assembly of the entire weapon is presented, or the functioning of any group of parts may be discussed immediately following instruction in disassembly and assembly of that group of parts.
- (2) The importance of using training aids during this instruction cannot be over-emphasized. Use them whenever possible.

*b.—Equipment and Training Aids.* See paragraphs 223–230.

## 196. FUNCTIONING OF THE OPERATING GROUP

You can simplify your instruction in the functioning of the operating group by dividing the discussion into two phases—the rearward and the forward movement of the operating parts. Each of these two phases is further divided into steps. There are seven steps in the rearward movement and five steps in the forward movement. These steps are listed in paragraphs 24–36.

*a.* Have all operating groups disassembled and name those parts and surfaces involved in the functioning of each group. As this is done, have your assistant instructors point out these parts and surfaces to each soldier.

*b.* Discuss the action of the gas from the time the cartridge is fired until the gas escapes through the six gas escape ports, the path that the gas takes, and the purpose of the two guide rings on the gas piston. Emphasize that energy for the rearward movement of the operating parts comes from the gas that is developed when a cartridge is fired. A chart on the gas system similar to figure 94 is very helpful in this instruction.

*c.* Discuss the movement of the slide assembly to the rear. Explain how the recoil spring is compressed and how the center rib of the hammer is withdrawn from the head of the firing pin. To illustrate this step, have the gas cylinder tube and forearm removed from all automatic rifles and require each soldier in turn to place a finger against the piston head and push the slide assembly to the rear, noticing the actions just discussed. To

further illustrate this step of functioning, require each automatic rifle team to use the small group training aid.

*d.* Using either the automatic rifle or the small group training aid, discuss unlocking. The three steps in unlocking are:

- (1) When unlocking begins.
- (2) What takes place during unlocking.
- (3) When unlocking is completed.

*e.* Discuss the withdrawal of the firing pin, explaining the importance of the cam surface on the firing pin tang and the cam surface in the slot of the bolt lock.

*f.* Discuss extraction, and emphasize the importance of slow initial extraction; explain how this is accomplished. Initially, the speed of the bolt assembly is much slower than that of the slide assembly. Explain this difference in speed by comparing the difference in distance that the bolt assembly moves with the distance the slide assembly moves.

*g.* Explain that the ejector is stationary. During ejection, the empty cartridge case strikes the receiver to the rear of the ejection opening and then rebounds to the right front.

*h.* Discuss the termination of the rearward movement. Emphasize that the rear of the slide strikes the sear release first and then the buffer head.

*i.* Emphasize that the energy for the forward movement comes from the action of the recoil

spring which is compressed during the rearward movement.

*j.* A chart similar to figure 96 is helpful in discussing loading. Each instructional group discusses loading using the automatic rifle, a magazine, and several dummy cartridges.

*k.* Cover locking action in a manner similar to your coverage of unlocking.

*l.* Emphasize that the weapon cannot fire as long as the bolt lock is down and out of the locking recess. Demonstrate this by using the small group training aid or by using the automatic rifle with the trigger group and the gas cylinder tube and forearm removed.

*m.* Demonstrate the termination of the forward movement by using the gas cylinder tube and the slide. The heat shield must be moved to the rear to show this action.

### **197. FUNCTIONING OF THE BUFFER AND RATE REDUCING GROUP (BUFFER PORTION ONLY)**

Divide your instruction in the functioning of the buffer and rate reducing group into two parts so that you can discuss the rate reducing mechanism and the buffer mechanism separately. As the rate reducing mechanism is so closely associated with the trigger group, explain the action of this mechanism at the time you cover trigger group functioning (par. 39). The purpose of the buffer mechanism is to absorb the shock of the recoil of the moving parts. Explain and show how this is done.

a. With all buffer and rate reducing groups disassembled, name those parts and surfaces involved in the functioning of the buffer mechanism. As this is done, the assistant instructors point out the parts and surfaces to each soldier.

b. Point out the four slots in each buffer friction cup. Require each soldier to place a brass buffer friction cup over a steel buffer friction cone, press the two together, and notice how the cup expands over the cone. Explain that the same action occurs in all four sets of cups and cones when the weapon fires. Explain how friction is produced, reducing the recoil.

c. Explain the purposes of the buffer spring.

#### 198. FUNCTIONING OF THE TRIGGER GROUP AND THE BUFFER AND RATE REDUCING GROUP (RATE REDUCING PORTION ONLY)

a. *General.* Present your instruction in functioning of the trigger group in three steps corresponding to the three change lever settings. Follow this sequence:

- (1) S or safe setting.
- (2) A or fast cyclic rate setting.
- (3) F or slow cyclic rate setting. Discuss the functioning of the rate reducing portion of the buffer and rate reducing group during instruction on the slow cyclic rate (F) setting.
- (4) TF 9-1205 can be used advantageously to follow the instruction on the trigger group.

*b. Procedure.*

- (1) With all trigger groups disassembled, name and have the assistant instructors point out those parts and surfaces that are involved in functioning.
- (2) In addition to naming the various parts and surfaces, the purpose of certain parts should be explained and demonstrated as follows:
  - (a) With the change lever, trigger, and trigger pin replaced in each trigger group, explain the action of the shoulders of the trigger, as the trigger is pressed, on each of the three settings.
  - (b) With the connector replaced in each trigger group, explain the action of the connector on each of the three settings.
  - (c) Have the sear, sear release stop lever, sear spring, change and stop lever spring assembly, and sear pin replaced in all trigger groups. Explain the actions of the sear and sear release stop lever for each of the three settings when the trigger is pressed.
- (3) After having all trigger groups assembled, explain the functions of the trigger group on the S setting. Emphasize the purpose and importance of the connector.
- (4) Explain the functioning of the trigger group on the A setting. Emphasize the

relationship of the cutaway portion of the change lever bar and the tongue of metal in the cutaway portion. Explain how the change lever bar rotates exposing the cutaway portion and tongue of metal.

- (5) Describe the functioning on the slow cyclic rate (F) setting. Discuss the rate reducing mechanism during this part of the instruction. Conduct the instruction in a manner similar to the procedure followed in (2) and (3) above. Stress the following points:
- (a) Position of the cutaway portion of the change lever bar and the tongue of metal in the cutaway portion.
  - (b) Why the connector is not held upright and how the connector is cammed forward allowing the sear to be repositioned.
  - (c) Action and function of the rate reducing mechanism which causes a reduction in the rate of fire.
  - (d) Action when the trigger is released.
  - (e) Action of the rate reducing mechanism on the A setting. The mechanism operates but performs no function on the A setting.

## 199. FIELD EXPEDIENTS

Discuss the importance of and explain field expedients (replacing a damaged firing pin and extractor without removing the bolt).

## 200. GAS ADJUSTMENT

*a. Equipment.* The instructor, each assistant instructor, and every two members of the class require an automatic rifle and a combination tool or dummy cartridge.

*b. Procedure.* Explain and have the assistant instructors demonstrate the correct method of adjusting the gas cylinder on each gas port and the method for obtaining a better alinement of the gas ports.

## 201. IMMEDIATE ACTION

*a. Equipment.* The instructor, each assistant instructor, and every two members of the class require an automatic rifle and a magazine.

*b. Procedure.*

- (1) Explain each of the five key words (PULL, PUSH, TAP, AIM, FIRE) used to teach the first phase of immediate action. To demonstrate the exercise, have the assistant instructors assume the prone position and talk them through the exercise. Now require each soldier in turn to assume the prone position and apply the first phase of immediate action as you announce the five key words. As the class's ability to do the exercise im-

proves, gradually increase the speed of the exercise until each soldier can apply the first phase without hesitation. Teach this exercise as a drill.

- (2) Explain and demonstrate the second phase of immediate action as taught by the five key words—TAKE, LOOK, PULL, LOCATE, REDUCE. Have the assistant instructors demonstrate. Now require each soldier in turn to practice the second phase of immediate action. Do not teach this exercise as a drill.

## 202. SET-UPS FOR SECOND PHASE STOPPAGES

*a. General.* The stoppages discussed in this paragraph are those most commonly found when you apply the second phase of immediate action. Charts can be used to explain and illustrate each of these stoppages; these stoppages can also be demonstrated by using the automatic rifle, magazine, dummy cartridges, ruptured cartridges, and an empty cartridge case.

*b. Equipment.* See paragraph 224.

*c. Procedure.* To present second phase stoppages, demonstrate each stoppage as outlined below. Require various soldiers to explain the corrective action for each stoppage.

- (1) *Partial feeding (fig. 112).* Cock the automatic rifle. Place a dummy cartridge in a magazine and insert the magazine part way into the weapon. Press the trigger, allowing the operating parts to move forward. The feed rib will not

contact the base of the dummy cartridge. However, it should contact the cartridge case and force the dummy cartridge part way out of the magazine as shown in figure 112. This stoppage is known as partial feeding.

- (2) *Double feeding (fig. 113)*. Cock the automatic rifle. Place one dummy cartridge in the receiver (not in the chamber). Load one dummy cartridge into a magazine and insert the magazine into the weapon. Press the trigger. As the operating parts move forward, the loose cartridge in the receiver is forced forward. The feed rib contacts the top cartridge in the magazine. Both the dummy cartridge in the receiver and the dummy cartridge in the magazine will attempt to load into the chamber at the same time, producing a stoppage.
- (3) *Ruptured cartridge (fig. 116)*. Cock the weapon. Insert a ruptured cartridge into the chamber. Place a dummy cartridge in the magazine and then insert the magazine into the receiver. Press the trigger, allowing the operating parts to move forward and jam the dummy cartridge and the ruptured cartridge case into the chamber. If the ruptured cartridge case is not extracted with the dummy cartridge when the operating handle is pulled to the rear, use the ruptured cartridge extractor to remove it.

- (4) *Insufficient gas (fig. 115).* Load a dummy cartridge in the magazine. Cock the automatic rifle and insert the magazine into the weapon. Place the weapon on a flat surface with the ejection opening up. Place an empty cartridge case, base first, into the receiver so that the mouth of the cartridge case protrudes from the ejection opening. Press the trigger and allow the operating parts to move forward contacting the top cartridge in the magazine. The empty cartridge case will be wedged in the ejection opening as the parts move forward.
- (5) *Failure to extract (fig. 114).* Cock the automatic rifle and place an empty cartridge case in the chamber. Place a dummy cartridge in the magazine and insert the magazine into the automatic rifle. Press the trigger, allowing the operating parts to move forward. This set-up shows the dummy cartridge blocked from entering the chamber by the empty cartridge case.
- (6) *Sluggish operation of parts.* Cock the automatic rifle. Load a dummy cartridge into the magazine and insert the magazine into the automatic rifle. Press the trigger, allowing the operating parts to go forward and to load the dummy cartridge. Assume that the cartridge did not fire. Pull the operating handle to the rear and eject the dummy car-

tridge. Instruct the class to assume that the primer is only slightly dented, thereby indicating sluggish operation of the parts.

## 203. CARE AND CLEANING

*a. Equipment.* The instructor, each assistant instructor, and every two members of the class require an automatic rifle, a magazine, and care and cleaning materials.

*b. Procedure.* Explain, demonstrate, and conduct practical work in cleaning the automatic rifle to include the gas system, operating parts, forearm, sling, and magazine.

## 204. SPARE PARTS AND ACCESSORIES

*a. Equipment.* The instructor and each instructional group require a spare parts kit and a set of accessories.

*b. Procedure.* Discuss the purpose and use of each spare part and accessory.

## Section V. ADVICE TO INSTRUCTORS— PREPARATORY MARKSMANSHIP TRAINING

### 205. GENERAL

*a.* Marksmanship is the basic step in training the automatic rifleman to use his weapon in combat. An automatic rifleman subconsciously applies in combat the habits he forms during marksmanship training. Therefore these habits must be based on sound fundamentals.

b. Present the six steps of preparatory marksmanship training by explanation, demonstration, and application.

c. Organize the class into four-man instructional groups. Automatic rifle teams should work together insofar as possible. Assign a trained and previously rehearsed enlisted assistant instructor to every two or three instructional groups if possible.

d. In this section, the recommendations concerning equipment are based on the assumption that the automatic rifles and other equipment of a unit are pooled for training. In some situations it may be necessary to modify these recommendations.

e. Instruction in each step of preparatory marksmanship training is conducted as follows:

- (1) *Explanation.* Introduce and explain the principles of marksmanship pertinent to the particular step of training.
- (2) *Demonstration.* As you explain each exercise, one or more assistant instructors, using an automatic rifle and other necessary equipment, demonstrates the principles covered in the exercise.
- (3) *Evaluation.* After completing your explanation and the demonstration, ask several questions to determine if the class has assimilated the instruction.
- (4) *Application.* Instruction is then decentralized to the groups where, under the supervision of the assistant instructors,

each member of the class performs the practical work that you designate. Each man has an opportunity to ask questions or discuss pertinent points with the assistant instructors. After short intensive periods of practical work, reassemble the class and explain and demonstrate the next phase of preparatory marksmanship.

## 206. PROGRESS CHARTS

Keep a progress chart (fig. 157) on all men during preparatory marksmanship training. Each squad leader notes the progress of his men. Using the progress chart, the organization commander can tell at a glance how much each man knows about each subject. Give extra instruction to those men found to be weak in certain steps.

## 207. PREPARATORY MARKSMANSHIP FIELD

*a. General.* The preparatory marksmanship training field is selected, inspected, and prepared in advance to make sure that it is ready for use. The necessary equipment and training aids must be at the training area and read for use before the class arrives.

*b. Types.* There are several types of preparatory marksmanship training fields. Three of the more common types are the parallel line, the circular, and the training field that is installed on the 1000-inch range. The parallel line and circular fields are discussed in succeeding para-

STATE OF INSTRUCTION

| NAME  | DISASSEMBLING AND ASSEMBLING | KNOWLEDGE OF FUNCTIONING | OPERATION | CARE AND CLEANING | IMMEDIATE ACTION AND STOPPAGES | SIGHTING BAR (FIRST SIGHTING AND AIMING EXERCISE) | ALIGNING SIGHTS (SECOND SIGHTING AND AIMING EXERCISE) | MAKING SHOT GROUPS (THIRD SIGHTING AND AIMING EXERCISE) | PRONE POSITION ADJUSTMENT OF LOOP AND HASTY SLING | SITTING POSITION | KNEELING POSITION | CROUCH POSITION | SIGHT SETTING AND AIMING EXERCISE | TRIGGER MANIPULATION EXERCISE | LOADING INITIAL MAGAZINE | CHANGING MAGAZINES | CLEARING THE WEAPON | DEFLECTION RULE | ELEVATION RULE | UNDERSTANDING OF THE ZERO OF AUTOMATIC RIFLE | USE OF THE SCORE CARD | FINAL GRADE |  |  |
|-------|------------------------------|--------------------------|-----------|-------------------|--------------------------------|---|---|---|---|------------------|-------------------|-----------------|-----------------------------------|-------------------------------|--------------------------|--------------------|---------------------|-----------------|----------------|--|-----------------------|-------------|--|--|
| BROWN | X                            |                          |           |                   |                                |   |   |   |   | X                |                   |                 |                                   |                               |                          |                    |                     |                 | X              | X  | X                     |             |  |  |
| JONES |                              |                          |           |                   |                                | X   | X   |   |   |                  |                   |                 |                                   |                               |                          |                    |                     |                 |                | X  | X                     | X           |  |  |
| SMITH |                              |                          |           |                   |                                |   |   |   |   |                  |                   |                 |                                   |                               |                          |                    |                     |                 |                |  |                       |             |  |  |

EXCELLENT AND HAS INSTRUCTIONAL ABILITY

EXCELLENT

VERY GOOD

GOOD

FAIR

Figure 157. Sample progress chart.

graphs. The use of a 1000-inch range for preparatory marksmanship training is satisfactory; however, it involves the use of a training area that may be required for a firing exercise.

## 208. PREPARATORY MARKSMANSHIP FIELD (TEMPORARY)

a. *General.* The parallel-line type and modified circular type preparatory fields are temporary installations. Therefore, when they are not in use for marksmanship training, the areas may be used for other purposes.

b. *Organization of the Parallel-Line Type Preparatory Marksmanship Field.* The class is organized in two parallel lines facing away from each other. The preparatory field is organized as shown in figure 158. Observe the following guides in organizing the training area:

- (1) The aiming stakes are used during position exercises.
- (2) The 1000-inch U.S. rifle caliber .30 M1 targets are used during trigger manipulation and automatic fire exercises.

c. *Organization of Circular Type Preparatory Marksmanship Field.* The preparatory field is organized as shown in figure 159. Observe the following guides in organizing the training area:

- (1) A bleacher for the class is placed on the rim of the circle as shown in figure 159. All periods of conference and

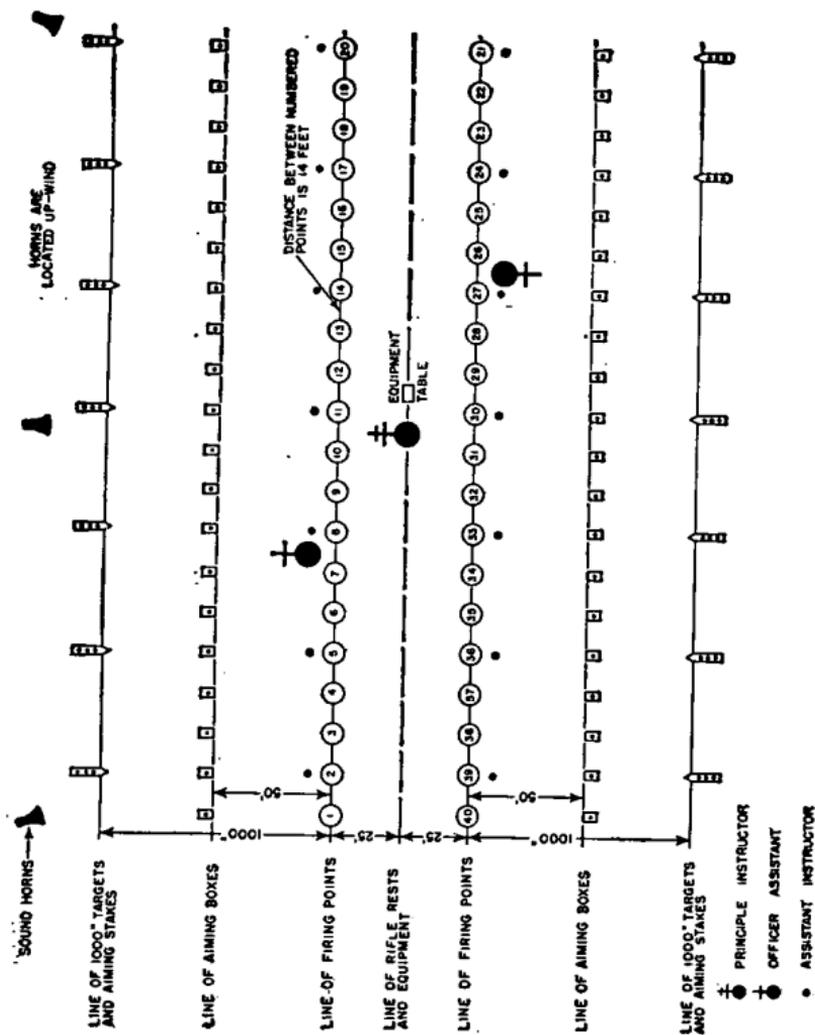
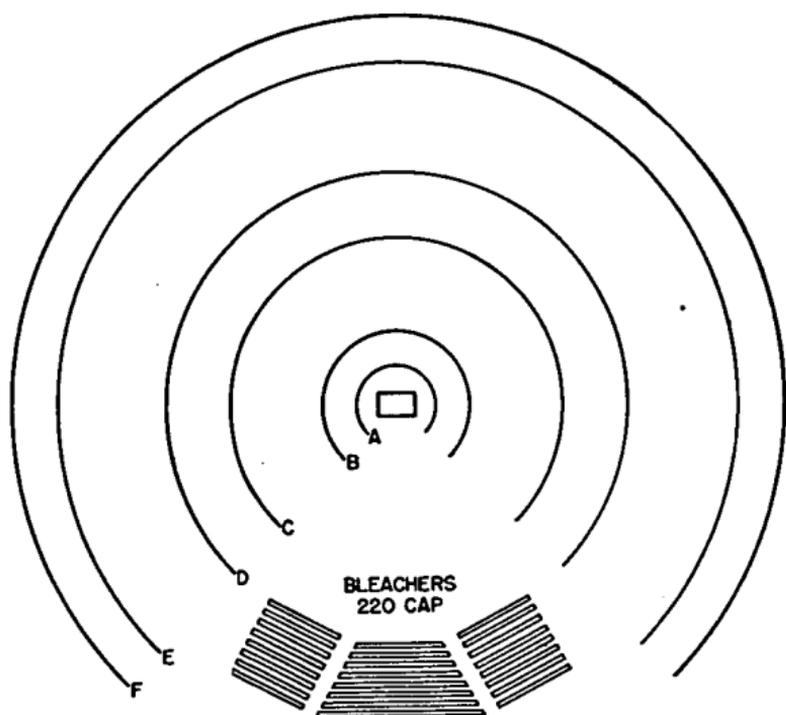


Figure 158. Layout of the preparatory marksmanship field, parallel type.



|                       | RADII    |
|-----------------------|----------|
| A-1000" STAKES        | 6 FEET   |
| B-50' AIMING BOXES    | 29 FEET  |
| C-INNER FIRING POINTS | 79 FEET  |
| D-OUTER FIRING POINTS | 107 FEET |
| E-50' AIMING BOXES    | 157 FEET |
| F-1000" STAKES        | 190 FEET |

DISTANCE ALONG FIRING LINE BETWEEN AIMING POINTS  
 C RING 16 FEET  
 D RING 17 FEET

*Figure 159. Layout of the preparatory marksmanship field, circular type (temporary).*

demonstration are conducted in front of the bleachers.

- (2) The aiming stakes are used during position exercises.
- (3) The 1000- inch U.S. rifle caliber .30 M1 targets are used during trigger manipulation and automatic fire exercises.

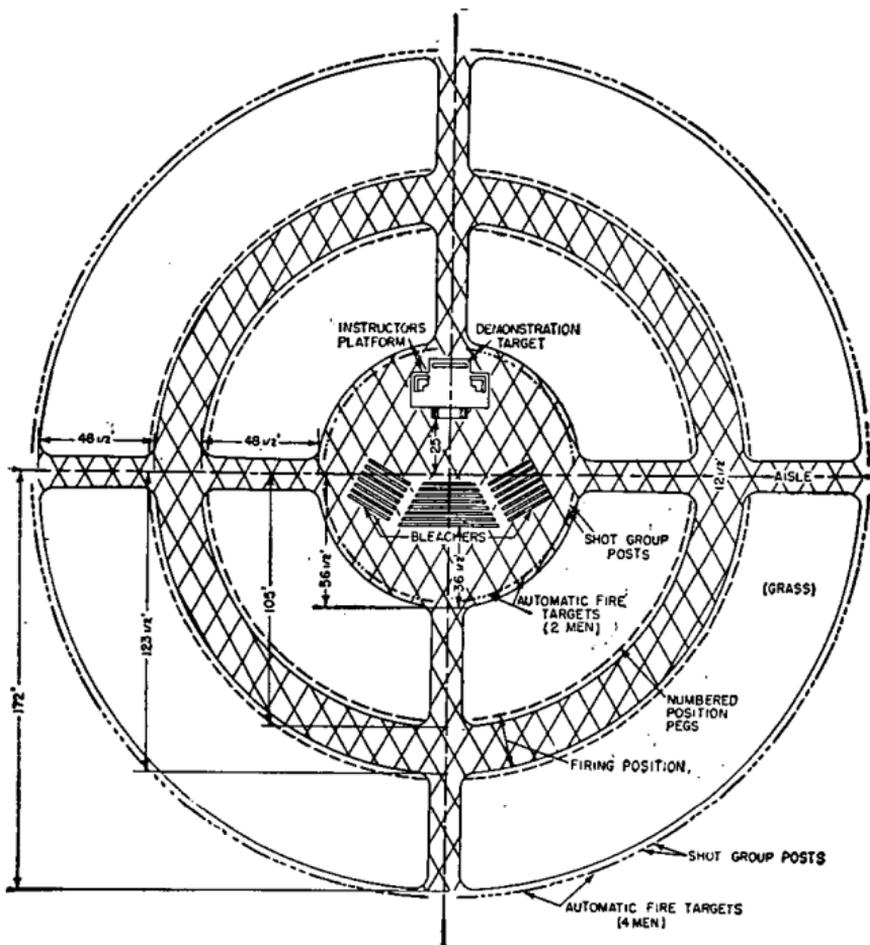
- (4) The public address system, if available, is located around the control stand so that announcements can be heard by everyone on the field.

## 209. PREPARATORY MARKSMANSHIP FIELD, (PERMANENT)

*a. General.* The preparatory marksmanship instruction circle is a permanent installation; therefore, this training area cannot be used for other instruction.

*b. Organization of the Circular Type Preparatory Marksmanship Field.* The preparatory marksmanship instruction circle may consist of either four concentric circles (for two companies) or two concentric circles (for one company). The two-company installation (four concentric circles) is organized as shown in figure 160. Observe the following guides in organizing the preparatory marksmanship instruction circle for two companies.

- (1) The field is centered around a demonstration platform which is fronted by bleachers for seating the class. A sliding target frame, similar to the type used on the known-distance range, may be constructed on the rear of the demonstration platform for use as a training aid. Other training aids may be placed on the demonstration platform as required for each step of the instruction.
- (2) The inner and outer circles consist of manually operated disappearing targets



*Figure 160. Layout of two-company circular preparatory marksmanship field (permanent).*

for automatic fire exercises (figs. 161 and 162) and vertical posts 5½ inches wide for the second and third sighting and aiming exercises (fig. 162). The men take positions at the numbered stakes which are placed on the circular lane formed by the two middle circles and face the targets indicated above.

DISAPPEARING TARGET  
TYPE-A

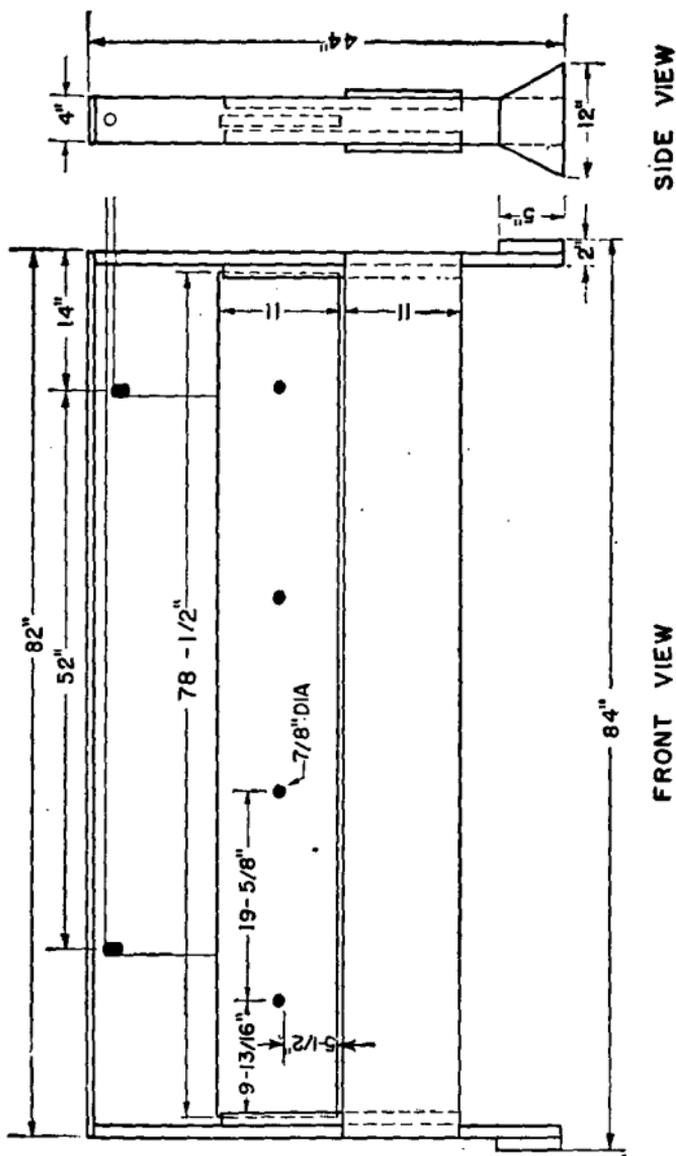


Figure 161. Disappearing target, type A.

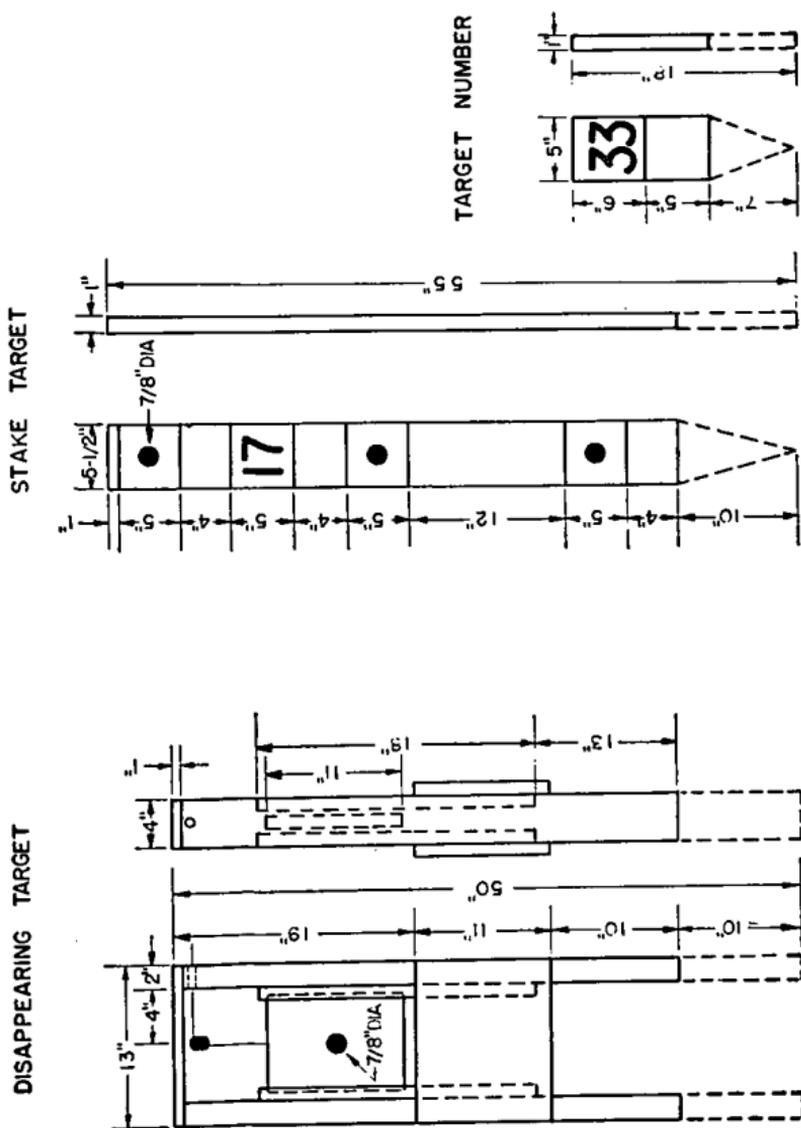


Figure 162. Disappearing target, type B, and stake target.

If the installation is designed for one company, the men take positions on either circle facing the targets on the other circle.

- (3) Lanes or aisles are provided so that the assistant instructors may move freely in supervising the work and so that the men may move from the bleachers to their numbered positions on the circles.
- (4) Several automatic fire targets can be operated simultaneously by connecting them with a draw rope.
- (5) See figures 161 and 162 for necessary information concerning the dimensions of the disappearing targets, types A and B.
- (6) The public address system, if available, is located around the control and demonstration stand so that announcements can be heard by everyone on the field.

## 210. SIGHTING AND AIMING EXERCISES

a. *General.* During sighting and aiming exercises, the soldier learns how to obtain the correct sight picture to hit the target in the center of the bull's eye.

b. *Procedure.*

- (1) Using the sight picture model or a blackboard, explain and demonstrate the meaning and importance of the terms correct sight alinement and correct sight

picture. Emphasize that sight alignment is more important than sight picture.

- (2) Explain and demonstrate the three sighting and aiming exercises.
- (3) Discuss incorrect sight alignment, incorrect sight picture, and their effect on shot groups. To emphasize the effect of an error in sight alignment and sight picture, use a blackboard and chalk to illustrate the type of shot groups which result from different errors (fig. 125).
- (4) Explain and emphasize the importance and demonstrate the correct method of blackening the sights.
- (5) Explain the organization of the class for the coach-and-pupil method of instruction, showing how each member of the four man instructional group is kept busy. During practical work, one member of each group works with the M15 sighting device practicing setting up the correct sight alignment and the correct sight picture. The windage and elevation information on the back portion of the M15 sighting device cannot be used as it pertains only to the M1 rifle.
- (6) During practical work on the second and third sighting and aiming exercises, the members of the instructional group rotate until all men have made a satisfactory shot group.

## 211. POSITION EXERCISES

*a. General.* With any shoulder fired automatic weapon, it is essential that the firer have a correct position to deliver accurate bursts of fire. For this reason, position exercises are the most important single step of preparatory training with the automatic rifle. The instructor must convince the soldier of the importance of a good position. The prone position is more important and more stable than the other positions; therefore, more time should be spent on this position.

*b. Procedure.*

- (1) Introduce position exercises and explain the importance of a good position while firing the automatic rifle.
- (2) Discuss, demonstrate, and conduct practical work on the prone, kneeling, sitting, crouch, and aerial target positions. A period of practical work should follow the discussion and demonstration for each position. Use the following sequence in discussing and demonstrating the positions:
  - (a) The adjustment of the sling.
  - (b) How to assume the position.
  - (c) Features of the position.
  - (d) Coach's duties and position where applicable.
  - (e) Modifications which are permissible, if any.
  - (f) Common errors which may be found and the action to correct each error.

- (3) Discuss the effect of a poor position using the shot group training aid shown in figure 125. Explain what faults in the position caused the error shown on each shot group. If the training aid is not available, use a blackboard and chalk to demonstrate the shot groups.

## 212. SIGHT SETTING AND TRIGGER MANIPULATION EXERCISES

*a.* Training in sight setting teaches the soldier how to set the rear sight quickly and accurately. Trigger manipulation exercises train the soldier to fire single shots and to control the number of rounds fired in each burst.

*b. Procedure.*

- (1) Explain that this step of preparatory marksmanship consists of a sight setting exercise, a trigger manipulation exercise, and a third exercise which combines the two.
- (2) Discuss the rear sight, emphasizing that partial clicks of windage may be taken but that it is possible to take only full clicks of elevation. If available, use a chart to explain the rear sight.
- (3) Explain, demonstrate, and conduct practical work on the three exercises used to teach this step of preparatory marksmanship training. Follow the discussion and demonstration for each exercise with a period of practical work. During the discussion, emphasize:

- (a) Duties of the coach for each exercise.
- (b) Reasons for starting the first and third exercises with the rear sight set at five hundred yards elevation and zero windage.
- (c) The importance of being able to fire both single shots and bursts. Before discussing trigger manipulation, explain that marksmanship with the automatic rifle involves both types of fire. Show that each type of fire is obtained by correct trigger manipulation.
- (d) Meaning of the six key words used to teach the second exercise (trigger manipulation). Use the trigger manipulation chart (fig. 184 and par. 120) or a blackboard and chalk to explain these key words.

## 213. AUTOMATIC FIRE EXERCISES

*a. General.* Automatic fire exercises are practiced primarily to develop the automatic riflemen's ability to change magazines quickly and smoothly. Emphasize, however, that preparatory marksmanship training is progressive. The material taught during sighting and aiming exercises, position exercises, and sight setting and trigger manipulation exercises is applied in this exercise also. Continue to emphasize the importance of the coach.

*b. Procedure.*

- (1) Explain and demonstrate the correct method of placing a magazine in the automatic rifle belt and how to grasp the magazine to remove it from the belt and place it in the weapon.
- (2) Discuss loading the initial magazine, changing magazines, and clearing the automatic rifle.
- (3) Explain and demonstrate the three-magazine and the eight-magazine automatic fire exercises.

**214. B TARGETS, SIGHT CHANGES, CLOCK SYSTEM, EFFECT OF WIND, SCORE CARD, ZEROING, RANGE REGULATIONS, AND SAFETY PRECAUTIONS**

*a. General.* This portion of preparatory marksmanship instruction may be given either indoors or outdoors. It may be taught at any time between the first step and the last step of preparatory marksmanship training. It is, therefore, a suitable subject to be taught during periods of inclement weather. Emphasize the importance of keeping the score card accurately posted at all times.

*b. Procedure.*

- (1) Using a target training aid (fig. 146), discuss the B target. Explain that a shot cutting a division line or the edge of the bull's eye is considered in the higher scoring space. The target training aid should be so prepared that it can be

propped up during the discussion of this step. Either a chart or the B target may be used. In either case, have the dimensions indicated on the training aid.

- (2) Using a chart on sight changes or a blackboard, explain the elevation and deflection rules. Require the class to work several practical problems involving the use of these rules. Allow the class a few minutes to solve the problems; call on different soldiers for their answer; then write the problems on the blackboard, and solve them for the class.
- (3) Explain the method for determining the velocity of the wind through the use of the range flag or a few blades of grass. Using a blackboard, prepare problems by drawing several pictures of the range flag flying at various angles from the flag staff. Allow the class time to work each problem and then call on various soldiers for their answers. Solve the problems on the blackboard.
- (4) Using the chart on sight changes or a blackboard, explain the wind rule. Give several problems involving the use of the wind rule and require each member of the class to solve each problem. Call on individual soldiers for their solutions. Solve the problems on the blackboard.
- (5) Using a clock system chart (fig. 147), or a blackboard, explain and illustrate the use of the clock system to indicate

the direction and effect of the wind. Explain why winds from six and twelve o'clock have no appreciable effect on the path of the bullet, yet winds from other hours do have an effect depending on the strength of the wind and the direction from which it blows.

- (6) Using a chart of the enlarged score card (fig. 151), or a blackboard, and the B target, explain and illustrate the correct procedure to be followed in making entries on the score card. Tell the class you will simulate firing shots to zero the automatic rifle and will indicate where they hit by placing spotters in the target. Have each soldier solve several score card problems. Solve each problem, using the score card chart. The stated velocity and direction of the wind should be different for each problem. Include in this discussion how to obtain the correct zero of the automatic rifle from the score card.
- (7) Discuss range procedures and safety precautions.

## 215. EXAMINATION BEFORE RANGE FIRING

*a. General.* The examination may be a written one, a practical work examination conducted by the county fair method, or a combination of the two. The combination type examination is the most desirable. The purpose of the examination is to determine whether each soldier is pre-

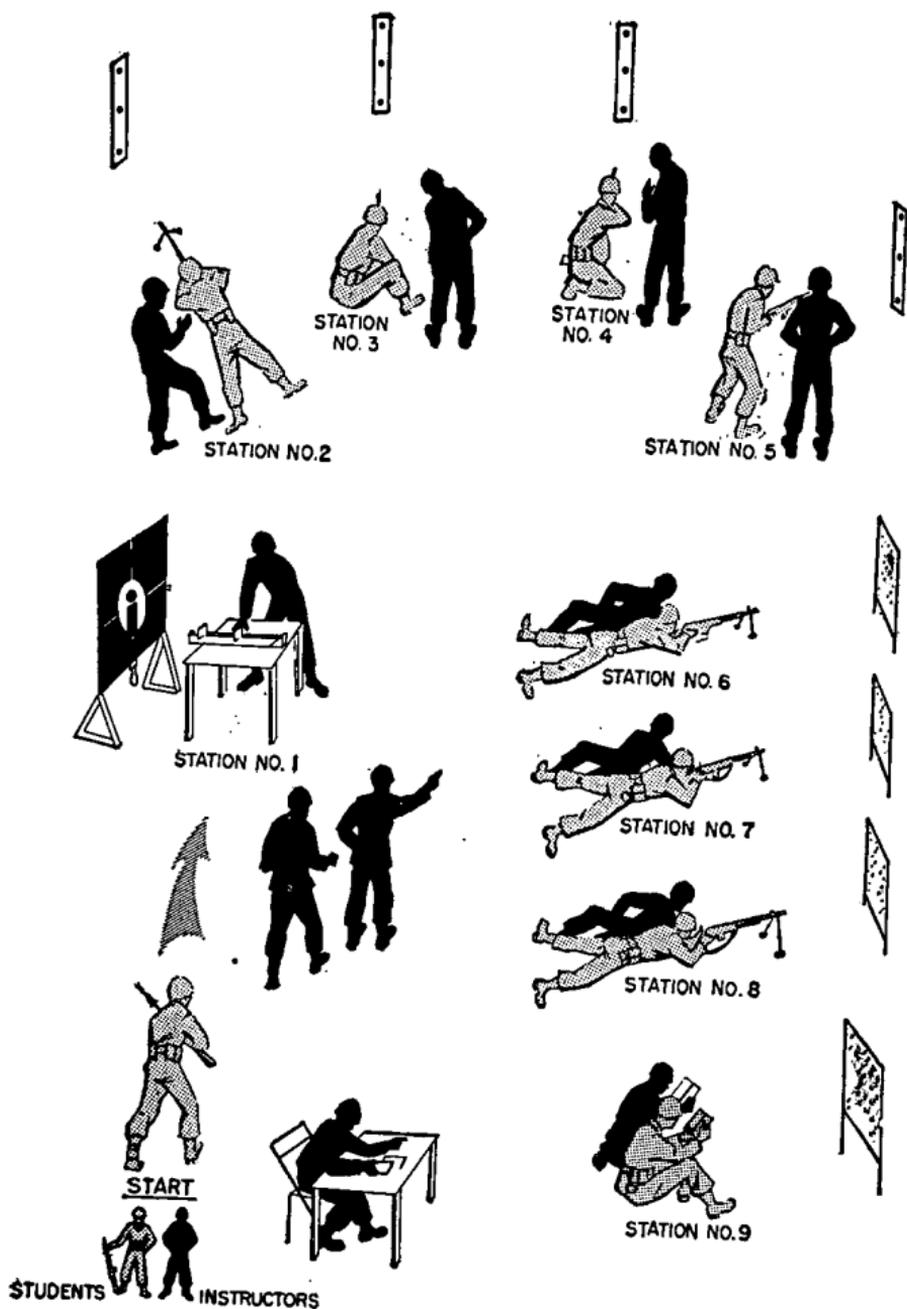


Figure 163. Recommended layout for county fair type examination.

pared to advance to the range firing phase of marksmanship training. For this reason, schedule the examination far enough in advance of range firing to allow time for additional instruction when necessary. If the progress charts are properly maintained, they will indicate to you in advance of the examination which soldiers need additional instruction.

*b. Procedure for Conducting a Combined Written and Practical Work Examination.*

- (1) Lay out the examination area as illustrated in figure 163.
- (2) Assign a qualified noncommissioned officer to each station to examine the class.
- (3) Rotate the class through each station, maintaining a record on each soldier.
- (4) Establish an area where the written portion of the examination may be conducted.
- (5) Conduct a critique during which time the examination questions and any other ones that may arise are answered.

## **216. RANGE ORIENTATION**

*a.* The equipment required for the orientation before range firing is listed in paragraph 185.

*b.* Range firing is not only a continuation of preparatory marksmanship training but it also serves as a practical test of what soldier has learned during the preceding periods of instruction. Before allowing any firing, conduct a period

of range orientation and discuss the following subjects:

- (1) The need for continuously applying what was learned in preparatory marksmanship training.
- (2) The importance of coaching and the duties of the coach.
- (3) The use of spotters and disks.
- (4) The use of dummy cartridges.
- (5) The use of telephone (appropriate telephone expressions).
- (6) The importance of keeping the score card accurately posted.
- (7) Zeroing.
- (8) Striving for accuracy before speed.
- (9) The course to be fired.
- (10) Range regulations and safety precautions.

## 217. TRANSITION FIRING

*a.* *Transition firing* is designed to bridge the gap between known distance firing and field target firing. Individual combat marksmanship is developed by requiring the firer to search for an indistinct target, estimate the range to it, and place accurate fire on it within a limited time. The initial step in transition firing is instruction in the theory and use of the battle sight. It includes the use of the aiming point on targets within 400 yards and the application of leads to moving personnel (par. 169). Three phases of

transition firing (tables VI, VII, and VIII) are prescribed for the automatic riflemen in the standard qualification course.

b. The *chief instructor* is responsible for:

- (1) Securing, training, and rehearsing, commissioned and noncommissioned assistants and demonstrators before instruction begins.
- (2) Arranging for equipment, ranges, pit details, and communication facilities, to have them available for rehearsals and instruction.

c. The *troops being trained* in transition firing and in the technique of engaging moving targets must have completed known distance firing with the automatic rifle and the training in range estimation (FM 23-5).

## 218. TABLE VI, PRELIMINARY INSTRUCTION FOR TRANSITION FIRING

a. Instruction firing in the method of engaging a silhouette target and in the use of the aiming point is conducted on the known distance range in much the same manner as known distance firing. The target is made up locally by pasting two paper kneeling silhouette (E) targets (ORD Stock No. L001-60-06874) 18 inches apart and equal distance from the center of the target panel on a blank target frame (fig. 164). In about the center of the body of the left silhouette, paste or stencil an aiming point at least 8 inches square. A sheet of white letter size paper (8" x 10½"),

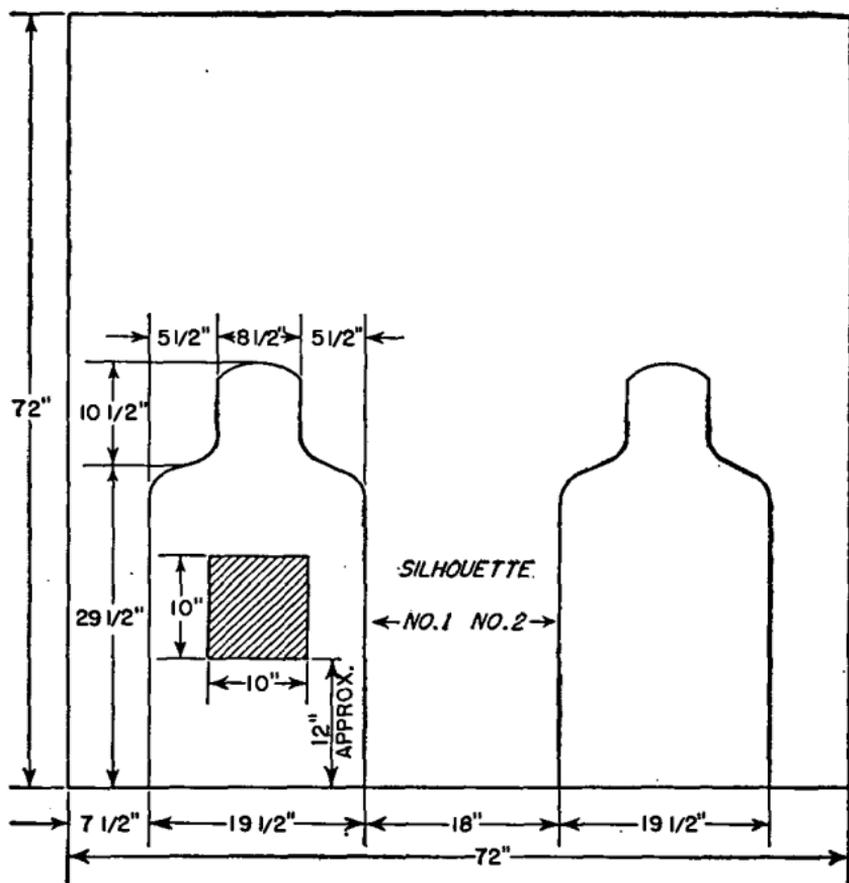


Figure 164. Target used for instruction in the use of the aiming point (table VI).

with the lower 12 inches above the bottom of the silhouette may be used.

b. Starting on the 300 yard firing line, shot groups are fired on the No. 1 silhouette using the aiming point to confirm the battle sight and to acquaint the firer with the part of the target that he is to shoot for. Targets are pulled and the shot groups spotted after each burst. The No. 2 unmarked silhouette target is then fired on with

the firer trying for hits on the same part of the target. In a like manner, firing is conducted at 200 yards and 400 yards to provide instruction in the use of the aiming point.

- (1) During the firing of table VI, give concurrent rear area instruction to small groups in anticipation of firing tables VII and VIII. For example, have the groups practice assuming the combat firing positions, using the position mock-ups to be used on table VII, and have them practice the crouch position and alertness while advancing.
- (2) There is no prescribed sequence for firing transition tables VII and VIII. Both phases of the standard qualification course may be conducted at the same time and groups alternated on the ranges.

*c.* Require each man to fire table VI at least once and demonstrate proficiency in the use of the battle sight and aiming point before allowing him to progress to table VII.

## 219. TABLE VII, TRANSITION FIRING

*a.* A field target range like the one shown in figure 165 is used for firing table VII. Ranges may vary slightly to fit local terrain conditions. Except for lane 6, no range will be over 400 yards. This layout is superimposed on the first six lanes of the rifle transition range (FM 23-5).

NOTES:  
 AVERAGE TIME PER  
 FIRER PER LANE IS  
 55 SECONDS.  
 THE THREE PANELS  
 ENCIRCLED IN AR  
 LANE NO. 2 ARE RAISED  
 AND LOWERED SIMUL-  
 TANEOUSLY.

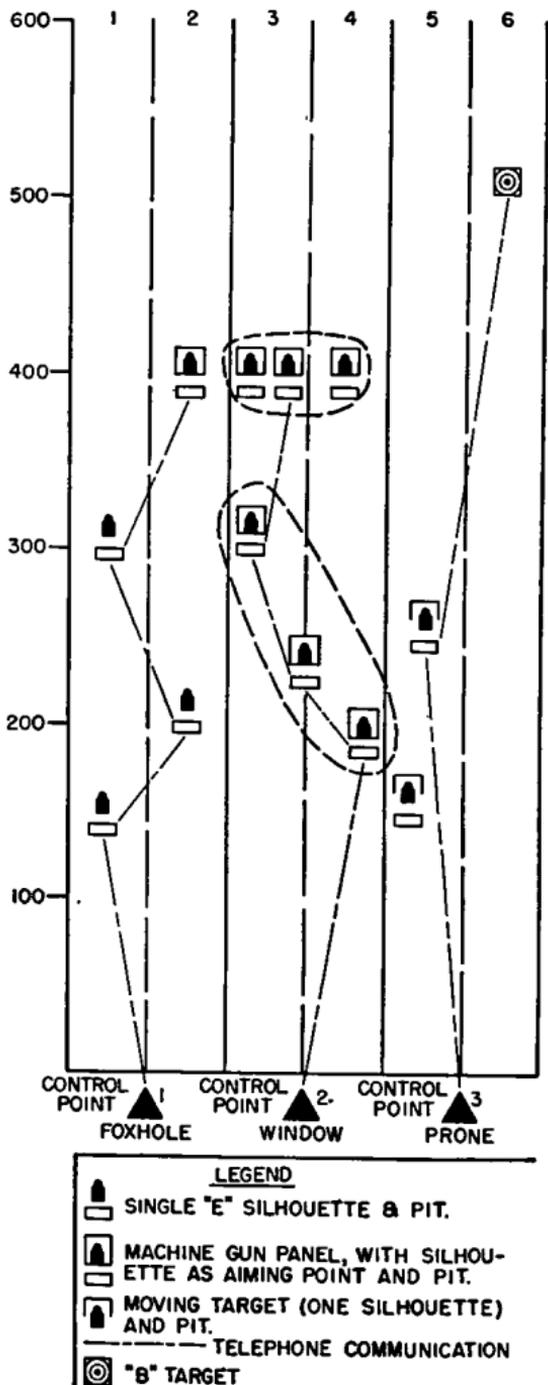


Figure 165. Layout for automatic rifle transition range for firing table VII.

*b.* The firing line is controlled by an officer who is assisted by a noncommissioned officer at each firing point. Each lane has a control point (telephone) operator who controls the raising or lowering of the targets by verbal messages to the pit operators.

*c.* The noncommissioned officers at each firing point—

- (1) Receive and record individual scores when obtained by the control point operator.
- (2) Are constantly on the alert to see that safety precautions are observed and, on orders of the officer in charge, check weapons for clearance.

*d.* Firing is controlled as follows:

- (1) On command of the officer in charge, each firer examines his automatic rifle in preparation for firing and assumes the position required for the lane he is using.
- (2) A firer is assigned to each lane before the exercise begins. After completing a lane, the firers on lanes 1 and 2 displace to the right to successive positions. The man on lane 3 moves left to lane 1. Movement is made only on command of the officer in charge after all weapons have been cleared.
- (3) When the firers have signaled "ready" the officer in charge commands: ONE MAGAZINE OF 20 ROUNDS, LOAD. READY ON THE RIGHT? READY

ON THE LEFT? READY ON THE FIRING LINE. COMMENCE FIRING. At the command to commence firing, the control point operators assume control of target operations. The three lanes are operated together.

- (4) The control point operator for lane 1 directs that one of the four silhouettes be raised. After 7 seconds, the target is lowered and the operator orders that another target be raised. This procedure is repeated until all four targets have been exposed. The order in which the silhouettes appear is varied.
- (5) The control point operator for lane 2 directs that either the diagonal target group or the lateral target group be exposed. After expending one magazine of 20 rounds, or when the target disappears, the automatic rifleman reloads immediately in anticipation of the second target. Each target is exposed for 20 seconds or until one magazine is expended, whichever happens first. The lapse between the disappearance of one target and the appearance of the other is kept to the minimum required for the automatic rifleman to reload.
- (6) The control point operator for lane 3 calls for the appearance of one of the moving targets. After it has been exposed for 8 seconds, the second moving target is caused to appear. Targets

should be so controlled that they traverse in opposite directions. After the second moving target disappears, the B target is ordered raised and is left exposed for 10 seconds. The firer estimates the range, sets his sights, and fires his remaining ammunition at this target.

- (7) After the last target has disappeared, the officer in charge gives the command **CEASE FIRING, CLEAR RIFLES**. When the line has been cleared, control point operators on signal from the officer in charge order the pit detail to mark targets.
- (8) It is desirable that the pits and targets be so constructed that the men need not leave the pits to score the targets. If this is not possible, the men in the pits display a red flag over their pits after clearance from the firing line and move quickly to the targets, note the number of hits, and mark or paste the bullet holes. After marking the targets, the men return to their pits, lower the red flag, and report the number of hits to the control point operator. This information is given to the noncommissioned officer in charge of the firing point who enters the score on the firer's score card.

## 220. TABLE VIII, TRANSITION (QUICK) FIRING

A field target range of the type shown in figure 166 is used for firing table VIII. This range may be superimposed on the rifle quick fire transition range (FM 23-5). The number of lanes is determined by local terrain and safety conditions.

### *a. Target Operation.*

- (1) Targets between phase lines are exposed in sequence on signal of the control officer. Signals should not be visible or audible to the firer.
- (2) Phase lines are placed after targets 4 and 7 to permit the firer to reload and to assist in the enforcement of safety precautions.

*b. The Crouch Position.* This position is used during the automatic rifleman's advance to place quick fire on the surprise targets.

*c. Firing Procedure.* The automatic rifleman starts from the prone position with 3 magazines of 20 rounds each in his belt and none in his automatic rifle.

- (1) On order of the lane control officer or noncommissioned officer, the automatic rifleman rises, adjusts the sling for the crouch position, loads one magazine into his automatic rifle, and moves down the lane on the alert. If parallel lanes are being used, the lane control officer must keep the automatic riflemen abreast as they move forward. As the targets are

**NOTES**

1. TO MINIMIZE TIME REQUIRED TO SCORE TARGETS, SCORERS MAY FOLLOW GUNNER. HITS ON FRAME 10 SHOULD BE TELEPHONED TO CONTROL POINT WHILE FIRER RETURNS TO STARTING LINE.
2. TARGET FRAMES MAY BE OPERATED BY REMOTE CONTROL LEVERS OR BY PULL ROPES IN REAR OF ADVANCING GUNNER.

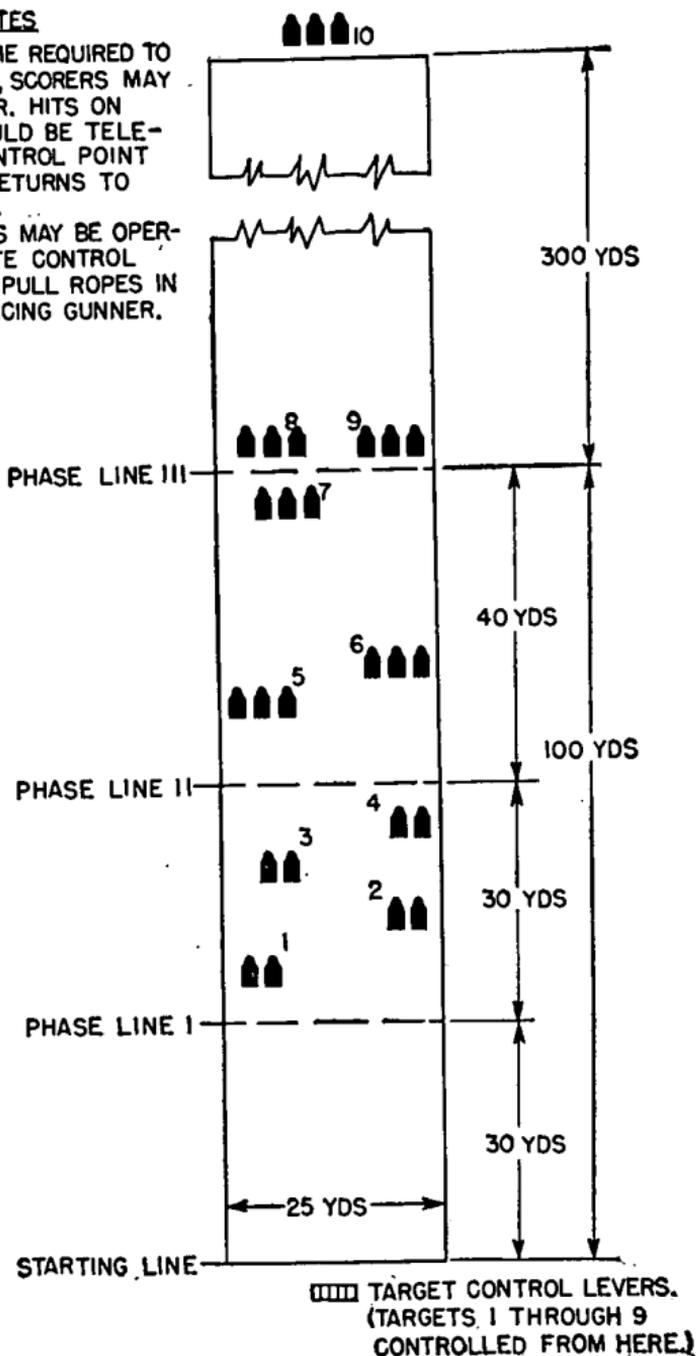


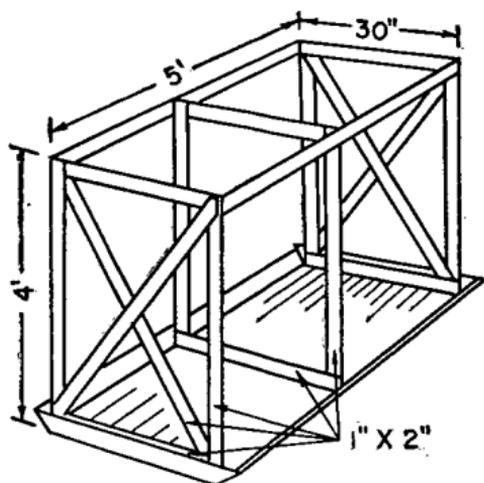
Figure 166. Layout for automatic rifle transition range for firing table VIII.

exposed, 5 rounds are fired at the double silhouettes and 6 rounds at the triple silhouettes in short, two- or three-round, bursts.

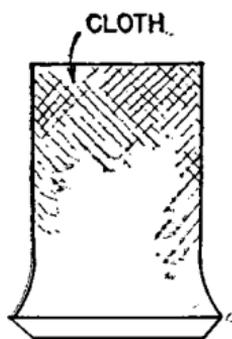
- (2) The double silhouette targets are exposed for 3 seconds. The triple silhouettes are exposed for 4 seconds. Targets 8 and 9 are exposed simultaneously and remain up for 6 seconds. Target 10, the distant target, is exposed for 20 seconds.
- (3) In firing at the distant target, the automatic rifleman, having advanced beyond targets 8 and 9, assumes the prone position, adjusts the sights, and fires the remaining ammunition from the third and last magazine. This target is used to impress the automatic rifleman with the importance of taking a position to cover the reorganization of his squad after capturing an objective.

## **221. ALTERNATE TRANSITION RANGE FIRING**

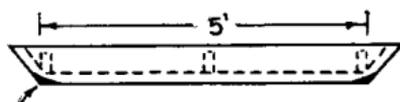
If local facilities are not adequate for transition firing as prescribed in the standard qualification course (tables VII and VIII) described above, tables IX and X may be fired as alternates. This course for the automatic rifleman corresponds, in range requirements, time, and procedure, with the alternate course for the U.S. rifle caliber .30, M1.



TARGET FRAME.



FRONT VIEW OF TARGET



EDGE COVERED WITH SHEET METAL.

ELEVATION OF BASE.

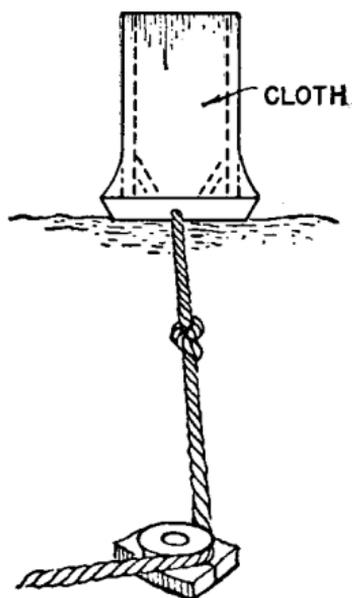


Figure 167. Sled target.

## 222. MOVING VEHICLE MARKSMANSHIP

*a.* While there is no prescribed course for training in firing on moving vehicles, with ingenuity and imagination an instructor can devise instructive exercises. The subject lends itself to rear area concurrent training. Examples of this type of training are practiced in—

- (1) Speed estimation, using a vehicle moving at predetermined speeds.
- (2) Tracking, having men track along a fence line to maintain a uniform swing.

*b.* Moving target range firing is valuable training if time and facilities permit.

- (1) A sled target, with a low center of gravity, of the type shown in figure 167 can be constructed of scrap material and can be readily towed over rough ground.
- (2) For towing with a vehicle, use 500 yards of  $\frac{1}{2}$  inch rope. The pulley seen in figure 167 is a channel wheel bolted to a wooden or metal base which is firmly staked down. When a knot tied in the tow rope 10 to 12 feet ahead of the target hits the wheel, the rope is thrown off the pulley and causes the target to change direction. A schematic layout for a moving target range is shown in figure 168.

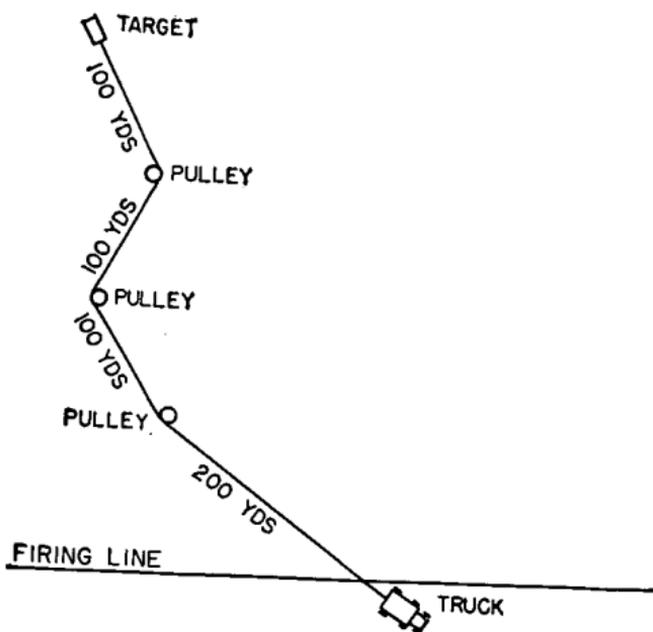


Figure 168. Layout for a moving target range.

## Section VI. TRAINING AIDS

### 223. GENERAL

There are many excellent automatic rifle training aids such as working models, charts, training mats, and training films. Some of these training aids are available through normal supply channels. Others can be constructed locally. Your use of training aids enables the soldier to remember the material longer. Some recommendations and suggestions concerning the construction and use of the various automatic rifle training aids follow:

a. Scrap lumber may be used in constructing models, but hardwood is recommended for those parts subject to strain.

*b.* All charts and models should be painted with highly contrasting colors. These colors help to identify the various parts shown on the chart or model.

*c.* Mount wooden working models on stands that are all of the same height. In some cases, two models can be made to work together as they actually function in the automatic rifle.

*d.* The working models are merely designed to show the functioning of the parts, therefore the models lack some of the refinements of the weapon. Some of the parts on the model are cut away to show other parts located in the rear which play an important role in the functioning.

*e.* Generally, a scale of ten to one will enlarge drawings or models to a size sufficient to be seen clearly at a distance of 75 feet.

*f.* All lettering on charts, models, and other training aids must be large enough to read easily. Lettering  $2\frac{1}{2}$  inches high can be seen at a distance of 75 feet.

*g.* Charts painted or drawn on paper are just as satisfactory as those painted on wood. However, they are not as durable.

*h.* Before using a chart to illustrate portions of your instruction, explain how certain parts are identified by colors; for example: "This part painted blue is the bolt lock."

*i.* Some charts may be used as effective substitutes for large wooden working models.

*j.* A useful chart may be made to illustrate any portion of the field manual.

# RIFLE, AUTOMATIC, CAL. .30, BROWNING, M1918A2

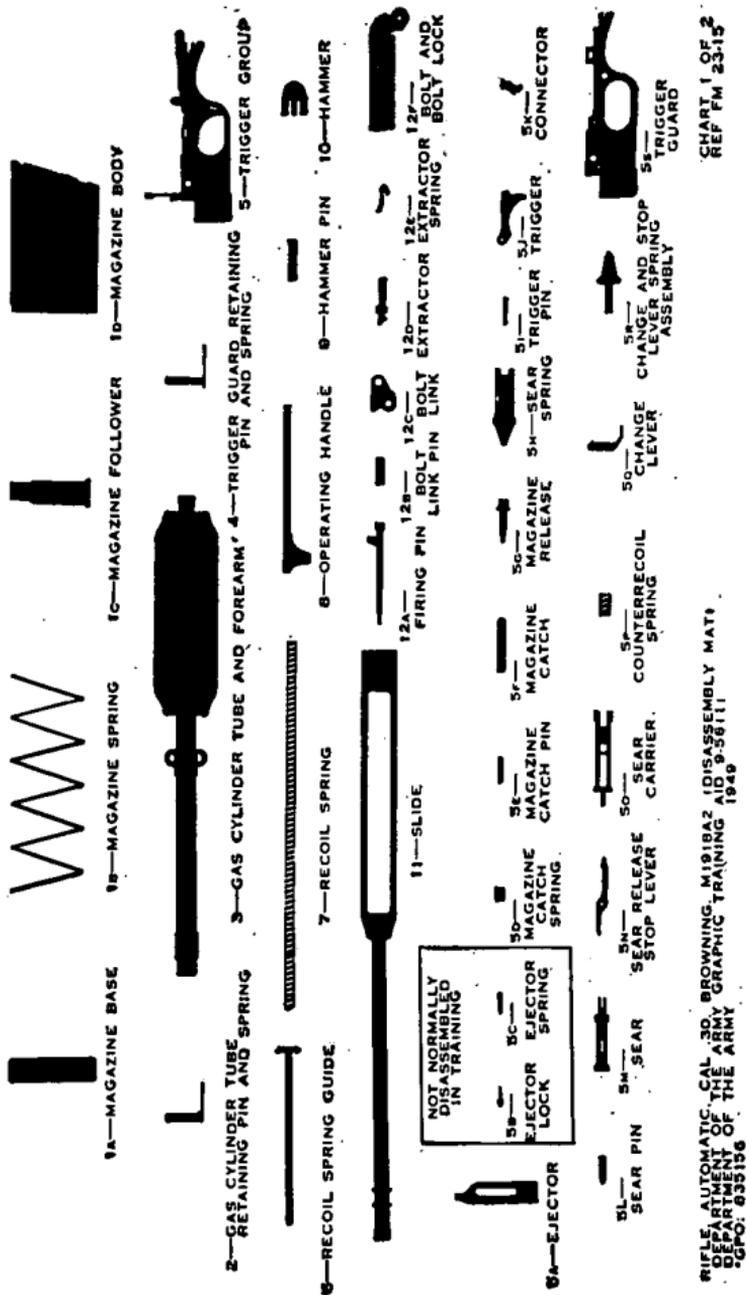


Figure 169. Disassembly training mats, GTA 9 56 (1).

# RIFLE, AUTOMATIC, CAL. .30, BROWNING, M1918A2

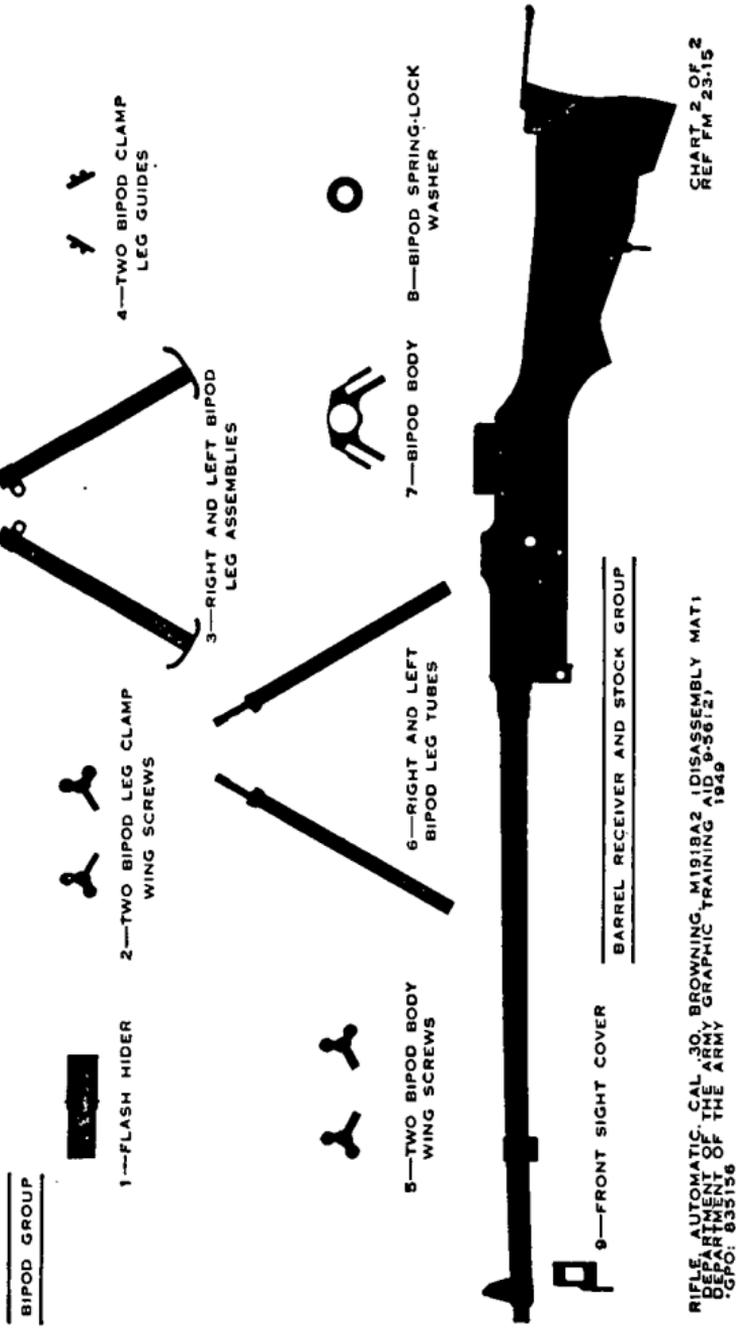


Figure 170. Disassembly training mats, GTA 9-56 (2).

## 224. TRAINING AIDS USED IN MECHANICAL TRAINING

*a.* The first subject taught in mechanical training with the automatic rifle is the disassembly and assembly of those groups and parts that the soldier is to disassemble. The plastic disassembly training mats are excellent training aids to assist you in teaching disassembly, assembly, and nomenclature. The mats are available on the basis of one set per ten automatic rifles and are issued in two sheets as shown in figures 169 and 170.

*b.* Large wooden working models of the operating group, the trigger group, and the buffer and rate reducing group are illustrated in figures 171 through 173. The dimensions for constructing each of these models are indicated on the drawings.

*c.* Should you not choose to construct the models illustrated in figures 171 through 173, a suitable substitute for the operating group model is the small group training aid shown in figures 174 and 175. Many steps of functioning which can be shown on the operating group model can be shown on the small group training aid, using the bolt and slide assemblies. However, this training aid cannot be used for large groups and, when it is used for small groups, trained assistant instructors are needed to explain the steps of functioning. Construction details for this training aid are shown in figure 175.

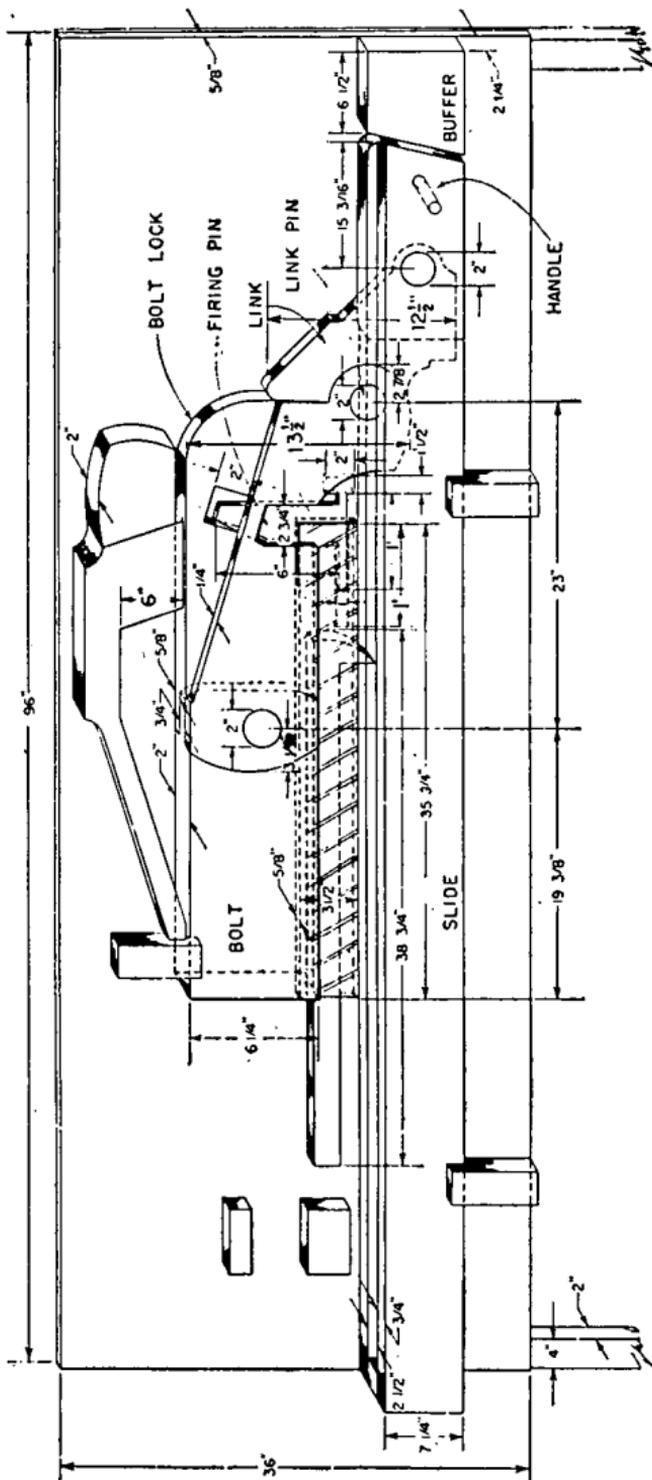


Figure 171. Operating group model.

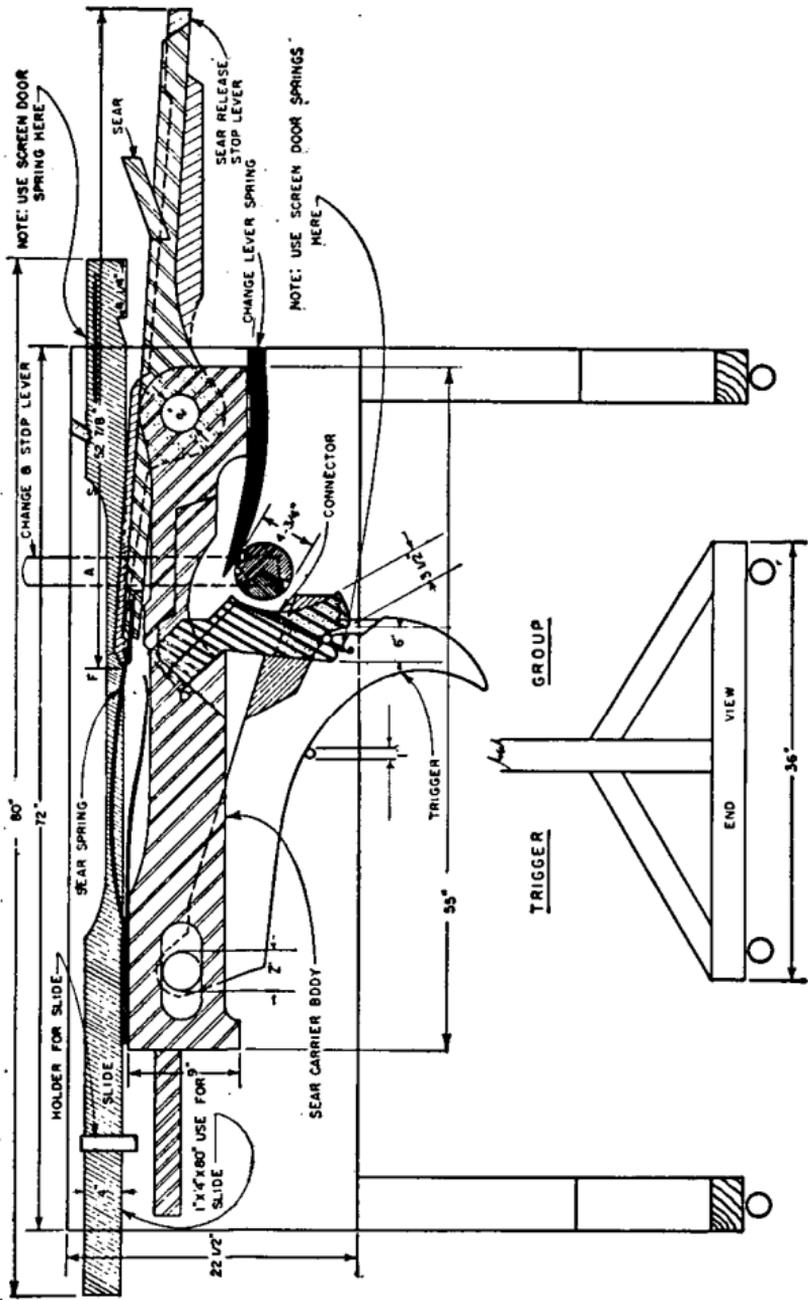
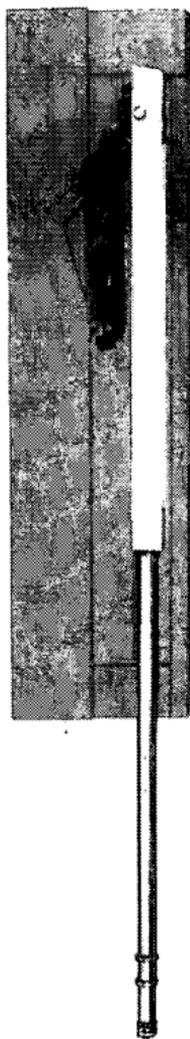
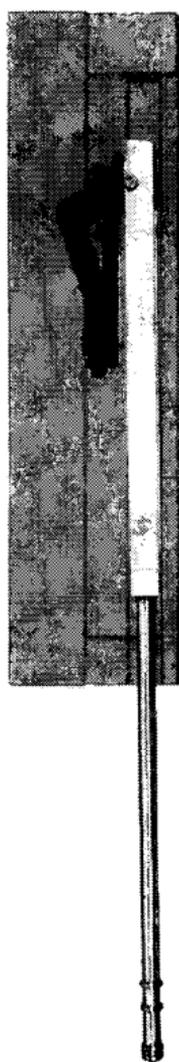


Figure 172. Trigger group model.





OPERATING PARTS IN REARWARD POSITION



OPERATING PARTS IN FORWARD POSITION

*Figure 174. Small group training aid assembled.*

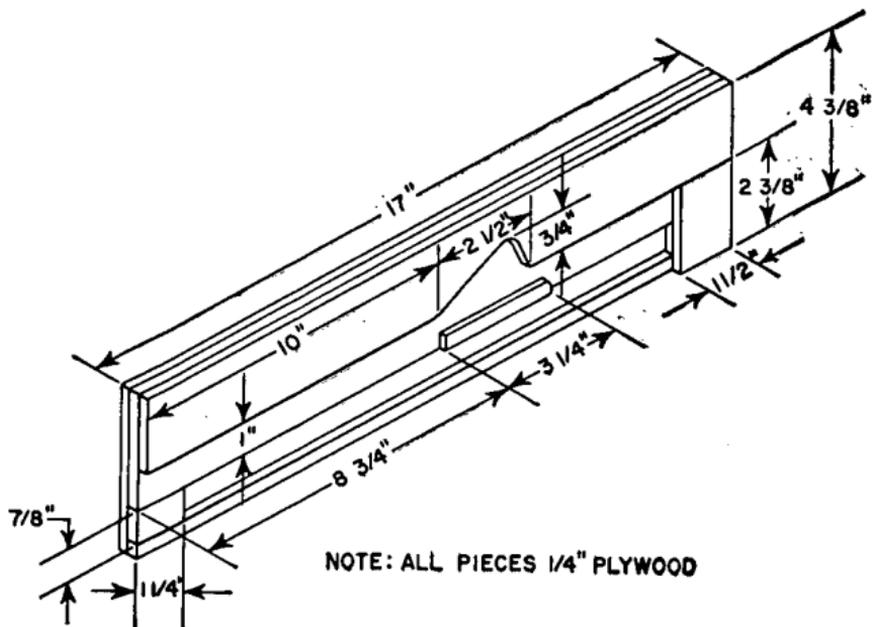
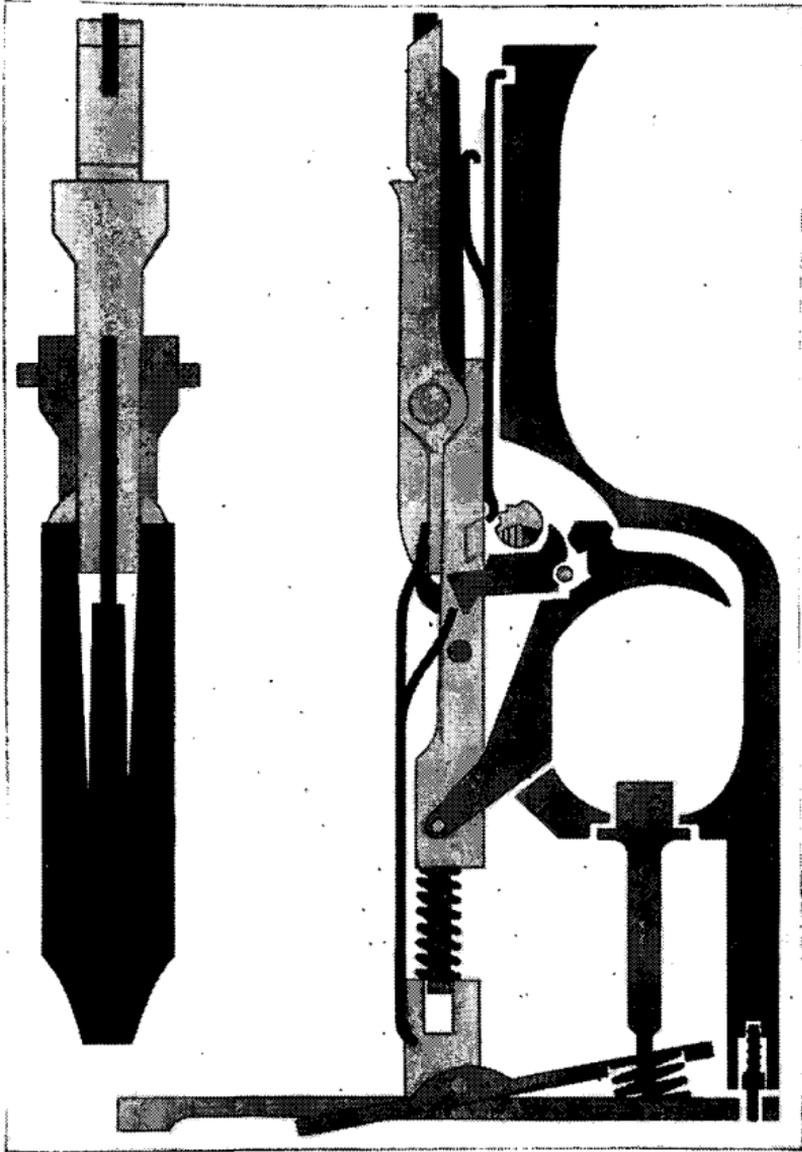


Figure 175. Small group training aid.

d. Additional training aids are desirable to teach loading and the action of the gas. Charts based on figures 94 and 96 are recommended.

e. A chart of the buffer and rate reducing group based on figure 97 and a chart of the trigger group (fig. 176) are excellent to orient and assist the class in disassembly and assembly of those groups. The buffer and rate reducing group chart should be made in two sections because of the size of this group. The charts of these groups can also be used to teach functioning if the large wooden working models are not available. Charts are not as effective as working models for teaching functioning.

f. Included in the subject of mechanical training with the automatic rifle are stoppages and



*Figure 176. Trigger group chart.*

immediate action. Certain stoppages are more common than others. To show five of the more common stoppages, charts based on figures 112 through 116 may be used.

*g.* Other training aids that can be used to assist in presenting mechanical training with the automatic rifle are—

- (1) Training films and film strips.
- (2) Graphic Training Aid 9-6.
- (3) Cut-away model of the automatic rifle.

## **225. TRAINING AIDS USED IN PREPARATORY MARKSMANSHIP TRAINING**

The training aids used to assist in teaching preparatory marksmanship with the automatic rifle are explained in the order in which they are used.

## **226. SIGHTING AND AIMING EXERCISES**

*a.* A sight picture device similar to the one shown in figure 177 can be used to show the correct sight alinement and the correct sight picture as well as the errors in sight alinement and sight picture.

*b.* During the first sighting and aiming exercise, the sighting and aiming bar is used in teaching as well as testing the pupil's ability to set up the correct sight alinement and correct sight picture. A detailed drawing of the sighting and aiming bar is given in figure 178.

*c.* The sighting disk used in the second and third sighting and aiming exercises is shown in

figure 179. The automatic rifle rest used in this exercise is an empty wooden caliber .30 ammunition box with the necessary notches cut to secure the weapon.

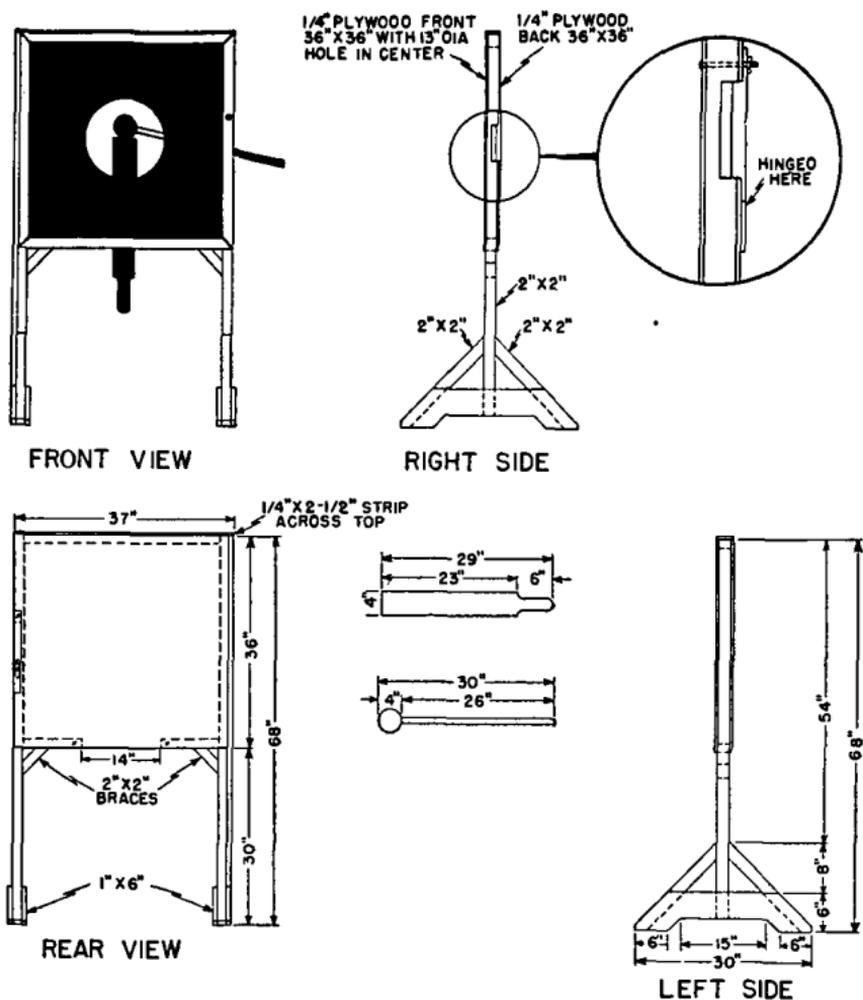


Figure 177. Sight picture device.

d. The one man sighting and aiming device shown in figures 180 and 181 may be used in place of those training aids listed elsewhere in

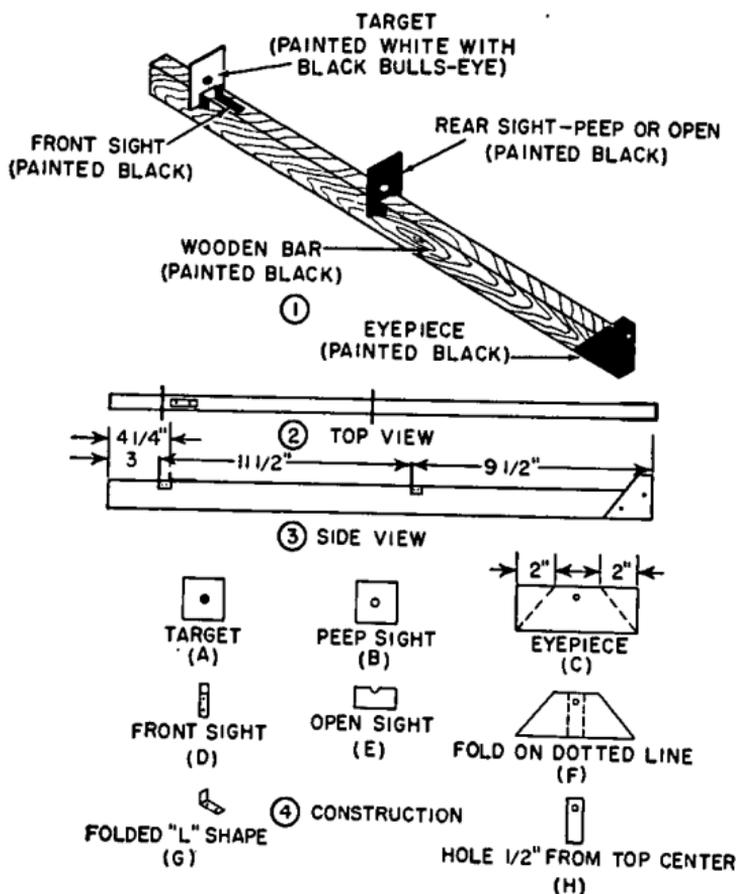


Figure 178. Sighting and aiming bar.

this manual for the second and third sighting and aiming exercises.

- (1) This device is a sawhorse 9 feet long and 36 inches high. On one end are two clamps to hold the automatic rifle in position. On the other end is a permanently attached mirror. A target board is fixed beside the automatic rifle to hold a sheet of paper on which sight pictures are plotted. A split handle fits

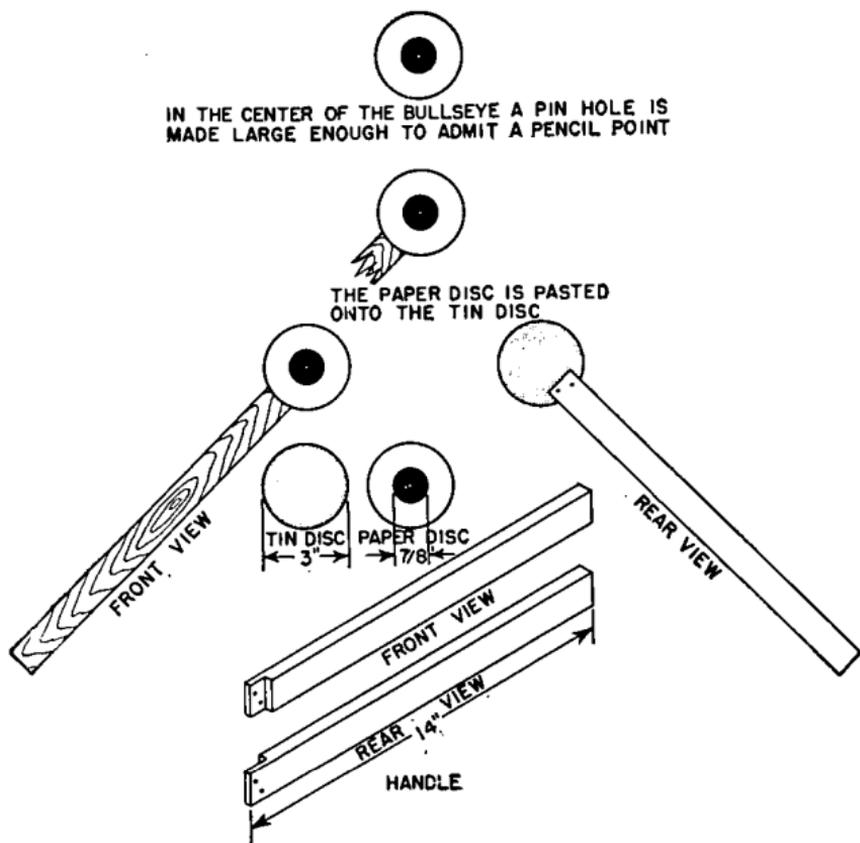
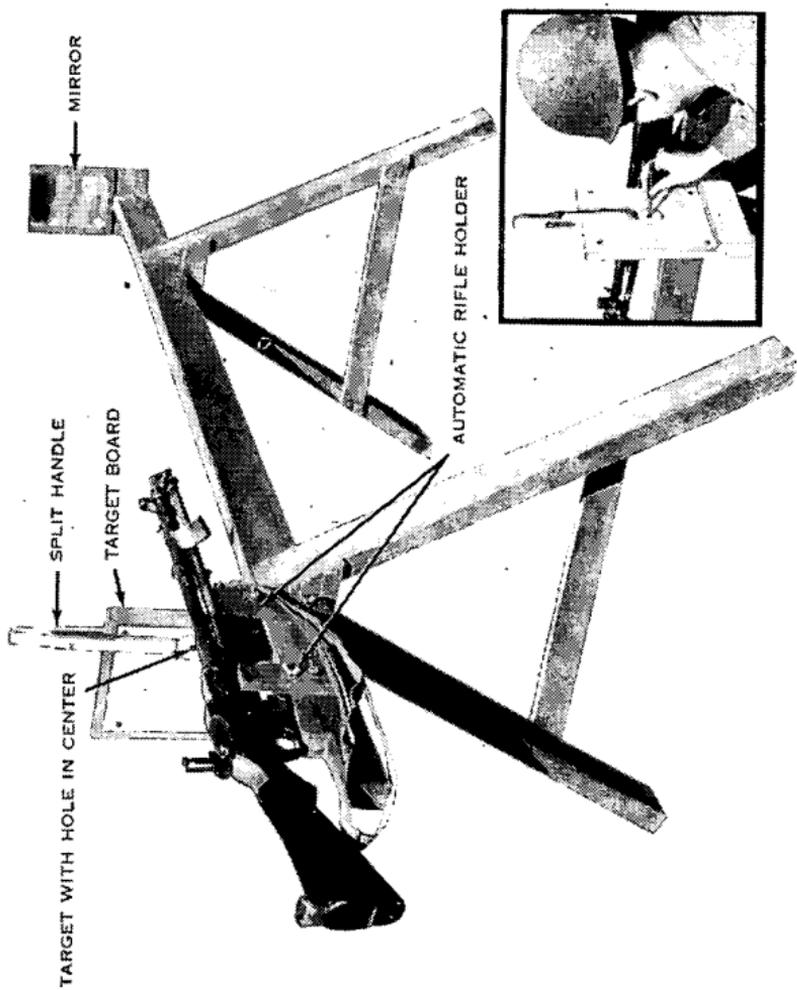


Figure 179. Sighting disk.

down over the target board. On that handle is a bolt that, when tightened, holds the handle in any desired point on the board. A metal target representing those used in 1,000-inch firing is placed on the mirror side of the split handle. A similar target, with a hole in the center, is fastened on the other side. For sight picture exercises, the instructor or soldier adjusts the target so that its reflection in the mirror gives



*Figure 180. One man sighting and aiming device assembled.*



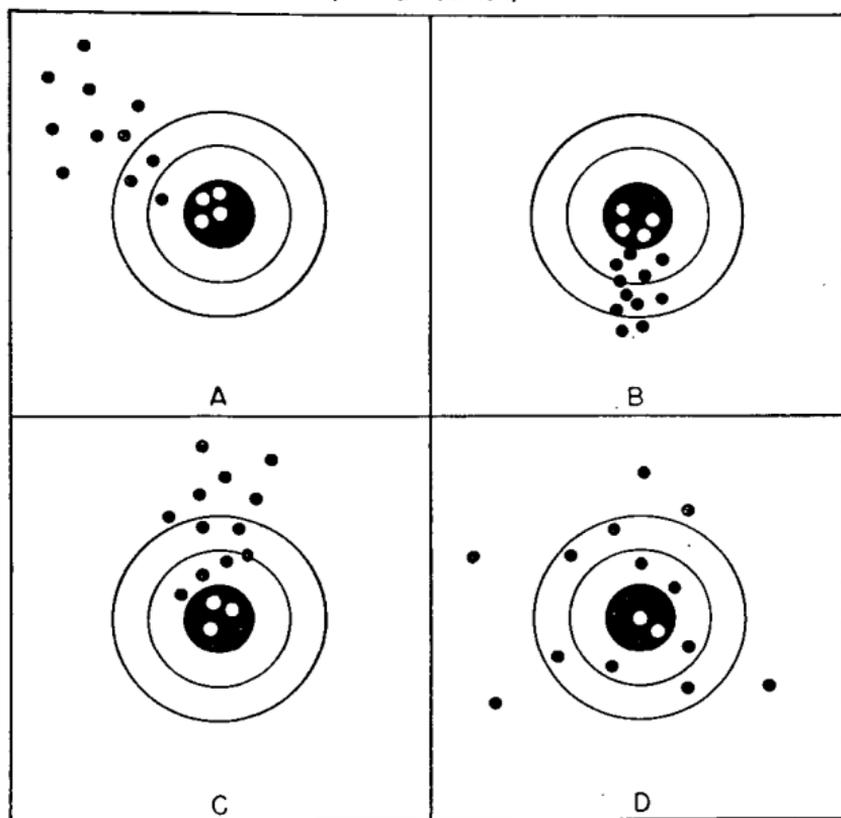
the correct sight picture. For shot group exercises, the correct sight picture is made and then marked on the paper by inserting a pencil point through the hole in the target as shown in figure 180.

- (2) Among the advantages of the one man device over the other training aids are the following: there is no requirement for markers, consequently the number of men required to conduct training is reduced; as no targets are used at 1,000 inches it is possible to conduct this training in a restricted area or indoors; because only one man is required to operate it, individual soldiers can use the device on their own time to practice sighting and aiming by plotting shot groups. The only disadvantages of the one man device result from its size and weight. When not in use it takes up considerable storage space and it is not easily moved from one training area to the other.

## 227. POSITIONS

A series of charts like those shown in figure 182 can be used to illustrate the effect of errors in the prone position.

FAULTY SHOT GROUPS  
(PRONE POSITION)



CAUSES

- |  |   |
|--|---|
| <p>A. 1. LOW RIGHT SHOULDER</p>                        | <p>2. BIPOD LEGS ADJUSTED TOO HIGH CAUSING FIRER TO HOLD ELBOWS IN, SETTING UP A TENSION.</p> |
| <p>B. 1. BIPOD LEGS ADJUSTED TOO LOW</p>               | <p>3. FAILED TO HOLD BREATH. EXHALED WHILE FIRING.</p>  |
| <p>2. FAILED TO HOLD DOWN WITH LEFT HAND.</p>          | <p>4. TENSED MUSCLES AND RAISED RIGHT SHOULDER INTO BUTT OF AUTOMATIC RIFLE.</p>              |
| <p>3. FAILED TO HOLD BREATH. INHALED WHILE FIRING.</p> | <p>D 1. FAILED TO HOLD AUTOMATIC RIFLE TIGHTLY</p>  |
| <p>C. 1. ELBOWS SLID OUT WHILE FIRING.</p>             | <p>2. LOOSE FLASH HIDER.</p>  |

*Figure 182. Shot group series.*

## 228. SIGHT SETTING AND TRIGGER MANIPULATION EXERCISES

a. Before explaining the sight setting exercises, you should explain the rear sight. A chart similar to the one shown in figure 183 is an excellent aid in this explanation.

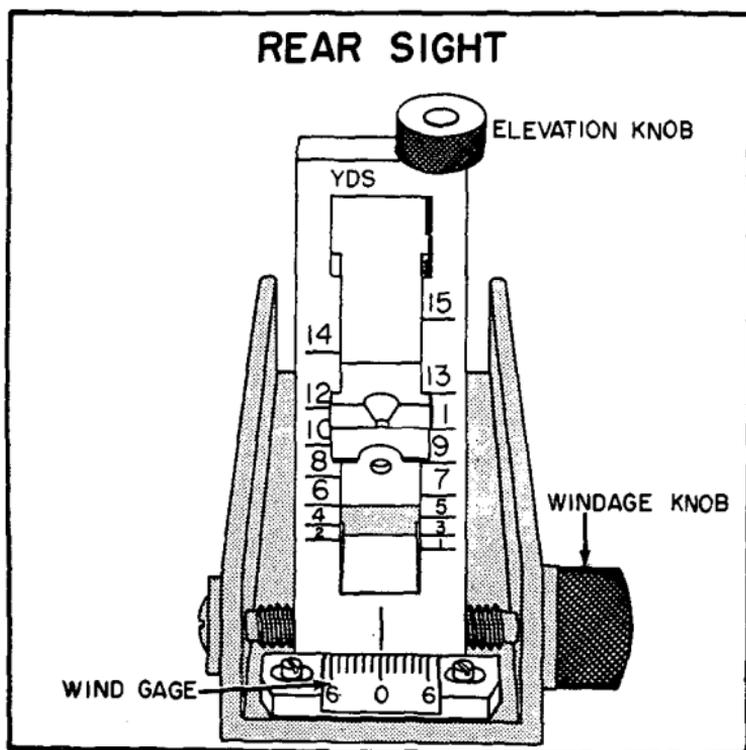


Figure 183. Rear sight chart.

b. The trigger manipulation step is taught through the use of six key words. The chart shown in figure 184 can be used to teach this exercise.



*Figure 184. Trigger manipulation chart.*

## **229. AUTOMATIC FIRE EXERCISES**

The class should be oriented concerning the fundamentals of automatic fire exercises before the exercises are conducted. The chart listing the six key words (fig. 184) can be used in this phase.

## **230. SIGHT CHANGES, EFFECT OF THE WIND, AND DIMENSIONS OF THE TARGET**

*a.* There are several charts that can be used during the fifth step of preparatory marksmanship training. The chart shown in figure 185 can be used to explain the clock system, the effect of the wind, and sight changes.

b. To make precise adjustments on the rear sight to move the shots into the center of the bull's eye, the dimensions of the target must be known. A chart based on figure 146 fulfills this requirement. Note that the dimensions of the target are included on the target. If chart making materials are not available, the B target mounted on a frame with the dimensions of the scoring spaces properly indicated can be used.

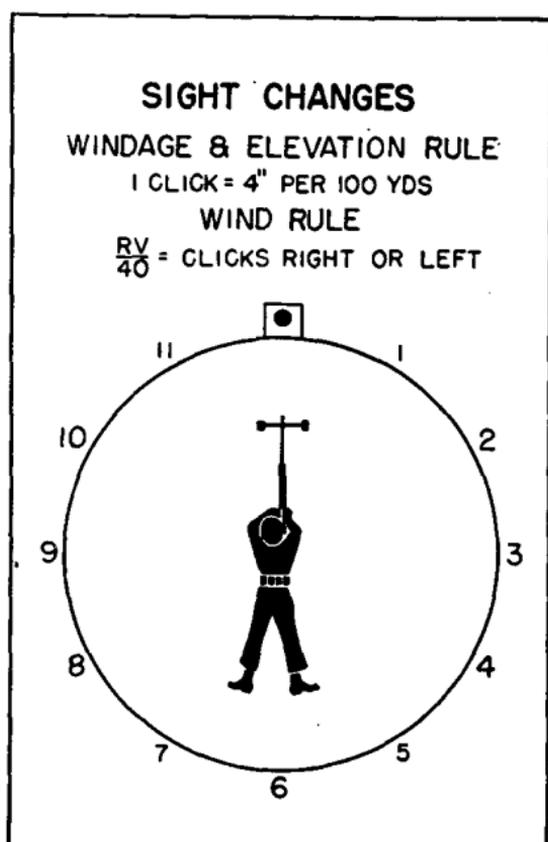


Figure 185. Clock system chart.

c. The importance of the score card cannot be over-emphasized. A chart based on figure 151 or 152 is desirable during this instruction. The chart is placed on plywood, masonite, or some similar material. As blackboard paint is used for the background, this training aid may be used several times to explain and demonstrate typical score card problems. A chart can be prepared for both the slow fire and automatic fire portions of the scorecard.

## CHAPTER 7

### SAFETY PRECAUTIONS

---

#### 231. GENERAL

Safety is the first concern of everyone during any exercise in which weapons are used. The Army has prescribed certain safety precautions. When everyone follows these precautions carefully, accidents do not occur. Start observing safety precautions as soon as you receive your weapon. You are responsible for your own safety and for that of those around you. You are expected and required to assist in enforcing safety precautions *at all times*.

#### 232. SAFETY PRECAUTIONS TO BE OBSERVED AT ALL TIMES

The more important safety precautions to be observed at all times are:

a. Never playfully or carelessly point any weapon at anyone or in any direction where people may be.

b. Always assume that a weapon is loaded until it has been thoroughly inspected and found to contain no live ammunition.

c. Never carry your automatic rifle with the operating parts to the rear. The only exception to this rule is when you are in combat and are in

contact with the enemy or when you are engaged in certain training exercises and are specifically told to carry your automatic rifle with the operating parts to the rear.

*d.* Except when specifically instructed otherwise (*c* above), always carry your automatic rifle with the muzzle pointing up.

*e.* Never place an obstruction of any kind in the bore or muzzle of your automatic rifle. Always examine the bore before starting to fire.

*f.* Except on a firing line where both live ammunition and dummy cartridges are used, always take particular care with dummy ammunition to make sure that no live cartridges are present.

*g.* Never fire blank ammunition at anyone who is closer than 20 yards.

### **233. SAFETY PRECAUTIONS TO BE OBSERVED DURING MECHANICAL TRAINING**

The more important safety precautions to be observed during mechanical training are:

*a.* Check the chamber and receiver to see that no live cartridges are in the automatic rifle.

*b.* Check all magazines, spare parts kits, and other containers for live ammunition.

*c.* Check each dummy cartridge carefully to make sure that it is not a live cartridge and check each empty cartridge case to make certain that it does not have a live primer.

## 234. SAFETY PRECAUTIONS TO BE OBSERVED DURING PREPARATORY MARKSMANSHIP TRAINING

During preparatory marksmanship training, the primary safety precaution is to make certain that no live cartridges are present. The precautions listed in paragraph 233 must be followed rigidly. Because preparatory marksmanship training prepares you to fire live ammunition on the range, you must learn to observe certain safety precautions during this period that will apply on the range. These safety precautions are enforced on the preparatory marksmanship field:

*a.* Keep the automatic rifle pointed in the air and toward the targets.

*b.* On the command CEASE FIRING, drop your hands from the weapon if you are in the prone position. In the other positions, take your finger off the trigger and out of the trigger guard.

*c.* Before leaving the preparatory marksmanship line, clear your automatic rifle; remove the magazine, cock the weapon, and then press the trigger.

*d.* Never pull back on the operating handle or insert a magazine in the automatic rifle away from the preparatory marksmanship line.

## 235. SAFETY PRECAUTIONS TO BE OBSERVED DURING RANGE FIRING

*a.* It is the responsibility of all officers conducting firing with the automatic rifle to know the pertinent safety rules in the following publications:

- (1) SR 385-310-1.
- (2) TM 9-1990.
- (3) Local (installation or unit) safety regulations.

*b.* It is also the officer's responsibility to familiarize you with such of the above regulations as you need to know before going on the range.

*c.* Besides the safety precautions described above that you will be given, observe these additional precautions while on the range:

- (1) Do not draw or issue ammunition until the officer in charge of firing directs you to do so.
- (2) Do not load or commence firing until the command to do so has been given.
- (3) Once you pick up your automatic rifle, keep it pointing in the air and down range.
- (4) Load and unload your weapon only on the firing line.
- (5) Do not remove your weapon from the firing line until it has been cleared and inspected and until you have been authorized to remove it.

- (6) Do not cock the weapon or insert a magazine while you are behind the firing line.
- (7) While you may practice sight setting, trigger manipulation, and magazine changing on an extension of the firing line, never practice these techniques behind the firing line.
- (8) Never step in front of the firing line for any reason unless the officer in charge of firing gives you permission.
- (9) As soon as you have completed firing, or at the command CLEAR WEAPONS, clear your automatic rifle; remove the magazine, cock the weapon, and press the trigger to allow the operating parts to go forward.
- (10) When you hear the command CEASE FIRING, drop both hands to the ground if you are in the prone position, and wait for further instructions. In the other positions, remove your finger from the trigger and out of the trigger guard. Anyone may give the command CEASE FIRING when it is necessary for safety.
- (11) Take proper care of the ammunition. Keep it free from grease and do not allow it to remain in the direct rays of the sun for long periods of time. Inspect the ammunition carefully and turn in any defective cartridges including misfires.

- (12) Do not fire if a red flag is displayed above the pits.
- (13) Do not fire unless a red streamer is displayed at a prominent point on the range. This streamer serves as a warning to everyone in the vicinity that firing is in progress.
- (14) Before throwing away any ammunition cartons, make sure that they do not contain any cartridges.
- (15) Before turning in your empty cartridge cases, inspect each one to make certain that it does not contain a live primer and that no live cartridges are present.
- (16) Before you are permitted to leave the range, you will be inspected by the officer in charge of firing or his representatives to make certain that you have no live cartridges on you or in your automatic rifle or magazines.
- (17) Before firing on any moving target range, the right and left safety limits will be pointed out by the officer in charge of firing. Do not fire unless you clearly understand these safety limits. Do not fire outside of these limits.

## APPENDIX

### REFERENCES

---

#### 1. CHEMICAL

TM 3-220 Decontamination.

#### 2. ORDNANCE

TM 9-850 Cleaning, Preserving,  
Sealing and Related  
Materials Issued for  
Ordnance Materiel.

TM 9-855 Targets, Target Material,  
and Training Course  
Layouts.

TM 9-1211 Caliber .30, Browning  
Automatic Rifle  
M1918A2.

TM 9-1900 Ammunition, General.

TM 9-1990 Small Arms Ammunition.

ORD 7-SNL A-4 Organizational Spare  
Parts and Equipment  
for Rifle, Automatic  
Caliber .30, Browning,  
M1918A2.

### 3. INDIVIDUAL SOLDIER

- |          |                                  |
|----------|----------------------------------|
| FM 21-8  | Military Training Aids.          |
| FM 21-40 | Defense Against Chemical Attack. |

### 4. BASIC WEAPONS

- |         |                              |
|---------|------------------------------|
| FM 23-5 | U. S. Rifle, Caliber .30 M1. |
|---------|------------------------------|

### 5. TRAINING FILMS AND FILM STRIPS

- |           |   |
|-----------|---|
| TF 9-1205 | Rifle, Automatic, Caliber .30, Browning M1918A2—Principle of Operation. |
|-----------|---|

- |         |   |
|---------|---|
| FS 7-74 | The Browning Automatic Rifle, Caliber .30, M1918A2 with Bipod—Part I: Mechanical Training: Description. |
|---------|---|

- |          |   |
|----------|---|
| FS 7-106 | The Browning Automatic Rifle, Caliber .30, M1918A2—Part II: Mechanical Training (Continued): Operation. |
|----------|---|

- |          |   |
|----------|---|
| FS 7-115 | The Browning Automatic Rifle, Caliber .30, M1918A2—Part III: Care and Cleaning. |
|----------|---|

FS 7-120

The Browning Automatic Rifle, Caliber .30, M1918A2—Part IV: Stoppages and Immediate Action.

## 6. MISCELLANEOUS

GTA 9-6

Browning Automatic Rifle, Caliber .30, M1918A2.

GTA 9-56

Rifle, Automatic, Caliber .30, Browning M1918A2.

SR 110-1-1

Index of Army Motion Pictures and Film Strips.

SR 310-20-3

Index of Training Publications.

SR 310-20-4

Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, Modification Work Orders, Tables of Organization and Equipment, Reduction Tables, Tables of Allowances, Tables of Organization, and Tables of Equipment.

- SR 320-5-1 Dictionary of United States Army Terms.
- SR 385-310-1 Regulations for Firing Ammunition for Training, Target Practice, and Combat.
- AR 775-10 Qualification in Arms and Ammunition Training Allowances.

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