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8th Company

U. S. CARBINE
CAL. .30 M 1

TANK DESTROYER SCHOOL
WEAPONS DEPARTMENT
CAMP HOOD, TEXAS

CHAPTER I

General Data - Characteristics

1. The U. S. Carbine, Caliber .30 M1 is a gas operated, magazine fed, air cooled, semi-automatic, shoulder-hip weapon. The Carbine has controlled fire power at limited ranges against personnel and light materiel targets up to approximately 300 yards.

2. The applicatory system of instruction should be used throughout the soldiers course on this weapon. That is: Explanation by the senior instructor. Demonstration by the well trained assistant instructors to small groups. Practical work by the soldiers under the Supervision of both senior and assistant instructors; and a practical Examination before firing by the soldier. The proper Preparation before class will aid greatly to the value of any instruction on the Carbine.

3. The importance of the proper knowledge of this weapon is threefold:

(1) Success in battle.

(2) Self-preservation.

(3) Newest small arms weapon for Tank Destroyer Units.

4. (1) Gas Operated. - Bolt locked to receiver before, during, and after the explosion of cartridge. No direct action of gas to force bolt to rear.

(2) Magazine Fed. - Magazine weighs approximately one-half (1/2) pound loaded with fifteen (15) rounds. The fifteen (15) cartridges are staggered in the tube of the magazine, under pressure from the magazine spring, and are aligned at the mouth of the magazine by the lips of the magazine and the dummy round on the follower:

(3) Air Cooled. - The air, in and around the barrel, is the only method of cooling the Carbine.

(4) Semi-Automatic. - The trigger, after being squeezed to fire a shot, must be released to its forward normal position before another round may be fired. This weapon will fire fifteen (15) shots only on fifteen (15) squeezes of the trigger, the pressure having been released on the trigger after each explosion.

(5) Shoulder-Hip Weapon. - The Carbine can be fired accurately both from the shoulder in the usual known distance range firing position of offhand, kneeling, sitting, or prone; and from the hip, combat style.

(6) It is recommended that the weapon be used only against Personnel (people) and Light Materiel Targets (unprotected gun crews, gun emplacements, motorcycles, peeps or jeeps, one-half (1/2) ton W.C., etc.; not against any armored vehicles.)

(7) The usual accurate range is about 300 yards.

5. Weights and Lengths (Approximate). -

(1)	unloaded Carbine (without magazine and with sling)	5 1/4 lbs.
(2)	loaded magazine	1/2 lb.
(3)	loaded Carbine	5 3/4 lbs.
(4)	overall length	36 inches
(5)	barrel	18 inches
(6)	sight radius	21 1/2 inches

a. The sight radius is the distance between the front sight blade and the rear sight leaf.

6. Chamber Pressure. - 31,000 lbs. per square inch.

(1) The instantaneous explosion of the powder in the chambered cartridge case causes expanding gases, thus forming 31,000 lbs. per square inch chamber pressure.

7. Muzzle Velocity. - 1900 feet per second.

(1) The expanding gases force the projectile out of the muzzle at the speed of 1900 feet per second.

8. Rifling of Barrel. - Projectile makes uniform right hand twist one (1) turn in twenty (20) inches while moving down barrel's four (4) lands and four (4) grooves. This rifling makes bullet spiral in flight and keeps it from tumbling.

9. Unit of Fire. - Sixty (60) rounds per weapon.

(1) Logistics and supply figure to control weights and measurements of train or boat loadings.

10. Rate of Fire. - Undetermined at this writing.

(1) Believed to be thirty (30) well aimed shots per minute by average individual.

11. Outstanding New Characteristics. -

(1) Gas cylinder just four and one-half (4 1/2) inches from forward face of the receiver, thus reducing carbonization.

(2) Barrel without taper for two thirds (2/3) of length.

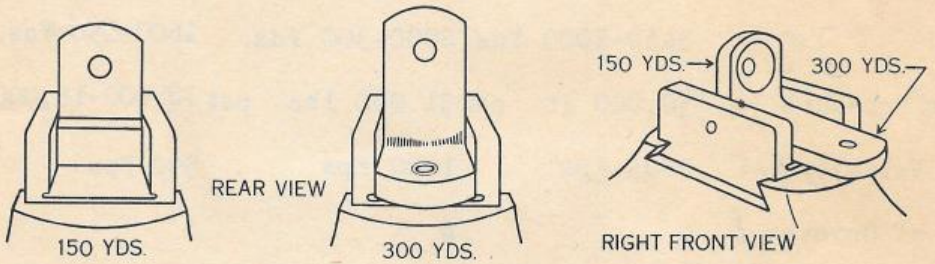
(3) Elongated slot in sear, to allow semi-automatic action of Carbine.

12. Trigger Pull. - Approximately four (4) to six (6) pounds.

(1) Recommend about three (3) pound pull.

13. Rear Sight. - Apertures on "L" type leafs for ranges of 150 yards, 300 yards.

(1) Models of the Carbine initially issued are equipped with an "L" type rear sight, consisting of two (2) arms at right angles, each pierced with an aperture. A flat spring is placed between the sight leaf and sight base to retain the sight leaf in position. Either sight may be raised into position by turning with the fingers, and the leaf is held correctly by the pressure of the spring. The apertures provided are computed for ranges of approximately 150 and 300 yards. With this sight it will be necessary to aim off the target to secure intermediate changes in range and windage corrections. In other words, Kentucky windage and Kentucky elevation.



(2) It is believed that later models of the Carbine will be equipped with an adjustable sight. This sight will be graduated from 100 yards to 300 yards in increments of 50 yards and will provide for 3 points of both left and right windage. However, the exact point of strike must be determined by experiment.

14. Manufacture of Weapon. -

(1) Designed by Winchester Repeating Arms Co., New Haven, Conn.

(2) Production by General Motors Co., Inland Division, Dayton, Ohio.

15. The following chart is a comparison of the U. S. Rifle, Cal. .30 M1 (Garand); U. S. Carbine Cal. .30M1; Thompson Sub-Machine Gun (Tommy Gun).

COMPARISON OF SEMI-AUTOMATIC SMALL ARMS

CHARACTERISTICS .45 Cal Pistol	M1	CARBINE	SUB M. G.
Operation Recoil	Gas	Gas	Recoil
Feed Magazine	Clip (8)	Magazine (15)	Magazine (20-30)
Cooled Air	Air	Air	Air
Fire Semi-Auto	Semi-Auto	Semi-Auto	Semi-Auto; Automatic
Type	Shoulder-Hip	Shoulder-Hip	Shoulder Hip
Weight-Weapon ~ 10 lb.	9 lb.	5 1/4 lb.	10 3/4 lb.
Bayonet	1 "	None	None
Loaded Clip ~ 1/2 lb.	1/2 lb.	1/2 lb.	1 1/2 lbs. - 2 lbs.
Length-Overall	43 inches	36 inches	33 1/2 inches
Barrel	22 inches	18 inches	10 1/2 inches
Sight Radius	28 inches	21 1/2 inches	22 1/2 inches
Ammunition M-1911-234 gr	M2.30-152 GRS	M1.30-110 GRS	M1911.45-234 GRS
Ranges 1700 50	3450-1000 Yds.	2000-300 Yds.	1600-150 Yds.
Chamber Pressure 12,000-16,000 psi	50,000 lb. psi	31.000 lbs. psi	12.000-16,000 lbs.psi
Muzzle Velocity 835	2805 Fps	1900 Fps	990 Fps
Number of Grooves 6	4	4	6
Twist in Rifling U.L. 1 turn in 16"	U-R 1/10	U-R 1/20	U-R 1/16
Rate of Fire (Appx.)	27 RPM	30 RPM	50 RPM
Unit of Fire	150 RDS	60 RDS	200 RDS

16. External Nomenclature. - Nomenclature should be taught in conjunction with Disassembly and Assembly, not as a separate subject.

(1) Muzzle. - Bore of barrel 30/100 of an inch. (Cal. .30)

Front Sight Assembly. - Front sight ring around barrel held in place by a keyway. Two wings protect knife blade type sight. (Also known as post type blade). Blade held in place between wings by front sight pin.

Barrel. - 18 inches long, without taper for 2/3 of length, air cooled.

Front Band. - Holds barrel to stock. Also holds hand guard to both barrel and stock. Is held tight by two (2) flanges on left side and screw.

Front Band Screw. - Holds front band tight. Also holds sling swivel in place. Never take out.

Front Band Locking Spring. - On right side of stock holding front band. Must be compressed to release front band.

Sling Swivel. - Holds web sling in place. Is held in place by both front band and front band screw.

Web Sling. - Held in forward end of Carbine by sling swivel. Designed to carry the weapon only.

Hand Guard. - Wooden part above barrel to protect hand from meeting hot barrel when firing. Grooved on top to allow vision of proper sight picture.

Stock. - Wooden part below barrel going from front band to the trigger guard. Holds mechanism of the Carbine.

Receiver. - Metal fixture into which fit both the bolt and the magazine. Never removed.

Operating Slide. - On right hand side of the weapon. Attached to bolt by cam surface of slide to operating lug on bolt. Moves bolt to rear, and returns it forward.

Operating Slide Handle. - Projection on right rear side of operating slide. For manual operation of bolt.

Operating Slide Catch. - Small, cylindrical button on top of operating slide handle. Engages into Operating Slide Catch Recess, which is on the rear right of the receiver. Used to keep operating slide to rear. Only way slide can be held to rear.

Bolt Assembly. - Rides, and locks, in its grooves in the receiver.

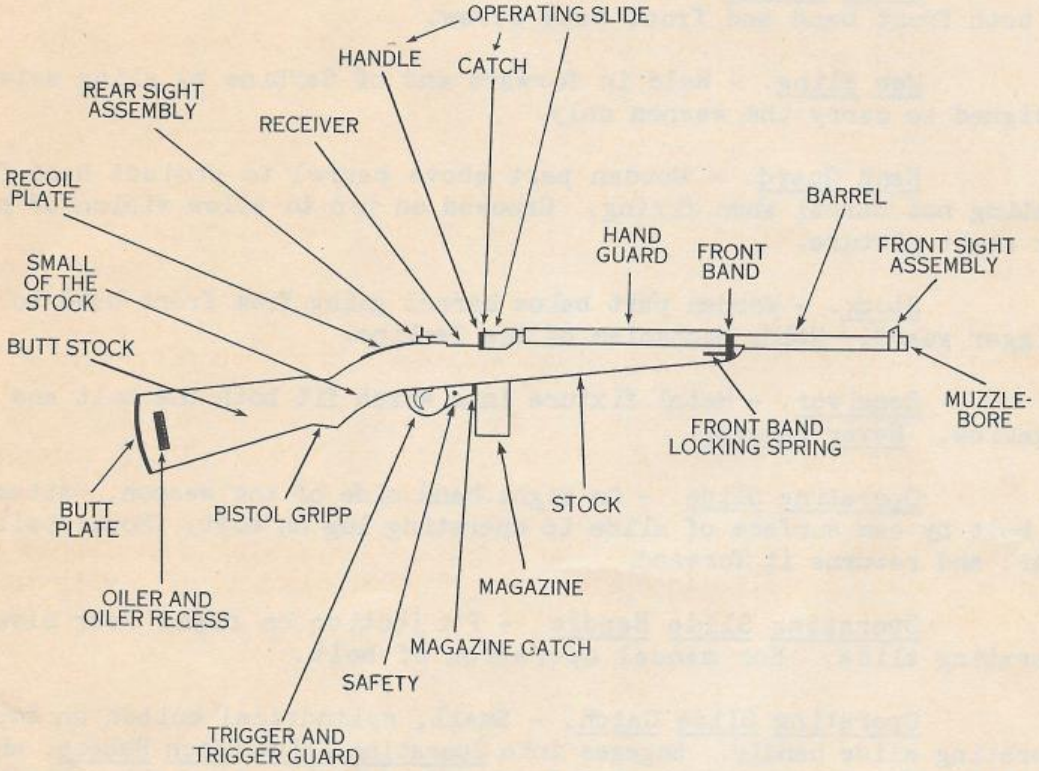
Rear Sight Assembly. - "L" type sight leaf, with an aperture in each leaf, short one for 150 yards, the longer for 300 yards.

Recoil Plate and Screw. - Recoil plate attached to stock by screw. Two (2) functions of recoil plate:

A. To hold barrel and receiver group to stock.

B. To absorb shock so as not to damage stock. Screw goes all the way through small of the stock.

Small of Stock. - Smallest part of stock, just behind recoil plate and trigger guard.



U. S. CARBINE

CAL. .30 M1

EXTERNAL NOMENCLATURE

RIGHT HAND SIDE VIEW

Pistol Grip. - Wooden projection on bottom of small of stock. Aids in holding weapon firmly.

Butt Stock. - Large rear surface of stock. Usually goes against shoulder or hip when firing.

Oiler Recess in Butt Stock. - Recess cut through butt stock to keep oiler in place and to aid in holding web sling.

Oiler. - Small cylindrical metal case holding lubricating oil. Oiler holds web sling in place at butt end of Carbine.

Butt Plate. - Metal plate at butt end of weapon to protect wooden stock. Held in place by screw.

Trigger Guard. - Metal ring to protect trigger.

Trigger. - Metal finger which is squeezed to fire Carbine, must be squeezed for each shot, as weapon is semi-automatic.

Safety. - Small round button on forward part of trigger guard. When safety protrudes to the right, the weapon is on "safe", as safety blocks the trigger. Safety most accessible to trigger finger to place in "fire" position.

Magazine. - Light metal tube, holding fifteen (15) rounds Cal. .30 M1 short cartridges. Held in place by a catch.

Magazine Catch. - By functioning of a spring and plunger the catch holds the magazine in place. Always press catch to left with trigger finger to both insert and withdraw magazine.

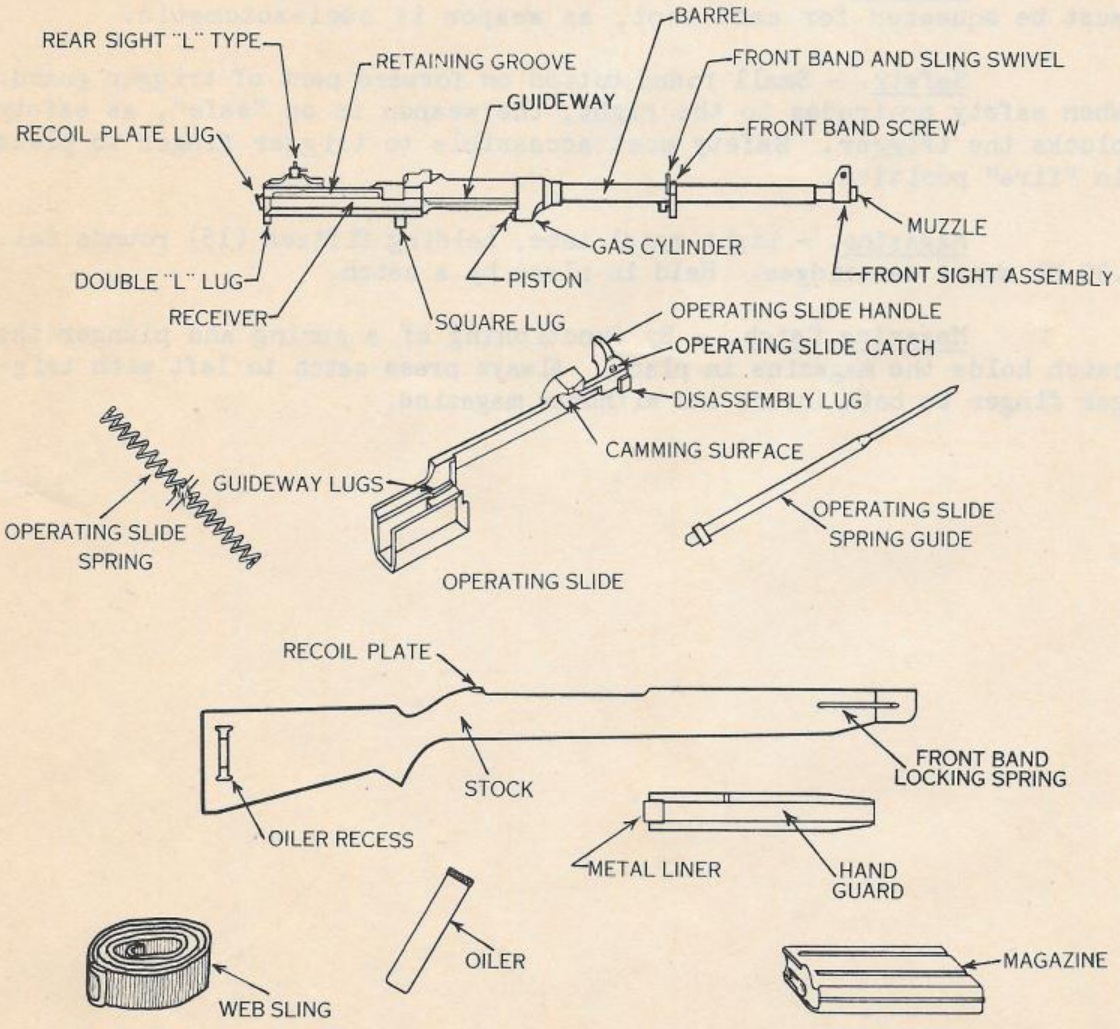
CHAPTER II

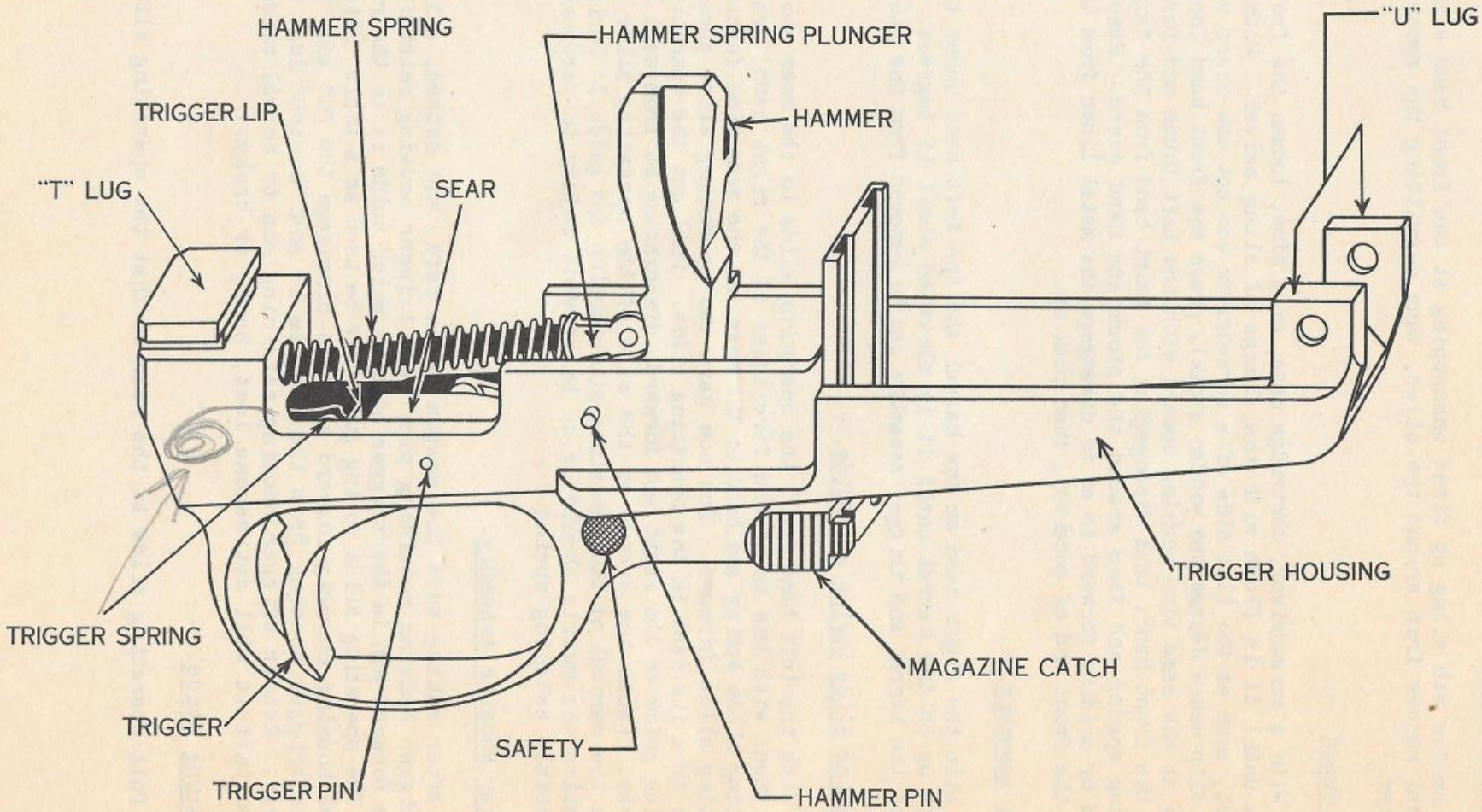
DISASSEMBLY AND ASSEMBLY

17. Main Groups

(1) Disassembly

Following are the only parts removed by the line soldier without supervision. All parts, as disassembled, are placed in order on a clean surface.





TRIGGER HOUSING ASSEMBLY
RIGHT SIDE VIEW

A. Sling and Oiler. -

Remove web sling by first unsnapping at the front band sling swivel, then remove from around the oiler, thus permitting the removal of the oiler.

B. Hand Guard. -

With a screwdriver, cartridge case, or a dime, loosen the front band screw until it is flush with the flange of sling swivel. With a flat object, such as the flat side of a screwdriver (do not use sharp end because a slip would damage the wooden stock), press the front band locking spring at the same time pushing upward with the left thumb and forefinger on the front band, thus disengaging the front band from the front band locking spring and from around the stock and hand guard. Remove hand guard by sliding forward so as to disengage the metal liner from the groove in the front end of receiver, then pick up.

C. Stock Assembly. -

With the right hand on the barrel and the left hand under the stock, lift up on the barrel until it is elevated about 15 degrees, at which point the barrel and trigger assembly can be removed from the stock.

D. Operating Slide Spring and Guide. -

With the left hand, pull the operating slide to the rear about one inch, then. with the thumb and forefinger of the right hand, grasp the operating slide spring and hold to the rear, at the same time forcing the operating slide forward. You now have the operating slide spring guide free from its seat in the operating slide. Pull out the operating slide spring guide to the right and forward, disengaging it from well in the receiver. (Note the groove on the side of the operating slide to facilitate the removal of the operating slide spring and guide.) During this operation the muzzle should be up to prevent injury to personnel from a possible escaping spring.

E. Trigger Housing Assembly. -

After making sure the weapon is on Safe, and cocked, drift out the trigger housing retaining pin, (the trigger housing retaining pin is the forward pin in the trigger housing which holds it to the receiver). The operating slide spring guide may be used as a tool. Slide the trigger housing assembly forward so as to disengage the "U" and "T" lugs on the trigger housing from the "Double L" and "Square" lugs on the receiver. Return trigger housing retaining pin to normal closed position so that it will not become lost, bent, or broken.

F. Operating Slide. -

Pull operating slide to the rear so that the operating slide

catch is opposite the rear face of the receiver. Pull out and up on the operating slide handle so as to disengage the guide lug from the retaining groove by means of the disassembly notch in the side of the retaining groove on the right side of the receiver. (Continue to hold out on the handle with the right hand. Place the left hand under the operating slide and push it forward 1/4 of an inch.) Turn counter clockwise and remove the operating slide. This disassembly is accomplished by aligning the guideway lug on the left side of the operating slide with the relief cut in the guideway.

G. Bolt. -

To remove the bolt, grasp operating lug with right hand and turn counter clockwise. At the same time draw it to the rear about one inch, continuing to turn about 180 degrees - elevate about 45 degrees and lift out.

(2) Assembly

A. Replace Bolt. -

With the right hand, grasp the bolt by the large lug (operating), turn so that this lug is all the way to the left (bolt upside down) holding it at an angle of about 45 degrees. Slip into receiver and turn clockwise, engaging the locking lug into its groove, and at the same time move it forward.

B. Operating Slide. -

Engage the operating lug of the bolt with the camming surface of operating slide handle - line up the relief cut and the guideway lug. Turn clockwise and draw operating slide to the rear engaging guide lug in the disassembly notch in the retaining groove.

C. Trigger Housing. -

Replace trigger housing (the hammer should be in the cocked position) by lining the "U" lug with the "Square" lug, the "T" lug with the double "L" lug and sliding to the rear. Line up the holes and push trigger housing retaining pin home with your thumb.

D. Operating Slide Spring. -

Insert small end of guide into the spring. Insert the spring into well of receiver; with thumb and forefinger of right hand depress spring, so that the end of guide may be inserted into its seat in the slide.

E. Stock Assembly. -

Grasp the barrel and stock as in disassembly - they should go together without forcing. If trouble is encountered start over, being

sure the lug on the receiver is engaged under the notch in the recoil plate and the trigger pin is firmly seated.

F. Hand Guard. -

Replace hand guard by laying it flat on the barrel and sliding it to the rear. Slide the front band down over the stock and hand guard, at the same time depressing front band locking spring so that it is under the front band. Tighten up the front band screw.

G. Sling and Oiler. -

The top button of the sling should be snapped into place first. Replace oiler, then the web sling.

18. DISASSEMBLY AND ASSEMBLY OF THE TRIGGER HOUSING MECHANISM

IMPORTANT: (a) These operations are done only under proper supervision.

(b) To obtain best results in this operation, the entire paragraph should be read before attempting operation.

(1) Disassembly

A. Hammer Spring and Plunger. -

Squeeze the trigger and ease the hammer forward by retarding its action with the left thumb. Insert the operating slide spring guide through the hole in the hammer spring plunger. The guide should not extend through to the left further than 1/8 of an inch. Compress the hammer spring enough to allow the front of the hammer spring plunger to be moved to the right to free it from the hammer. Allow the hammer spring to decompress slowly so as not to lose parts.

B. Hammer. -

Holding the hammer between thumb and forefinger of the left hand, withdraw the hammer pin to the right. (Notice that the head of the hammer is directly above the wider of the two flanges along the side of the trigger housing). Unless the hammer is held it will fly out of the trigger housing, as it is under tension from the sear spring.

C. Sear and Trigger. -

Using the small end of the operating slide spring guide, drift out the trigger pin. Should it be necessary to apply pressure to the trigger pin, use a wooden object to tap the guide, not a metal hammer, place the thumb over the top opening of the trigger housing and withdraw the operating slide spring guide. Remove sear and sear spring. Placing the thumb over the housing prevents the sear and sear spring from flying out of the housing and being lost. Push the trigger forward and up and remove the trigger and trigger spring from the top of the trigger housing.

D. Safety and Magazine Catch. -

Turn the trigger housing upside down with the trigger guard in the up position. Notice the hole between the trigger guard and magazine catch through which the shoulder of the magazine catch retaining plunger can be seen. Using the operating slide spring guide as a tool, push rearward on the shoulder of the magazine catch retaining plunger. The magazine catch will spring outward through the action of the magazine catch plunger and spring. Remove the magazine catch plunger, magazine catch retainer plunger, safety plunger spring, and safety plunger through the hole in the magazine catch guideways. The safety may be removed from either side of the trigger housing by easing it out with the hammer spring plunger.

(2) Assembly

A. Magazine Catch and Safety. -

Place the safety in its well in the trigger housing. The safety is a symmetric piece and may be replaced with either end on the right side of the gun. The cutaway portion of the safety must be to the rear of the trigger housing so as to allow the long arm of the trigger to move through this opening. Replace the safety plunger, safety plunger spring, and magazine catch retainer plunger into their well through the guideway for the magazine catch. The safety plunger and the magazine catch retainer plunger are identical parts and may be replaced with either end toward the safety. Replace the magazine catch plunger and spring. Start the magazine catch into its guideways and push it in until it hits the magazine catch retainer plunger. Using the operating slide spring guide as a punch, compress the safety plunger spring sufficiently to allow the magazine catch to go fully into its position in the trigger housing.

B. Trigger Spring. -

Replace the trigger spring into the well in the trigger housing by using the large end of the operating slide spring guide to move the spring into position. If difficulty is experienced in withdrawing the rod from the trigger housing, put the hammer pin through the coil of the trigger spring when it protrudes through the rear of the trigger housing, thus preventing the spring from being withdrawn with the operating slide spring guide. When this operation is completed, the entire trigger spring should be in the well in the trigger housing. The straight portion of the trigger spring will be on the flat portion of the well in the trigger housing.

C. Trigger. -

Place the trigger in position and push the trigger so it is approximately half way forward in the trigger guard. In this position the step on the trigger is adjacent to the flat portion of the well in the trigger housing, and the trigger spring may be pushed on to this step.

D. Trigger Pin. -

Insert the trigger pin from the left side of the trigger housing so it will be flush with the inside of the long arm of the trigger. If any difficulty is encountered in aligning the holes in the housing with the holes in the trigger, the small end of the operating slide may be used as a drift pin.

E. Sear Spring. -

Drop the sear spring into its position in the trigger housing and seat it into its well in the trigger with the operating slide spring guide.

F. Sear. -

Place the sear into position over the sear spring so that the wide portion of the sear will be toward the front of the gun and the projection which seats the sear spring is downward. Holding the trigger housing mechanism in the left hand with the "T" lug away and the right side of the housing upward, and using the large end of the operating slide spring guide, compress the sear and sear spring until the holes become aligned. Hold one finger on the sear to prevent it from coming out of place. Press the trigger pin through the trigger housing, holding the mechanism in place.

G. Hammer Pin. -

Place the hammer pin into the trigger housing from the right so it will be flush with the inside of the trigger housing.

H. Hammer. -

Looking at the left side of the trigger housing, place the hammer in position and push the hammer pin home when the hole in the hammer comes in alignment with the hole in the trigger housing. In performing this operation the hammer is held perpendicular to the trigger housing. It is necessary to compress the sear. Leave the hammer forward.

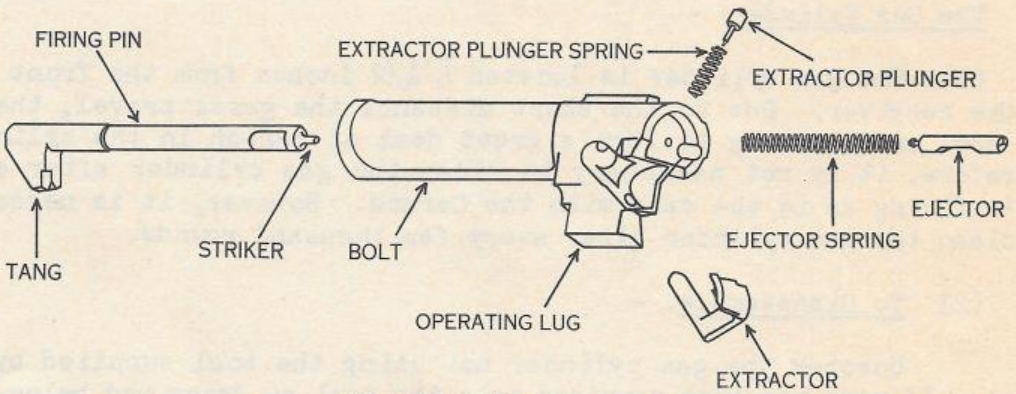
I. Hammer Spring and Plunger. -

Assemble the hammer spring to the hammer spring plunger. Place the rear of the hammer spring and plunger into the trigger housing. Be sure the hammer is in the forward position. Place the small end of the operating spring guide into the hole in the front of the hammer plunger so that the guide extends not more than 1/8 of an inch. Look into the rear of the trigger housing to make the alignment of the hammer plunger with the hole in the trigger housing. Place the thumb on the upper part of the trigger guard and compress the hammer spring and plunger into position. Continue to look into the hole in the rear of the trigger housing while compressing the hammer spring.

19. Bolt Group. -

(1) Disassembly. -

A. To disassemble the bolt group place a screw driver, or any flat edge, in the opening between the extractor and the edge of the bolt next to the operating (large) lug. Keeping the thumb over the ejector, which protrudes through the face of the bolt, pry the extractor away from the edge of the bolt. Remove the ejector, the ejector spring, the extractor, the firing pin, and the extractor plunger and spring, in that order, from the bolt.



U.S. CARBINE CAL. .30 M1
BOLT DISASSEMBLED

(2) Assembly. -

A. To assemble, place the parts in the bolt in the following order: the ejector and spring attached, the extractor plunger and spring, the firing pin and the extractor. After all parts are placed, exert pressure on the ejector, forcing it into its well until it is flush with the rim around the face of the bolt. Then exert pressure on the extractor, and force the extractor plunger and spring into its well, flush with the top of the well. Increase the pressure on the extractor. A definite click will be heard when the assembly is properly locked. It may be necessary or helpful, to place the bolt on a table, or some hard surface, extractor down, in order to exert the additional pressure necessary for locking.

20. Magazine

(1) Disassembly. -

A. Remove the base by sliding it out in the direction of the curved edge. Lift out spring from magazine tube. Tip up magazine tube and catch the follower in the hand.

(2) Assembly. -

A. To assemble magazine, insert short (curved) end of the follower into the rear bottom end of the magazine tube (dummy round is on right looking from the back or smooth side). Replace the spring (long edge of spring toward smooth rear surface of magazine). Depress the spring slightly and slide the base on, square edge first, with hook downward.

21. The Gas Cylinder. -

(1) The gas cylinder is located 4 1/2 inches from the front face of the receiver. Due to the short distance the gases travel, they do not cool sufficiently to form a great deal of carbon in the cylinder. Therefore, it is not necessary to clean the gas cylinder after every day's firing as is the case with the Garand. However, it is necessary to clean the gas cylinder after every few thousand rounds.

(2) To Disassemble. -

Unscrew the gas cylinder nut using the tool supplied by Ordnance. If none has been provided make the tool as described below. Do not use a punch to drift out the screw. Any burring will interfere with the operation of the piston. Remove the piston, using the fingers to properly align, and lift out.

(3) To Clean. -

Ream out any dirt in the gas port using a broom straw. Wash thoroughly with hot soapy water or hot water. Use no abrasives. If carbon is noticeably caked on any of the parts, scrape off, being careful not to scratch any of the metal parts. Wipe dry and cover the parts with a light coat of lubricating oil.

(4) To Assemble. -

Place the piston in the cylinder, head first. Screw the gas cylinder nut in firmly, allowing the rear of the piston to protrude through the nut.

(5) To Make the Gas Cylinder Tool. -

Get from your Post plumber a piece of 3/8 inch steel pipe two inches long. Using a steel saw and file, cut out one end to fit firmly over the gas cylinder nut. Drill two holes along the side of the pipe into which fit a steel handle. For sufficient leverage the handle should be about four inches long. This makes a workable tool and will not damage or burr the gas cylinder nut, or piston.

CHAPTER III

FUNCTIONING - IMMEDIATE ACTION - STOPPAGES

22. Functioning.

(1) The correct knowledge of the proper functioning of the Carbine is vitally important. Knowing, and understanding, what each part does and how it does it is of great value in applying immediate action and reducing stoppages.

The functioning of the Carbine is divided into three (3) main phases: -

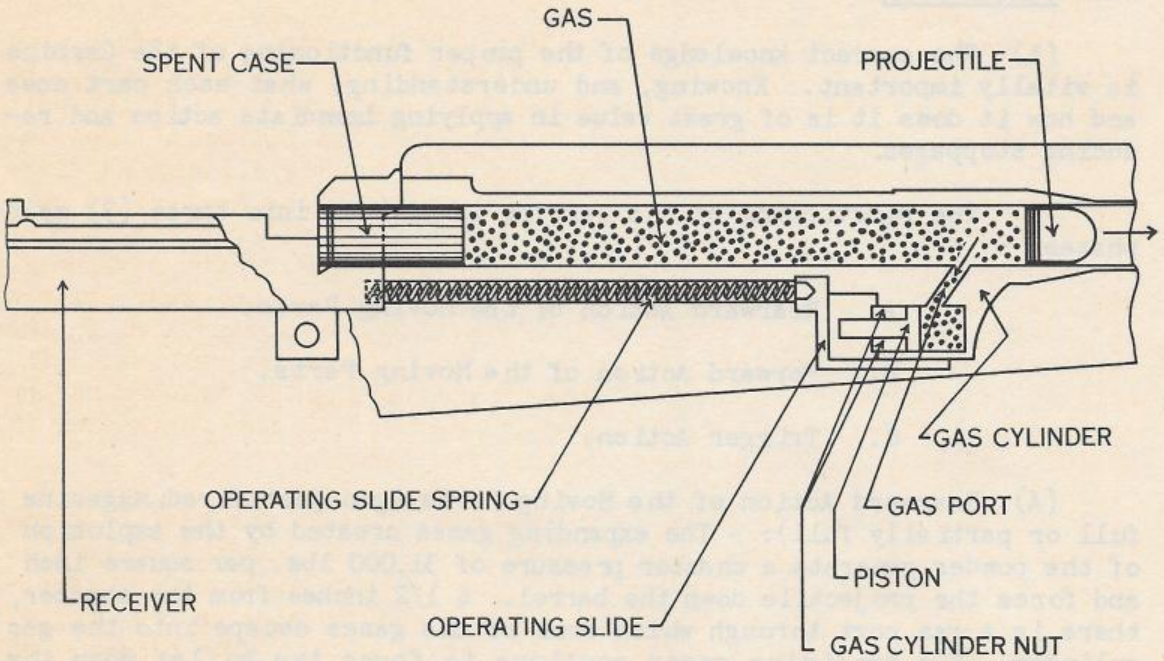
A. Rearward Action of the Moving Parts.

B. Forward Action of the Moving Parts.

C. Trigger Action.

(A) Rearward Action of the Moving Parts (gun just fired; magazine full or partially full): - The expanding gases created by the explosion of the powder generate a chamber pressure of 31,000 lbs. per square inch and force the projectile down the barrel. 4 1/2 inches from the chamber, there is a gas port through which some of the gases escape into the gas cylinder. The remaining gases continue to force the bullet down the barrel. The energy of the gas in the cylinder is enough to force the piston to the rear 1/4 inch where its (the piston's) movement is stopped by the gas cylinder nut. This movement is transmitted to the operating slide, the face of which has been bearing against the piston, and the operating slide begins to move to the rear. Blow backs are prevented by the fact that the first 1/2 inch of rearward movement of the slide is independent of any movement of the bolt. This allows time for all gases in the chamber to escape thru the muzzle before unlocking starts.

At the end of this first 1/2 inch of free movement the camming surface of the slide contacts the operating lug of the bolt and unlocks the bolt from the locking shoulders of the receiver, rotating it counter clockwise. During this rotating of the bolt the tang of the firing pin, bearing against the camming surface face of the bridge of the receiver, withdraws the striker out of the face of the bolt. Now the bolt begins to move to the rear, under the action of the operating slide, and begins, by the action of the claw type extractor, to extract, or withdraw, the spent case out of the chamber. When the case clears the chamber, it is ejected by the force of the compressed ejector spring and plunger. The bolt and operating slide continue to the rear. The rear of the bolt forces against the front face of the hammer, pushing the hammer, which rotates around the hammer pin, back and down, and compressing the hammer spring. The sear moves up under the action of the sear spring, engages in the sear notch in the hammer, and holds the hammer in a cocked position. The operating slide spring is now fully compressed due to the rearward movement of the operating slide. The bolt is fully to the rear.



OPERATION OF GAS CYLINDER

RIGHT SIDE VIEW

(B) Forward Action of the Moving Parts: - Under the energy of the compressed operating slide spring, the operating slide and bolt move forward. The lower face of the bolt strikes the base of the cartridge, which has been pushed into place by the magazine follower and spring, and moves it forward into the chamber with the aid of the bullet ramp. The bolt reaches its foremost position and is rotated clockwise by the camming surface of the operating slide acting upon the operating lug of the bolt. The bolt is now locked by its locking lugs engaging behind the locking shoulders of the receiver. The extractor grips the rim of the cartridge, the ejector spring and plunger are compressed against the base of the round, and the tang is aligned with the recess in the camming surface in the bridge of the receiver. The front face of the operating slide is against the piston, forcing it into the gas cylinder. The forward movement is completed and the gun is ready to fire.

If the bolt is not fully forward and locked, the tang of the firing pin will be against the bridge of the receiver, and will not be free to ride in the recess in the camming surface. The hammer will strike the firing pin,but the firing pin will not be able to go all the way forward due to its being locked, and the gun will not fire.

(C) Trigger Action. - The action of the moving parts is so rapid that there is not enough time to release the trigger. Therefore, the trigger is in the rearward position when the piece is re-cocked, the trigger lip is raised and the trigger spring is compressed. As the bolt moves forward, the hammer rises slightly under the action of the compressed hammer spring, but is prevented from moving all the way forward due to the sear engaging in the sear notch of the hammer. A circular movement is brought about by the hammer spring forcing the top of the hammer forward, and the bottom of the hammer forcing the sear back, compressing the sear spring and bringing the rear of the sear against the trigger lip. This is only possible due to the elongated slot in the sear. In order to fire the gun again, the trigger must be released. The trigger is returned to its normal forward position by the trigger spring and the trigger lip is lowered allowing the sear to move back over it through the action of the hammer spring and hammer.

Now the gun is ready to fire again, because the sear is resting on top of the trigger lip instead of against it. As the trigger is squeezed,it rotates on the trigger pin. The trigger lip moves up, carrying the rear end of the sear with it. As the sear rotates on the trigger pin, the front end moves down out of the sear notch of the hammer, and there is nothing to hold the hammer back. The hammer goes forward, under the action of the compressed hammer spring, and hits the firing pin, driving it forward and firing the round.

23. Immediate Action.

(1) IMMEDIATE ACTION IS THE UNHESITATING APPLICATION OF A PROBABLE REMEDY FOR A STOPPAGE. It deals not with the cause of the stoppage, but with the reduction of that stoppage, and should be carried out almost automatically. In combat we do not worry about finding out why, or what, made the gun stop firing, but in getting it to fire again right away. There is time enough after the heat of battle to examine the gun and determine why it failed to function. Immediate action should be taught before firing, so that in case of a stoppage, the man firing will know what to do.

A. If the gun fails to fire, wait a few seconds to allow for a hang fire, and then pull the operating slide handle to the rear, ejecting the round. Let the bolt go forward on a new round and attempt to fire. Care should be taken in pulling the bolt to the rear, that the right hand is used with the palm up, and the fingers joined. This is to prevent injury by the rearward movement of the operating slide in case of a hang fire.

B. If the bolt is not fully closed, slam it shut with the heel of the hand. If it still will not close, pull the operating slide to the rear, eject the round, and check for dirt on the bolt, in the chamber, or in the locking recesses of the receiver. The round may be battered. Get rid of it, or clean the dirty parts. Then let the bolt forward and fire.

C. If the gun fires but fails to feed, work the operating slide manually, as the gun is still effective.

D. If the trigger fails to return to its normal position, push it forward manually after each shot.

24. Stoppages.

(1) A stoppage is the failure of a Carbine to fire. Following is a list of usual stoppages, their causes and remedy. (Many times the application of immediate action will automatically eliminate the cause; keep the weapon firing and worry about the cause later.)

STOPPAGES

STOPPAGE	CAUSE	REMEDY
1. Failure to Feed	(a) Dirty chamber	(a) Clean chamber
	(b) Restricted gas port	(b) Oil or clean gas port
	(c) Dirty or improperly lubricated carbine	(c) Clean and lubricate
	(d) Damaged magazine	(d) Replace magazine
	(e) Magazine not fully home	(e) Ease magazine home
	(f) Ruptured cartridge case in chamber	(f) Remove ruptured cartridge case
	(g) Battered round	(g) Remove battered round
	(h) Obstruction on the face of the bolt	(h) Remove obstruction and clean bolt - or replace bolt
	(i) Re-feed spent case back into chamber	(i) Lubricate weapon or replace ejector - or replace bolt
2. Failure to Fire	(a) Defective ammunition	(a) Discard the round
	(b) Defective firing pin	(b) Check and clean, or replace firing pin or replace bolt
	(c) Bolt not fully closed	(c) Clean receiver, check operating slide spring, oil gas port.

STOPPAGE		CAUSE		REMEDY
2a	Squeeze on trigger does not release hammer	(d) Bent or broken hammer or trigger, or worn trigger pin	(d)	Replace part; or trigger housing group
2b	Safety releases when pressure is applied to trigger	(e) Round heel on safety or broken safety	(e)	Replace safety
2c	Fires automatically	(f) Sear or sear spring broken, sear remains in open position.	(f)	Replace sear or trigger housing group
2d	Trigger fails to return to forward position	(g) Bent or broken trigger spring	(g)	Replace trigger spring or operate by hand
3.	Failure to Extract	(a) Dirty chamber	(a)	Clean chamber
		(b) Dirty ammunition	(b)	Clean ammunition
		(c) Improper assembly of carbine	(c)	Re-assemble weapon correctly
		(d) Cartridge case chambered in hot chamber	(d)	Snap the operating slide smartly fully to the rear, or use cleaning rod from muzzle end to eject case
		(e) Broken extractor	(e)	Replace extractor or bolt
		(f) Broken ejector	(f)	Replace ejector or bolt

4. (a) Proper CARE of the Carbine, BEFORE, DURING, AND AFTER firing will usually ELIMINATE STOPPAGES.

   (b) Proper understanding of FUNCTIONING aids in the ELIMINATION OF STOPPAGES.

5. Immediate Action is the unhesitating application of a probable remedy for a stoppage.

   (a) Remove stoppages without DETAILED consideration of their cause.

CHAPTER IV

CARE AND CLEANING

25. The subject Care and Cleaning is a very important one. It should be learned in detail by everyone, from the private to the highest ranking officer. The care given any weapon is directly reflected in the life and service that weapon will give. This is especially true of the Carbine because of the moving parts and the great pressure which the chamber must withstand. If the moving parts were allowed to stay dirty over a period of time, the abrasive formed by combination of dirt, grit, or dust with grease or oil would cause excessive wear which in turn would result in the Carbine's failure to function. Dirt, rust, powder fouling, etc., if allowed to remain in the chamber and bore, would cause excessive wear, dangerous chamber pressure, and rusting which would all lead to but one thing, inefficient functioning and inaccurate shooting.

In care and cleaning of the Carbine, due to its construction, the following points are to be remembered:

(1) The bore of the Carbine is always cleaned from the muzzle end.

(2) The Carbine is always held with the gas cylinder up so that the solution used in cleaning will not flow into the gas port and fill the cylinder.

(3) Extreme care must be taken not to foul the gas port with patches during cleaning.

(4) Metal fouling solution is never used.

(5) When the Carbine is cleaned without disassembly, steps must be taken to prevent injury to the bolt; patches wadded in front of the bolt to act as a protection from the cleaning rod being forced against it serve very well.

PREPARATORY TO FIRE - Insure efficient functioning.

A. Main groups should be disassembled. - Cleaned and fresh oil applied.

B. Bore cleaned of oil and left dry.

C. Do not oil face or under side of the bolt as oil might get into the chamber or barrel.

D. Lubricate moving parts of trigger housing, using oil, lubricating, light preservative.

E. Oil should be applied lightly, as too much oil collects grit and dirt which will cause excessive wear.

AFTER FIRING

The carbine should be cleaned thoroughly by the evening of the day it was fired, and for the next two days. The method of cleaning, with the exception of the above mentioned points, is the same as the cleaning of other weapons. Whenever possible, hot water is used. Use a rod, a patch, plenty of hot water and scrub the full length of the barrel well. Scrub with wire brush and plenty of water, making a full stroke before reversing; then again with patch and water. Dry thoroughly and apply a good coat of oil, lubricating, light preservative, holding the top side up so that a little oil will run into the gas cylinder.

This cleaning should be done with main groups disassembled, as the water or cleaning solution is bound to get into the trigger groups if left assembled.

SUB-ZERO CLIMATES

When use in temperature below zero is foreseen, the Carbine should be completely stripped and all oil removed with dry cleaning solvent. Old oil left on the weapon will solidify in extremely low temperatures, causing malfunctions. After the Carbine has been dried you will find that a very light film of oil has been left by the evaporation of the dry cleaning solvent, that is, if you have used a petroleum base solvent such as varsol or white gasoline. No further lubrication is necessary unless, after using, you find excess wear on some of the parts; then put some light preservative lubricating oil on a rag, wring out the rag thoroughly, and wipe the parts showing wear, thus giving them a very thin coating of oil.

Immediately upon bringing indoors, the Carbine should be thoroughly oiled because moisture caused by the condensation of air on the cold metal will cause rusting. After the Carbine has reached room temperature it should be wiped dry and oiled again. All this makes double work as the oil must be removed again before using, so it is well to provide a sheltered room for storage where the temperature is near that of the outside.

CARE OF STOCK

The wood stock and hand guard must be protected from damage caused by drying out; or by over absorbing of moisture, which would cause swelling. This is done by rubbing raw linseed oil into them thoroughly. The linseed oil fills up the pores of the wood so that no moisture may be absorbed; it also prevents drying out. If, in wet tropical climates, the stock swells, the moving parts will bind. It is permissable in this case, to pare away enough wood to permit free action.

CHAPTER V

AMMUNITION

26. The ammunition used in this gun is a special type used in no other weapon - cartridge, ball, caliber .30 M1, short rifle. It consists of a case, non-mercuric primer, powder charge of Hercules #2400 powder and bullet. The over-all length of the complete cartridge is 1.68 inches. (Approximately half the length of the standard .30 caliber cartridge used in the Garand, Springfield or Enfield rifles.) The weight is approximately 195 grains (438 grains per ounce). The bullet weighs 110 grs. This ammunition comes in boxes of 2700 rounds packed in 60 cartons of 45 rounds each. These 45 rounds are packed in flat cardboard containers of 15 rounds each. It develops a muzzle velocity of 1900 feet per second, under pressure of 31,000 pounds per square inch. The approximate maximum range is 2000 yards, the maximum effective range is 300 yards. The Carbine is used against personnel and light materiel objects only.

When ammunition is manufactured a lot number is assigned. This lot number is marked on all packing containers and on the identification card enclosed in each packing box. It is very important that the lot number be known for each individual round for identification in reports on condition, functioning, and accidents in which ammunition may be involved. Any unidentified ammunition is put in Grade 3. The following grades will be used in grading ammunition for this weapon:

Grade R - Serviceable and may be fired.

Grade 3 - Unserviceable and will not be fired.

Carbine ammunition is not dangerous to handle, but care must be exercised to keep the boxes from becoming broken or damaged. All broken boxes must be repaired immediately and all markings transferred to the new parts of the box. Boxes should not be opened until the cartridges are required for use. Ammunition if unpacked is apt to corrode, particularly in damp climates, and therefore, become unserviceable. Ammunition should not be exposed to heat or the direct rays of the sun. Cartridges exposed to heat or the sun's rays develop excessive chamber pressure. In desert warfare, exposure to the excessive heat of the sun's rays may cause cartridges to explode. Ammunition should be protected from mud, sand, dirt, and water. If it gets wet or dirty, it must be wiped off at once with a rag damped with oil. Light corrosion may be removed in the same manner.

APPENDIX I.

1. The following pictures are published for the information of all concerned. These pictures are in use at the Tank Destroyer School. All prints prepared by the Signal Corps Photo Lab, and reproduced by the Reproduction Department, Tank Destroyer School, Camp Hood, Texas.

2. The "battle firing" positions shown in the following pictures need not be adhered to rigidly. It is definitely believed that best results are obtained when the position is comfortable and natural. Excellent results have been secured from large groups of men who have had only a few hours instruction in the positions demonstrated. It should be noted throughout that the position of the firer's right thumb, firmly gripped around the small of the stock, is a natural one. It should be noted, too, that both eyes are open at all times. It is recommended that daily dry firing be encouraged for all ranks and grades. This will train the man to assume the proper position automatically and will help in getting the correct muzzle elevation needed to lay the grazing fire which short ranges up to 100 yards demand.

3. The following commentaries are explanations of the various pictures used to illustrate the Carbine and its employment:

Figure 1. Comparison between (A) U.S. Carbine, cal. .30M1 and (B) Reising Submachine gun, M50, cal. .45, used by U.S. Marines.

Figure 2. Field strip of U.S. Carbine (chapt. 2).

Figure 3. Break-down of the U.S. Carbine into four (4) Main Groups (chapt. 2).

A. Stock Group
   1. Stock
   2. Hand guard
   3. Oiler
   4. Web Sling

B. Trigger Housing Group
   1. Trigger housing, assembled
   2. Magazine

C. Operating Slide Group
   1. Operating slide spring guide
   2. Operating slide spring
   3. Operating slide
   4. Bolt, assembled

D. Barrel and Receiver Group
   1. Front and rear sights
   2. Gas cylinder
   3. Barrel
   4. Receiver

Figure 4. Exploded view, Trigger Housing Group, U.S. Carbine (chapt. 2).

Figure 5. Comparison of Ammunition (chapt. 5).

Figure 6. Cleaning material to be used (chapt. 4).

A. Oil, lubrication, preservative, light
B. GI soap
C. Rags
D. Cal. .30 cleaning rods
E. Cal. .30 brass brush
F. Patches
G. Hot water

Figures 7, 7a, 7b - Demonstrate the use of TD Bn vehicles to secure some concealment and cover without restricting fields of fire.

Figure 8. Normal standing position (to be avoided, if possible, in combat). Presents a very high silhouette which can be seen and hit by the enemy.

Figure 9. Normal prone position. Presents very low silhouette but average terrain foilage obstructs field of fire. Excellent position on clean ground, beaches, desert, etc.

Figures 10, 10a, 10b, 10c - Consist of a group of four (4) pictures demonstrating the rapid assuming of combat position from the carry.

EXPLANATION:

Figure 10. - Soldier, with full equipment, carries Carbine over left shoulder, muzzle down. Left hand hangs normally and naturally at side, easily holding piece at front band. Figure 10a - Target sound, or enemy noise, is heard. Firer's eyes are riveted on spot as Carbine is snapped straight out by left hand. During this action, sling falls from left arm. As body is pivoted on foot nearest noise, right hand grasps small of stock. Soldier's ears, eyes, and nose are directed at sound which is the target. Figure 10b - Body continues to swing until it faces the target squarely. Position of body is similar to that of offensive football back, with weight evenly distributed on both feet. Left hand has not changed position and left elbow is close to weapon. Butt stock is held tight to right side of body by right forearm, from wrist to elbow. Ears, eyes, nose are still on target so weapon is now naturally pointed at the same object. Soldier has only to fire "down his nose" to hit enemy. Changes in elevation are made by lowering or raising left hand and forearm. Firer must watch and sense all shots. Figure 10c- Changes in direction are made by "jumping", or moving the entire body, to point directly at new target. Never move only gun, always move body and Carbine as one. With modification, this combat firing has been used with the M1 (Garand) and the M1903.

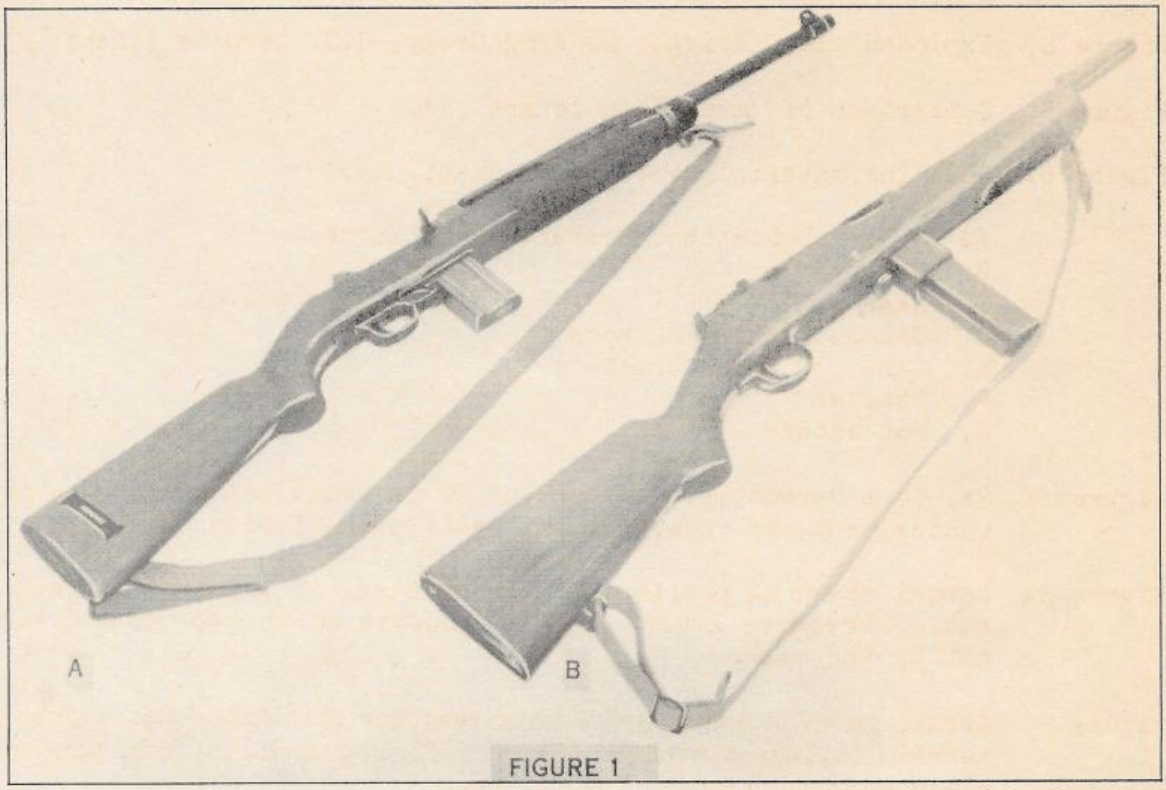


FIGURE 1

FIGURE 2

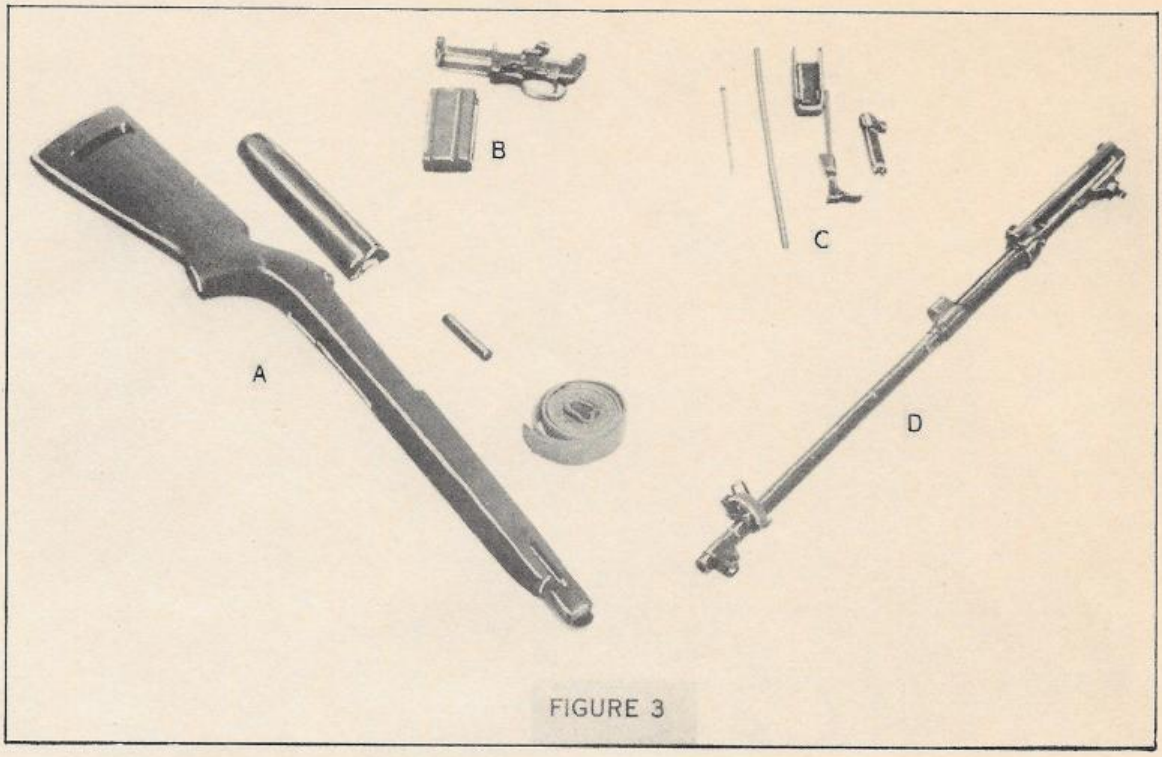


FIGURE 3

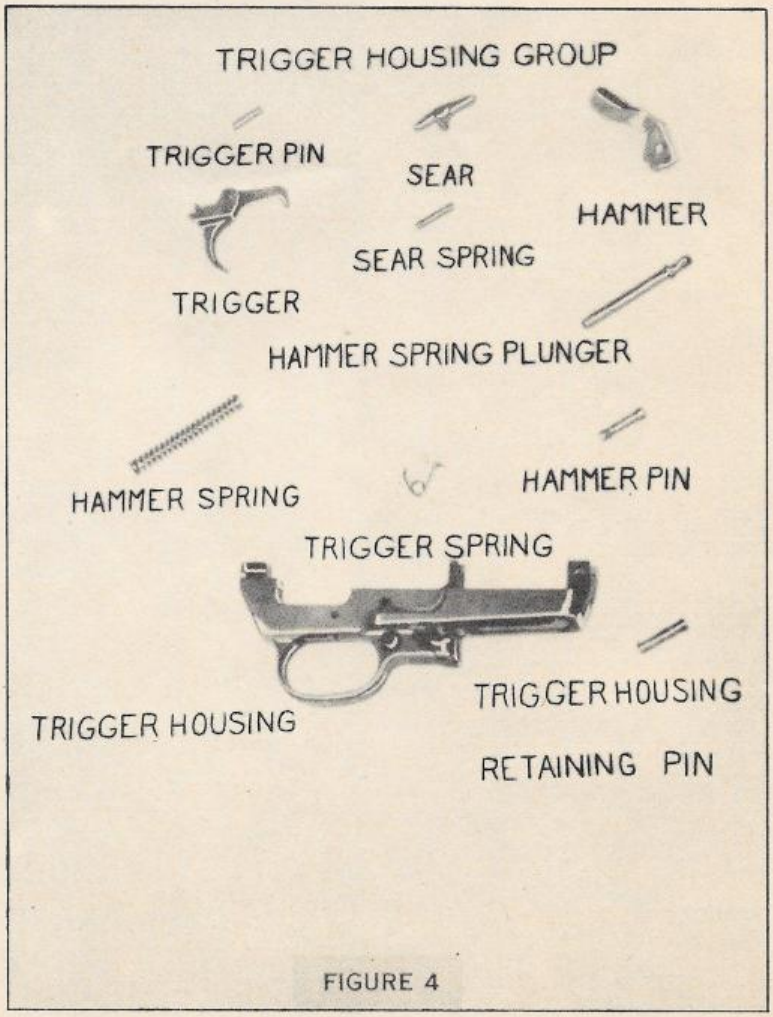


FIGURE 4

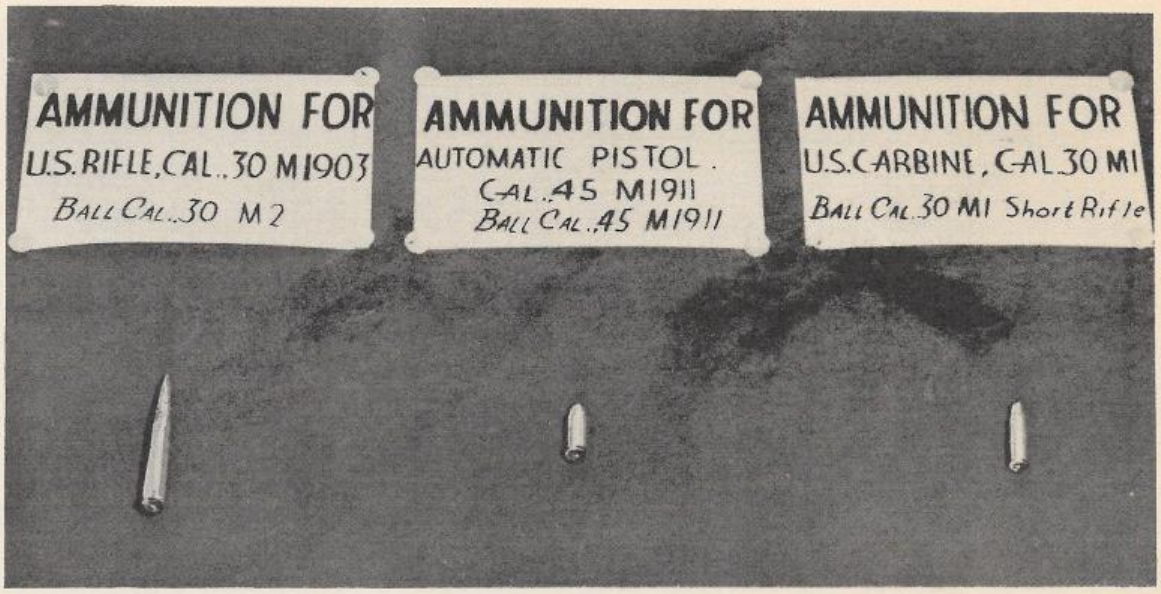
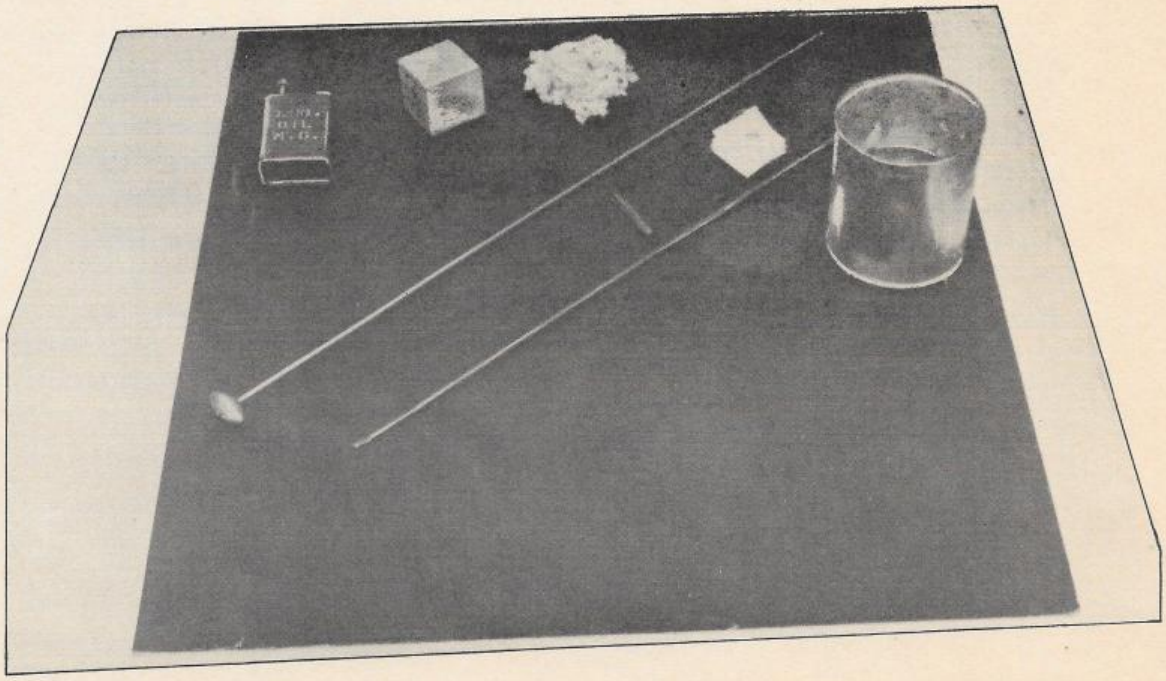


FIGURE 5



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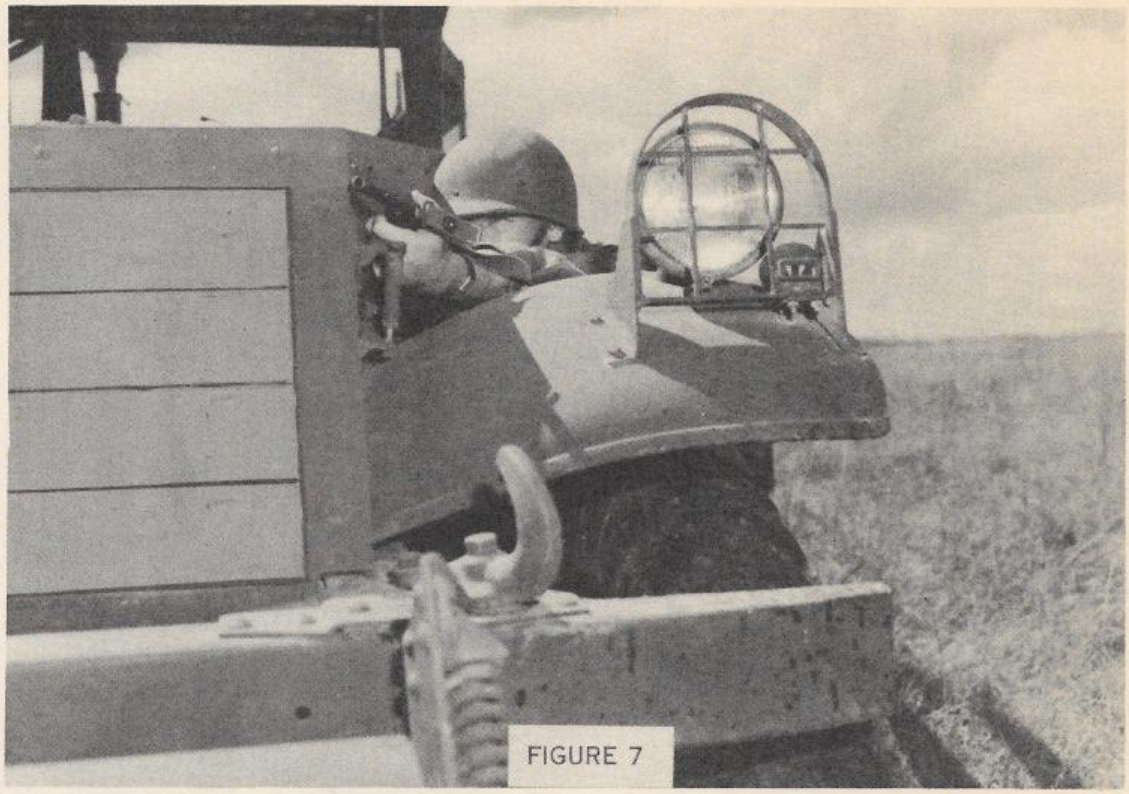

FIGURE 7

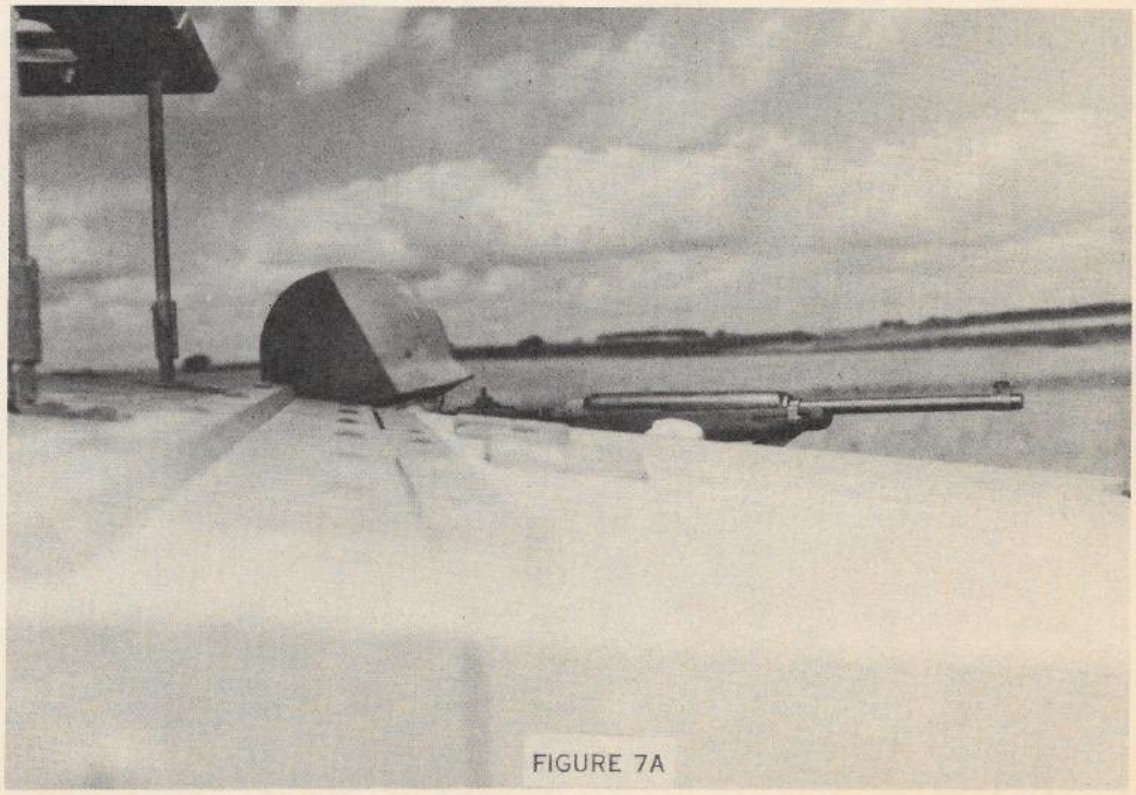

FIGURE 7A

FIGURE 7B

FIGURE 8

FIGURE 9

FIGURE 10

FIGURE 10A

FIGURE 10B

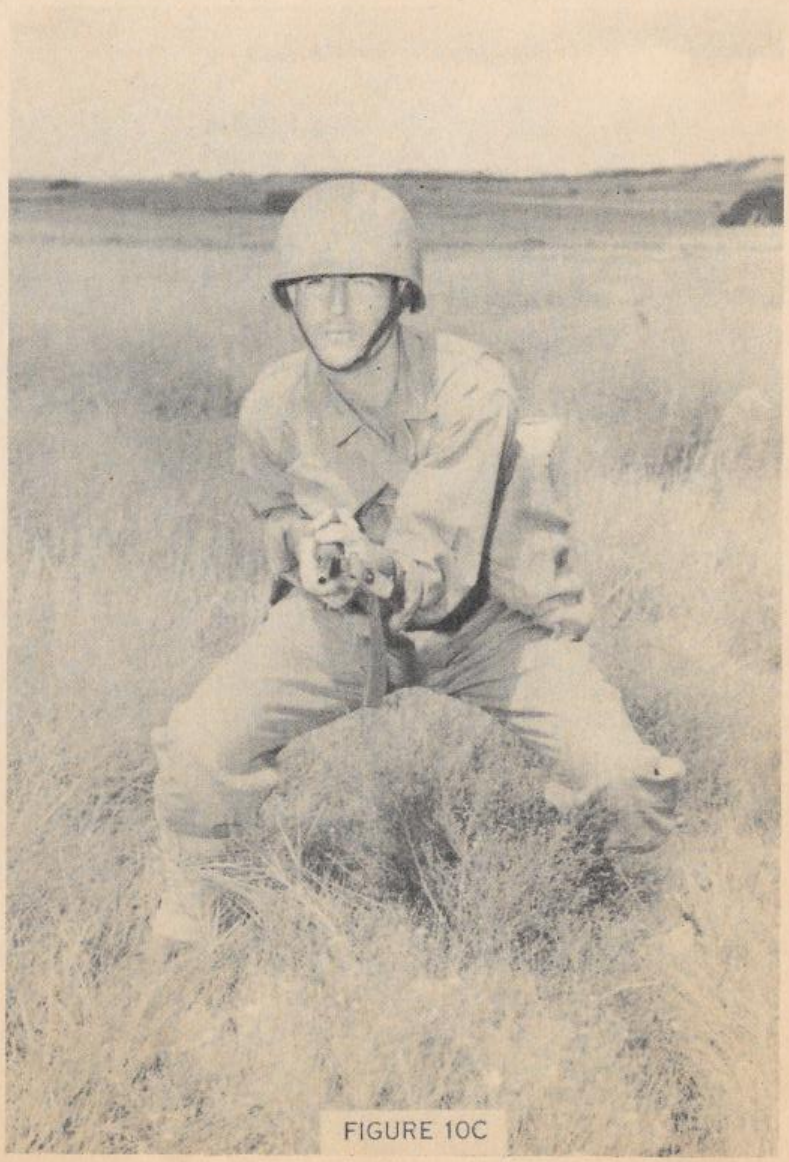

FIGURE 10C