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TM 9-240

WAR DEPARTMENT TECHNICAL MANUAL

37-MM AUTOMATIC GUNS AN-M4 AND M10 (AIRCRAFT)

WAR DEPARTMENT • 7 MAY 1945

WAR DEPARTMENT TECHNICAL MANUAL

TM 9-240

This TM supersedes TM 9-240, dated 1 Nov 43. It also supersedes portions of OFSTB 1200-3, dated 6 May 43 (reprinted as WDTB Ord 49); WDTB Ord 193, dated 30 Sep 44; and WDTB Ord 237, dated 26 Dec 44, which apply to the materiel covered in the TM; however, these TB's remain in force until incorporated in all other affected TM's or specifically rescinded.

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WAR DEPARTMENT *7 MAY 1945*

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WAR DEPARTMENT

Washington 25, D. C., 7 May 1945

TM 9-240, 37-mm Automatic Guns AN-M4 and M10 (Aircraft), is published for the information and guidance of all concerned.

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(Refer to FM 21-6 for explanation of distribution formula.)

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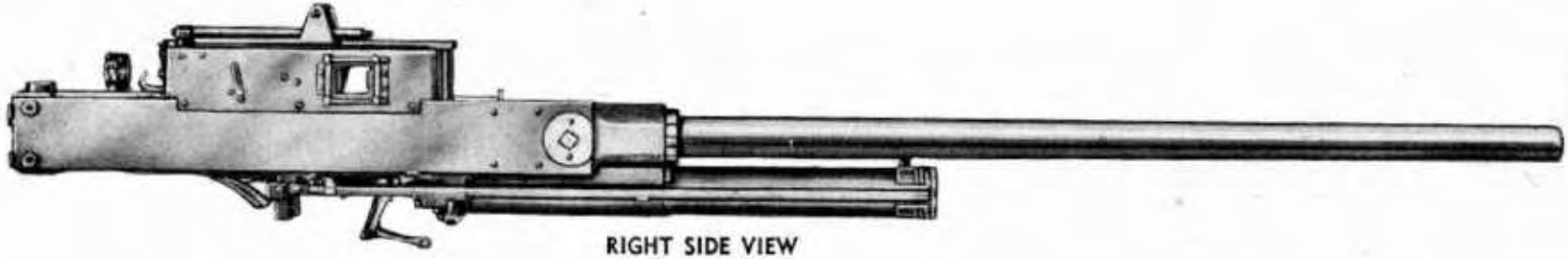
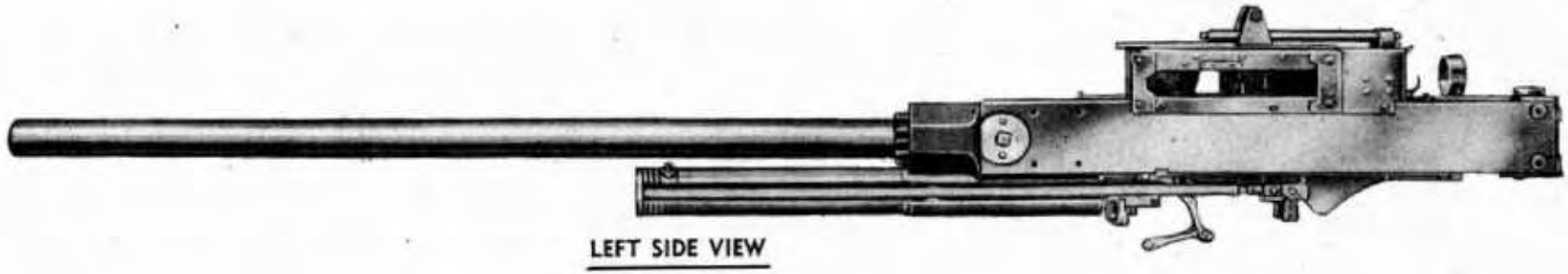


RIGHT SIDE VIEW



LEFT SIDE VIEW

RA PD 95387

Figure 1—37-mm Automatic Gun AN-M4 (Aircraft)

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PART ONE—INTRODUCTION

Section I

GENERAL

1. SCOPE.

a. This manual is published for the information and guidance of the using arms and services.

b. In addition to a description of the 37-mm Automatic Guns AN-M4 and M10 (aircraft), this manual contains technical information required for the identification, use and care of the weapon, ammunition, and accessory equipment.

c. In all cases where the nature of the repair, modification, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed in order that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

2. RECORDS.

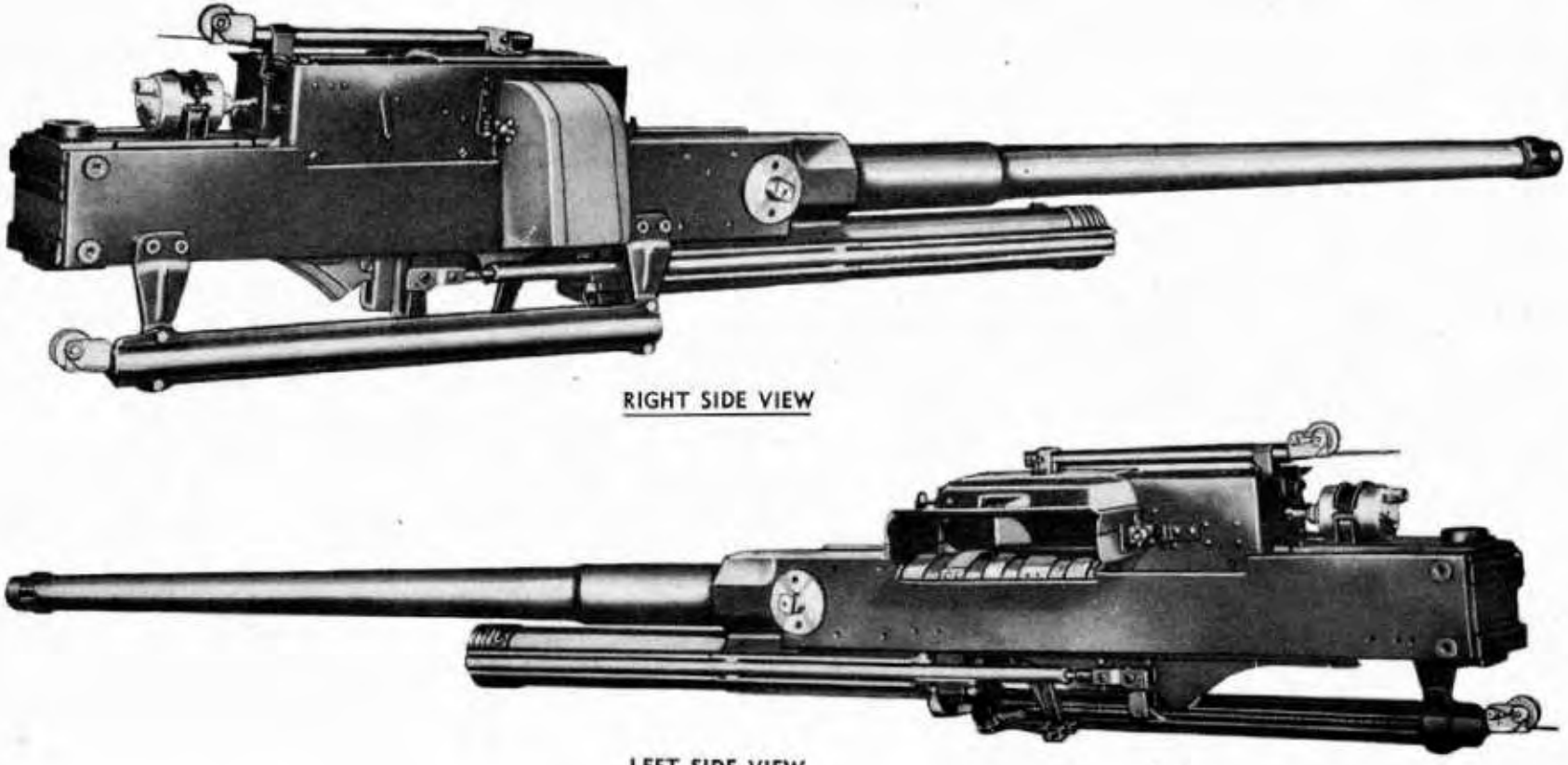
a. Modification Record Card.

(1) The Modification Record Card (O.O. Form 7451) is used for the purpose of keeping an accurate record of all modification work orders performed on the gun.

(2) The top of the card will bear the caliber, model, and serial number of the gun. Each modification work order applied to the materiel will be listed on the face of the card by number and short title. It will show the date applied and initials of the officer or mechanic responsible for completion of the modification.

(3) The card should be kept in the holder C7225029 provided and the holder will be kept attached to the gun at all times. The holder will be attached under the safety wire on the top plate screw of the Gun AN-M4 (fig. 9). The holder can be attached under the safety wire on the top plate screw or to the eye bolt for the feed or link chutes on the Gun M10.

(4) If a modification record card is lost, it shall be replaced at once and all entries brought up to date. A supply of these cards and holders is available from Ordnance Officer, Air Technical Service Command, Wright Field, Ohio.

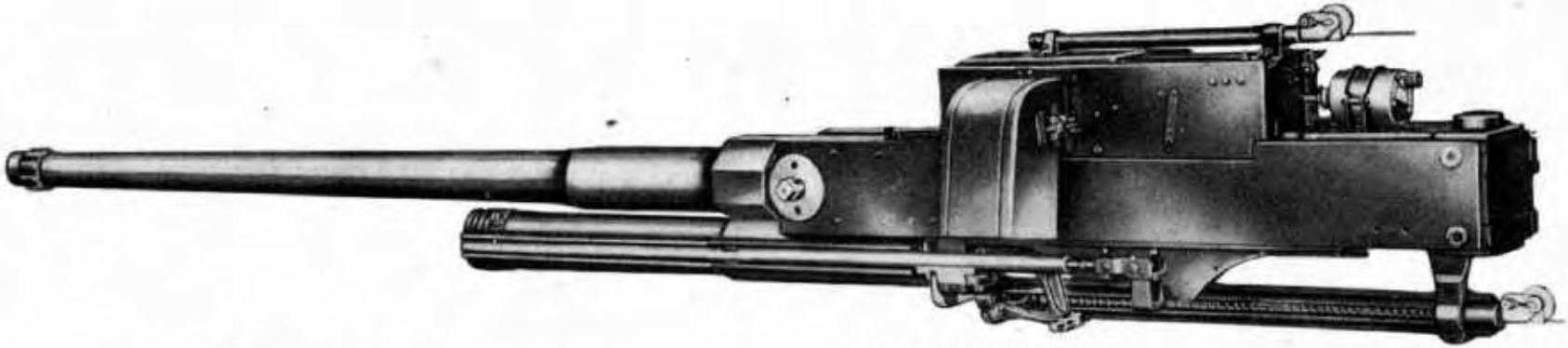


RIGHT SIDE VIEW

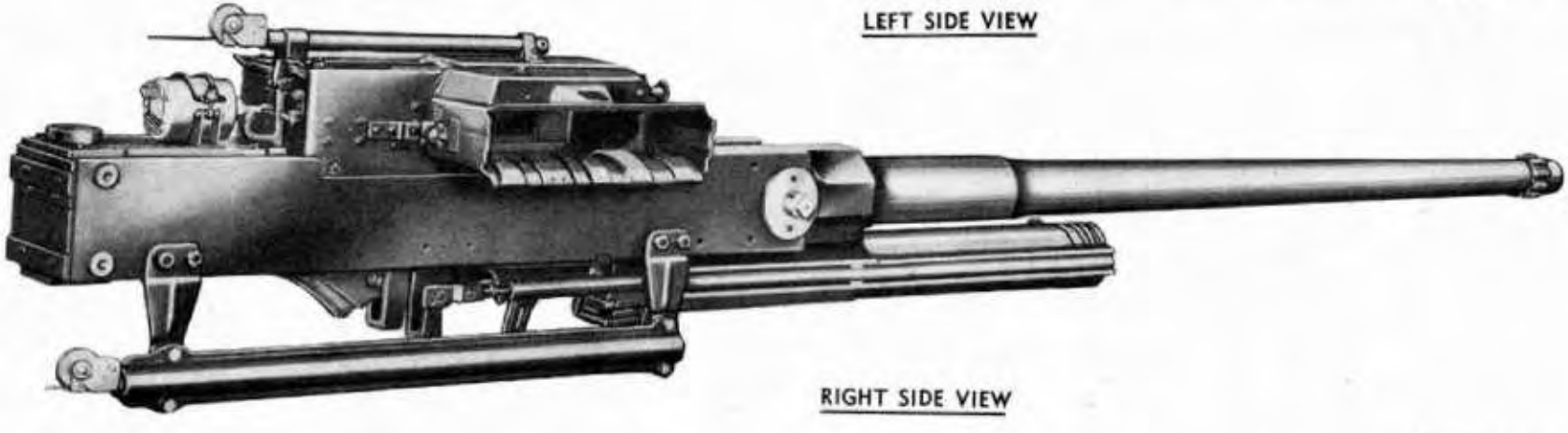
LEFT SIDE VIEW

RA PD 90075

Figure 2—37-mm Automatic Gun M10 (Aircraft)—Left-hand Feed



LEFT SIDE VIEW



RIGHT SIDE VIEW

RA PD 90076

Figure 3—37-mm Automatic Gun M10 (Aircraft)—Right-hand Feed

b. Field Report of Accidents. When accident involving the use of ammunition occurs during training practice, the incident will be reported as prescribed in AR 750-10 by the ordnance officer under whose supervision the ammunition is maintained or issued. Where practicable, reports covering malfunctions of ammunition in combat will be made to the Chief of Ordnance, giving the type of malfunction, type of ammunition, the lot number of the complete rounds or separate loading components, and condition under which fired.

c. Unsatisfactory Report. Suggestions for improvement in manufacture, design, maintenance, safety, and efficiency of operation prompted by chronic failure or malfunction of the weapon, spare parts, or equipment should be reported on WD AAF Form No. 54, Unsatisfactory Report, with all pertinent information necessary to initiate corrective action. This form will also be used for reporting complaints on the application or effect of prescribed petroleum fuels, lubricants, and preserving materials and, when so used, will contain identifying details on both the products and the associated equipment. The report should be forwarded to: Commanding General, Headquarters Air Service Command, Patterson Field, Fairfield, Ohio. If WD AAF Form No. 54 is not available, one may be improvised by referring to sample in TM 37-250.

Section II

DESCRIPTION AND DATA

3. GENERAL.

a. The 37-mm Guns AN-M4 and M10 are fully automatic aircraft weapons of the long recoil type (figs. 1, 2, and 3). They are mounted to fire through the propeller shaft. They are not used as synchronized weapons. These guns may be fired by means of a remotely controlled solenoid mounted at the rear of the gun.

4. IDENTIFICATION INFORMATION.

a. The 37-mm Guns AN-M4 and M10 may be identified by the model and serial number stamped on the top plate (fig. 4).

5. DIFFERENCES IN MODELS.

a. The feed box and feeding mechanism of the Gun M10 are designed to feed ammunition from a disintegrating link belt. By changing the feed box and feeding mechanism, the gun can be made to feed from left to right or from right to left, the belt links being ejected through a link chute.

b. The Gun AN-M4 feeding mechanism is designed to feed ammunition only from left to right and commonly makes use of a 30-round endless belt, the links of which do not disintegrate. No link ejection chute is therefore used with this model.

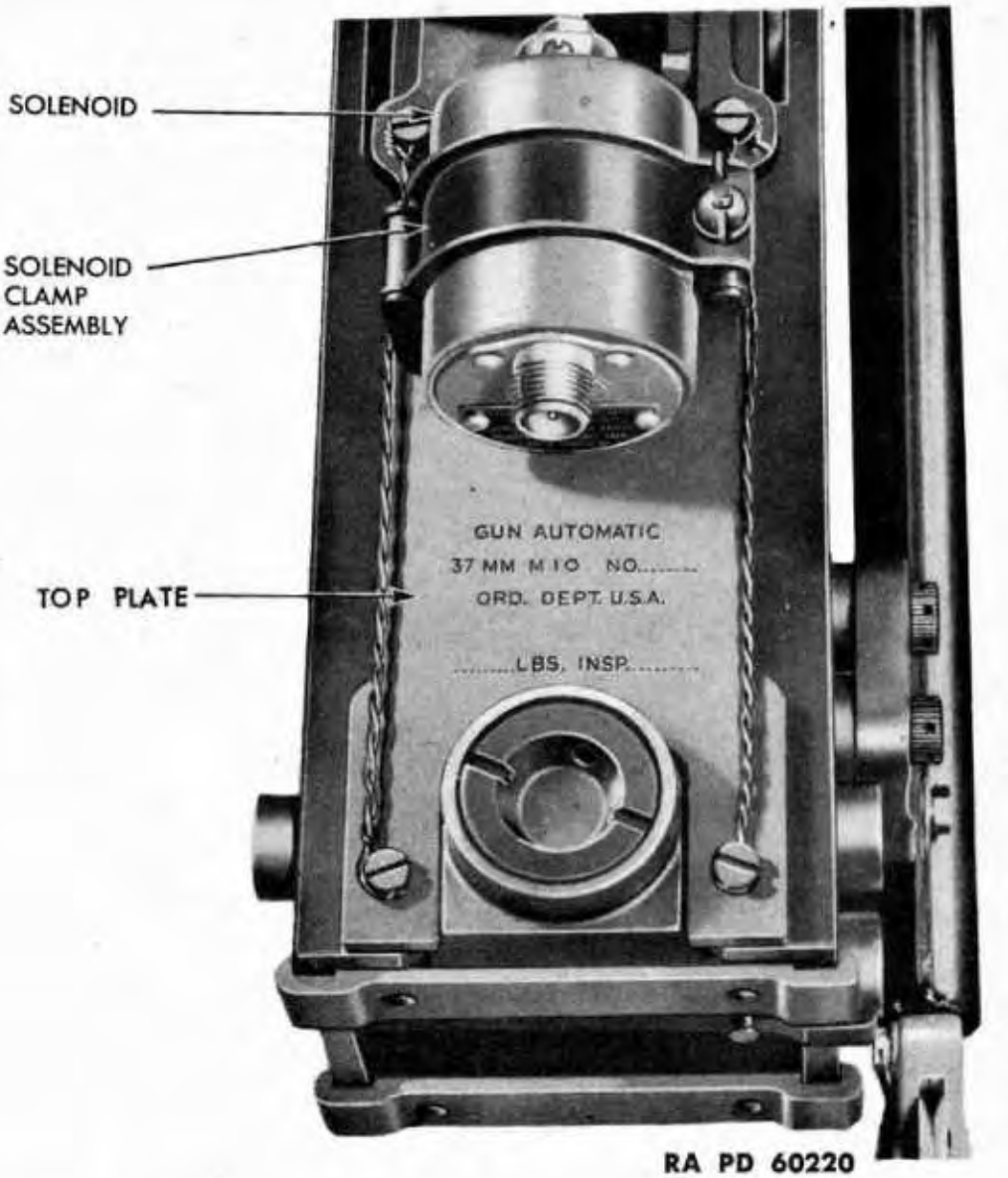


Figure 4—Top Plate of Gun M10 Showing Serial Number and Model

c. A loading handle for manual loading is located on top of the Gun AN-M4 feed box while the Gun M10 makes use of a cable for manual loading.

d. The Gun M10 tube may be identified by the splines at the muzzle end for application of a tube wrench. The Gun AN-M4 tube does not have these splines.

e. The trunnion block bushing of a Gun M10 is of single-piece construction, pressed into place slightly more than flush with the end of the trunnion block. It does not have the notches at the front outer

edge of the bushing which are characteristic of the Gun AN-M4 bushing.

f. The back plate assembly is similar for these guns; however, in early manufacture the Gun M10 buffer adjusting screw is recessed on the top, and the buffer plunger is longer than in the case of the Gun AN-M4. In present manufacture the rear buffer assemblies are the same.

g. A more detailed comparison of these guns will be found in the following paragraph on data (par. 6).

6. TABULATED DATA.

a. Data Pertaining to 37-mm Guns AN-M4 and M10 (Aircraft).

(1) GENERAL.

	AN-M4	M10
Weight of gun	213 lb	231 lb
Weight of tube	55.0 lb	57.5 lb
Length of gun	89.50 in.	89.57 in.
Total length of tube	65 in.	65 in.
Type of breechblock	Vertical sliding wedge	Vertical sliding wedge
Type of firing mechanism	Percussion	Percussion

Ammunition—for complete data, see section XXIV.

(2) PERFORMANCE.

Muzzle velocity (average velocity with a new gun)		
HE shell	2,000 fps	2,000 fps
AP shell	1,825 fps	1,825 fps
Cyclic rate of fire	150 rounds per minute	165 rounds per minute
Average accuracy life	1,950 rounds	1,950 rounds
Maximum allowable recoil	9⅝ in.	9¾ in.
Type of recoil mechanism	Hydrospring	Hydrospring
Type of recoil oil	Light recoil oil	Light recoil oil
Recuperator oil capacity	42 oz	42 oz

Section III

TOOLS, PARTS, AND ACCESSORIES

7. ORGANIZATIONAL SPARE PARTS.

a. A set of organizational spare parts is supplied to the using arm for field replacement of those parts most likely to become broken, worn, or otherwise unserviceable. The set will be kept complete by requisitioning new parts for those used. The parts comprising the set

are listed below for information only; this list will not be used for requisitioning. The authority upon which requisitions are based is SNL A-46.

FOR 37-MM AUTOMATIC GUN AN-M4

Spare Part	Piece Mark
EXTRACTOR	B163393
GUIDE, hammer spring	A25658
HAMMER	B163397
LEVER, cocking	B163400
LEVER, trigger, assembly	B163436
LOCK, loading handle cam	B163403
NUT, loading handle cam lock	A25696
PACKING, recuperator filler screw	A25672
PIN, cocking lever	A25679
PIN, cotter, split, S., 1/16 x 5/16	BFAX1BA
PIN, cotter, split, S., 1/16 x 5/8	BFAX1BD
PIN, cotter, split, S., 3/32 x 3/4	BFAX1CE
PIN, cotter, split, S., 3/32 x 1	BFAX1CG
PIN, firing	A25688
PIN, hammer spring guide	A25690
PIN, locking, breechblock stop	A25678
PIN, operating lever strut	A25698
PIN, sear	A25701
PIN, stop, firing pin	A25689
SEAR	B163416
SPRING, breechblock stop retaining screw	A25780
SPRING, carrier catch	A25782
SPRING, cartridge feeder holding pawl	A25783
SPRING, driving	B163418
SPRING, driving, L.H., assembly	C70562
SPRING, driving, R.H., assembly	C70563
SPRING, driving, spring rod hook	A25466
SPRING, driving, spring tube connection pin	A25467
SPRING, ejector	A25786
SPRING, extractor	A25787
SPRING, feed lever	A25788
SPRING, feed pawl	A25789
SPRING, feed slide lever	A25790
SPRING, firing pin	A25791
SPRING, hammer	A25792
SPRING, loading handle	A25793
SPRING, operating lever	A25795
SPRING, sear	A7225516
SPRING, switch	A25797
SPRING, trigger lever	A25798
STRUT, operating lever	A25809
TRIP, trigger	B163423
WIRE, S., low carbon, bright anld., 0.041 in. diam., 25 ft. long	BFWX1A

FOR 37-MM AUTOMATIC GUN M10

EXTRACTOR	B163393
GUIDE, hammer spring	A25658
HAMMER	B163397
LEVER, cocking	B163400
LEVER, trigger, assembly	B163436
PACKING, recuperator filler screw	A25672
PIN, cocking lever	A25679
PIN, cotter, split, S., 1/16 x 5/16	BFAX1BA
PIN, cotter, split, S., 1/16 x 7/16	BFAX1BB
PIN, cotter, split, S., 1/16 x 5/8	BFAX1BD
PIN, cotter, split, S., 3/32 x 3/4	BFAX1CE
PIN, cotter, split, S., 3/32 x 1	BFAX1CG
PIN, firing	A25688

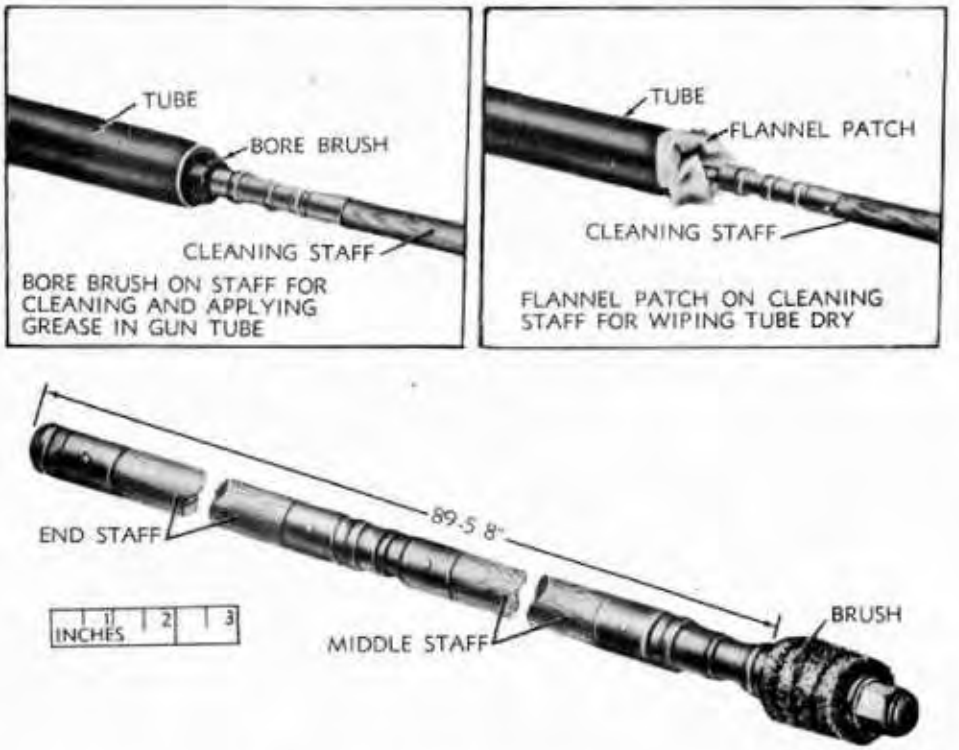
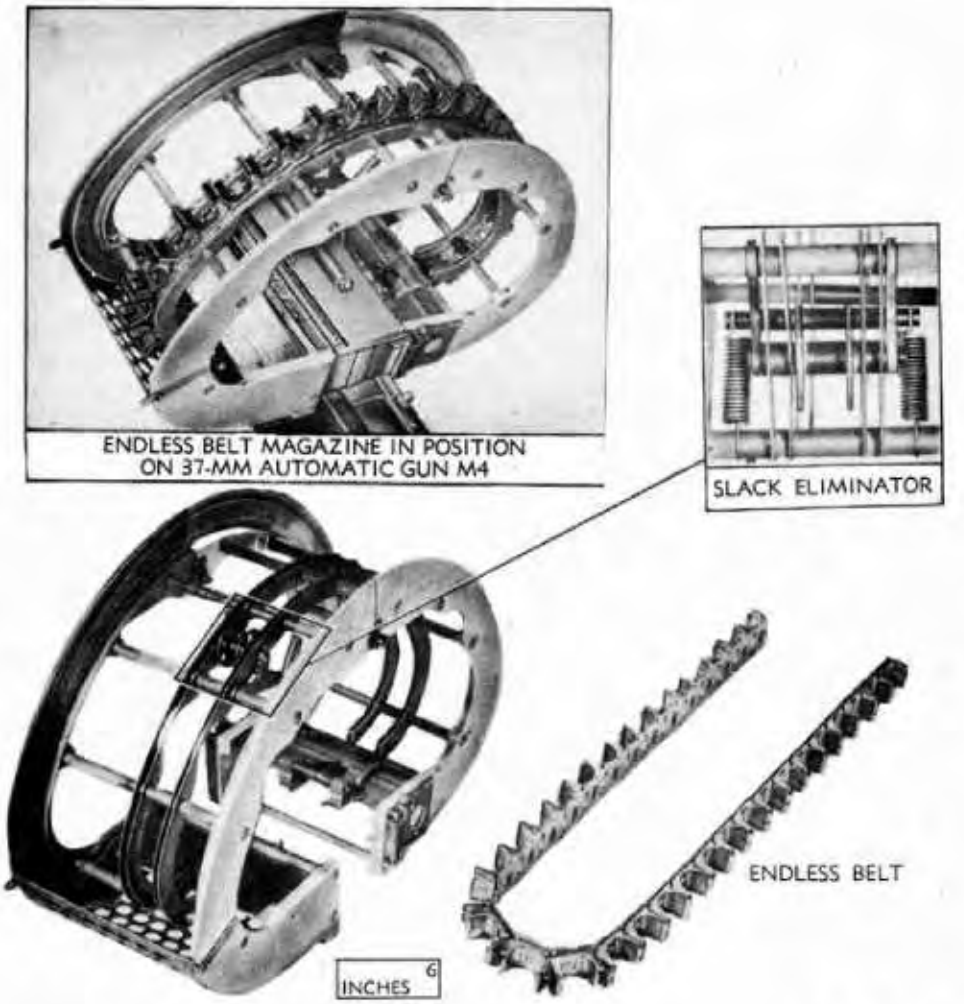


Figure 5—37-mm Bore Brush M8 (B157305) and 37-mm Cleaning Staff M5A2 (B154621)

Spare Part	Piece Mark
PIN, hammer spring guide	A25690
PIN, locking, breechblock stop	A25678
PIN, operating lever strut	A25698
PIN, sear	A25701
PIN, stop, firing pin	A25689
SEAR	B163416
SPRING, breechblock stop retaining screw	A25780
SPRING, carrier catch	A25782
SPRING, cartridge feeder pawl	A25410
SPRING, driving	B163418
SPRING, driving, L.H., assembly	C70562
SPRING, driving, R.H., assembly	C70563
SPRING, driving, spring rod hook	A25466
SPRING, driving, spring tube connection pin	A25467
SPRING, ejector	A25786
SPRING, external stop pawl and stop pawl plunger	A207433
SPRING, extractor	A25787
SPRING, feed lever	A25788
SPRING, feed pawl	A207515
SPRING, feed slide lever	A207598
SPRING, firing pin	A25791
SPRING, hammer	A25792
SPRING, loading slide switch, interlock, and trigger lock levers	A207646
SPRING, operating lever	A25795
SPRING, sear	A25489
SPRING, switch	A25797
SPRING, trigger lever	A25798
STRUT, operating lever	A25809
TRIP, trigger	B163423
WIRE, S., low carbon, bright anld., 0.041 in. diam., 25 ft. long	BFWX1A



RA PD 26854

Figure 6—37-mm Endless Belt Magazine M6 (D36483) (Gun AN-M4 Only)

8. ACCESSORIES.

a. Accessories include the tools and equipment required for such disassembling and assembling as the using arm is authorized to perform, and for the cleaning and preservation of the gun, ammunition, etc. Accessories should not be used for purposes other than as prescribed and, when not in use, should be properly stored.

b. The accessories provided with each weapon are listed below. If it becomes necessary to replace a broken or missing accessory, this list should be checked with SNL A-46 which is the authority for requisitioning.

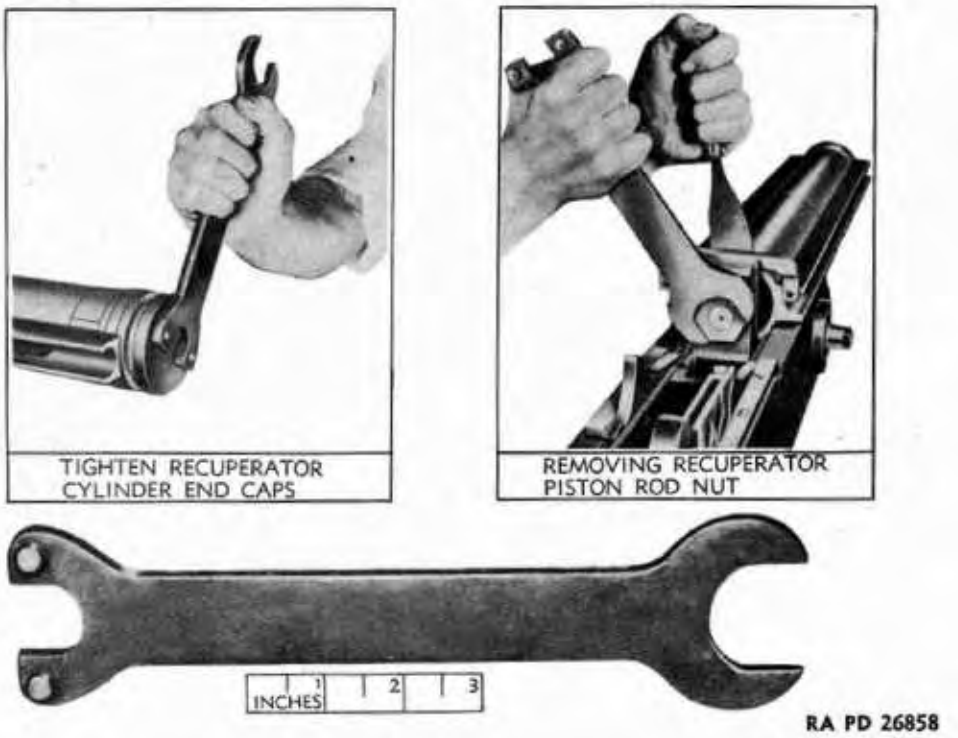


Figure 7—Double-end Combination Spanner Wrench 41-W-3252-80

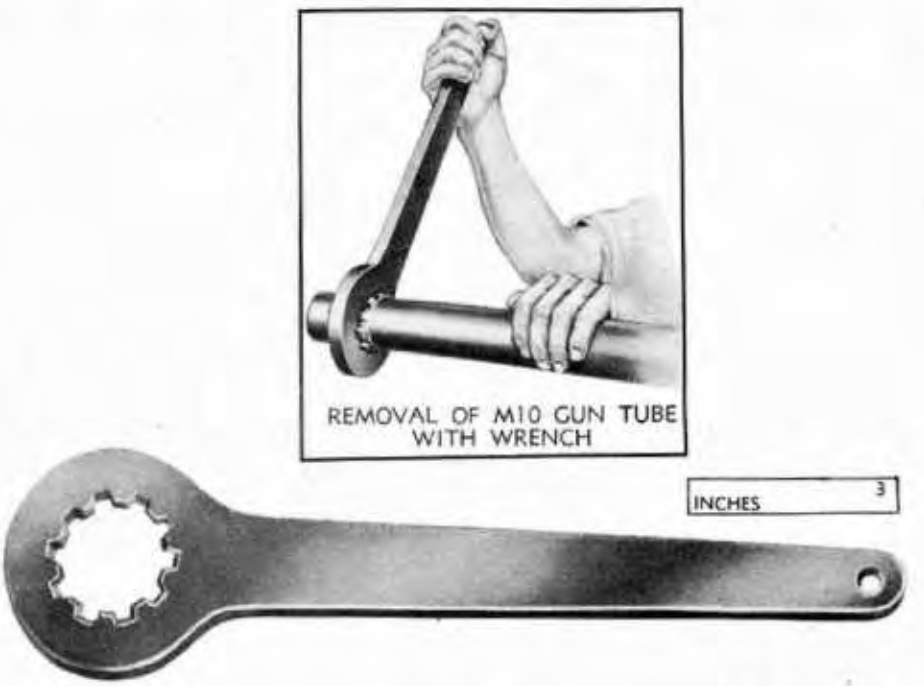
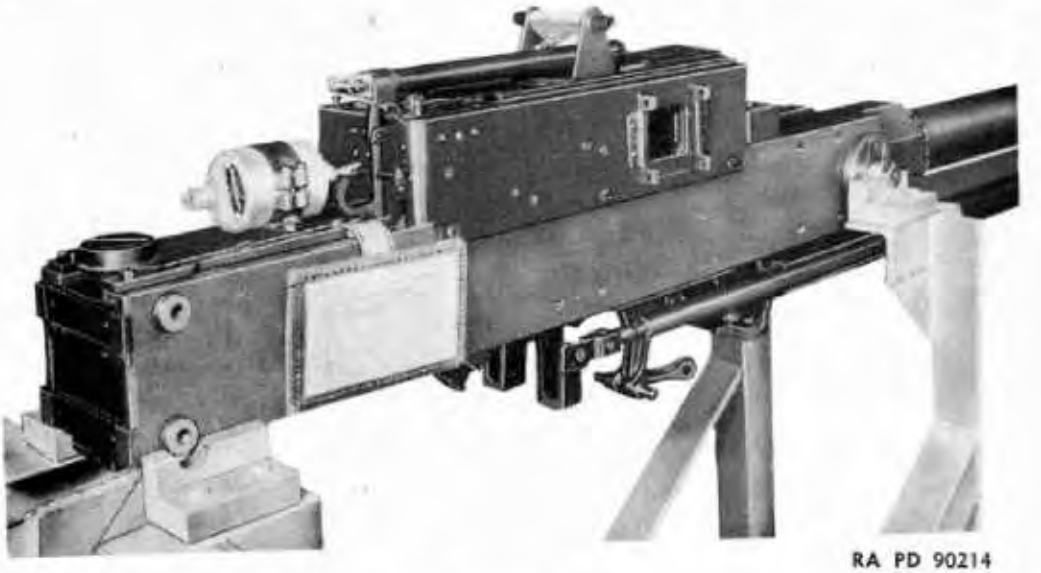


Figure 8—Special Splined Opening Single-end Box Wrench 41-W-640-300 (Gun M10 Only)



RA PD 90214

Figure 9—Modification Record Card Holder (C7225029) Attached to Gun AN-M4

FOR 37-MM AUTOMATIC GUN AN-M4

Accessory	Piece Mark or Fed. Stock No.	Fig. No.	*Use
BOOK, Technical Manual 9-240, 37-mm Automatic Guns AN-M4 and M10 (Aircraft)	—		—
BRUSH, bore, 37-mm, M8	B157305	5	Cleaning and oiling bore of gun.
CARD, modification record (O.O. Form 7451)	—		—
COVER, bore brush, 37-mm, M530	C7225002		—
FUNNEL, cop., w/strainer, cap. ½ pt.	41-F-3573		—
HOLDER, modification record card	C7225029	9	—
MAGAZINE, endless belt, 37-mm, M6	D36483	6	Provides means for feeding 37-mm ammunition into gun.
STAFF, cleaning, 37-mm, M5A2	B154621	5	—
WRENCH, spanner, comb., dble-end., type pin face, open end, and hex. box	41-W-3252-80	7	—

FOR 37-MM AUTOMATIC GUN M10

BOOK, Technical Manual 9-240, 37-mm Automatic Guns AN-M4 and M10 (Aircraft)	—		—
BRUSH, bore, 37-mm, M8	B157305	5	Cleaning and oiling bore of gun.
CARD, modification record (O.O. Form 7451)	—		—
COVER, bore brush, 37-mm, M530	C7225002		—
FUNNEL, cop., w/strainer, cap. ½ pt.	41-F-3573		—

FOR 37-MM AUTOMATIC GUN M10—Contd.

Accessory	Piece Mark or Fed. Stock No.	Fig. No.	*Use
HOLDER, modification record card	C7225029	9	—
STAFF, cleaning, 37-mm, M5A2	B154621	5	—
WRENCH, adj., crescent type, sgle-end., length 8 in., jaw opng. 15/16 in.	41-W-486		—
WRENCH, spanner, comb., dble-end., type pin face, open end, and hex. box	41-W-3252-80	7	—
WRENCH, box, special, sgle-end., splined opng., size of opng. 4¼ in., length over-all 15⅛ in.	41-W-640-300	8	Used for removal of gun tube.

*Where the accessory's use is not indicated, the nomenclature is self-explanatory or the accessory has general use.

PART TWO—OPERATING INSTRUCTIONS

Section IV
GENERAL

9. SCOPE.

a. Part two contains information for the guidance of the personnel responsible for the operation of this equipment. It contains information on the operation of the equipment with the description and location of the controls.

Section V
SERVICE UPON RECEIPT OF EQUIPMENT

10. GENERAL.

a. Upon receipt of new or used materiel, it is the responsibility of the officer in charge to ascertain whether or not it is complete and in sound operating condition. A record should be made of any missing parts and of any malfunctions, and any such conditions should be corrected as quickly as possible.

b. Attention should be given to small and minor parts as these are the more likely to become lost and may seriously affect the proper functioning of the materiel.

c. The materiel should be cleaned and prepared for service in accordance with instructions given in paragraph 11 or 12. The materiel should be lubricated in accordance with instructions in section XII.

11. NEW EQUIPMENT.

a. If the gun is coated with corrosion preventive, the preventive must be removed (before the gun is inspected) as follows:

(1) Disassemble the gun as required and clean all parts with dry-cleaning solvent or rifle-bore cleaner.

(2) Clean the bore with waste to remove bulk of rust-preventive compound before using the dry-cleaning solvent. A cloth saturated with dry-cleaning solvent is run through the bore until the rust-preventive compound has been entirely removed.

b. Inspect for any broken or missing parts.

c. Inspect all operating parts for smoothness of operation.

d. Check electric solenoid by attaching to source of power.

e. Check spare parts and accessories with OSP and E of Ord 7 SNL A-46.

f. Inspect tools and accessories (sec. III).

12. USED EQUIPMENT.

a. The services required to insure proper operation of the materiel are identical with the information given in paragraph 11, except for the following additional points:

(1) Check Modification Record Card (O.O. Form 7451) to see if it is up to date.

(2) Check recuperator for proper oil level.

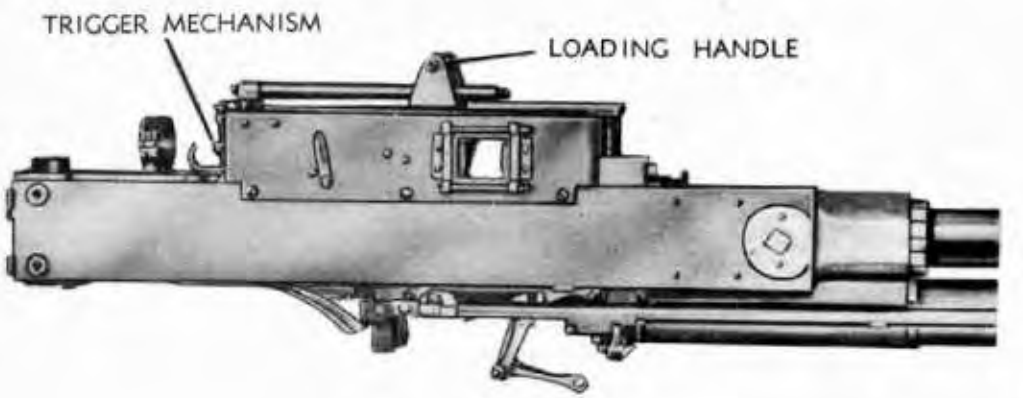
Section VI

CONTROLS

13. CONTROLS.

a. The loading handle on top of the feed box of the Gun AN-M4 (fig. 10) is used to actuate the feeding mechanism. It is operated by pulling it to the rear.

b. The hand loading cable on top of feed box of Gun M10 is used to actuate the feeding mechanism (fig. 11). It is operated by pulling it to the rear.



RA PD 95388

Figure 10—Controls of Gun AN-M4 (Without Charger)

c. The manual charger cable at rear end of manual charger (fig. 11) is used to charge the Gun M10. It is operated by pulling it to the rear far enough so that lock frame is engaged by the carrier dog.

NOTE: *The Gun AN-M4 may also be equipped with a manual charger.*

d. The firing switch is usually located on the control wheel in the pilot's compartment. Closing of the switch energizes the solenoid which, in turn, actuates the trigger mechanism.

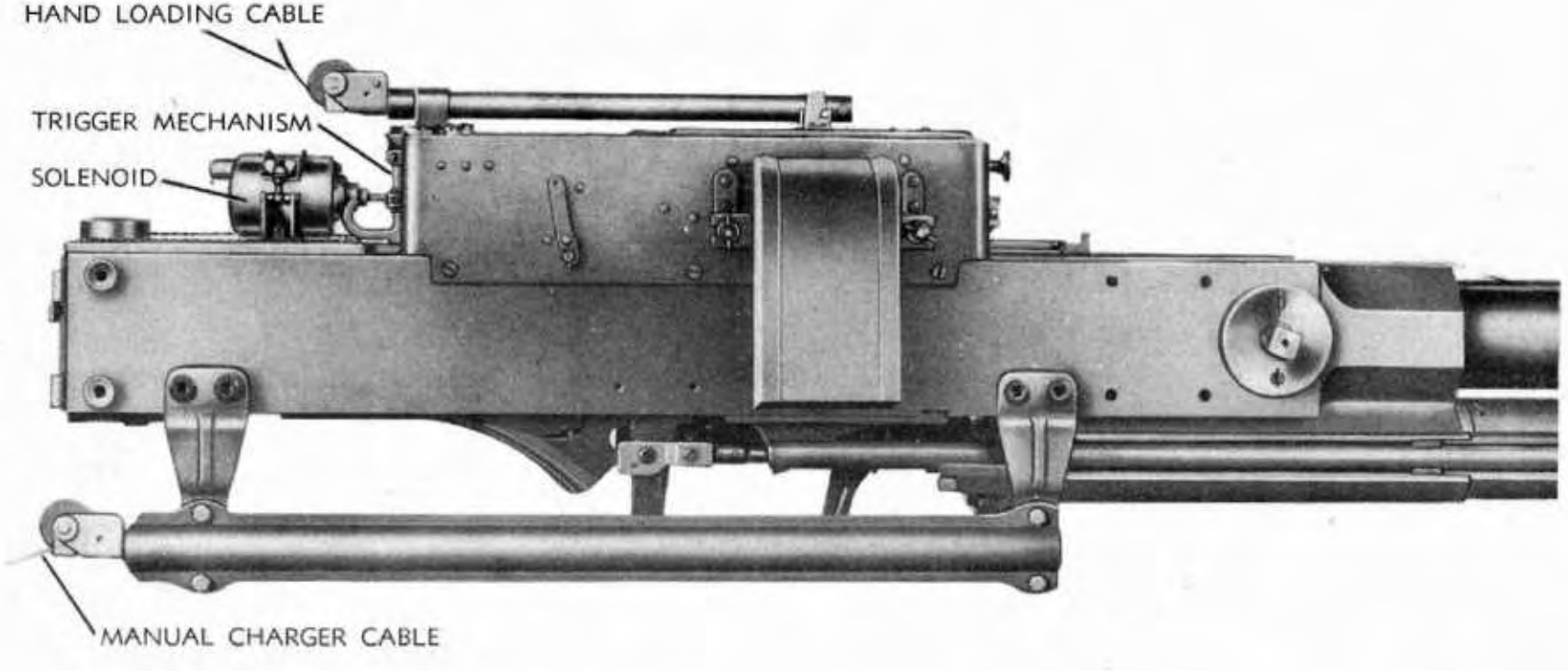


Figure 11—Controls of Gun M10

Section VII

OPERATION UNDER USUAL CONDITIONS

14. LOADING THE GUN M10.

a. Filling the Disintegrating Belt (figs. 12 and 13).

(1) Place the links on a flat surface, open ends up and single loop to the left. Slide the single loops between the double loops until they are in line.

(2) Place the ammunition, projectile forward, in the loop openings with the locating projection on the front side of the single loop in the locating groove of the rotating band on the projectile (fig. 12).

(3) Snap the ammunition into the links. Ammunition must be inserted in all links except the openings at each end. When loading a right-hand gun, the double loop of the first link must be filled by installing a spring plug C70927 (fig. 13).

(4) In the event belt links are saved, after going through the gun for reuse, they should never be rebelted without first being checked for defects. This visual inspection should include checking for warpage or deformed links.

NOTE: *For use of linking machine, see paragraph* 31 **b.**

b. Feeding the Ammunition Into the Gun.

(1) Inspect the bore and gun to see that no ammunition or foreign material is present.

(2) Pull the manual charger cable until the lock frame is engaged in the retracted position.

(3) A Gun M10 (left-hand feed) is loaded by feeding the single-loop end of the ammunition belt into the feed box. To load a Gun M10 (right-hand feed), the double-loop end of the belt is fed into the feed box.

(4) Enter the outer ears of the first link between the feed slide track and the wall of the feed chute.

(5) Release the external stop pawl by pushing rearward on its serrated lever which protrudes upward through the opening in the feed chute (fig. 14). The pawl will remain released without further pressure.

(6) Push the belt into the gun until the stop pawl inside the feed box is contacted.

(7) Pull the cartridge feeder pawl handle forward (fig. 14). This releases the pawl and permits the belt to advance until it is again stopped by the stop pawl.

(8) Feed the initial round into the gun by pulling the loading slide rearward. The cartridge is stripped from the belt, and the forward movement of the lock frame charges the cartridge into the chamber. The gun is ready for firing.

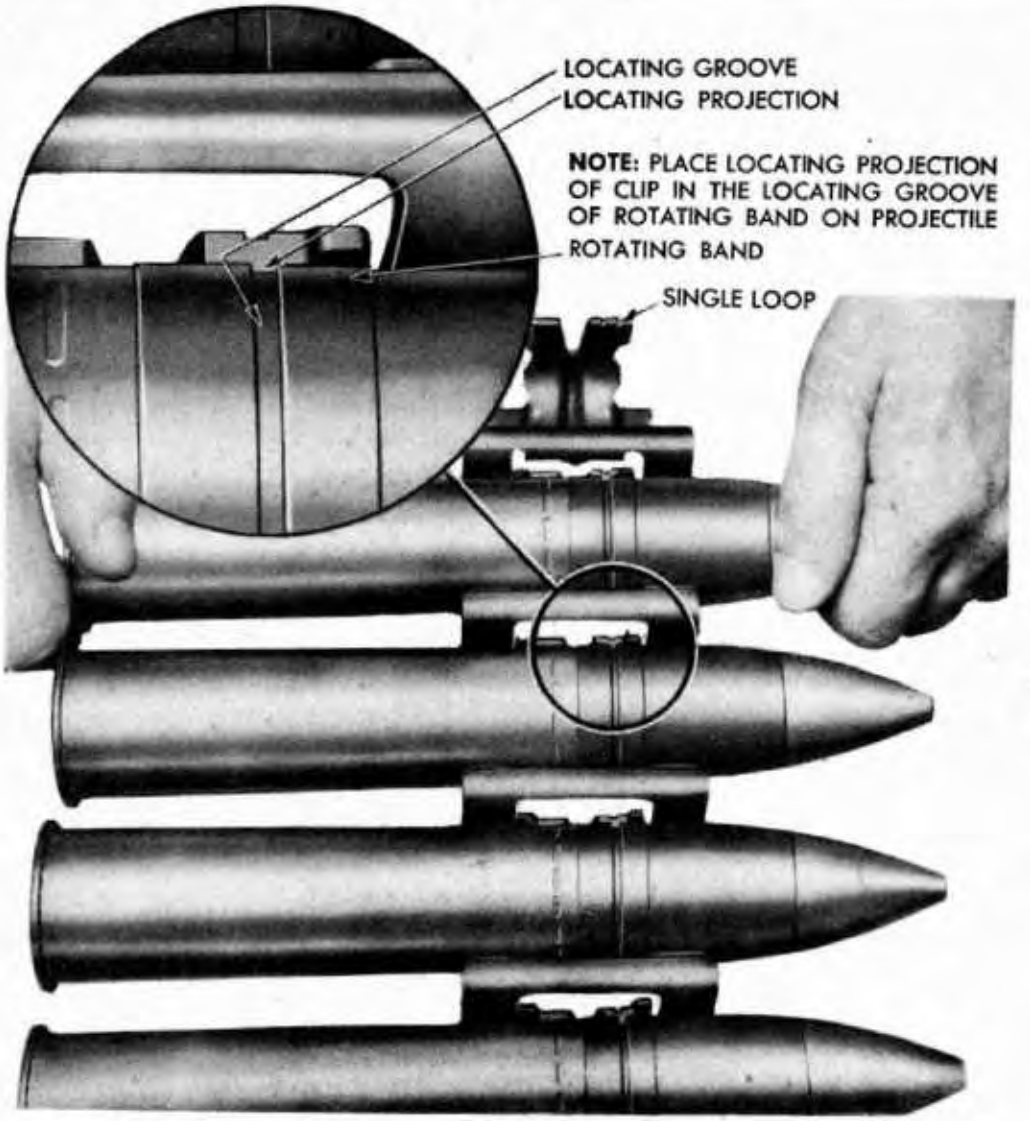


Figure 12—Belting 37-mm Ammunition

15. LOADING THE GUN AN-M4.

a. Installing the Endless Belt Magazine M6.

(1) Replace the center and front (right side) feed box screws with magazine support studs (fig. 96).

(2) Attach the right half of the magazine by means of the retaining rods and secure with the cotter pins (figs. 15 and 96).

(3) Attach the left half of the magazine so that the spring latches on the magazine half engage the latch studs on the feed box (figs. 15 and 96).

(4) Secure the magazine halves at the top by replacing the pin and bushing fasteners on front and rear (fig. 96). NOTE: *Early models may have bolts instead of fasteners as means of securing the halves.*

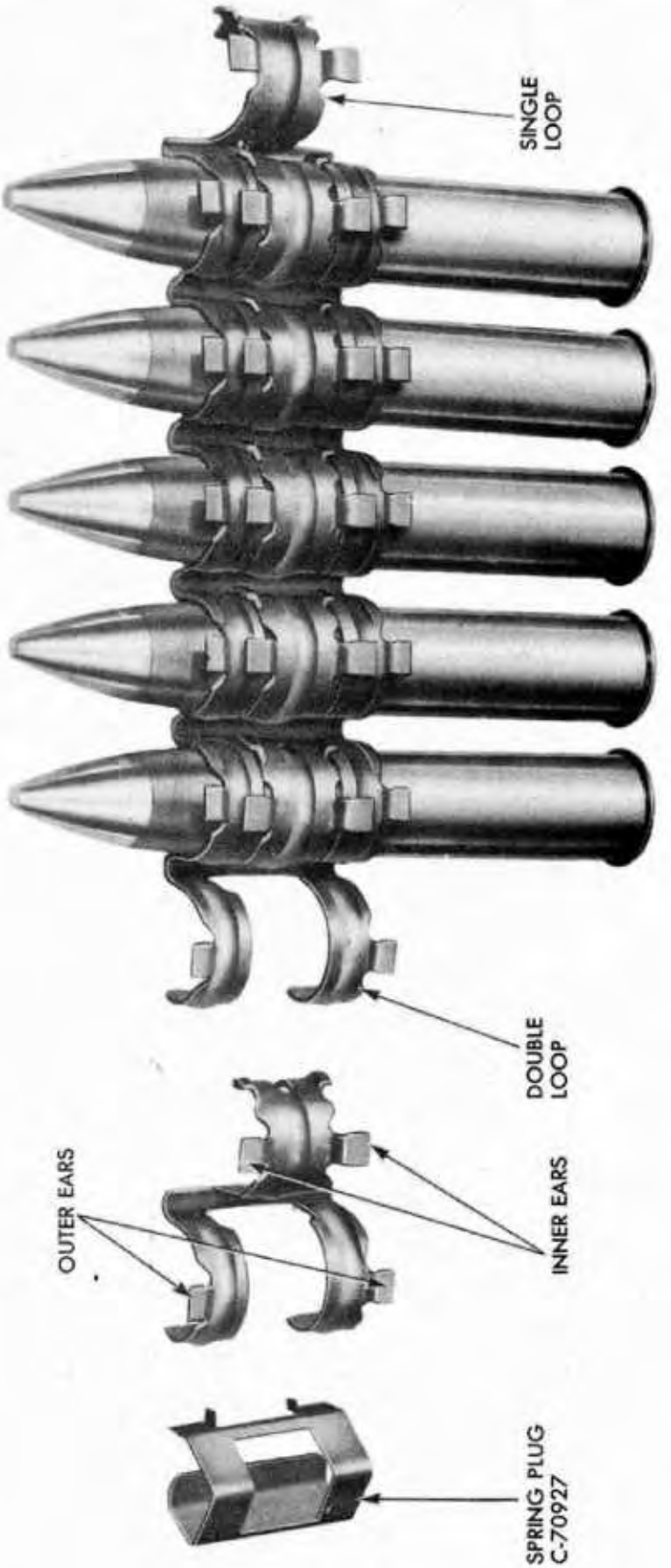


Figure 13—Ammunition Belt

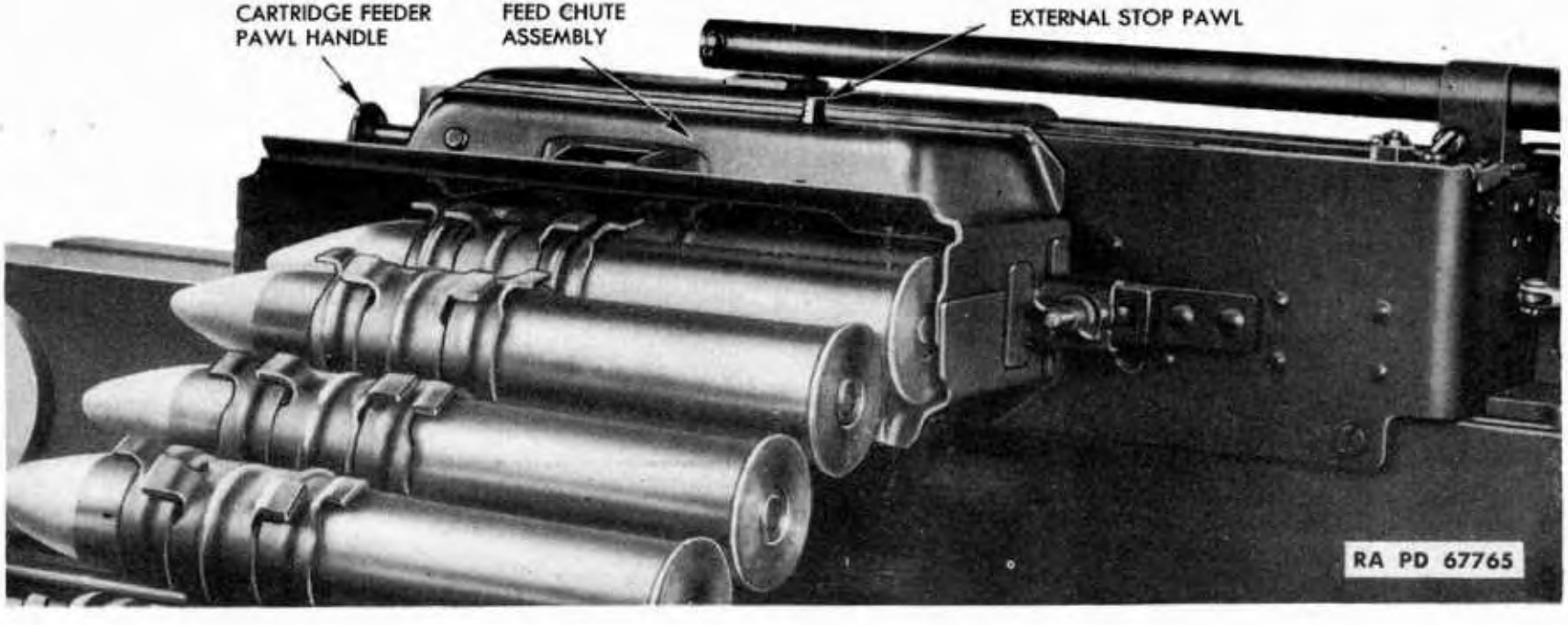
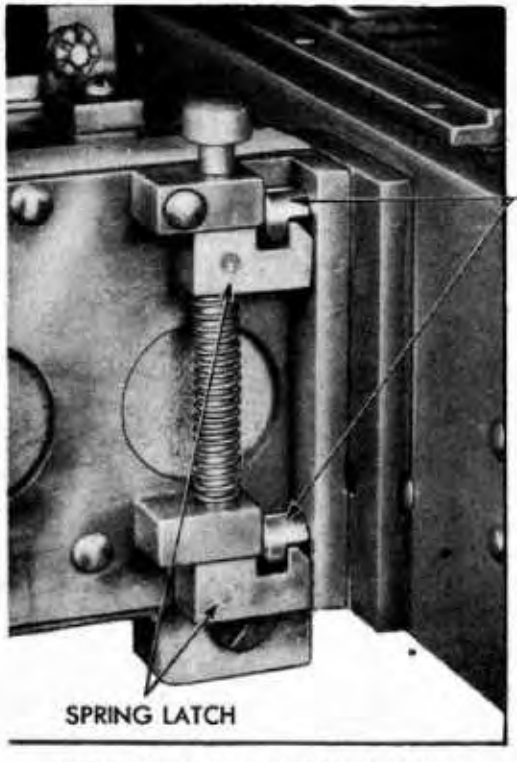


Figure 14—Feeding Ammunition Belt Into Gun M10



CLOSE-UP OF MAGAZINE LATCHES AND LATCH STUDS

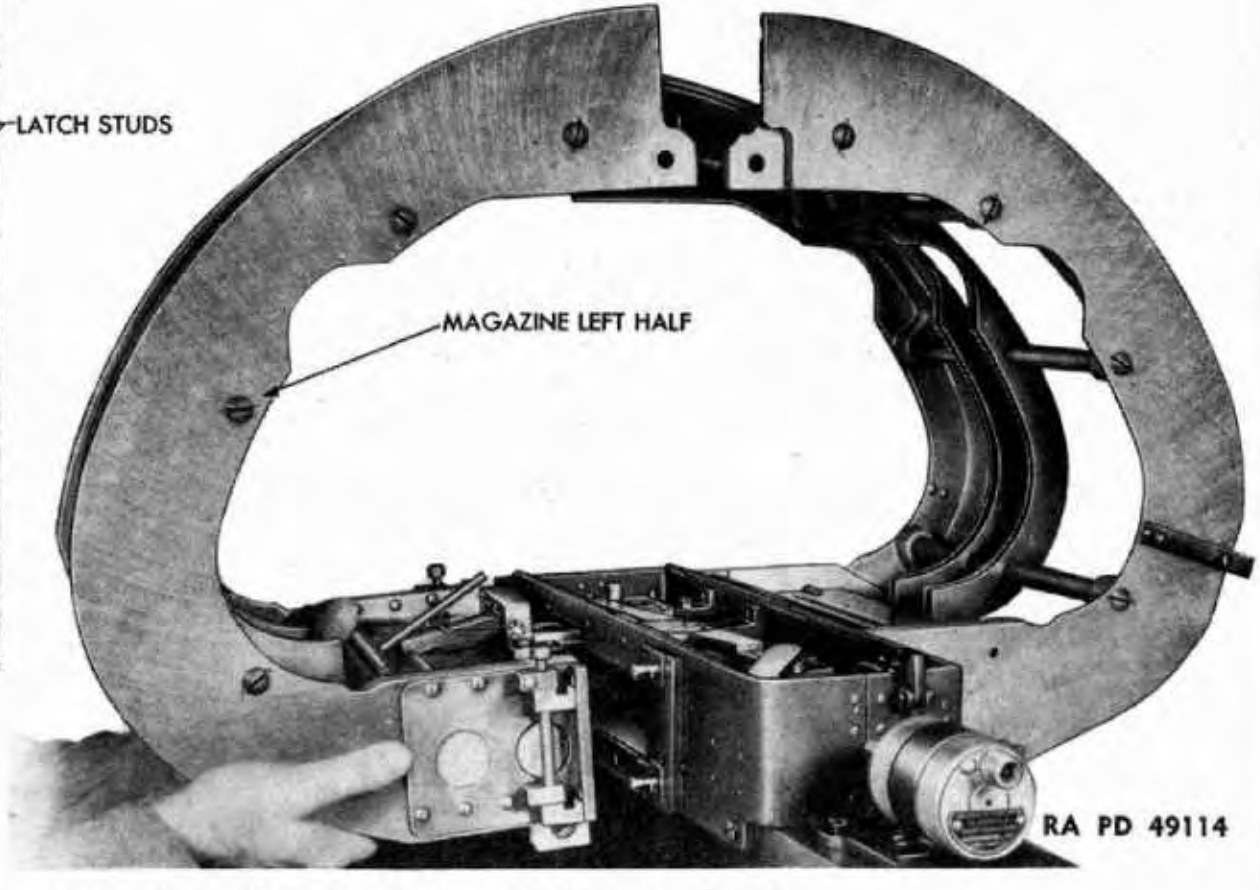


Figure 15—Installing the Endless Belt Magazine M6

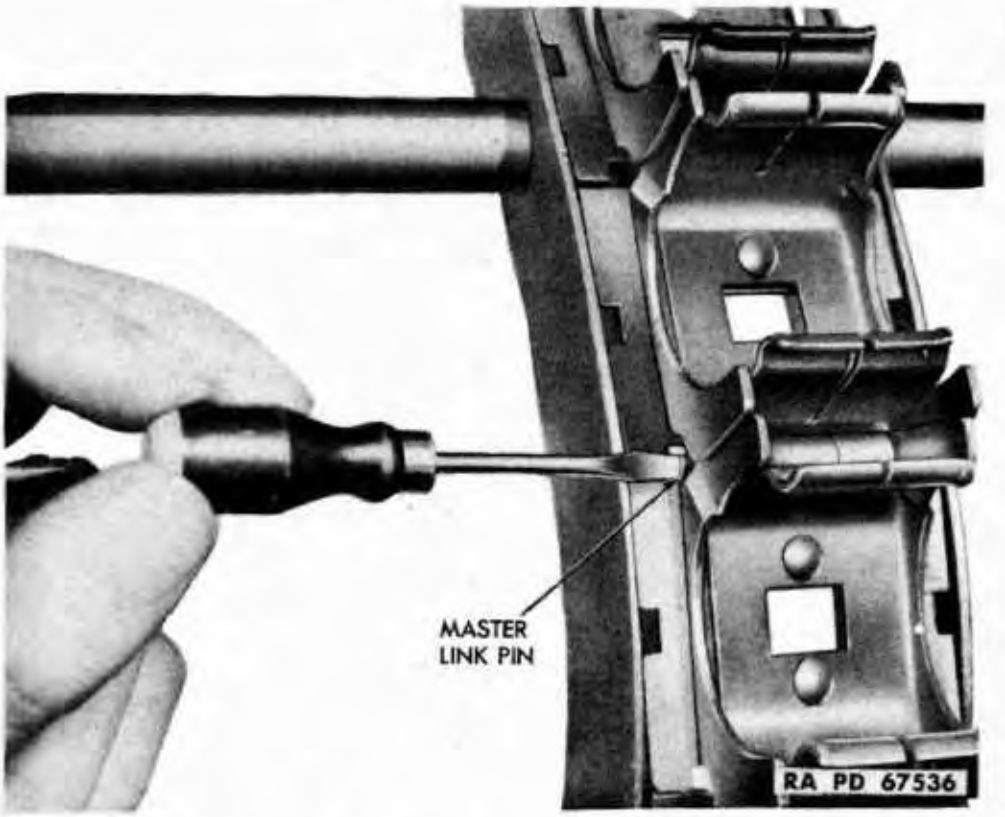


Figure 16—Screwing in the Master Link Pin

(5) After the magazine has been mounted on the gun, remove magazine feed door.

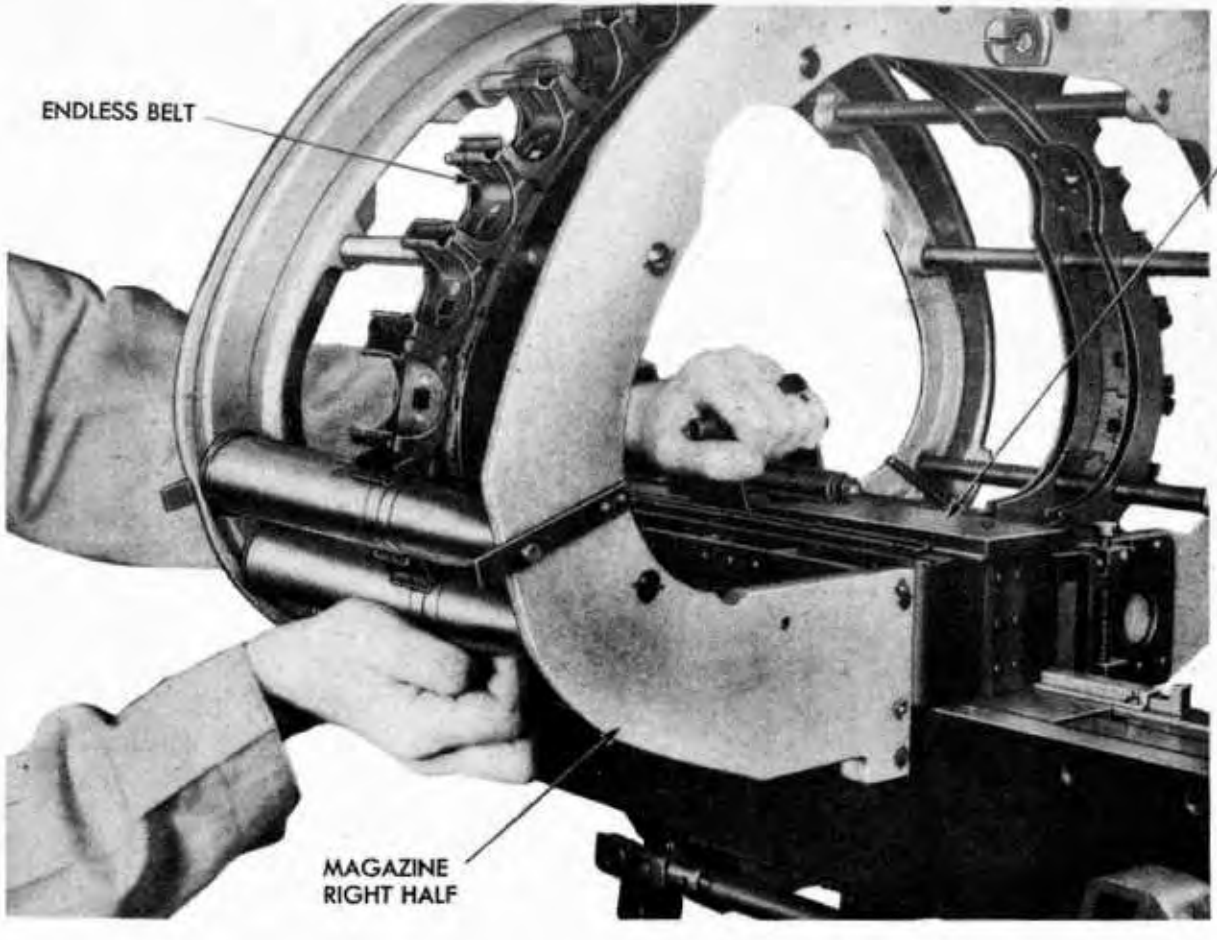
(6) Hold stop pawl in released position, insert the belt first in the raceways of the left magazine belt guide, then into the feed box of the gun, and, finally, into the raceways of the right belt guide. The end links of the belt are joined by the master link pin (fig. 16).

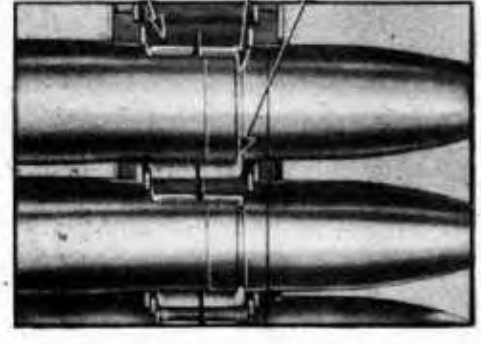
b. Loading the Endless Belt Magazine M6.

(1) Insert a single round of live ammunition in the belt and pull it from one side of the magazine to the other. This is done to check for burs and rough spots on the side plates, guide rails, and support rails.

(2) Press one round of ammunition into the second open link of the belt protruding from the right-hand side of the magazine, making certain that grooves on rotating band engage the mating projections in the spring clip (fig. 17).

(3) Pull the loading handle once, thus moving the belt one clip, and repeat the process to fill the second clip (fig. 17). Repeat until 30 rounds have been loaded (fig. 18). Then replace the feed door (fig. 18).





NOTE: PLACE LOCATING PROJECTION OF CLIP IN THE LOCATING GROOVE OF ROTATING BAND ON PROJECTILE

RA PD 67539

Figure 17—Loading the Endless Belt Magazine M6

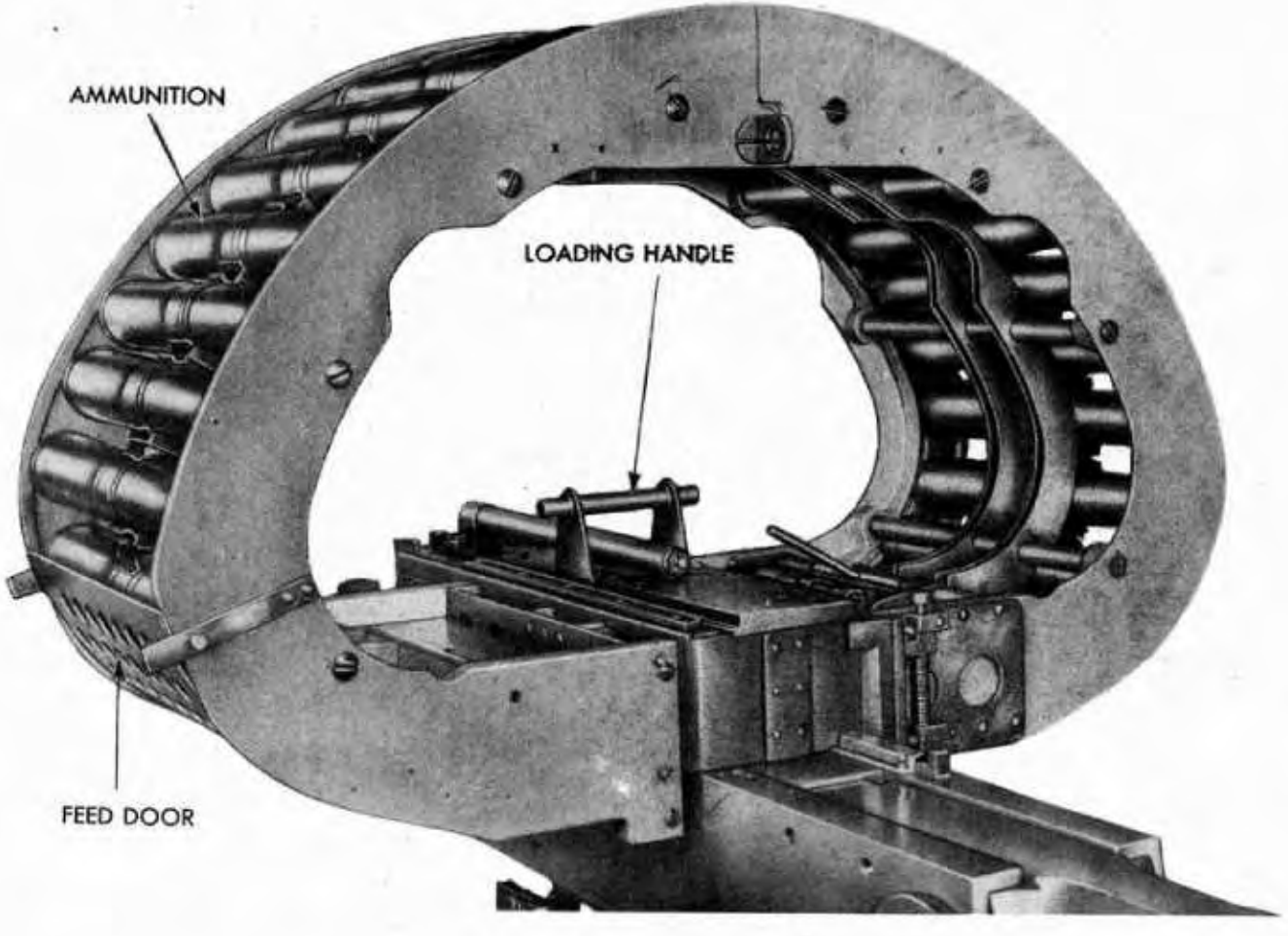


Figure 18—Endless Belt Magazine M6—Loaded

(4) One empty clip must be protruding from the right side of the magazine. Instructions for loading are to be rigidly followed to prevent a possibility of double feeding when the gun is loaded manually by pulling the loading handle. *Only* 30 rounds are to be loaded. Before removing any rounds, the magazine feed door must be removed.

c. Feeding the Ammunition Into the Gun.

(1) To load the gun from the magazine, give the charging handle and then the loading handle a vigorous pull and release immediately. Quick operation insures proper functioning of the moving parts of the loading and charging mechanisms.

(2) The charging handle retracts the lock frame until it is held by the carrier dog and positions the first round in the feed box; the loading handle strips the first round from the belt, releasing the carrier. The released carrier forces the round into position in front of the charger. Forward movement then chambers the round and the gun is ready to fire.

CAUTION: *If, in loading the belt, a round is positioned inside the feed box, the operation of the charging handle only will strip it from the belt and chamber the round. In such a case the loading handle should not be pulled as this would feed a round into the gun on top of the charger and result in a jam.*

16. FIRING.

a. Closing of the circuit in the firing switch operates the trigger by means of the solenoid located on the top plate of the gun.

b. The trigger will remain pulled as long as the switch is closed, and the gun will fire automatically until the ammunition is expended. When the switch is released, the trigger is returned to its released position, and firing ceases.

17. CORRECTIONS OF STOPPAGES IN COMBAT FIRING.

a. The design of the gun and its location outside the reach of the gunner usually make it impossible to remedy stoppages in flight.

b. When a stoppage occurs during combat firing, recharge the gun immediately, if recharging is possible, and attempt to fire. If the weapon cannot be recharged, no corrective action is possible.

18. UNLOADING.

a. Gun M10.

(1) To Remove the Ammunition Belt.

(a) Release the external stop pawl (fig. 19).

(b) Pull forward on the cartridge feeder pawl handle, and hold in the forward position to keep the holding pawl released (fig. 19).

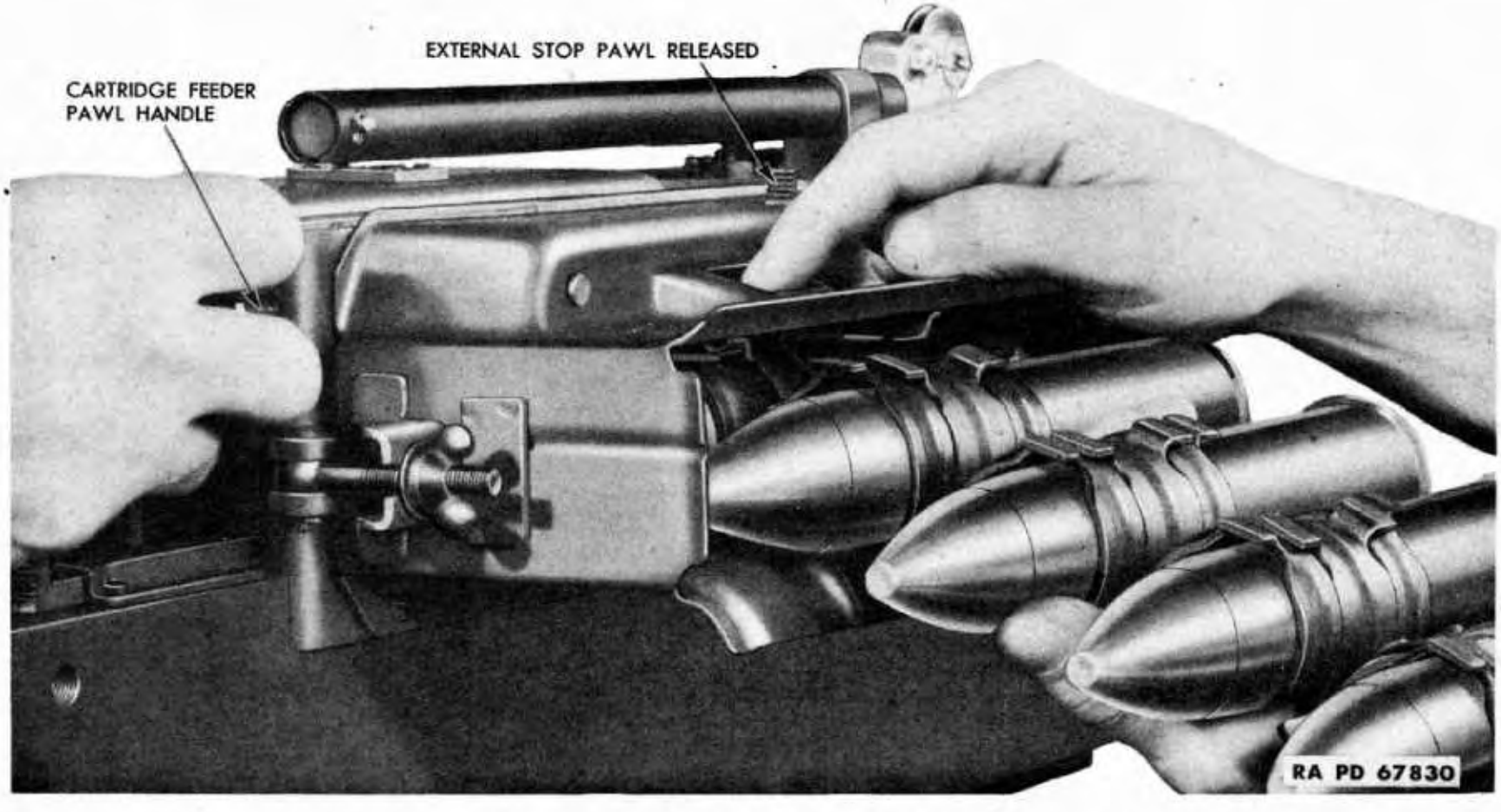


Figure 19—Removing Ammunition Belt From Gun M10

(c) Depress the finger release tab on the feed slide pawl. Hold the pawl released while the belt is being pulled out of the feed box (fig. 19).

(2) TO REMOVE CARTRIDGE FROM CHAMBER.

(a) Retract the lock frame until caught by the carrier dog. The extractor will withdraw the round and it will fall out through the bottom of the gun.

(b) Examine the chamber to see that it is empty.

(c) While holding the operating lever rearward, release the lock frame by releasing the carrier catch. Then allow the lock frame to move forward slowly.

(3) TO EMPTY AMMUNITION BELT.

(a) Place the belt on a flat surface with the rounds up.

(b) Starting at one end of the belt, grasp the projectile with one hand and, with the other pressed against the adjacent cartridges, pull up with a twisting motion. Continue until all ammunition has been removed.

b. Gun AN-M4.

(1) TO REMOVE ROUNDS FROM MAGAZINE.

(a) Remove the loading handle cam and base assembly from the top of the feed box by lifting the latches and sliding the assembly forward.

(b) Depress the feed pawl lifter and push the cartridge feeder holding pawl in the direction that releases it.

(c) The link belt can then be rotated so that all rounds still in the belt are out of the feed box.

(d) These rounds then may be pulled from the spring clips.

(2) TO REMOVE CARTRIDGE FROM CHAMBER. Proceed as in subparagraph **a** (2), above.

(3) TO REMOVE ENDLESS BELT MAGAZINE M6.

(a) Remove all rounds from the magazine (subpar. **b** (1), above.

(b) Unscrew the master link pin from the endless belt (fig. 16). NOTE: *The master link pin can be located by an indicating red paint marking on the belt.* CAUTION: *Do not let the belt fall, as the plates of the belt may become sprung.*

(c) Pull the belt out from the right side by holding the stop pawl in released position.

(d) Remove the two pin and bushing fasteners which secure the halves of the magazine at the top.

(e) Depress the latch pins at the front and rear of the magazine left half, so that the latch hooks are released from the latch studs. The left half can now be removed.

(f) Remove the cotter pins from the retaining rod which hold the right half.

(g) Withdraw the rods and pull the right half from the gun.

Section VIII

OPERATION UNDER UNUSUAL CONDITIONS

19. GENERAL.

a. When operating the gun under unusual conditions, such as extreme cold or heat, severe dust or sand conditions, and near salt water, the precautions listed below should be scrupulously followed.

20. EXTREME COLD.

a. In extremely cold temperatures, it is essential that all moving parts be kept absolutely free of moisture. Clean and lubricate all parts but do not use excess lubricant because it may solidify to such an extent as to cause sluggish movement or complete failure. When the gun is in the open, cover all unprotected parts with tarpaulin or other suitable material. Select a firm covering so that no loose material will get into the working parts of the gun. When the gun is transferred from the outside into a heated building, clean and oil it immediately. After the gun has reached room temperature, wipe it dry with a clean cloth, and oil again.

b. The cleaning of a cold gun tube after firing cannot be accomplished in the normal manner at temperatures below +32° F because the water in the cleaning solution will freeze in the tube. If cleaning can be done with the tube hot, it may be possible to use the normal cleaning solutions. Otherwise, it will be necessary to add denatured alcohol or, as emergency alternatives, grade A glycerine or antifreeze compound. To 10 parts by volume of cleaning solution, add the number of parts of 1 of the following antifreeze solutions:

Temperature (degrees F)	Denatured Alcohol	or	Glycerine	or	Antifreeze Compound
20	2		2½		2
10	4		5		3⅓
0	6½		6½		5
−15	9		10		7¼
−30	16		13		10
−40	27		16		12

c. If it is not possible to mix a cleaning solution with an antifreeze solution as indicated above, the bore may be cleaned with dry cleaning solvent. This should be done only in an emergency since it is not very effective as a cleaning solution.

21. EXTREME HEAT.

a. Where extremely high temperature and humidity are encountered, inspect and clean gun frequently, as required, rather than at fixed intervals. Clean and oil as soon as possible after firing, when the gun gets wet or dirty, or if there is any reason to expect corrosion to start.

22. SEVERE DUST OR SAND CONDITIONS.

a. If considerable dust is present when the gun is operated, all lubricants on working surfaces should be reduced to a minimum. Lubricants contaminated with dust or sand are more harmful to the gun than no lubricant at all, as the grease or oil will catch and hold dust or sand which acts as an abrasive. Clean the gun thoroughly when firing is over, and relubricate.

23. LOCATIONS NEAR SALT WATER.

a. In excessively salty atmosphere, the oil or rust preventive used should be changed often as the salt has a tendency to emulsify the oil and destroy its rust-preventive qualities.

Section IX

DEMOLITION TO PREVENT ENEMY USE

24. GENERAL.

a. The destruction of the materiel when subject to capture or abandonment in the combat zone will be undertaken by the using arm only as a command function, on authority delegated by the division or higher command when such action is deemed necessary as a final resort to keep the materiel from reaching enemy hands.

25. DESTRUCTION BY FIRE.

a. Generally, the destruction of the airplane by incendiary means is sufficient to render the armament useless. However, since there are cases where it is impractical to set fire to the plane, additional methods are outlined below in order of effectiveness.

26. DESTRUCTION BY TNT.

a. Open drain plug on recoil mechanism, allowing recoil fluid to drain. *It is not necessary to wait for the recoil fluid to drain completely before igniting the fuze* (subpar. **e**, below).

b. Remove an HE shell from a complete round, and seat the shell in the chamber.

c. Plug the bore for approximately two-thirds of its length, using a cleaning staff wrapped with cloth or waste to make it fit tightly in the bore. Mud, stones, clay, etc., may be used to plug the bore in lieu of the ramrod.

d. Cut down a ½ pound TNT block to fit snugly in the chamber behind the HE shell. Insert a tetryl, non-electric cap, with approximately 3 to 4 feet of safety fuze, into the TNT block. Close the breech as far as possible without damaging the safety fuze.

e. Ignite the safety fuze and take cover at least 100 yards from the gun. Elapsed time: 2 to 3 minutes if cleaning staff is used to plug the bore, and cut down TNT block is carried with gun; longer if other bore obstructions are used.

27. EXPLOSION OF PROJECTILE IN PLUGGED TUBE.

a. See paragraph 26 a.

b. See paragraph 26 c.

c. Insert one complete HE round into gun and close breech.

d. Take cover and fire the gun, using a lanyard 100 feet long. Elapsed time: 1 to 2 minutes, using cleaning staff to plug the bore; longer if bore is plugged with mud, etc.

28. FIRE FROM ADJACENT GUNS.

a. Fire adjacent guns at each other at point blank range, using HE or AP shells. Several direct hits from a weapon of the same caliber on a vital spot, such as the breech mechanism, recoil mechanism, or tube, should adequately destroy an artillery piece. Fire from cover. Danger space is from 200 to 500 yards.

29. EXPLOSION OF PROJECTILE AGAINST A ROUND JAMMED IN MUZZLE.

a. See paragraph 26 a.

b. Fire an HE round against similar round jammed in the muzzle.

c. Same as paragraph 27 d. Elapsed time: 2 to 3 minutes.

PART THREE—MAINTENANCE INSTRUCTIONS

Section X

GENERAL

30. SCOPE.

a. Part three contains information for the guidance of the personnel of the using organizations responsible for the maintenance (1st and 2nd echelon) of this equipment. It contains information needed for the performance of the scheduled lubrication and preventive maintenance services as well as description of the major systems and units and their functions in relation to other components of the equipment.

Section XI

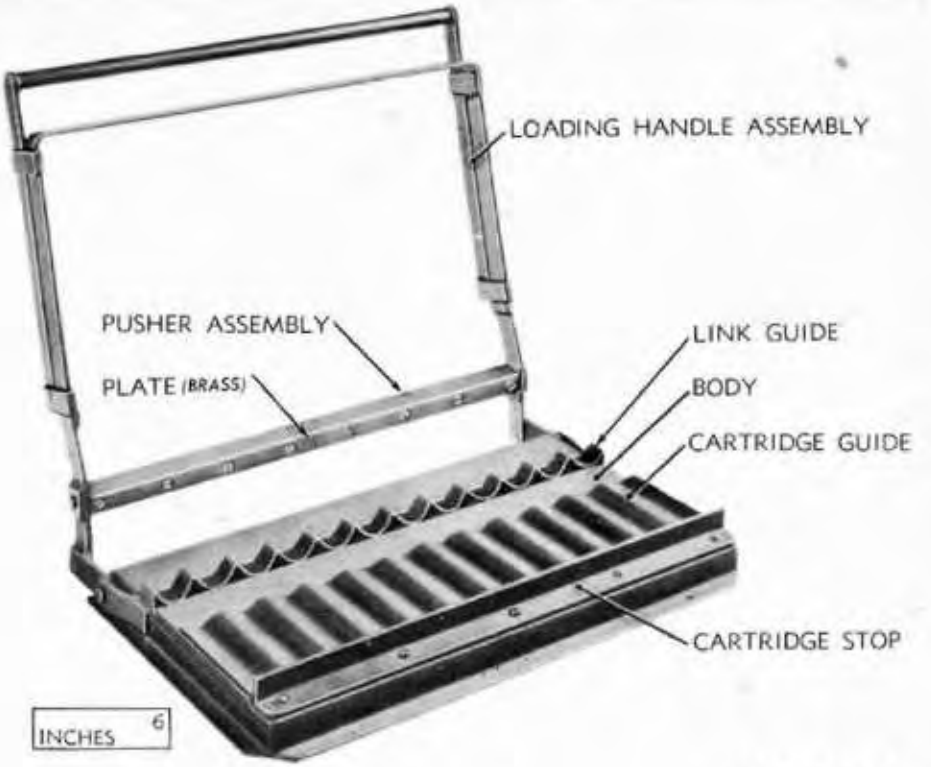
SPECIAL ORGANIZATIONAL TOOLS AND EQUIPMENT

31. GENERAL.

a. The following is a list of accessories issued per organization.

FOR 37-MM AUTOMATIC GUN AN-M4

Accessory	Piece Mark or Fed. Stock No.	Fig. No.	*Use
HAMMER, machs., ball-peen, 8 oz.	41-H-521		—
PIN, stght., S., drill rod, 0.102 x 2½ in. (drift)	42-P-11888-70		Used as drift for removing firing pin stop pin.
PLIERS, side-cutt., fl-nose., length over-all 8 in.	41-P-1977		—
PUNCH, drive pin, standard, diam. of point $\frac{5}{32}$ in., over-all length, 4 in.	41-P-3601		—
REAMER, carb-S., hand, stght-shank., stght-flutes., diam. 0.1100 in.	41-R-780	21	—
SCREWDRIVER, comm., normal duty, sgle-grip, length of blade 6 in., width of blade $\frac{5}{16}$ in.	41-S-1104		—
SCREWDRIVER, special, sgle-end., sq-body., width of blade 0.0438 in., length 8½ in.	41-S-1653	22	—
STONE, sharpening, comb. one-face—coarse, other face—fine, mounted, thickness ⅝ in., width 1¾ in., length 4 in.	41-S-5315		—
WRENCH, adj., crescent type, sgle-end., length 8 in., jaw opng. $\frac{1}{8}$ in.	41-W-486		—
WRENCH, pipe, girth 2¼ in.	41-W-1802-25	23	—
WRENCH, special (spanner) trunnion block bushing	41-W-3336-800	24	—



RA PD 87641

Figure 20—37-mm Linking Machine M8 (Gun M10 Only)

FOR 37-MM AUTOMATIC GUN M10

Accessory	Piece Mark or Fed. Stock No.	Fig. No.	*Use
HAMMER, machs., ball-peen, 8 oz.	41-H-521		—
MACHINE, linking, 37-mm, M8	—	20	Rapid loading of ammunition into metallic links.
PIN, stght., S., drill rod, 0.102 x 2½ in. (drift)	42-P-11888-70		Used as drift for removing firing pin stop pin.
PLIERS, side-cutt., fl-nose., length over-all 8 in.	41-P-1977		—
PUNCH, drive pin, standard, diam. of point $\frac{3}{32}$ in., over-all length 4 in.	41-P-3601		—
REAMER, carb-S., hand, stght-shank., stght-flutes., diam. 0.1100 in.	41-R-780	21	—
SCREWDRIVER, comm., normal duty, sgle-grip, length of blade 6 in., width of blade $\frac{7}{16}$ in.	41-S-1104		—
SCREWDRIVER, special, sgle-end., sq-body., width of blade 0.0438 in., length 8½ in.	41-S-1653	22	—
STONE, sharpening, comb. one-face—coarse, other face—fine, mounted, thickness ⅝ in., width 1¾ in., length 4 in.	41-S-5315		—

*Where the accessory's use is not indicated, the nomenclature is self-explanatory or the accessory has general use.

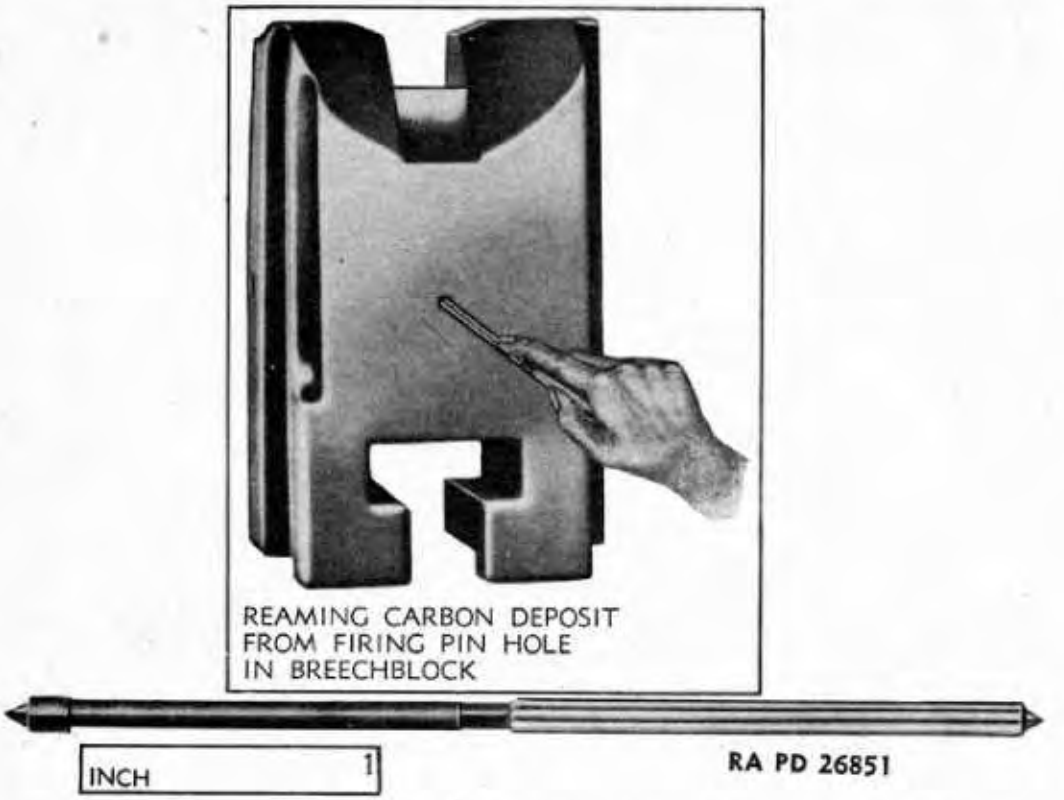


Figure 21—Straight Shank Carbon Steel Reamer 41-R-780

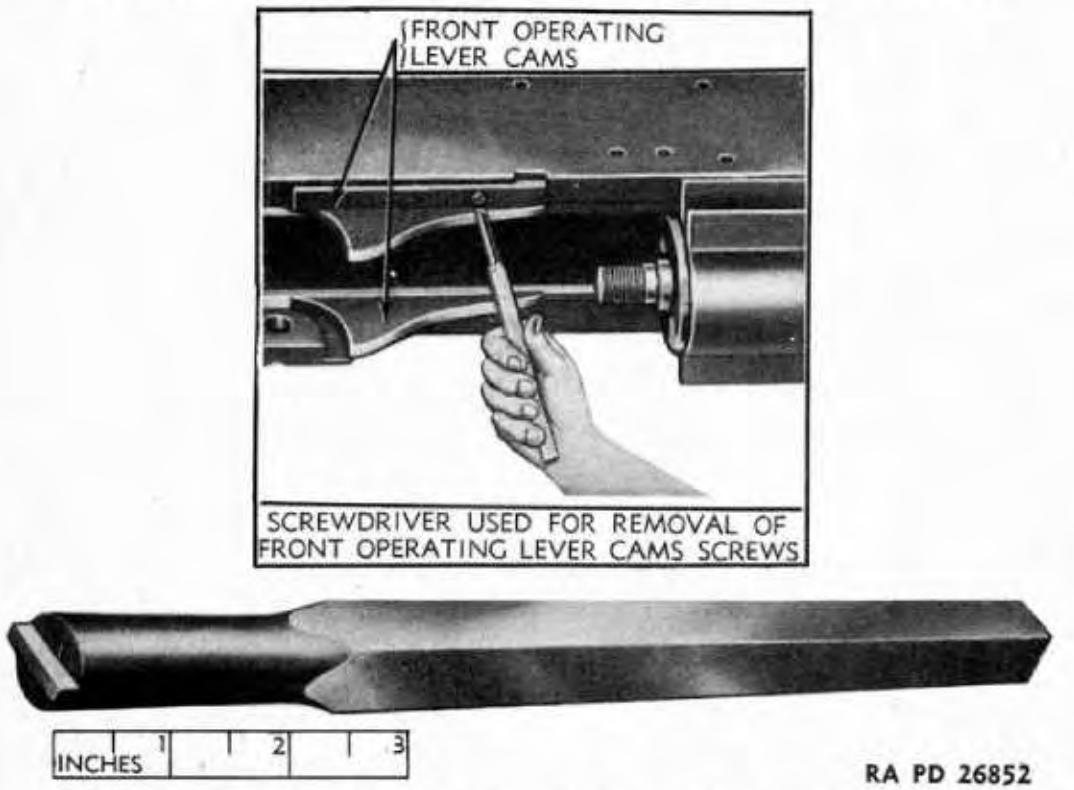


Figure 22—Special Single-end Screwdriver 41-S-1653

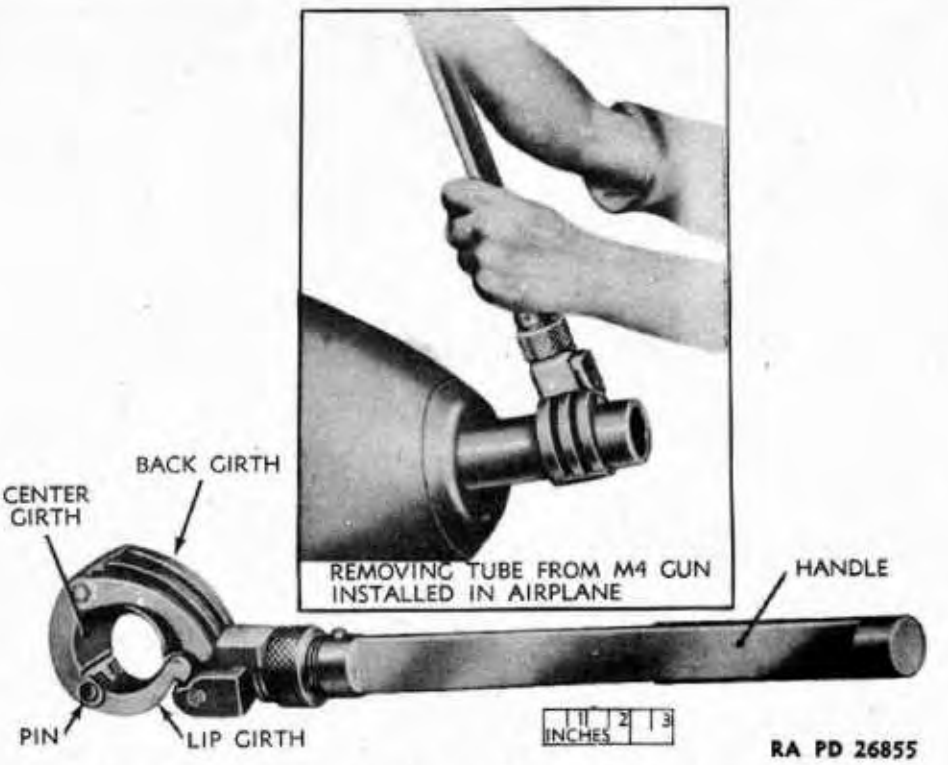


Figure 23—Girth Pipe Wrench 41-W-1802-25 (Gun AN-M4 Only)

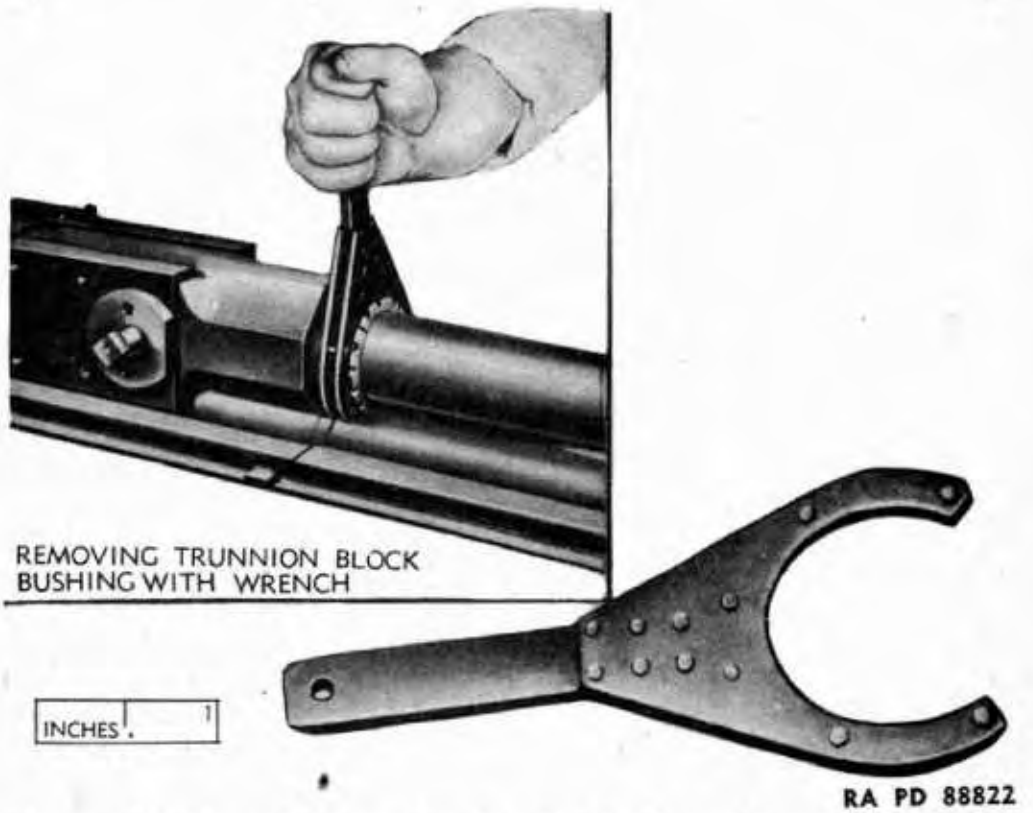


Figure 24—Special Trunnion Block Bushing (Spanner) Wrench 41-W-3336-800 (Gun AN-M4 Only)

b. Instructions as to Use of 37-mm Linking Machine M8. The linking machine (fig. 20) is used for rapid loading of ammunition into metallic links for use with the Gun M10. It may be screwed to a bench, ammunition box, or other suitable support when in use, screw holes being provided in its base for this purpose. To operate, first place the links on the body of the machine, open ends up, single loop to the left. Then slide the single loops between the double loops. Next place the ammunition in the cartridge guide with the base against the cartridge stop and the projectiles in the link openings. Be sure to position the groove of the rotating band on the projectile in the locating projection on the front side of the single loop. With the links and projectiles in their proper position, pull the loading handle assembly forward. This moves the pusher assembly forward and down until the brass plate on the pusher assembly comes in contact with projectiles directly over links. Continue forward movement of loading handle assembly until ammunition snaps into the links.

Section XII
LUBRICATION

32. LUBRICATION ORDER.

a. Reproductions of War Department Lubrication Order LO 9-240 (fig. 25) prescribe first and second echelon lubrication maintenance.

b. A War Department Lubrication Order is placed on or issued with each item of materiel and is to remain with it at all times. In the event the materiel is received without a War Department Lubrication Order, a replacement will be requisitioned in conformance with instructions and lists in FM 21-6.

33. LUBRICATION UNDER NORMAL CONDITIONS.

a. Clean with rifle-bore cleaner after firing and on 3 consecutive days thereafter. After the fourth cleaning, carefully wipe out all traces of rifle-bore cleaner and coat the bore with preservative lubricating oil (special). Wipe dry and relubricate every 5 days between firings.

b. Clean and lubricate the following points with preservative lubricating oil (special) daily or before and after firing:
Breech mechanism
Firing mechanism
Movable parts of the loading and firing mechanisms
Exposed unpainted metal parts

34. INTERVALS.

a. Lubrication intervals should be reduced whenever the daily inspection reveals evidence of the formation of rust. It will usually

WAR DEPARTMENT LUBRICATION ORDER **LO 9-240**
25 JANUARY 1945

GUN, AUTOMATIC, 37-MM, AN-M4, M9, M10

BREECH & FIRING MECH.—Daily and after firing, clean with CR, dry, recoil with PS. In humid and salt air areas use PM above 32°F.

BORE—Immediately after firing, and on 3 consecutive days thereafter, clean with CR, dry, recoil with PS. In humid and salt areas use PM above 32°F. When gun is not being fired, renew oil film every 5 days.

RECUPERATOR—Check daily or before firing. Use RL at all temperatures.

PS-OIL, lubricating, preservative, special
PM-OIL, lubricating, preservative, medium
RL-OIL, recoil, light
CR-CLEANER, rifle bore

For additional WDLO's see FM 21-6

[A.G. 300.8 (25 Jan. 1945)]
By Order of the Secretary of War:
G. C. MARSHALL, Chief of Staff.
Official:
J. A. ULIO, Major General,
The Adjutant General.

RA PD 95391

Figure 25—Lubrication Order LO 9-240

be necessary to reduce the intervals when operating in areas characterized by high temperatures, dust and sand in the atmosphere, or high humidity.

35. METHODS.

a. Cleaning.

(1) Use dry-cleaning solvent or rifle-bore cleaner to clean or wash all metal parts whenever partial or total disassembly is undertaken or when renewing the preventive lubricant film on exposed metal surfaces. Use of gasoline for cleaning is prohibited. Dry all parts thoroughly before lubricating.

(2) Care must be taken when cleaning internal mechanisms to insure the complete removal of all lint, residue, and sediment. Necessary wiping should be done with a piece of firm lintless cloth. Grit must be kept out of the lubricant and lubricating openings.

b. Oiling. Oil should be applied while the parts are being operated by hand to insure proper distribution of lubricant to all moving parts. Because of the extremely low temperatures prevailing at high altitudes, apply only a thin film of lubricant before flights. At other times, apply lubricant freely but avoid excessive and wasteful practices. Excessive lubrication will result in dust accumulations on some moving parts and cause wear and malfunctioning.

36. LUBRICATION UNDER UNUSUAL CONDITIONS.

a. Substitute preservative lubricating oil (medium) for preservative lubricating oil (special) for the following conditions:

(1) Salt air areas.

(2) Extremely high humidity or other excessively moist conditions.

Section XIII

PREVENTIVE MAINTENANCE SERVICE

37. GENERAL.

a. Preventive maintenance services prescribed by Army Regulations are a function of using organization echelons of maintenance. This section contains preventive maintenance service allocated to squad and scheduled preventive maintenance service allocated to (2nd echelon) organizational maintenance. Also paragraph 38 in this section contains important general preventive maintenance procedures.

38. COMMON PROCEDURES.

a. The following general preventive maintenance will be observed in addition to that referred to in the schedules below:

(1) Rust, dirt, grit, gummed oil, and water cause rapid deterioration of internal mechanisms and outer unpainted surfaces. At time of disassembly, the gun parts should be thoroughly cleaned and inspected for wear, scoring, cracks, burs, carbon, pitting, and rust. Bearing surfaces, latches, and their movable parts should be clean, free from rust and other foreign matter, and well lubricated.

(2) Parts, such as the recuperator cylinder end caps, stuffing box, and filler screws, should be inspected to see that no oil leaks exist at these points.

(3) Avoid getting dry-cleaning solvent or Diesel fuel oil on electric wires, as petroleum products are extremely injurious to rubber.

(4) Wash rubber parts and equipment with soap solution (¼ pound of soap chips to a gallon of water) or with water alone.

(5) Loose parts will be kept tightened; broken parts replaced; paint in good condition, etc.

39. PREVENTIVE MAINTENANCE SCHEDULE.

a. The items or points to be inspected and serviced at scheduled times are listed below with cross references to pertinent instructions covered in other sections.

b. Pre-flight.

Point	Preventive Maintenance	Detailed instructions
Bore	Clean and dry with burlap or wiping cloths.	
Operating mechanisms	Test functioning.	Paragraph 56 a (1)
Solenoid	Test functioning.	Paragraph 68 c
Recuperator	Check oil level.	Paragraph 66 b
	Fill.	Paragraph 66 a

c. After Firing.

Bore	Clean and oil.	LO 9-240
Breech and firing mechanism	Clean and oil.	LO 9-240
Recuperator	Fill.	Paragraph 66 a

d. Daily.

Bore	Clean and oil.	Paragraph 63 a
Breech and firing mechanism	Clean and oil.	LO 9-240

Section XIV

MALFUNCTIONS AND CORRECTIONS

40. MISFIRE.

a. If the gun is not accessible, all stoppages will be considered misfires. The following procedure will be observed immediately after the occurrence of a misfire.

(1) AIR TESTING. If the weapon can be recharged, either manually or remotely, wait 30 seconds and then recharge. If the weapon cannot be recharged, no corrective action is possible.

(2) GROUND TESTING. If firing is being done on the ground, wait 30 seconds from the time of occurrence of the misfire. Recharge the gun and remove the round from the vicinity of the aircraft. Proceed to determine the cause of the malfunction or stoppage and to apply the correction prescribed by referring to the following paragraphs.

CAUTION: *If the gun is hot and the round cannot be removed from the chamber, the breechblock should be closed. It should not be opened until the hand can be placed on the breech or tube without discomfort.*

41. FAILURE TO FIRE.

a. Examine the extracted round. If there is an indentation on the primer, the round is defective and the responsible ordnance officer

should be notified. If there is no indentation on the primer, proceed as follows:

(1) Check whether or not the trigger is engaged with the trigger bar. If not, assemble properly. If the trigger or trigger bar is broken, it must be replaced.

(2) Disassemble the gun far enough to check for broken firing pin, hammer or hammer spring, warped or broken trigger trip, trigger lever, or trigger lever connector. Replace broken or worn parts.

42. FAILURE OF TUBE EXTENSION TO RETURN COMPLETELY TO BATTERY POSITION.

a. Failure of the tube and tube extension to return to battery position is usually due to jamming in the feed box mechanism, and excessive friction caused by dirt, foreign matter, gummy lubricant, and scored bearing surfaces.

b. Check the feed box mechanism to determine the point of jamming and remove the cause. Stone the scored bearing surfaces with a fine oilstone, clean with dry-cleaning solvent or rifle-bore cleaner, and lubricate. If these corrective measures do not remedy the malfunction, it is probably caused by a weak or broken recuperator spring, and ordnance maintenance personnel should be notified.

43. FAILURE OF LOCK FRAME TO BE HELD TO REAR (MOVES FORWARD WITH TUBE EXTENSION WITHOUT LOADING).

a. This may be due to insufficient recoil or defective parts of the weapon.

b. Stone scored bearing surfaces, clean with dry-cleaning solvent to remove all dirt and gummy lubricant, and then lubricate. Drain the recuperator and refill with proper oil (par. 66 a).

c. Check the driving spring assemblies for free movement. Clean and lubricate. Disassemble and replace any damaged parts.

d. Disassemble the weapon far enough to check for broken carrier, carrier catch, and carrier dog, and weak or broken carrier spring and carrier catch spring. Replace worn or broken parts.

44. FAILURE OF BREECHBLOCK TO MOVE COMPLETELY INTO BATTERY.

a. Failure of the breechblock to move completely into battery may be due to excessive friction, breechblock plunger adjustment too tight, weak or broken driving springs, damaged driving spring housing or rod, and weak or broken operating lever spring.

b. Stone rough spots on breechblock and lock frame with a fine

oilstone, clean with dry-cleaning solvent or rifle-bore cleaner to remove dirt, gummy lubricant, and foreign matter, and then lubricate.

c. Check the effect of the breechblock plunger upon the movement of the breechblock. If the breechblock plunger screw is too tight, the breechblock plunger will hinder the breechblock from moving completely into battery. If the screw is adjusted too tight, adjust it so that the breechblock can move completely into battery and then stake the screw in place.

d. Disassemble the driving spring assemblies and check whether any springs are weak or broken, housing bent or dented, and rod bent or burred. Replace damaged parts. Place front end of driving spring assembly in dry-cleaning solvent or rifle-bore cleaner and thoroughly flush by operating the rod as a pump. Dry and lubricate lightly.

e. Remove the lock frame assembly and check whether the operating lever spring is weak or broken. The compressed operating lever spring assists the operating lever in lifting the breechblock into battery. Replace the spring if weak or broken.

45. FAILURE TO FEED (CARRY CARTRIDGE INTO POSITION TO LOAD).

a. Failure to feed (carry cartridge into position to load) may be due to improper belting of ammunition or defective parts in feed mechanism.

b. Remove ammunition belt and examine for stretched links and for proper positioning of rounds. Position cartridges properly and replace unserviceable links.

c. Check the feed mechanism for the following:

(1) Worn or broken feed pawl; weak or broken feed pawl spring.

(2) Binding of cartridge feeder stop or holding pawl; worn or broken pawls; weak or broken feeder pawl spring.

(3) Broken or bent feed lever; broken or bent feed lever swivel.

(4) Weak or broken feed lever plunger spring.

(5) Weak carrier spring.

d. Replace worn or broken parts.

46. FAILURE TO LOAD (CARRY CARTRIDGE INTO CHAMBER).

a. Lock frame not held to rear. Proceed as in paragraph 43.

47. FAILURE TO EXTRACT.

a. Failure to extract may be due to scored chamber, too fast recoil, short recoil, or defective parts.

b. If the chamber is scored, replace with a new tube.

c. Insufficient oil in recuperator cylinder will produce recoil at such high speed that the cartridge case will be torn (or extractor broken). Check oil level in recuperator and fill to proper level (par. 66 a). If necessary, replace the extractor and extractor spring.

d. If recoil is short, proceed as in paragraph 43.

48. RUN-AWAY GUN.

a. A run-away gun may be due to malfunctioning of the trigger mechanism caused by bent or jammed trigger bar, dirt, grit, or gummy lubricant around the trigger bar. Disassemble the gun; clean and lubricate the trigger bar. Replace trigger bar if unserviceable.

49. SLOW-FIRING GUN.

a. A slow-firing gun may be due to excessive friction, slow recoil, or slow counterrecoil.

b. Disassemble the gun and clean all parts with dry-cleaning solvent to remove dirt, grit, and gummy lubricant. Stone scored bearing surfaces with a fine oilstone. Oil lightly at assembly.

c. If recoil is slow, drain the recuperator and refill with proper oil (par. 66 a).

d. If counterrecoil is slow, disassemble feed box mechanism and check for scored or worn parts and improper lubrication. Stone scored parts with a fine oilstone. Replace worn parts, clean, and oil lightly at assembly. See that driving springs are not unhooked; replace weak or broken driving springs.

e. If recuperator spring is weak, notify ordnance maintenance personnel.

Section XV

BACK PLATE ASSEMBLY

50. FUNCTIONING.

a. The function of the back plate assembly is to absorb the force of recoil of the lock frame not absorbed by the driving springs. The recoil force is absorbed by the resistance of friction pieces and springs.

b. As the lock frame of the Gun AN-M4 nears the end of its rearward travel during recoil, the rear of the lock frame body strikes the buffer plunger (fig. 26). The plunger forces the two buffer friction pieces to compress the buffer springs (fig. 26).

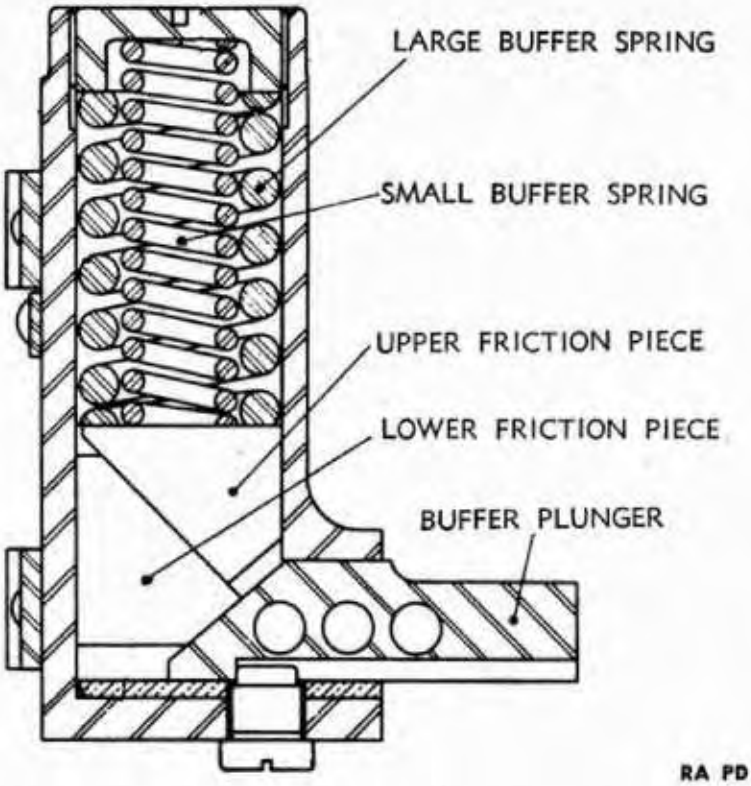


Figure 26—Back Plate (Gun AN-M4)—Cross Section

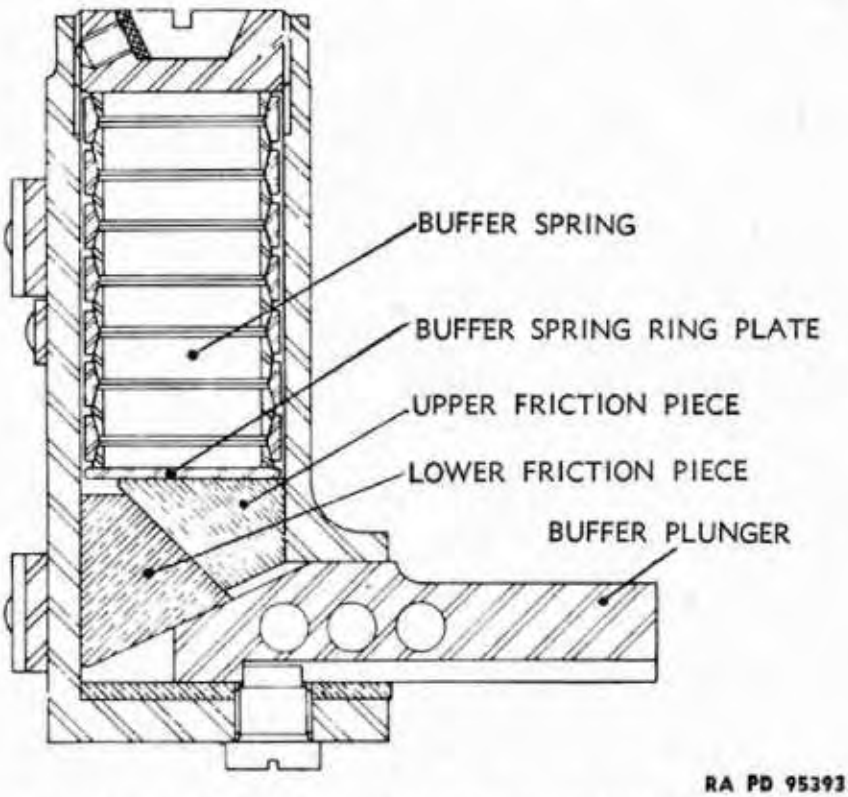


Figure 27—Back Plate (Gun M10)—Cross Section

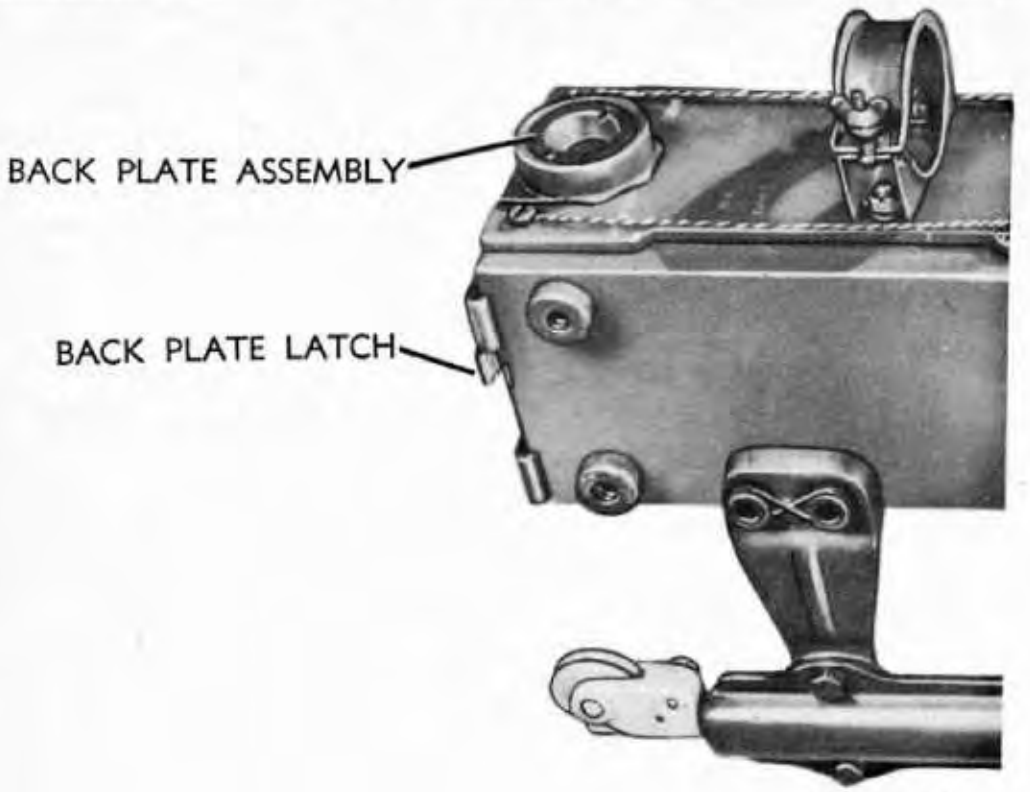


Figure 28—Removal of Back Plate Assembly

c. As the lock frame of the Gun M10 nears the end of its rearward travel during recoil, the rear of the lock frame strikes the buffer plunger (fig. 27). The plunger forces the two buffer friction pieces to compress the buffer spring (fig. 27).

51. REMOVAL AND REPLACEMENT (fig. 28).

a. To remove, pull out slightly on the back plate latch and slide back plate assembly downward.

b. To replace, slide back plate assembly upward and engage latch.

52. MAINTENANCE.

a. Remove back plate and see that the latch works properly. The buffer plunger stop screw should be securely tightened and staked so that the parts will not vibrate loose during firing. Tighten plunger stop screw and stake in place.

b. Remove all burs and rough spots from sliding surfaces.

c. If back plate assembly is damaged or does not latch properly, it must be replaced. The back plate will not be disassembled by the using arm.

Section XVI

BREECH OPERATING MECHANISM

53. FUNCTIONING.

a. General. For purposes of explanation, the functioning of the breech operating mechanism is divided into the stages given below.

b. Cocking and Loading.

(1) When the manual charger is operated by pulling the cable, the shoe of the manual charger contacts the pin on the operating lever of the lock frame and causes the lever to rotate. This cams the hammer rearward beyond the latching hook of the sear, thus permitting the firing pin spring to retract the firing pin. The breechblock is lowered until it rests against its stop (fig. 29) at the bottom of the tube extension. The rotation of the operating lever also forces the strut back against the follower, thus compressing the operating lever spring located in the body of the lock frame. When the lever is completely rotated, the lock frame continues rearward, compressing the driving springs. The lock frame continues rearward until it passes under and raises the carrier dog and contacts the plunger of the back plate. In Gun M10 the carrier dog, when raised, contacts the interlock body, lifting the body and plate, thus positioning the interlock lever to permit operation of the loading slide. With the release of the charger cable, the lock frame moves forward until the carrier dog engages the notch in the top of the lock frame.

(2) When the loading slide is pulled rearward, the initial round is fed into the gun. This actuates the feed box mechanism, which strips the round from the belt. Just before the cartridge is stripped from the links, it contacts the carrier catch, moving it sufficiently to release the carrier. This allows the carrier to snap downward under force of the carrier spring. As the front end of the carrier pushes the cartridge downward, the carrier dog releases the lock frame. The cartridge rests on the ejector (fig. 30).

(3) As the lock frame goes toward battery under force of the driving springs, the charger (assisted by the extractor) forces the round into the cartridge chamber (fig. 31). The lug on the front end of the operating lever enters the T-slot in the lower end of the breechblock (fig. 32), while the short guide pin of the operating lever comes in contact with the rear surface of the front operating lever cams. This rotates the operating lever which raises the breechblock toward battery position. The compressed operating lever spring, acting on the rear end of the strut, assists in completing this movement. The final chambering of the round is completed by the wedging action brought about by the inclined lands in conjunction with the beveled surface on the front upper face of the breechblock as it slides up

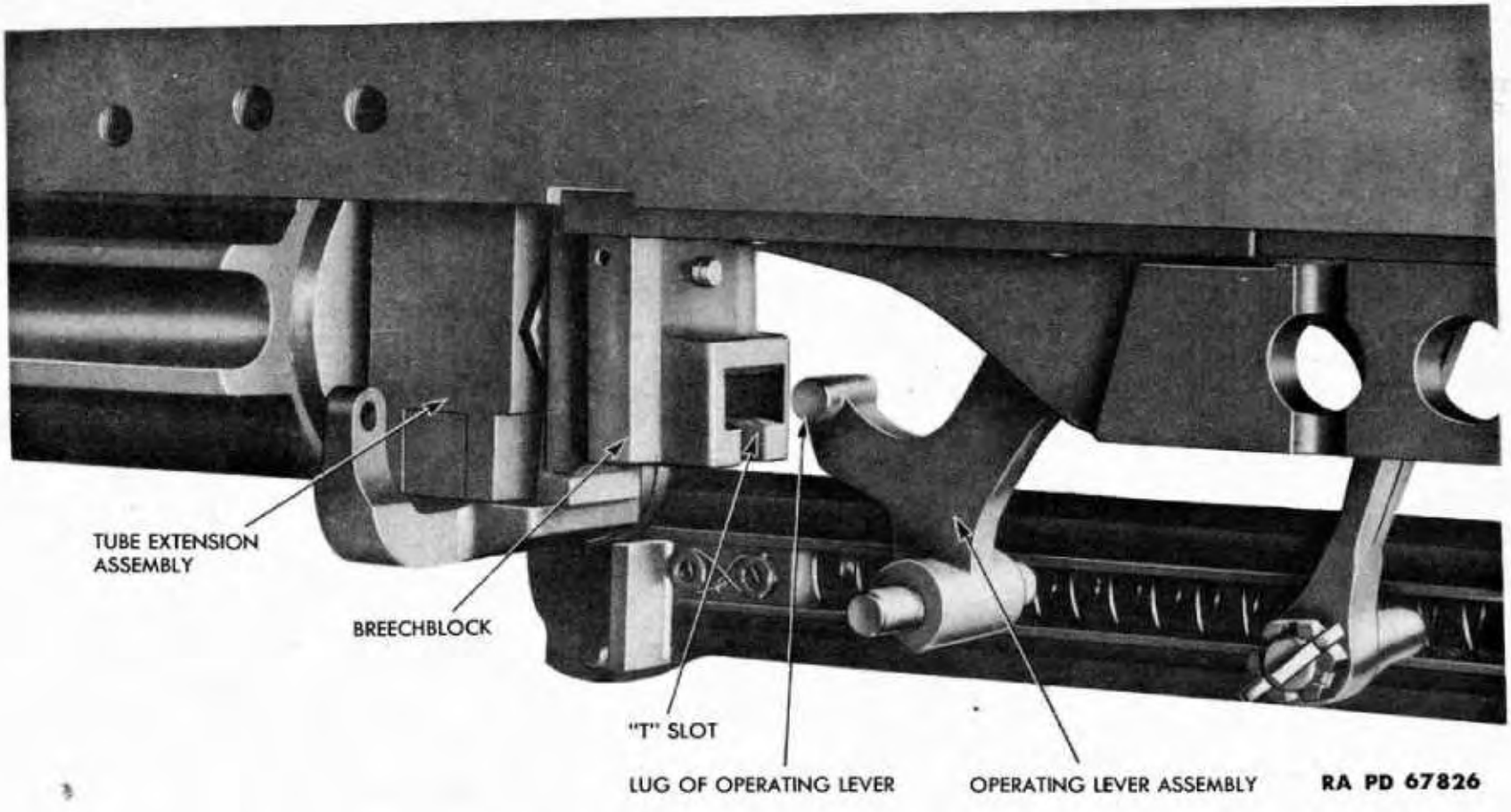


Figure 29—Breechblock Down, Resting Against Stop

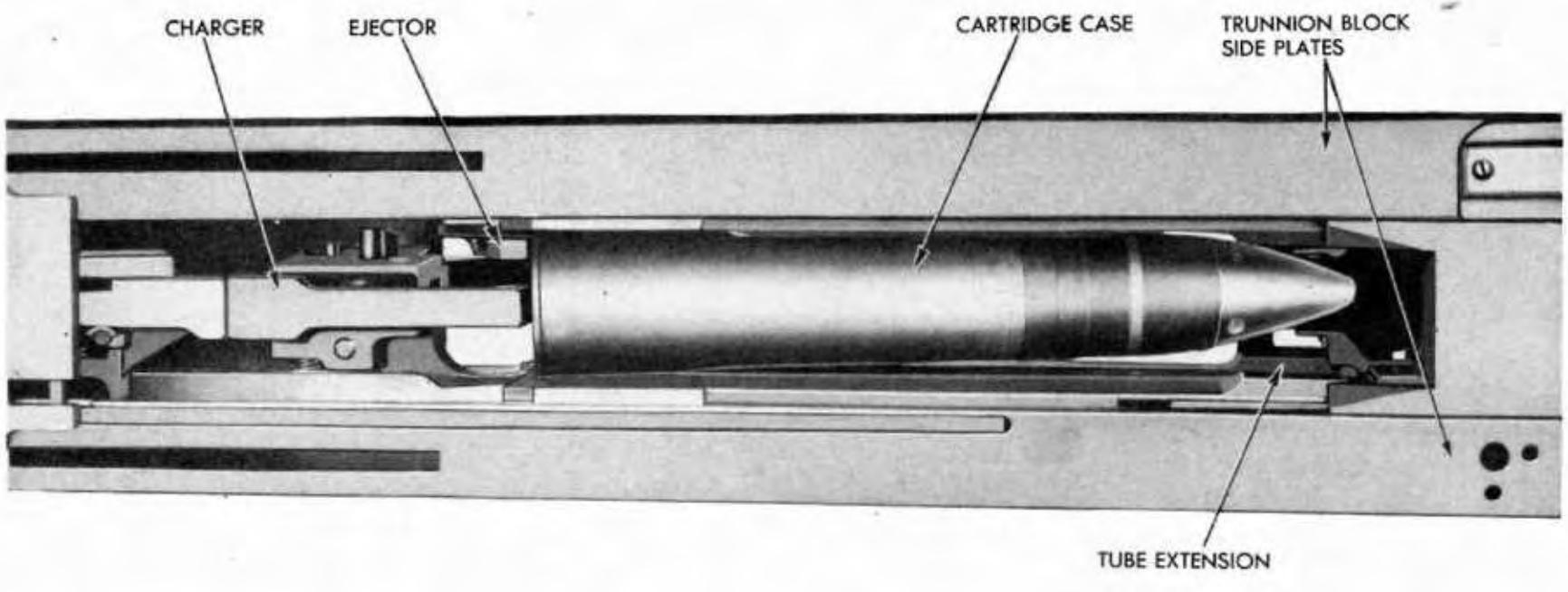


Figure 30—Lock Frame in Rear Position—Round Resting on Ejector

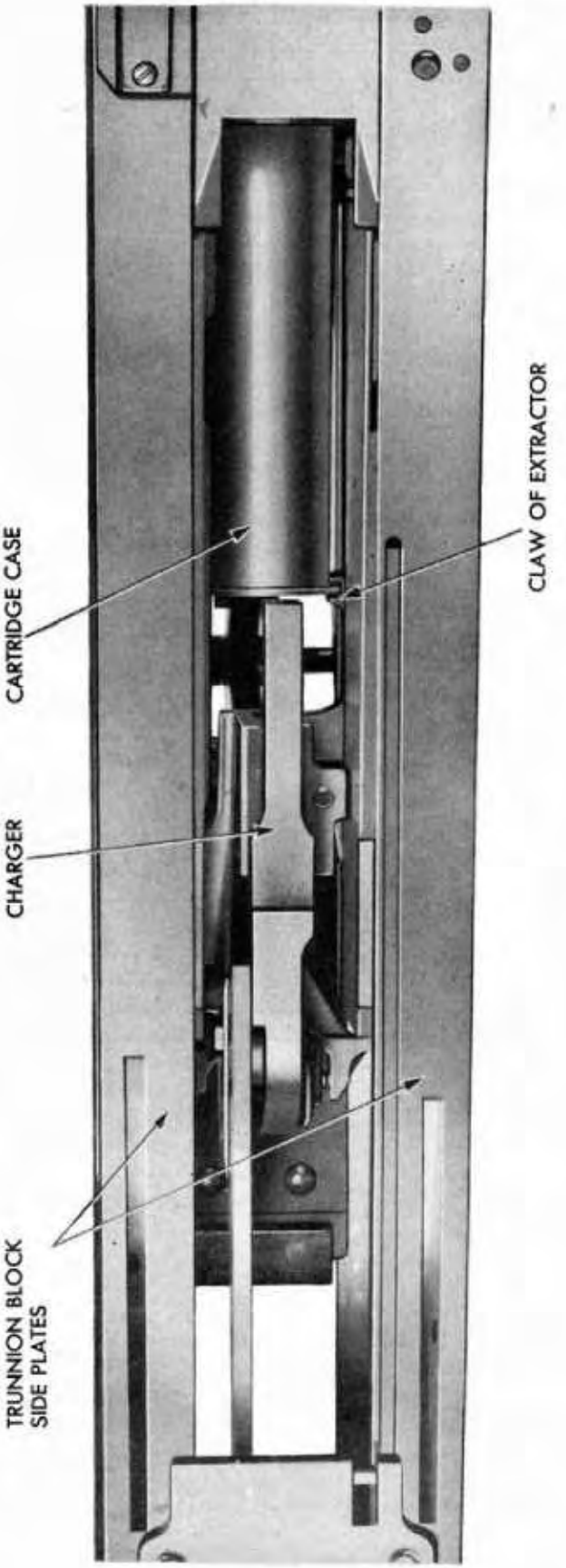


Figure 31—Lock Frame Assembly Moving Forward—Round Held in Claw of Extractor

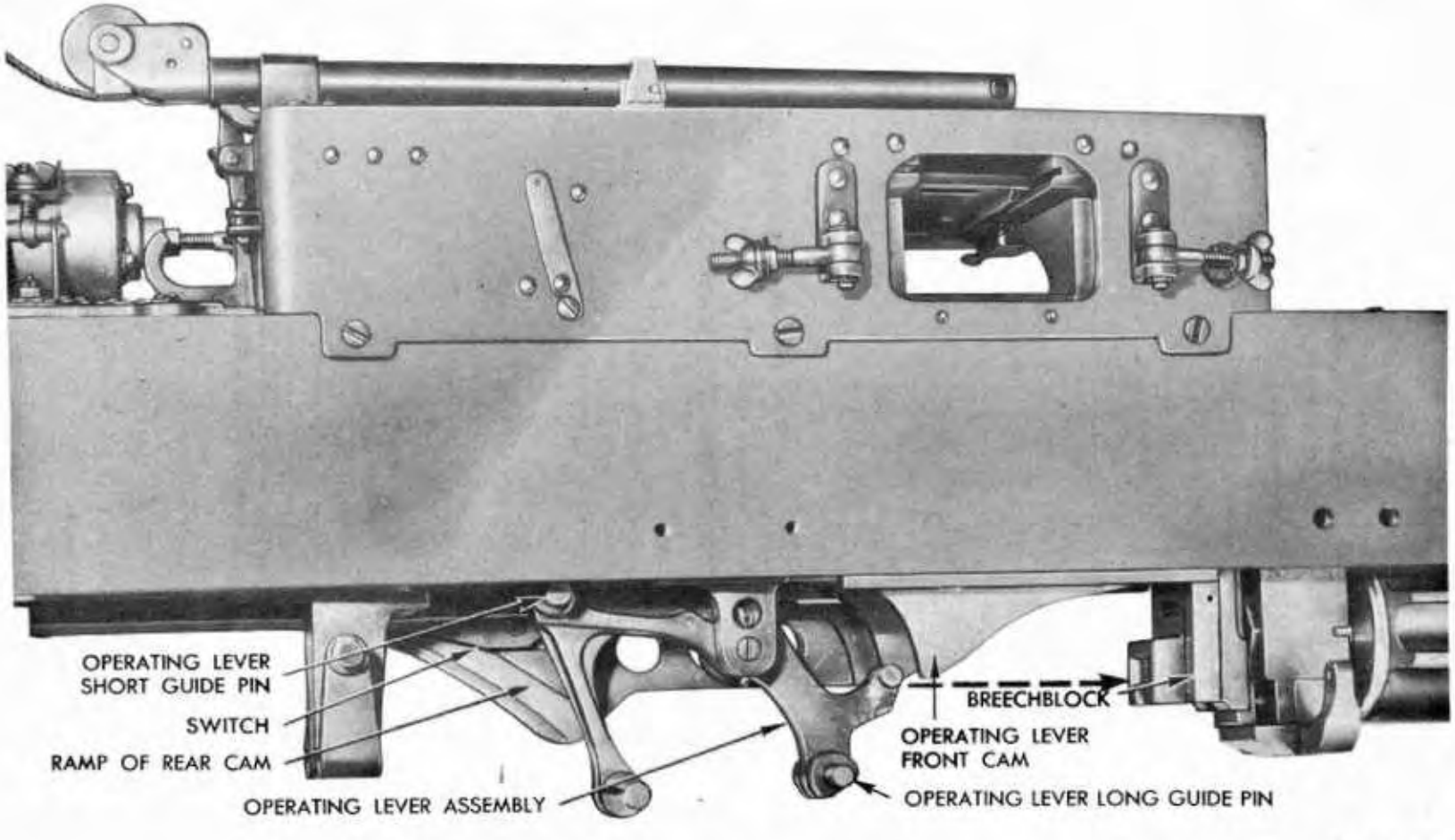


Figure 32—Operating Lever and Cams

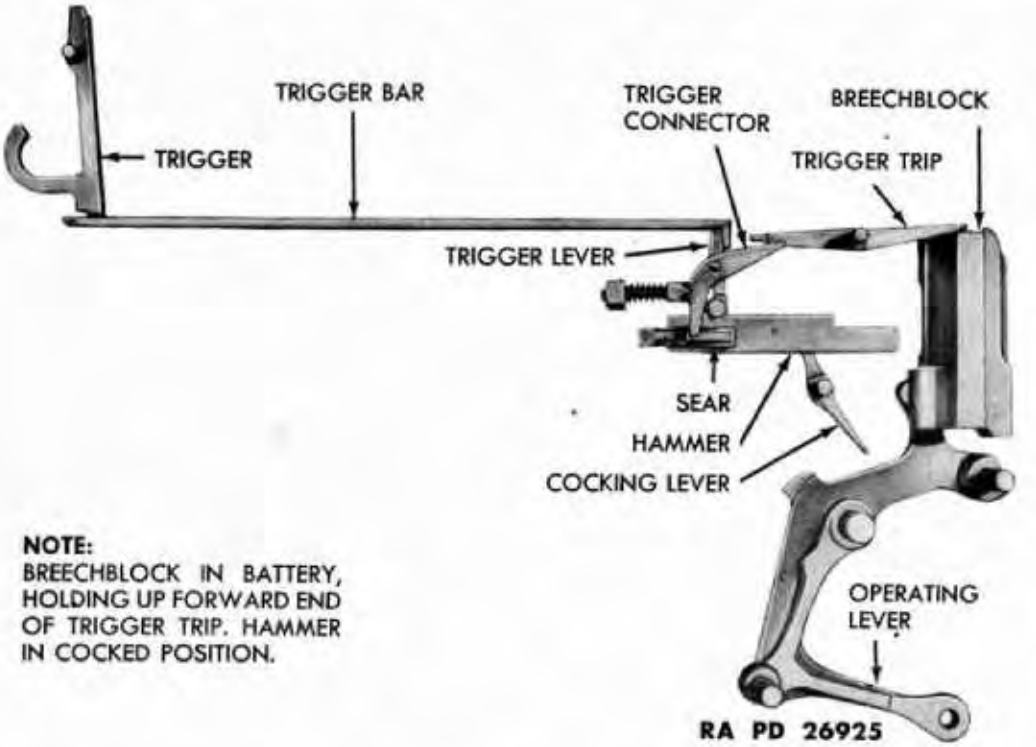


Figure 33—Trigger Mechanism, Manual Fire—Ready To Fire

behind the cartridge. During final chambering, the extractor is cammed away from the rim of the cartridge by a cam surface on the side of the right-inclined land of the breechblock. The gun is now ready to fire when the trigger is pulled.

c. Trigger Action.

(1) MANUAL FIRE.

(a) As the breechblock moves into battery position, it raises the front end of the trigger trip (fig. 33). The rear end of the trigger trip is held downward to serve as a stop for the front end of the trigger lever connector. The trigger engages the rear end of the trigger bar, while the forward end of the bar hooks over the upper end of the trigger lever. The trigger, trigger bar, trigger lever, and connector are all held in a forward position by the trigger lever spring and plunger.

(b) When the trigger is pulled to fire the initial round (fig. 34), the trigger bar pulls the upper end of the trigger lever rearward, causing it to rotate on the trigger lever pin. Since the front end of the trigger lever connector is held down by the trigger trip, the connector is moved rearward. The rear end of the connector contacts the outer arm of the sear, causing it to rotate out of engagement with the latching hook of the hammer. The hammer is then driven forward by the force of its spring, striking the firing pin to fire the round (fig. 35).

(2) AUTOMATIC FIRE (fig. 36).

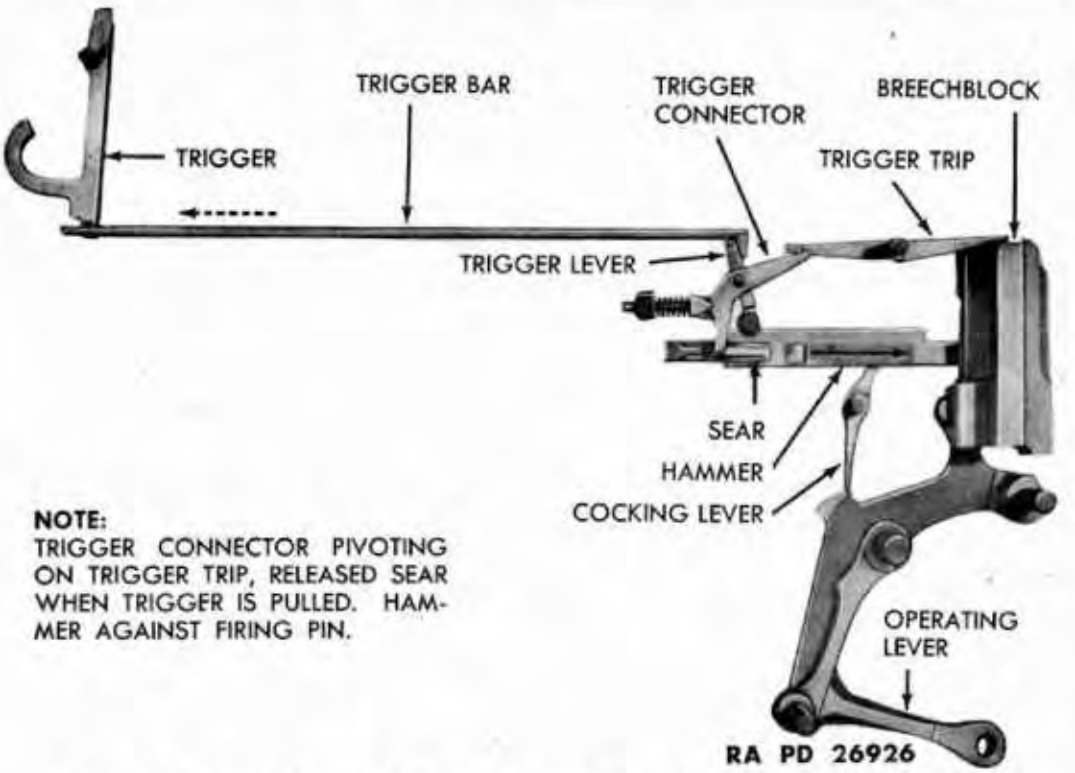


Figure 34—Trigger Mechanism, Manual Fire—Firing Position

(a) If the trigger is held in the firing position, the gun will continue to fire automatically (fig. 37). As the breechblock is lowered, it releases the trigger trip and the front end of the trigger lever connector.

(b) The connector is then rotated out of contact with the sear by the force of the trigger lever spring and plunger (fig. 38). When the breechblock returns to battery position, it pivots the trigger trip which, in turn, rotates the connector, so that the rear end of the connector again contacts the sear to release the hammer and fire the next round (fig. 39).

d. Recoil Action (fig. 40). When the round is fired, the recoiling parts (tube, tube extension, breechblock, lock frame, driving spring assemblies, piston, and piston rod) are all driven to the rear together. All of the recoiling parts remain together during part of the distance of recoil when the breechblock is lowered and the lock frame is separated from the breechblock. The lock frame continues rearward while the other recoiling parts are forced forward by the recuperator action.

e. Breechblock Action (fig. 32). The breechblock is lowered (breech opened) during recoil. The operating lever long guide pin, following the front operating lever cams, causes the operating lever to rotate, bringing the breechblock downward. Rotation of the operating lever during recoil causes a lobe on top of the lever to move

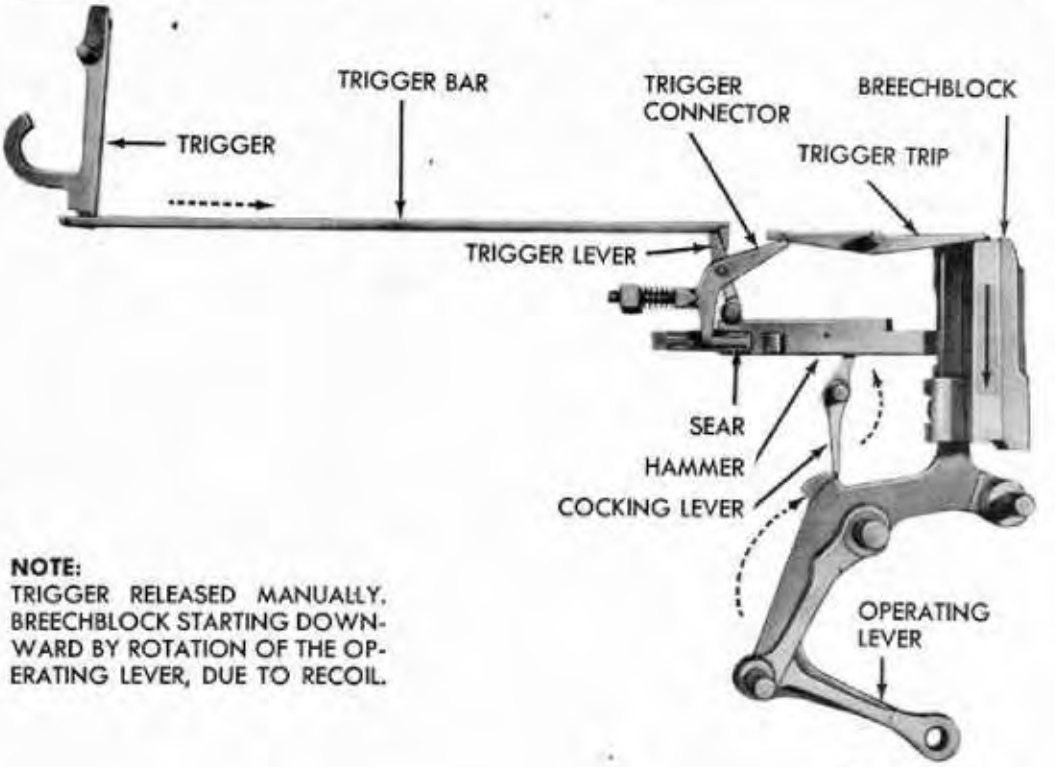


Figure 35—Trigger Mechanism, Manual Fire—Beginning of Recoil

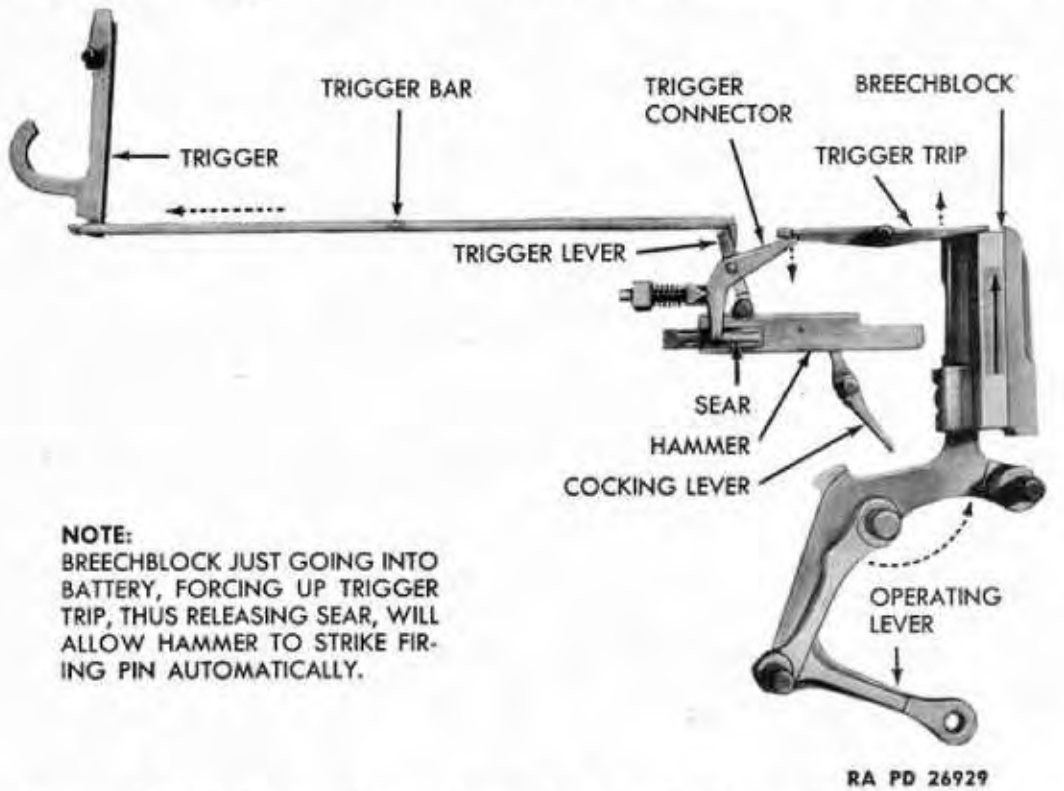


Figure 36—Trigger Mechanism, Automatic Fire—Ready To Fire Automatically

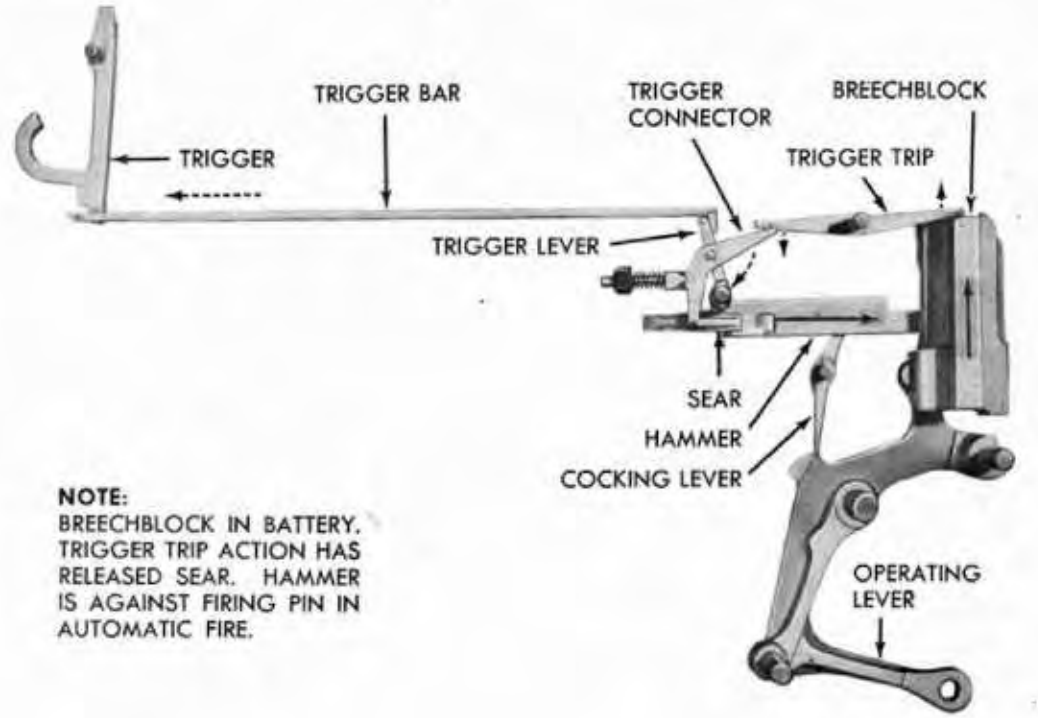


Figure 37—Trigger Mechanism, Automatic Fire—Firing Position

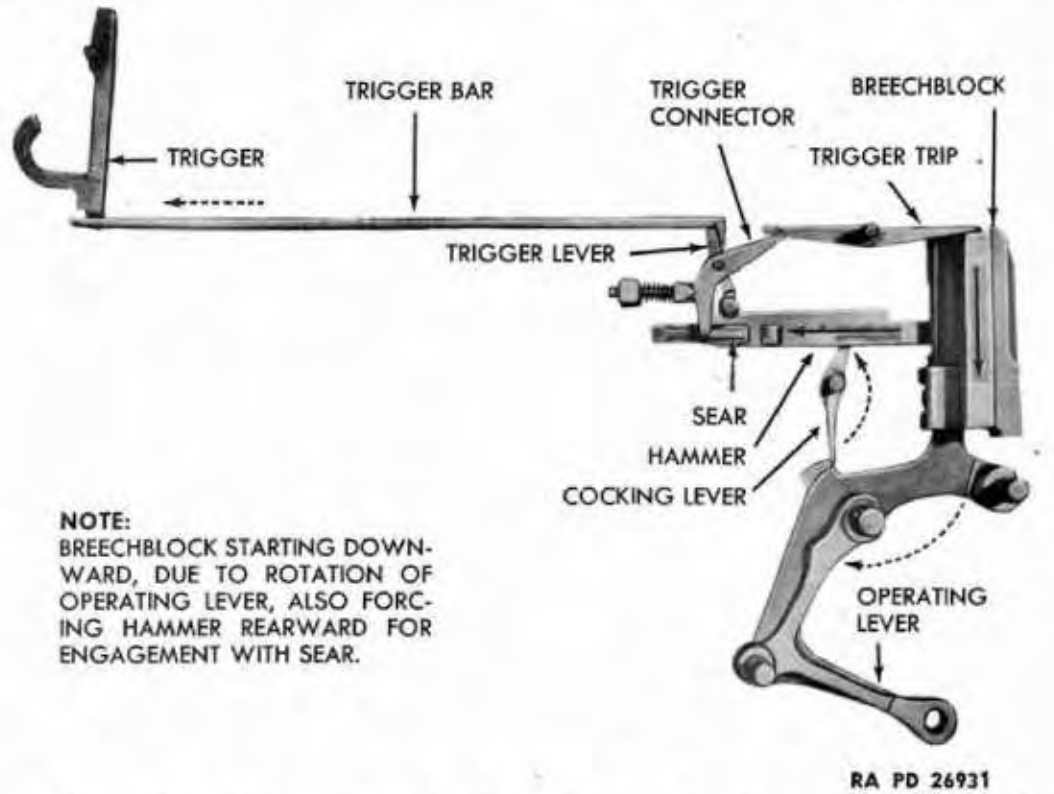
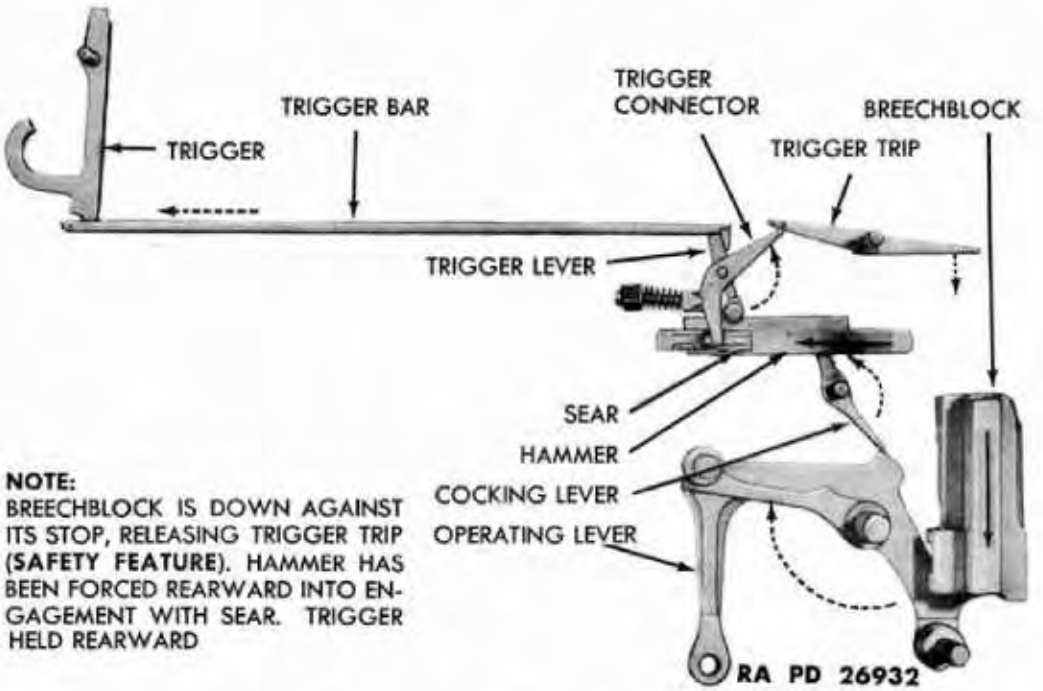


Figure 38—Trigger Mechanism, Automatic Fire—Beginning of Recoil



NOTE:
BREECHBLOCK IS DOWN AGAINST ITS STOP, RELEASING TRIGGER TRIP (**SAFETY FEATURE**). HAMMER HAS BEEN FORCED REARWARD INTO ENGAGEMENT WITH SEAR. TRIGGER HELD REARWARD

Figure 39—Trigger Mechanism, Automatic Fire—Breech in Open Position

the lower end of the cocking lever forward. As the lever pivots in the lock frame, the upper end, operating in a recess in the hammer, cams the hammer to the rear. This movement compresses the hammer spring and forces the latching hook on the hammer past the hooked end of the sear, thus cocking the hammer. When the hammer is cammed rearward, it releases the firing pin, which allows the firing pin spring to retract the pin. The short guide pin enters the ramp of the rear cam and is carried above the switch into the horizontal groove of the rear cam. This completes the downward movement of the breechblock which is now resting against the breechblock stop. As the breechblock moves downward, it releases the trigger trip and the front end of the trigger connector as previously explained in subparagraph **e**, above (fig. 39).

f. Lock Frame Action (fig. 41).

(1) The lock frame assembly is not affected by the retarding action of the recuperator, since it was unlocked from the tube extension by the downward movement of the breechblock. Therefore, as the tube and tube extension near the end of their rearward travel, the lock frame separates from these parts and continues rearward because of its inertia.

(2) The rear of the lock frame body strikes the buffer plunger and the remaining recoil force of the lock frame is transferred to the back plate assembly.

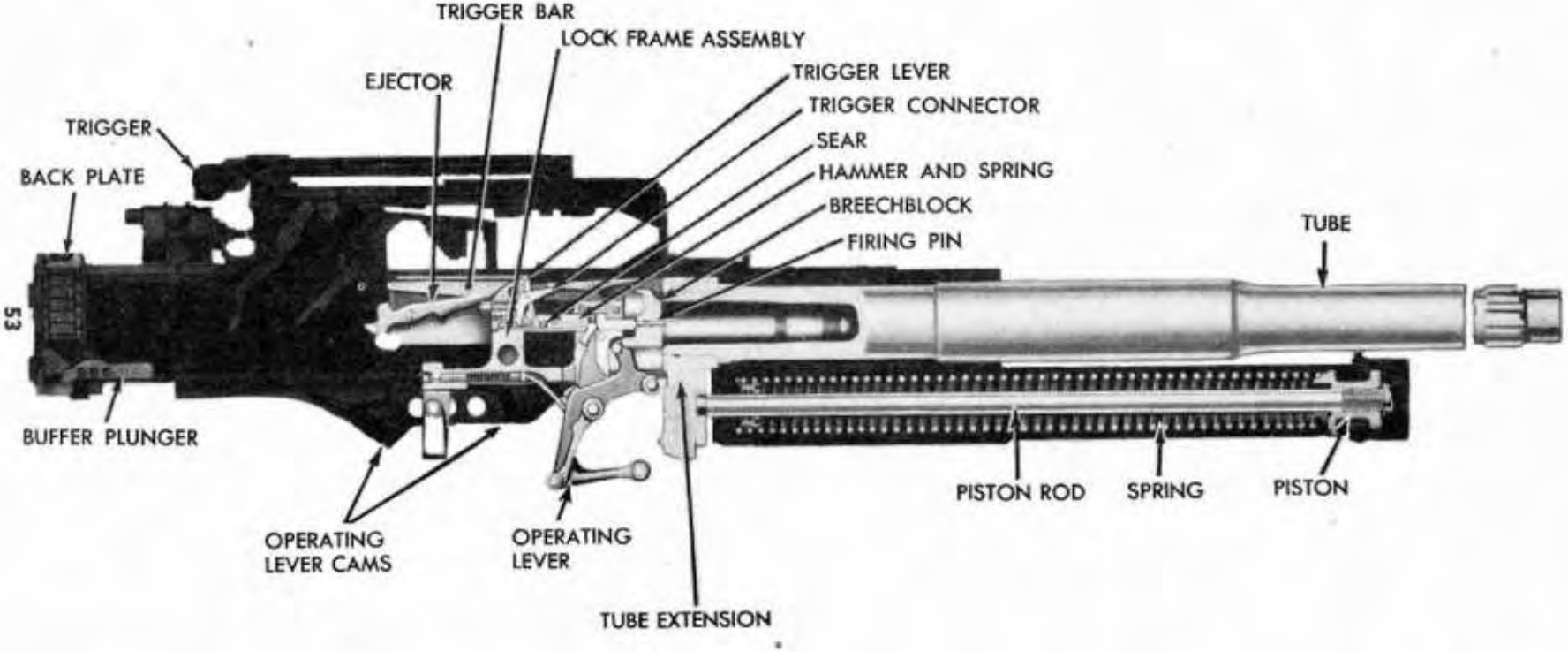


Figure 40—Showing Recoiling and Non-recoiling Components Gun M10—Cross Section

(3) The lock frame is carried forward by action of the driving springs. After traveling a short distance forward, the carrier dog engages the notch in the top of the charger (on the lock frame) holding the lock frame stationary, while the tube and tube extension continue forward toward battery.

g. Extraction and Ejection (figs. 42 and 43).

(1) Initial extraction occurs during the separation of the lock frame from the tube extension. The rim of the cartridge case is engaged by the extractor hook and, as the lock frame assembly separates from the tube extension, the case is partially withdrawn from the cartridge chamber (fig. 42).

(2) When the lock frame is held in its rearward position, and the tube extension has gone forward on counterrecoil to a point where the empty case is entirely extracted from the chamber, the ejector is pivoted downward by a cam on the left side of the lock frame. The front end of the ejector (fig. 43) deflects the empty case downward between the side plates and out of the gun.

h. Driving Spring Action. The driving spring assemblies are used to drive the lock frame assembly to battery position. As the tube extension travels forward on counterrecoil, the driving spring housings are also carried forward. The rods are connected to the lock frame (fig. 41) which is held back by the carrier dog; therefore, the four driving springs are compressed. These compressed springs act on the driving spring rods to force the lock frame assembly forward into battery position when it is released by the carrier dog.

54. REMOVAL AND REPLACEMENT.

a. Removal of Lock Frame Assembly.

(1) Make sure that lock frame is in the battery position.

(2) Remove the back plate assembly as described in paragraph 51.

(3) Disconnect the driving spring assembly from the lock frame by lifting the driving spring rod hook safety and rotating it downward. Pivot the driving spring rod hook down off the lock frame stud (fig. 44).

(4) Rotate the operating lever and remove the lock frame from the gun by sliding it rearward until it clears the side plates. CAUTION: *Keep a firm grip on the lock frame and on the operating lever, in order to prevent the operating lever from springing forward and injuring the operator* (fig. 45).

(5) Ease the operating lever into the forward position (fig. 46).

b. Replacement of Lock Frame Assembly.

(1) Release the carrier catch.

(2) Rotate the operating lever to the rear. Engage the grooves

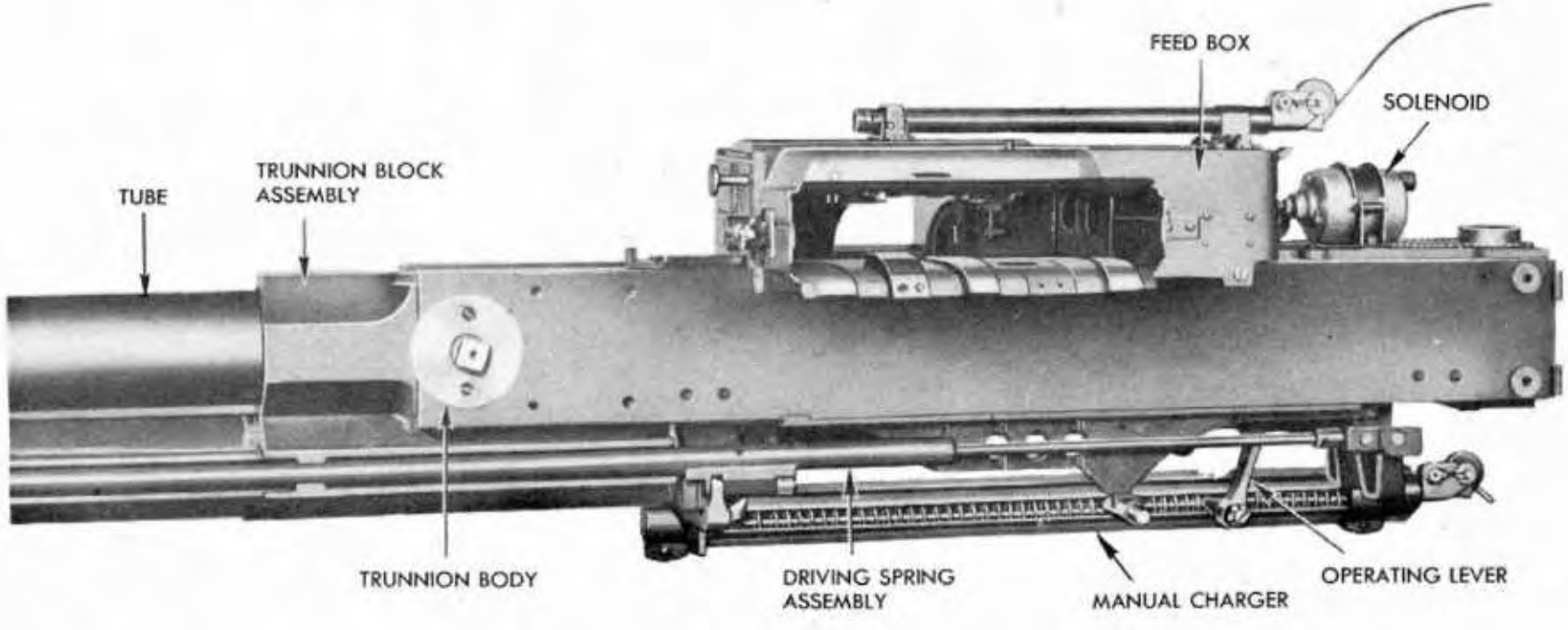


Figure 41—Lock Frame Retracted (Gun M10)

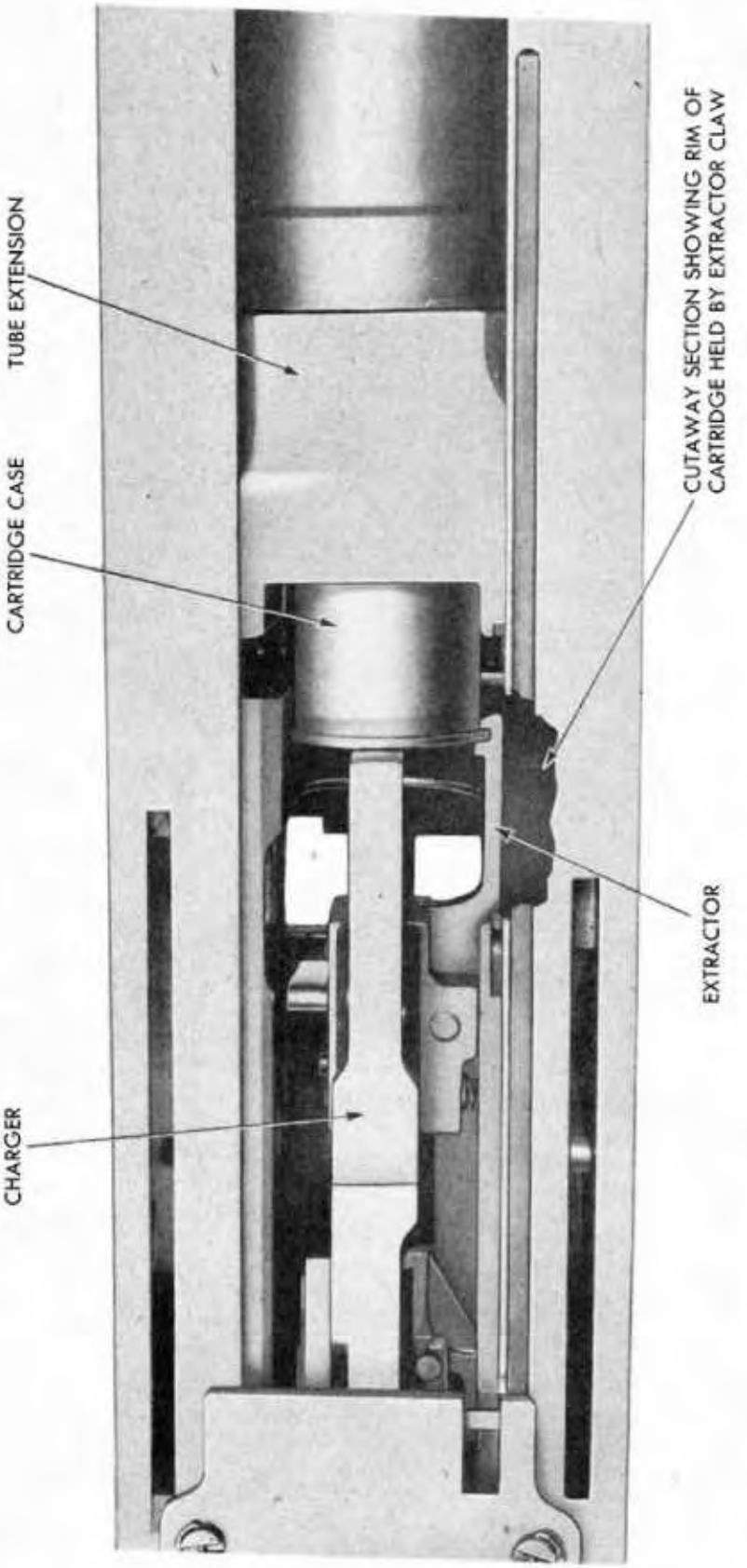


Figure 42—Initial Extraction Taking Place During Separation of Lock Frame From Tube Extension

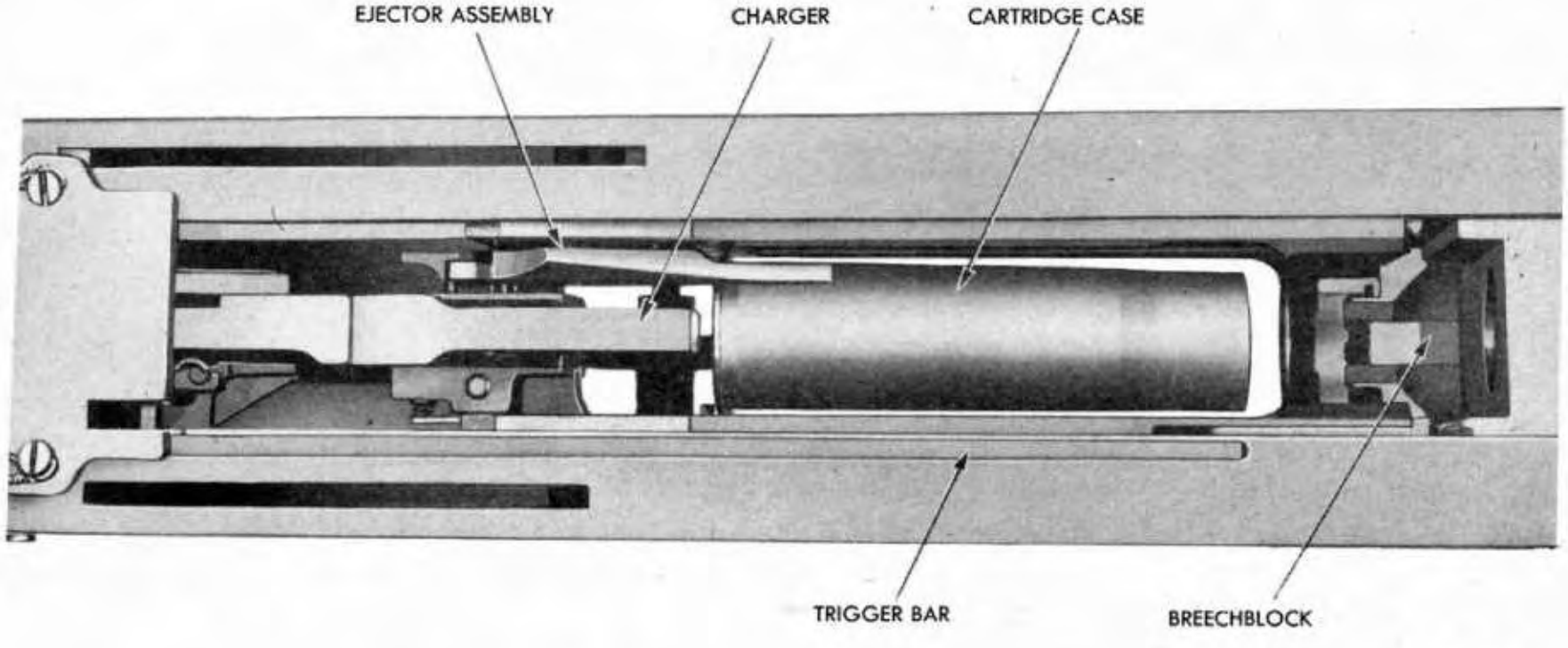


Figure 43—Ejection of Empty Cartridge Case—Lock Frame Held to the Rear, Tube Extension Moving Forward

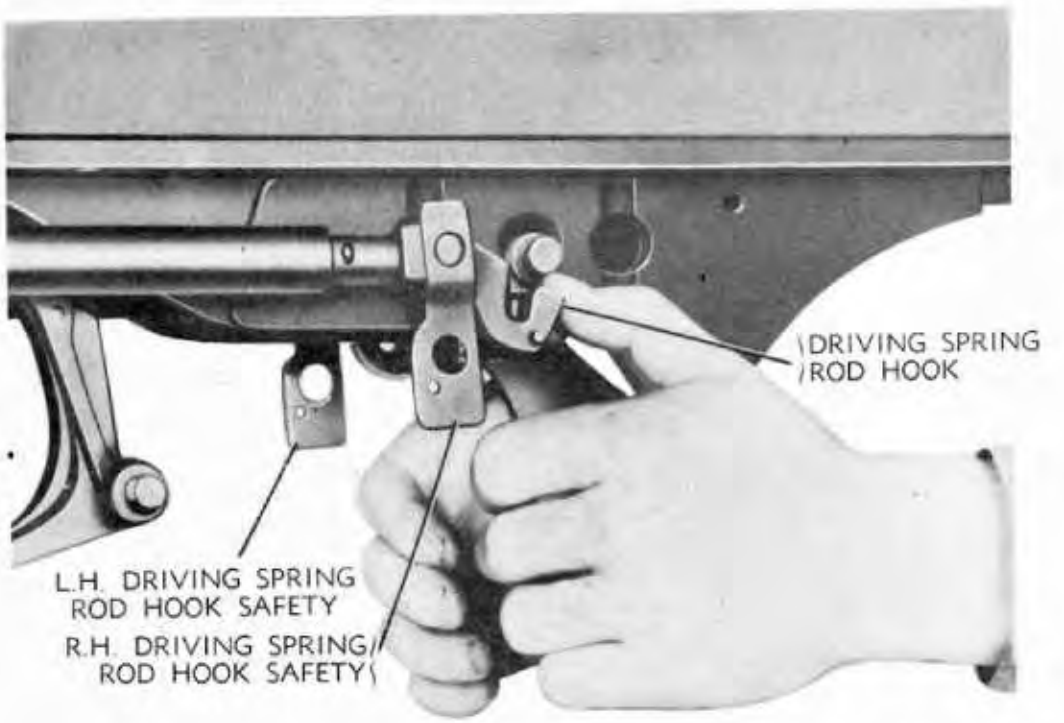


Figure 44—Unhooking Driving Spring Assemblies

of the lock frame body with the side plate lower flanges, and slide the lock frame assembly to its forward position.

(3) Connect the driving spring rod hooks and safeties.

(4) Install the back plate assembly (par. 51).

c. Removal of Breechblock.

(1) Unhook driving springs and retract the lock frame.

(2) Holding the breechblock stop depressed, remove the breechblock (fig. 47).

d. Replacement of Breechblock. Depress the breechblock stop and hold it depressed while sliding the breechblock into place.

e. Removal of Driving Spring Assemblies.

(1) Remove the manual charger as described in paragraph 71 a.

(2) Remove the lock frame as described in subparagraph a, above.

(3) Disconnect the driving spring assemblies from the tube extension by pulling the driving spring tube connection pin knobs to the rear, and rotating the driving spring tubes so that they are disengaged from the tube extension. Slide driving spring assemblies rearward clear of their tube bearings.

f. Replacement of Driving Spring Assemblies. The assemblies are installed in the reverse order of removal.

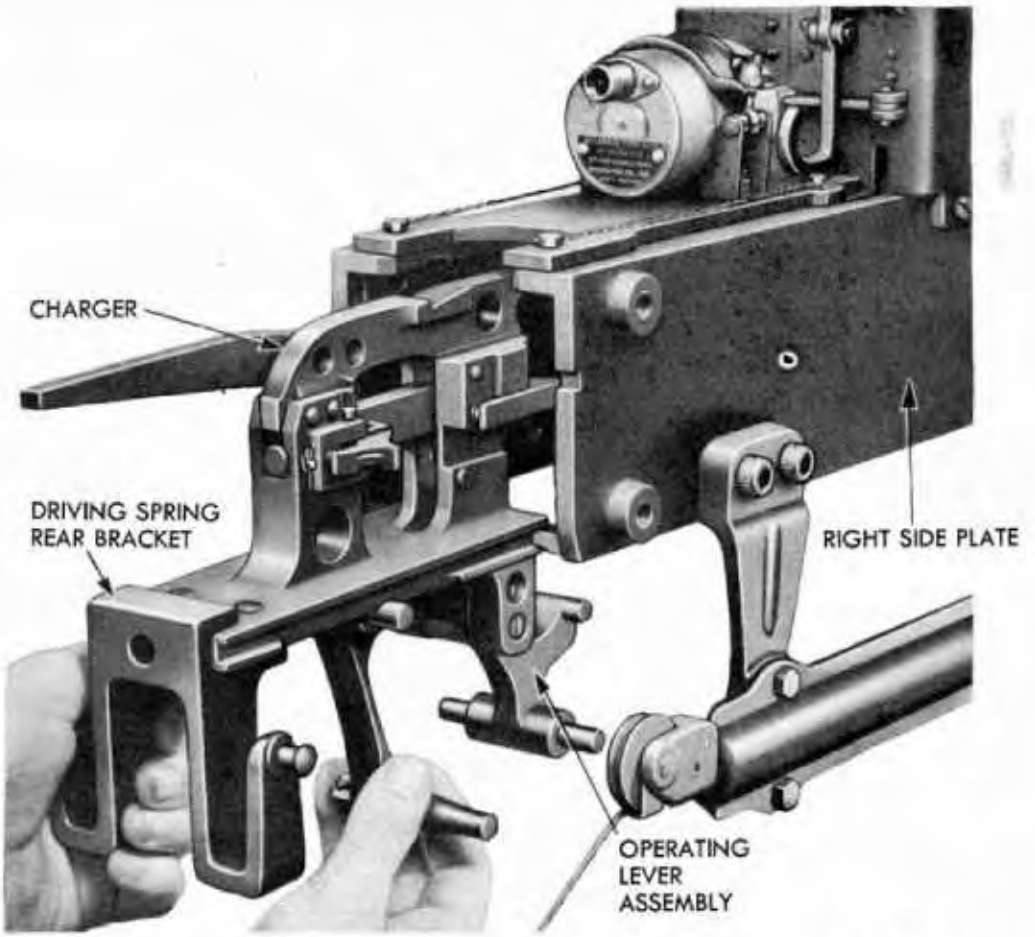


Figure 45—Removing Lock Frame Assembly (Gun M10)

55. DISASSEMBLY AND ASSEMBLY.

a. Disassembly of Lock Frame Assembly (figs. 48 and 49).

(1) Always release sear and place operating lever in forward (battery) position before disassembling lock frame.

(2) Remove operating lever spring lock assembly, spring, and follower by engaging a screwdriver in slotted end of lock, forcing it in, and turning counterclockwise approximately one-quarter of a turn. Lock assembly, spring, and follower can then be removed.

(3) Remove cotter pin, operating lever pivot pin, and operating lever.

(4) Remove operating lever strut by drifting out strut pin.

(5) Remove cotter pin, compress sear spring, and remove pin and sear. Remove sear spring.

(6) Remove cotter pin from hammer spring guide pin. Now compress hammer spring firmly with thumb while removing the hammer spring guide pin. Remove hammer spring guide and spring.

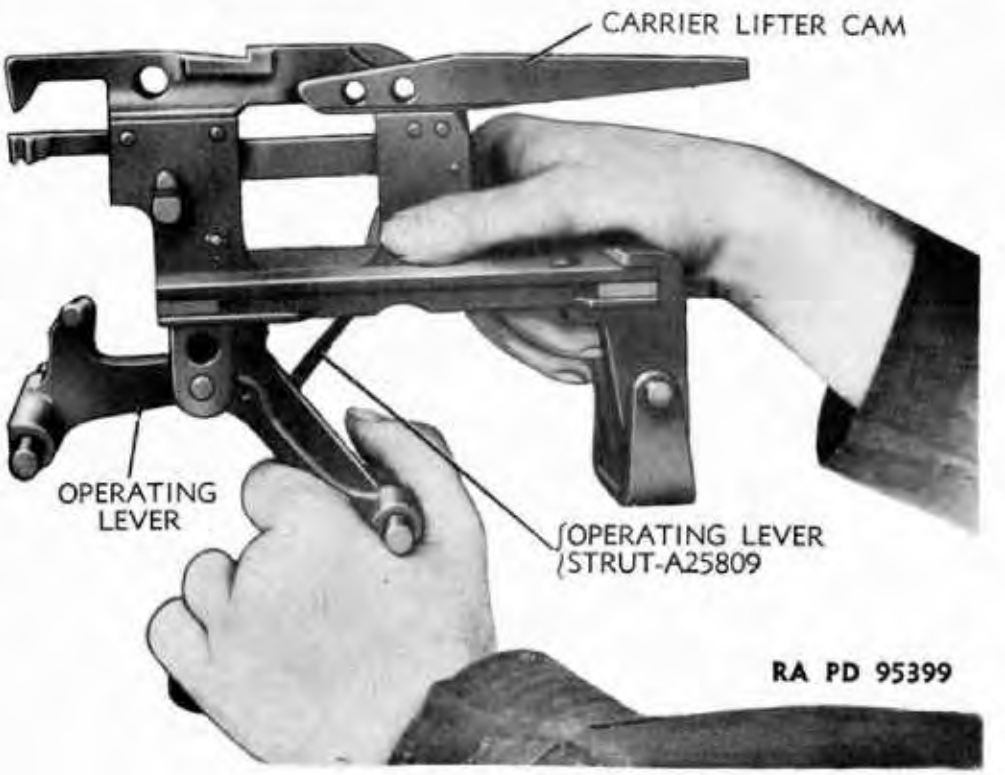


Figure 46—Easing the Operating Lever Forward

(7) Remove cotter pin, cocking lever pin, and cocking lever.

(8) Remove hammer.

(9) Pull out on front end of extractor so that extractor clears shoulder on lock frame body. Slide extractor from the extractor stud, making sure the extractor spring does not fly out.

(10) Parts of lock frame assemblies are shown in figures 50 and 51.

b. Assembly of Lock Frame Assembly (figs. 48, 49, 50, and 51).

(1) Place extractor spring in hole in right side of lock frame and compress it firmly while pushing extractor on stud. Push extractor up until it snaps behind the shoulder on the lock frame.

(2) Place hammer in lock frame.

(3) Place cocking lever in lock frame, with concave side forward and rounded end engaged in groove in hammer. Install cocking lever pin and lock with a $\frac{1}{16}$- by $\frac{5}{16}$-inch cotter pin.

(4) Place hammer spring and guide in hammer. Compress spring firmly while inserting hammer spring guide pin through holes in lock frame body and spring guide. Lock guide pin with a $\frac{1}{16}$- by $\frac{5}{16}$-inch cotter pin.

(5) Place sear spring in hole in lock frame, and install sear and sear pin. Lock sear pin with a $\frac{1}{16}$- by $\frac{5}{16}$-inch cotter pin.

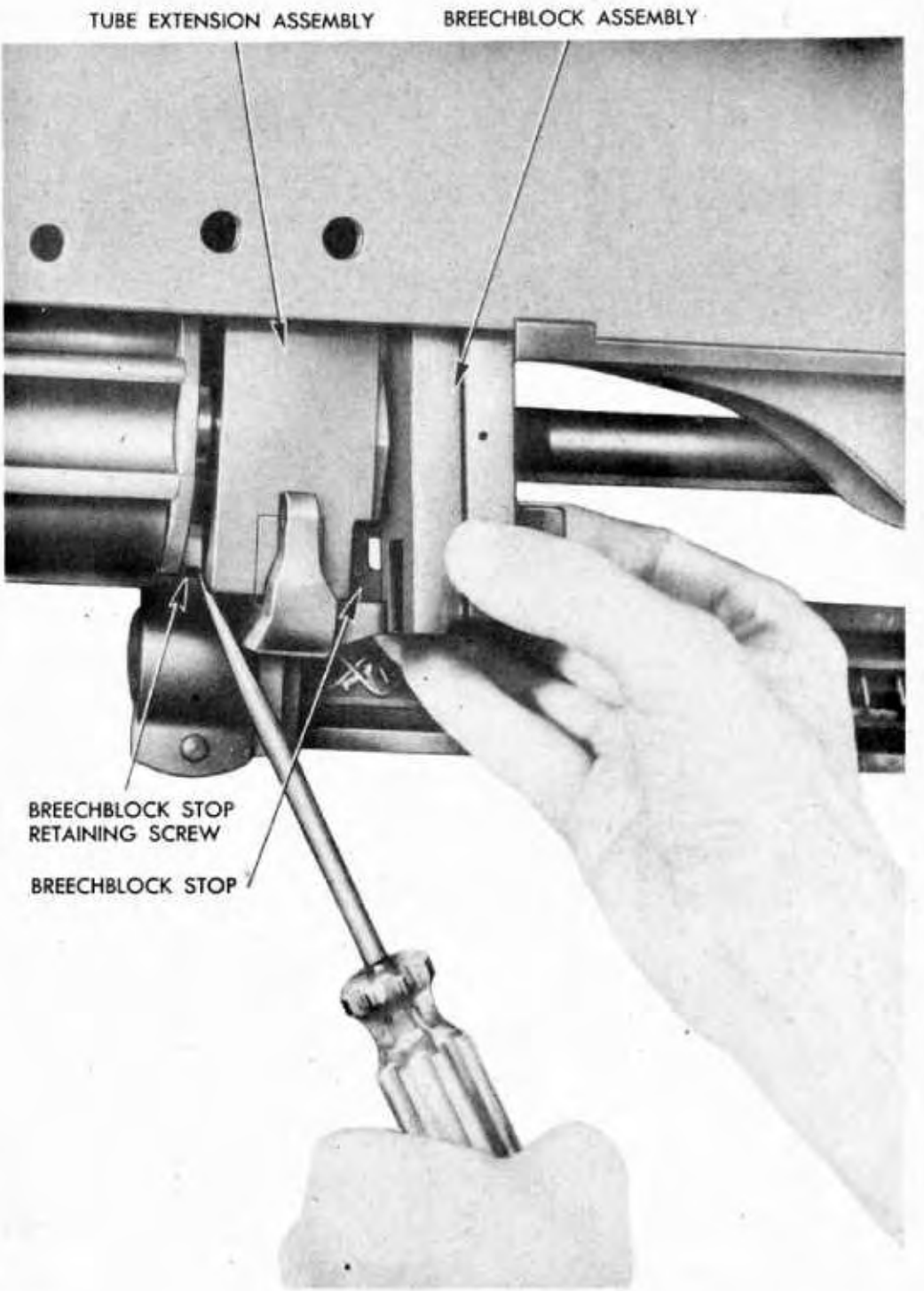


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Figure 47—Removing Breechblock

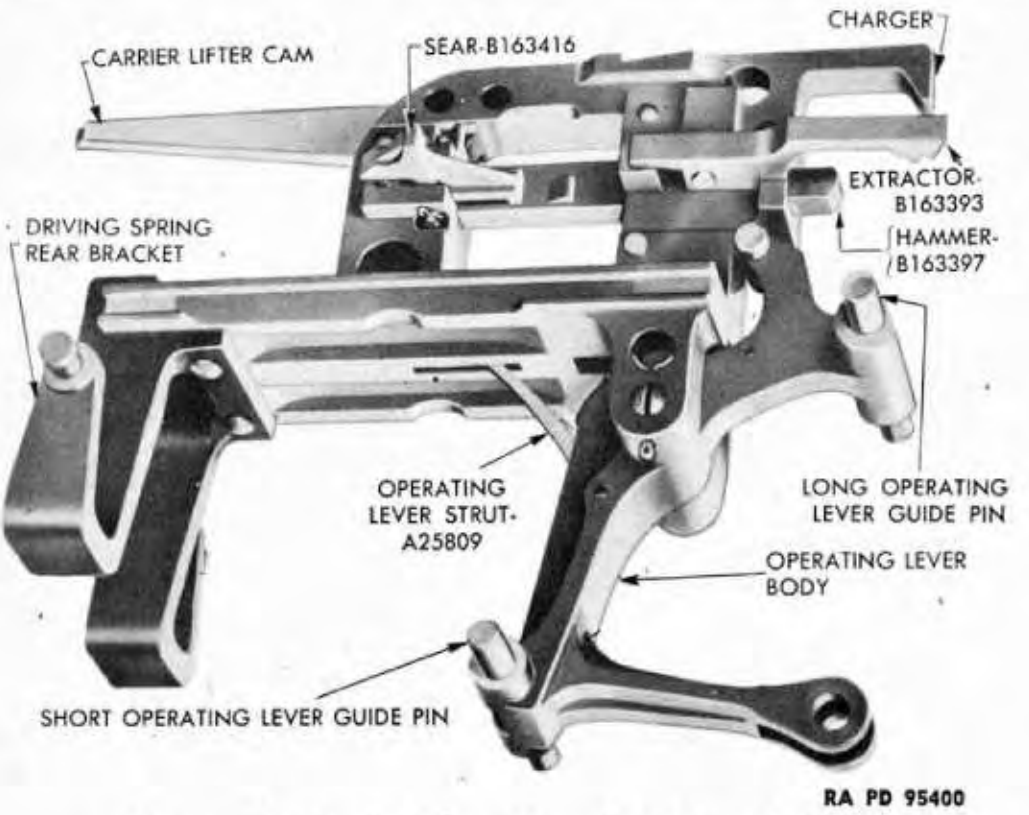


Figure 48—Lock Frame Assembly (Gun AN-M4)

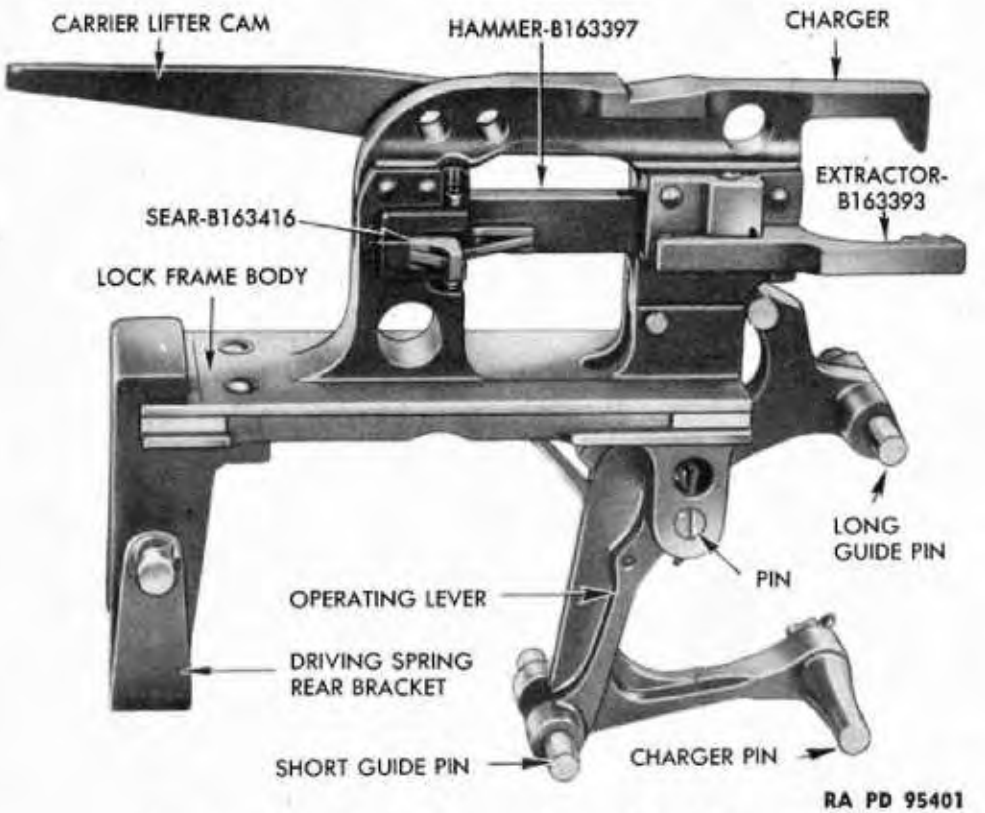
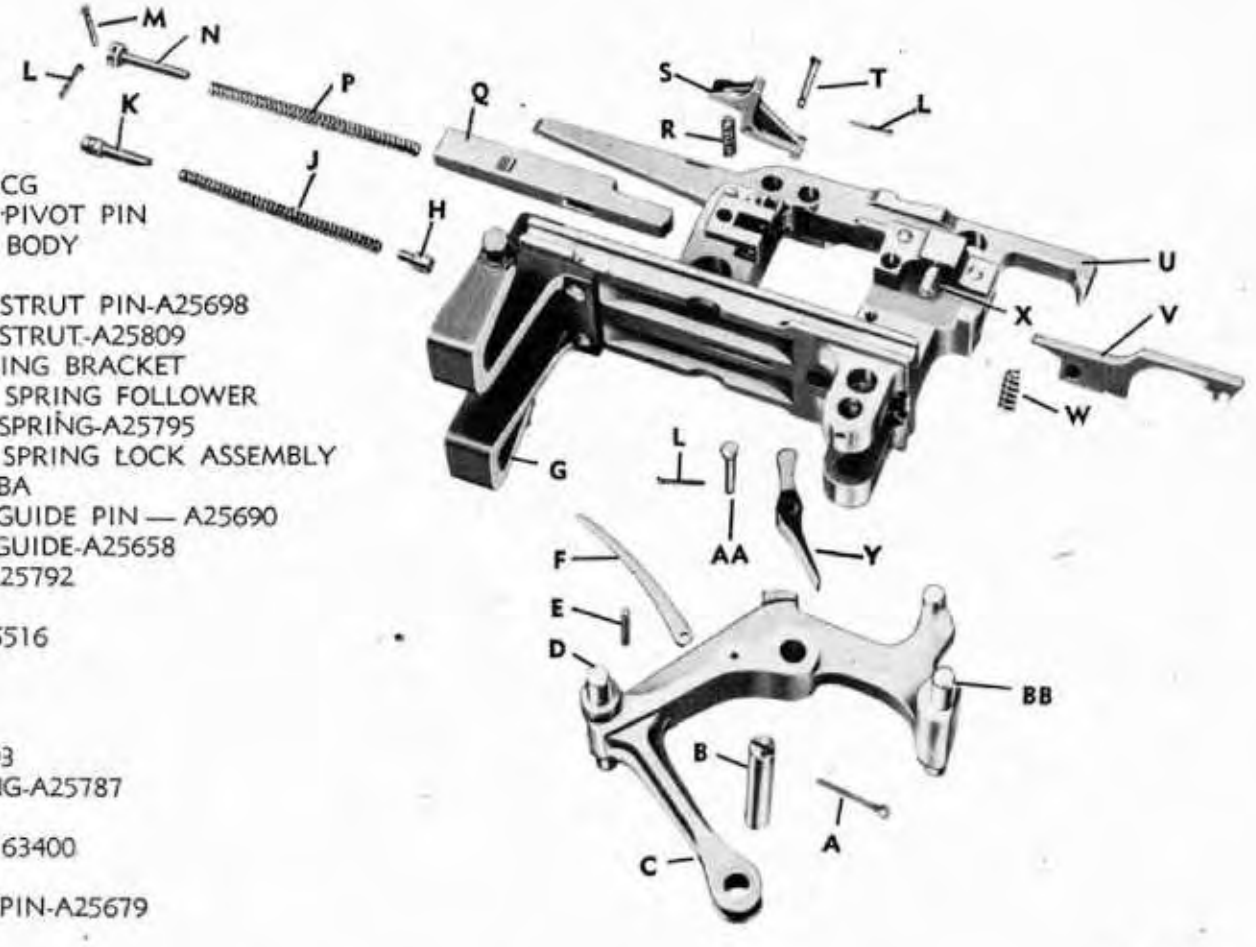


Figure 49—Lock Frame Assembly (Gun M10)



A — COTTER PIN-BFAX1CG
B — OPERATING LEVER PIVOT PIN
C — OPERATING LEVER BODY
D — SHORT GUIDE PIN
E — OPERATING LEVER STRUT PIN-A25698
F — OPERATING LEVER STRUT-A25809
G — REAR DRIVING SPRING BRACKET
H — OPERATING LEVER SPRING FOLLOWER
J — OPERATING LEVER SPRING-A25795
K — OPERATING LEVER SPRING LOCK ASSEMBLY
L — COTTER PIN-BFAX1BA
M — HAMMER SPRING GUIDE PIN — A25690
N — HAMMER SPRING GUIDE-A25658
P — HAMMER SPRING-A25792
Q — HAMMER-B163597
R — SEAR SPRING-A7225516
S — SEAR-B163416
T — SEAR PIN-A25701
U — CHARGER
V — EXTRACTOR-B163393
W — EXTRACTOR SPRING-A25787
X — EXTRACTOR STUD
Y — COCKING LEVER-B163400
BB — LONG GUIDE PIN
AA — COCKING LEVER PIN-A25679

Figure 50—Parts of Lock Frame Assembly (Gun AN-M4)

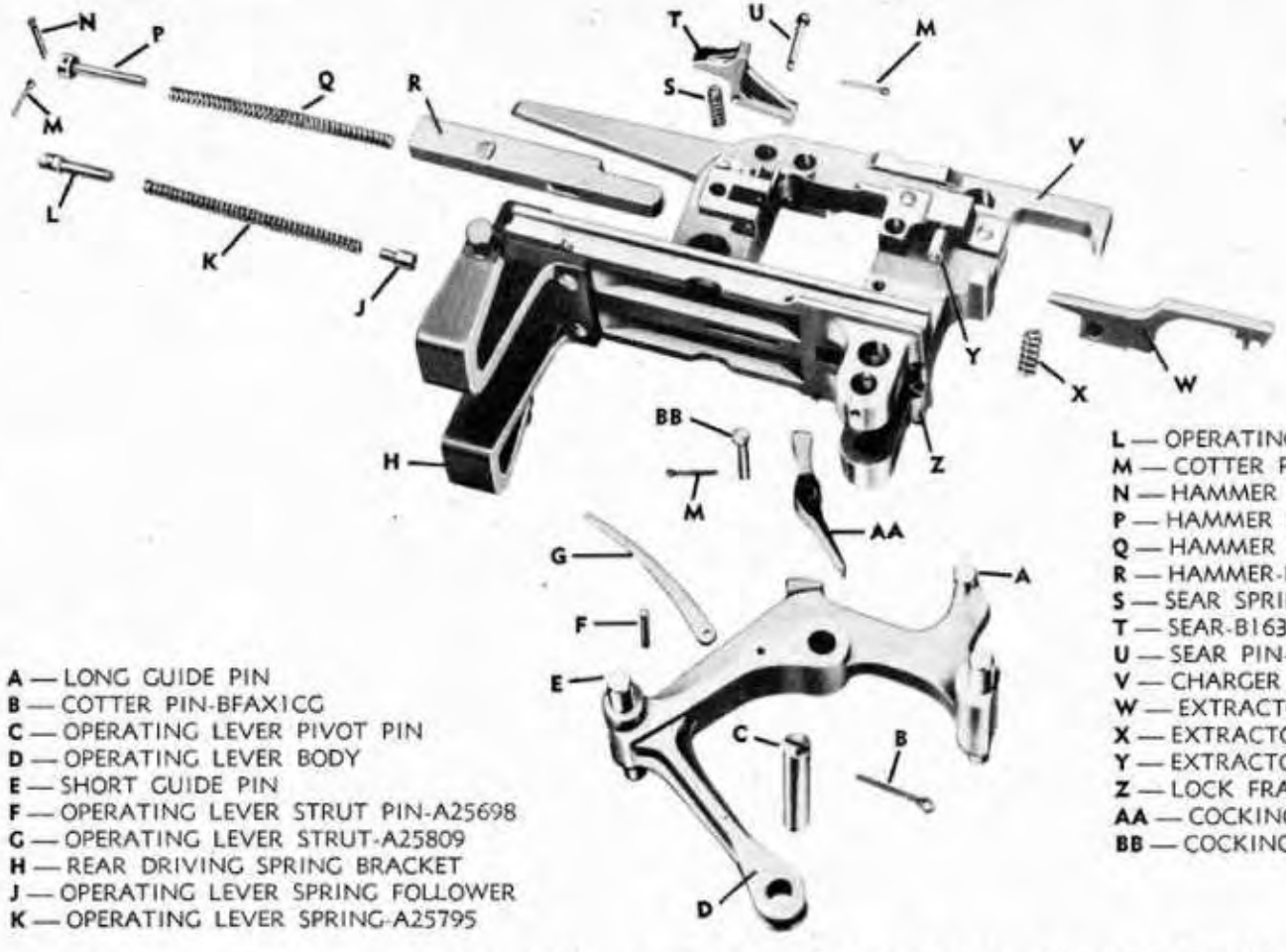


Figure 51—Parts of Lock Frame Assembly (Gun M10)

(6) Install operating lever strut in operating lever, with concave side towards rear. Install strut pin and stake in place.

(7) Place operating lever in lock frame, with lobe on the rear side of cocking lever. Install pivot pin from the right side, and lock it in place with $\frac{3}{32}$- by 1-inch cotter pin.

(8) Swing end of strut into slot in lock frame. Place operating lever spring follower, spring, and lock assembly in lock frame, with the follower engaging end of strut.

(9) Push lock in with screwdriver, engage lock pin in groove in lock frame, and lock it in position with one-fourth turn clockwise.

c. Disassembly of Breechblock (fig. 52).

(1) Hold finger over the rear end of firing pin.

(2) Drift out the firing pin stop pin which is lightly staked in place.

(3) Remove the firing pin and firing pin spring.

d. Assembly of Breechblock. Assemble in the reverse order of disassembly. Be sure that the flat on the firing pin will line up with the firing pin stop pin. In assembling the breechblock, the firing pin stop pin should be staked lightly and all burs removed after staking.

e. Disassembly of Driving Spring Assemblies (fig. 53).

(1) Unscrew driving spring tube connection pin knob after first removing the lock wire, thus releasing connection pin and spring.

(2) Remove cotter pin from driving spring rod connection, thus releasing the safety, rod hook, plunger, and spring.

(3) Unscrew driving spring tube bushing. The edges of the tube are staked into slots in the bushing. Withdraw driving spring rod assembly from the tube.

(4) Remove cotter pin from rod connection and remove connection from rod. NOTE: *These connections and rods are not interchangeable. Slide the bushing, two driving springs, and spacer from rod. Then place connections back on the same rods to avoid interchanging these parts.*

(5) Unscrew driving spring tube end cap only when absolutely necessary as this part A25454 cannot be removed without rendering it unserviceable, due to damage of threads caused by heavy staking of the tube body.

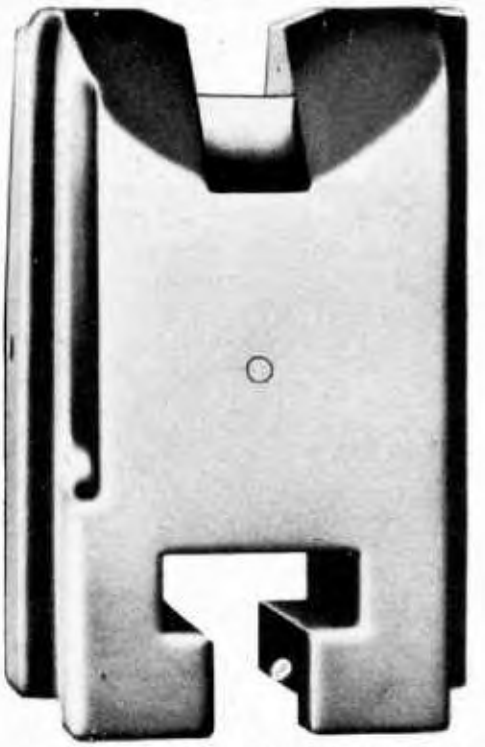
(6) Piston is not to be removed from the rod.

(7) Parts of driving spring assembly are shown in figure 54.

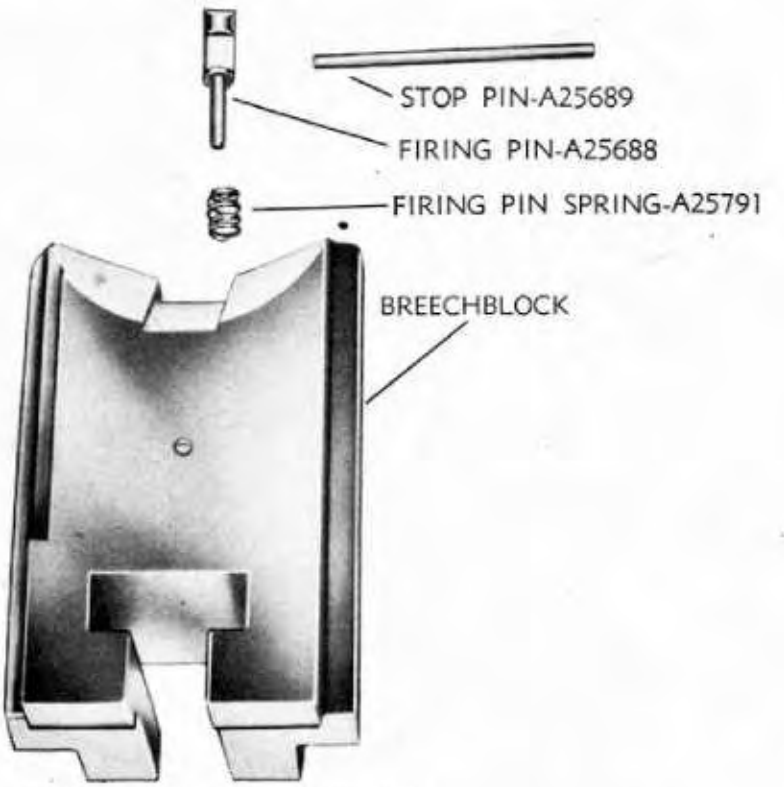
f. Assembly of Driving Spring Assemblies.

NOTE: *Both assemblies are identical, except as outlined in the note in step* (5), *below.*

(1) Screw driving spring tube cap into front (long) end of tube. Be sure venthole is clear.



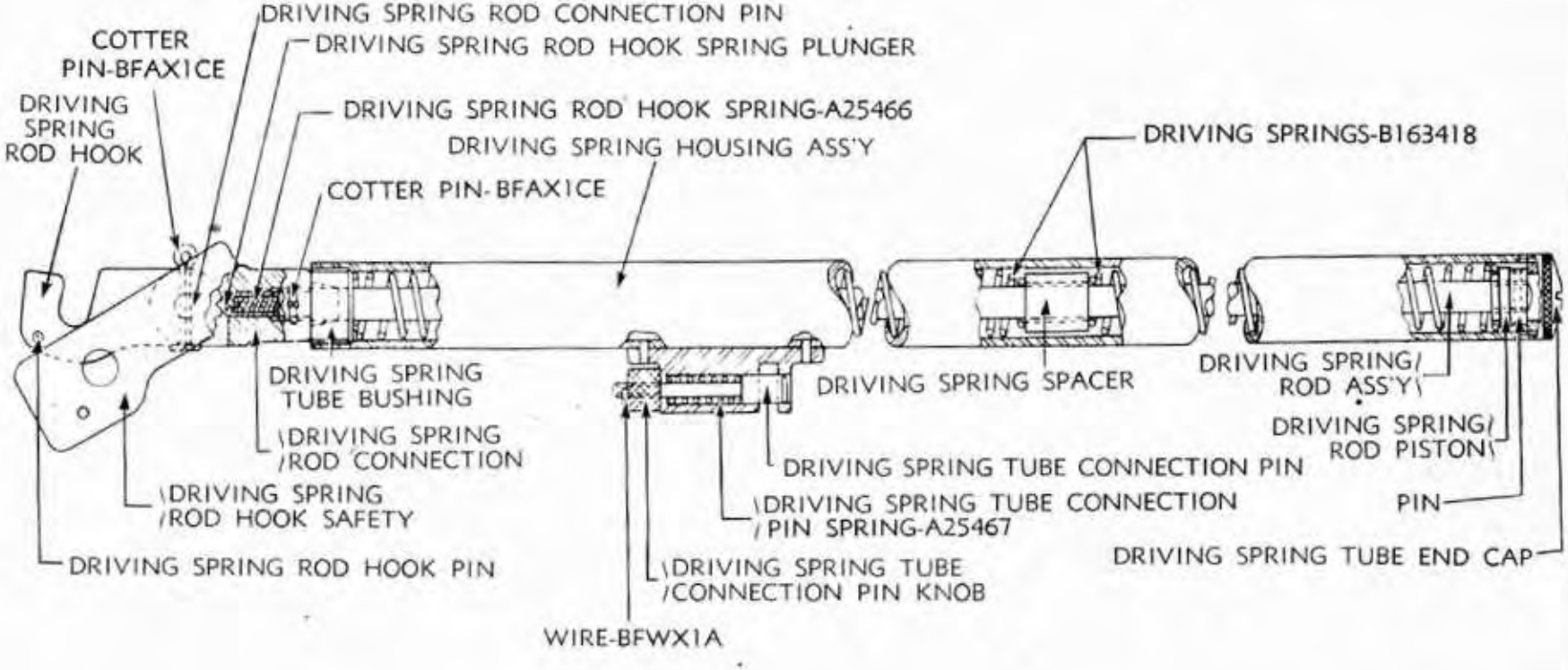
BREECHBLOCK ASSEMBLY *(AN-M4 GUN)*



BREECHBLOCK PARTS *(M10 GUN)*

RA PD 95404

Figure 52—Breechblock Assemblies



RA PD 95405

Figure 53—Driving Spring Assembly—Cutaway View

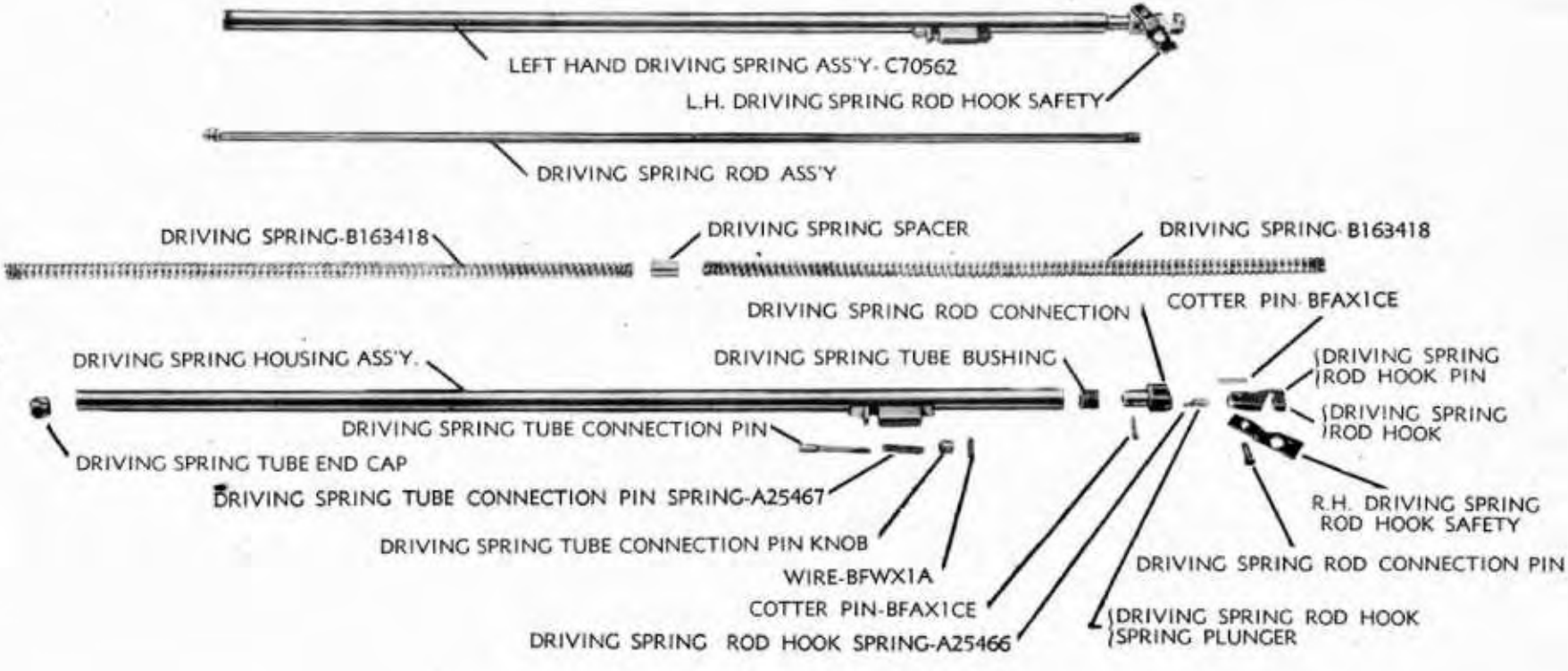


Figure 54—Parts of Driving Spring Assembly

(2) Remove connection from rod.

(3) Slide driving spring, spacer, driving spring, and bushing, on driving spring rod assembly, in the order named. The smaller diameter ends of the springs must be towards the bronze spacer.

(4) Holding springs compressed, install rod connection on rod and screw up to index cotter pin holes. Install a $^{3}/_{32}$- by $^{3}/_{4}$-inch cotter pin from opposite side to the hole for the connection pin cotter pin.

(5) Install spring and rod assembly in tube and screw bushing down flush with end of tube. The edges of the tubes are staked into the slot in bushing. NOTE: *Driving spring assemblies are not interchangeable because of the driving spring rod hook safety, left and right.*

(6) Place hook spring and plunger in rod connection. Place hook in the connection, with dowel pin on same side as head of cotter pin in connection. Install rod connection pin and safety on the same side. Secure connection pin with a $^{3}/_{32}$- by $^{3}/_{4}$-inch cotter pin with head up (fig. 55).

(7) Place spring on driving spring tube connection pin. Install pin and spring in tube connection, compress spring, and screw knob on the pin until locking wire hole is through the knob. Install tube connection pin locking wire, bending ends around connection pin. Unscrew knob tight against locking wire.

56. MAINTENANCE.

a. Lock Frame.

(1) Retract lock frame and ease it to battery position several times, noting the following:

(a) Smoothness of operation of lock frame.

(b) Driving spring action.

(c) Operation of breechblock.

(d) Locking and releasing by carrier dog.

(2) Remove lock frame assembly. Manipulate operating lever, sear, and extractor, and note spring action and free movement of all parts.

(3) Check long and short guide pins, hammer, sear, extractor, and cocking lever for burs, scoring, or worn surfaces.

(4) Check all pins for proper locking with cotter pins.

(5) Clean lock frame slideways, remove burs, and lubricate.

(6) Smooth all pivot and contact points, check springs, and replace worn and damaged parts.

(7) Disassemble lock frame; clean and lubricate all parts.

b. Breechblock.

(1) Remove breechblock assembly.

(2) Examine block for burs or scoring. Check firing pin for free movement and spring action.

(3) Check firing pin point for burs or excessive wear. Smooth all rough sliding surfaces of breechblock.

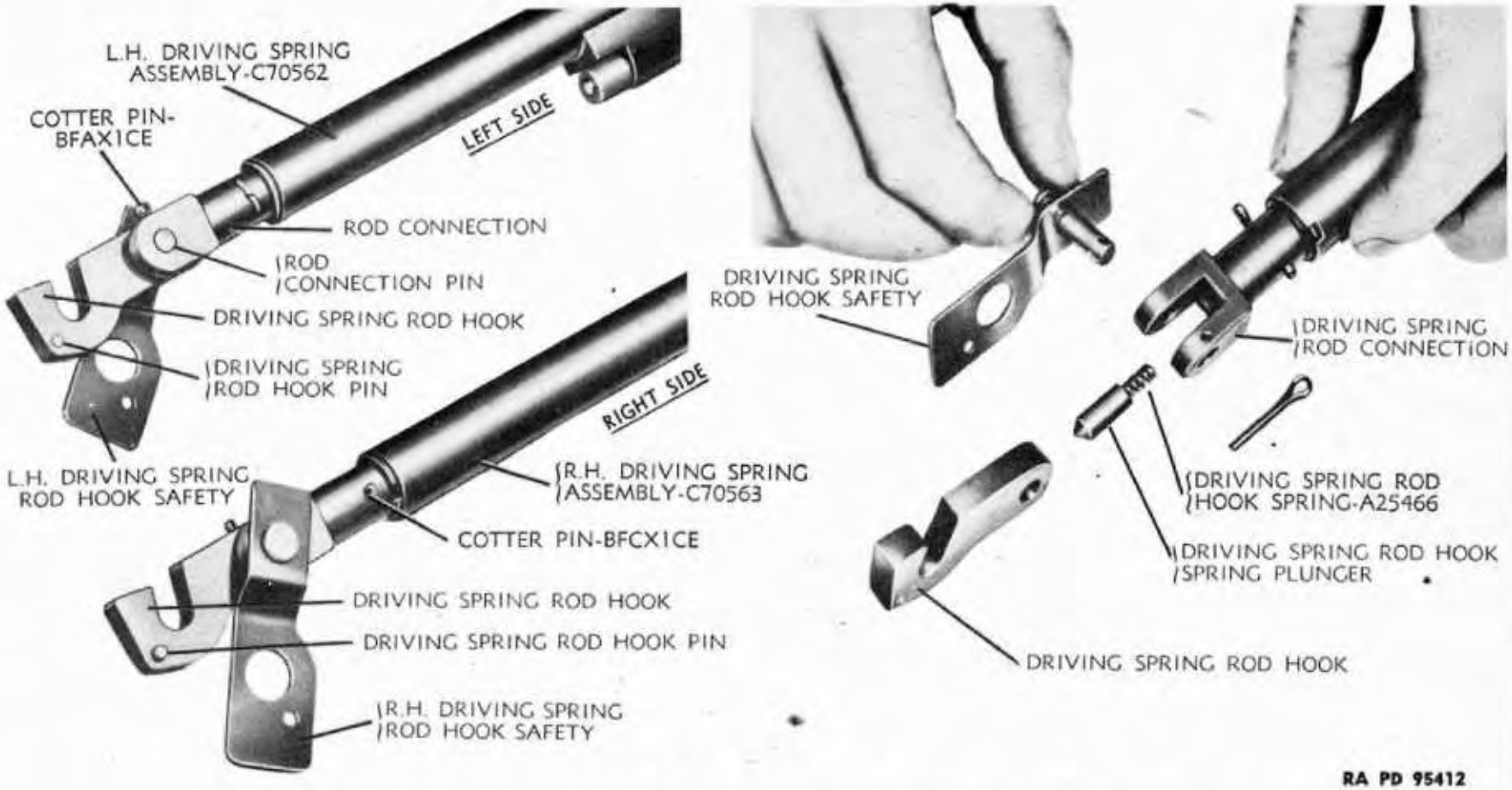


Figure 55—Assembly of Driving Spring Rod Hooks and Safeties

(4) Replace firing pin if it is worn or bent, and the spring if it does not return firing pin properly.

c. Driving Spring Assemblies.

(1) No adjustments are provided for the driving springs. A critical point in the operation occurs when the forward movement of the lock frame ceases and the breechblock is forced into firing position. At this point, the driving springs cease to function and give over to the small operating lever spring in the lock frame itself.

(2) It is important that the connections of the driving spring assemblies to the tube extension and lock frame be properly locked and secure at all times.

(3) Remove driving spring assemblies. Check hooks, safeties, and connections for proper assembly and condition of cotter pins. Check for dents in housing, bent rods, or plugged ventholes in front end caps.

(4) If the driving springs appear to be weak, remove the driving spring assemblies for thorough cleaning as follows: Place the forward end in a quantity of dry-cleaning solvent, or rifle bore cleaner, and, using the rod as a plum plunger, draw solvent through the small hole in the forward end of the cover. Try to remove all possible gummy or heavy lubricant in this manner. (Do not clog hole or bend rod.) After cleaning, flush with preservative lubricating oil (special).

Section XVII

FEED BOX GROUP

57. FUNCTIONING.

a. Gun M10.

(1) The function of the feed box group is to draw belted ammunition from a belt or magazine and feed it into the gun automatically as the gun is fired.

(2) When the gun is charged, the lock frame is forced to the rear, raising the carrier dog (fig. 56). The carrier dog, when raised, contacts the interlock body and plate (fig. 56), thus positioning the interlock lever to permit operation of the loading slide. When the loading slide is pulled to the rear, the initial round is fed into the mechanism. This actuates the mechanism.

(3) During recoil the feed lever operating stud on the side of the tube extension contacts the lower end of the feed lever (fig. 56), pivoting it rearward. The stud passes under the end of the lever which then snaps back into position, in front of the stud, by the force of the feed lever rear spring and plunger. During counterrecoil, the operating stud pushes the lower end of the feed lever forward.

(4) The feed lever swivel (fig. 56) actuates the feed crank (fig. 56), which in turn moves the feed slide lever, forcing the feed slide toward the inside of the feed box. The springloaded feed pawl on the under side of the slide engages the inner ears of the link holding the first round. Therefore, as the slide moves inward (fig. 57), the belt is

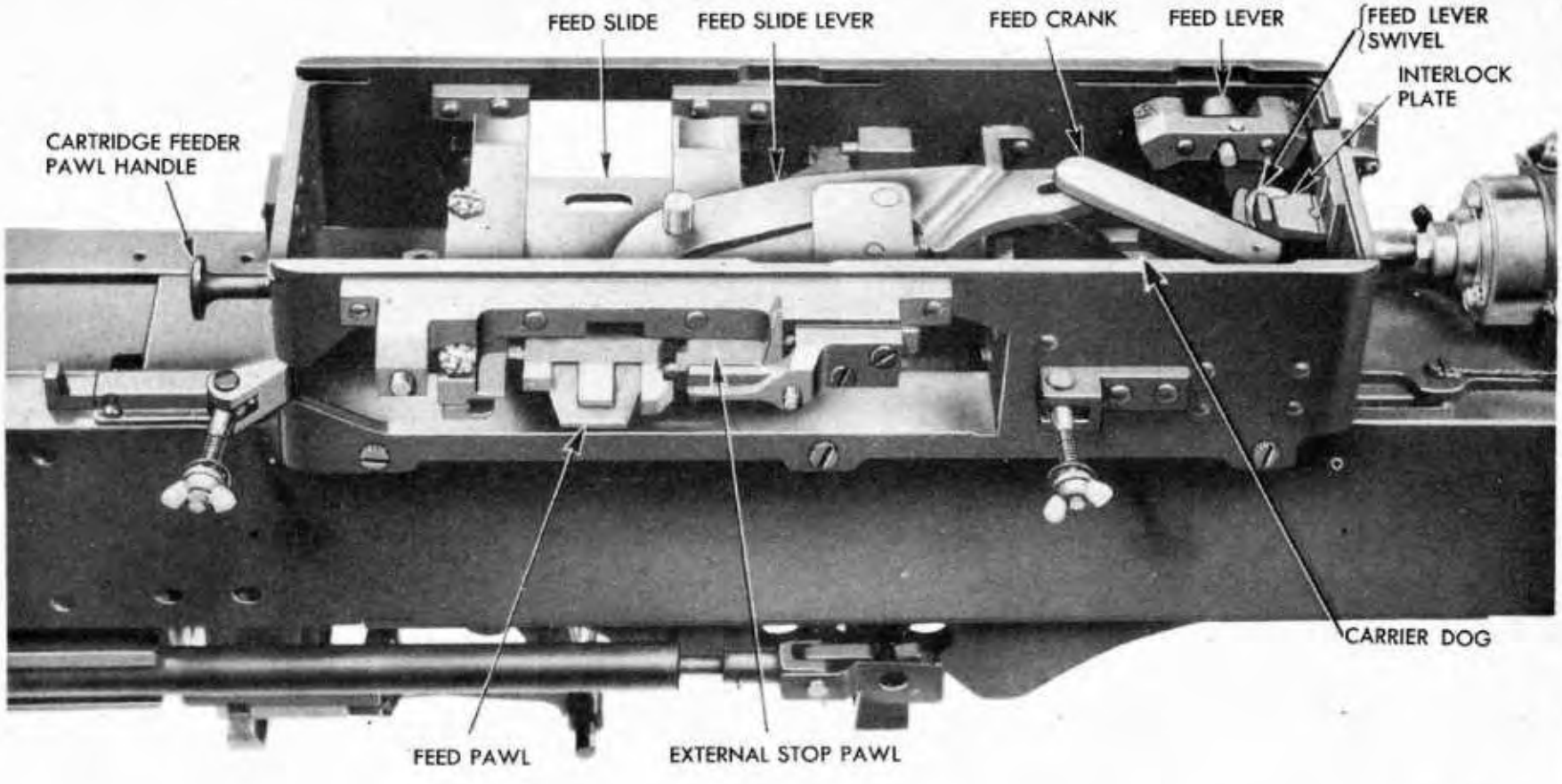


Figure 56—Feed Box Mechanism (Gun M10)

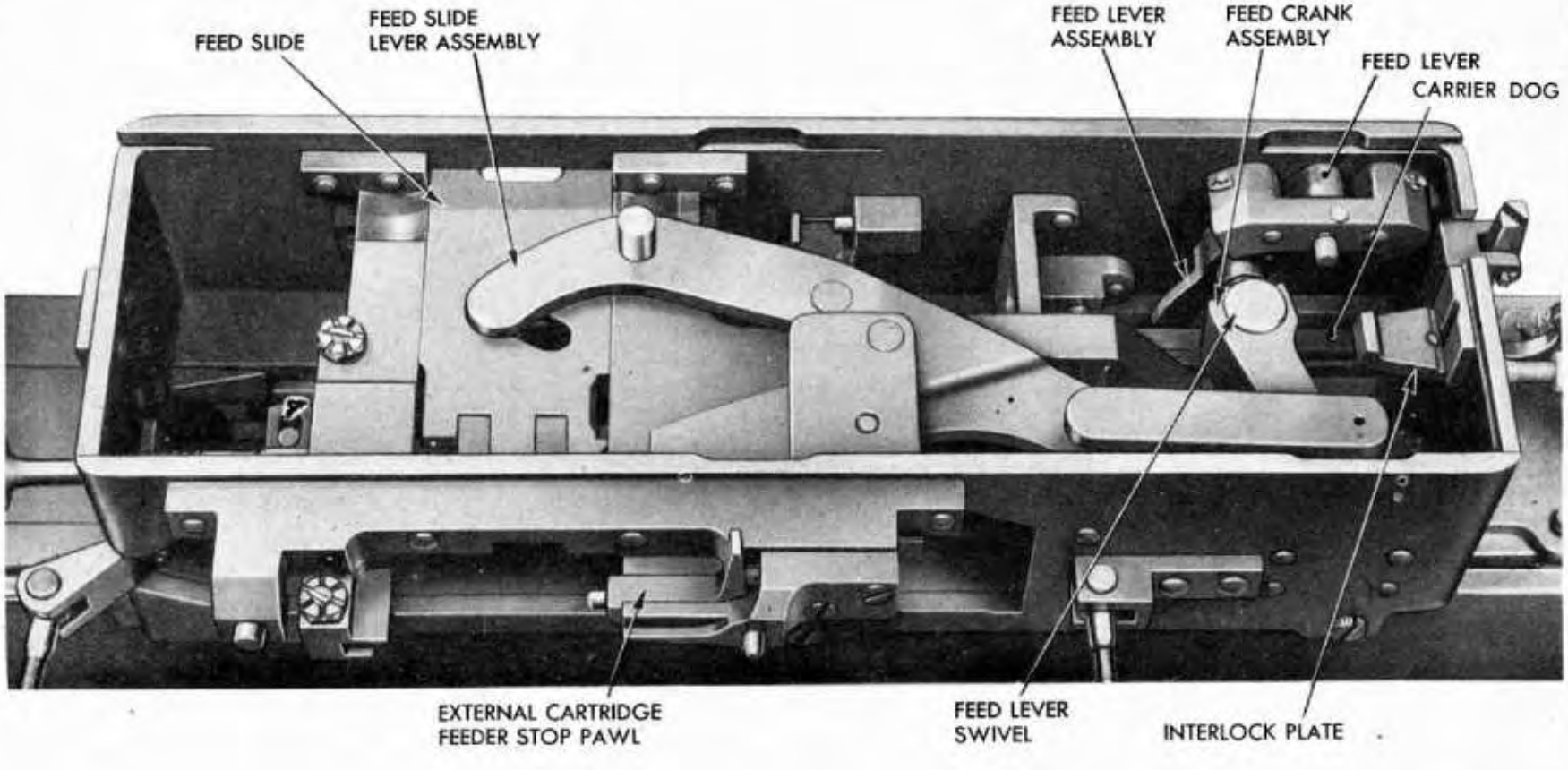


Figure 57—Feed Box Mechanism (Gun M10)

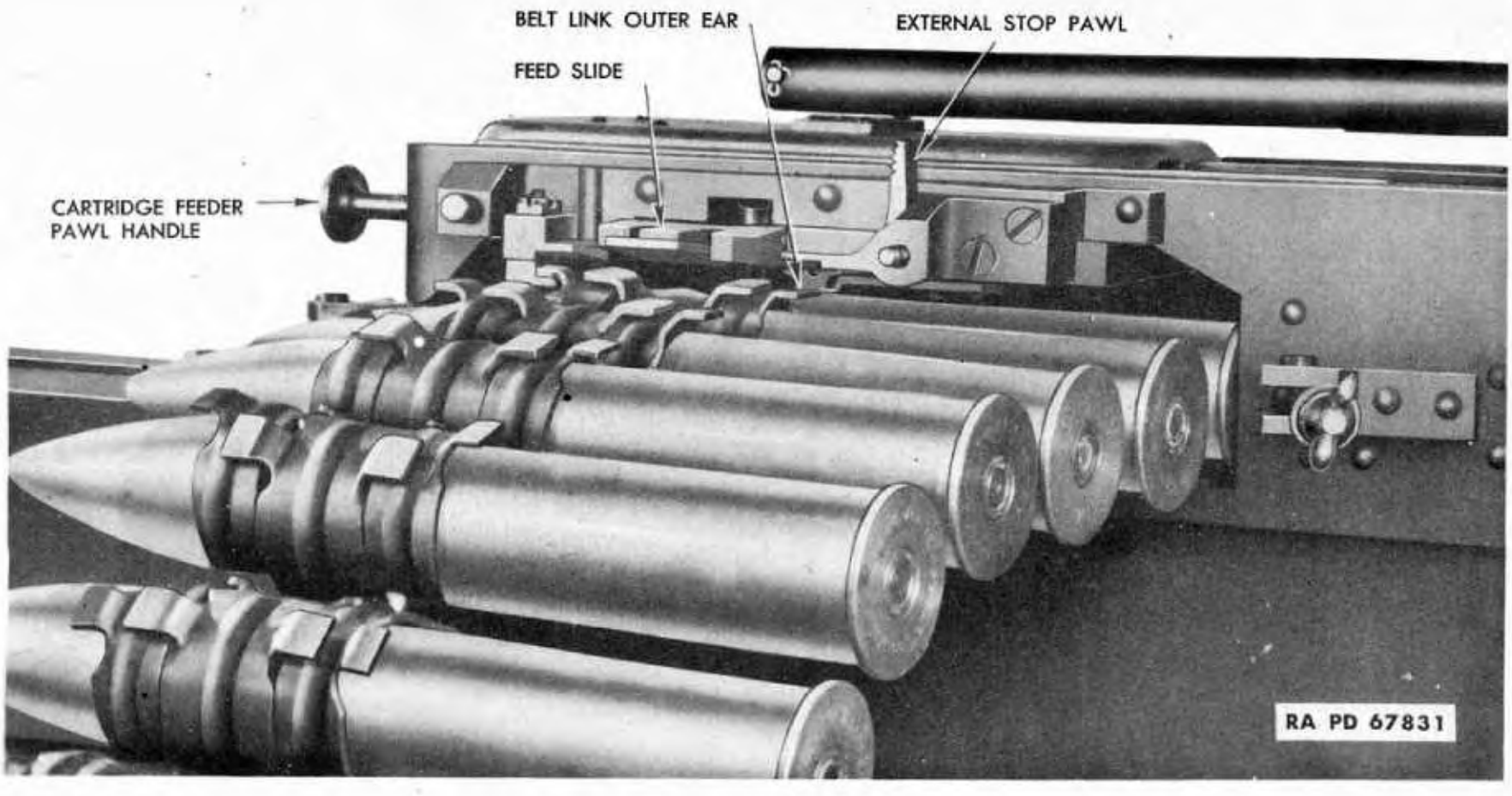


Figure 58—External Stop Pawl Contacting Belt Link Outer Ear

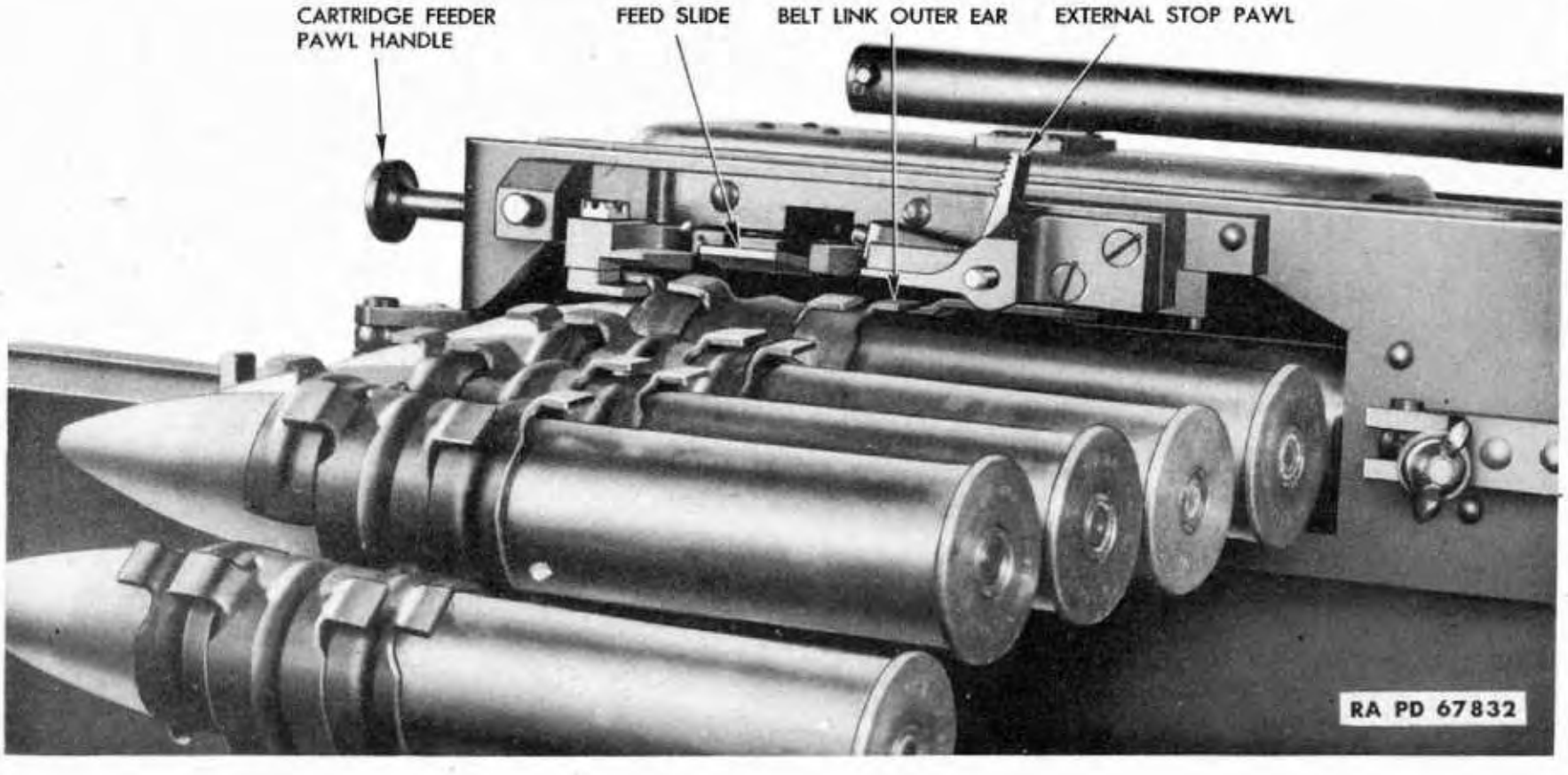


Figure 59—External Stop Pawl Released—Ammunition Belt Entering Feed Box

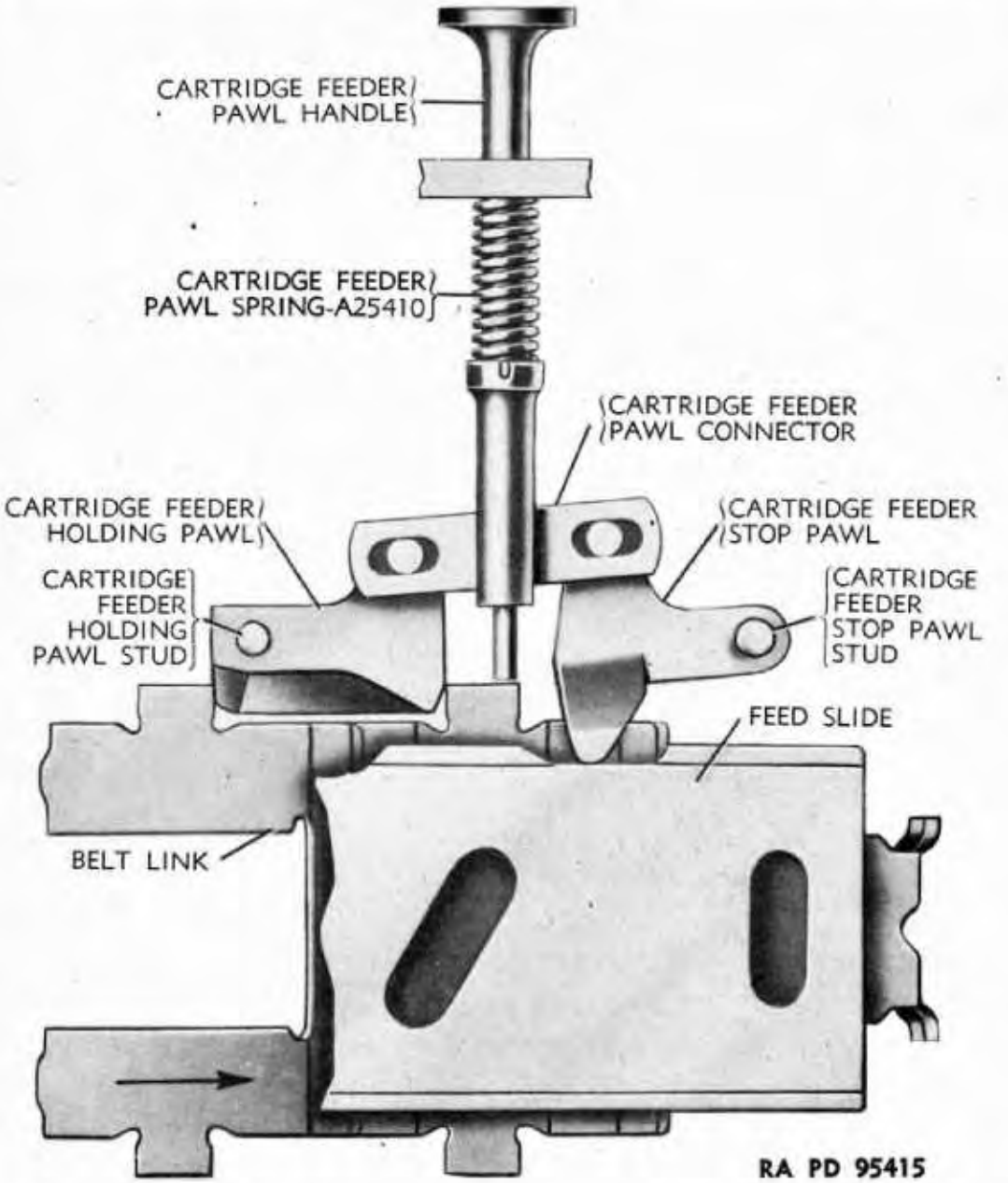


Figure 60—Cartridge Feeder Stop and Holding Pawls (Gun M10)

moved with it, bringing this round further into the feed box. Near the end of the motion of the feed slide, the stop pawl on the front feed slide guide drops off the tongue of the slide and engages the outer ear of the link, positioning the round.

(5) The external cartridge feeder stop pawl is pivoted on a bracket which is attached to the side of the feed box by two screws. The external stop pawl has a plunger which contacts camming surfaces on the feed slide. When assembled to the bracket, a bracket spring and plunger tend to keep the pawl pivoted in its down posi-

tion, where it engages the outer ear on the belt link (fig. 58). The action of the feed slide on the external stop pawl plunger, however, raises the stop pawl to permit the belt to move into the feed box (fig. 59). The external cartridge feeder stop pawl differs in action from the cartridge feeder stop pawl as it does not disengage from the link ear when the feed slide returns, thus preventing overfeeding when there is a heavy load tending to push the rounds inward. The holding pawl on the front feed slide guide, slides behind the outer link ear of the following round, preventing the belt from moving backward as the feed slide returns to engage the next link to feed in another round. The stop pawls are operated by beveled surfaces on the feed slide, while the holding pawl is operated by the outer ears of the belt links (fig. 60).

(6) The carrier pivots vertically on a pin extending through the sides of the feed box. The carrier dog pivots on a pin (fig. 61) through the lower rear end of the carrier and is positioned by a spring and plunger located in the carrier body. During recoil, when the lock frame cams the carrier dog up, the spring and plunger are compressed. The compressed spring forces the dog downward, so that it will engage a notch in the top of the lock frame and thus hold the lock frame in the rearward position. In this position, the compressed carrier spring causes the carrier to exert a downward force on the carrier catch. The carrier catch is so positioned that it holds the carrier in a horizontal plane just above the incoming cartridges. As the cartridge is stripped from the belt link, it pushes the carrier catch against a spring and plunger, thus freeing the carrier to push the cartridge down into the gun mechanism. During this downward movement of the carrier, the carrier dog is released from the notch in the lock frame, thus releasing the lock frame which drives the cartridge forward into the chamber. The carrier is raised above the carrier catch by the carrier lifter cam during the forward movement of the lock frame.

(7) When the tube extension is near the battery position, the feed lever operating stud passes under the lower end of the feed lever. The feed slide lever, plunger, and spring then force the feed slide toward the inlet side of the feed box to pick up the next round. This movement carries the feed crank and feed lever back to the initial feeding position (fig. 62). As the belt moves in, the stripper cam forces the cartridges from the belt links and down into position for chambering.

b. Gun AN-M4.

(1) The feeding operation of the Gun AN-M4 is very similar to the Gun M10; however, the Gun AN-M4 is provided with two feed pawls instead of one as in the case of the Gun M10. These feed pawls engage openings in the endless belt link plates.

(2) Stop and holding pawls engage notches which are cut in the side of the belt link plates.

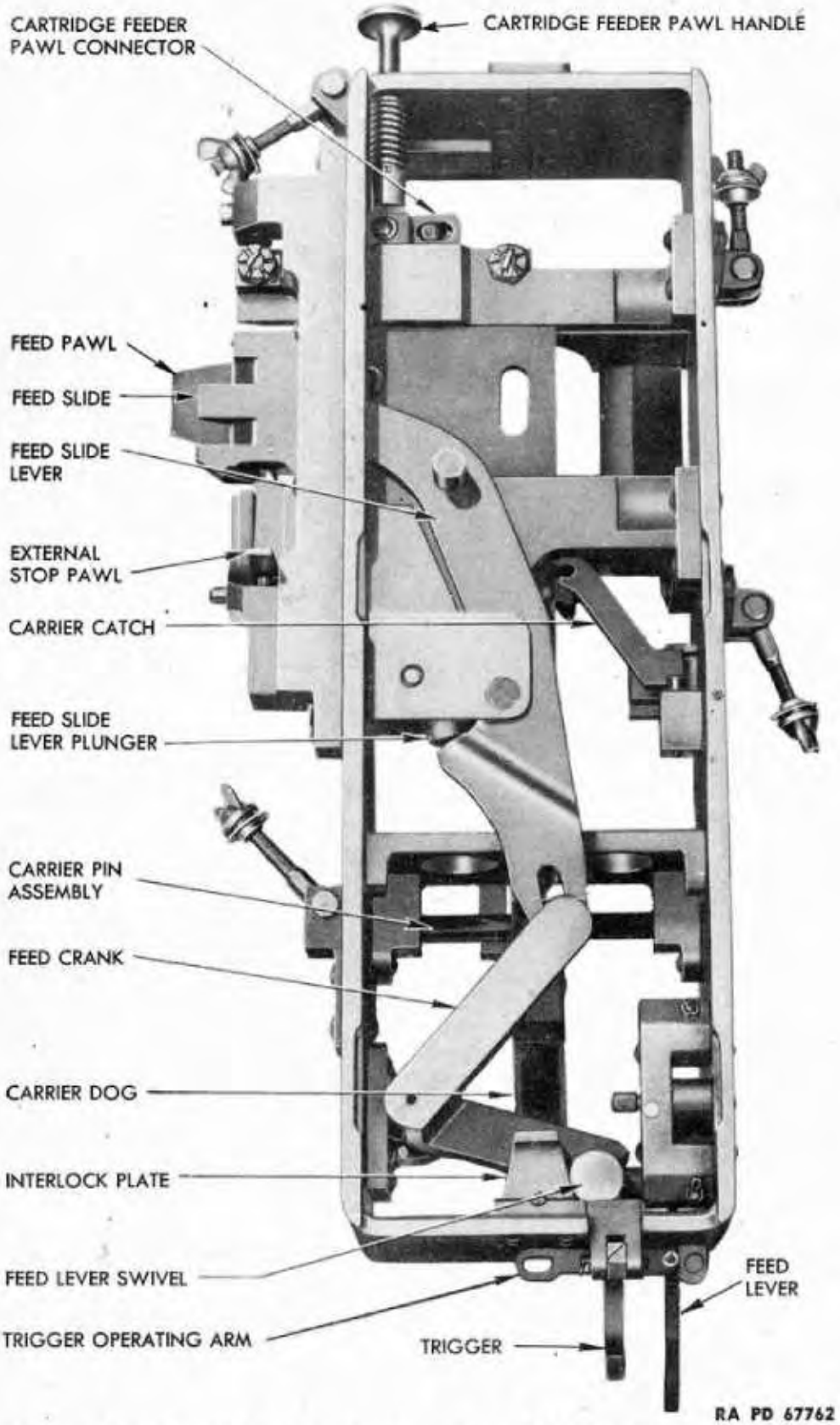


Figure 61—Feed Box Mechanism (Gun M10)—Removed From Gun

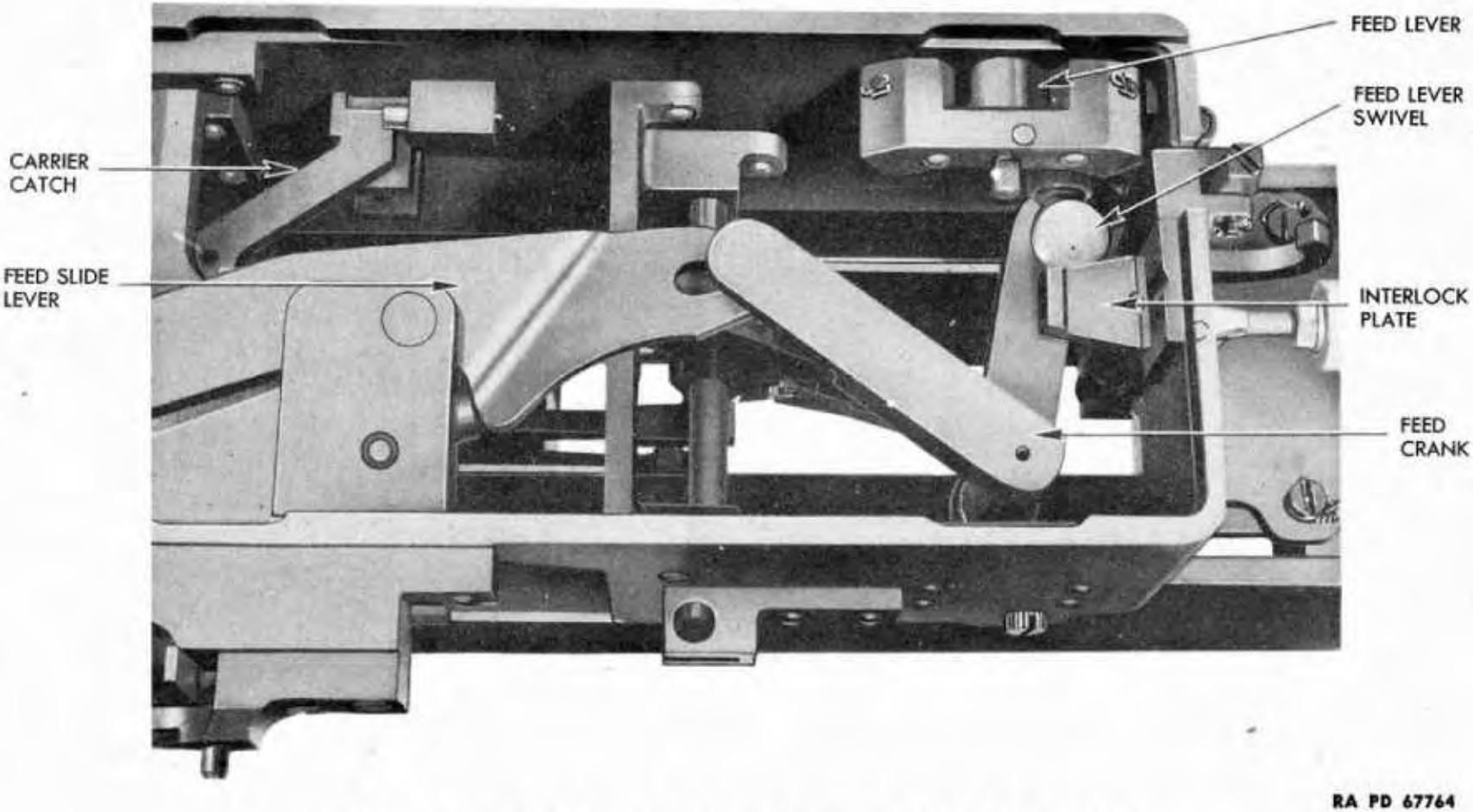


Figure 62—Feed Box Mechanism (Gun M10)—Rear Section

(3) Due to the fact that the Gun AN-M4 does not incorporate an external stop pawl in its design, the tendency towards double feeding is reduced by incorporating an index pawl into the endless belt magazine. This index pawl is actuated by the upper left end surface of the feed slide. The index pawl is spring loaded and engages the openings in the belt link plates.

58. DISASSEMBLY AND ASSEMBLY.

a. Disassembly of Loading Cover and Slide Assembly (fig. 63).

(1) Lift the latches and slide assembly off the feed box.

(2) Remove loading slide retaining plug pin and retainer plug assembly, and disengage the loading slide assembly from the cover by moving it to clear the cover gibs. NOTE: *The slide assembly is under tension of the slide spring which must be controlled when the retaining plug pin is removed.*

(3) Remove the loading slide spring and cable from the loading tube.

(4) Using a small screwdriver, depress the cam switch plunger and lift the switch from its position in the cam.

(5) Remove the cam switch plunger and cam switch spring.

(6) Remove locking wire, pulley bracket screw, pulley bracket clamp screw, and pulley pin.

(7) Remove pulley, pulley spacer, and pulley guard.

(8) Unscrew loading pulley seat and remove it and its lock washer.

(9) Remove the trigger lock lever nut and remove the trigger lock lever, lever spring, and plunger.

(10) Remove interlock lever nut, interlock lever, spring, and plunger.

(11) Parts of loading cover and slide assembly are shown in figure 64.

b. Assembly of Loading Cover and Slide Assembly. Proceed in reverse order of disassembly.

c. Disassembly of Loading Handle Cam and Base Assembly (fig. 65).

(1) Lift the latches and slide assembly forward off feed box.

(2) Remove cotter pin and unscrew front loading handle rod nut, and remove fiber washer, thus releasing loading handle cam assembly and spring.

(3) To remove loading handle cam switch, depress plunger and pull out switch, thus releasing plunger and spring.

(4) Unscrew loading handle rod by removing cotter pin and rear castellated nut.

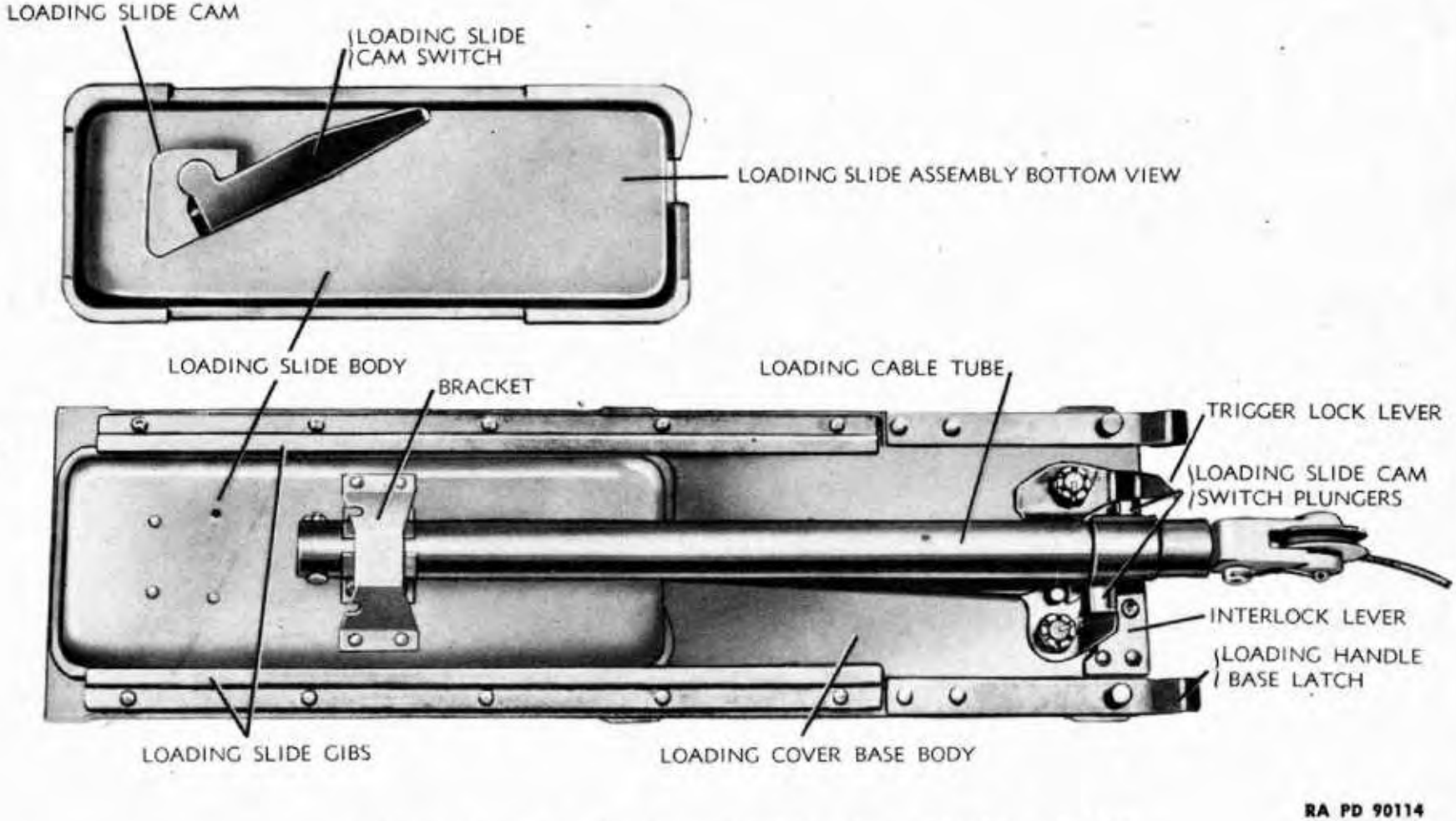


Figure 63—Loading Cover and Slide Assembly (Gun M10)

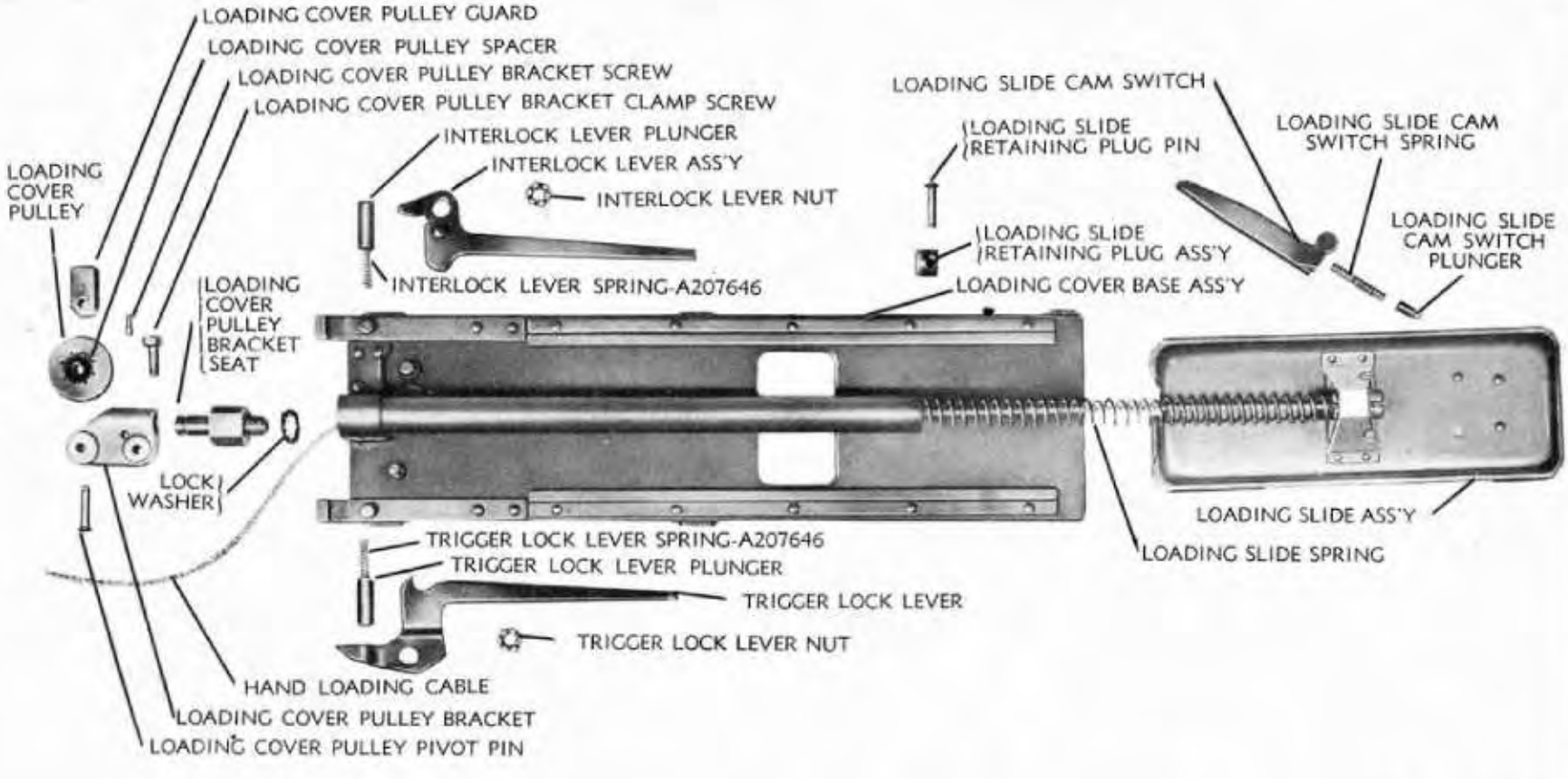


Figure 64—Parts of Loading Cover and Slide Assemblies (Gun M10)

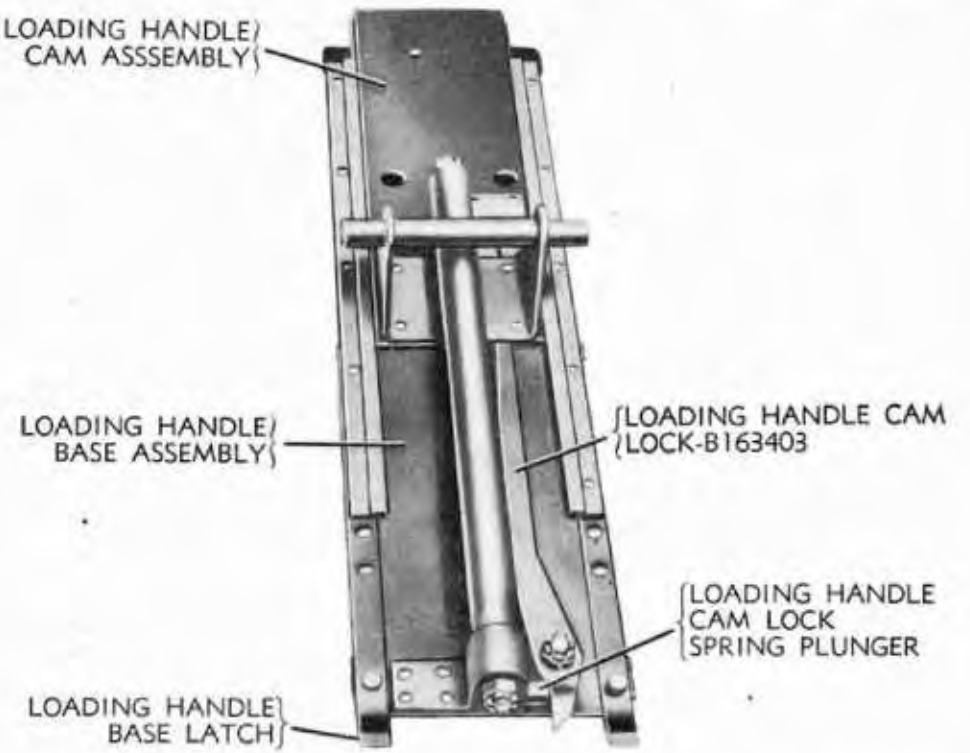


Figure 65—Loading Handle Cam and Base Assembly (Gun AN-M4)

(5) Remove cotter pin and loading handle cam lock nut. Remove loading handle cam lock, thus releasing loading handle cam lock spring and plunger.

(6) Parts of loading handle cam and base assembly are shown in figure 66.

d. Assembly of Loading Handle Cam and Base Assembly.

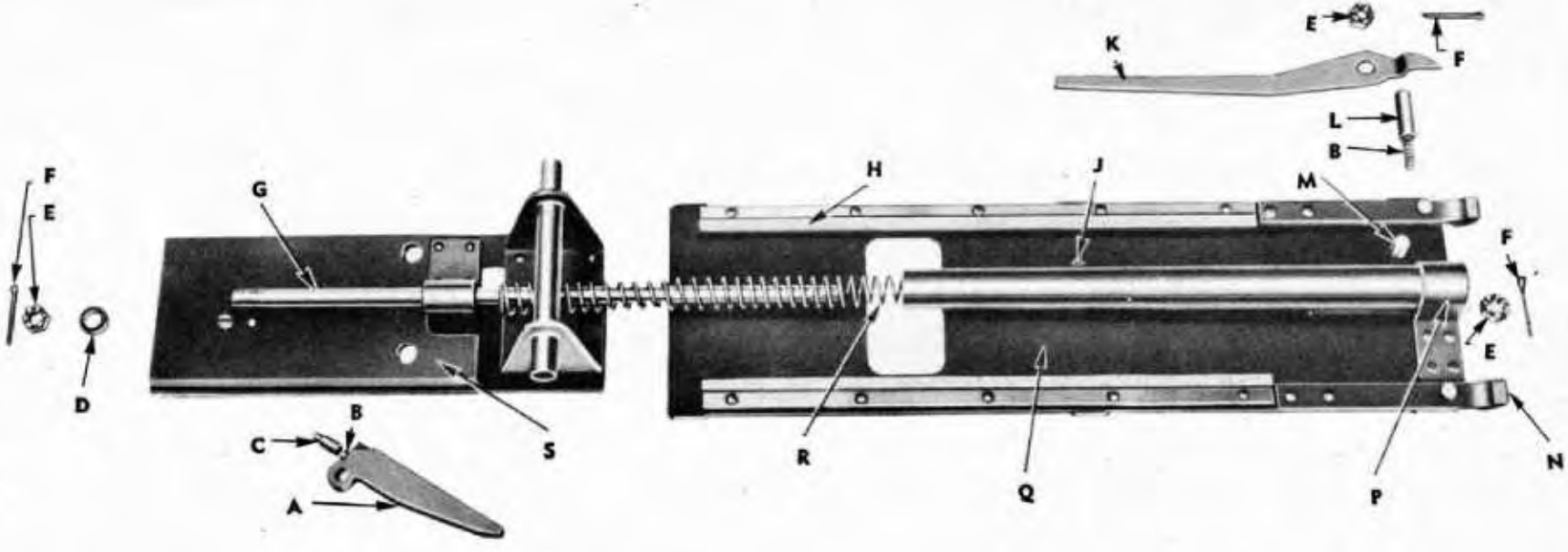
(1) Install loading handle cam lock spring and plunger in tube rear bracket. Place cam lock on stud with front end on right side of stop. Install castellated nut and a $\frac{1}{16}$- by $\frac{5}{8}$-inch cotter pin.

(2) Install loading handle rod in tube and thread into rear bracket. Install castellated nut and a $\frac{1}{16}$- by $\frac{5}{8}$-inch cotter pin (cotter pin head up).

(3) Install loading handle cam switch spring and plunger in switch. Depress plunger and spring while installing switch on stud in cam assembly.

(4) Slide loading handle spring into tube. Slide cam assembly (handle end first) into gibs on base. Compress spring and install fiber washer and castellated nut.

(5) Adjust castellated nut on the front end of the loading handle rod until the loading handle cam follower is centered under



A — LOADING HANDLE CAM SWITCH
B — SPRING TUBE CONNECTION PIN DRIVING SPRING-A25467
C — LOADING HANDLE CAM SWITCH PLUNGER
D — LOADING HANDLE ROD WASHER
E — LOADING HANDLE CAM LOCK NUT-A25669
F — PIN-BFAX1BD
G — LOADING HANDLE ROD
H — LOADING HANDLE CAM GIB
J — LOADING HANDLE CAM LOCK STOP
K — LOADING HANDLE CAM LOCK-B163403
L — LOADING HANDLE CAM LOCK SPRING PLUNGER
M — STUD
N — LOADING HANDLE BASE LATCH
P — LOADING HANDLE TUBE BRACKET ASSEMBLY
Q — LOADING HANDLE BASE BODY
R — LOADING HANDLE SPRING-A25793
S — LOADING HANDLE CAM ASSEMBLY

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Figure 66—Parts of Loading Handle Cam and Base Assembly (Gun AN-M4)

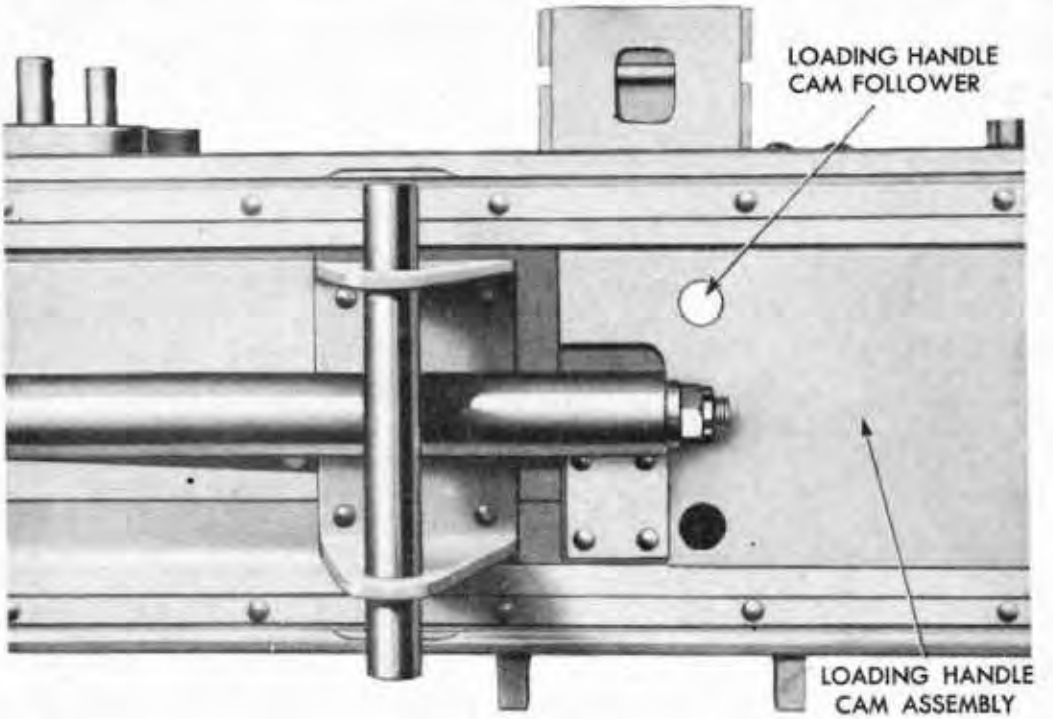

Figure 67—Adjustment of Loading Handle Cam Follower (Gun AN-M4)

the left hole in the cam assembly (fig. 67). This should be done only after gun has been assembled.

e. Disassembly of Feed Box (Gun M10).

(1) Remove the loading cover and slide assembly (par. 58 a).

(2) Loosen wing nuts and remove feed and link chutes (fig. 68).

(3) Remove two external stop pawl screws (fig. 69). Disassemble external stop pawl assembly by sliding pawl from bracket and removing the stop pawl bracket spring and plunger. Drift out stop pawl plunger stop pin and remove external stop pawl plunger and spring.

(4) Lift out the feed crank assembly and remove swivel from the feed lever (fig. 70).

(5) Remove the feed slide lever pin and lever. Depress slide lever plunger and remove retaining pin, which has a head on upper end. Remove plunger and spring (fig. 71).

(6) Remove feed lever pin retaining pin and remove feed lever pin. Remove feed lever from feed box. Remove the two feed lever plungers and springs (fig. 72).

(7) Release the holding pawl and pull feed slide assembly out of feed box. Disassemble feed slide assembly by removing cotter pin and drift out feed pawl pin. Remove feed pawl and spring.

(8) Pry carrier pin lock out slightly and rotate until short end is clear of lock screw; then remove the pin and lock assembly. Lower the carrier assembly down between the side plates (fig. 73).

(9) Hold the carrier catch spring and plunger depressed while removing the carrier catch. Remove plunger and spring (fig. 74).

(10) Remove cotter pin and castellated nut from the cartridge feeder holding pawl (outer) and remove pawl and cartridge feeder pawl connector.

(11) Remove cotter pin and castellated nut from the cartridge feeder stop pawl (inner) and remove the pawl.

(12) Remove cotter pin, and unscrew cartridge feeder pawl handle from the cartridge feeder pawl connector shaft assembly. Remove handle, spring, and shaft from the feed box.

(13) Remove solenoid plunger shaft pin at trigger operating arm.

(14) Remove trigger operating arm and trigger by removing cotter pins and pins.

(15) Unscrew interlock body from interlock plate and remove interlock body, spring, and plate.

(16) Remove six attaching screws and lift feed box from gun.

(17) Parts of feed mechanism are shown in figure 75.

f. Assembly of Feed Box Mechanism (Gun M10).

(1) Install interlock spring and body through feed box rear tie (interlock bracket). Position interlock plate on top of tie, and screw body tight to plate with wrench applied to flats on lower end of interlock body. Stake body to plate. NOTE: *The interlock spring must be positioned in the lower end of the opening through the feed box tie.*

(2) Install trigger and trigger operating arm and pin. Lock pins with $\frac{1}{16}$- by $\frac{5}{16}$-inch cotter pins.

(3) Place rear end of cartridge feeder pawl connector shaft assembly in hole in feed slide guide. Place spring between front end of shaft and feed box. Screw feeder pawl handle into connector shaft through hole in feed box and through the spring. Aline the cotter pin holes and install a $\frac{1}{16}$- by $\frac{5}{8}$-inch cotter pin.

(4) Install stop pawl (inner pawl) in the feed slide guide. Install castellated nut and a $\frac{1}{16}$- by $\frac{5}{8}$-inch cotter pin. Be sure that pawl swings freely.

(5) Hold cartridge feeder pawl connector in position to engage pins on stop pawl and connector shaft while installing holding pawl (outer pawl) on outer end of feed slide guide. Install castellated nut and a $\frac{1}{16}$- by $\frac{5}{8}$-inch cotter pin. Be sure that pawl swings freely.

(6) Place carrier catch plunger and spring in carrier catch bracket in feed box frame. Depress plunger with end of screwdriver

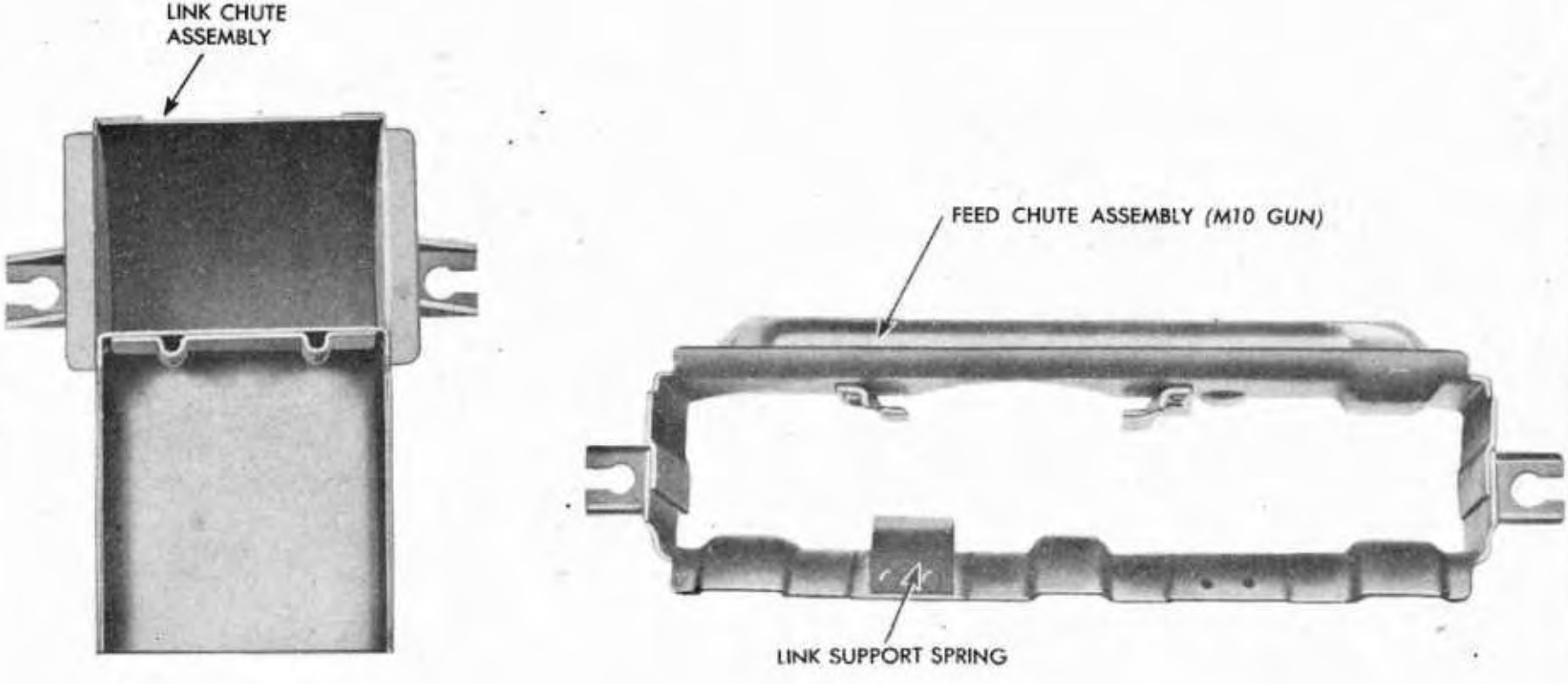

Figure 68—Feed and Link Chute Assemblies (Gun M10)

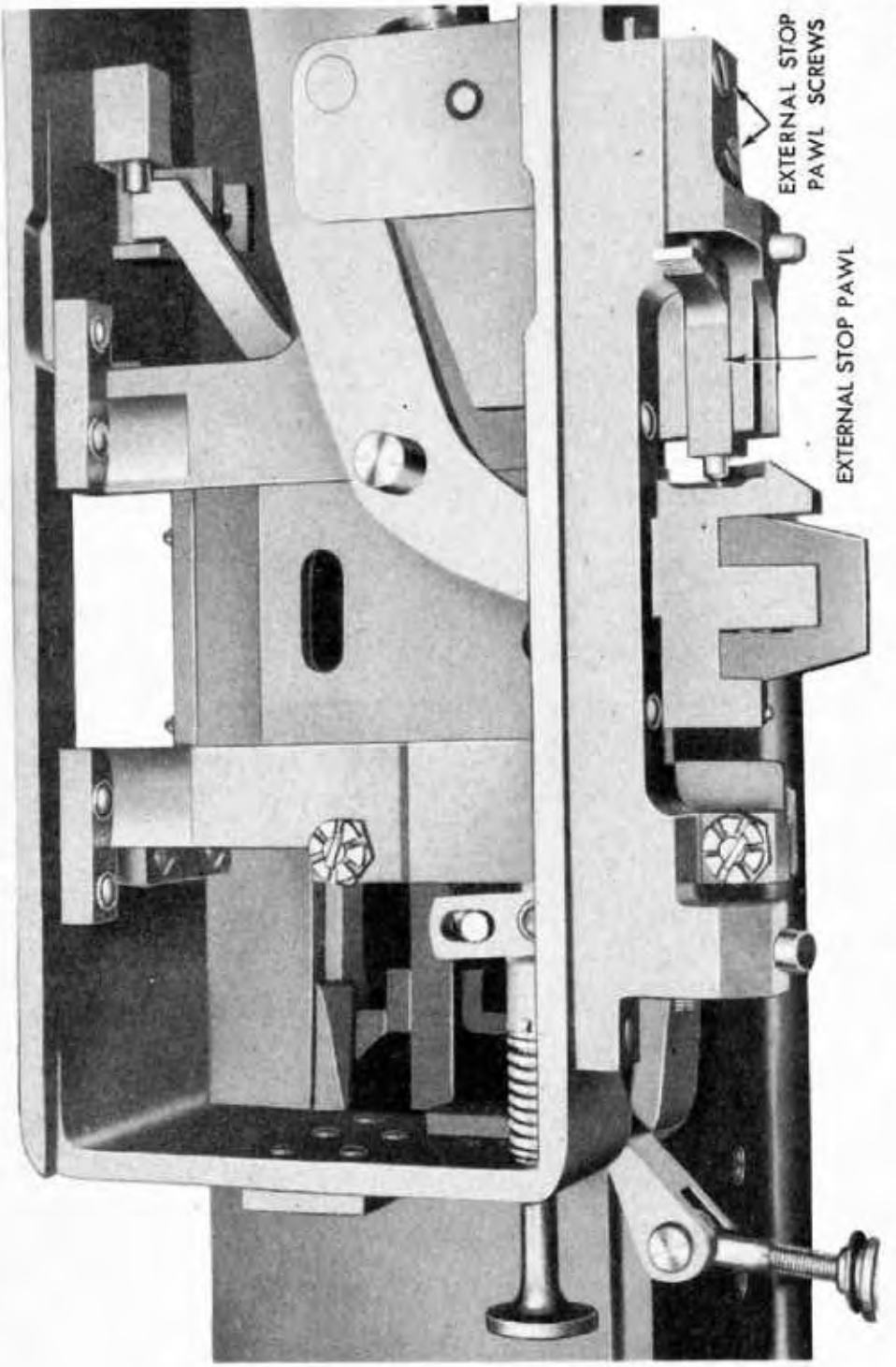

Figure 69—Removal of External Stop Pawl (Gun M10)

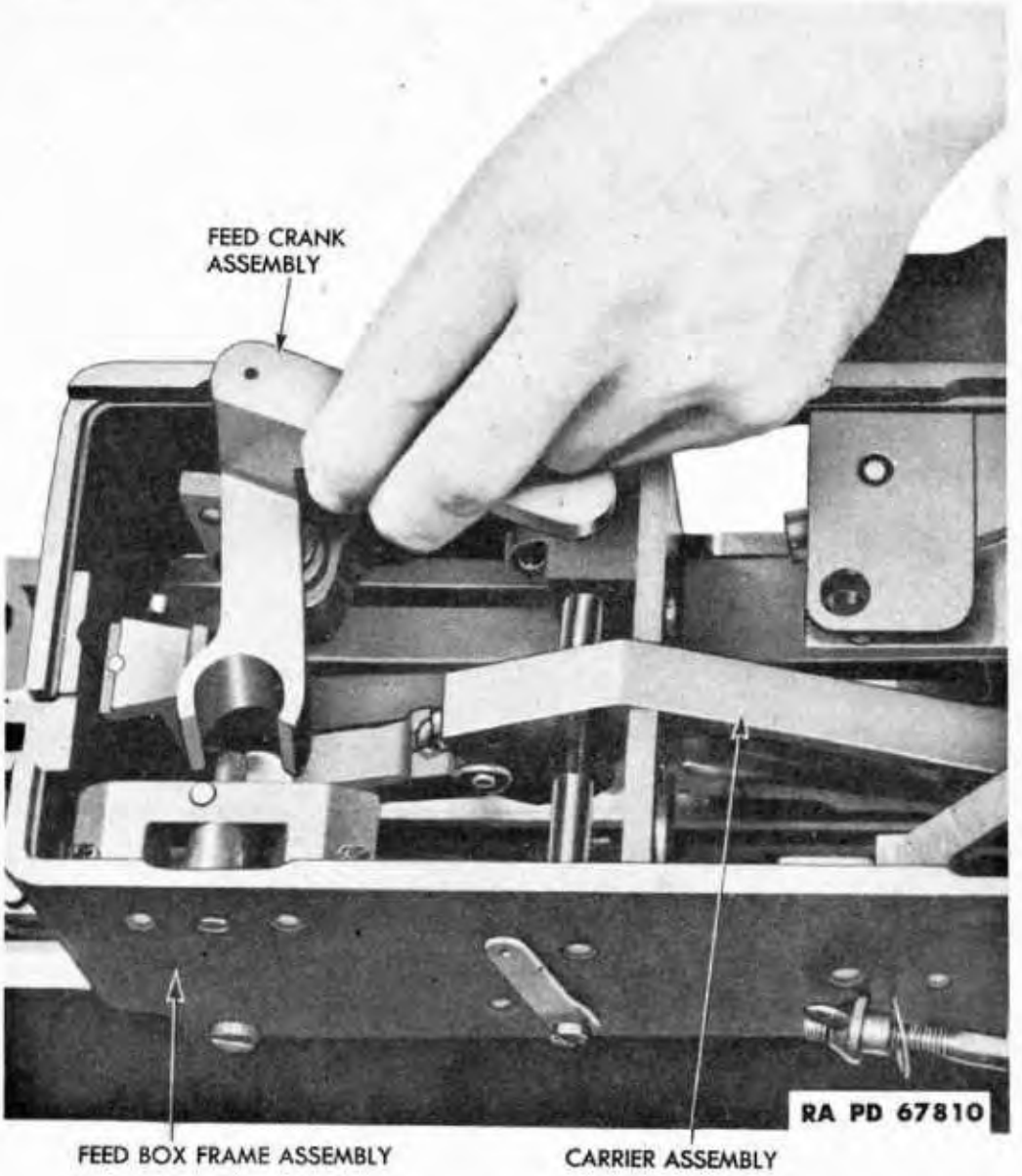

Figure 70—Removing Feed Crank Assembly (Gun M10)

so that carrier catch can be installed. Check for free movement of carrier catch.

(7) Place carrier assembly in feed box, from below, with carrier dog towards rear. Install carrier pin assembly through feed box and carrier. Press pin in and turn lock until short end is engaged under the head of the carrier pin lock screw. Check for free movement of carrier.

(8) Assemble feed slide by inserting feed pawl spring into spring seat, and install pawl with spring entering spring seat. Line up hole in pawl, and slide and install feed pawl pin and a $\frac{1}{16}$- by $\frac{1}{2}$-inch cotter pin.

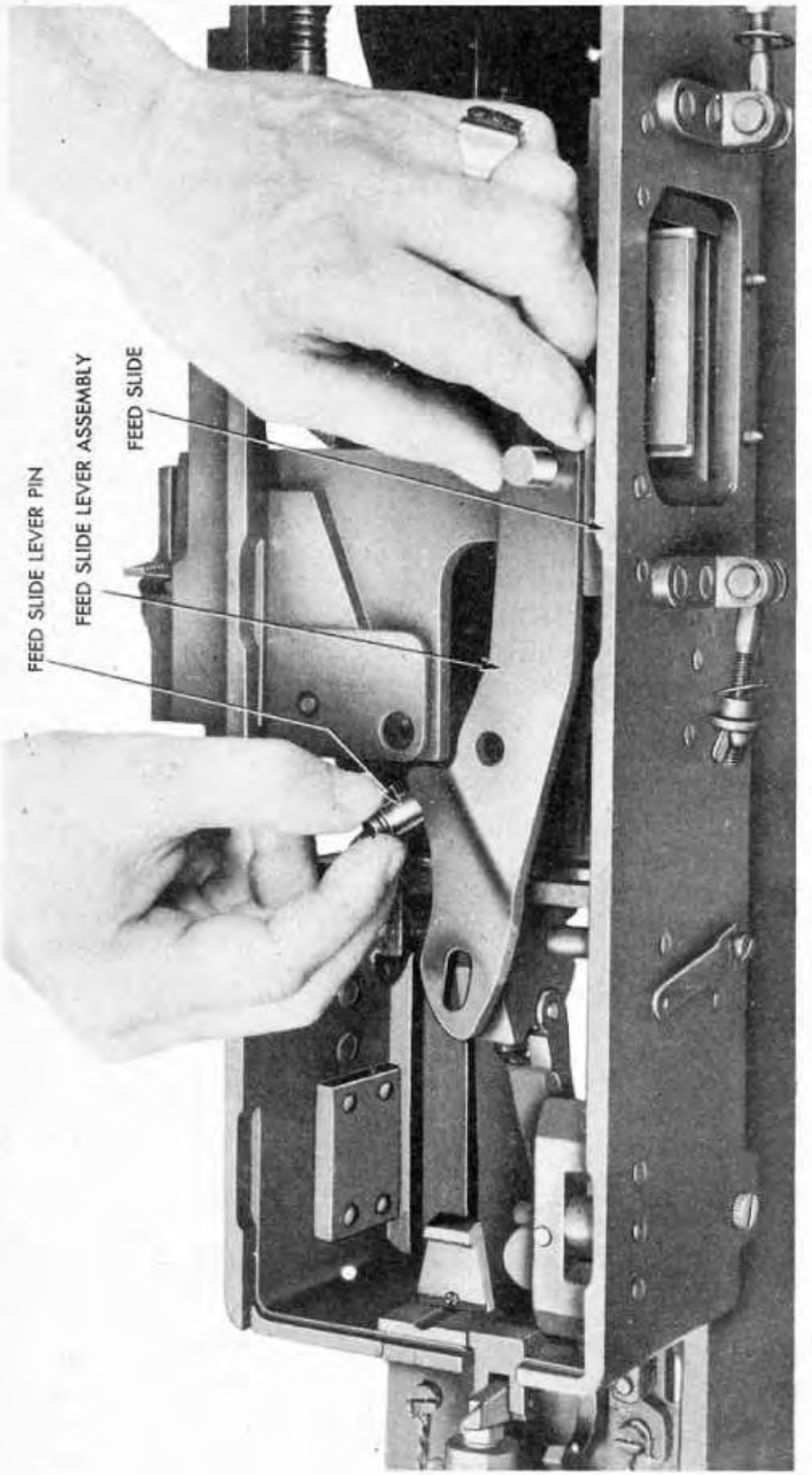

Figure 71—Removal of Feed Slide Lever (Gun M10)

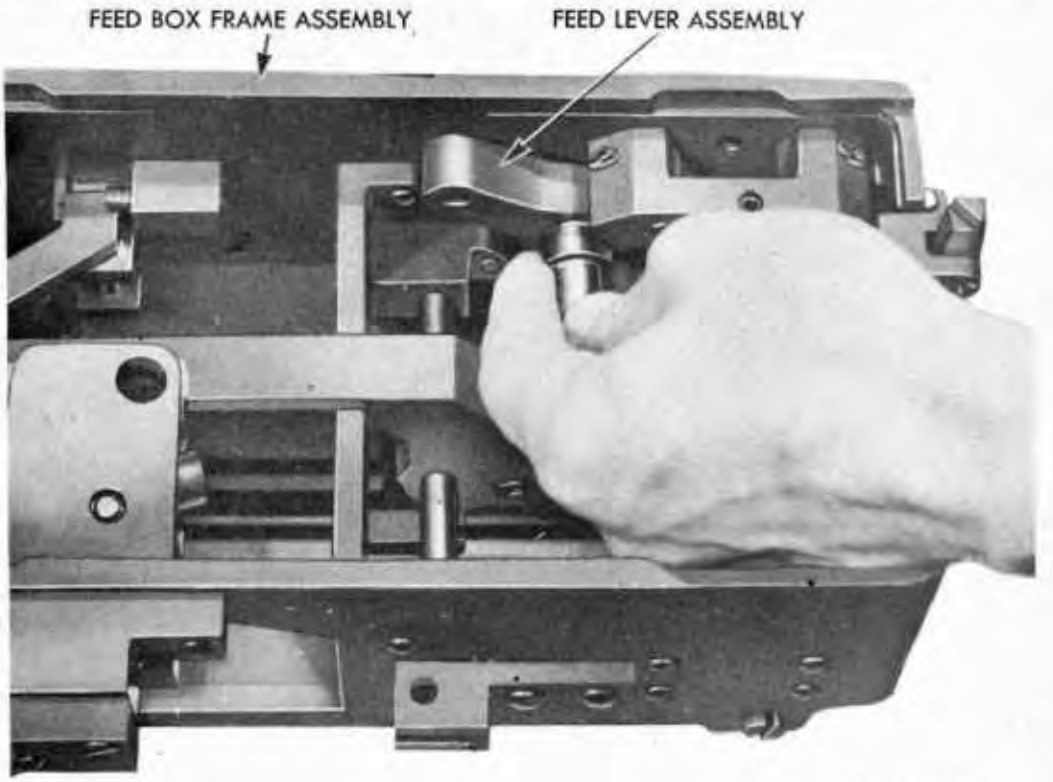

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Figure 72—Removing Feed Lever Assembly (Gun M10)

(9) Install feed pawl assembly (pawl down and to outside) by releasing stop pawl and inserting slide into grooves in feed slide guide.

(10) Install feed lever springs and spring plungers in feed lever bracket (rear corner of feed box) and lock the plungers in place with $\frac{1}{16}$- by $\frac{1}{2}$-inch cotter pins.

(11) Install feed lever, pin, and pin retaining pin. Place swivel on feed lever stud.

(12) Place feed crank assembly in position, with yoke end to rear of feed lever bracket, and with yoke end of feed crank engaging the feed lever swivel.

(13) Install feed slide lever plunger and pin. Hold the plunger and spring depressed and insert the retaining pin.

(14) Push feed slide to the inner side of feed box. Install feed slide lever and pin, with the forked rear end engaging stud on feed crank, and stud on front end engaged in large slot in top surface of the feed slide.

(15) Assemble external stop pawl assembly by placing the stop pawl plunger and spring in pawl, compressing spring sufficiently to permit installation of plunger stop pin, which should be staked in place. Place stop pawl bracket spring and plunger into bracket, compress spring, and install external stop pawl in position on the

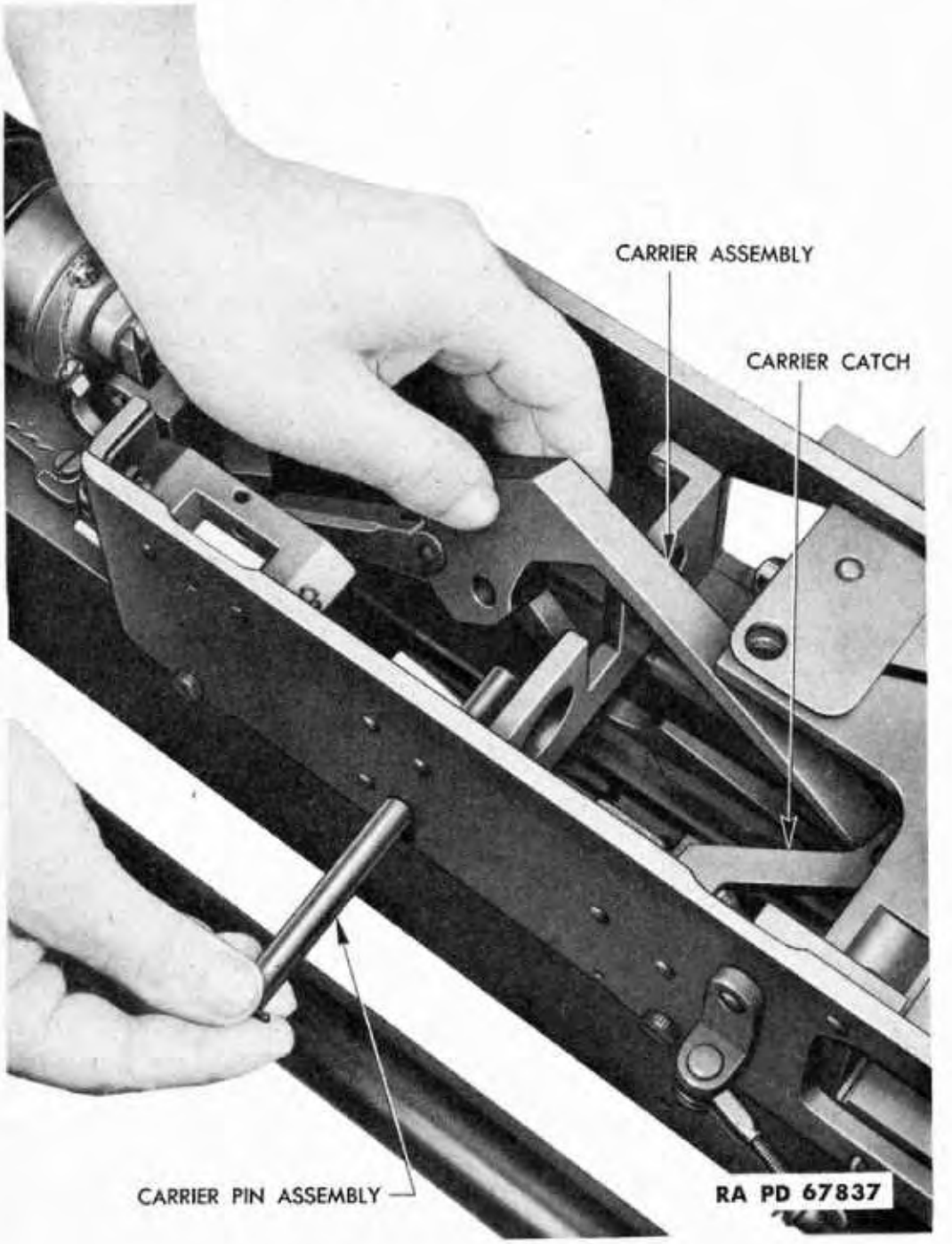

Figure 73—Removing Carrier Assembly (Gun M10)

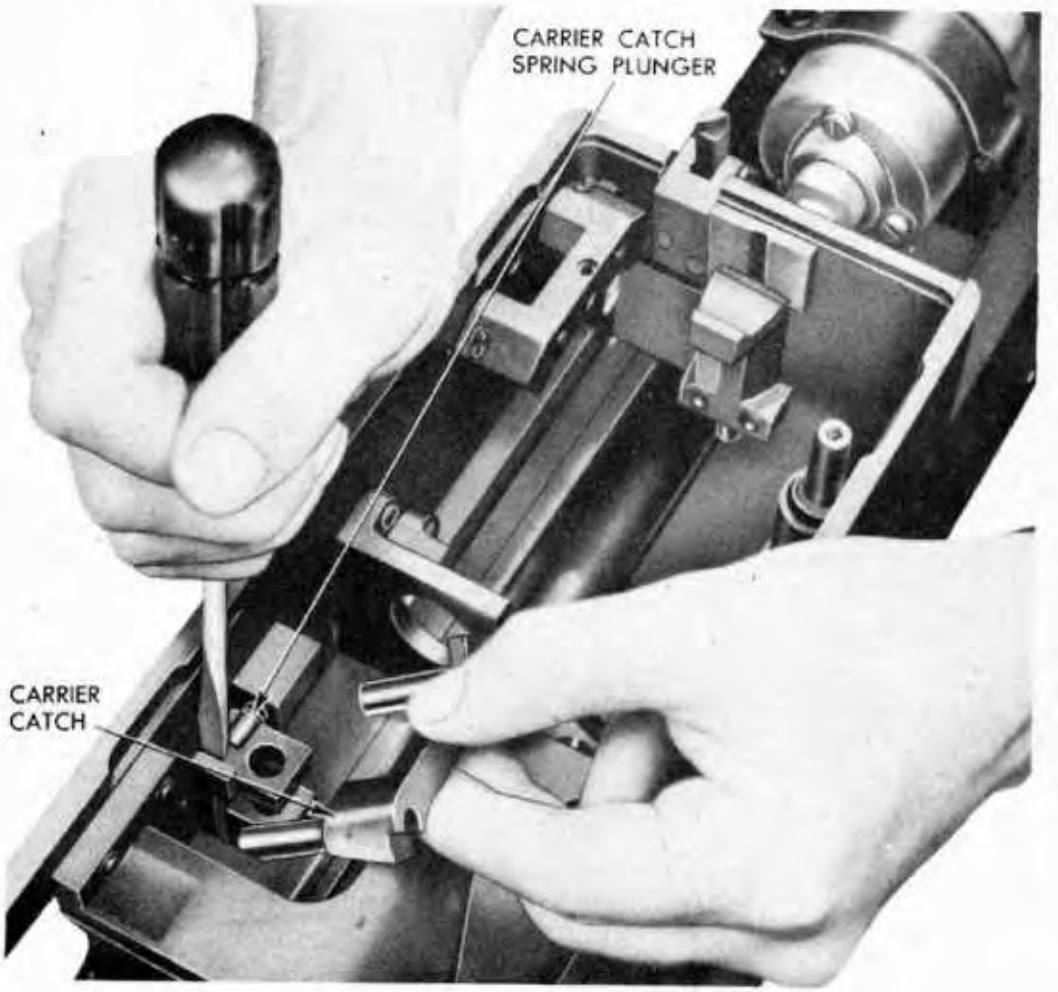

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Figure 74—Removing Carrier Catch (Gun M10)

bracket. Attach external stop pawl assembly to feed box with two fillister-head screws.

g. Disassembly of Feed Mechanism (Gun AN-M4) (fig. 76).

(1) Remove loading handle cam and base assembly (par. 58 **c**).

(2) Lift out the feed crank assembly and remove swivel from the feed lever.

(3) Remove feed slide lever pin and lever. Depress slide lever plunger and remove retaining pin, which has a head on upper end. Remove plunger and spring.

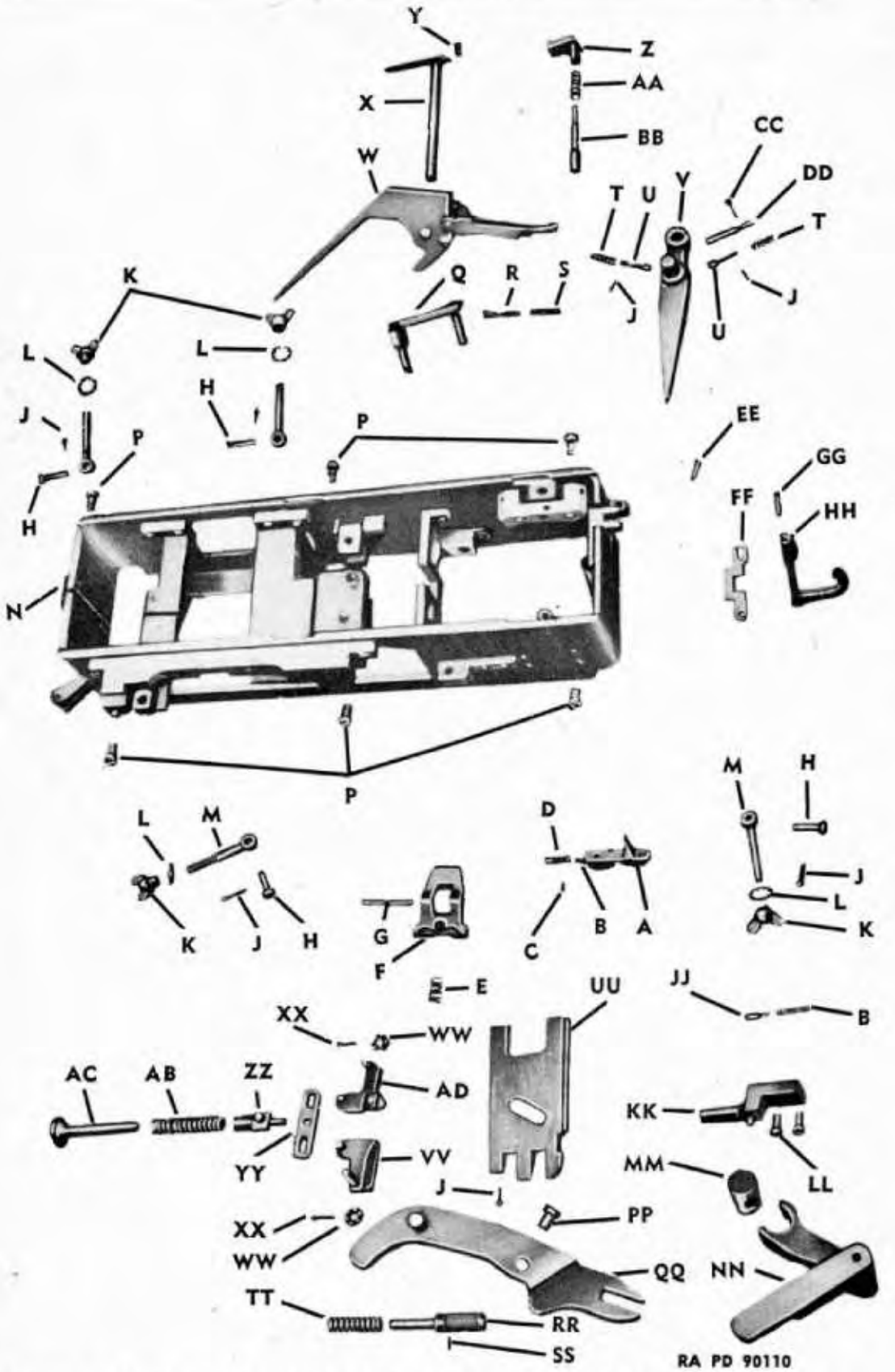

Figure 75—Parts of Left-hand Feed Box and Feed Mechanism (Gun M10)

A — EXTERNAL CARTRIDGE FEEDER STOP BODY
B — EXTERNAL STOP PAWL SPRING-A207433
C — EXTERNAL STOP PAWL PLUNGER STOP PIN
D — EXTERNAL STOP PAWL PLUNGER
E — FEED PAWL SPRING-A207515
F — FEED PAWL BODY
G — FEED PAWL PIN
H — FEED CHUTE EYEBOLT PIN
J — COTTER PIN-BFAX1BA
K — LINK CHUTE EYEBOLT WING NUT
L — LOCK WASHER
M — FEED CHUTE EYEBOLT
N — FEED BOX FRAME
P — FEED BOX SCREW
Q — CARRIER CATCH
R — CARRIER CATCH SPRING PLUNGER
S — CARRIER CATCH SPRING-A25782
T — FEED LEVER SPRING-A25788
U — FEED LEVER SPRING PLUNGER
V — FEED LEVER ASSEMBLY
W — CARRIER ASSEMBLY
X — CARRIER PIN ASSEMBLY
Y — CARRIER PIN LOCK SCREW
Z — INTERLOCK PLATE
AA — INTERLOCK SPRING
BB — LOADING CABLE INTERLOCK BODY
CC — FEED LEVER PIN RETAINER PIN
DD — FEED LEVER PIN
EE — TRIGGER PIN
FF — TRIGGER OPERATING ARM
GG — TRIGGER OPERATING ARM PIN
HH — TRIGGER
JJ — EXTERNAL STOP PAWL BRACKET PLUNGER
KK — EXTERNAL STOP PAWL BRACKET
LL — EXTERNAL STOP PAWL BRACKET SCREW
MM — FEED LEVER SWIVEL
NN — FEED CRANK
PP — FEED SLIDE LEVER PIN
QQ — FEED SLIDE LEVER
RR — FEED SLIDE LEVER PLUNGER
SS — FEED SLIDE LEVER PLUNGER RETAINING PIN
TT — FEED SLIDE LEVER SPRING-A207598
UU — FEED SLIDE
VV — CARTRIDGE FEEDER HOLDING PAWL
WW — CARTRIDGE FEEDER PAWL STUD NUT
XX — COTTER PIN-BFAX1BD
YY — CARTRIDGE FEEDER PAWL CONNECTOR
ZZ — CARTRIDGE FEEDER PAWL CONNECTOR SHAFT
AB — CARTRIDGE FEEDER PAWL SPRING-A25410
AC — CARTRIDGE FEEDER PAWL HANDLE
AD — CARTRIDGE FEEDER STOP PAWL

RA PD 102997

Legend for Figure 75—Parts of Left-hand Feed Box and Feed Mechanism (Gun M10)

(4) Remove feed slide bridge pin. Slide bridge slightly to the left and lift out.

(5) Remove feed slide assembly by releasing cartridge feeder holding pawl. Drift out long pin and remove long feed pawl and spring. Drift out short pin and remove short feed pawl and spring.

(6) Remove carrier pin and lock by prying the lock out slightly and moving it to the rear (counterclockwise) to unlock pin, so that pin and carrier may be removed.

(7) Hold carrier catch spring and plunger depressed while removing catch.

(8) Remove feed lever pin retaining pin and lever.

(9) Depress feed lever plungers and springs, remove cotter pins, and carefully remove springs and plungers.

(10) Remove solenoid plunger shaft pin at trigger operating arm.

(11) Remove the six attaching screws and remove feed box frame assembly.

(12) Remove cartridge feeder stop and holding pawls by removing cotter pins and unscrewing castellated nuts. Remove studs, pawls, springs, and plungers. NOTE: *When servicing this gun, spring A25783 should be used in both the cartridge feeder holding and stop pawls.*

(13) Remove trigger, and trigger operating arm, from feed box by removing cotter pins and pivot pins.

(14) Parts of feed box mechanism are shown in figure 77.

h. Assembly of Feed Box Mechanism (Gun AN-M4).

(1) Place trigger operating arm in feed box frame with square notch in the arm to the outside.

(2) Install operating arm pin with head up, and lock with a 1/16- by 5/16-inch cotter pin.

(3) Place trigger in feed box frame, and install trigger pin and a 1/16- by 5/16-inch cotter pin.

(4) Place plunger and spring A25783 in cartridge feeder stop pawl (short pawl). Install pawl on right end of feed slide track with stud head and pawl on under side. Install castellated nut and lock with a 1/16- by 5/8-inch cotter pin.

(5) Place feed box frame on trunnion block side plates, with end of trigger in front of arm on trigger bar. Install six screws and stake in place.

(6) Check for free movement of trigger, trigger operating arm, and trigger bar.

(7) Install both feed lever plungers and springs and lock in place with 1/16- by 6/16-inch cotter pins.

(8) Install feed lever, pin, and pin retaining pin.

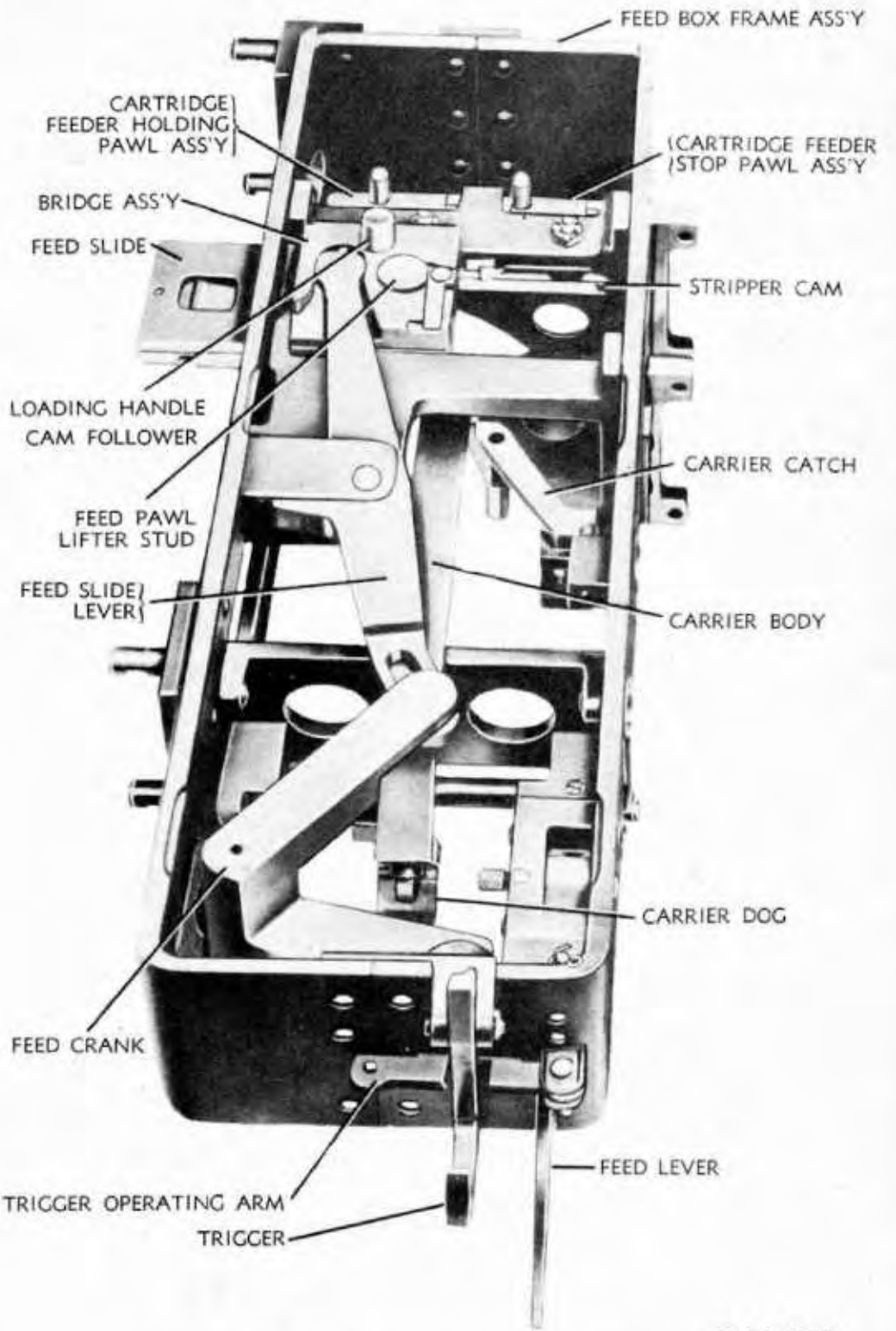

Figure 76—Feed Box Mechanism (Gun AN-M4)

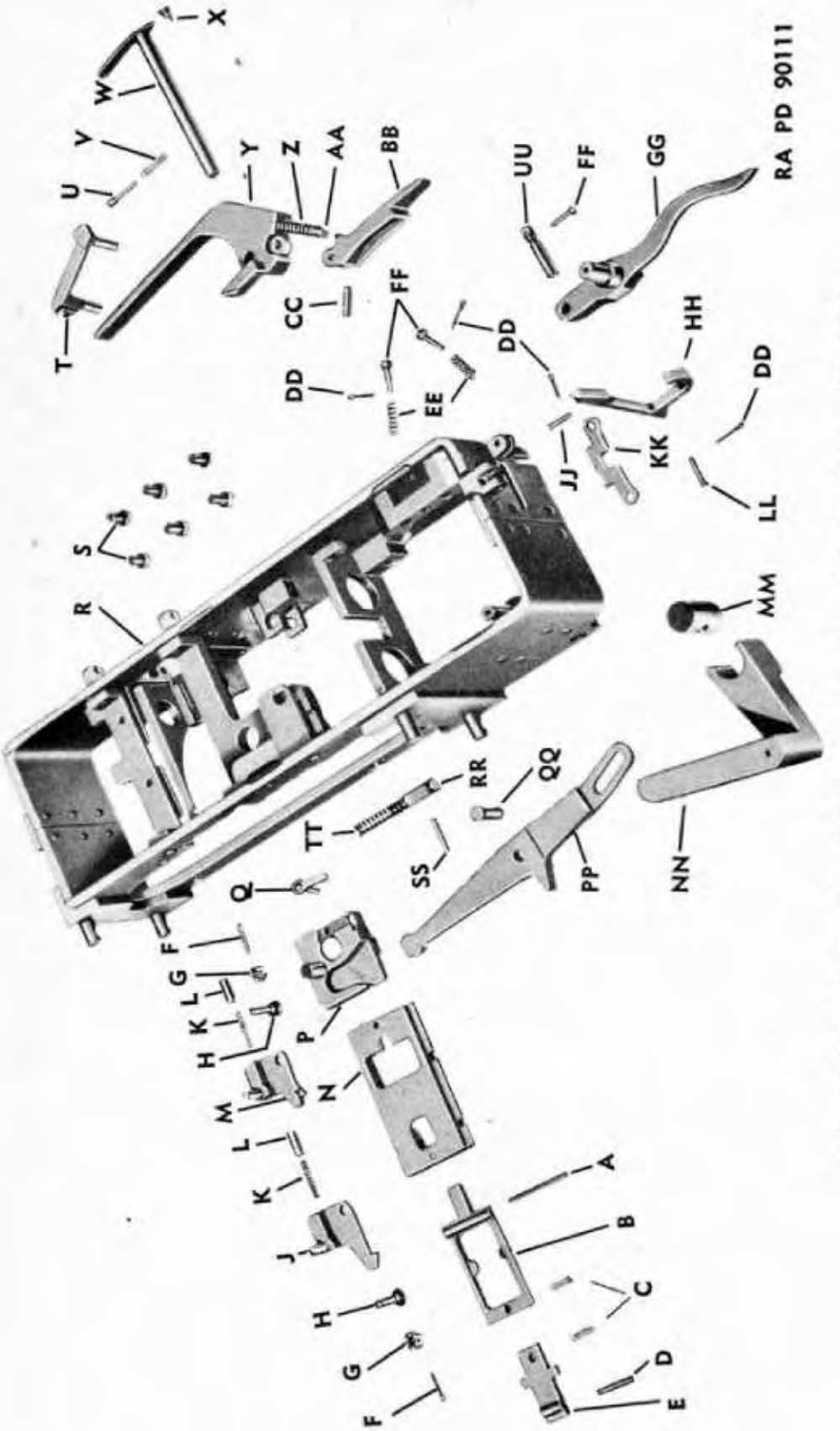

Figure 77—Parts of Feed Box and Feed Mechanism (Gun AN-M4)

A — LONG FEED PAWL PIN
B — LONG FEED PAWL
C — FEED PAWL SPRING-A25789
D — SHORT FEED PAWL PIN
E — SHORT FEED PAWL
F — COTTER PIN-BFAX1BD
G — CARTRIDGE FEEDER PAWL STUD NUT
H — CARTRIDGE FEEDER PAWL STUD
J — CARTRIDGE FEEDER HOLDING PAWL
K — CARTRIDGE FEEDER HOLDING PAWL SPRING-A25783
L — CARTRIDGE FEEDER PAWL PLUNGER
M — CARTRIDGE FEEDER STOP PAWL
N — FEED SLIDE
P — FEED SLIDE BRIDGE
Q — FEED SLIDE BRIDGE PIN ASSEMBLY
R — FEED BOX FRAME ASSEMBLY
S — FEED BOX SCREWS
T — CARRIED CATCH
U — CARRIER CATCH SPRING PLUNGER
V — CARRIER CATCH SPRING-A25782
W — CARRIER PIN ASSEMBLY
X — CARRIER PIN LOCK SCREW
Y — CARRIER BODY
Z — CARRIER SPRING
AA — CARRIER SPRING PLUNGER
BB — CARRIER DOG
CC — CARRIER DOG PIN
DD —COTTER PIN-BFAX1BA
EE — FEED LEVER SPRING-A25788
FF — FEED LEVER PIN RETAINER PIN
GG — FEED LEVER ASSEMBLY
HH — TRIGGER
JJ — TRIGGER OPERATING ARM PIN
KK — TRIGGER OPERATING ARM
LL — TRIGGER PIN
MM — FEED LEVER SWIVEL
NN — FEED CRANK ASSEMBLY
PP — FEED SLIDE LEVER
QQ — FEED SLIDE LEVER PIN
RR — FEED SLIDE LEVER PLUNGER
SS — FEED SLIDE TRACK PLATE PIN
TT — FEED SLIDE LEVER SPRING-A25790
UU — FEED LEVER PIN

RA PD 102999

Legend for Figure 77—Parts of Feed Box and Feed Mechanism (Gun AN-M4)

(9) Place carrier catch plunger and spring in carrier catch bracket in feed box frame. Depress plunger with end of screwdriver so that carrier catch can be installed. When released, the plunger must hook over the top of carrier catch to hold it in place. Check for free movement.

(10) Place carrier in feed box with dog towards rear. Install carrier pin and lock through feed box and carrier from the right side. Press pin in and turn lock clockwise until short end is engaged under the head of the carrier pin lock screw. Check for free movement of carrier.

(11) Place spring and short feed pawl in feed slide with notched end of pawl up. Insert short pin through slide and pawl. Place spring and long pawl (notched end up) in slide, and insert long pin through slide and pawl.

(12) Install slide in feed box, with feed pawls downward, bridge end first.

(13) Place slide bridge on slide and push it to the right. Lock bridge in place by installing feed slide bridge pin and turn the pin lock clockwise to engage notch in the rear edge of bridge.

(14) Place feed slide lever spring and plunger in rear feed slide track in feed box frame. Compress spring and plunger and lock in place with retaining pin inserted from above.

(15) Install feed slide lever, compress plunger, and install feed slide lever pin.

(16) Place swivel on feed lever swivel stud, and install feed crank on feed crank bearing. Lower arm of crank must engage swivel, and feed crank stud must be entered in the slot in rear end of feed slide lever.

(17) Operate feed lever through full travel to check for free movement of all parts of the feed mechanism.

(18) Do not install feed box loading handle base and cam assembly (cover) until gun assembly is completed.

59. MAINTENANCE OF FEED BOX MECHANISM.

a. The many parts of the feed box mechanism must be kept clean and free from dirt, grit, and moisture. All studs, pivoting parts, holes, and plungers must be kept clean, properly lubricated, and free from dents and burs. Cotter pins should always be bent close to their pins or nuts, so that no projecting parts will interfere with the operation of the mechanism.

b. Remove loading cover base assembly and operate feed lever to check action of all of the feeding mechanism.

c. Disassemble and remove feed box parts.

d. Check thoroughly all parts for burs or wear at points of engagement.

e. Check all springs for proper tension.

f. Replace damaged or missing parts. Smooth all burred pivot points, such as pins and studs.

Section XVIII

TUBE AND TUBE EXTENSION GROUP

60. GENERAL.

a. This group consists of the tube and tube extension.

b. Gun Tube (fig. 78).

(1) The gun tube is threaded into, and locked to, the front of the tube extension. There are splines at the muzzle end of the Gun M10 tube for application of a wrench for removing and replacing the tube. The breech end has a deep notch to accommodate the extractor, and a recess is provided to accept the tube lock.

c. Tube Extension (figs. 79 and 80).

(1) The tube extension guides the rear end of the tube and provides a means of connecting the tube to the recuperator mechanism. The recoil and counterrecoil of the tube extension actuate the feed mechanism while the relative movement between the tube extension and lock frame extracts and ejects the empty cartridge case.

(2) The spring-loaded tube lock engages a notch provided in the rear outer circumference of the tube. The lock can be released, when the tube extension is in battery position, by pushing the tube lock depressor to the rear.

(3) A breechblock plunger held in contact with the breechblock by a spring steadies the motion of the breechblock in its slideways (fig. 79). This plunger holds the breechblock in the open position in the slideways if the gun or plane is inverted, thus permitting the weapon to function independent of gravity.

(4) The driving spring front bracket is located at the lower front end of the tube extension. This bracket has two projections to which the driving spring tubes are attached (fig. 80).

(5) The spring-loaded breechblock stop is located at the lower front end of the tube extension. The stop limits the downward movement of the breechblock and positions it where the operating lever of the lock frame may enter the T-slot. It also provides a lock for the recuperator piston rod nut.

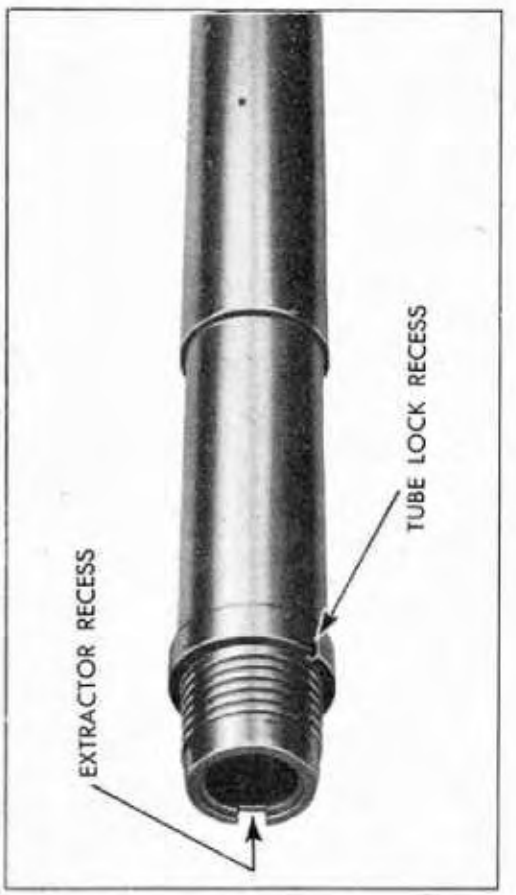

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Figure 78—Gun Tube (Gun M101)

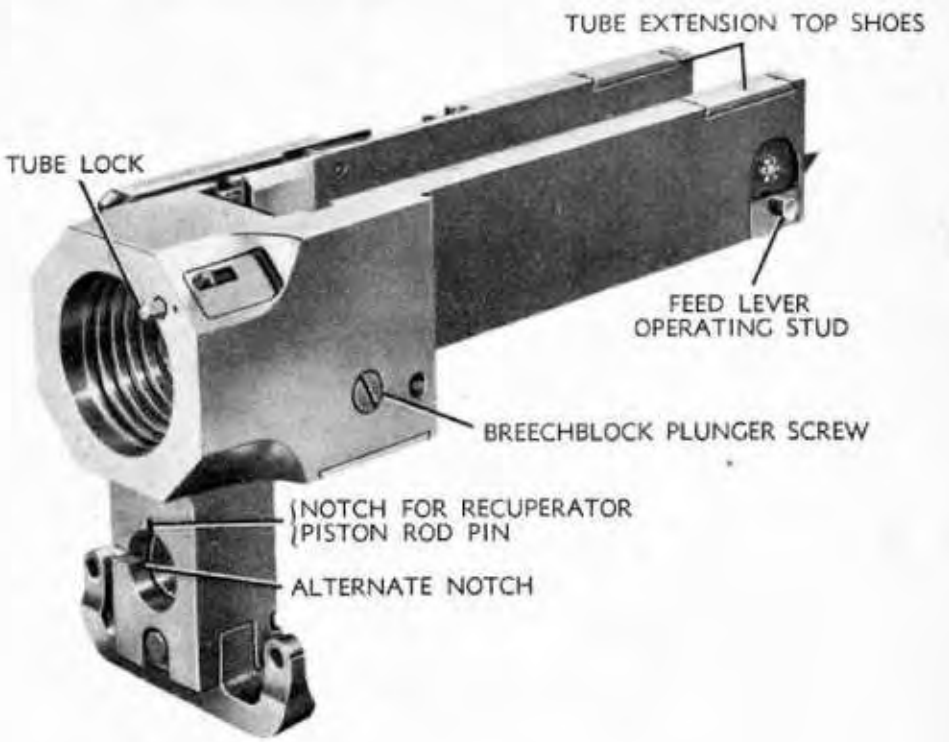

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Figure 79—Tube Extension Assembly (Gun M10)—Left View

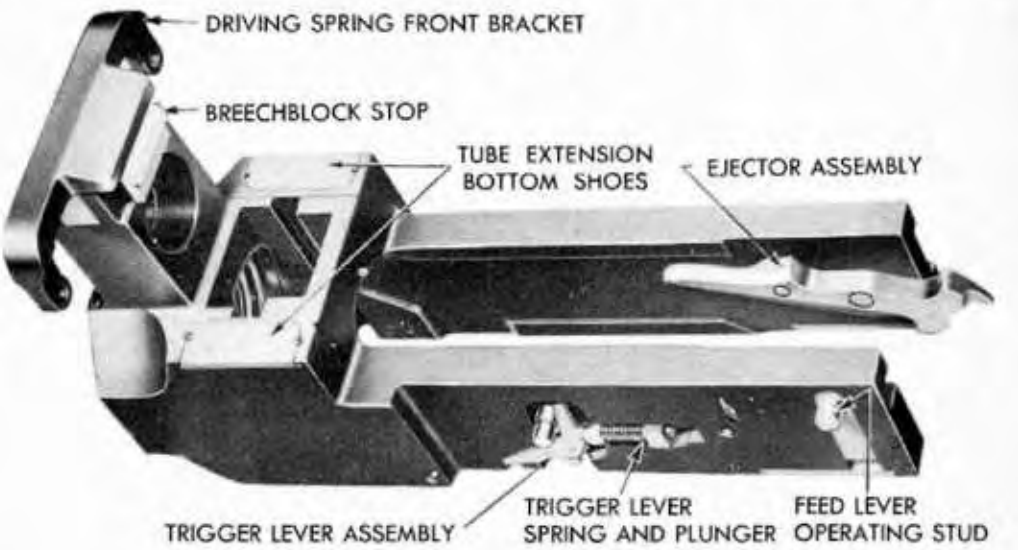

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Figure 80—Tube Extension Assembly (Gun AN-M4)—Bottom View

(6) In Guns M10, two feed lever operating studs are provided (one on each side), so that the tube extension assembly can be used with either a left- or right-hand feed. As the tube extension recoils, the stud passes to the rear of the feed lever. On counterrecoil, the stud

pivots the feed lever forward, thus actuating the entire feeding mechanism and feeding a new round into the gun. The Gun AN-M4 has but one feed lever operating stud provided on the right side, as this gun feeds only from the left.

(7) The ejector (fig. 80) pivots on a stud and is located on the inside of the left side plate of the tube extension. As the cartridge case is extracted from the cartridge chamber, a stud located in the left side of the lock frame assembly operates the ejector which forces the case out through the bottom of the gun.

(8) The trigger lever assembly, trigger lever spring, and plunger are located on the right side of the tube extension. The trigger trip is also located on the right side in a recess provided in the tube extension. The trigger bar lies in a groove along the top of the right side plate top flange, and transmits the motion of the trigger to the sear through the trigger levers. The trigger is pivoted on a pin so that when its front end is raised by the breechblock (in battery position) its rear end is held down to serve as a stop for the trigger lever connector. The trigger lever spring and plunger serve to return and hold the trigger, trigger bar, and trigger lever assembly forward when the trigger is released.

61. REMOVAL AND REPLACEMENT.

a. Removal of Tube (Gun AN-M4).

(1) Retract the lock frame. *This is very important; otherwise the extractor will be damaged.*

(2) Unscrew the trunnion block bushing until the threads are disengaged from the trunnion block (fig. 24) using special wrench 41-W-3336-800.

(3) Keeping the tube lock depressor pushed to the rear, unscrew the tube counterclockwise five turns (fig. 23) using girth pipe wrench 41-W-1802-25.

(4) Remove the tube. The trunnion block bushing will be carried forward by the shoulder of the tube. The halves of the bushing may be separated by inserting a screwdriver in slots provided for this purpose (fig. 81).

b. Replacement of Tube (Gun AN-M4).

(1) Reassemble the trunnion block bushing on the tube with flange toward muzzle. CAUTION: *Make certain that the lock frame is retracted.*

(2) Coat threads of tube with anti-seize mica-base compound, to prevent damage to the threads.

(3) Carefully insert tube and bushing until pilot on bushing has fully entered the trunnion block.

(4) Push the tube rearward until it contacts the tube extension. Maintaining pressure rearward, slowly turn tube counterclockwise

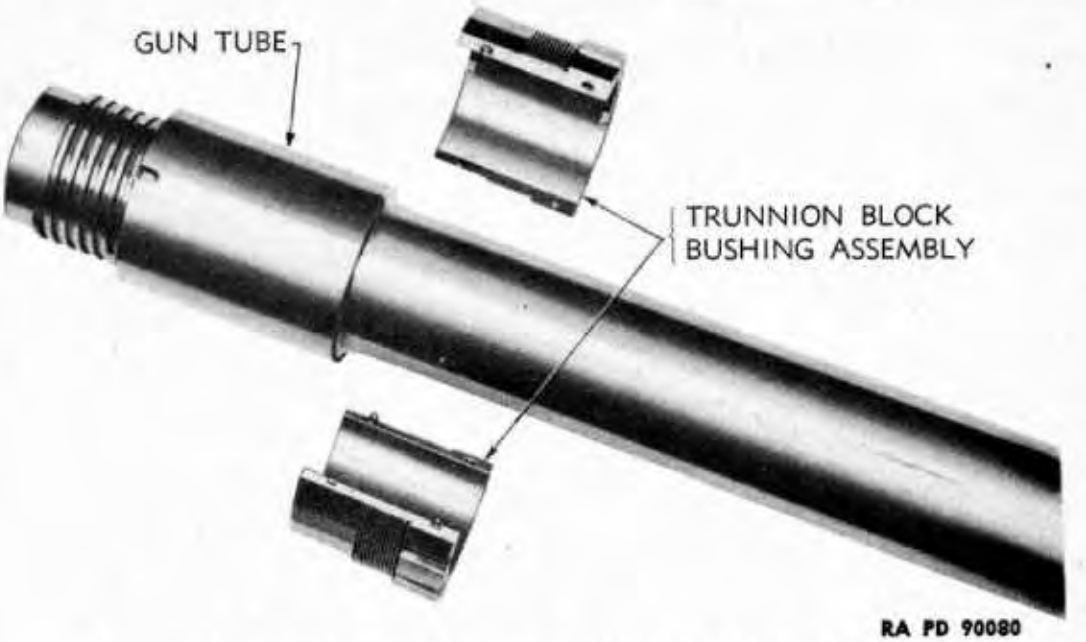

Figure 81—Tube and Trunnion Block Bushing (Gun AN-M4)

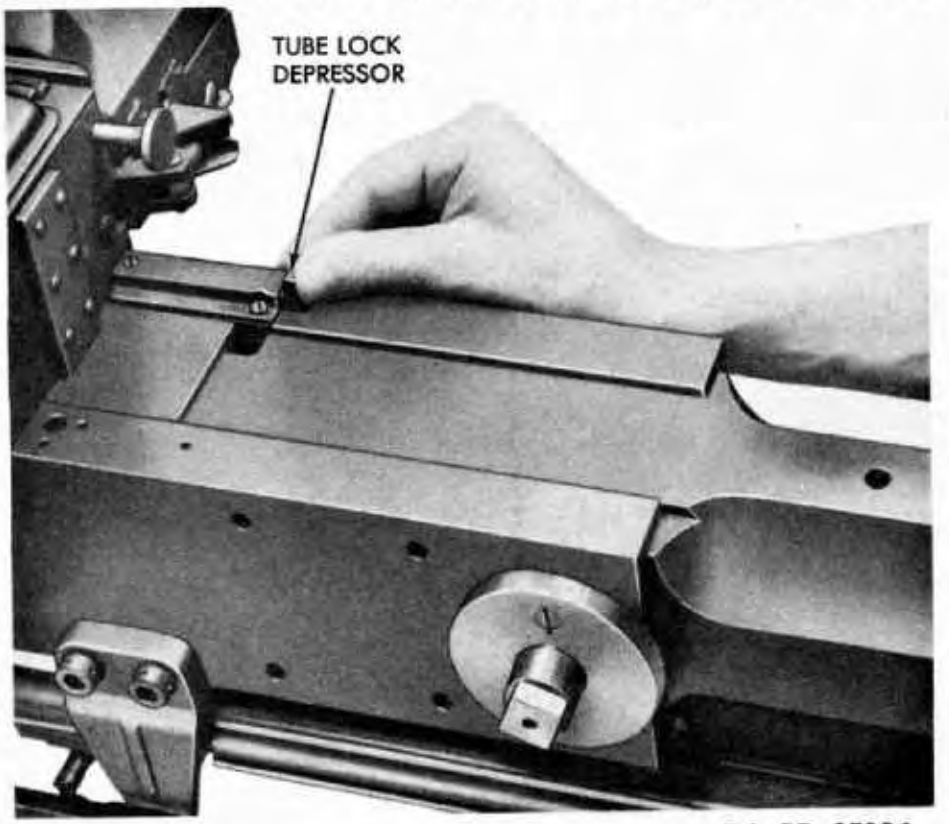

Figure 82—Depressing Tube Lock Depressor

until a slight bump is felt, indicating that the end of the thread on the tube has indexed with the thread in the tube extension. Turn tube clockwise, approximately five revolutions by hand, until the tube is

seated. Do not depress the tube lock because it must snap into the groove in the tube just as the shoulder contacts the tube extension. Check this lock engagement by looking through the sighting hole. CAUTION: *Tube should thread into tube extension freely.* If it does not, do not force it with the girth wrench. Remove the tube and examine threads on tube and in extension for burs or rough spots, which should be removed with a fine stone. NOTE: *If the recuperator piston rod nut has been removed or loosened during repairs to gun, it should not be reinstalled until after the gun tube has been installed. When indexing the tube threads when this nut is off, it will be necessary to hold the tube extension forward either by hand or with a suitable wooden wedge inserted between the lower flange of the side plate and the tube extension.*

c. Removal of Tube (Gun M10).

(1) Retract lock frame.

(2) Place tube wrench 41-W-640-300, on the splines at the muzzle end, push tube lock depressor to the rear as far as it will go (fig. 82), and unscrew the tube counterclockwise (fig. 8). After about one-quarter turn, the tube lock depressor can be released and the tube unscrewed by hand until the threads are disengaged after approximately five turns. If considerable force is required, it is probably due to binding of the threads which may be avoided by lifting slightly on the muzzle end and turning only when the tube rotates freely.

(3) Slide the tube from the trunnion block.

d. Replacement of Tube (Gun M10).

(1) Retract the lock frame, coat threads of tube with anti-seize compound and install, following the same procedure as in the case of Gun AN-M4.

e. Removal of Tube Extension.

(1) Remove the lock frame, back plate, breechblock, feed lever, tube, and carrier from the gun.

(2) Detach the driving spring assemblies from the tube extension.

(3) With the breechblock stop depressed, unscrew the piston rod nut using wrench 41-W-3252-80 (fig. 7).

(4) Slide the tube extension out through the rear of the trunnion block side plates.

f. Installation of Tube Extension.

(1) Insert the tube extension into the rear of the trunnion block assembly and slide it to its forward position.

(2) Aline the pin on the shoulder of the recuperator piston rod assembly with the mating notch in the front face of the tube extension (fig. 83). During the installation of the recuperator piston rod

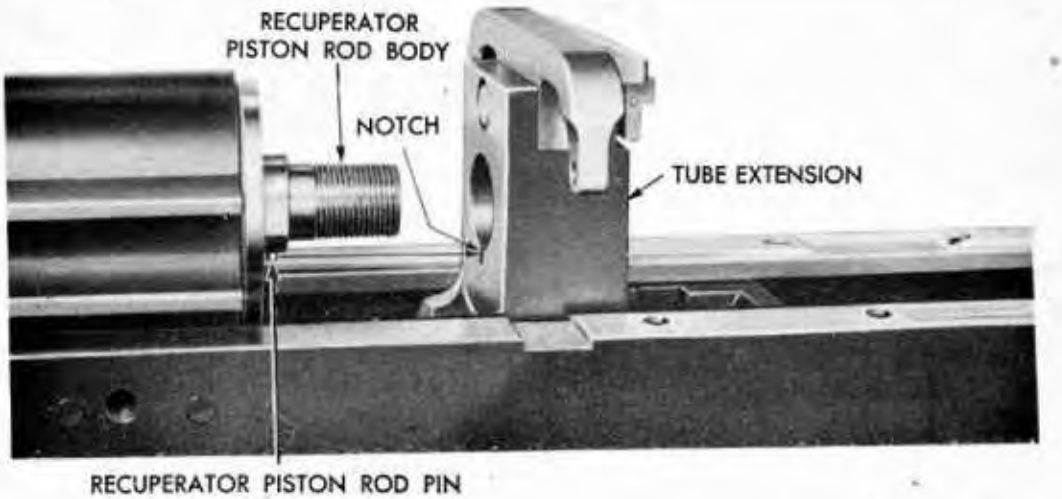

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Figure 83—Installing Tube Extension on Recuperator Piston Rod

nut, the piston rod must be prevented from turning so that the pin will engage this notch.

(3) Install the gun tube.

(4) Holding the breechblock stop depressed, screw the piston rod nut on tight, making sure that one flat of the nut is in line with the top of the breechblock stop. When properly tightened, this nut should be approximately flush with the end of the recuperator piston rod. NOTE: *The gun tube should be installed before the recuperator piston rod nut is tightened to permit slight shifting of the tube extension and insure proper alinement.*

(5) Replace the driving spring assemblies, carrier, feed lever, breechblock, lock frame, and back plate.

62. DISASSEMBLY AND ASSEMBLY.

a. Disassembly of Tube Extension.

(1) Remove breechblock stop by drifting out breechblock stop locking pin. Unscrew breechblock stop retaining screw and remove spring and stop.

(2) Remove tube lock plate assembly by depressing tube lock plate plunger through the small hole in front face of tube extension (fig 84). Then remove tube lock spring and lock.

(3) Remove trigger trip pin and trigger trip.

(4) Remove trigger lever pin, compress trigger lever plunger and spring, and hold fully compressed by means of wire looped over front end of plunger, or by holding rear end of plunger with pliers. If pliers are used, care must be exercised not to bur the plunger. Remove trigger lever assembly, spring, and plunger.

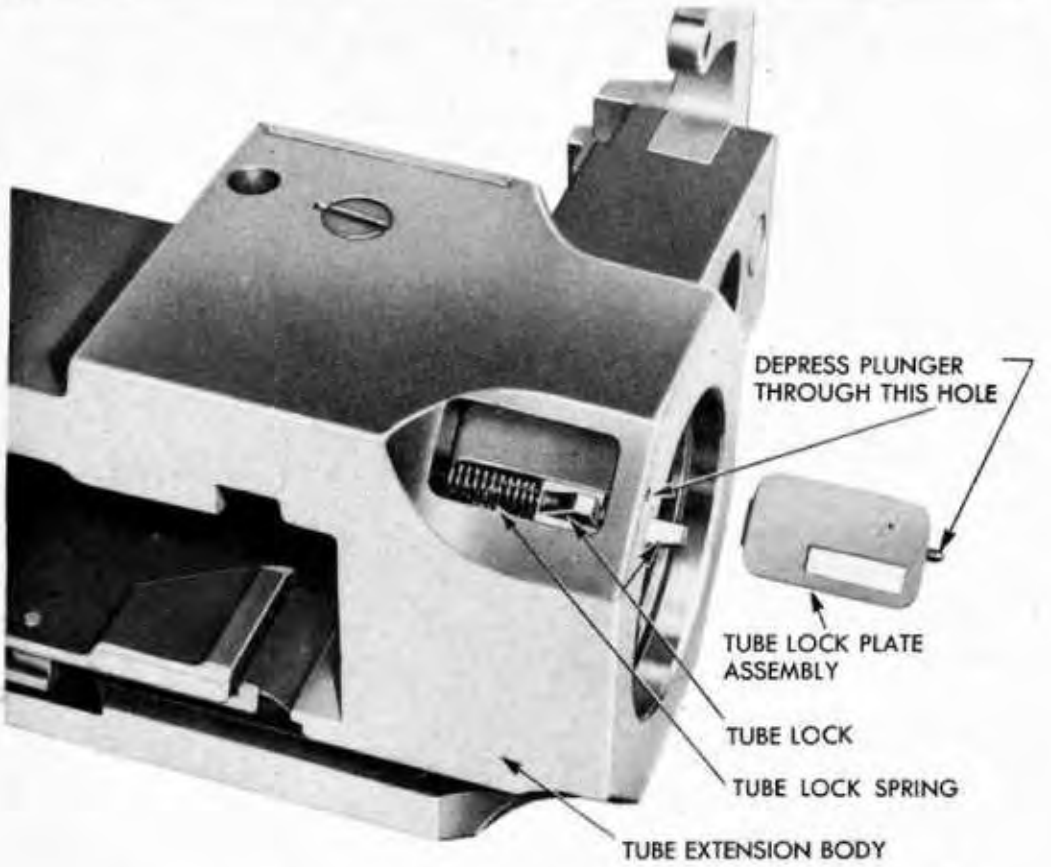

Figure 84—Tube Lock and Lock Plate Assembly

(5) Remove cotter pin and castellated nut from ejector stud, and remove ejector, ejector stud, spring, and plunger.

(6) Remove breechblock plunger screw, spring, and plunger. The screw is staked in place.

(7) Riveted parts of the tube extension will not be removed by using arms. Replacement of these parts will be made only by authorized ordnance service personnel.

(8) Parts of tube extension are shown in figure 85.

b. Assembly of Tube Extension.

(1) Install breechblock plunger, spring, and screw in left side of tube extension until screw is slightly below surface. Stake screw in place. Screw must not be screwed in until it bottoms spring and binds the breechblock.

(2) Place ejector spring and plunger and stud in ejector. Install these parts in tube extension with stop pin on ejector in recess in tube extension. Install castellated nut and lock pin (0.041-by 7/8-inch wire).

(3) Place trigger lever spring and plunger in the trigger lever

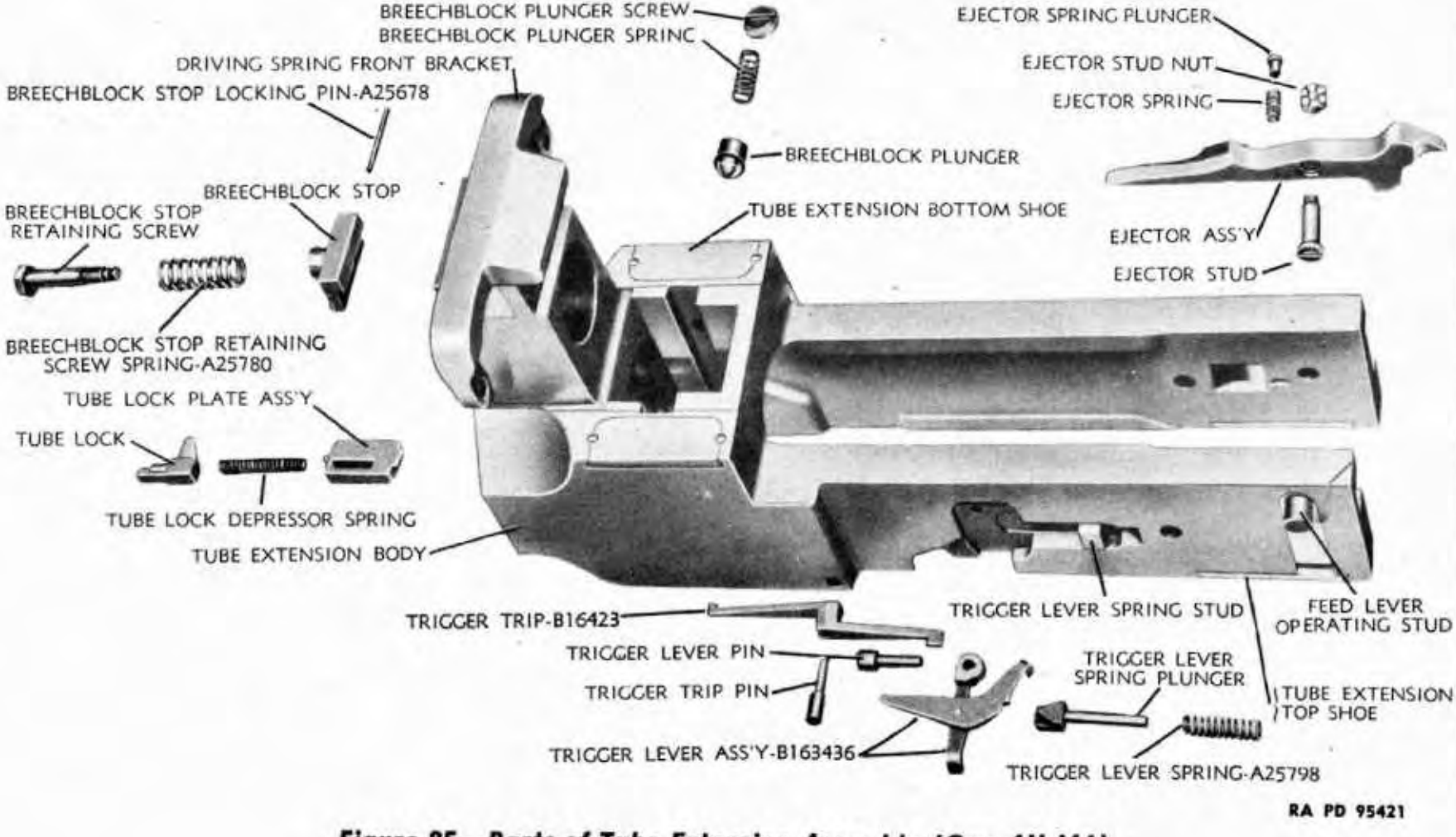

Figure 85—Parts of Tube Extension Assembly (Gun AN-M4)

stud on tube extension. Hold the spring fully compressed by drawing back on a wire looped over the front end of the plunger while installing the trigger lever assembly. Install trigger lever pin. NOTE: *As an alternative, the spring may be held fully compressed by pliers on the rear end of the plunger. However, when using this method, care must be exercised to avoid burring the plunger.*

(4) Install trigger trip and pin with long end of trigger trip to the front.

(5) Install tube lock and spring. Install tube lock plate assembly, with tongue on the rear end downward, to engage groove in tube extension body.

(6) Install breechblock stop retaining screw, spring, and stop. Screw retaining screw into stop until rear end is flush with surface of stop. Install locking pin, turning screw slightly as needed to allow pin to enter groove in end of screw.

NOTE: *The Barrels M4 and M10 are interchangeable in their respective breech rings. When circumstances are such that the barrel cannot be separated from the breech ring and a complete cannon must be substituted for an unserviceable barrel, cut off the old barrel about 3 inches from the breech ring. Ship the ring to the Commanding General, Watervliet Arsenal, Watervliet, N. Y. If the breechblock will not be needed as a replacement or as a spare block, it should be shipped with the breech ring. Parts of breech mechanisms that can be used as spares may be retained. All other parts should be returned to Watervliet Arsenal.*

63. MAINTENANCE OF TUBE AND TUBE EXTENSION.

a. Tube.

(1) Daily, clean the bore out by thoroughly wiping with clean burlap or wiping cloths and oiling the bore with preservative lubricating oil (special). Because of the possibilities of damage to the bore, decoppering is prohibited. Steel wire bore brushes will not be used. Bronze wire brushes are furnished for removing light rust and residue.

(2) Remove tube and trunnion block bushing. Examine the bore and note cleanliness and any evidence of pitting, erosion, and wear of the cartridge chamber. Check exterior polished bearing surface for mutilation or scoring. Note condition of threads. Check interior surface of trunnion block bushing for wear or scoring.

(3) Smooth down all burs and abrasions with a fine abrasive such as crocus cloth. Smooth damages on the threads of the gun tube or tube extension. If the tube does not seat firmly, the trunnion block bushing or the tube threads might be excessively worn. Replace all parts which cannot be made to fit properly.

b. Tube Extension.

(1) Remove tube extension.

(2) Check for wear or scoring on shoes, breechblock recess, and tube threads.

(3) Check action of ejector and note spring tension.

(4) Check breechblock plunger for free movement.

(5) Manipulate trigger mechanism and check for freedom of action. Note condition of tube lock.

(6) Smooth all rough surfaces and replace all parts which cannot be made to function properly when repaired.

(7) Check and replace worn springs.

Section XIX

RECUPERATOR MECHANISM

64. FUNCTIONING (fig. 86).

a. The recuperator group consists principally of an oil-filled recuperator cylinder, bushing, two end caps and packings, piston, and piston rod, stuffing box packings, and one recuperator spring. It hydraulically controls the recoil and counterrecoil of the tube and tube extension, and serves to return these parts to the battery position.

b. The recuperator piston rod is pulled rearward by the tube extension during recoil. The piston on the front end of the rod is drawn rearward in the recuperator bushing. This bushing, secured in the front end of the recuperator cylinder, has three elongated slots tapered at the rear end and rounded at the front end.

c. The fluid on the rear side of the piston is forced through these slots to the front side, as the piston moves rearward. Therefore, the long tapered rear ends of the slots restrict the bypassing of oil as the tube and tube extension near the rear end of their travel. The tapered slots provide an increasingly greater restriction to the flow of oil on the last part of the recoil stroke, and the rearward movement of the tube and tube extension is decreased accordingly.

d. During this action the recuperator spring is compressed. When the land of the piston reaches the end of the slots, the passage of oil has been entirely blocked, thus providing an almost solid stop against the confined fluid. The tube and tube extension are returned to battery position by the force of the recuperator spring.

e. The movement of these parts near the forward end of their travel during counterrecoil is controlled by the rounded front end of the slots in the recuperator bushing in the same manner as the recoil action.

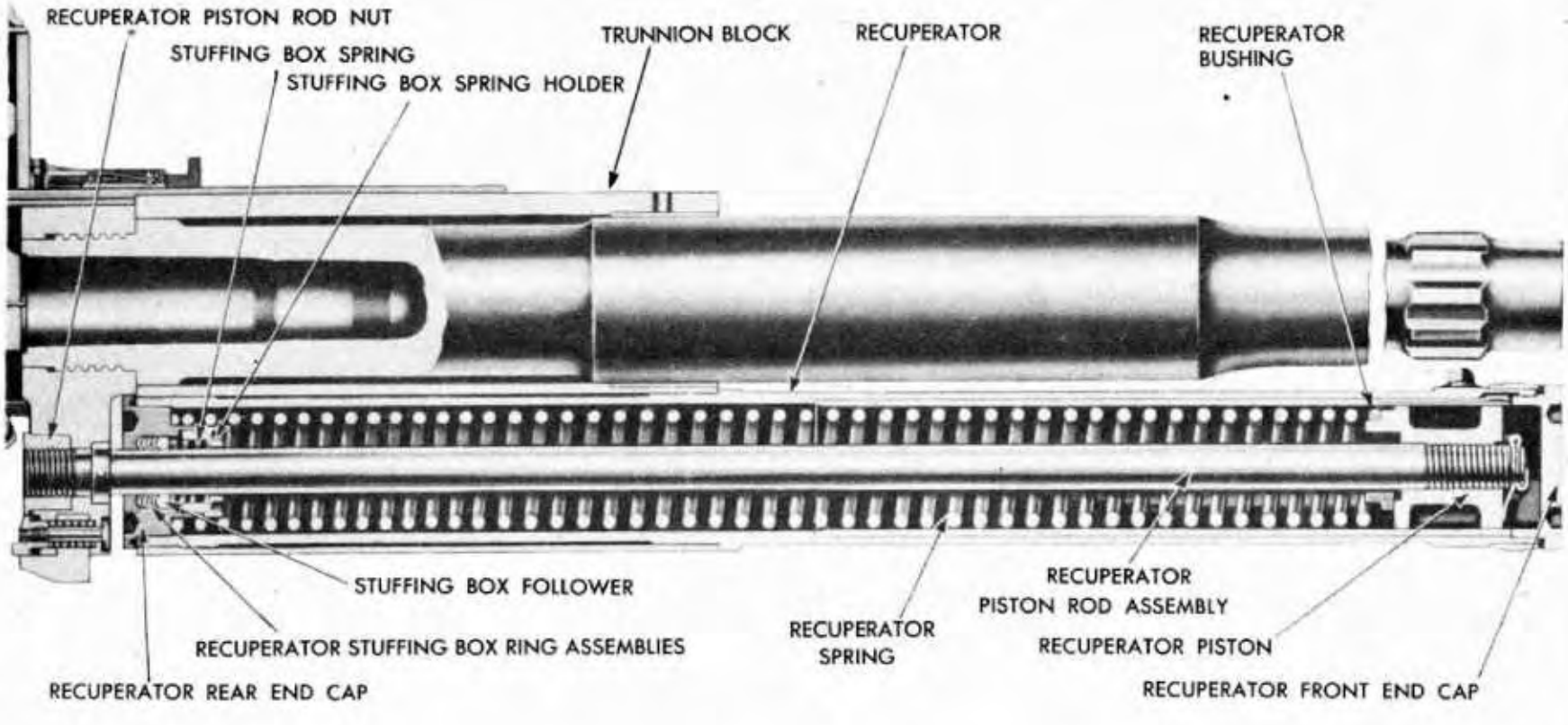

Figure 86—Recuperator (Gun M10)—Cross Section

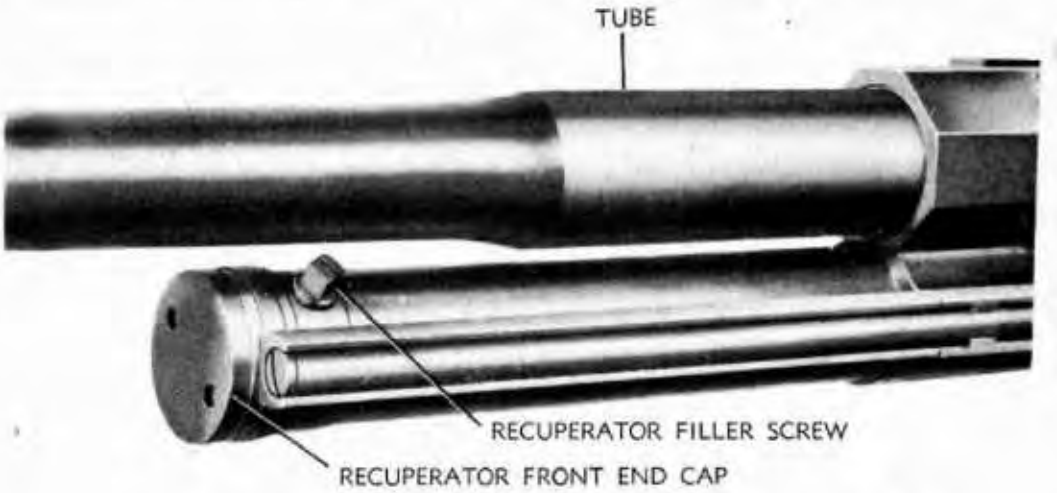

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Figure 87—Recuperator Cylinder (Gun M10)

65. REMOVAL AND INSTALLATION.

a. Removal of Driving Spring Tube Front Guard Assembly.

(1) Remove driving spring assembly as described in paragraph 54 e.

(2) Remove recuperator front end cap (fig. 87), using wrench 41-W-3252-80 (fig. 7). CAUTION: *Stand clear of front end so that recoil oil will not flow out on operator, or drain recoil oil before removal.*

(3) Remove the driving spring tube front guard assembly by drifting forward on rear ends of guards with a brass drift until they are clear of trunnion block body (fig. 88).

(4) The recuperator spring will not be removed from the recuperator piston rod by the using arms.

b. Installation of Driving Spring Tube Front Guard Assembly.

(1) Install driving spring tube front guard assembly by compressing the rear ends to enter the trunnion block body, while tapping on front end until spacer contacts shoulder on recuperator.

(2) Install driving spring assembly.

(3) Screw recuperator front end cap into place and tighten, using wrench 41-W-3252-80 (fig. 7). Fill recuperator cylinder to proper level with specified oil.

66. MAINTENANCE OF RECUPERATOR MECHANISM.

a. Filling Recuperator Cylinder (fig. 89).

(1) To fill recuperator cylinder, first elevate front of gun 5 degrees. Remove the filler screw on the left side of the recuperator. Gun elevation may be checked by use of a protractor placed on the

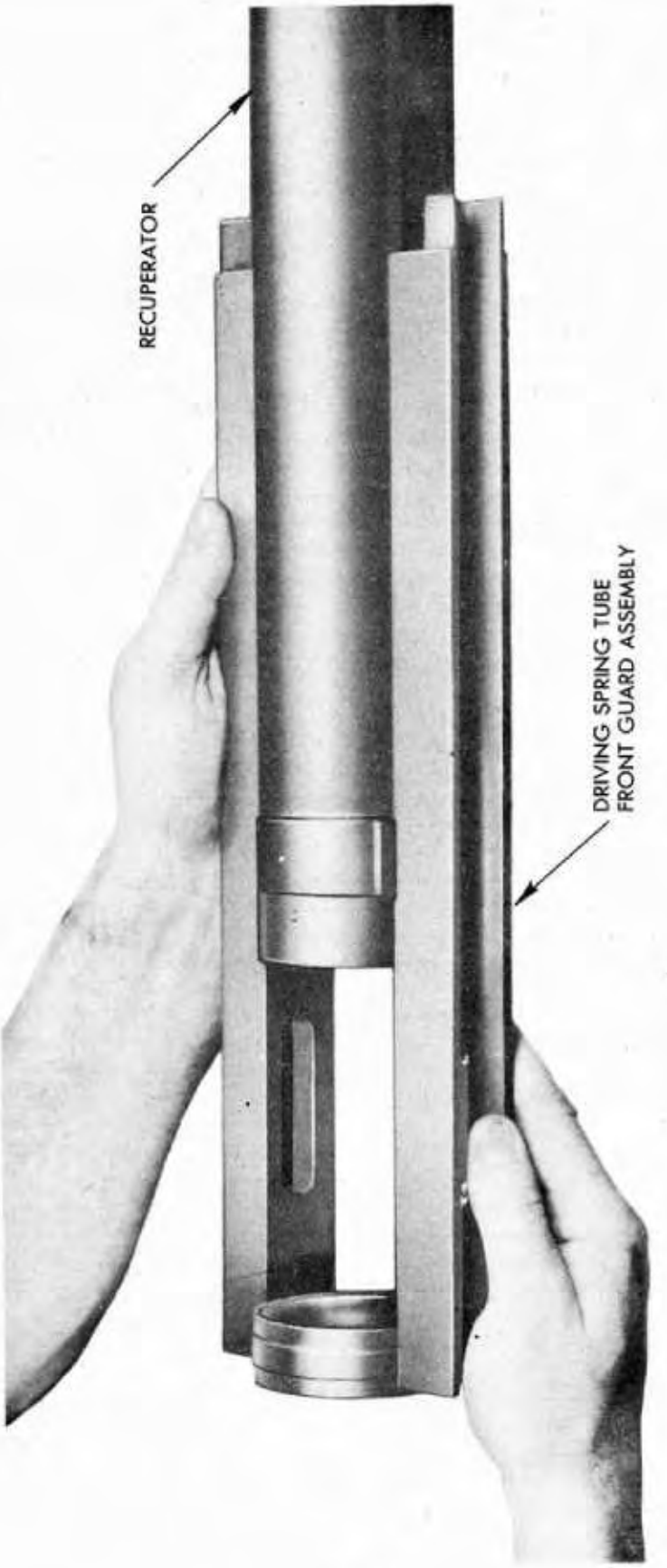

Figure 88—Removing Driving Spring Tube Front Guard Assembly

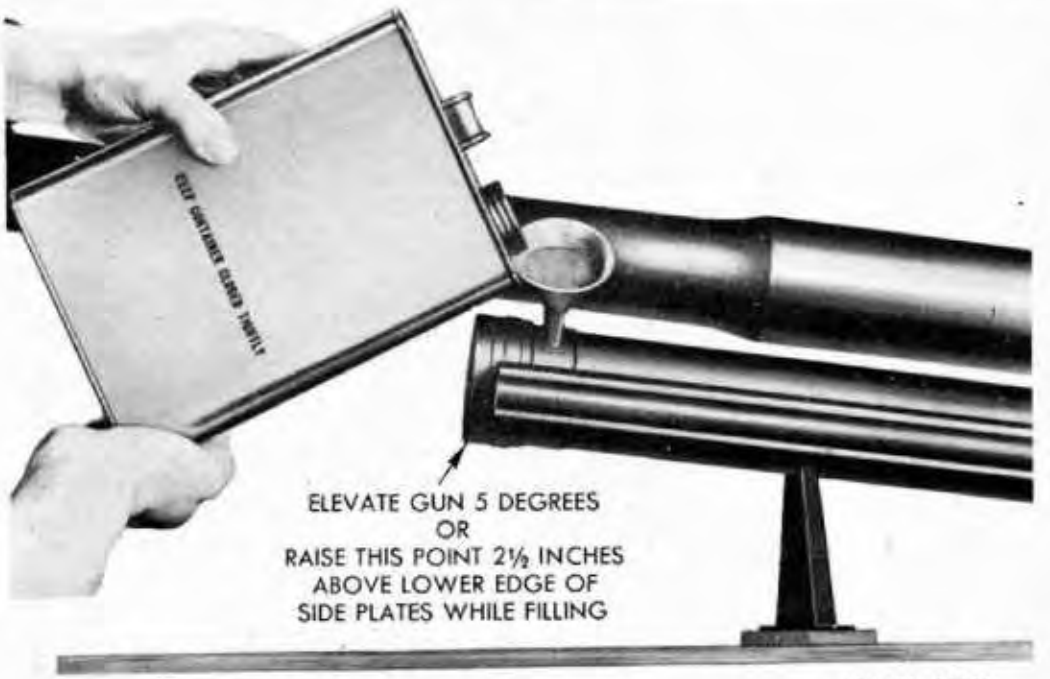

Figure 89—Filling Gun Recuperators AN-M4 and M10

trunnion block. If the bottom of the recuperator front end cap is raised 2½ inches above the lower edge of the side plates, the gun will be in approximately 5 degrees elevation.

(2) Using a small funnel, fill cylinder with recoil oil (light) until it is level with the bottom of the filler hole. The oil should be poured slowly into the recuperator through a fine mesh screen while slapping the outside of the cylinder with the hands to aid in expelling air bubbles. The use of other than specified oil is strictly prohibited.

(3) Reinstall the filler screw with its packing tightly, to prevent oil leakage.

b. Checking Recuperator Oil Level (fig. 90).

(1) The oil level in the recuperator should be checked daily and before firing. Elevate the front of the gun 5 degrees and remove the filler screw.

(2) Inspect oil level which should be level with the bottom of the filler screw hole. Add recoil oil (light) if needed.

c. Checking Length of Recoil.

(1) Put a film of grease on the tube for 12 or more inches forward from the trunnion block bushing.

(2) Fire one or more rounds.

(3) If the length of recoil is too great, check for low oil level in recuperator cylinder and fill to proper level.

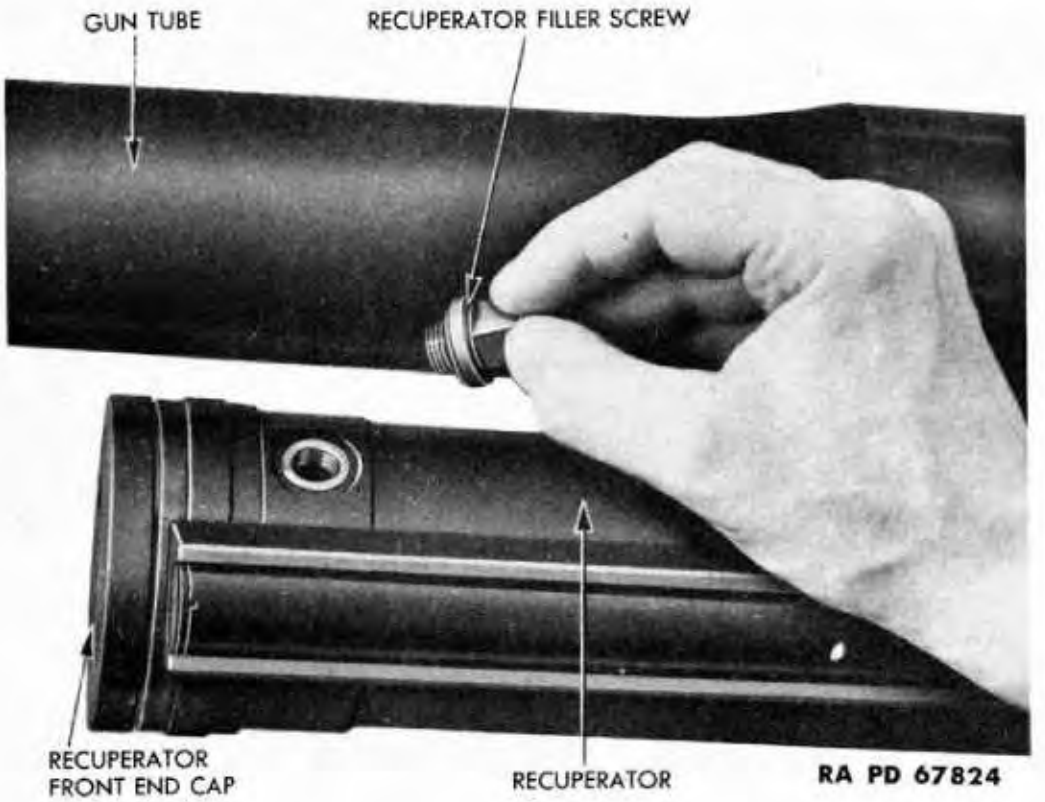

Figure 90—Checking Recuperator Oil Level

(4) If the length of recoil is too small, check viscosity and oil level in recuperator cylinder. Drain excessive oil or replace with correct oil and obtain proper level.

(5) Measure the distance that the grease has been pushed forward by the bushing which should be approximately 9⅝ inches.

(6) Recheck the length of recoil by firing another round.

(7) Examine the rear portion of the cylinder for signs of excessive leakage. Examine all other portions of the cylinder for leakage. Note the action of the recuperator when firing the gun.

(8) Excessive leakage of the recuperator mechanism, or improper action of the mechanism when every other part of the gun is in proper working condition, should be reported to ordnance maintenance personnel.

d. Recuperator Piston Rod Nut.

(1) This nut should be screwed on the recuperator piston rod so that the nut seats solidly on the shoulder of the tube extension, and so that the flat on the nut is in line with the top surface of the breech-block stop. This latter provision is necessary to prevent the nut from shaking loose on the piston rod.

e. Recuperator Recoil Springs.

(1) The recuperator spring must move the weights of the tube, the tube extension, and the piston and piston rod and, in addition, force the oil past the piston. It has very little power in excess of that required for these functions. The use of recoil oil of improper viscosity, the development of undue friction due to dirt, old grease, or improper lubricants, may cause the gun to fail to return completely into battery. If this failure does not exceed one-eighth of an inch, the gun will fire safely. When the lock frame is more than one-eighth of an inch out of battery, the breechblock cannot close and the gun will not fire.

(2) Great care should be exercised in maintaining the correct amount of oil in the mechanism. With too little oil, it is possible to have excess recoil to the extent that the recuperator piston drives against a solid column of the compressed springs, which will severely damage the gun.

(3) There is no manual adjustment provided for the stuffing box packing in the rear end of the cylinder. The development of excess leakage should be reported to ordnance personnel.

Section XX

RECEIVER GROUP

67. GENERAL.

a. The receiver group (figs. 91 and 92) may be considered the housing of the gun. It consists principally of the trunnion block, side plates, and top plate assemblies.

68. DISASSEMBLY AND ASSEMBLY.

a. Removal of Top Plate and Solenoid (fig. 93).

(1) Remove cotter pin and solenoid plunger pin from trigger operating arm.

(2) Remove top plate, with solenoid attached, by removing lock wire and four screws threaded into side plates.

(3) Loosen solenoid clamp screw and remove solenoid.

b. Installation of Top Plate and Solenoid.

(1) Install solenoid in clamp.

(2) Install top plate and secure with four screws and locking wire.

(3) Install solenoid plunger pin in trigger operating arm and secure with cotter pin.

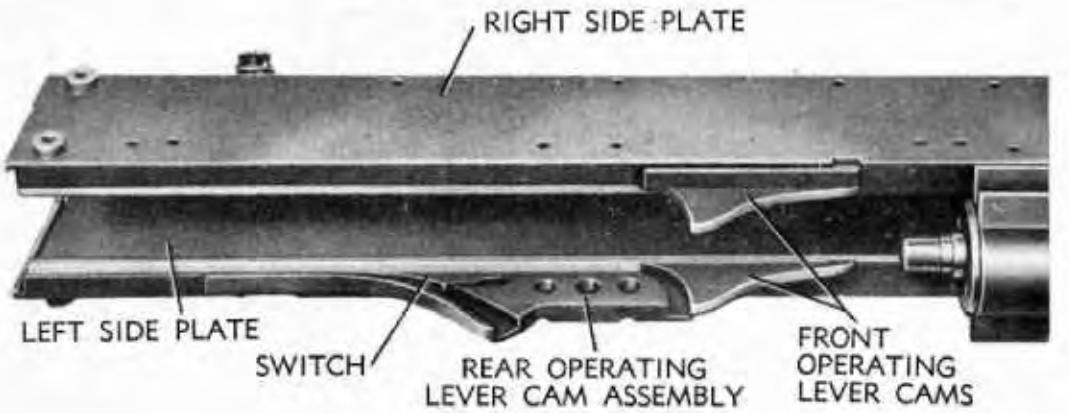

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Figure 91—Receiver Group (Gun M10) With Recuperator Parts Assembled

c. Adjustment of Solenoid.

(1) Lengthen solenoid plunger shaft until operation of the solenoid fails to fire the gun.

(2) Shorten the plunger shaft one-half turn at a time until the gun will fire when the solenoid is operated.

(3) Shorten the shaft one full turn and lock in position with the check nut.

(4) Connect solenoid to source of power, actuate solenoid and observe functioning.

d. Removal of Tube Lock Depressor (fig. 94).

(1) Remove the one long and two short fillister-head screws which secure the tube lock depressor to the side plate flange and remove the body, depressor, and spring.

e. Installation of Tube Lock Depressor.

(1) Proceed in reverse order of removal.

f. Removal of Operating Lever Cams.

(1) Remove the eight short cap screws which hold the front operating lever cams and the left rear operating lever cam assembly to the side plates (fig. 22).

g. Installation of Operating Lever Cams.

(1) When installing, securely tighten screws and stake in place.

CAUTION: *Extreme care should be taken that the proper screws A25765 be used for attaching the operating cams to the side plates. The attaching screws A25763 for the feed box have the same thread but are one-eighth of an inch longer. If the feed box screws are used*

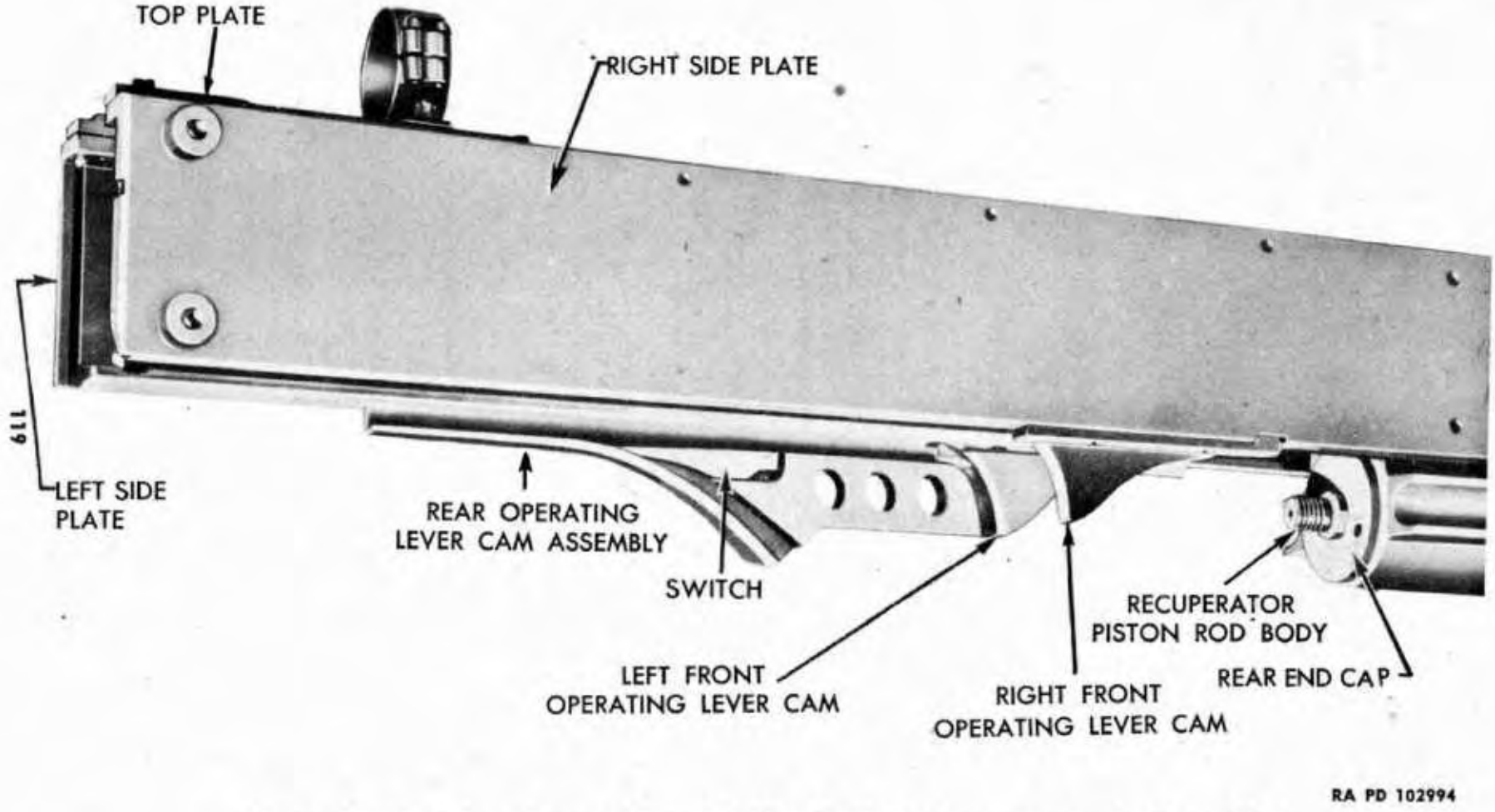

Figure 92—Receiver Group (Gun AN-M4) With Recuperator Parts Assembled

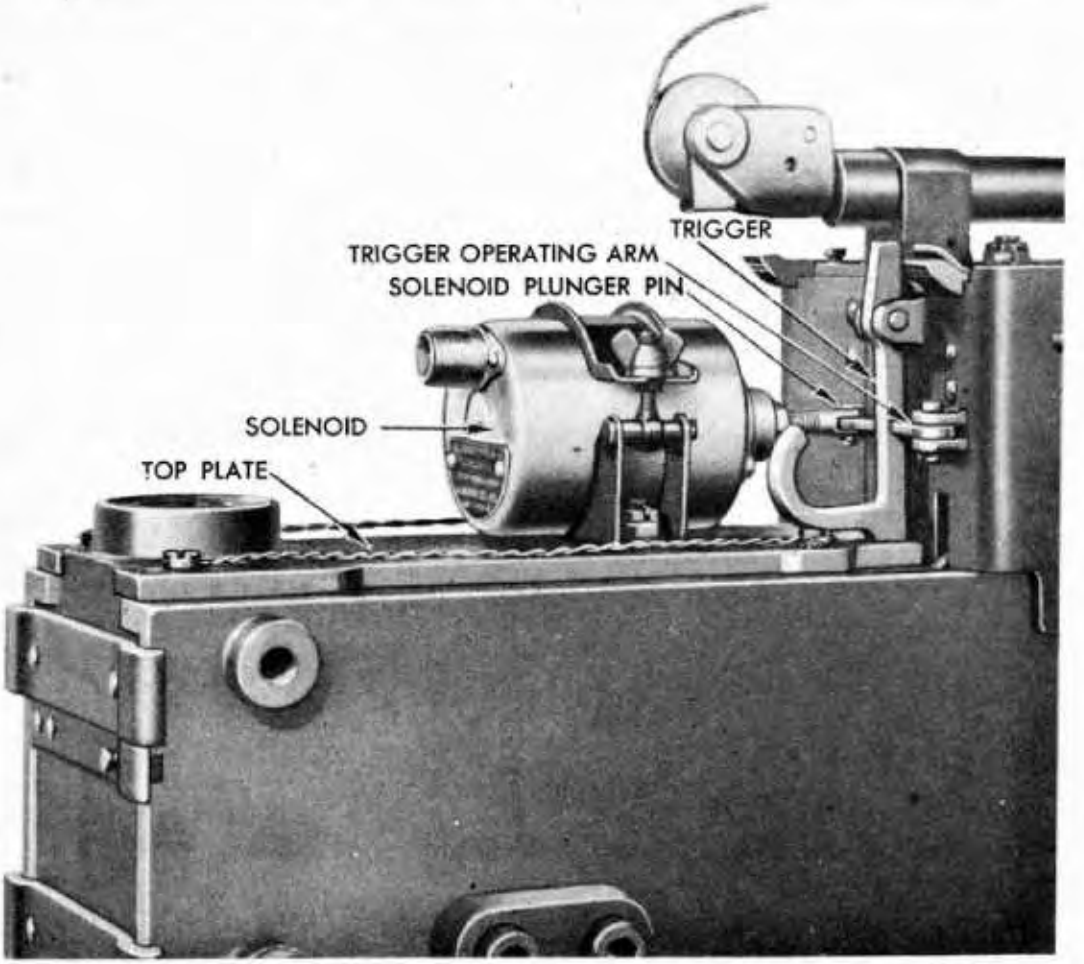

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Figure 93—Removal of Top Plate

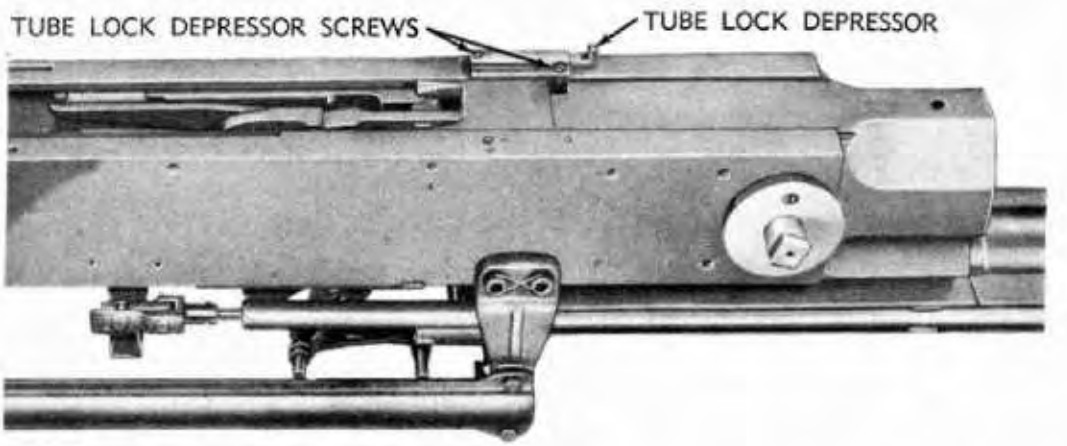

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Figure 94—Removal of Tube Lock Depressor

to secure the operating cams, the screws will protrude through the side plates and interfere with the tube extension during recoil to cause serious damage.

69. MAINTENANCE.

a. Examine interior surfaces of side plates for scoring and rust.

b. Check operating lever cam surfaces for scoring and wear.

c. Manipulate tube lock depressor to check for proper operation and spring tension.

d. Note condition of driving spring tube bushings.

e. Clean and smooth all cam surfaces.

f. Replace worn or weak springs.

Section XXI
MANUAL CHARGER

70. GENERAL.

a. A manual charger assembly may be attached to either side of the gun by four cap screws. This assembly consists principally of a longitudinally slotted tube fitted with two mounting brackets and enclosing a coil spring and plunger. The plunger is fitted with a projecting shoe which contacts a pin attached to the operating lever. A flexible charging cable engages a plunger plug which contacts the plunger and moves it rearward within the tube when the cable is pulled, thus charging the gun manually. The plunger is returned to its forward position by the coil spring when the charging cable is released. In certain installations it may be necessary to mount the charger on the left side. This may be done by installing the mounting brackets C70997 on the left side plate and replacing charger shoe C70999A (R.H.) with charger shoe C70999B (L.H.). The manual charger shoe contact pin must be installed from the left side of the operating lever to complete this installation.

71. REMOVAL AND INSTALLATION OF MANUAL CHARGER, GUN M10.

a. Removal.

(1) Remove the figure-eight locking wires from the bracket attaching screws.

(2) Using set screw wrench, remove the four cap screws attaching charger front and rear brackets to trunnion block side plate.

b. Installation.

(1) To install the charger, proceed in reverse order of removal.

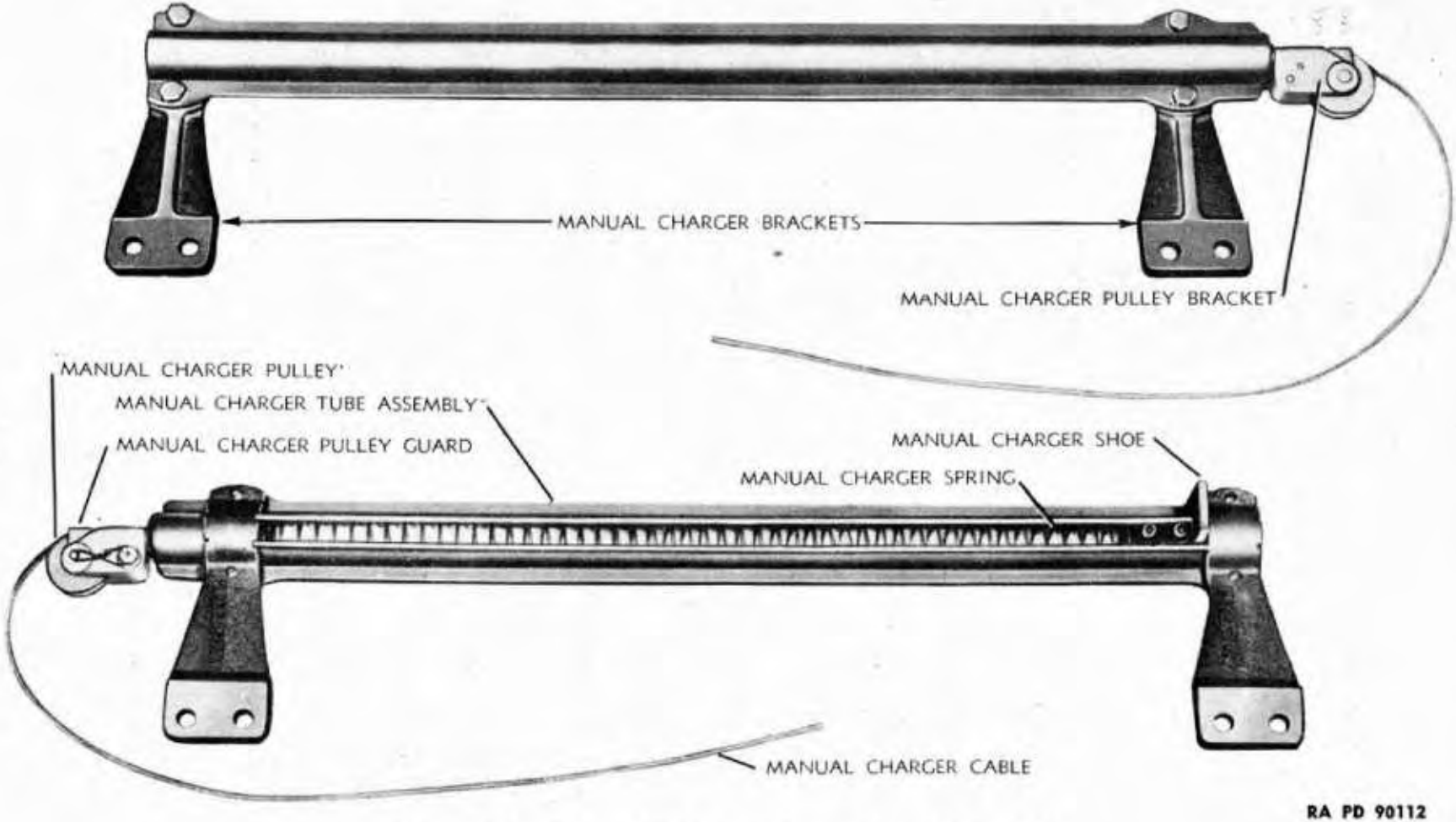

Figure 95—Manual Charger Assembly of Gun M10

72. DISASSEMBLY AND ASSEMBLY OF MANUAL CHARGER.

a. Disassembly of Manual Charger (fig. 95).

NOTE: *The disassembly procedure to be described will include only the operations necessary to change the charger from one side of the gun to the other. The manual charger will not be further disassembled by the using arms.*

(1) Remove the front and rear brackets.

(2) Remove the plunger shoe screws locking wire. Loosen screws with set screw wrench and remove. With a finger over the front of the charger tube to hold the plunger depressed, remove the shoe.

b. Assembly of Manual Charger.

(1) Install the shoe for the opposite side. Replace the screws and lock with wire. NOTE: *If the charger is to be installed on the right-hand side of the gun, use charger shoe C70999A. When installation is made on the left-hand side, it will be necessary to substitute charger shoe C70999B for shoe C70999A.*

(2) Install the brackets and four attaching screws on the opposite side of the charger tube.

73. MAINTENANCE OF MANUAL CHARGER.

a. If the manual charger does not operate properly, it will be replaced as a unit. Further disassembly other than that given in paragraph 72 is prohibited.

Section XXII

ENDLESS BELT MAGAZINE M6

74. GENERAL (figs. 6 and 96).

a. The 30-round Endless Belt Magazine M6 is an oval shaped framework providing a track for the endless belt. The belt is automatically rotated about its track by the feeding mechanism within the feed box. The magazine is made up of right and left halves. These halves are attached to their respective sides of the feed box and are joined at the top by two fasteners. Spring-loaded latches are provided to attach the left side of the magazine to the brackets on the feed box. Two each of brackets, retaining rods, and support pins provide a means of attaching the right half of the magazine to the feed box.

b. The articulated link belt contains 33 clips, although only 30 rounds are ordinarily loaded into the magazine. The end links of the belt are joined by a link pin and are painted red for identification. Openings in the center of the link plates are engaged by the feed pawls, which provide a means of actuating the belt. Notches in the sides of the link plates are engaged by the stop and holding pawls. Each

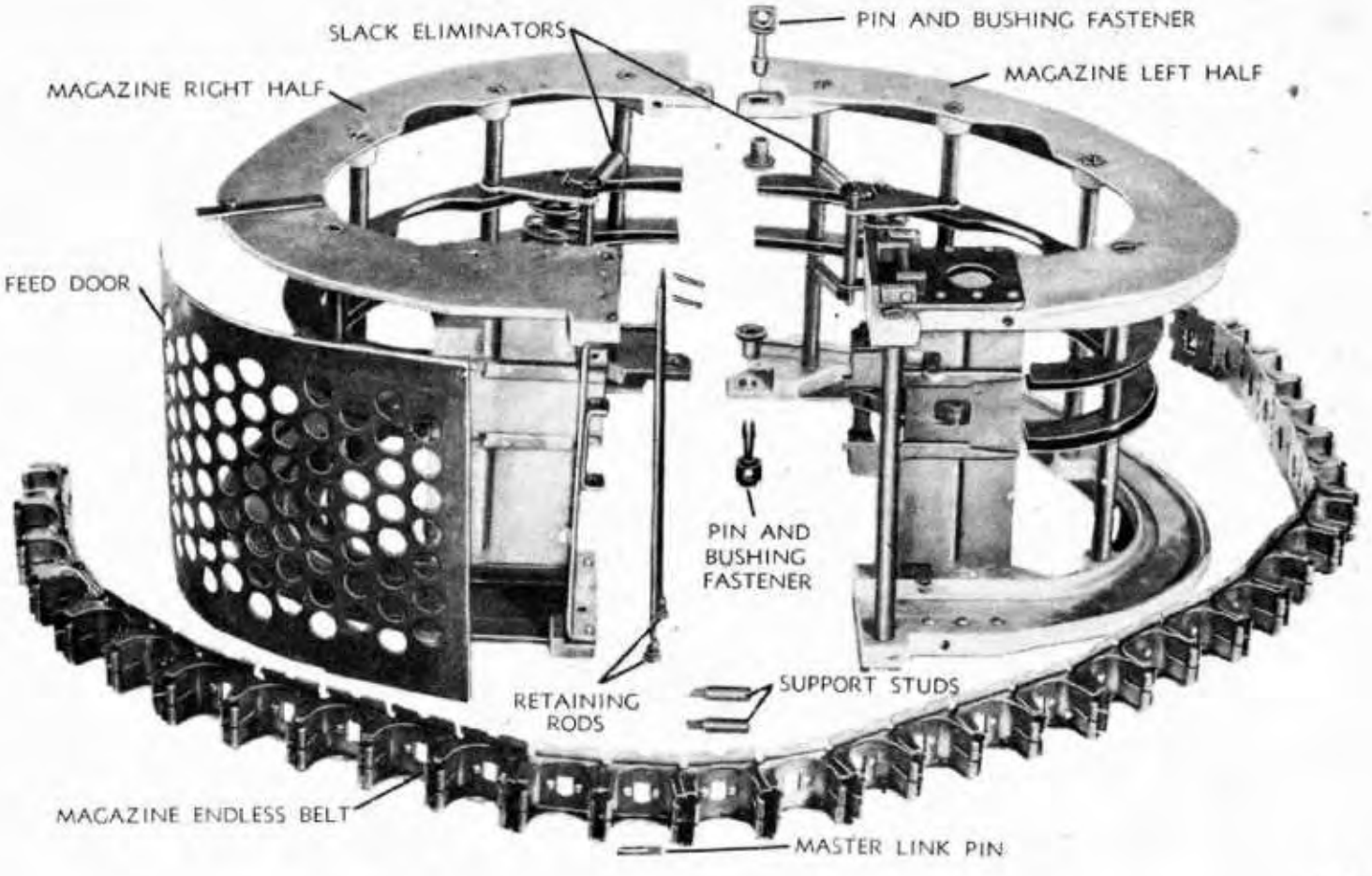

Figure 96—Parts of Endless Belt Magazine M6

spring clip is provided with a projection which must mate with the groove in the rotating bands of the ammunition when the magazine is loaded. The magazine is provided with an index pawl on the platform of the left half. Its purpose is to provide a lock for the belt when the feed slide is halfway across the full travel, and thus reduce double feeding, particularly when the magazine is half empty. Each magazine half is equipped with a slack eliminator to take up the slack of the belt as the rounds are stripped from the belt.

75. MAINTENANCE OF ENDLESS BELT MAGAZINE M6.

a. The Magazine M6 may be cleaned by removing from the gun, cleaning the entire unit in dry-cleaning solvent or rifle-bore cleaner and allowing it to dry.

b. Inspect the ammunition track on aluminum end plates and remove all dents and burs with a fine stone. Finish by polishing the ammunition track with succeedingly finer grades of emery cloth, ending with number 400. Remove emery dust by washing with dry-cleaning solvent and allow to dry. Apply a light coat of preservative lubricating oil (special).

c. Inspect endless belt track on magazine, smooth rough places, clean and reoil.

PART FOUR—AMMUNITION

Section XXIII

GENERAL

76. SCOPE.

a. Part four contains information for the guidance of the personnel responsible for the operation and maintenance of this equipment. It contains only the information necessary to using personnel to properly identify, connect, and protect such auxiliary equipment while being used or transported with the main equipment. Detailed instructions pertaining to auxiliary equipment are contained in the TM's.

Section XXIV

AMMUNITION

77. GENERAL.

a. Ammunition for the 37-mm Aircraft Guns AN-M4 and M10 is issued in the form of fuzed, complete rounds of fixed ammunition. The round consists of a primer and propelling charge contained in a cartridge case which is crimped rigidly to the projectile. The term "fixed" used in connection with ammunition signifies that the propelling charge is fixed (not adjustable) and that the round is loaded into the gun as a unit.

78. FIRING TABLES.

a. Firing tables for aircraft weapons are not available for general distribution.

79. CLASSIFICATION.

a. Dependent upon the type of projectile, ammunition for the Guns AN-M4 and M10 is classified as high-explosive, armor-piercing, practice, and drill. High-explosive projectiles are comparatively thin-walled and contain a high-explosive bursting charge. They are intended principally for fragmentation or mining effect. Armor-piercing projectiles in the 37-mm caliber are solid steel and especially designed for penetration of armor plate. The practice projectile for these weapons is of the same size, shape, and weight as the service high-

explosive projectile but is inert. The drill cartridge is a completely inert assembly for practice in loading and handling and for testing the feed mechanism incident to operation of the weapon.

80. IDENTIFICATION.

a. The various rounds may be identified as follows:

(1) By marking listed below on the components of each round.

On the Projectile[1]	On the Base of the Cartridge Case[4]	On the Fuze[4]
Ammunition lot number[2] Caliber and type of weapon Model of shell Kind of filler (on HE shell) "WITH TRACER" Lot number of filled projectile[3]	Cartridge case lot number Caliber and model of the cartridge case[5] Manufacturer's initials Year of manufacture	Type and model Lot number of the fuze, including loader's initials and year of manufacture.

(2) As to type, by the color of painting:

High-explosive	Olive drab, marking in yellow
Armor-piercing	Black, marking in white
Practice	Blue, marking in white
Drill	Black, marking in white

b. Ammunition Lot Number. A lot number is assigned all ammunition at the time of manufacture. It is stenciled on every loaded complete round and on all packing containers. It is required for all purposes of record, including reports on condition, functioning, and accidents in which the ammunition is involved.

81. CARE, HANDLING, AND PRESERVATION.

a. Complete rounds and ammunition components are packed to withstand conditions usually found in the field. Complete rounds are shipped in individual moisture-resistant fiber containers inclosed in a wooden packing box. Nevertheless, since explosives are adversely affected by moisture and high temperature, due consideration should be given to the following:

(1) Do not break moisture-resistant seal until the ammunition is to be used.

(2) Protect ammunition, particularly fuzes, from high temperature, including direct rays of the sun. More uniform firing is obtained if the rounds are at the same temperature.

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[1] Stenciled on the projectile.
[2] Lot number will have suffix "X" when projectile is assembled with a steel cartridge case.
[3] Stenciled below rotating band, in which position it is hidden by neck of cartridge case.
[4] Stamped.
[5] Model designation will have "B1" suffix when case is made of steel.

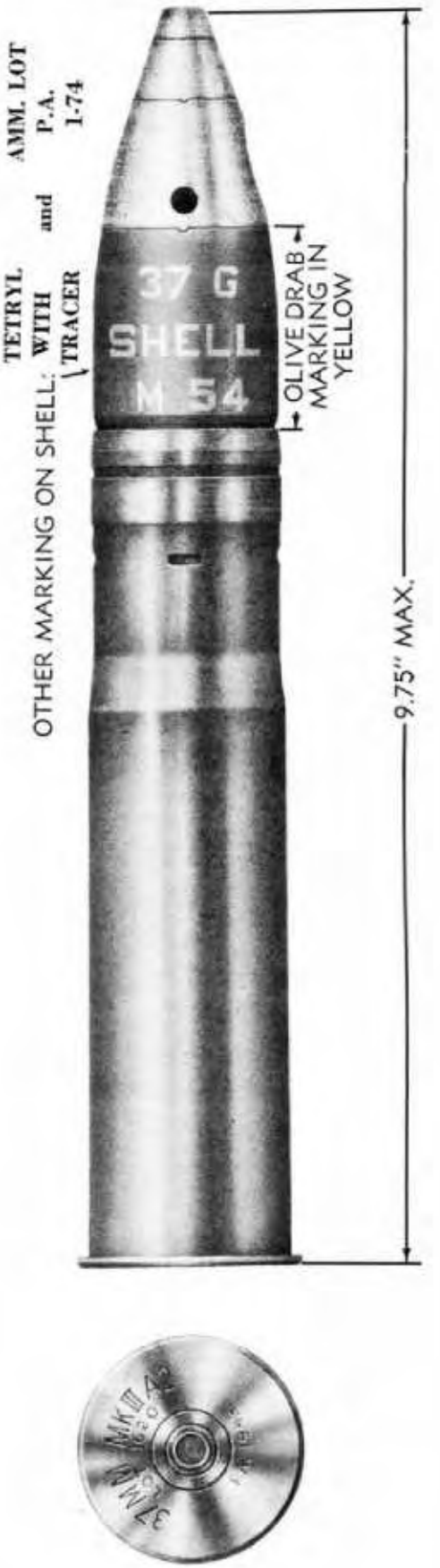


Figure 97—The High-explosive Shell M54 for 37-mm Aircraft Guns AN-M4 and M10

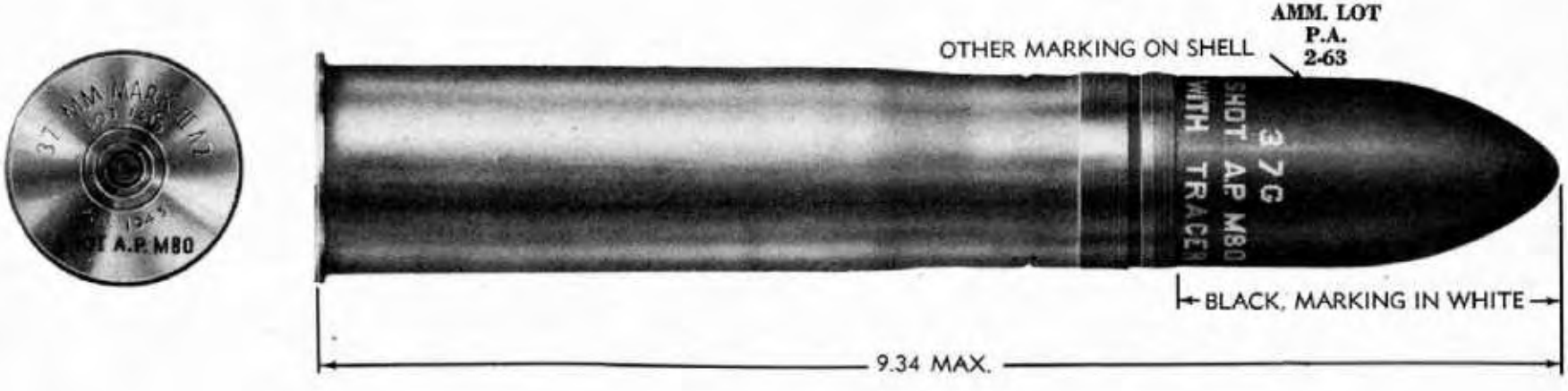


Figure 98—The Armor-piercing Shot M80 for 37-mm Aircraft Guns AN-M4 and M10

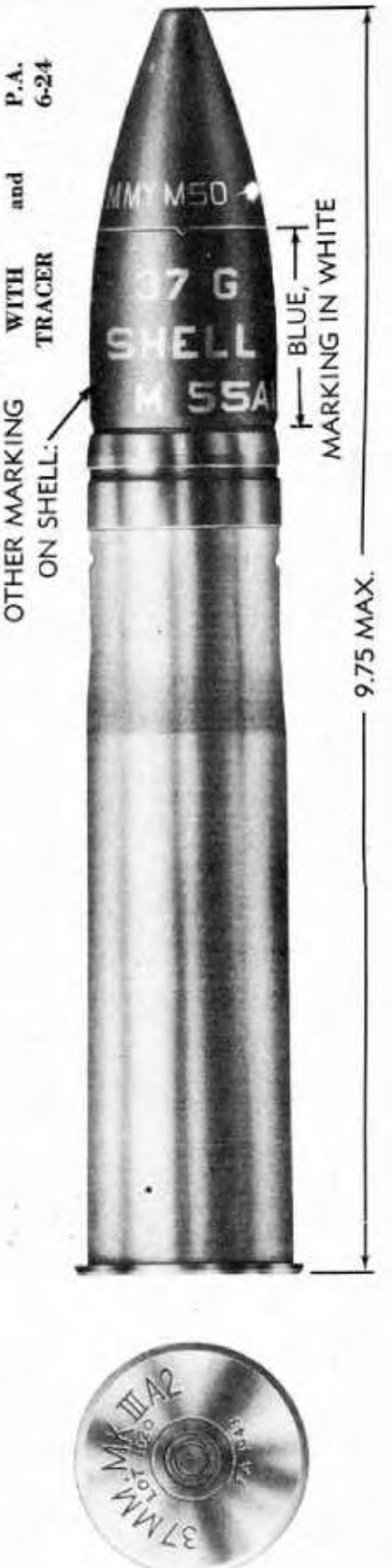
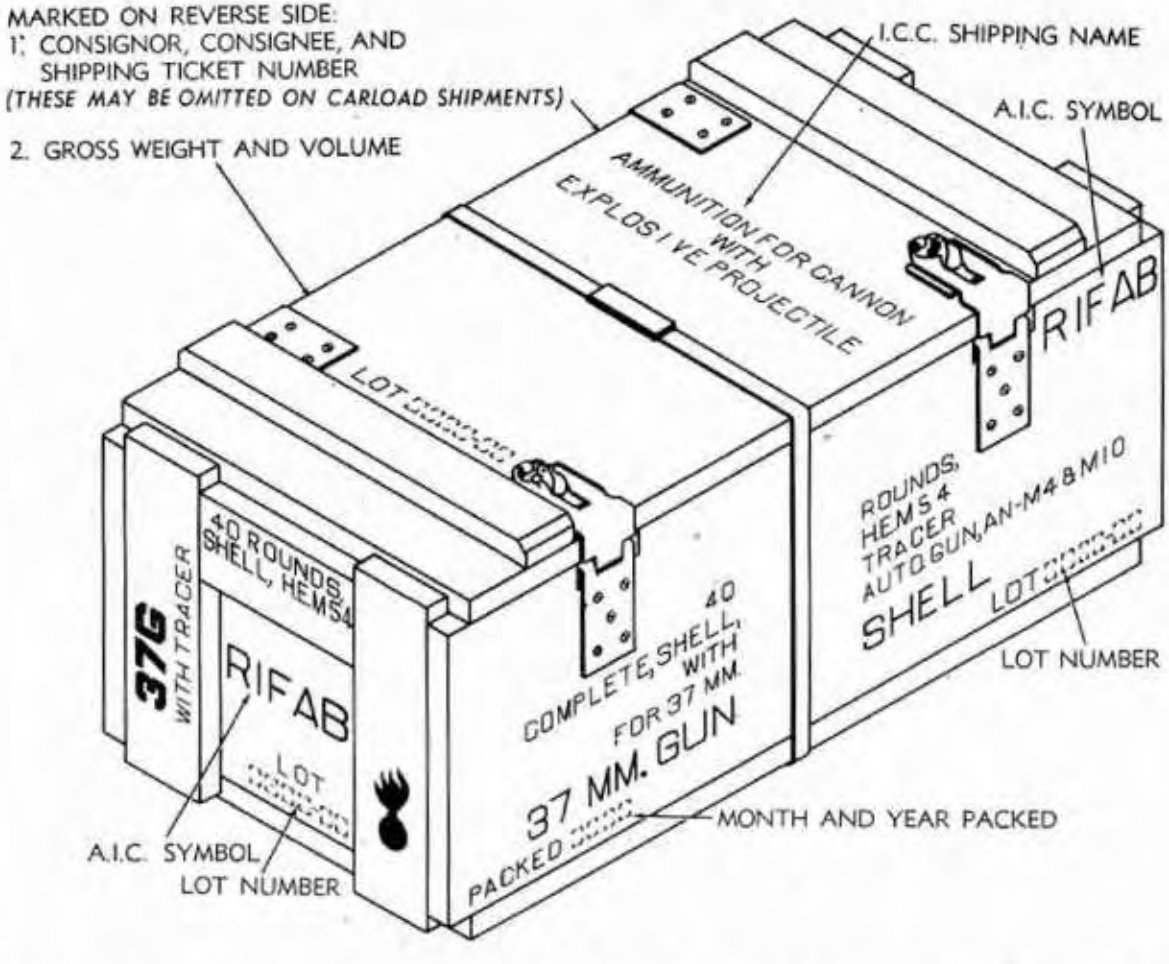


Figure 99—Practice Shell M55A1 for 37-mm Aircraft Guns AN-M4 and M10



RA PD 82447

Figure 100—Representative Packing Box for 37-mm Automatic Gun Rounds

TABLE I. AUTHORIZED AMMUNITION

STANDARD NOMENCLATURE OF COMPLETE ROUND[1]	COMPLETE ROUND		PROJECTILE[2]			ACTION OF FUZE	PROPELLING CHARGE	
	Weight (lb)	Length (in)	Weight as Fired (lb)	CHARGE Kind	CHARGE Weight (lb)		Type	Weight (lb)
Service Ammunition								
SHELL, fixed, HE-T, SD, M54, for 37-mm auto. guns, AN-M4 and M10	1.98	9.75	1.34	Tetryl	0.10	SQ	FNH	0.15
SHOT, fixed, AP-T, M80, 1,825 ft/sec, for 37-mm auto. guns, AN-M4 and M10	2.29	9.34	1.66	None	—	None	FNH	0.15
SHOT, fixed, AP-T, M80, 1,650 ft/sec, for 37-mm auto. guns, AN-M4 and M10	2.28	9.34	1.66	None	—	None	FNH	0.14
Practice Ammunition								
SHELL, fixed, TP-T, M55A1, for 37-mm auto. guns, AN-M4 and M10	2.00	9.75	1.34	None	—	Inert	FNH	0.17
Drill Ammunition								
CARTRIDGE, drill, M23, 37-mm auto. guns, AN-M4 and M10 (aircraft)	1.93	9.75	—	—	—	None	—	—

AP-T—armor-piercing with tracer
FNH—flashless nonhygroscopic
ft/sec—feet per second
HE-T—high explosive with tracer
SD—shell destroying
SQ—superquick
TP-T—target-practice with tracer

[1] Nomenclature and data listed refer to rounds assembled with brass cartridge cases. For rounds assembled with steel cases, the nomenclature is the same except that the words "steel case" are included, immediately following the model designation of the shell. Data for steel-cased rounds also is the same except that the complete rounds weigh approximately 0.03 lb less than brass-cased rounds.

[2] All service and practice projectiles have a tracer with a burning time of approximately 8 seconds. The tracer in the High-explosive Shell M54 causes the shell to destroy itself at the end of the burn-out in the event that prior functioning of the shell has not been caused by impact.

b. Do not attempt to disassemble any fuze.

c. Do not remove protection or safety devices from fuzes until just before use.

d. Before loading, the complete round should be free of foreign matter such as, sand, mud, moisture, grease, etc.

e. Rounds prepared for firing but not fired will be returned to their original condition and packings, and appropriately marked. Such components will be used first in subsequent firings, in order that stocks of opened packings may be kept at a minimum.

82. AUTHORIZED ROUNDS.

a. The ammunition authorized for use in the 37-mm Aircraft Guns AN-M4 and M10 is listed in Table I together with essential data. The nomenclature completely identifies the ammunition.

83. PREPARATION FOR FIRING.

a. Fixed rounds of 37-mm ammunition once removed from their packing are ready for firing, it being necessary only to load the rounds into the belt links provided with the guns.

84. FUZES.

a. **Fuze M56.** This fuze, shown assembled to the projectile in figure 97, is a supersensitive type. The fuze is fitted with a firing pin and safety blocks which move to the armed position under rotational force after the projectile has left the bore of the gun. The arrangement of the firing pin is such that it will cause the fuze to function instantly on impact with any light material target. The fuze is made boresafe by a centrifugally actuated interrupter, set at an angle and carrying a section of the explosive train. Being a single-action (superquick) type, no setting is required.

85. PACKING.

a. Complete packing data covering dimensions, volume, and weight of the rounds described herein are published in ORD 11 SNL's R-1 and R-6. Although weight of individual rounds varies somewhat, dependent upon the type and model, the following data are representative for estimating weight and volume requirements:

Packing	Approx. Weight (lb)	Volume (cu ft)
40 rounds, packed one round per fiber container, 40 containers (40 rds.) per wooden box	115.0	2.00
Over-all dimensions of box (in.): 25 x $12\frac{3}{16}$ x $11\frac{11}{32}$		
10 rounds in portable-type box	51.6	0.75
Over-all dimensions of box (in.): $13\frac{3}{4}$ x $6\frac{3}{16}$ x $12\frac{7}{8}$		

APPENDIX

Section XXV

SHIPMENT AND STORAGE

86. PREPARATION FOR DOMESTIC SHIPMENT.

a. General. Preparation for domestic shipment and limited storage will be the same. (Materiel in limited storage is that materiel which is out of service for less than 30 days or materiel that must be ready for operation on call.)

b. Cleaning. The materiel shall be thoroughly cleaned and made free of all foreign matter with dry-cleaning solvent, soap solution or soda-ash.

c. Lubrication. Lubrication will be accomplished in accordance with the procedure as prescribed in section XII.

d. Painting. All metal surfaces that have become pitted or rusted will be thoroughly cleaned with aluminum-oxide cloth or crocus cloth and repainted where necessary.

e. Preservative Materials. Additional materials required for preparation for storage and shipment are listed below:

(1) COMPOUND, rust-preventive, light.
(2) COMPOUND, rust-preventive, thin film.
(3) PAPER, wrapping, greaseproof.
(4) PAPER, wrapping, waterproof barrier.
(5) TAPE, adhesive, non-hygroscopic, O.D.

f. Application of Preservatives. Preservatives should be applied immediately after cleaning and drying, as a rust stain will form if materiel is handled between operations. Rust-preventive compound (light) used herein must be heated for proper consistency before application. (See TM 9-850, dated 24 August 1944, for method of heating and application of rust-preventive compounds.)

(1) BREECH MECHANISM. Where possible, the breech mechanism should be partially disassembled and parts dipped, sprayed, or brushed with rust-preventive compound (light). After assembly of the breech, apply a coating of rust-preventive compound (light) to the exterior portion.

(2) GUN TUBE. Swab the entire bore of the gun thoroughly with rust-preventive compound (light).

(3) EXTERIOR UNPAINTED SURFACES. Use rust-preventive compound (thin film) on exterior unpainted operating or machined surfaces from which preservatives should be completely removed before materiel is placed in operation.

g. Sealing.

(1) MUZZLE. Seal muzzle with Expendable Muzzle Cover M1 (see SNL K-1, COVER, muzzle, expendable, M1), or with non-hygroscopic adhesive tape. The standard muzzle cover, if available, will then be installed.

(2) BREECH. Seal breech with two layers of greaseproof wrapping material and overwrap with one layer of waterproof barrier wrapping paper. Secure by wrapping with non-hygroscopic adhesive tape. Spray over tape with rust-preventive compound (thin film). If greaseproof wrapper is not available, use canvas or burlap impregnated with rust-preventive compound (thin film) and tie or strap in place.

(3) AMMUNITION BOXES. Seal the ammunition boxes with non-hygroscopic adhesive tape.

h. Gun Book.

(1) During transfer or shipment, the gun book must be kept in a waterproof envelope fastened to the cannon with waterproof tape.

(2) Under one of the wrappings of tape, one end of a small tab will be inserted, reading: "Gun Book here".

i. Inspections. All missing or broken parts will be promptly repaired or replaced. If repairs cannot be made prior to placing materiel in storage, a tag will be attached to the materiel specifying the repairs needed and a written report of these items will be made to the officer in charge of the materiel.

87. BOXING DATA.

a. Style. The shipping box described herein is a double-end style 5, nailed wood shipping box, containing one complete gun.

b. Data.

Length (inches)	(inside) 66 3/8	(outside) 69 1/2
Width (inches)	(inside) 16 1/4	(outside) 17 13/16
Height (inches)	(inside) 10 1/2	(outside) 12 1/16
Square feet		8.22
Volume (cu ft)		8.22
Ship tons		0.205

c. Bill of Material. The following materials are required to construct the shipping box. (For additional information on construction and nailing, refer to TM 9-2854, Instruction Guide, Ordnance Packaging and Shipping (Posts, Camps, and Stations).)

BILL OF MATERIAL

Indicating Number	Quantity Required	Part	ACTUAL SIZE OF FINISHED PIECE INCHES		
			Length	Width	Thickness
1	1	Top[1]	69 1/2	12 1/16	25/32
2	2	Top cleat	10 5/16	2 1/4	25/32
3	1	Bottom[1]	69 1/2	12 1/16	25/32
4	2	Sides[1]	69 1/2	16 1/4	25/32
5	2	Ends[1]	16 1/4	10 1/2	25/32
6	2	Ends[1]	10 1/2	16 1/2	25/32
7	1	Brace No. 1	10 1/2	5 1/8	1
8	2	Brace cleat	11 1/16	1 3/4	25/32
9	1	Support No. 1	10 1/2	2 1/8	1 1/8
10	2	Support No. 2	11	7 5/8	1 1/8
11	2	Spacer	16 3/16	7 5/8	1 9/16
12	1	Support No. 3	10 1/2	2 1/8	1 1/8
13	1	Support No. 3	10 1/2	2 3/8	1 1/8
14	1	Support No. 3	10 1/2	11 11/16	1 1/8
15	1	Support No. 4	10 1/2	2 1/8	1 1/8
16	1	Support No. 4	10 1/2	5 3/8	1 1/8
17	1	Support No. 4	10 1/2	8 11/16	1 1/8
18	4	Cleat (long)	16 3/16	1 3/4	25/32
19	2	Cleat (short)	15 7/16	1 3/4	25/32
20	1	Spacer No. 5	7 3/8	4 5/8	1 1/8
21	4	Spacer cleat	5 3/16	1 3/4	25/32
22	1	Tray	14 9/16	10 1/2	25/32
23	2	Tray	10 1/2	4 15/16	25/32
24	2	Tray cleat	15 13/16	1 1/2	25/32
25	2	Tray cleat	5 23/32	1 1/4	25/32
26	2	Wedges	5	3	3/4
	190	8-penny cement-coated nails (used in sides and bottom)			
	180	6-penny cement-coated nails (used in cleats and ends)			
	28	No. 12 x 2 1/2 fl.hd. wood screws (used in cover and center support)			
	12	No. 12 x 2 fl.hd. wood screws (used in center spacer)			
	2	No. 12 x 2 1/4 fl.hd. wood screws (used in tube rear brace)			
	8	1/4-20NC-2 x 2 hex. hd. cap screws (used for attaching handles)			
	8	1/4" washers (steel for handle cap screws)			
	8	1/4-20NC hex. nuts (for handle cap screws)			
	2	Handles			
	As Required	Greaseproof paper			
	As Required	Waterproof paper liner			

[1]Ends, sides, top, and bottom may be made of several pieces, one piece for each 3 inches of width, but no piece shall be less than 2 1/2 inches wide.

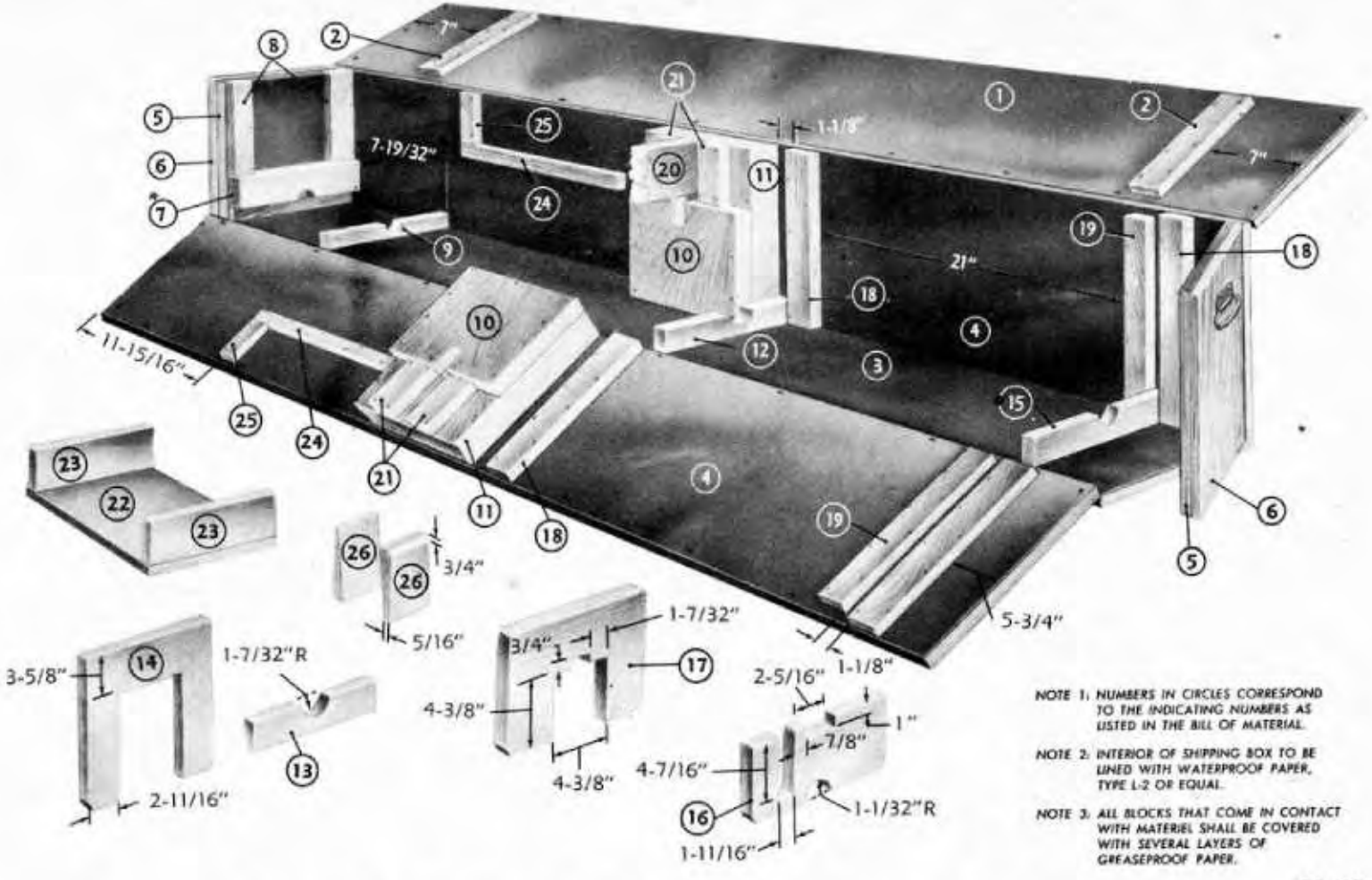


Figure 101—Packing Box for One 37-mm Automatic Gun AN-M4

d. Waterproof Paper. The container must be lined inside with a case liner, waterproof barrier wrapping paper, type L-2, and the paper so placed as to effectively surround the entire contents of the container to prevent entry of direct moisture.

e. Packing Procedure.

(1) Construct the box with the waterproof barrier case liner, cleats, and shelf supports in place as shown on figure 101. All supporting cleats that come in contact with the materiel shall be wrapped with several layers of greaseproof wrapping paper.

(2) Place tube in box resting on supports (9), (12), and (15) with breech end fitting into brace (7).

(3) Insert wedge (26) against muzzle end of tube and drive other wedge (26) between end of box and first wedge and secure with one nail. Be extremely careful not to puncture muzzle covering.

(4) Secure tube with center supports (13) and (16).

(5) Lower gun into box so that the gun rests on center supports (13) and (16) and secure with top supports (14) and (17).

(6) Feed chute and link chute shall be wrapped separately and placed in tray (22), (23), (24), and (25).

(7) Place top cover on box and secure by countersinking eighteen No. 12 x 2½-inch wood screws.

Section XXVI

REFERENCES

88. PUBLICATIONS INDEXES.

The following publications indexes should be consulted frequently for latest changes or revisions of references given in this section and for new publications relating to materiel covered in this manual:

a.	Ordnance supply catalog index (index to SNL's)	ASF Cat. ORD 2
b.	Ordnance major items and combinations, and pertinent publications	SB 9-1
c.	List of publications for training (listing CCBP's, FM's, FT's, MTP's, TB's, TM's, TR's, TC's, and LO's	FM 21-6
d.	List of training films, film strips, and film bulletins	FM 21-7
e.	Military training aids (listing graphic training aids, models, devices, and displays)	FM 21-8
f.	List and index of administrative and supply publications (listing new AR's, Cir's, GO's, and WDB's, T/O & E's, T/O's, T/E's, TA's, T/BA's, MR's, RR's, WDP's, SB's, MWO's, and forms)	WD Pam. 12-6

89. STANDARD NOMENCLATURE LISTS.

a. Ammunition.

Ammunition, fixed and semifixed, including subcaliber, for pack, light and medium field, aircraft, tank, and antitank artillery, including complete round data	ASF Cat. ORD 11 SNL R-1
Ammunition instruction material for pack, light and medium field, aircraft, tank, and antitank artillery	ASF Cat. ORD 11 SNL R-6

b. Cleaning and Preserving.

Cleaning, preserving, and lubricating materials; recoil fluids, special oils, and miscellaneous related items	ASF Cat. ORD 5 SNL K-1

Soldering, brazing, and welding materials, gases and related items	ASF Cat. ORD 5 SNL K-2
c. Gun, Automatic, 37-mm, AN-M4 and M10 (Aircraft)	ASF Cat. ORD SNL A-46

90. EXPLANATORY PUBLICATIONS.

a. Ammunition.

Ammunition, general	TM 9-1900
Ammunition, inspection guide	TM 9-1904
Artillery ammunition	TM 9-1901
Ballistic data, performance of ammunition	TM 9-1907
Qualifications in arms and ammunition training allowances	AR 775-10
Range regulations for firing ammunition for training and target practice	AR 750-10

b. Cleaning, preserving, sealing, lubricating, and related materials issued for ordnance materiel — TM 9-850

c. General.

Basic maintenance manual	TM 37-250
Decontamination	TM 3-220
Defense against chemical attack	FM 21-40
Dictionary of U. S. Army Terms	TM 20-205
Instruction guide, ordnance packing and shipping (posts, camps, and stations)	TM 9-2854
O.O. List of Forms	
Unsatisfactory Report	WD AAF Form No. 54
Modification Record Card	O.O. Form 7451

d. Film Strips.

Disassembly and assembly	FS 9-28 FS 9-29

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