Lyt. Raymond W. Black

TM 9-1225

WAR DEPARTMENT TECHNICAL MANUAL

ORDNANCE MAINTENANCE

BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

WAR DEPARTMENT • 23 OCTOBER 1944

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TM 9-1225

This Technical Manual supersedes TM 9-1225, dated 15 April 1943; Changes No. 1, dated 1 July 1943; Changes No. 2, dated 5 September 1943; Changes No. 3, dated 15 October 1943; and Changes No. 4, dated 6 April 1944. This manual also supersedes TB 9-1225-21, dated 20 June 1944; TB 9-1225-22, dated 21 June 1944; and TB 9-1225-23, dated 25 August 1944.

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WAR DEPARTMENT
Washington 25, D. C., 23 October 1944

TM 9-1225, Ordnance Maintenance: Browning Machine Gun, Cal. .50, M2 All Types, and Ground Mounts, is published for the information and guidance of all concerned.

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(For explanation of symbols, see FM 21-6.)

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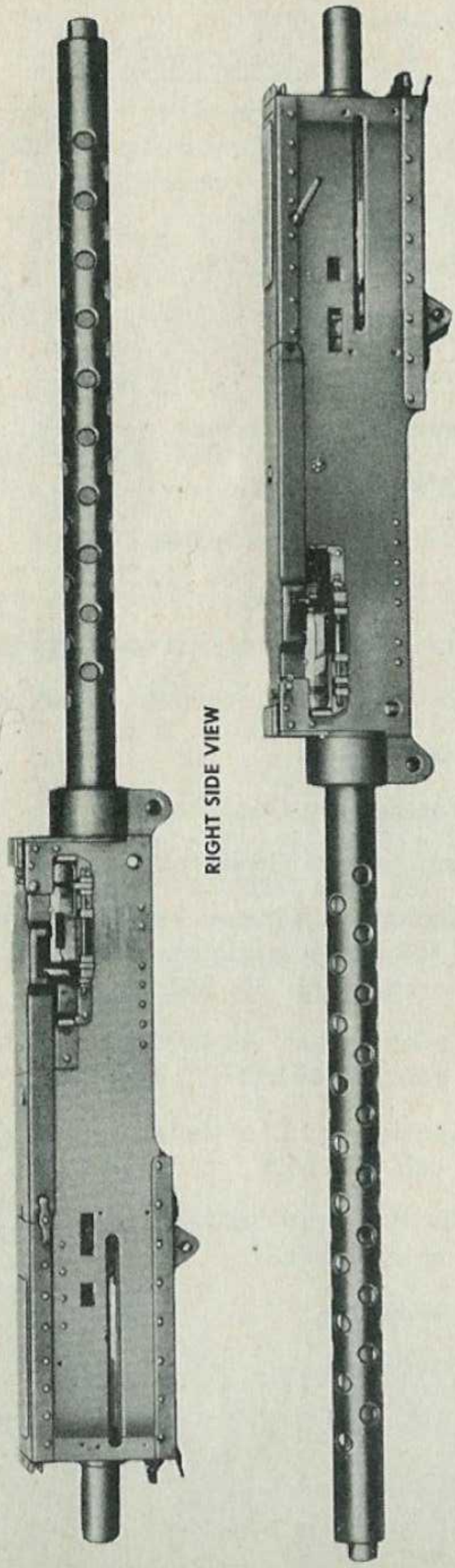

Figure 1—Browning Machine Gun, Cal. .50, M2, Aircraft, Basic

RESTRICTED

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Section I

INTRODUCTION

1. SCOPE.

a. This Technical Manual is published for the information and guidance of ordnance maintenance personnel. It contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the following materiel:

Browning machine guns
- Cal. .50, M2, aircraft, basic
- Cal. .50, M2, water-cooled, flexible
- Cal. .50, M2, heavy-barrel, fixed
- Cal. .50, M2, heavy-barrel, flexible
- Cal. .50, M2, heavy-barrel, turret type

Water Chest, Cal. .50, M3

Ammunition Chest, Cal. .50, M2

Machine gun mounts
- Tripod Mount, Cal. .50, M3 and Antiaircraft Elevator Cradle, Cal. .50, M1
- Antiaircraft Mount, Cal. .50, M2A1
- Antiaircraft Mount, Cal. .50, M3
- Antiaircraft Mount, Cal. .50, M63

b. This manual does not contain information on operation, adjustment, and maintenance normally performed by the using arm, since such information is available to ordnance maintenance personnel in TM 9-225, TM 9-226, and FM 23-65. The information on the guns in this manual deals with all listed models and types simultaneously, with exceptions for certain models or types being noted where necessary.

c. Comparison With Preceding Edition. This Technical Manual differs from TM 9-1225, dated 15 April 1943, by numerous small changes and the following important additions and changes:

(1) Deletion of all information on the Aircraft Fixed and Flexible Guns M1921 and the Water-cooled Gun M1921A1.

(2) Addition of information on the Heavy-barrel, Turret-type Guns M2.

(3) Addition of information on the water chest, ammunition chest, mounts, and elevator cradle listed above.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

Section II

GENERAL DESCRIPTION

2. GENERAL DESCRIPTION OF THE GUNS.

a. The Aircraft Basic Browning Machine Gun, Cal. .50, M2 is an air-cooled, recoil-operated, alternate-feed gun which may be mounted on either a rigid, turret, or a hand-operated mount.

(1) The basic gun shown in figure 1 is equipped with a trigger bar, trigger bar pin assembly, bolt stud, bolt latch bracket, and a back plate with horizontal buffer assembly.

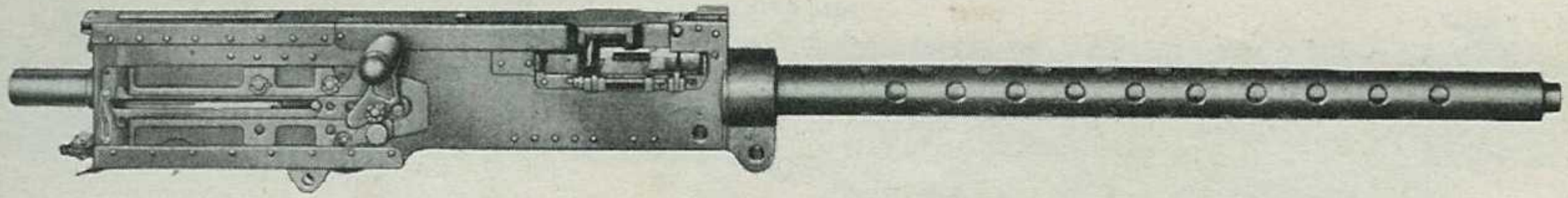
(2) Under different circumstances, the aircraft basic gun may be equipped with a retracting slide group assembly (fig. 2), an operating slide group assembly (fig. 3), a spade grip back plate assembly, or a combination of these assemblies. The basic gun and these assemblies are separate items of issue.

(3) Synchronizing mechanisms, solenoids, and various other special mechanisms are supplied by the Army Air Forces.

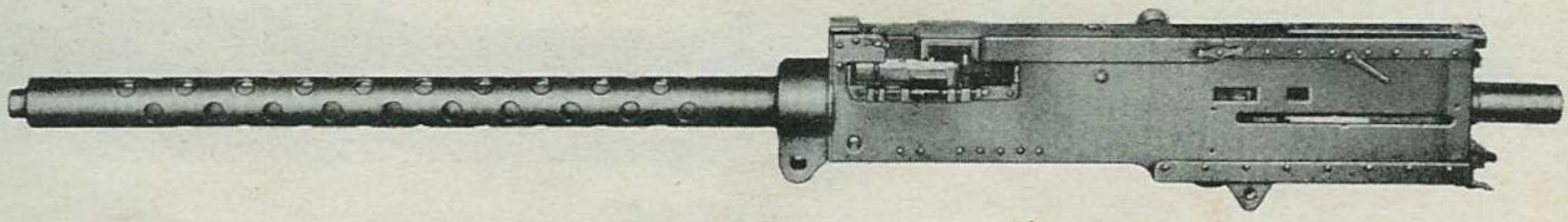
b. The Water-cooled, Flexible-type Browning Machine Gun, Cal. .50, M2 (fig. 4) is a recoil-operated, water-cooled, alternate-feed gun. It can be equipped with a retracting slide group assembly, a flexible back plate having a trigger and trigger safety, or a spade grip back plate assembly. The front and rear sights have been removed. The front sight base is retained for locating an antiaircraft sight.

c. The Heavy-barrel Browning Machine Gun, Cal. .50, M2, fixed, flexible, and turret types, are air-cooled, recoil-operated, alternate-feed guns. The main difference between this type of gun and other types of Guns, Cal. .50 M2 is the heavy barrel, the barrel support, and the oil buffer assembly. The barrel of this type of gun must be unscrewed and removed through the front of the gun before the oil buffer group and barrel extension can be removed from the gun. The heavy barrel does not recoil with as much force as the lighter barrels, and therefore, the oil buffer piston valve assembly, the oil buffer gland packing, packing gland ring, packing gland spring, relief valve, relief valve spring, relief valve screw, and oil have been omitted. These heavy-barrel guns are installed in mounts of several different types, in combat vehicles and tanks, or are used as ground guns mounted on the Machine Gun Tripod Mounts, Cal. .50, M3 and M63.

(1) The Heavy-barrel, Fixed Gun M2 shown in figure 5 is equipped with a basic back plate with horizontal buffer assembly (vertical buffer assembly may be used), and retracting slide group assembly for fixed installations in tanks. This gun can also be



RIGHT SIDE VIEW



LEFT SIDE VIEW

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Figure 2—Browning Machine Gun, Cal. .50, M2, Aircraft, Basic, Equipped With Retracting Slide Group Assembly

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

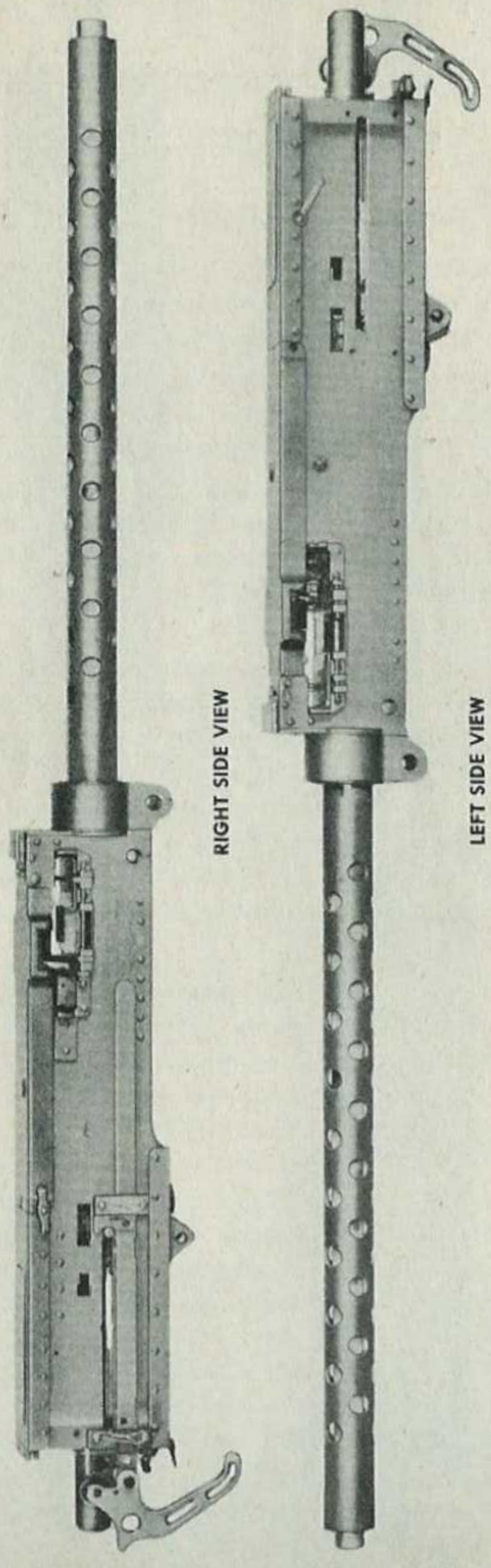

Figure 3—Browning Machine Gun, Cal. .50, M2, Aircraft, Basic, Equipped With Operating Slide Group Assembly

RIGHT SIDE VIEW

LEFT SIDE VIEW

RA PD 51073

Figure 4—Browning Machine Gun, Cal. .50, M2, Water-cooled, Flexible

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

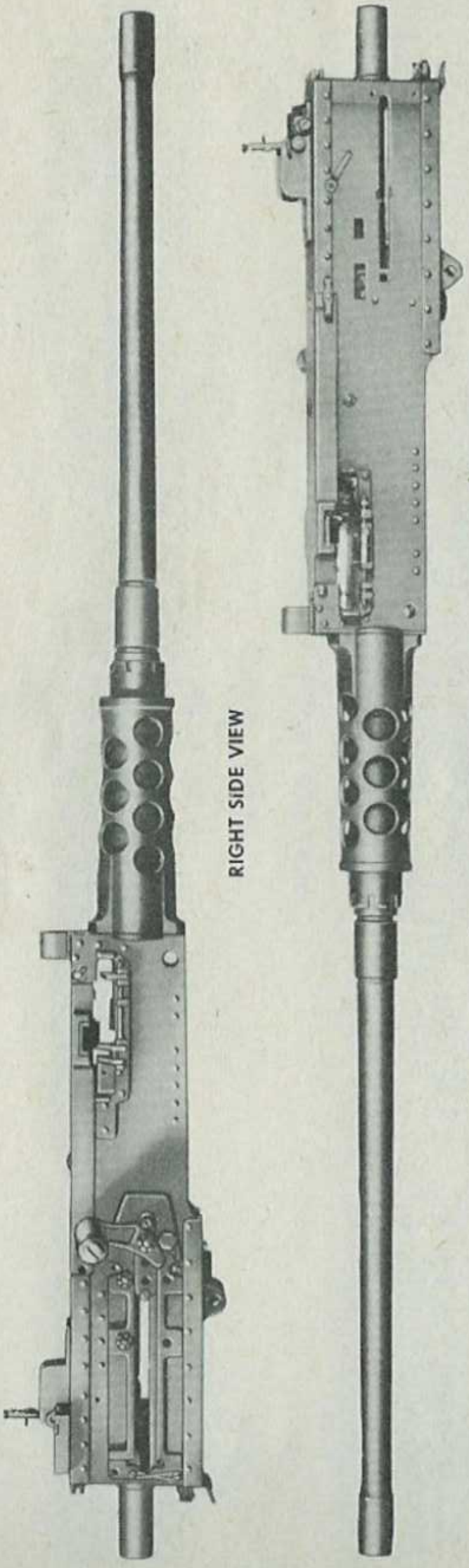

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Figure 5—Browning Machine Gun, Cal. .50, M2, Heavy-barrel, Fixed

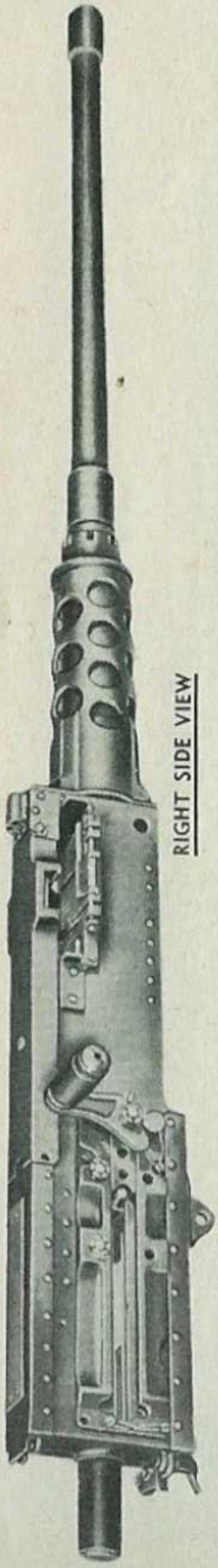
RIGHT SIDE VIEW

LEFT SIDE VIEW

RA PD 50942

Figure 6—Browning Machine Gun, Cal. .50, M2, Heavy-barrel, Flexible

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RIGHT SIDE VIEW

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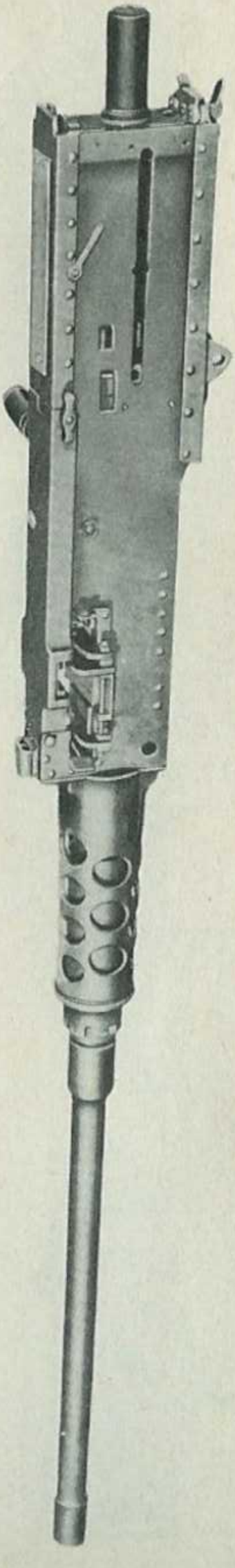

LEFT SIDE VIEW

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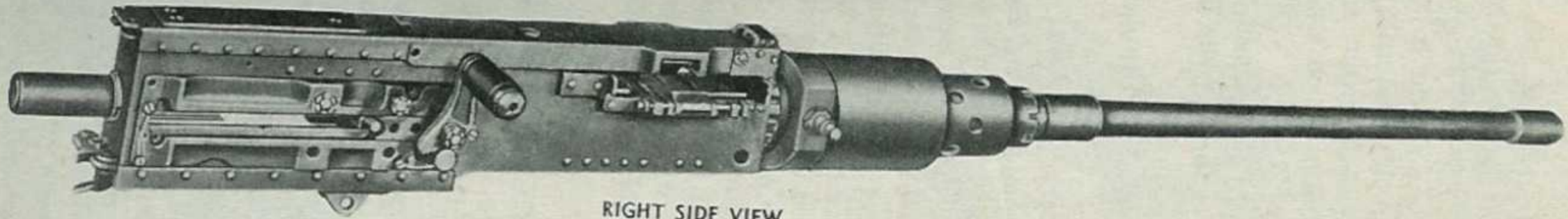
Figure 7—Browning Machine Gun, Cal. .50, M2, Heavy-barrel—Turret Type, Equipped With Barrel Support



RIGHT SIDE VIEW

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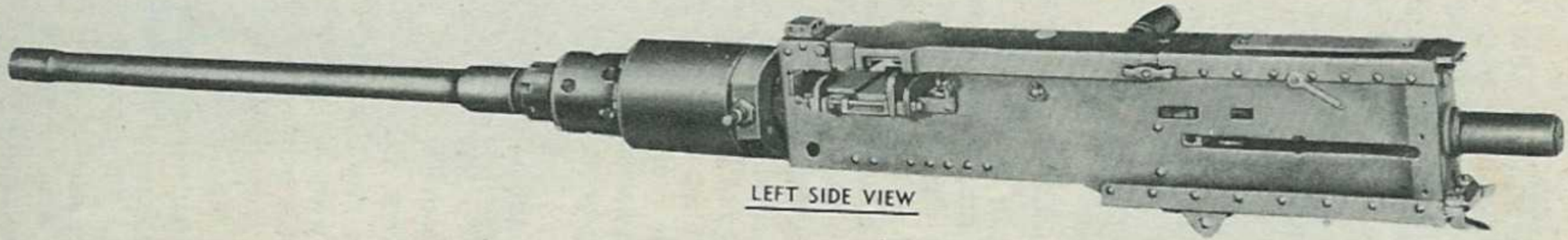

LEFT SIDE VIEW

RA PD 91961

Figure 8—Browning Machine Gun, Cal. .50, M2, Heavy-barrel—Turret Type, Equipped With Edgewater Adapter

mounted on the Machine Gun Antiaircraft Mount, Cal. .50, M2A1, when the barrel support adapter *C121036* is used in place of the barrel support. In these installations a side plate trigger is used.

(2) The Heavy-barrel, Flexible Gun, M2, as shown in figure 6, is equipped with a bolt latch, a spade grip back plate assembly which includes a bolt latch release, and a retracting slide group assembly for flexible mounting in combat vehicles and tanks, or on the Tripod Mount M3.

(3) The Heavy-barrel, Turret-type Gun M2 (shown in figs. 7 and 8) may be described as the aircraft basic gun with the following modifications:

(a) The barrel and jacket have been removed and replaced with the heavy barrel.

(b) The gun is charged by means of the retracting slide.

(c) The gun is provided with a barrel support or Edgewater adapter, depending on the type of installation. The barrel support is used with the Browning Machine Gun, Cal. .50, M2, heavy-barrel, turret-type when the gun is mounted on the Multiple Machine Gun Mount, Cal. .50, M45. The Edgewater adapter is used when the gun is mounted on the Twin Machine Gun Mount, Cal. .50, M33. The adapter is a spring-ring, recoil absorber. It consists of an inner shell which is threaded onto the trunnion block and an outer shell containing a series of overlapping spring rings. The springs consist of an overlapping inner and outer set with beveled and engaging surfaces. When the gun recoils, the springs act together to compress the inner rings and expand the outer rings. The recoil is neutralized by the frictional engagement of the rings.

3. GENERAL DESCRIPTION OF ACCESSORIES AND MOUNTS.

a. Accessories.

(1) WATER CHEST, CAL. .50, M3. This water chest (fig. 9) consists of a hand-operated, chain-driven rotor pump mounted in a steel chest with the necessary hose and connections. The pump is operated while firing, causing circulation of water in the water jacket of the gun, thereby keeping the gun barrel cool. This chest has a capacity of 8 gallons.

(2) AMMUNITION CHEST, CAL. .50, M2. This ammunition chest (fig. 10) provides a convenient means of handling and feeding belted ammunition. The chest is provided with a removable crank for use in loading, is made of steel, and is equipped with a hinge so that the upper half may be swung back for purposes of filling and cleaning. Latches are provided for locking the upper half in place. The upper

GENERAL DESCRIPTION

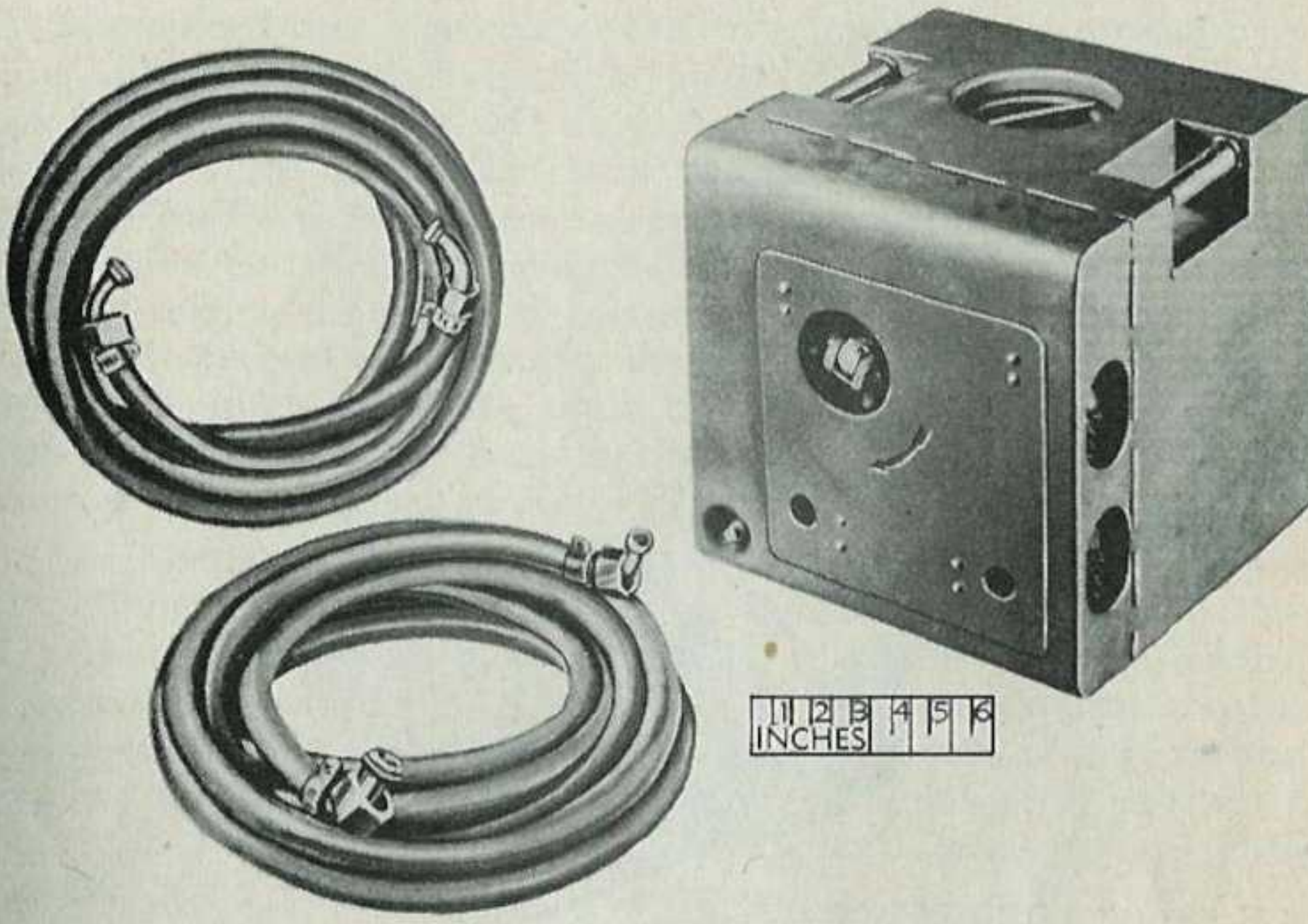

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Figure 9—Water Chest, Cal. .50, M3, *1-C-3506* w/Hose

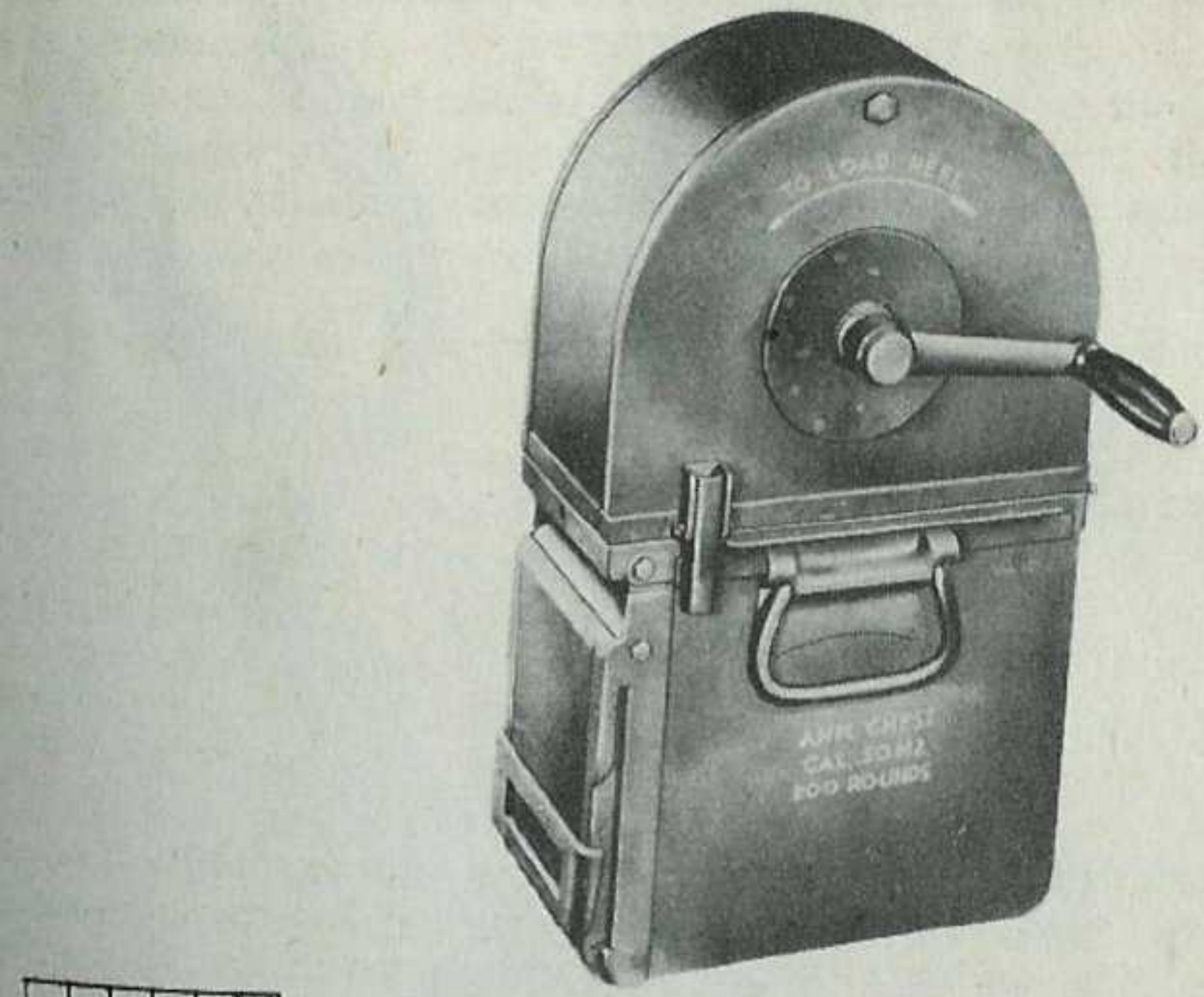

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Figure 10—Ammunition Chest, Cal. .50, M2, *4-C-1138-40*

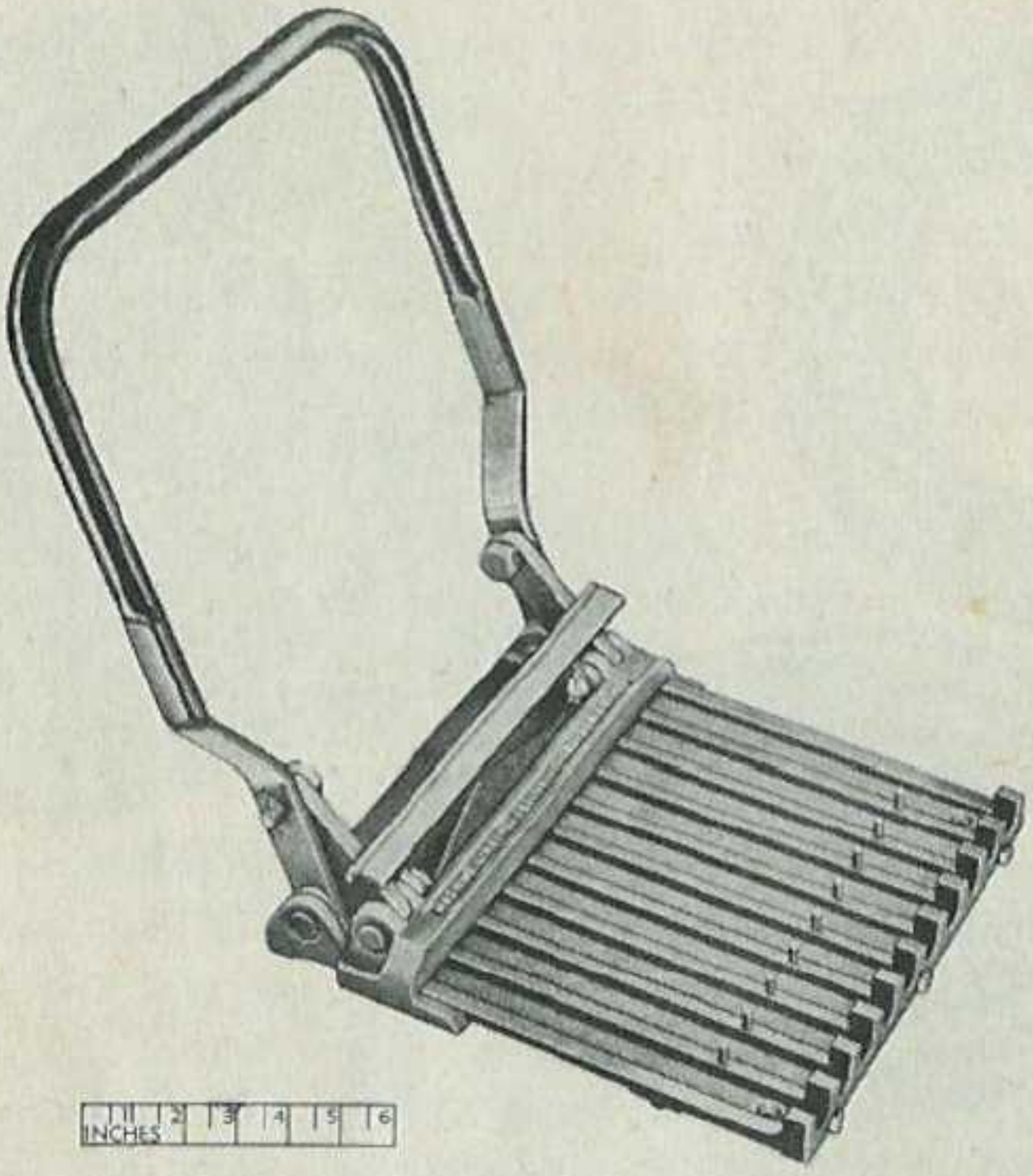

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Figure 11—Link-delinking Machine, Cal. .50, M7, *1-M-72-625*

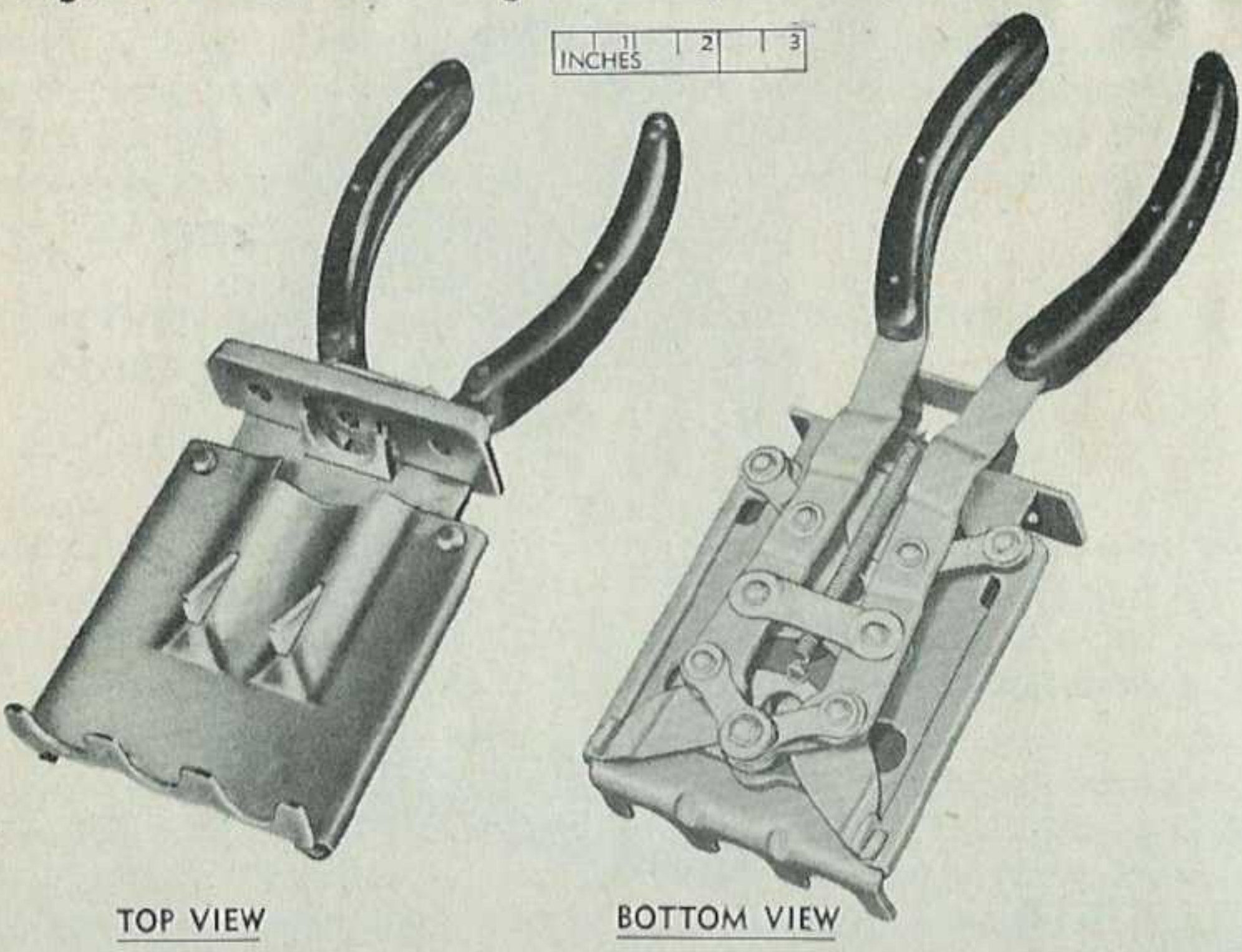

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Figure 12—Hand Linker-Delinker, Cal. .50, M12, *41-L-1604*

GENERAL DESCRIPTION

half is provided with a spindle or reel with fins, which is rotated by a removable crank; a cartridge filler piece located around the spindle and mating with the fins; and a spring-operated stop to hold the belt on the reel while closing the chest. The lower half is provided with rollers to facilitate feeding, and a spring-operated stop to prevent the ammunition belt from dropping back when the tension is released. When reversing the feed, the cartridge filler piece must also be reversed. To reverse the cartridge filler piece, loosen the set screw and slide horizontally on spindle until in position between the projectile ends of the rounds. To hold the cartridge filler piece in a locked position, tighten the set screw.

(3) LINK-DELINKING MACHINE, CAL. .50, M7, *1-M-72-625* (fig. 11). This machine is designed for the delinking as well as the linking of ammunition. The linking mechanism is used for rapid loading of ammunition into metallic links. The delinking apparatus consists of an L-shaped bar attached to the machine by means of longer hinge pins and separating pins set in the base. All Link-loading Machines, Cal. .50, M2 are being modified to Linking and Delinking Machines, Cal. .50, M7 by MWO ORD A19-W5.

(4) HAND LINKER-DELINKER, CAL. .50, M12, *41-L-1604* (fig. 12). The hand linker-delinker can be used to extract a defective round quickly and relink at any point in a cal. .50 metallic link belt. This tool will insert or extract a single cartridge and will position three cartridges.

(5) Various accessories are provided for use in the cleaning and maintenance of the weapon. The names or general characteristics of most of these accessories indicate their use and application and are, therefore, not covered in this manual.

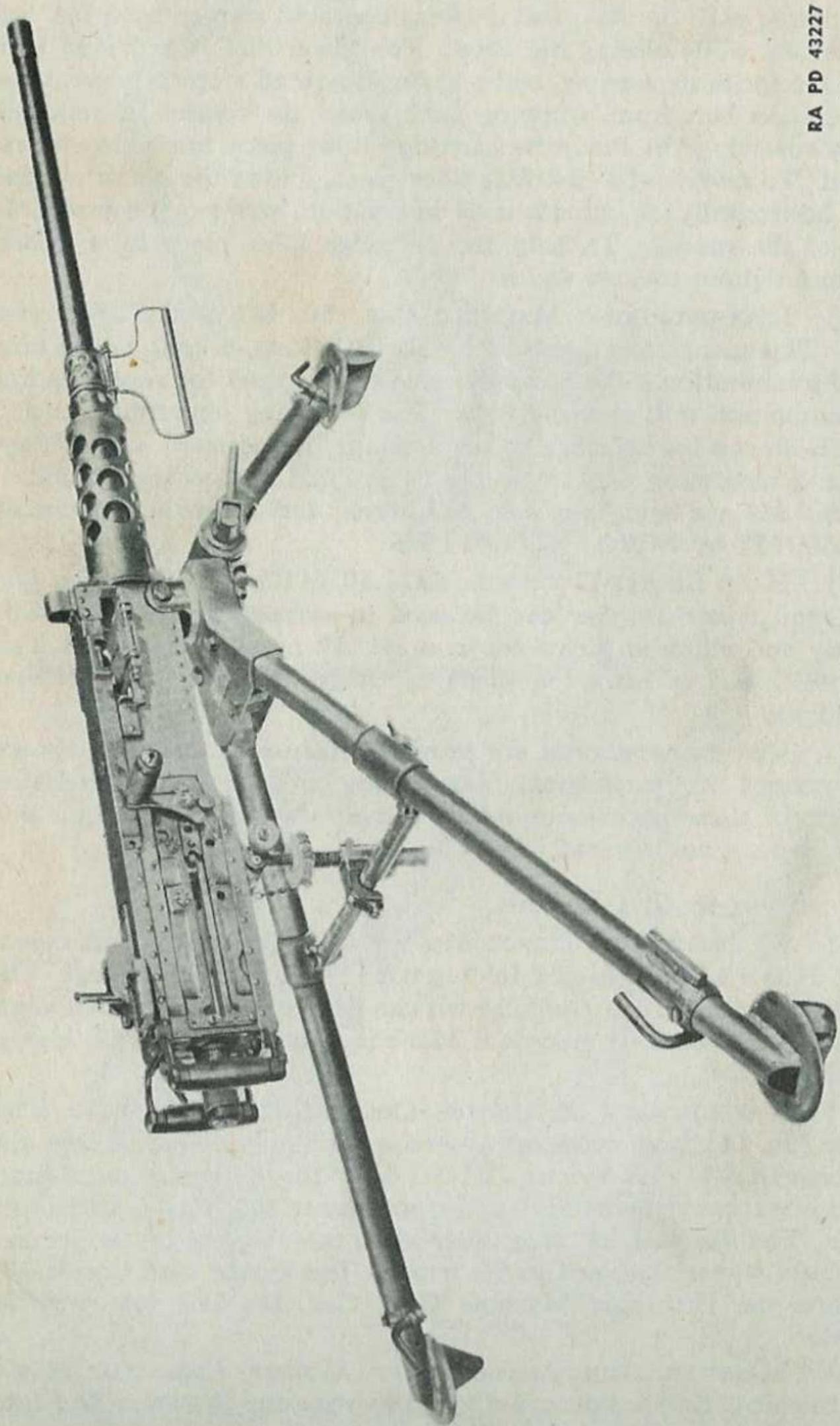
b. Machine Gun Mounts.

(1) MACHINE GUN TRIPOD MOUNT, CAL. .50, M3. This mount (fig. 13) is a variable-height, folding tripod with telescoping legs. The mount is intended for ground fire but can be used up to a limited angle for antiaircraft fire. It mounts a Machine Gun, Cal. .50, M2, heavy-barrel, flexible.

(2) ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1. This cradle (fig. 14) is an accessory to and is used in conjunction with the Machine Gun Tripod Mount, Cal. .50, M3. The principal components of the elevator cradle for this mount are the tripod legs, elevator, and cradle. The legs rest on the ground while the elevator pintle fits into the pintle seat in the head of the tripod. The mount with Cradle M1 supports the Browning Machine Gun, Cal. .50, M2, heavy-barrel, flexible.

(3) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M2A1. This mount (fig. 15) is designed for supporting the Browning Machine

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 43227

Figure 13—Browning Machine Gun, Cal. .50, M2, Heavy-barrel, Flexible, Mounted on Machine Gun Tripod Mount, Cal. .50, M3

GENERAL DESCRIPTION

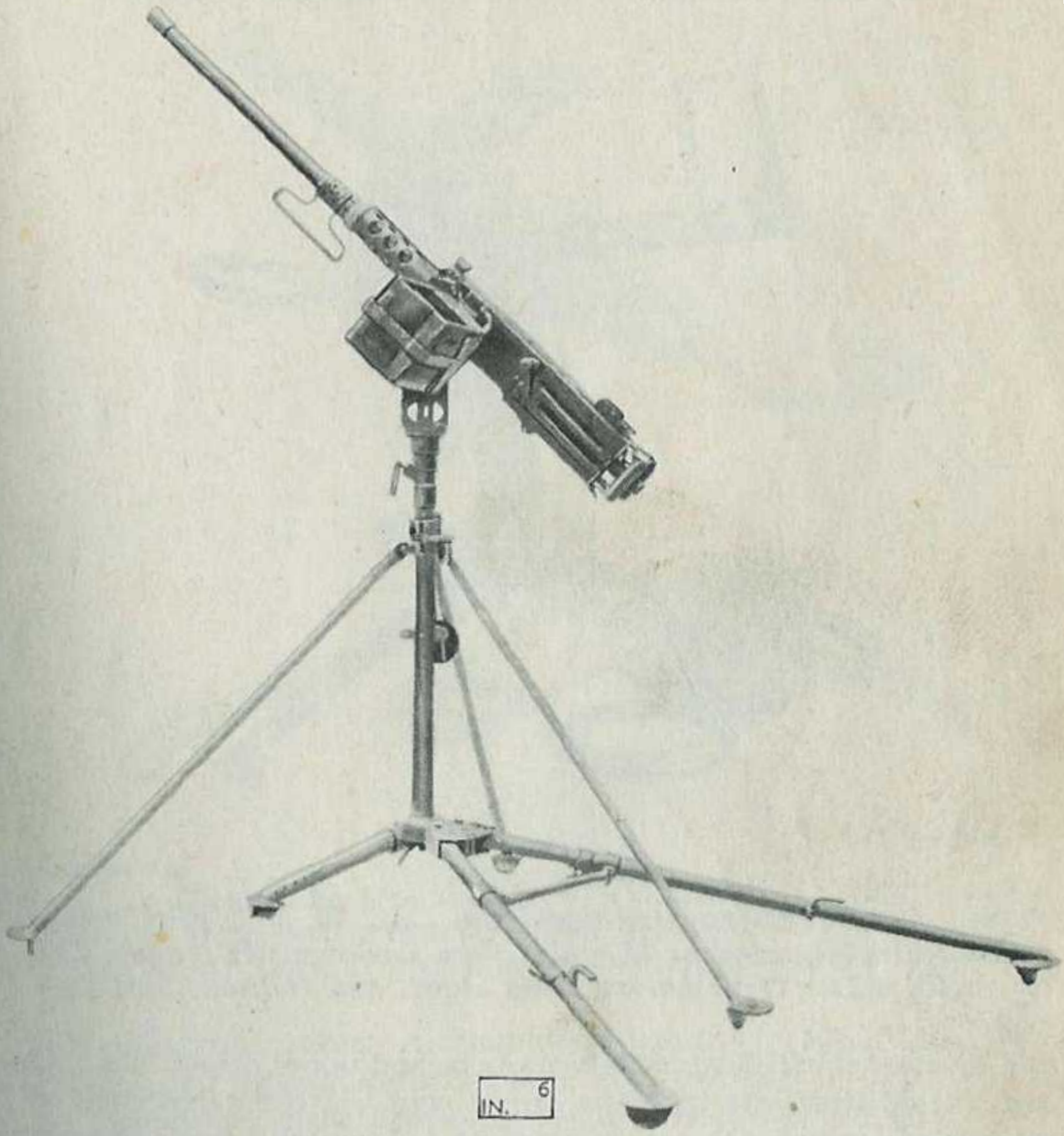


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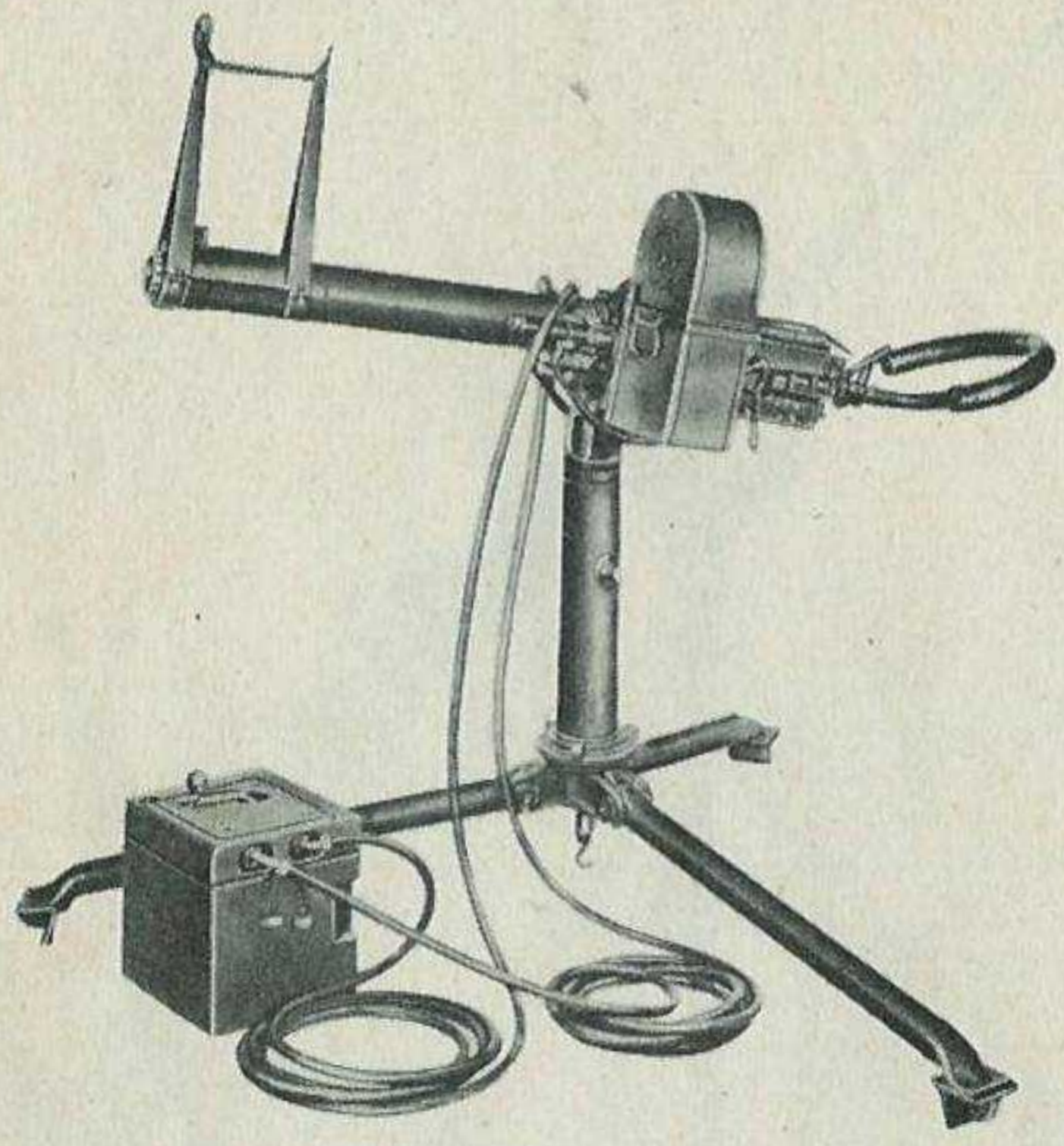
Figure 14—Browning Machine Gun, Cal. .50, M2, Heavy-barrel, Flexible, Mounted on Antiaircraft Elevator Cradle, Cal. .50, M1 and Machine Gun Tripod Mount Cal. .50, M3

Gun, Cal. .50, M2, water-cooled. The chief components of the mount are the cradle, pintle, pedestal, back rest, and tripod legs. By removing the tripod legs and assembling a pedestal base, the mount may be installed in a permanent position. When assembled with pedestal base, the mount is designated as Antiaircraft Machine Gun Pedestal Mount, Cal. .50, M2A1. A simple Antiaircraft Sight M1, for direct pointing, is clamped to the forward end of the water jacket of the gun. This sight is supplied as an accessory to the mount. This mount has been modified (MWO A37-W14) to include an armor shield attached to the mount for the protection of the gunner, consist-



RA PD 60278

Figure 15—Browning Machine Gun, Cal. .50, M2, Water-cooled, Flexible, Mounted on Machine Gun Antiaircraft Mount, Cal. .50, M2A1 With Antiaircraft Sight, and Without Shields

ing of lower shield, lower shield support, and upper shield. To balance the mount after attaching the armor shield, a counterbalance of 23 pounds of lead shot is poured into the hollow back rest. The mount with shield attached and without antiaircraft sight is shown in figure 16.

(4) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3. The principal components of this mount (fig. 17) are the cradle, pintle, pedestal, base rings, and tripod legs. Two protecting shields are attached to the mount. The mount supports a Browning Machine Gun, Cal. .50, M2, water-cooled, flexible. When other models of the Browning Machine Gun, Cal. .50, M2 are used with this mount, a counterweight is assembled to the front of the cradle to balance gun when assembled to the cradle (fig. 18). The rear gun cradle bracket is being modified to insure that all Water-cooled Guns M2 will assemble into the mount cradle. Also a trigger release spring *A7100105* is now being assembled to the frame under the trigger lock housing to insure return of trigger control mechanism to normal position when grips are depressed.

GENERAL DESCRIPTION

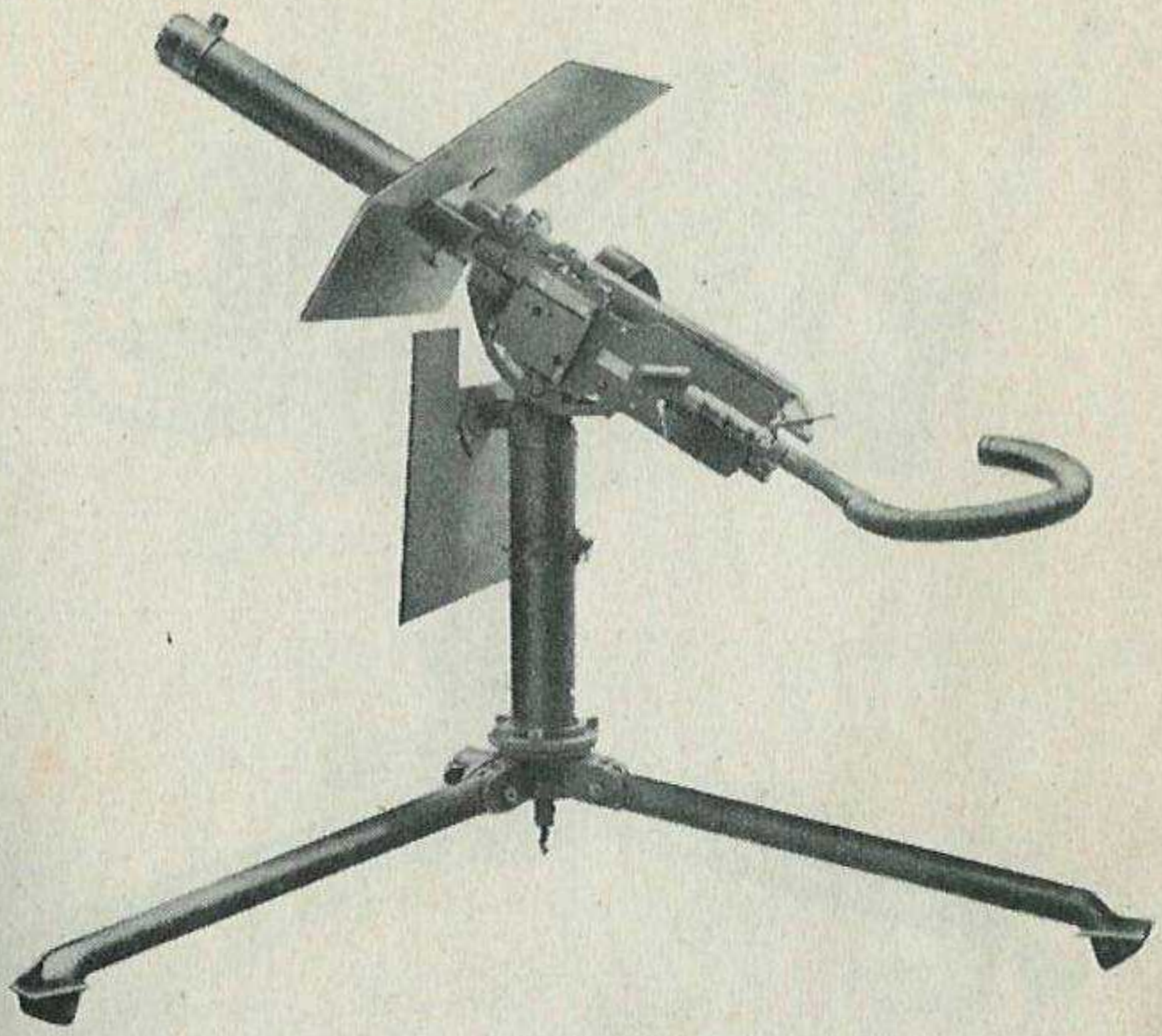


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Figure 16—Browning Machine Gun, Cal. .50, M2 Water-cooled, Flexible, Mounted on Machine Gun Antiaircraft Mount, Cal. .50, M2A1 With Shields and Without Antiaircraft Sight

(5) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63. This is a four-legged, low-silhouette, portable mount (fig. 19) designed primarily for the Browning Machine Gun, Cal. .50, M2, heavy-barrel. In an emergency, the Aircraft Basic Gun, Cal. .50, M2, or the Water-cooled Gun, Cal. .50, M2, can also be mounted. In addition, all machine guns, cal. .30, can be mounted on this mount. No antiaircraft sights are provided with this mount.

4. DATA.

a. Guns.

(1) CAL. .50, M2, AIRCRAFT BASIC.

Weight of gun	61.00 lb
Weight of barrel	9.50 or 9.85 lb
Weight of retracting slide group assembly	3.00 lb
Weight of operating slide group assembly	1.50 lb
Length of gun with retracting slide group assembly	56.25 in.
Length of gun with operating slide group assembly	57.00 in.
Length of barrel	36.00 in.

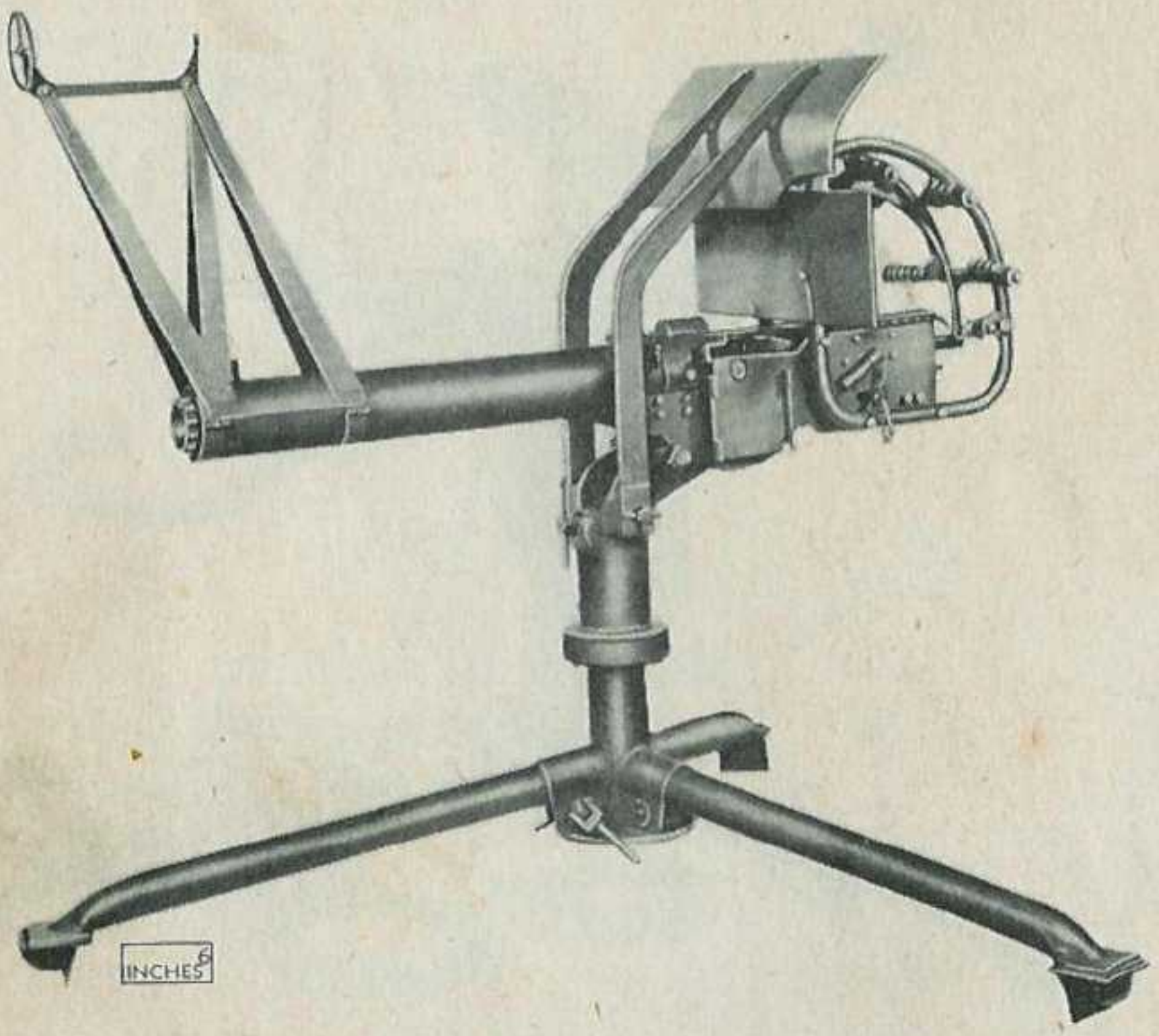

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Figure 17—Browning Machine Gun, Cal. .50, M2, Water-cooled, Flexible, Mounted on Machine Gun Antiaircraft Mount, Cal. .50, M3

Number of lands and grooves	8
Rifling—right-hand twist	1 turn in 15 in.
Rate of fire	750 to 850 rounds per min

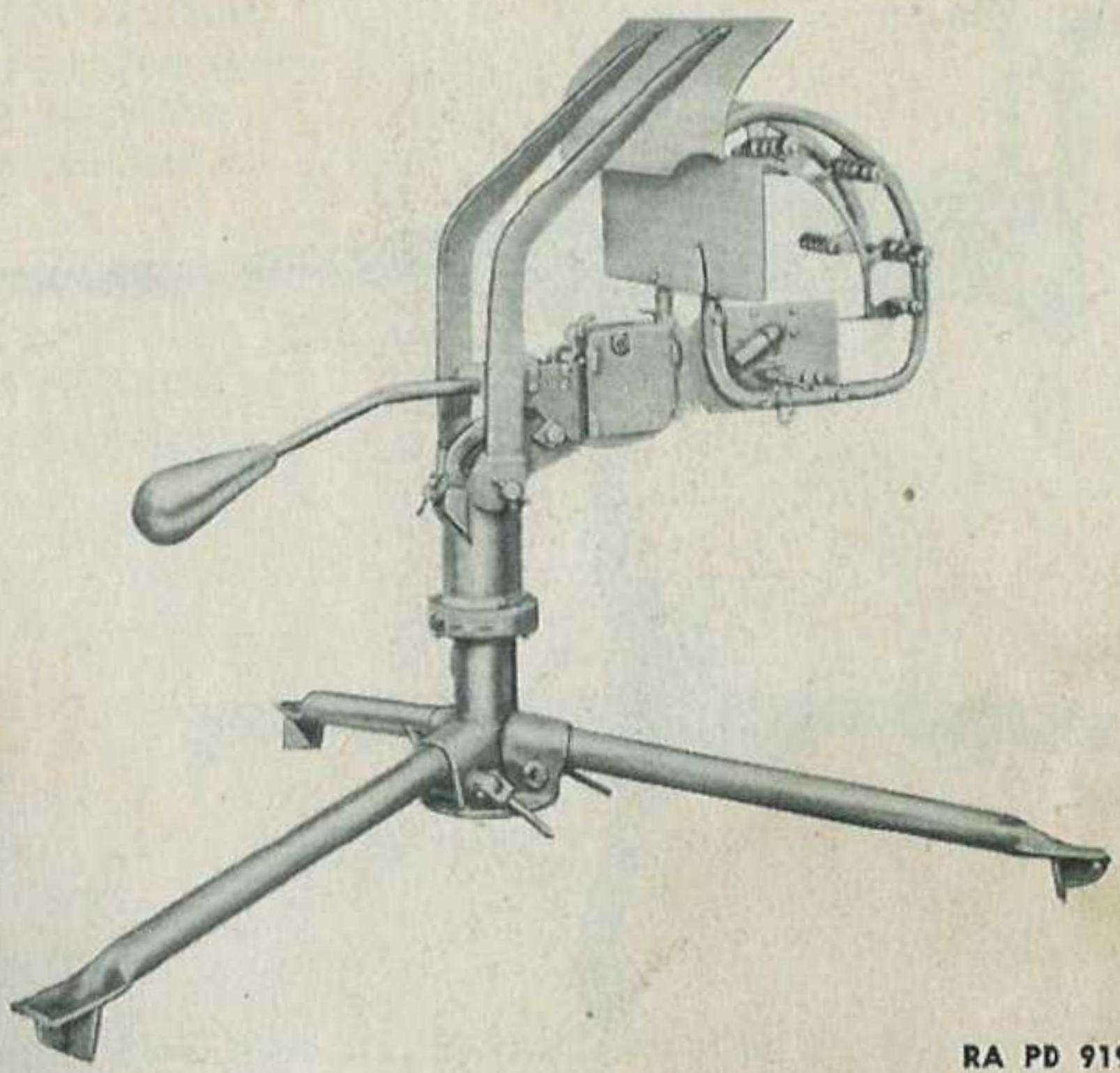
(2) CAL. .50, M2, WATER-COOLED, FLEXIBLE.

Weight of gun	100.50 lb
Weight of gun with water	121.00 lb
Weight of barrel	17.08 lb
Length of gun	66.00 in.
Length of barrel	45.00 in.
Number of lands and grooves	8
Rifling—right-hand twist	1 turn in 15 in.
Rate of fire	550 to 700 rounds per min

(3) CAL. .50, M2, HEAVY-BARREL, FIXED AND FLEXIBLE.

Weight of fixed gun	82.00 lb
Weight of flexible gun	84.00 lb
Weight of barrel	28.00 lb
Length of gun	65.13 in.
Length of barrel	45.00 in.

GENERAL DESCRIPTION



RA PD 91909

Figure 18—Machine Gun Antiaircraft Mount, Cal. .50, M3 With Counterbalance Assembled

Number of lands and grooves	8
Rifling—right-hand twist	1 turn in 15 in.
Rate of fire	450 to 550 rounds per min

(4) CAL. .50, M2, HEAVY-BARREL, TURRET-TYPE.

Weight of gun equipped with barrel support	80.00 lb
Weight of gun equipped with Edgewater adapter	81.00 lb
Weight of barrel	28.00 lb
Length of gun	65.13 in.
Length of barrel	45.00 in.
Number of lands and grooves	8
Rifling—right-hand twist	1 turn in 15 in.
Rate of fire	450 to 550 rounds per min

b. Water Chest, Cal. .50, M3.

Weight (empty with hose)	74.50 lb
Capacity	8 gal

c. Ammunition Chest, Cal. .50, M2.

Weight (empty)	32 lb
Capacity	200 rounds

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

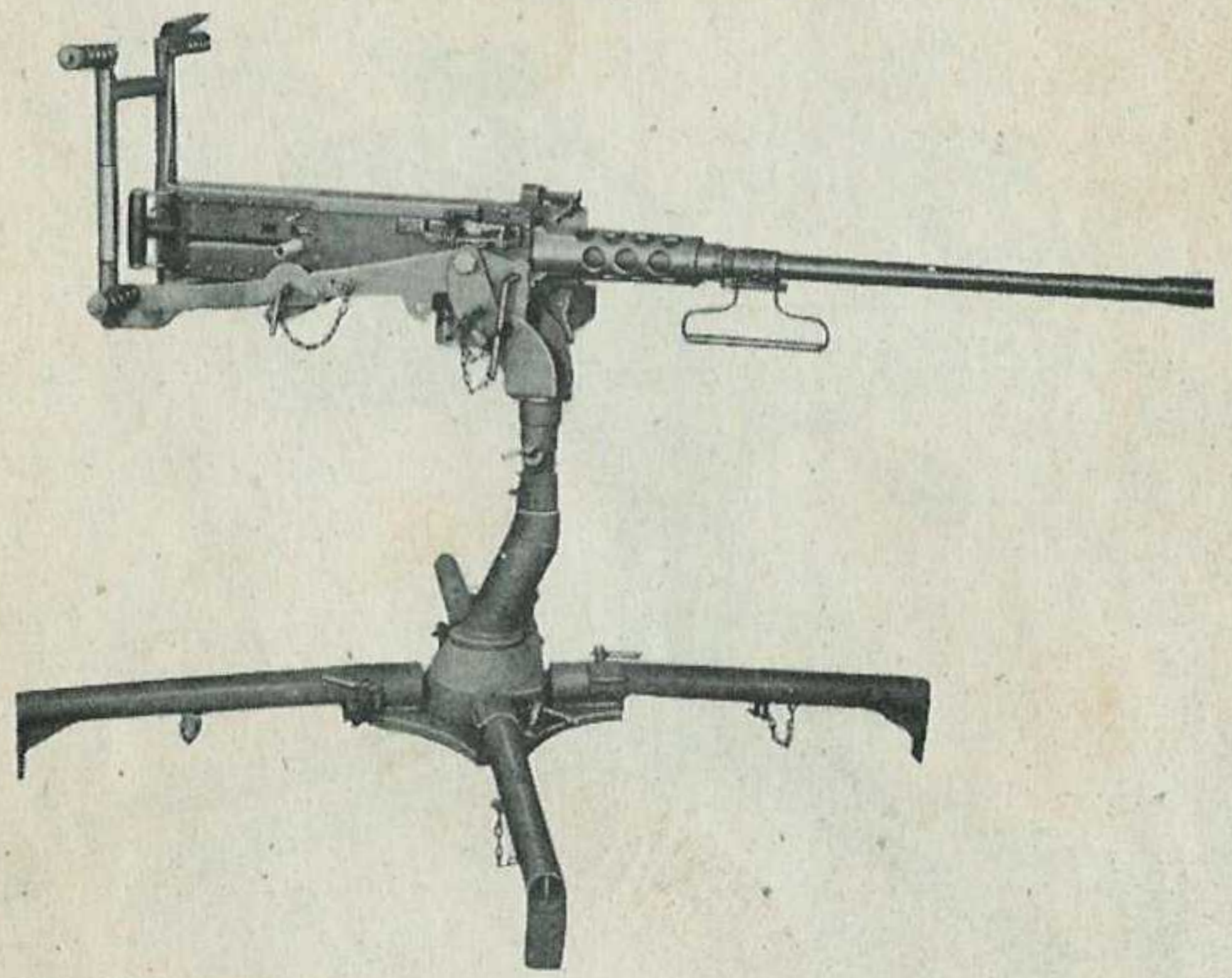


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Figure 19—Browning Machine Gun, Cal. .50, M2, Heavy-barrel, Mounted on Machine Gun Antiaircraft Mount, Cal. .50, M63

d. Mounts.

(1) MACHINE GUN TRIPOD MOUNT, CAL. .50, M3.

Weight	44 lb
Maximum elevation	5.6 deg
Maximum depression	14 deg
Traverse	360 deg

(2) ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1.

Weight with Mount, Cal. .50, M3	90.20 lb
Maximum elevation	82 deg
Maximum depression	16 deg
Traverse	360 deg

(3) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M2A1.

Weight (tripod type) without shields	359.50 lb
Weight (pedestal type) without shields	291.50 lb
Weight, upper shield assembly (approx)	72 lb
Weight, lower shield assembly (approx)	46 lb
Maximum elevation	68.75 deg
Maximum depression	15.00 deg
Traverse	360.00 deg

INSPECTION

(4) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3.

Weight (tripod type)	380.00 lb
Weight (pedestal type)	400.75 lb
Maximum elevation	90.00 deg
Maximum depression	15.00 deg
Traverse	360.00 deg

(5) MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63.

Weight	144 lb
Maximum elevation	84 deg
Maximum depression	29 deg
Traverse	360 deg

Section III

INSPECTION

5. GENERAL.

a. Safety Precautions. Before inspecting the weapon, raise the cover and retract the bolt sufficiently to make sure there are no cartridges in the feedway, T-slot, or chamber. Never cock the gun against the tension of driving springs with the back plate removed from the gun, as serious injury to personnel may result if the retaining pin disengages from the receiver.

b. General. Inspection serves the purpose of determining the condition of the materiel, whether or not repairs or adjustments are required, and what remedies are necessary to insure that the materiel is in operable condition. Before inspection is begun, the materiel should be properly cleaned to remove any grease, dirt, or foreign matter which might interfere with its proper functioning or obscure the true condition of the parts. General inspection instructions are contained in TM 9-1100, Inspection of Ordnance Materiel. The inspector should be well versed in maintenance procedures for the materiel and must have a working knowledge of the tools needed for inspection (sec. IV).

6. PURPOSE.

a. Fundamentally, inspection is for the purpose of determining whether or not the materiel is serviceable, or the extent of its serviceability. Important but secondary purposes are the detection of incipient failure and determination of whether or not proper care is

being taken of the materiel and accessories. Serviceability, as interpreted in this section, is the ability of the materiel to perform its intended functions completely.

b. In the event the materiel is found unserviceable or incipient failures are disclosed, the cause and extent of unserviceability will be determined. Such deficiencies as are found will be corrected on the spot or corrective measures will be taken. If the materiel is "deadlined" and sent to a higher echelon of maintenance for repair it will be thoroughly and completely inspected, put into the best possible condition that time, materials, and tactical circumstances will allow, and returned to the using arm ready for immediate use.

c. It is often desirable to determine the general condition of weapons, when complete disassembly of the parts is not possible or desirable. When malfunctions develop, it is also important that the gun be inspected and pertinent information recorded before the gun is disassembled. This also applies to mounts and other materiel. Such data will be very helpful in determining the true cause of improper operation of the weapon and in correcting the trouble. Inspection after disassembly is covered in the section pertaining to the group, mount, or accessories. The gun should be carefully checked for head space and timing (par. 9 **c**) and thoroughly cleaned before inspecting for functioning.

7. REPORTS.

a. Suggested improvements in design, maintenance, safety, and efficiency of operation prompted by chronic failure or malfunction of the weapon, spare parts, accessories, or equipment should be forwarded to the Office of the Chief of Ordnance, Field Service, Maintenance Division, with all available pertinent information necessary to initiate corrective action. This information should be reported on WD AGO Form No. 468, Unsatisfactory Equipment Report. Such suggestions are encouraged so that other organizations may benefit. If WD AGO Form No. 468 is not available, refer to TM 38-250 for list of data required on unsatisfactory equipment report.

b. Report to the responsible officer any persistent carelessness or negligence in the observance of preventive maintenance procedures and safety precautions. This report should be accompanied by recommendations for correcting the unsatisfactory conditions. NOTE: *The inspector's aim is not to find fault with the using troops, but to be helpful.*

INSPECTION

8. MATERIEL IN GENERAL.

a. Lubrication. Check to see that the materiel is properly lubricated in accordance with instructions in using-arm manuals.

b. Modifications. A check should be made to insure that all authorized modifications have been applied.

c. Name Plates. Lettering on name, direction, and caution plates should be legible.

d. Completeness. The materiel should be inspected for missing bolts, rivets, screws, pins, equipment, etc.

e. Cracks. Plates, castings, and welds should be inspected for cracks and breaks.

f. Painting. If paint has deteriorated or become damaged, leaving exposed portions of bare metal, the materiel should be repainted.

g. Spare Parts and Equipment. These should be inspected for completeness and serviceability. Inspect covers.

9. THE GUN AS A UNIT.

a. Check general appearance. Note smoothness of operation by pulling the retracting or operating slide to the rear and releasing. Check adjusting screw in the back plate for tightness. Observe the operation of the cover latch, making sure there is sufficient tension on the spring to keep the cover securely latched. Raise the cover and check the action of the cover detent pawl. Move the belt feed lever from side to side, making sure the belt feed mechanism moves freely in its full travel in both directions. Check the bolt for evidence of rust, and inspect the extractor and ejector. Make sure the screws at the front of the barrel jacket (aircraft guns) and those used in attaching the retracting or operating slide are properly in place, and that no cotter pins or locking wires are missing. Check back plate latch and lock for retention, and barrel jacket or water jacket for tightness on trunnion block. For test of guns after assembly, refer to paragraph 24.

b. If a gun is damaged by an accident, a complete report must be sent to the ordnance office. Instructions for the disposition of damaged parts will then be forwarded by the ordnance office.

c. Head Space and Timing of the Guns. Guns which have developed malfunctions should be carefully checked for head space and timing before the weapons are disassembled. For malfunction of short recoil due to causes other than incorrect head space or timing, refer to paragraph 47 **r**.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

10. WATER CHEST, CAL. .50, M3, *A037-03-00014.*

a. Inspect chest as a unit for general condition and appearance. Operate chest by turning handle and check to see that parts move smoothly and function properly. Inspect for missing hose connection caps and like parts. Check for leaks especially around pump packing.

11. AMMUNITION CHEST, CAL. .50, M2, *A037-6528399.*

a. Inspect chest as a unit for general condition and appearance. Operate chest by turning handle and check for smooth action of reel. Inspect interior of chest for dirt and grit in chest or reel mechanism. Check hinges and latches for operation and security. Check attachment slots in side of chest for wear, and lining for condition.

12. LINK-DELINKING MACHINE, CAL. .50, M7, *1-M-72-625.*

a. Inspect the machine for general condition, rust, and smoothness of operation. Use dummy cartridges and links to test operation and check to see that cartridges are fully loaded into links, and positively withdrawn.

13. HAND LINKER-DELINKER, CAL. .50, M12, *41-L-1604.*

a. Inspect linker-delinker for general condition and operation. Use dummy cartridges and links to test operation and see that cartridges are properly positioned in links and positively withdrawn. Check mechanism for looseness, lost motion and wear, cracked handles, and bent parts.

14. MACHINE GUN TRIPOD MOUNT, CAL. .50, M3, AND ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1.

a. Inspect the mount as a unit for general condition and rigidity. Check functioning of traversing and elevating mechanisms and locking devices. Check graduations on traversing bar with traversing dial for position. Check graduations on elevating handwheel with divisions on upper elevating screw scale. The mount in firing position must be rigid and the adjustments must be securely locked to prevent their becoming disengaged in service due to the hammering action of machine gun fire. Gun securing pins must have a snug but smooth fit to eliminate all play between the machine gun and the mount, and must permit mounting and dismounting of the gun without interference.

INSPECTION

b. The elevating mechanism assembly must be checked after replacing to insure the machine gun being level at "0." If not level, lift traversing slide from traversing bar and, holding upper and lower elevating screw to keep from rotating, rotate the elevating mechanism sleeve one turn and check, using level or quadrant on machine gun. Repeat this performance until the machine gun is horizontal at "0."

c. Check Elevator Cradle M1 for general condition, rigidity and straightness of legs, and positive action of leg and pintle locking clamps. Check pintle and pintle socket for wear and burs, and ammunition box bracket for security on yoke. Check gun securing pin for wear and looseness when assembled.

15. MACHINE GUN ANTIAIRCRAFT MOUNTS, CAL. .50, M2A1, M3, AND M63.

a. General. Inspect mounts as a unit for condition, rigidity and looseness or lost motion of their component assemblies, and for missing parts. Test mounts for elevation and traverse throughout entire range, and check locking devices. Check gun securing pins for wear and looseness when gun is mounted.

b. Antiaircraft Mount, Cal. .50, M2A1.

(1) Check action of pintle and transfer gears relative to adjusting racks and compensating spring of lower recoil mechanism.

(2) Check position of trigger control clamp and hand lever with relation to back rest bracket and test hand lever lock and action of lever. Check security and position of trigger control mechanism with relation to side plate trigger on gun (when mounted) and condition of contacting lugs on mechanism slide and side plate trigger. Check trigger control mechanism for functioning. See that trigger control mechanism slide returns to normal position when hand lever is released.

(3) Inspect upper buffer recoil mechanism for condition of springs, trunnion clamps, and spring adjusting plugs.

(4) Check slide stop assembly in lower recoil mechanism for conditioning and functioning with respect to the gun (when mounted).

(5) Check security of shields, ammunition chest support, and side plate trigger container.

(6) Check for presence of side plate trigger assembly in container.

c. Antiaircraft Mount, Cal. .50, M3.

(1) Inspect recoil mechanism group for security in cradle, functioning and condition, and security of springs and other parts.

(2) Check position and security of trigger control mechanism on cradle, and condition of contacting lugs on mechanism slide and side plate trigger.

(3) Inspect security of trigger frame group on cradle, action of trigger control group, and general condition and security of parts. See that trigger control mechanism slide returns to normal position when trigger control grip is released; and check function of trigger locking plunger.

(4) Check free movement of trunnion bracket socket when turned with respect to pedestal, for possible dirt in bearing, or damaged bearing.

(5) Check security of shields, ammunition chest bracket, and side plate trigger container, and locking of gun securing pins.

(6) Check for presence of side plate trigger assembly in container.

d. Antiaircraft Mount, Cal. .50, M63.

(1) Inspect cradle group for loose assemblies or parts, and rigidity of handle extensions. Test raising, folding, and locking of extensions. Check positive positioning of cradle in horizontal and vertical position.

(2) Inspect trigger control mechanism for security on cradle and condition of contacting lugs on mechanism and side plate trigger. Check operation of firing levers, and linkage for lost motion and wear, and see that trigger control mechanism slide returns to normal position when levers are released. Check action of safety.

(3) Check free movement of elevator in base, and for possible dirt in bearing or damaged bearing.

(4) Check all locking devices, and security of leg clamps. Check security of ammunition box bracket and side plate trigger container on cradle.

(5) Check for presence of side plate trigger assembly in container.

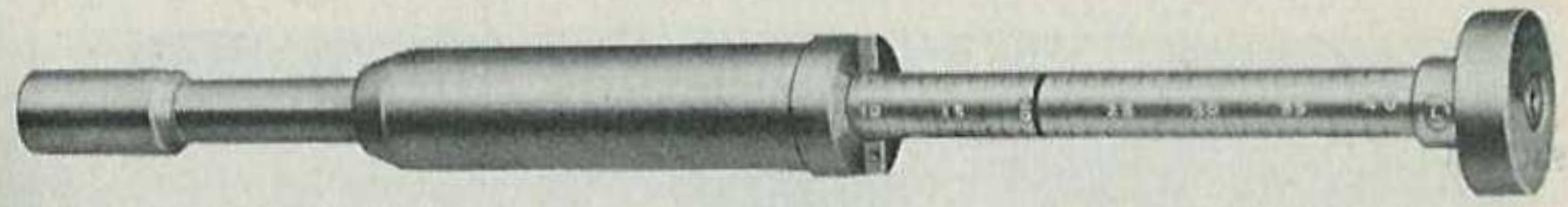
Section IV

TOOLS

16. GENERAL.

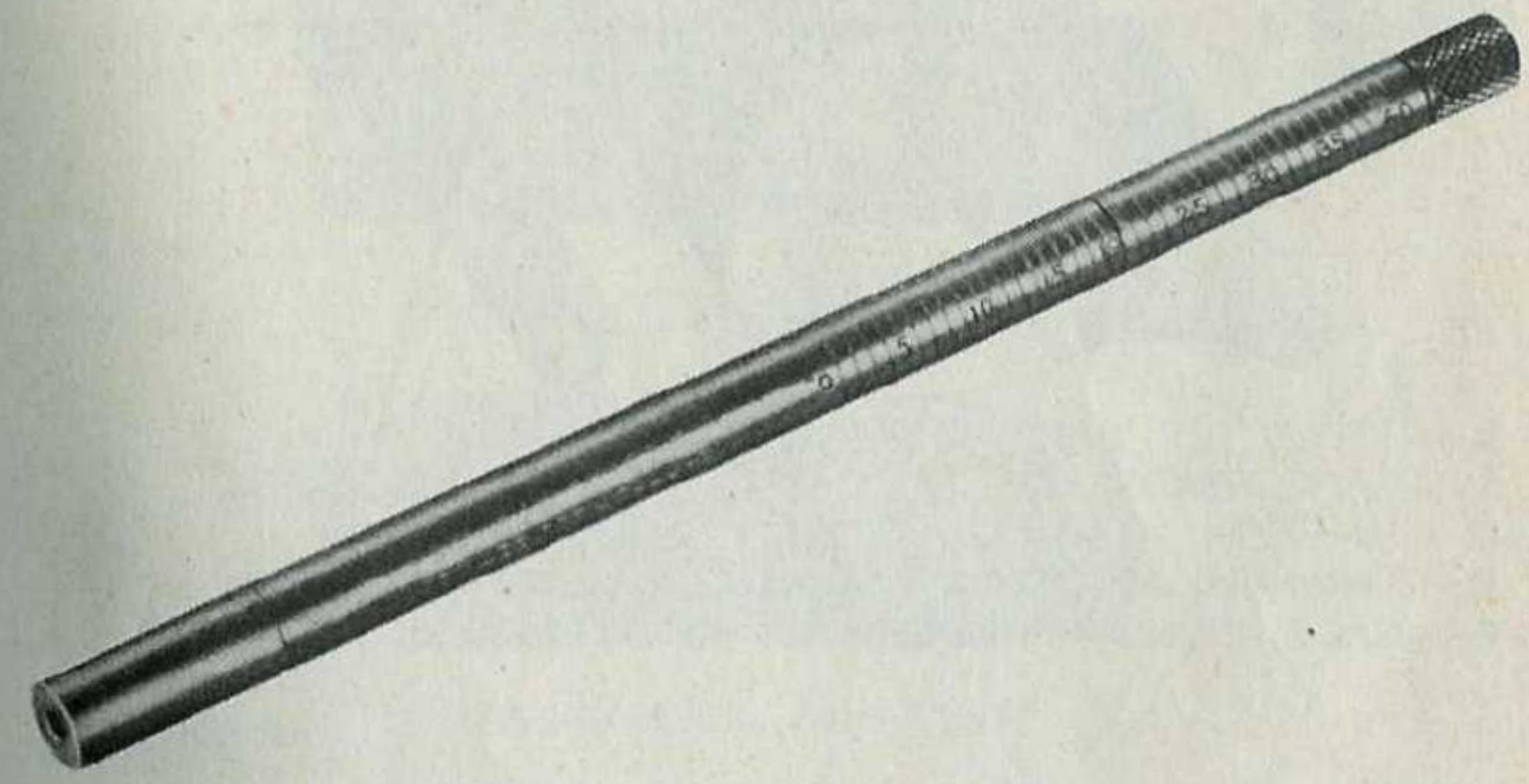
a. Special repair tools and gages for maintenance of the cal. .50 Browning machine gun are listed in SNL A-35 and pertinent Standard Nomenclature Lists. These tools and gages are included as part of the equipment of the armorer's tool chest.

TOOLS



RA PD 50971

Figure 20—Breech Bore Gage, Cal. .50, M1, *41-G-30*



RA PD 22709

Figure 21—Breech Bore Gage, Cal. .50, *41-G-29-50*

b. All inspection gages must be inspected yearly by an arsenal.

c. Common tools used in maintenance and repair operations, such as screwdrivers, drifts, pliers, hammers, chisels, files, wrenches, and punches, the names or general characteristics of which indicate their use and application, are not described or illustrated in this section. Fine-grained sharpening stones in special shapes and sizes are available for use in removing burs and smoothing working surfaces.

17. SPECIAL TOOLS.

a. Special tools developed particularly for use with this weapon are described below. Other wrenches and like tools issued to the using arm for use with the mounts are described as shown in TM 9-226.

(1) BREECH BORE GAGE, CAL. .50, M1, *41-G-30* (USABLE) (fig. 20). The bore gage is used for measuring the advancement of the bullet seat in the barrel to determine its serviceability. The complete

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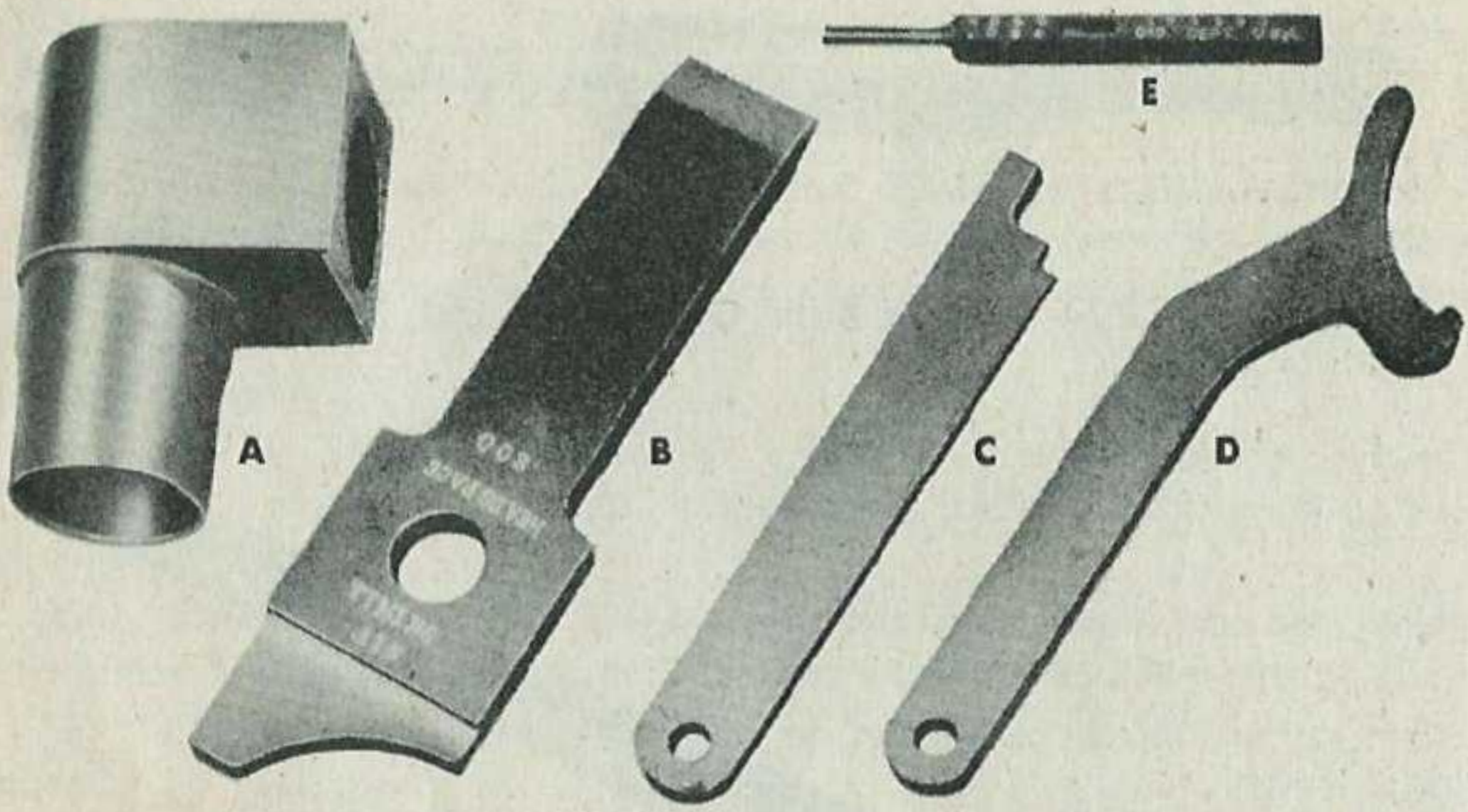


A — REFLECTOR, BARREL, CAL. .50-41-R-2331-25
B — GAGE, HEADSPACE AND TIMING, CAL. .50-41-G-201-150
C — WRENCH, HOLDING, BARREL-41-W-530
D — WRENCH, ADJUSTING, PACKING RING-41-W-3242-500
E — GAGE, FIRING PIN HOLE, CAL. .50-41-G-182-200

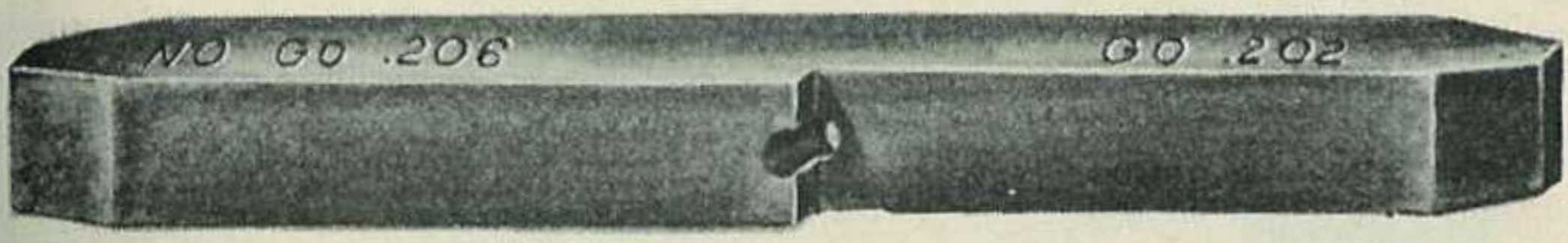
RA PD 91902

Figure 22—Special Tools and Gages

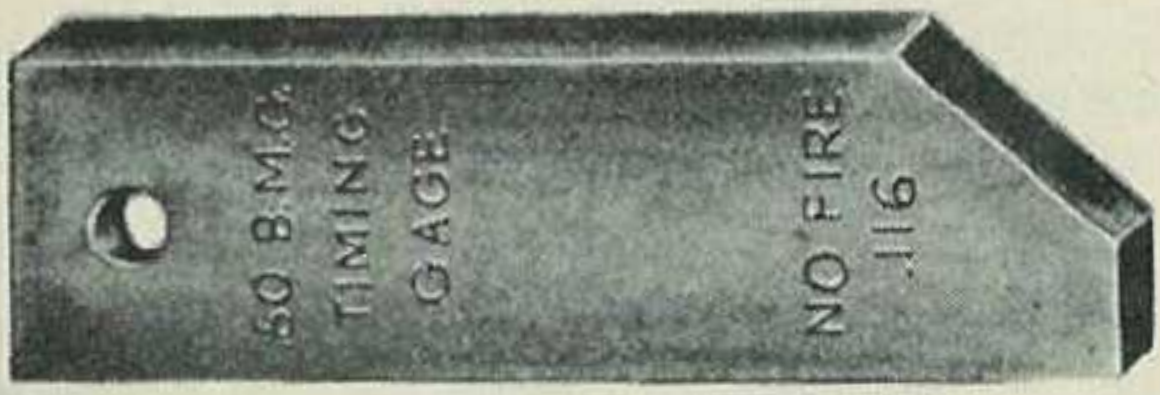
unit consists of an assembly made up of a gage, sleeve, knob, and taper pin. The gage is provided with index lines graduated in tenths of an inch for a distance of 4 inches. The maximum bullet seat in a new barrel is indicated when the zero line on the gage is alined with the long side of the sleeve. The gage is provided with a red index line at the 2.0-inch mark for checking the serviceability of the barrel. When the red index line is alined with the long side of the sleeve, the barrel is considered unserviceable. No special care is required beyond that normally given to gages, such as rust prevention and protection from nicks and burs. See paragraph 38 **b** (3) for detailed instructions on this gage.

(2) BREECH BORE GAGE, CAL. .50, *41-G-29-50* (PREFERRED) (fig. 21). The bore gage is used for measuring the wear of the lands in the breech end of the barrel to determine its serviceability. The gage is provided with index lines graduated in tenths of an inch for a distance of 4 inches. The maximum bullet seat in a new barrel is indicated by the zero line on the gage. When the red index line at the 2.0-inch mark is reached, the barrel is considered unserviceable. The knurled section on the gage serves as a handle grip. No special care is required beyond that normally given to gages such as rust

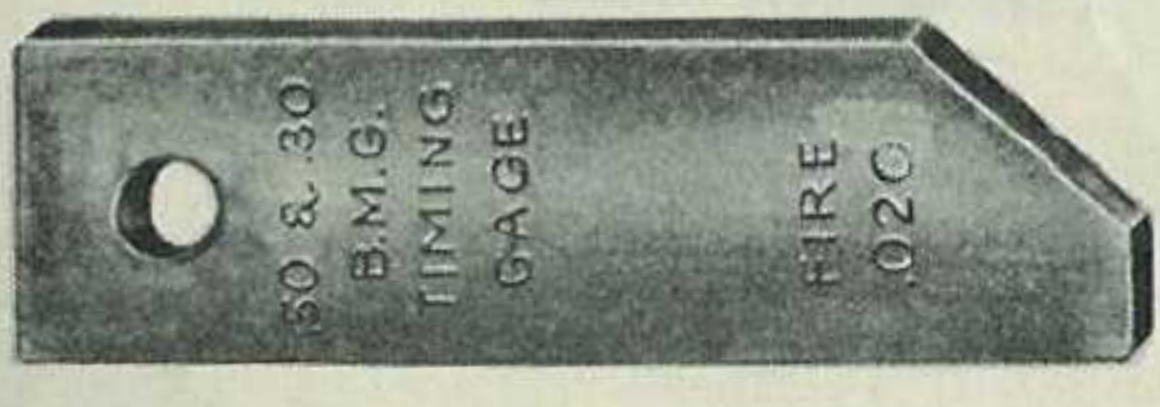
TOOLS



HEADSPACE GAGE, CAL. .50 (A351211)



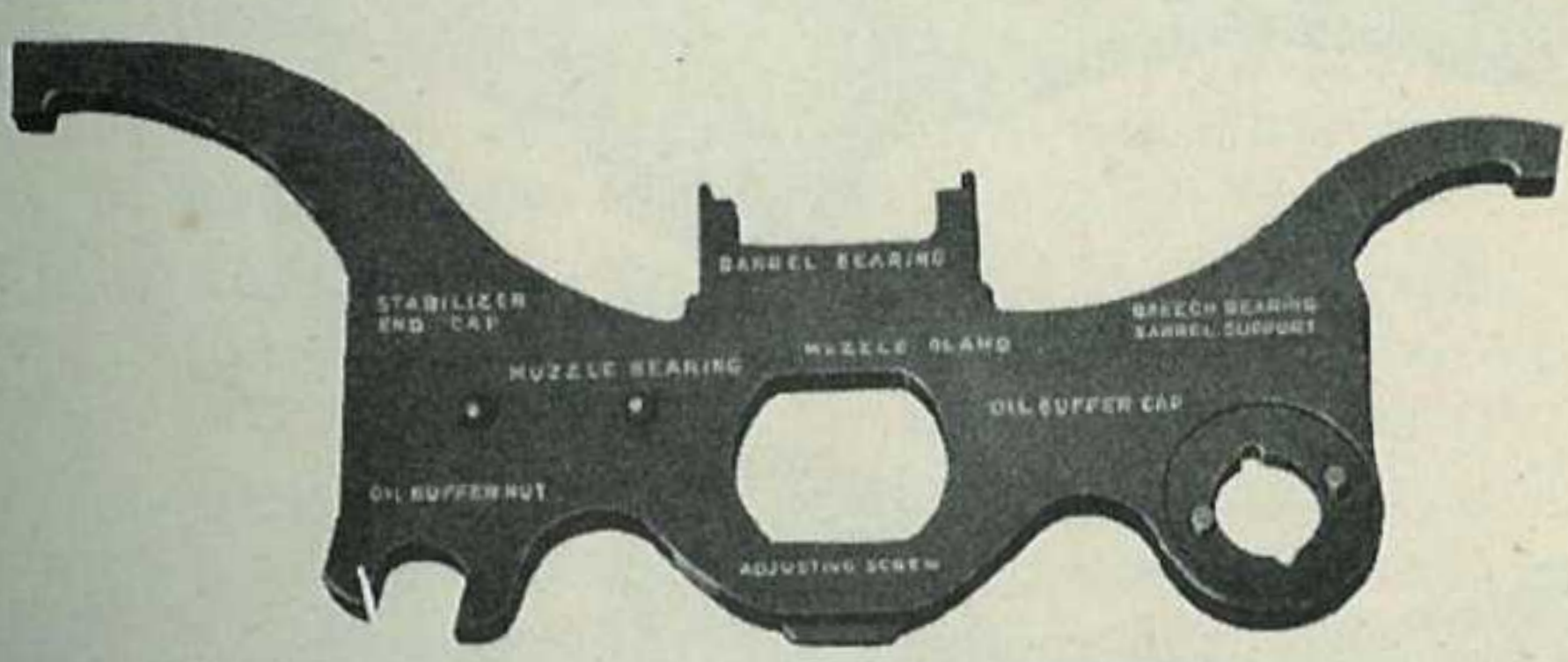
TIMING GAGE, CAL. .50 (A351213)



TIMING GAGE, CAL. .50 (A351214)

RA PD 65581

Figure 23—Headspace and Timing Gages Comprising Assembly *41-G-201-175*



RA PD 50973

Figure 24—Combination Wrench, Cal. .50, M2, *41-W-3249-850*

prevention and protection from nicks and burs. See paragraph 38 **b** (4).

(3) FIRING PIN HOLE GAGE, 0.084-INCH, CAL. .50, *1-G-182-200.* The firing pin hole gage is used to determine the serviceability of

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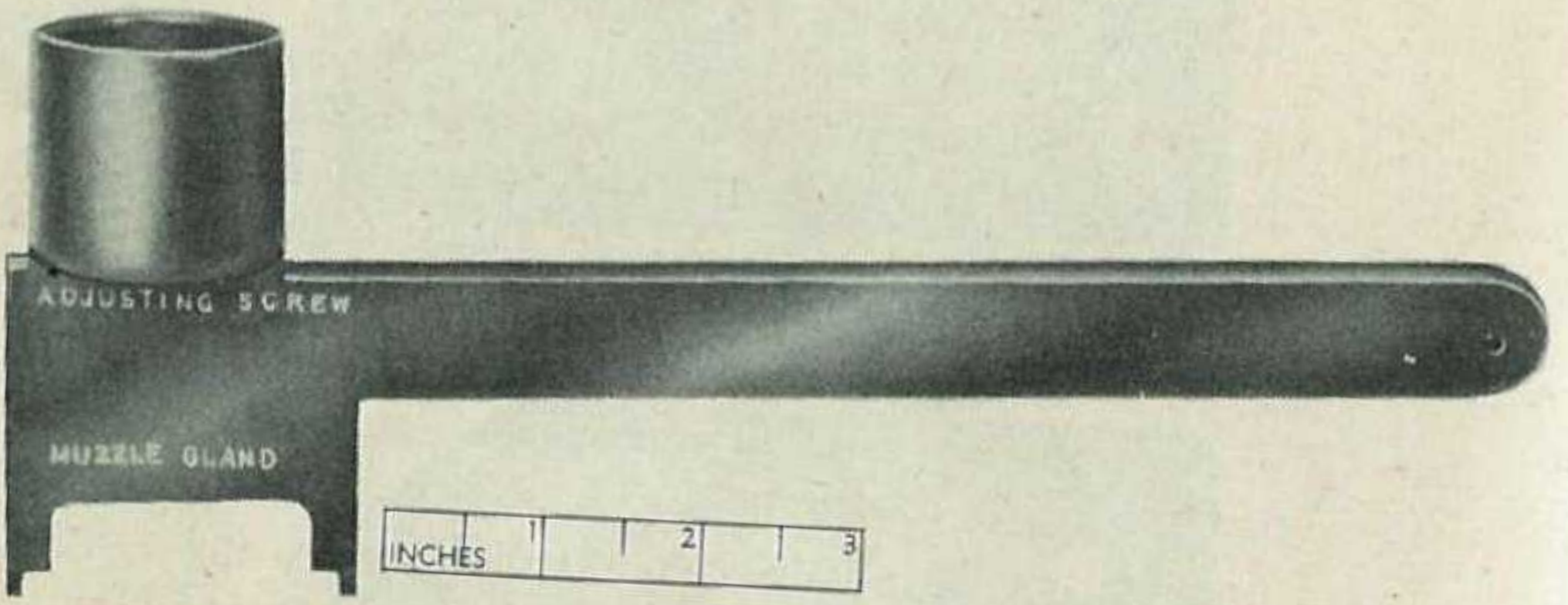
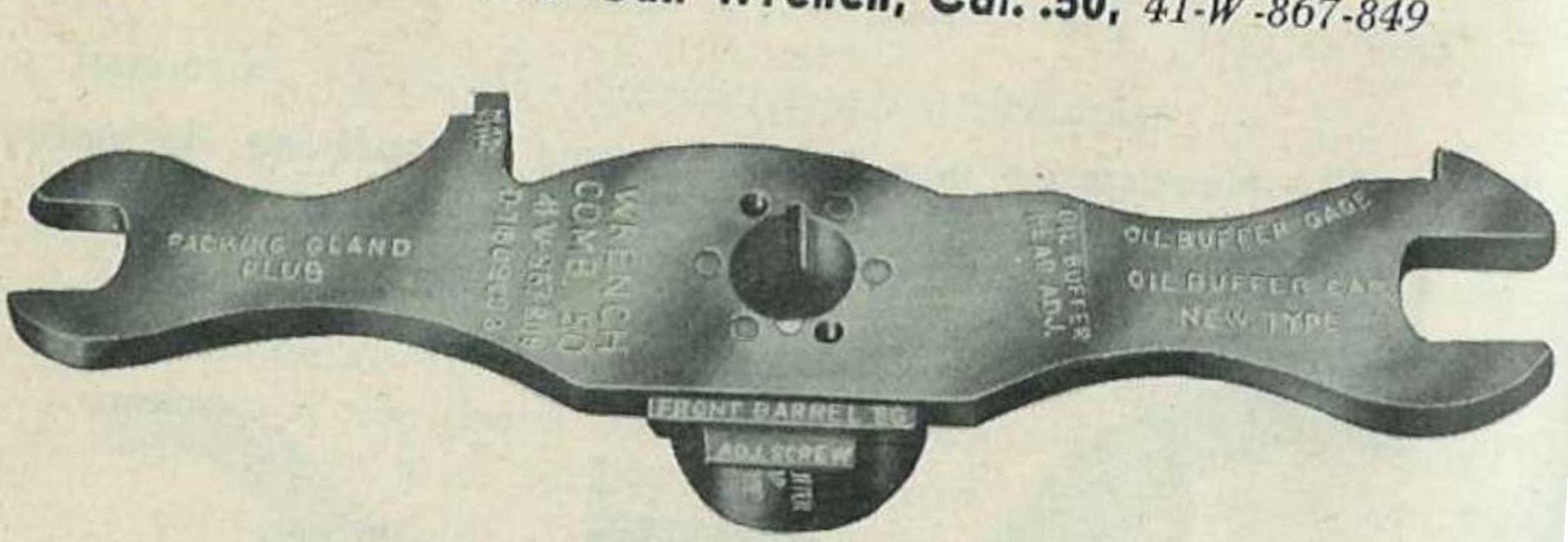


RA PD 26995

Figure 25—Machine Gun Wrench, Cal. .50, *41-W-867-849*



TOP VIEW

BOTTOM VIEW

RA PD 90816

Figure 26—Combination Wrench, Cal. .50, *41-W-867-808*

TOOLS

RA PD 68443

***Figure 27—Firing Pin Spring Removing Tool** 41-T-3098—Head Partly Cut Away To Show Construction*

the bolt (fig. 22). This is a "NO-GO" gage, and if the gage can be inserted into the firing pin hole, the bolt is unserviceable. All such bolts that are otherwise serviceable should be forwarded to Rock Island Arsenal for replacement of the recoil plate.

(4) HEAD SPACE AND TIMING GAGE, CAL. .50, *41-G-201-150*. This combination gage is used to check head space adjustment and the timing of the firing mechanism (fig. 22) for ground guns.

(5) HEAD SPACE AND TIMING GAGE (ASSEMBLY), CAL. 50, *41-G-201-175*. This assembly is composed of a double ended "GO" and "NO-GO" head space gage *A351211* fastened by a chain to a double leaf timing gage. One leaf is a "FIRE" gage *A351214*, and the other a "NO-FIRE" gage *A351213*. This gage is provided for aircraft guns. The components of the assembly are shown in figure 23.

(6) BARREL REFLECTOR, CAL. .50, *41-R-2331-25*. The barrel reflector, illustrated in figure 22, is used for the visual inspection of the barrel and in bore sighting.

(7) PACKING RING ADJUSTING WRENCH *41-W-3242-500*. This wrench is used with water-cooled guns to adjust the packing ring on the breech end of the barrel (fig. 22).

(8) BARREL HOLDING WRENCH *41-W-530*. This wrench is used to keep the barrel from turning when using the packing ring adjusting wrench *41-W-3242-500* to adjust the rear barrel packing (fig. 22).

(9) COMBINATION WRENCH, CAL. .50, M2, *41-W-3249-850*. This is a special tool used for disassembling, assembling, and making adjustments on the guns (fig. 24). Each opening and projection is marked to show its purpose.

(10) MACHINE GUN WRENCH, CAL. .50, *41-W-867-849* (fig. 25). This wrench is used for disassembly, assembly, and adjustment of the adjusting screw of the back plate buffer of the guns. It is also used to perform the same function with respect to the muzzle gland of the water jacket of the water-cooled gun. This wrench is issued to using arms in place of the combination wrench *41-W-3249-850* or *41-W-867-808*.

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(11) COMBINATION WRENCH, CAL. .50, *41-W-867-808* (fig. 26). This is a flat wrench with numerous openings marked with their use. It is used for removal and installation of the oil buffer cap (old and new designs), front barrel bearing (aircraft guns), back plate buffer adjusting screw, and packing gland plug. (Spare pins are inserted in the wrench.) It is also used as a gage to check the length of the oil buffer assembly. This wrench will take the place of the Combination Wrench, M2, *41-W-3249-850*.

(12) FIRING PIN SPRING REMOVING TOOL *41-T-3098*. This tool is for the purpose of disassembling the firing pin spring from the firing pin extension and assembling it thereto (fig. 27).

Section V

GENERAL MAINTENANCE

18. SCOPE.

a. Information and instructions contained herein are supplementary to instructions for the using arms contained in TM 9-225, TM 9-226, and FM 23-65; however, operations covered in these using-arm manuals are sometimes performed by ordnance maintenance personnel who should refer to TM 9-225, TM 9-226, and FM 23-65 for proper instructions.

b. In this manual, groups are disassembled and inspected, replacements and repairs are made, and groups assembled. For information on removal and installation of groups, refer to using-arm manuals. A group is a number of parts or assemblies, or both, which either function together in the gun or are intimately related to each other and should, therefore, be considered together.

c. For convenience and clarity the main groups of the gun are covered in separate sections. Likewise mounts and accessories are covered in separate sections. Although the Elevating Cradle M1 is an accessory of the Machine Gun Tripod Mount M3, it is covered along with the mount as it is used only with this mount.

d. In many cases it may not be necessary to completely disassemble the guns, mounts, or accessories, or groups and assemblies comprising them, unless a thorough cleaning or overhaul is necessary or desirable. However, for convenience, complete disassembly is covered in the following sections.

GENERAL MAINTENANCE

19. GENERAL METHODS.

a. The following general procedures should be carefully observed during repair and overhaul operations:

(1) Assemble groups before replacing them on the weapon. As a part of all assembly and replacement of groups, clean, oil for preservation, and lubricate the slide surfaces, threads, etc.

(2) Use only wrenches that fit snugly on parts. Tools that do not fit will fail or cause damage to the corners of nuts, bolt heads, etc.

(3) Disassembly and assembly of the weapon can be handled most efficiently if the gun is placed in rigid mounts attached to a substantial table. It is suggested that parts for each gun be kept intact and separated from those of other guns. Although parts are interchangeable, they will work together best in their original combination.

(4) When assembling parts, new cotter pins and locking wires should be used if available, and badly damaged or worn parts replaced by new ones.

(5) Repair of the gun mounts and other materiel, for the most part, entails replacement of the unserviceable parts or assemblies. Such repairs as stoning burs, chasing out damaged threads, and removing rust and dirt should be done where possible, unless such procedure so alters the part as to fit or function that replacement of the part is advisable. (Such repair should be done with great care so as not to alter dimension or shape of parts or their fit or function.) In the following sections, parts and assemblies found by inspection to be worn, damaged, or otherwise unserviceable, should be repaired or replaced. In cases where parts of an assembly are worn or broken, and it takes more time to remove the serviceable parts from the assembly than the parts are worth, the assembly should be replaced.

(6) Parts requiring replacement due to wear or breakage can be determined only by a complete inspection as generally outlined in section on inspection, and inspection paragraphs pertaining to the gun groups or other materiel. All parts should be carefully inspected. With respect to the guns, there are a number of parts which are subject to greater wear and more frequent breakage, and should receive particular attention each time the weapon is disassembled. These parts include the firing pin, firing pin extension, sear, extractor, ejector, ejector pin, belt feed lever, belt feed slide, belt feed pawl arm, accelerator, and breech lock cam. All springs in guns or other materiel should be checked carefully for free length, and to insure that they are properly assembled and seated. Only special repairs and modifications are covered in the maintenance paragraphs in the following sections. A list of malfunctions and corrections pertaining to the aircraft gun and which may also, in some cases, apply to other types of guns, is contained in TM 9-225.

(7) When guns are assembled after inspection, or after repair and inspection, head space and timing should be adjusted and carefully checked. Procedure is explained in TM 9-225, TM 9-226, and FM 23-65, pertaining to the gun in question.

(8) Nomenclature and part numbers appearing on figures in this manual are for identification only of parts and assemblies. When requisitioning parts and assemblies for replacement purposes, refer to addendum of the Standard Nomenclature List pertaining to the materiel in question. Pertaining Standard Nomenclature Lists, explanatory publications, and other reference material are listed in section XIX.

20. GENERAL LUBRICATION AND CLEANING.

a. General.

(1) Materiel should be kept clean and oiled as rust prevention at all times. Likewise materiel disassembled for cleaning or repair should be reoiled and lubricated when reassembled. Materiel received from storage should be carefully degreased, reoiled, and lubricated according to expected period of inactivity, or operation.

(2) Cleaning, oiling, and lubrication of the machine guns and mounts, which may be done by the using arms, are explained in TM 9-225, TM 9-226, and FM 23-65. General instructions for care, preservation, and lubrication are covered in WD TB 9-2835-8. Degreasing machine guns received from storage is explained below. Cleaning and lubricating materials are listed in SNL K-1, and their uses explained in TM 9-850.

b. Degreasing Machine Guns.

(1) GENERAL.

(a) The performance of aircraft machine guns is adversely affected if they have not been thoroughly degreased. Machine guns received from a depot or from a gun manufacturer are usually covered with rust-preventive compound (light). Guns which have been stored for more than a year might be covered with rust-preventive compound (heavy). Guns installed on crated military planes (export planes) are covered with preservative lubricating oil. Some Aircraft Machine Guns, Cal. .50, M2 are received in the "dry package" (a pliable transparent envelope made from a material resembling thick cellophane). It is unnecessary to degrease these guns because they are coated with preservative lubricating oil (special). Excess oil, however, should be wiped off, particularly from the firing pin before placing the gun in service.

GENERAL MAINTENANCE

(b) Thorough and careful degreasing of all types of machine guns is absolutely necessary if proper performance of the gun is to be obtained. The three accepted methods of degreasing are by the use of dry-cleaning solvent, hot-water solution, and commercial vapor degreasers. Degreasing by means of dry-cleaning solvent or hot-water solution is described for the aircraft and water-cooled guns in TM 9-225 and TM 9-226 and may be generally applied to heavy-barrel guns. Degreasing by means of a commercial vapor degreaser is explained in step (2), below. Each of these methods has the following procedures in common:

1. If a wire basket is used, it should be constructed so that the gun components of small size will not become lost because of excessive space between the wires.

2. If several guns are being degreased at the same time, keep the components of each gun separate from those of other guns. This will insure efficiency of operation of the assembled gun equal to that obtained at the factory when the gun was tested and accepted.

3. Do not touch dry gun components with bare hands. Wear cotton gloves.

4. It is best not to remove the breech lock cam for cleaning purposes so as not to disturb the factory setting of the required clearance between the breech lock cam and the bottom plate.

(2) USE OF A COMMERCIAL VAPOR DEGREASER. A vapor degreaser consists of a tank having a compartment in which trichlorethylene stabilized or similar solvent is heated by means of steam coils or a suitable heater. In most vapor degreasers, the vapor formed tends to rise to the top of the tank, but is kept below a safe level by cold water flowing through coils that are assembled to the upper sides of the tank. Other vapor degreasers are air cooled. To use a vapor degreaser proceed as follows:

(a) Disassemble the gun, by removing the back plate, the driving spring group, the bolt group, barrel, barrel extension, and oil buffer groups. Disassemble the bolt and remove the firing pin spring, and in the firing pin extension. Remove the switch and switch spring from the left-hand side plate of the receiver, and remove the oil buffer assembly from the oil buffer body. Disassembly is explained in this manual and pertinent Field Manuals and Technical Manuals.

(b) If the oil buffer assembly contains the old-type, leather, oil buffer packing *A9279* or *A9279A*, the buffer must be cleaned separately by hand with a brush and dry-cleaning solvent, to prevent a hardened packing and a leaky buffer. Leaky buffers are often caused by hot trichlorethylene vapors affecting the packing, because the material used to impregnate the leather for oil resisting purposes is removed by the vapor. Oil buffer assemblies containing this type of

packing should be left in contact with dry-cleaning solvent for as short a time as possible to prevent damage to the leather of the packing. Do not disassemble the oil buffer assembly for degreasing. CAUTION: *Always use dry-cleaning solvent. Never use carbon tetrachloride or any other cleaning solvents.*

(c) If the oil buffer assembly contains the new type packing *A153162* made of asbestos, synthetic rubber, and graphite, or similar composition, the oil buffers may be cleaned in a vapor degreaser along with the other components of the gun. Otherwise or when in doubt, clean oil buffer assemblies separately with dry-cleaning solvent and a brush. Do not disassemble the oil buffer assembly for degreasing.

(d) To avoid damage to wooden handles and buffer disks of the back plate, clean separately with dry-cleaning solvent and a brush.

(e) Place the gun casing and other components, except those to be cleaned with dry-cleaning solvent as explained above, in a wire basket. Lower the basket into the degreaser tank below vapor level and let it remain in the vapor for about 5 minutes. A longer period will be required if several guns are immersed in the tank at the same time.

(f) Remove the gun casing and other components from the degreaser, and dip them *immediately* into a tank containing preservative lubricating oil (special). Excess oil can then be drained and wiped off. The components do not need to be cooled off prior to immersion in the oil unless a suitable tank is not available and personnel must handle the components individually. The natural dark color of the phosphate-covered components will be restored when they are oiled.

21. INSPECTION AND REPLACEMENT OF SPRINGS.

a. If weakness of springs pertaining to the guns is suspected or if weapon has been fired 5,000 or more rounds since last replacement of springs, they should be checked for number of coils and minimum free length. If less than minimum free length, they should be replaced. Dimensions of the various springs is given in inspection paragraph of section pertaining to the group of parts to which the spring pertains. Broken, cracked, rusted, or otherwise damaged springs should be replaced.

22. REMOVAL OF BURS FROM SCREW HEADS AND WORKING SURFACES.

a. During the entire life of the gun and other materiel, polishing and stoning are necessary to relieve friction and to remove burs set

GENERAL MAINTENANCE

up by firing. Burs on screw heads, threads, and like surfaces should be removed with a fine file, or chased out by a die or tap. Burs on such working surfaces as the cam grooves in the top of the bolt, engaging surfaces of the sear slide, sear, and firing pin extension, and any roughness on working parts such as the accelerator, breech lock, breech lock cam, etc., should be removed with a fine-grained sharpening stone. Stones of various shapes and sizes are included in the armorer's tool chest. Rounded contacting surfaces can be smoothed with crocus cloth. CAUTION: *Care should be observed to stone and file evenly and lightly, and not to remove more metal than is absolutely necessary. Parts or assemblies should never be altered in any way that would make such parts noninterchangeable or affect their proper operation or function.*

23. REMOVAL OF RUST.

a. Light rust may generally be removed with a cloth moistened with light oil or rifle-bore cleaner. If this does not suffice, crocus cloth or fine abrasive cloth may be used. Care should be observed not to scratch or alter surfaces cleaned, to thoroughly remove all dirt and abrasive, and reoil surfaces before assembling the parts.

24. TESTING GUNS AFTER ASSEMBLY.

a. Testing.

(1) With head space and timing adjusted and carefully checked, test action of the gun by pulling the retracting slide, operating slide, or bolt handle completely to the rear, and releasing. Parts must work freely.

(2) Dummy cartridges assembled into new, accepted metallic links should be fed into the gun and the bolt should be retracted several times to determine whether cartridges will feed and eject properly.

(3) If the gun is an aircraft weapon, the action of the gun should be further tested to determine whether the parts are working freely and properly so as to pull long cartridge belts into the feedway. A 17-pound weight should be attached by cable or cord to a belt containing 12 rounds of dummy cartridges. Spring *A153086* should be introduced between the weight and the belt. This spring is made of 1095 War Department special wire, has 13 coils, is 0.093 inch in diameter, and has a 40-pound spring deflection per inch. The cable or cord should pass over a pulley in such a manner that the cartridge belt extends horizontally from the feedway. Hand-operate the gun a sufficient number of times to assure that the feeding is positive and that the mechanism fully closes under action of the driving spring. This test should be applied to the gun with feed from both the left- and right-hand side.

Section VI

BACK PLATE GROUP

25. DISASSEMBLY.

a. Back Plate With Horizontal Buffer Assembly.

(1) Loosen back plate adjusting screw, using machine gun or combination wrench. With the large screwdriver, remove the adjusting screw, taking care not to lose the adjusting screw plunger and spring when they are released as the adjusting screw moves out. Remove buffer disks and buffer plate.

(2) With small drift, force out the back plate filler piece pin and remove the back plate filler piece. The back plate latch is removed by forcing out the back plate latch pin. Do not lose the spring. Remove the latch lock by taking out the cotter pin and removing the pin. If desired, the latch lock spring can be removed by compressing the sides of the spring. Detach the lower filler piece by removing the cotter pins and taking out the two filler piece pins. All parts, in their relative position as removed from the back plate, are shown in figure 28. NOTE: *Some latch lock springs are of the leaf type and are held in place by a latch lock spring pin with a flat side* (NOTE, par. 28 a (2)).

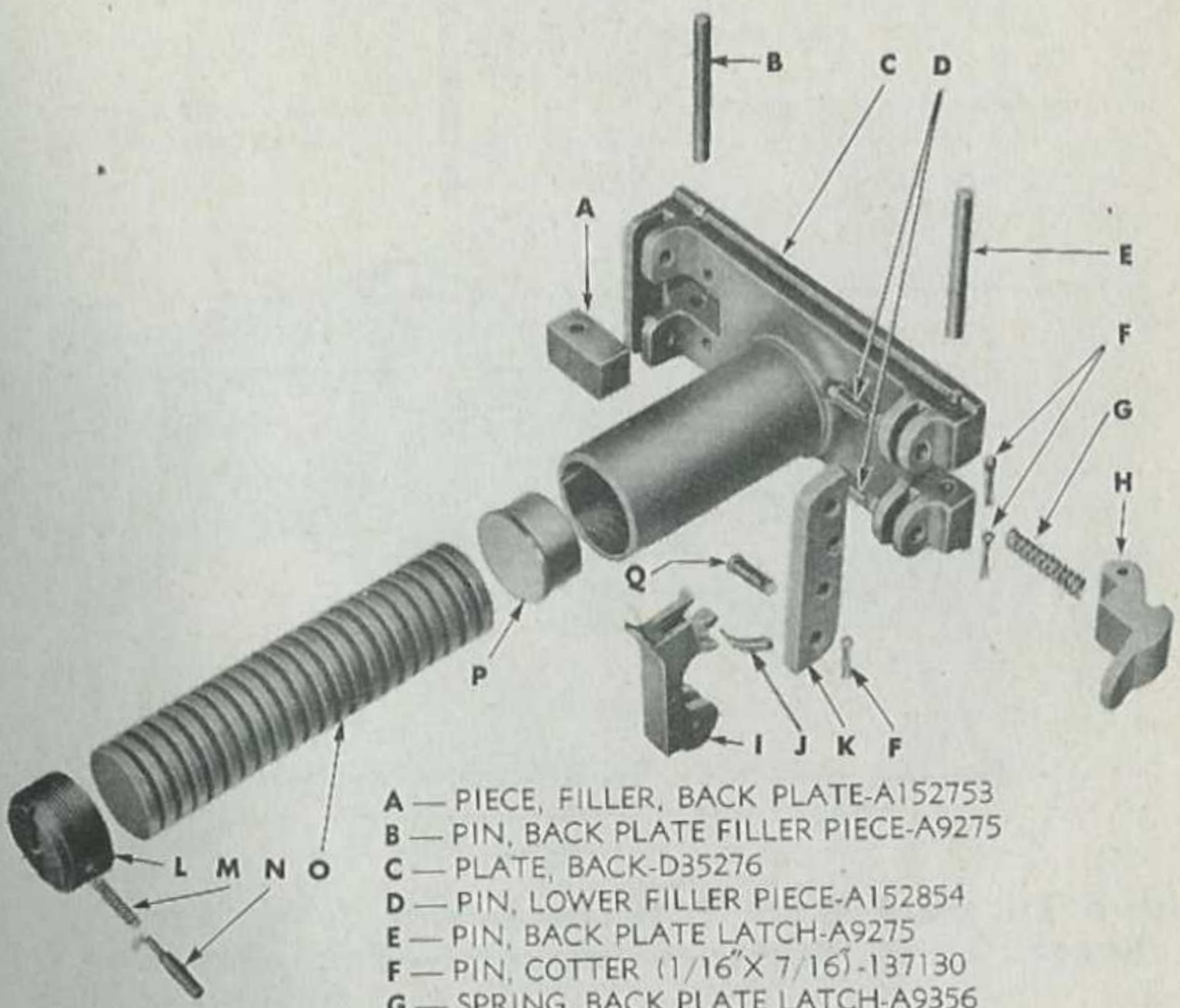
b. Back Plate With Horizontal Buffer Assembly With Trigger Group (Water-cooled Guns).

(1) Disassembly is identical with that of the back plate described in subparagraph a, above, except for the addition of trigger group and removal of the back plate filler piece. All trigger parts, in their relative position as removed from the back plate, are shown in figure 29. Procedure is the same as given previously, except for the disassembly and assembly of the trigger group which follows.

(2) Start trigger pin with a drift and remove it with pliers. Remove trigger, trigger spring, and trigger spacer, taking care not to lose the spring when the pin is removed. If it is necessary to remove the trigger safety assembly, it can be taken off by removing the two staked screws.

c. Spade Grip Back Plate Assembly. This assembly is shown in figure 30. Follow the procedure given in subparagraph a, above, except for removal of lower filler piece and back plate filler piece. Disassembly of the trigger group is described in subparagraph b (2), above.

BACK PLATE GROUP



A — PIECE, FILLER, BACK PLATE-A152753
B — PIN, BACK PLATE FILLER PIECE-A9275
C — PLATE, BACK-D35276
D — PIN, LOWER FILLER PIECE-A152854
E — PIN, BACK PLATE LATCH-A9275
F — PIN, COTTER (1/16"X 7/16")-137130
G — SPRING, BACK PLATE LATCH-A9356
H — LATCH, BACK PLATE-B8949
I — LOCK, BACK PLATE LATCH-B147464
J — SPRING, BACK PLATE LATCH LOCK-B243607
K — PIECE, FILLER, LOWER-A152750
L — SCREW, ADJUSTING-A152834
M — SPRING, ADJUSTING SCREW PLUNGER-A9300
N — PLUNGER, ADJUSTING SCREW-A152839
O — DISK, BUFFER (22 USED)-A152835
P — PLATE, BUFFER-A152869
Q — PIN, BACK PLATE LATCH LOCK-A13581

RA PD 91822

Figure 28—Back Plate With Horizontal Buffer Assembly—Exploded View

d. Spade Grip Back Plate Assembly With Bolt Latch Release (Heavy-barrel Guns). This back plate is used with heavy-barrel guns assembled with a bolt latch. It is similar to the spade grip back plate shown in figure 30, except that it is without a trigger safety and has a bolt latch release assembled with the trigger, and a sleeve assembled to the back plate tube. The lock on the sleeve is for the purpose of holding the bolt latch out of engagement when the gun is firing automatically, and is operated by turning the sleeve, with the latch release depressed, until the release is retained by the lock on the sleeve.

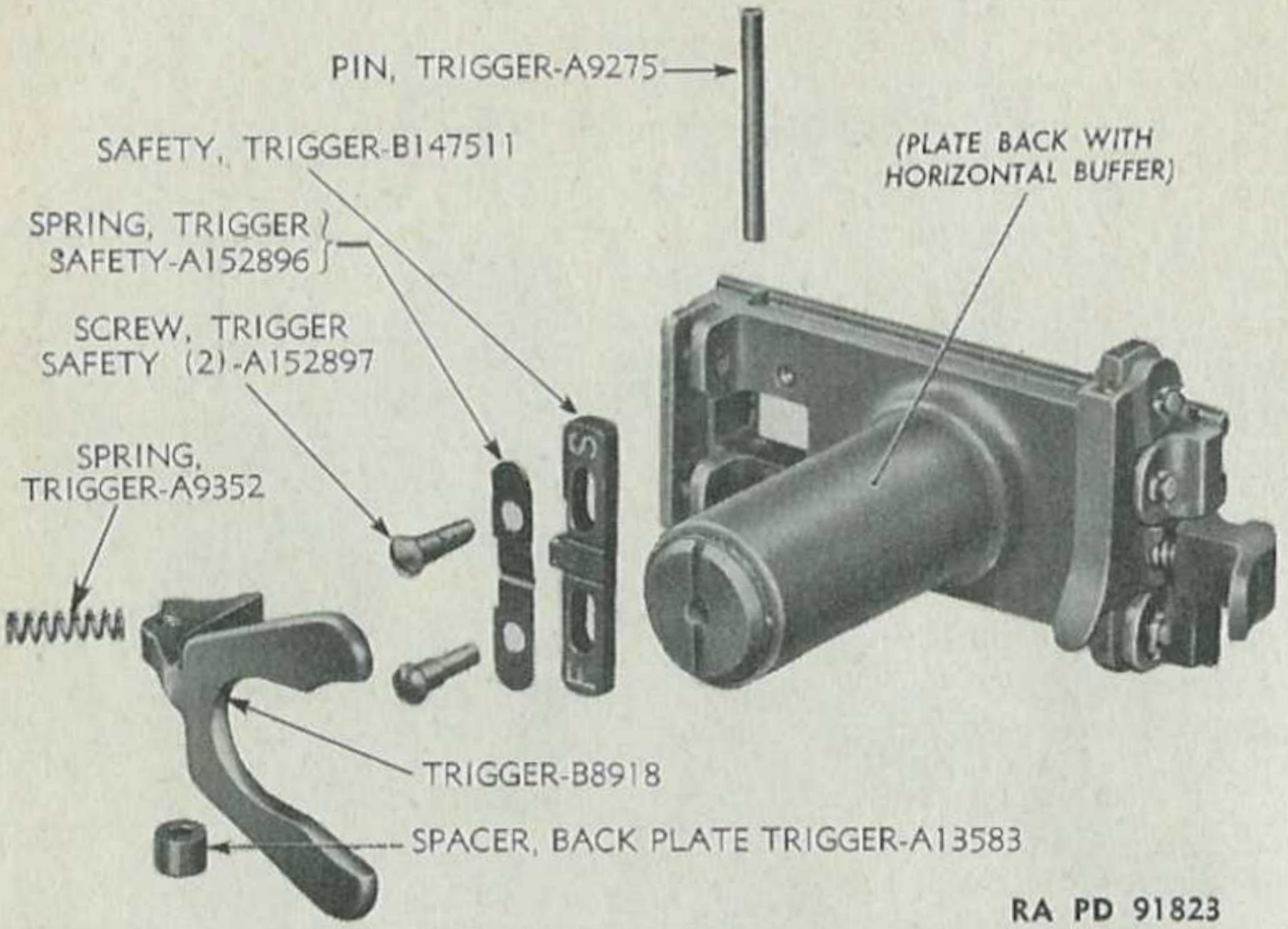


Figure 29—Back Plate With Horizontal Buffer Assembly With Trigger Group (Water-cooled Guns)—Partly Exploded View

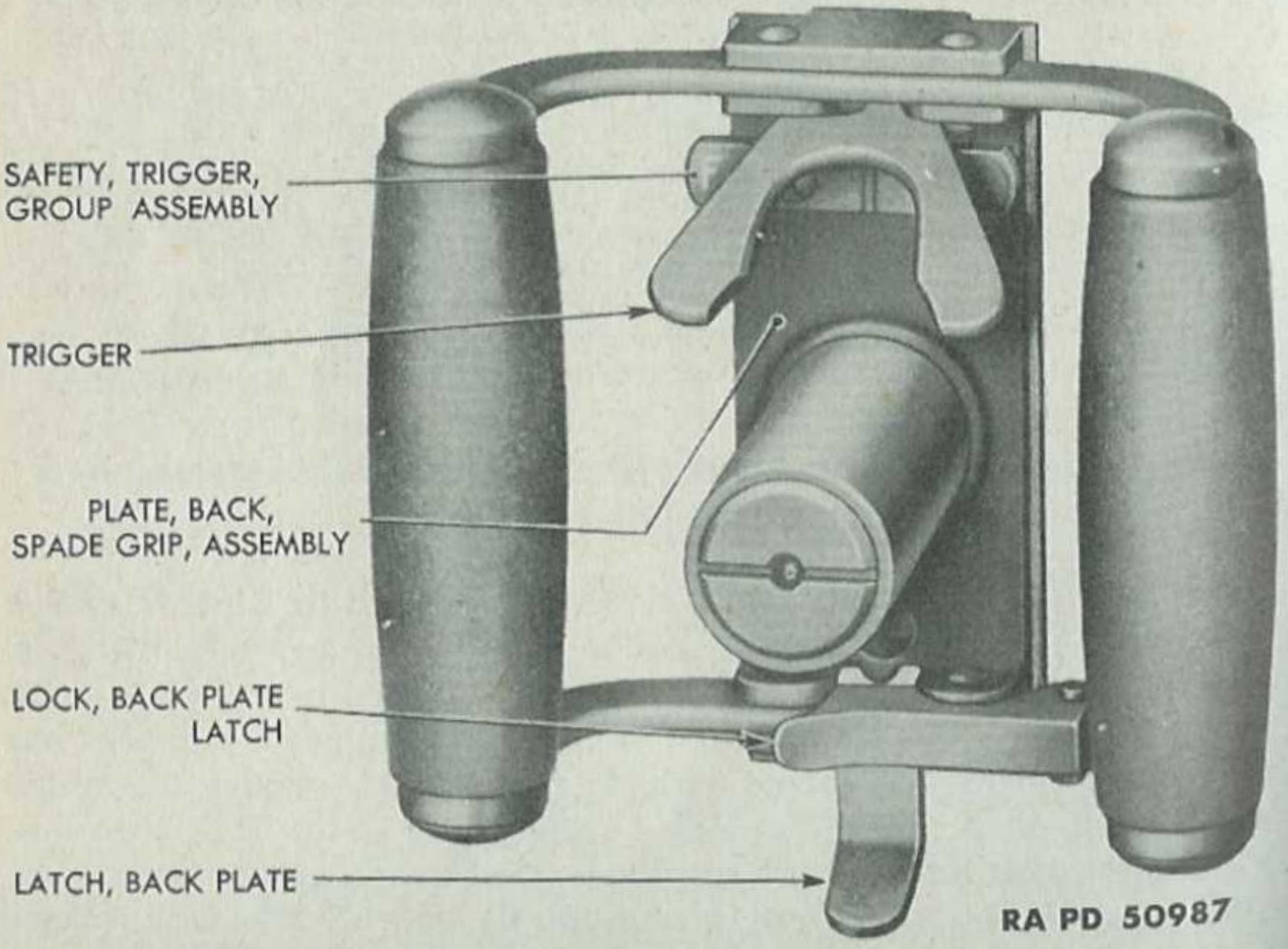
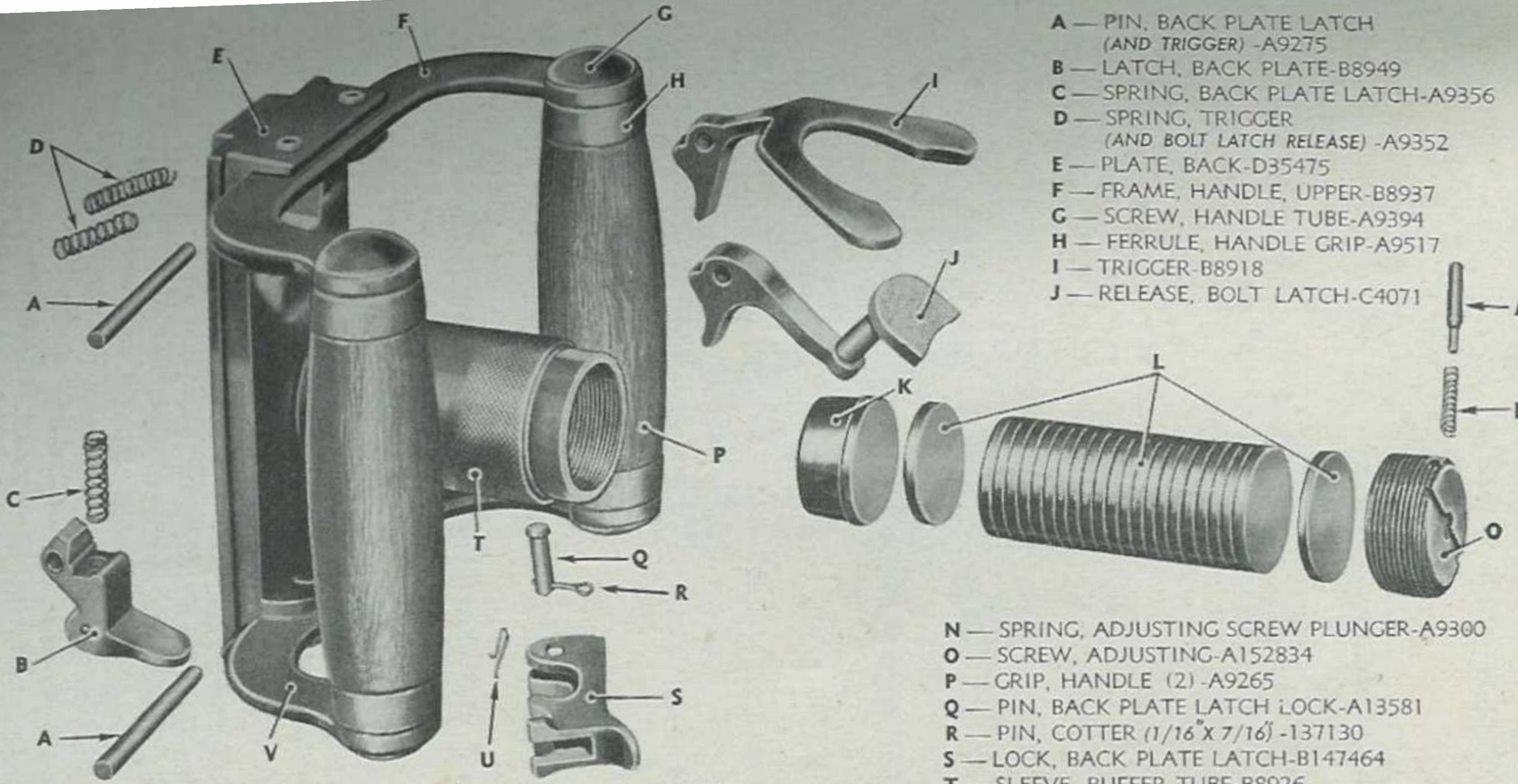


Figure 30—Spade Grip Back Plate Assembly



A — PIN, BACK PLATE LATCH *(AND TRIGGER)* -A9275
B — LATCH, BACK PLATE-B8949
C — SPRING, BACK PLATE LATCH-A9356
D — SPRING, TRIGGER *(AND BOLT LATCH RELEASE)* -A9352
E — PLATE, BACK-D35475
F — FRAME, HANDLE, UPPER-B8937
G — SCREW, HANDLE TUBE-A9394
H — FERRULE, HANDLE GRIP-A9517
I — TRIGGER-B8918
J — RELEASE, BOLT LATCH-C4071

K — PLATE, BUFFER-A152869
L — DISK, BUFFER-A152835
M — PLUNGER, ADJUSTING SCREW-A152839

N — SPRING, ADJUSTING SCREW PLUNGER-A9300
O — SCREW, ADJUSTING-A152834
P — GRIP, HANDLE (2) -A9265
Q — PIN, BACK PLATE LATCH LOCK-A13581
R — PIN, COTTER *(1/16" X 7/16")* -137130
S — LOCK, BACK PLATE LATCH-B147464
T — SLEEVE, BUFFER TUBE-B8926
U — SPRING, BACK PLATE LATCH LOCK-A152875
V — FRAME, HANDLE, LOWER-B8936

RA PD 91824

Figure 31—Spade Grip Back Plate Assembly With Bolt Latch Release (Heavy-barrel Guns)— Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

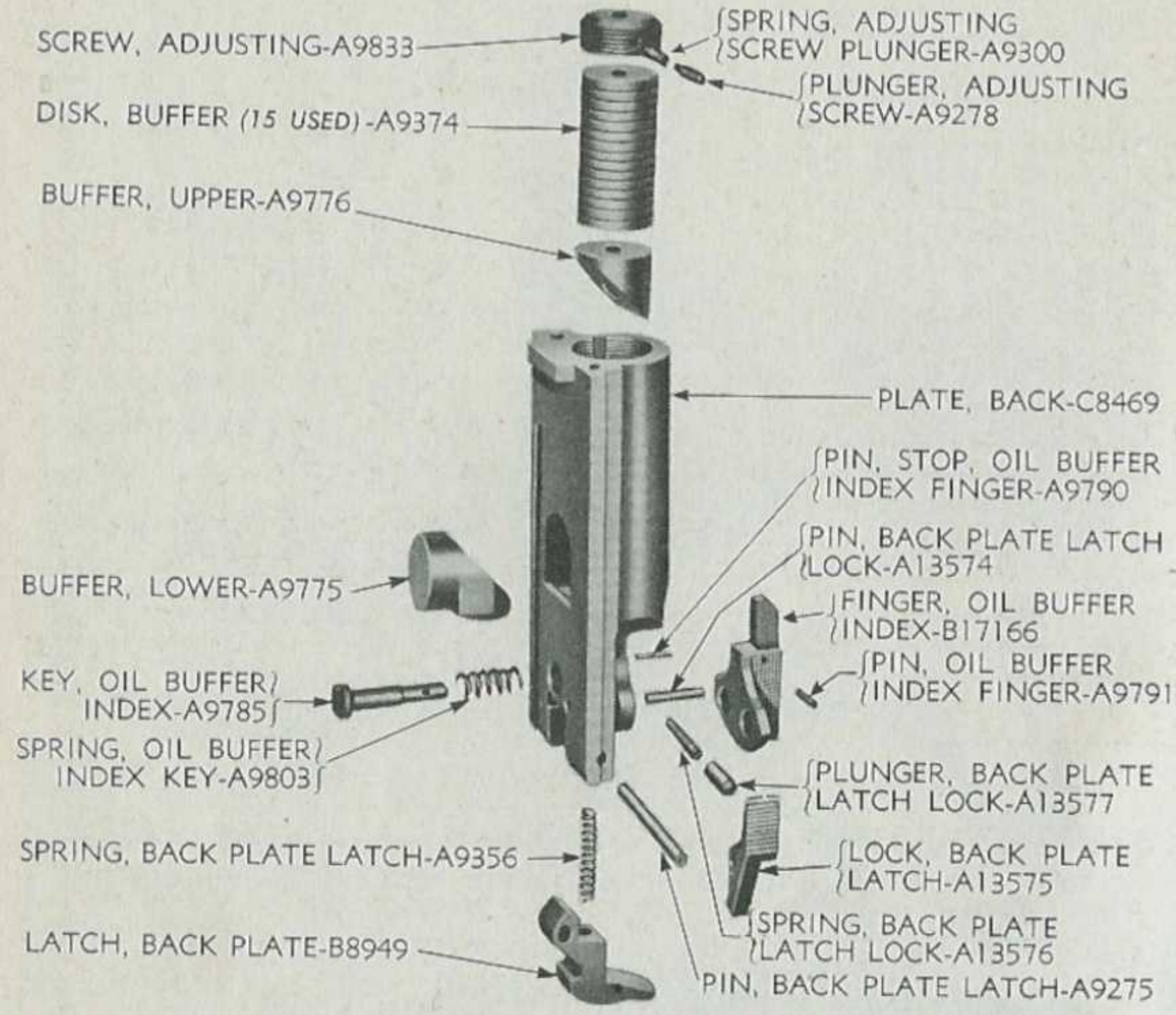


Figure 32—Vertical Buffer Back Plate Assembly—Exploded View

Exploded view of this back plate is shown in figure 31. Disassemble as follows:

(1) Remove the adjusting screw, buffer disks, and buffer plate as in subparagraph a (1), above. Then, remove the latch and latch lock with their component springs by removing cotter pin from latch lock pin and pushing out both pins. The lock should be removed first.

(2) Remove the buffer tube sleeve by raising the sleeve spring to disengage the stud from the buffer tube, and by sliding the sleeve to the rear. Then, remove the trigger and bolt latch release, together with their coil springs, by pushing out the trigger pin. NOTE: *An alternate design of buffer tube sleeve is without the sleeve spring and stud. This sleeve is split longitudinally and has a small projection formed on the inner surface for retaining the sleeve on the buffer tube. The sleeve is removed by forcing it to the rear to cam the projection*

BACK PLATE GROUP

out of the retaining groove in the buffer tube. This disengagement can be facilitated by spreading the split tube slightly with a screwdriver blade.

e. Vertical Buffer Back Plate Assembly. This back plate was used extensively on fixed guns of all types prior to 1939. Disassemble as follows:

(1) Remove the adjusting screw, using combination wrench and taking care not to lose the plunger and spring, and remove the buffer disks and upper buffer by turning the buffer upside down. If the buffer disks become wedged in the back plate, they may be removed by inserting a hooked wire through the hole in the disks (old-style disks only). Grasp the projecting part of the lower buffer and, after lifting it slightly, remove it from the front of the back plate.

(2) Using a drift, remove the back plate latch by removing the pin, taking care not to lose the latch spring. Remove the latch lock by removing the pin, and take out the spring and plunger. The oil buffer index finger is removed by taking out the pin and removing the index finger key and spring. All parts of this assembly, in their relative positions, are shown in figure 32.

26. INSPECTION.

a. The following inspection applies to all types of back plates. Items pertaining to the type to be inspected should be considered. Thoroughly clean and inspect all parts with particular attention to the points listed below.

(1) Check back plate for fit in grooves of receiver. It should not be loose or have any play. Check guides for burs and wear.

(2) Check buffer plate for free seating in tube. It should not bind and should project three-sixteenths inch from face of plate when assembled.

(3) Check adjusting screw for worn or burred threads, and lost or damaged plunger or spring. Spring *A9300* should have 10¼ to 11¾ coils and a minimum free length of five-eighths inch.

(4) Check buffer disks for condition and number. Normally 22 disks are assembled in tube. Adjusting screw should project approximately one-sixteenth inch from end of buffer tube and not more than one full thread when tightened against disk. Refer to assembly.

(5) Check latch and latch lock for function and wear, and pins for wear and burs, and for missing or broken cotter pins. Check latch spring for rust and free length. Spring *A9356* should have 11¼ to 12¾ coils and a minimum free length of $1\frac{3}{32}$ inches.

(6) Check trigger and spacer for wear and burs, and for operation when assembled; it should not catch or bind. Check trigger spring for rust and weakness. Spring *A9352* should have 8¼ to 9¾ coils and minimum free length of twenty-seven thirty-seconds inch.

(7) Check oil buffer index finger (vertical buffer) for burs, free movement, and spring action. Check upper and lower buffer for free movement; they should not bind.

(8) Check bolt latch release for burs and free movement, and sleeve for retention on buffer tube (heavy-barrel, flexible gun).

(9) Check handle frames and grips for security and cracks.

27. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Replacing Buffer Disks. Proper functioning of the gun requires that the buffer plate should project from the front of the back plate approximately three-sixteenths inch. The adjusting screw must be kept tight at all times, using combination or machine gun wrench. When screwed tight, the adjusting screw should project approximately one-sixteenth inch beyond end of the back plate buffer tube. Not more than one full thread of the adjusting screw should be exposed. It may be necessary to add or remove a buffer disk to secure tight adjustment and at the same time meet these requirements. If more than one thread is exposed when the adjusting screw is tightened, remove adjusting screw, remove one buffer disk, reinstall adjusting screw, plunger, and spring, and tighten screw. If adjusting screw is below flush, add one more buffer disk in like manner. Remove any burs found on the buffer plate. When assembling, remove any rough edges from the buffer disks and replace any disks showing signs of disintegration. Install buffer plate and insert the buffer disks, one at a time, making sure that each is properly seated. Set the adjusting screw tightly, using combination or machine gun wrench.

c. Conversion of Cal. .50 Heavy-barrel, Fixed and Flexible Guns for Use on Ring-type Truck Mount and Machine Gun Antiaircraft Mounts Cal. .50, M2A1 and M3.

(1) The Browning Machine Guns, cal. .50, M2, heavy-barrel, can be used on the ring-type truck mounts such as the M32, the Antiaircraft Mounts, Cal. .50, M2A1 and M3, and the Antiaircraft Elevator

BACK PLATE GROUP

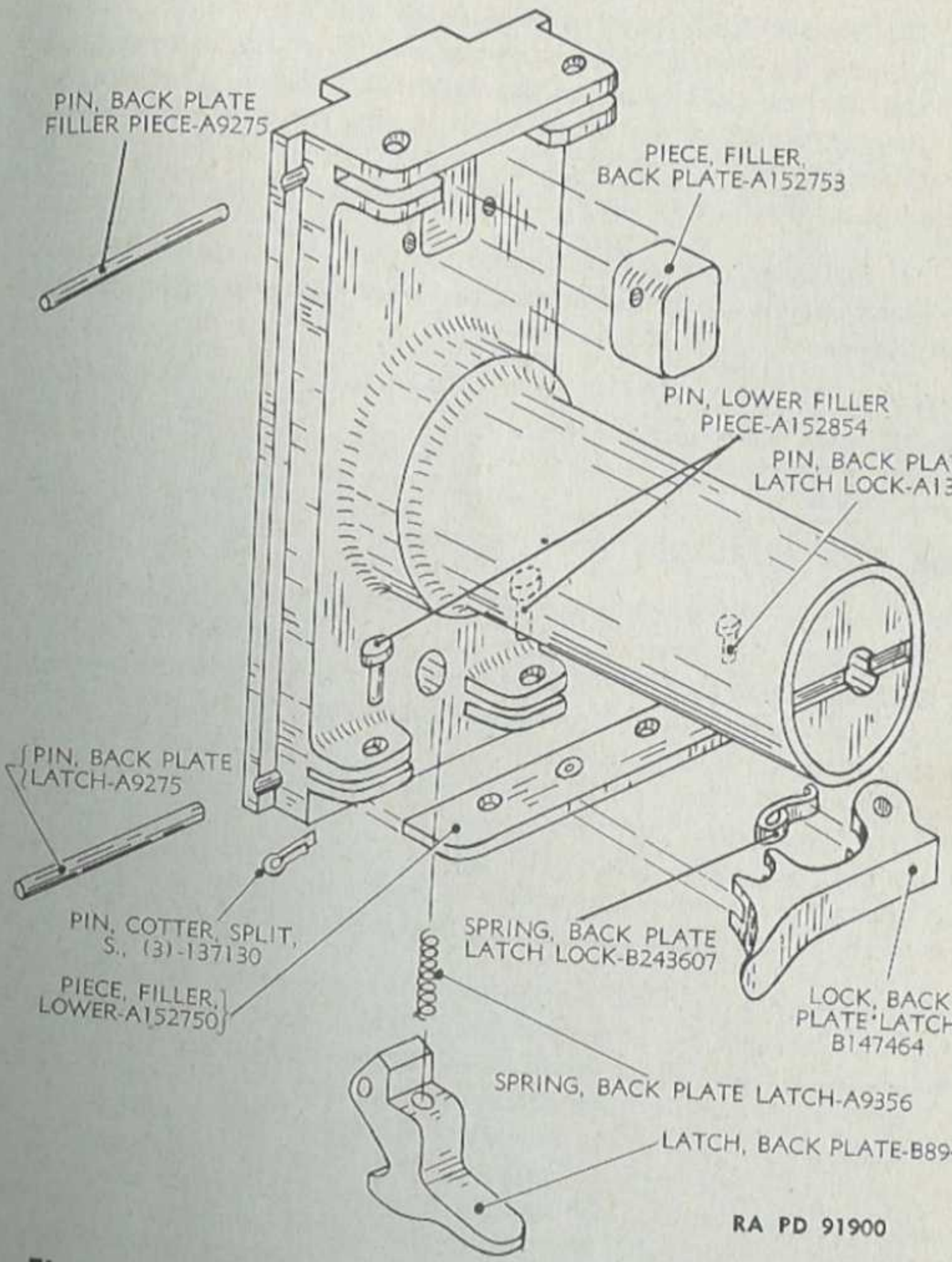


Figure 33—Back Plate With Horizontal Buffer Assembly—Exploded View

Cradle, Cal. .50, M1, provided certain changes are made in accordance with instructions outlined in the following paragraphs.

(2) The cal. .50, heavy-barrel, fixed gun can be used as issued on the Machine Gun Antiaircraft Mount, Cal. .50, M3. The cal. .50, heavy-barrel, flexible gun can be used as issued on the ring-type truck mounts and the Antiaircraft Elevator Cradle Cal. .50, M1.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

(3) To mount the heavy-barrel guns on the Antiaircraft Mount M2A1, a barrel support adapter is necessary. It is also necessary to convert the flexible back plate to the fixed back plate. The adapter must be requisitioned direct from Rock Island Arsenal. It is listed in the addendum of SNL A-39. The adapter is not necessary except when mounting the gun on the Antiaircraft Mount M2A1.

(4) If the fixed gun is to be mounted on truck mounts, the following parts are required to convert the back plate from fixed type to flexible type.

Item	Piece Mark	Quantity
PLATE, back, spade grip 'conversion group assembly	D35541	1
BAR, trigger	B8944 or B257592	1
PIN, trigger bar, assembly	B8683	1

(5) Remove the back plate latch, back plate latch spring, and back plate latch pin shown in figure 33. Spread one end of the back plate latch spring so that it will seat firmly in the latch without falling out in future disassembly. It will, therefore, not be necessary to remove the latch or latch pin entirely when removing the lower filler piece. Remove the lower filler piece pins and lift out the lower filler piece with latch lock. Extract cotter pin, remove back plate latch lock pin (fig. 33), and detach the latch lock with latch lock spring, which parts are to be permanently assembled to the lower handle frame of the spade grip conversion group assembly (fig. 34).

(6) Assemble the handle grips to their frames in the conventional method for the flexible, spade-grip back plate. Insert the handle tubes in each handle grip. Place the frames in the position shown in figure 34. Tighten the handle tube screws in the upper and lower ends of each handle tube. Stake the screws to frames as shown in figure 34. Four lower filler piece pins (handle frame pins) *A152854* are used to hold the upper and lower handle frames to the back plate. The pins may be held in place by cotter pins *137130* or wire. Then, replace the back plate latch with spring inserted, and replace latch pin. Remove the back plate filler piece pin and back plate filler piece (fig. 33).

(7) Install the trigger safety and trigger safety spring by two screws (which are supplied) near the top of the back plate. Stake screws as shown in figure 34. Fasten the trigger, trigger spring, and back plate trigger spacer in the opening left by the removal of the back plate filler piece. The trigger and spacer are retained by the back plate filler piece pin.

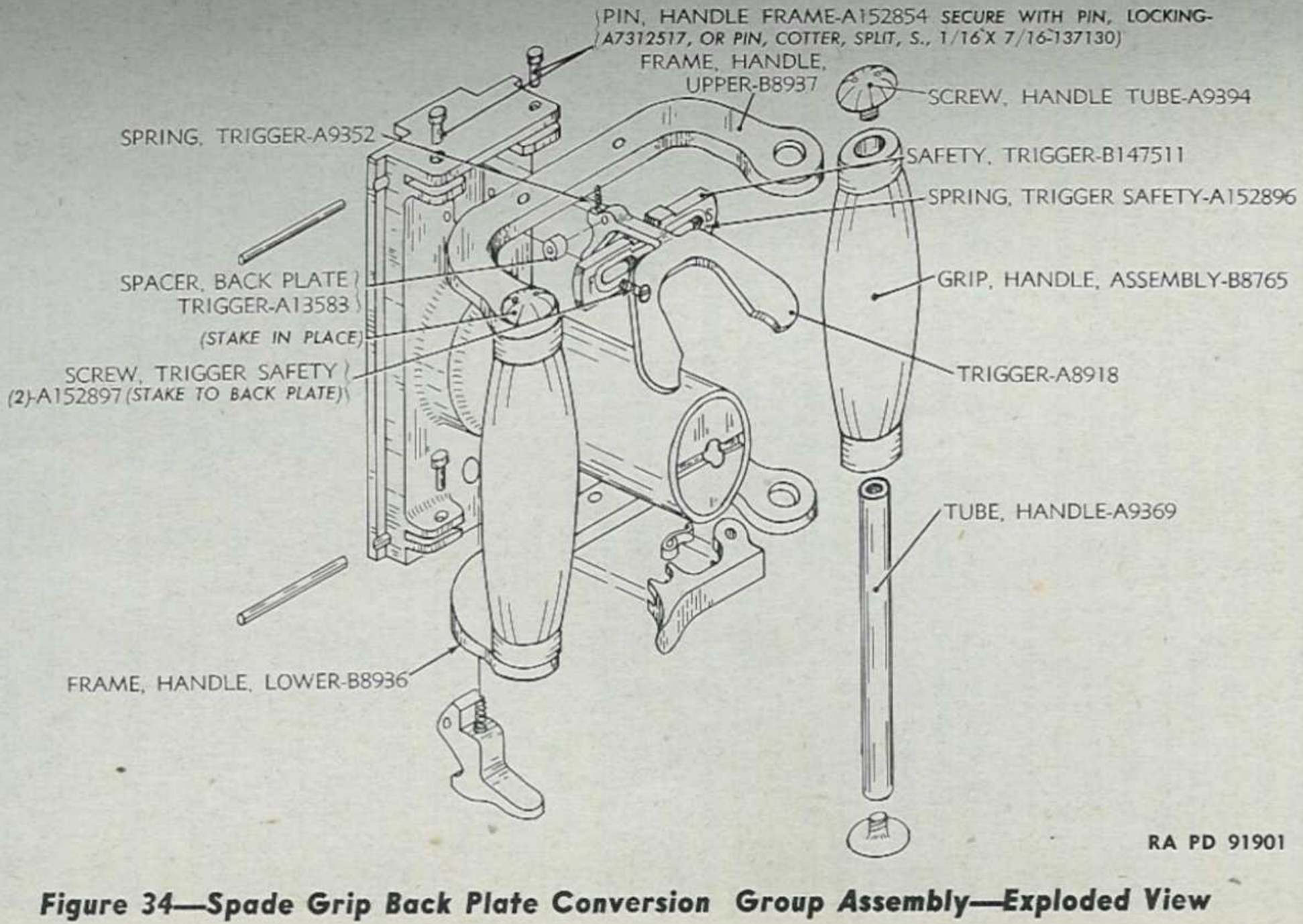


Figure 34—Spade Grip Back Plate Conversion Group Assembly—Exploded View

(8) Install the trigger bar and trigger bar pin assembly by placing the trigger bar, with the long end forward and the bowed surface upward, between the top plate bracket and the bolt latch bracket and hold upward firmly. With the trigger bar held in that position, insert the trigger bar pin, taking care to match the key on the pin with the keyway in the left side plate. After insertion, hold the pin assembly firmly against the side plate, and rotate the lock rearward until the projection seats in the small hole in the side plate. The gun is now ready for use with the truck mounts. The lower filler piece may be wired to the handle frame.

(9) In reverting to the fixed back plate, the latch lock is not needed. It should be retained in a detachable assembly composed of the upper and lower handle frames, handle tubes, handle grips, handle tube screws, latch lock, latch lock pin, and spring. These are the only parts which should be removed to mount the gun in the Antiaircraft Mounts M2A1 or M3. The back plate filler piece will not be used again. Replace the lower filler piece and retain it with two pins *A152854* secured by cotter pins or wire. The other two lower filler piece pins *A152854* may be left in the back plate or upper handle frame for safekeeping.

(10) In converting the heavy-barrel, flexible gun to fixed gun for use on the Antiaircraft Mount M3, the following parts are required:

Item	Piece Mark	Quantity
PIECE, filler, lower	A152750	1
PIN, lower filler piece	A152854	4
PIN, cotter, 1/16 x 7/16	137130	4

(11) Partially remove back plate latch pin (fig. 33). Remove back plate latch and back plate latch spring. Expand one end of back plate latch spring and replace it in latch. Remove the rivets holding the upper and lower handle frames to the back plate. Detach the frames from the back plate. Two of the lower filler piece pins *A152854* are used to retain the lower filler piece which is to be installed as shown in figure 33. Make sure that the recess in the filler piece for the back plate latch spring is sufficient to hold the spring securely in place, as the latch lock is not to be used on the fixed back plate.

(12) The upper and lower handle frames with handle grips, handle tube, handle tube screws, latch lock, and latch lock spring and pin assembled, should be stored in a convenient place where they will be readily available for use on the truck mount. It will be convenient to leave the two pins *A152854* in the back plate or upper handle frame secured by wire or cotter pins.

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(13) The gun is now ready for use on the Antiaircraft Mount M3 and can also be used on the Antiaircraft Mount M2A1, provided the gun is equipped with the barrel support adapter *C121036*. No attention need be given to the bolt latch release or trigger, as they are to remain assembled when the gun is used on any type of mount. In replacing the handle frames, four lower filler piece pins (handle frame pins) *A152?54* secured with cotter pins *137130*, or wire, should be used in place of rivets. Conversion from fixed to flexible back plate and vice versa will be the same for each type of gun after the instructions contained herein have been followed.

d. The Browning Machine Gun, Cal. .50, M2, water-cooled, flexible, can be used with the Pedestal Mounts, Cal. .50, M43, M43A1, and M46 by converting the back plate *D35476* with trigger and trigger safety, but without spade grips, to one with spade grips. To make this conversion the cal. .50 water-cooled spade grip back plate conversion group *D7160981* is used. The conversion is made in a manner similar to that of the heavy-barrel gun, as explained above.

e. The Browning Machine Gun, Cal. .50, M2, aircraft, basic, fixed, with back plate *C64311* without trigger, trigger safety, or spade grips can be converted into a flexible gun with these parts. To make this conversion, the spade grip back plate conversion group assembly *D35541* is used. The conversion is made in a manner similar to that of the heavy-barrel gun, as explained above.

28. ASSEMBLY.

a. Back Plate With Horizontal Buffer Assembly (fig. 28).

(1) Place the lower filler piece in the back plate with extension to left, or right, depending upon side to which latch lock is to be attached; insert the two filler piece pins from the top; and insert cotter pins. Assemble the back plate latch to back plate by inserting the back plate latch spring in the latch recess, with the other end of the spring in the recess in the lower filler piece. The latch is pressed forward between the thumb and forefinger, and the pin inserted.

(2) Assemble the latch lock spring in the latch lock, with the bowed side of spring bulging toward the latch lock, and the closed end toward the pin end of the lock. Insert the two ends of the spring in the small holes in the latch lock. Attach latch lock to filler piece extension by inserting latch lock pin from the top and inserting cotter pin. (The latch lock is normally attached with the pin to the left; however, if an operating slide is to be attached to the right side of the receiver, the latch lock is attached to the left side by reversing the lower filler piece. This provides hand clearance when operating

the slide.) *NOTE: One type of latch lock spring is in the form of a curved leaf spring B243607, with an eye on one end and a hook on the other. This spring is assembled in the lock by hooking the hooked end under the pin end of the lock, so that the eye will face down and bear on the lower handle frame when assembled. A latch lock spring pin A262799, with flat side, is used when this spring is assembled.*

(3) Place the buffer plate in the back plate with the small diameter forward and projecting from the front of the back plate. Insert 22 buffer disks, making sure they are seated properly, and start the adjusting screw. Insert the plunger and spring, depress them so the plunger may enter the tube, and tighten the adjusting screw, using the combination or machine gun wrench. When screwed tight, the adjusting screw should project approximately one-sixteenth inch beyond the end of the back plate buffer tube. Not more than one full thread of the adjusting screw should be exposed. It may be necessary to add or remove a buffer disk to secure tight adjustment and at the same time meet these requirements (par. 27 **b**). If more than one thread is exposed when the screw is tightened, remove adjusting screw, remove one buffer disk, and reinstall the adjusting screw, plunger, and spring. Tighten securely. If adjusting screw is below flush, add one more buffer disk in like manner. Place the back plate filler piece in its opening in the back plate and insert the pin.

b. Back Plate With Horizontal Buffer Assembly With Trigger Group (Water-cooled Guns) (fig. 29). Assembly is the same as in subparagraph **a**, above, except for the back plate filler piece. If the trigger safety assembly has been removed, reassemble the safety and safety spring, and attach to the back plate with the two screws which should be staked after being tightened. Insert the trigger in its recess with the trigger spacer to the left. Seat the spring in the holes in the back plate and trigger, aline the holes, and insert the pin.

c. Spade Grip Back Plate Assembly (fig. 30). Assembly is the same as in subparagraph **a**, above, except for assembly of back plate filler piece and lower filler piece. Latch lock is attached to the lower handle frame, which is riveted to the back plate. Assembly of the trigger group is outlined in subparagraph **b**, above.

d. Spade Grip Back Plate Assembly With Bolt Latch Release (Heavy-barrel Guns) (fig. 31).

(1) Assemble the latch and latch lock to the lower handle support in a similar manner to that employed when assembling to the lower filler piece described in subparagraph **a** (1) and (2), above.

BOLT AND DRIVING SPRING GROUP

(2) Assemble the buffer plate, buffer disks, and adjusting screw as described in subparagraph a (3), above.

(3) Raise the positioning stud of the buffer tube sleeve spring by lifting the spring and sliding the sleeve onto the buffer tube, lock-end first and knurled-end to rear, until the spring stud will snap into the retaining groove in the tube. The alternate-design tube is similarly assembled by slightly expanding the split sleeve and sliding it on the buffer tube until the positioning projection engages as above.

(4) Place the trigger and bolt latch release in the opening at the top of the back plate with the trigger on the right of the bolt latch release, so that the thumb piece of the release lies between the ears of the trigger. Seat the trigger and bolt latch release spring (identical) in their seats in the parts and back plate, aline pin holes, and push trigger pin through until flush. Be sure springs are securely seated at both ends.

e. Vertical Buffer Back Plate Assembly (fig. 32).

(1) Place the index finger spring over the key, and insert the key through the front of the back plate with the beveled surface down. Depress the key to compress the spring, place the index finger over the key with the pointer up, and insert the pin. Insert the latch spring in the back plate latch and attach the latch by inserting the pin. Insert the latch lock plunger and spring in the recess in the back plate, then place the latch lock in position and secure by inserting the pin.

(2) Insert the lower buffer with the beveled surface up, through the front of the back plate. Drop the upper buffer into the tube with the beveled surface down, and the long side to the rear. Insert the buffer disks in the tube, making sure they are seated properly, and start the adjusting screw. Insert the plunger and spring and tighten the adjusting screw, using the combination wrench.

Section VII

BOLT AND DRIVING SPRING GROUP

29. DISASSEMBLY.

a. Bolt Group. Disassemble as explained below. Exploded view of bolt group is shown in figure 46.

(1) Remove the extractor assembly by rotating it upward and pulling out from the bolt (fig. 35). The extractor assembly may be disassembled, as shown in figure 36, by placing a drift against the conical depression in one end of the pin and driving out the pin. Lift

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50. M2 ALL TYPES, AND GROUND MOUNTS

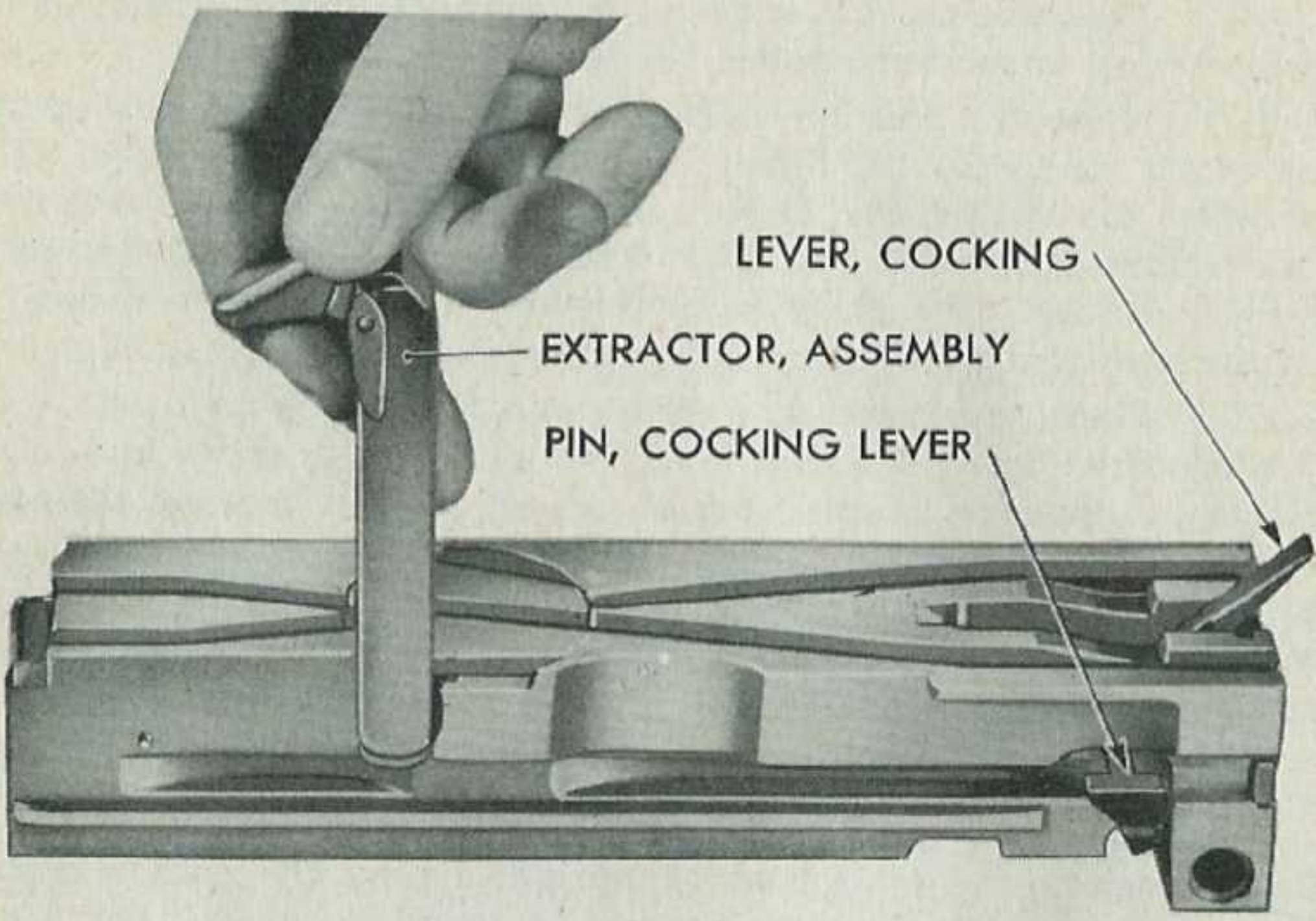

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Figure 35—Removing Extractor Assembly

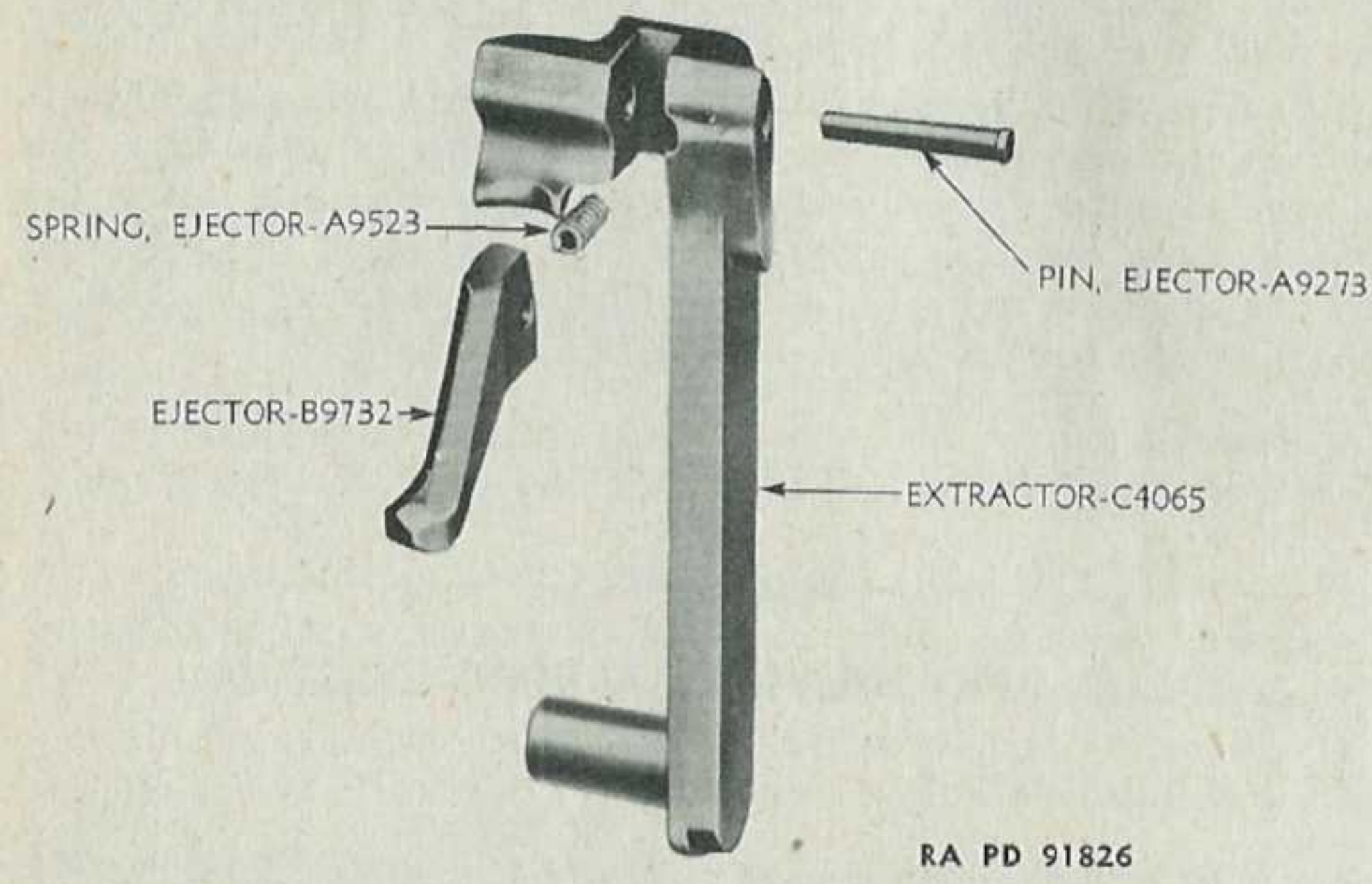

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Figure 36—Extractor Assembly—Exploded View

out bolt switch and bolt switch stud. CAUTION: *Before pushing down on the sear protrusion to release the firing pin, swing the cocking lever fully rearward. If this is not done, injury to personnel may result.*

BOLT AND DRIVING SPRING GROUP

Figure 37—Disengaging Sear Stop Assembly

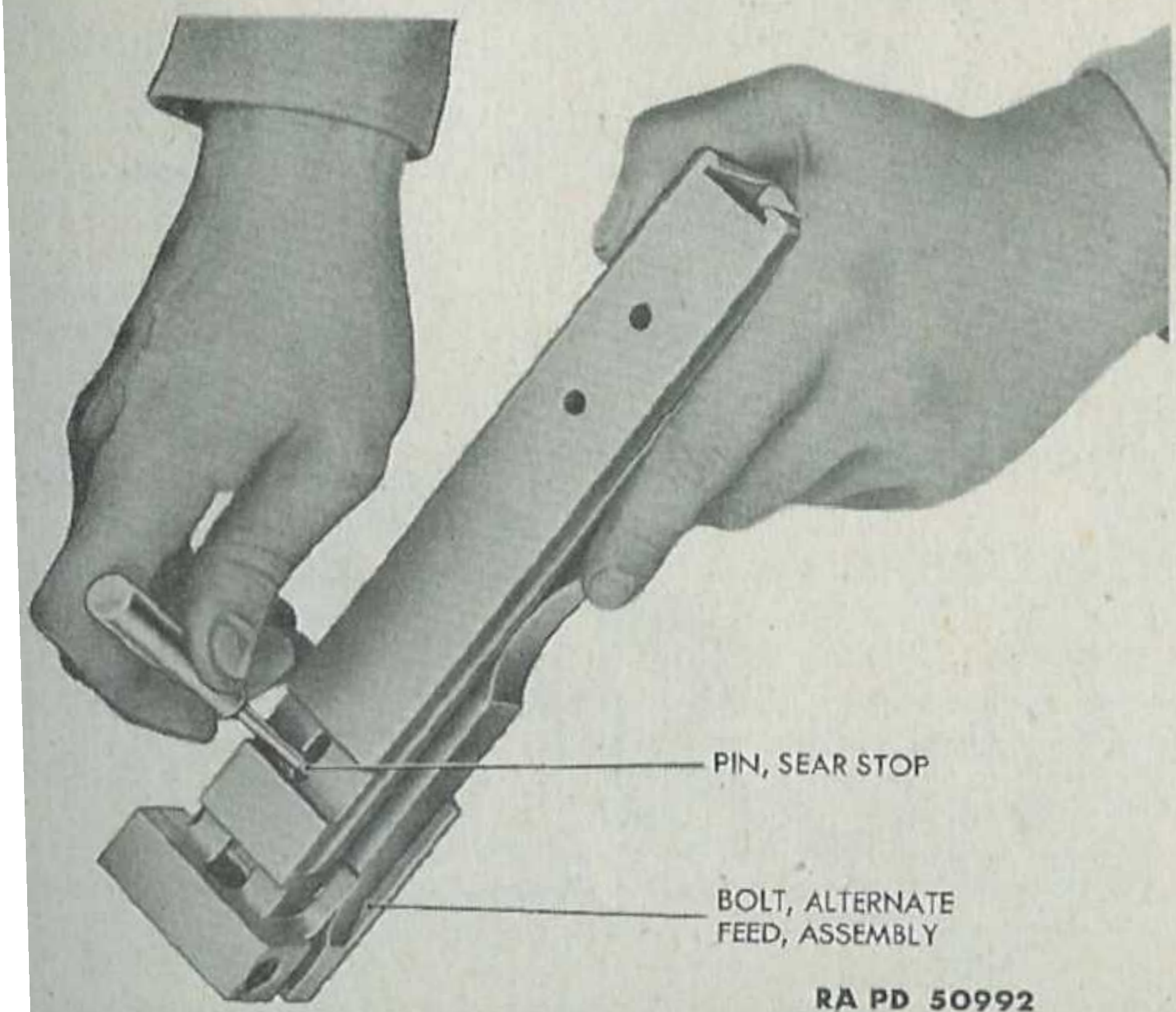


Figure 38—Pushing Out Sear Stop Assembly (Pin)

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

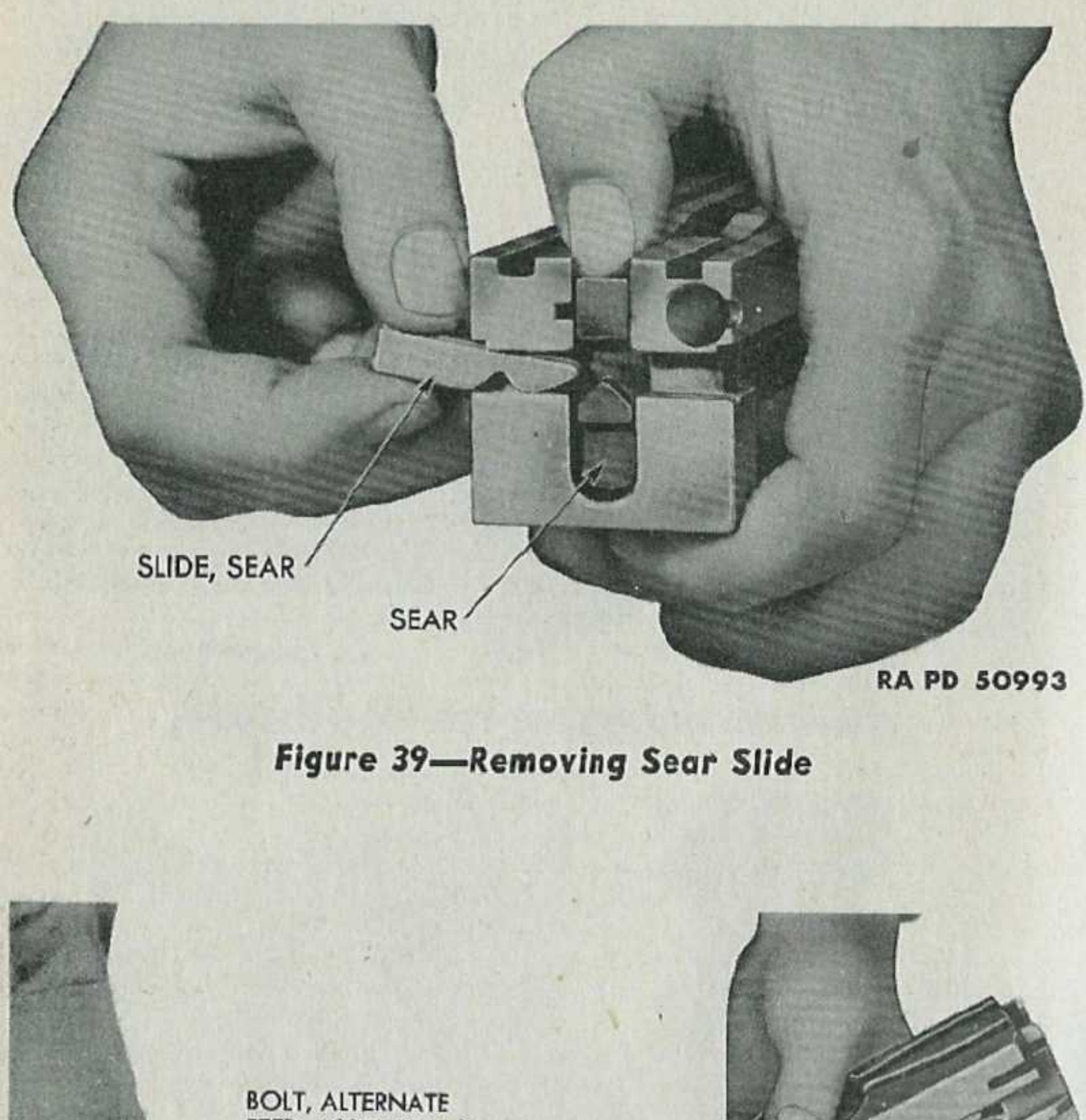


Figure 39—Removing Sear Slide

Figure 40—Removing Firing Pin Extension Assembly With Firing Pin Attached

BOLT AND DRIVING SPRING GROUP

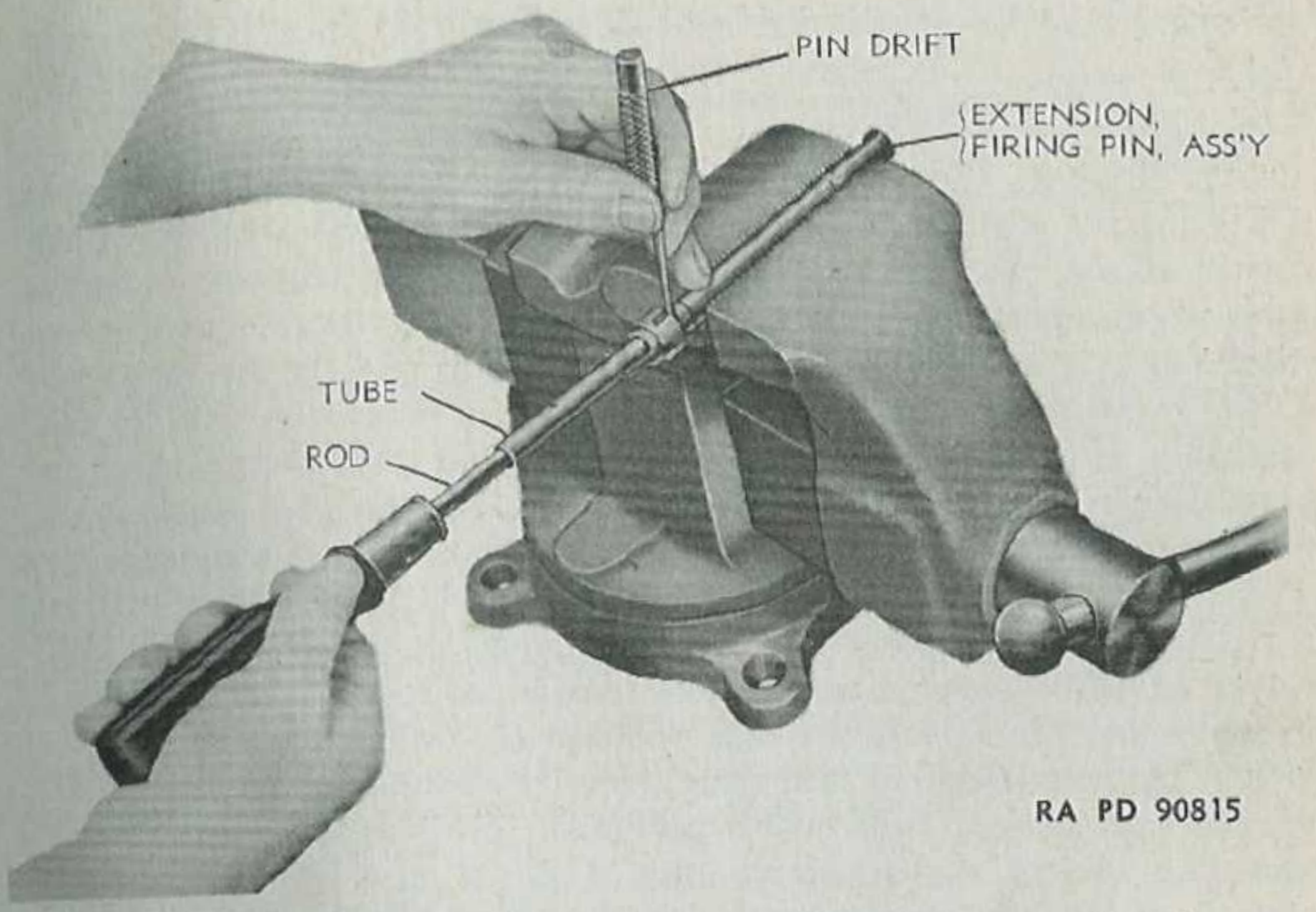


Figure 41—Using Firing Pin Spring Removing Tool

Figure 42—Firing Pin Extension Assembly—Exploded View

(2) Take out the cocking lever pin and cocking lever (fig. 35). With the thin end of the cocking lever, swing the sear stop out of its groove in the bolt (fig. 37). Turn over the bolt, and with a drift, push out the sear stop pin (fig. 38). NOTE: *To prevent locked accelerators in cal. .50 aircraft guns, a new-design accelerator stop B7161301 and stop lock B7161300 are now used in place of the sear stop pin assembly. When these parts are used, the modified breech lock with a slot B7161302 must be used. For disassembly or replacement, refer to paragraph* 31 f.

(3) Press down on the sear with the thumb and remove the sear slide (fig. 39) To prevent loss of the sear spring, insert thin end

of the cocking lever between coils of the spring; then remove sear and sear spring. (The spring may be left thus attached to the cocking lever for ease in reassembly.)

(4) Elevate the front of the bolt and the firing pin extension and firing pin will drop out (fig. 40). The firing pin extension is not usually disassembled unless replacement of parts or cleaning is necessary. If disassembly is necessary, the firing pin spring may be removed by removing the firing pin spring stop pin. If the firing pin spring removing tool is available (fig. 27), it should be used to disassemble and assemble the spring. To use the tool, clamp firing pin extension firmly but not tightly in a vise, and fit the head of the tool sleeve over the end of extension so that the cut straddles the stop pin (fig. 41). (Care must be taken not to bend extension.) Press in on rod of tool to compress spring and push out stop pin. Then hold sleeve against extension and relieve tension on rod so that the spring expands into the sleeve. To assemble spring, pull rod back in sleeve of tool, insert one end of spring in sleeve of tool and other end in extension, and press in and insert pin flush. If firing pin spring disassembling tool is not available, the stop pin may be removed by clamping the firing pin extension in a vise, as above, and removing the pin with a pin drift. Care should be observed not to bend the extension, and also to restrain the spring when drift is withdrawn. The disassembled extension is shown in figure 42. NOTE: *Some firing pins B7310080 were manufactured with four flats on the sides to provide space in the bolt tunnel for dirt to collect and thus prevent jamming of the pin.*

b. **Driving Spring Group.** Disassemble as follows: The driving springs may be removed from the driving spring rod by filing off the riveting from the riveted end of the stop pin and then driving out the stop pin with a pin drift. (Use new pin when assembling.) Then, restrain collar against springs, pull drift out, and remove collar and springs. Allow springs to expand slowly through hands to prevent kinking. An exploded view of the assembly is shown in figure 43.

30. INSPECTION.

a. Thoroughly clean and inspect all parts with particular attention to the following points:

(1) Check bolt handle and bolt stud for deformation, burs, and worn collar. Maximum length of seating end should be 0.585 inch.

(2) Check driving spring rod for rust, deformation, and loose burred or bent pins. Check inner and outer springs for rust and kinks. Inner spring *B147510* should have from 193 to 197 coils and mini-

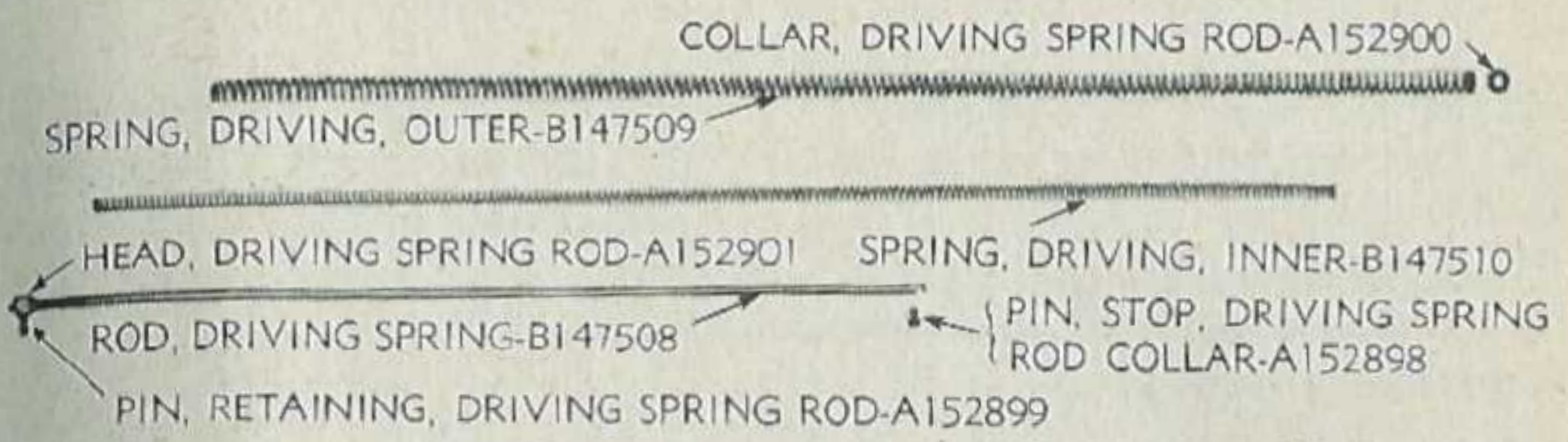


Figure 43—Driving Spring Rod With Springs Assembly—Exploded View

mum free length of 21 inches. Outer spring *B147509* should have from 142 to 146 coils and minimum free length of 21 inches.

(3) Check bolt cam grooves (for belt feed lever), and bolt switch for roughness and burs.

(4) Check extractor and ejector for deformation, wear, and burs; loose or unstaked ejector pin; and weak ejector spring. Spring *A9523* should have from 6 to 7 coils and minimum free length of eleven thirty-seconds inch.

(5) Check cocking lever for deformation, wear, and burs, particularly on camming ends.

(6) Check sear stop assembly for deformation, burs, and loose pin. Check accelerator stop and lock (when assembled) for deformation, looseness, wear, and burs.

(7) Check sear slide for binding or excessive looseness in guideways in bolt, and for wear and burs.

(8) Check sear for deformation, burs, and fracture, and spring for rust and set. Spring *A9524* should have from 6 to 7 coils and minimum free length of seventeen thirty-seconds inch.

(9) Check firing pin extension for deformation and burs, worn or burred sear notch, and free movement in bolt; it should not bind. Check firing pin spring for rust and set. Spring *A9353* should have from 35 to 39 coils and minimum free length after setting of $3\frac{5}{32}$ inches. The new-type spring should be used in all guns.

(10) Check firing pin for free movement in bolt and with extension assembled, and for deformation, worn nose, and burs; it should not bind. When fully forward, nose of pin should protrude from face of bolt between 0.074 and 0.079 inch.

(11) Using firing pin hole gage *41-G-182-200*, check firing pin hole in face of bolt. If gage (0.084 inch) enters hole, bolt is unserviceable (par. 17 a (3)).

(12) Check T-slot in bolt for broken or burred lips, and extractor stop pin for looseness, wear, and burs. (Chamfer on opening of driving

spring rod hole in bolt should be 60 degrees.) NOTE: *Unserviceable bolt assemblies having recoil plates which are serviceable (except for enlargement of the firing pin hole) and serviceable bolts found to have oversized firing pin holes, should be sent to Rock Island Arsenal for reworking. Broken, or otherwise unserviceable bolt assemblies, may be disposed of locally.*

31. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Firing Pin Binding in Bolt.

(1) In some cases the firing pins do not drop freely into the firing pin tunnel of the bolt. This condition may be corrected by reducing the largest diameter of the firing pin. The largest diameter, which was 0.490 inch —0.005 inch, may be ground to 0.482 inch —0.005 inch. This change provides a floating action for the firing pin even if it is not perfectly alined with the firing pin extension, and will in most cases overcome any minor defects made during the machining of the bolt. Firing pins of future manufacture will include these changes.

(2) If the firing pin binds in the bolt, tests may be made with a number of firing pins and a number of bolts to determine, if possible, whether the bolt is defective or the firing pin is bent. If several firing pins bind slightly in the bolt and if the bolt has been thoroughly cleaned, the firing pin tunnel in the bolt is probably at fault. The pin or the bolt or both should be replaced as necessary.

c. Countersinking of Driving Spring Rod Hole on Rear of Bolt To Prevent Binding of Spring. It has been reported that some bolts *D28256* for Browning Machine Gun, cal. .50, M2 have been issued without the 60-degree countersink at the opening of the driving spring rod hole on the rear of the bolt. The omission of this countersink will not prevent the gun from firing, but will affect the rate of fire and also cause the driving spring to wear because of binding as it enters the hole. Bolts encountered with this defect should be corrected by scraping or filing a 60-degree bevel approximately one thirty-second inch wide on the edge of the hole with a metal scraper or half-round file.

d. Revision of Bolt Handle To Eliminate Interference With Sear. Several cases have been encountered where proper functioning of Browning Machine Gun, cal. .50, M2, all types, is prevented

BOLT AND DRIVING SPRING GROUP

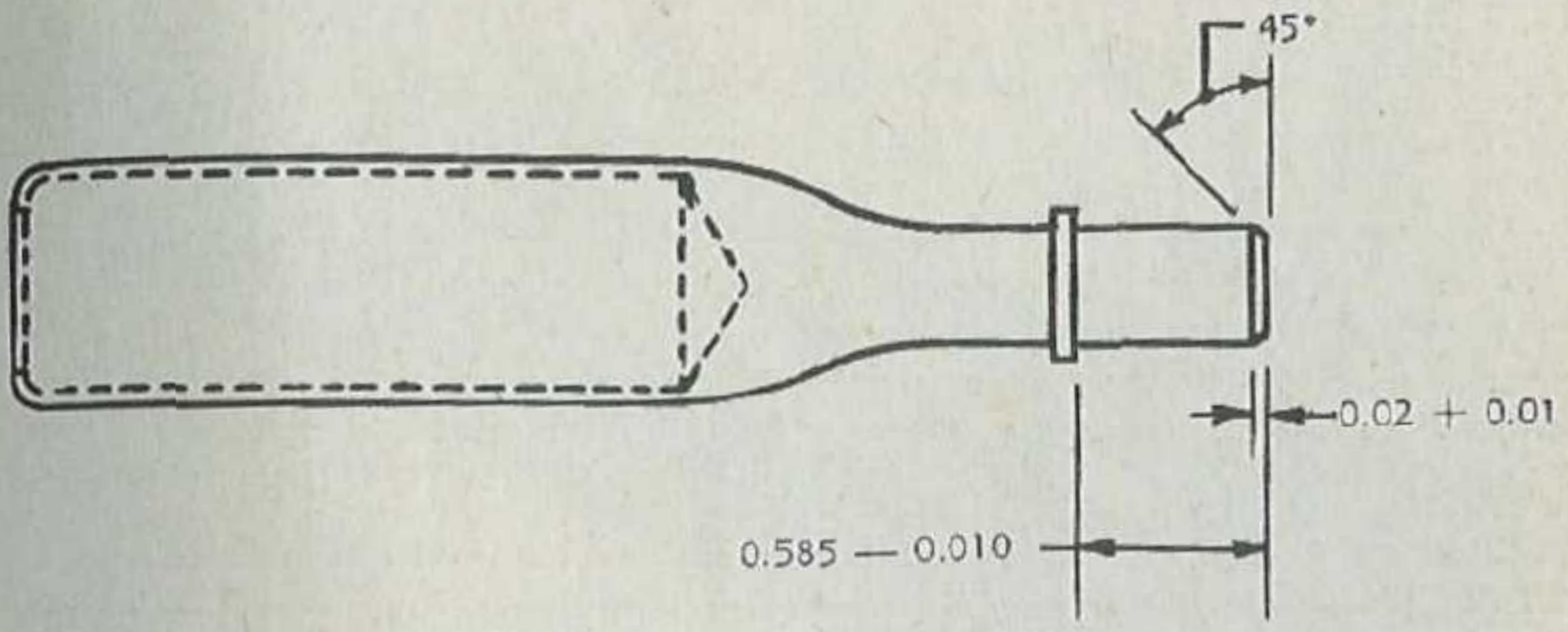


Figure 44—Bolt Handle, Showing Dimensions

by excessive length of stud on bolt handle *B8583*. If the stud is too long, it will extend too far into the gun and will prevent movement of the sear. This condition will exist in a very small number of bolt handles. When it is encountered, it should be overcome by grinding the bolt handle to within the dimensions shown on figure 44.

e. Excessive Play Between Sear and Sear Slide. Normally, the upward travel of the sear is limited by either the sear slide or the sear stop assembly. If parts are worn to the extent that the upward travel of the sear is instead being limited by the firing pin extension, then a new sear slide, sear, and/or bolt should be used.

f. Use of Accelerator Stop Assembly To Prevent Jamming of Accelerator. A new-design accelerator stop assembly is being installed in aircraft guns of recent manufacture to prevent the accelerator from jamming in the breech lock notch in the bolt. This assembly consists of an accelerator stop *B7161301* and an accelerator stop lock *B7161300*, and takes the place of the sear stop assembly when assembled. The accelerator stop is inserted in the bottom of the bolt and lies in the breech lock notch. The accelerator stop lock is assembled to the stop from the top of the bolt and is secured to the bolt in the same manner as the sear stop (fig. 45). The width of the stop prevents the accelerator from entering the breech lock notch in the bolt. The new-type breech lock *B7161302* (fig. 60), with a notch in the bottom to clear the stop, must be used with the accelerator stop assembly. The accelerator stop assembly is removed from the bolt

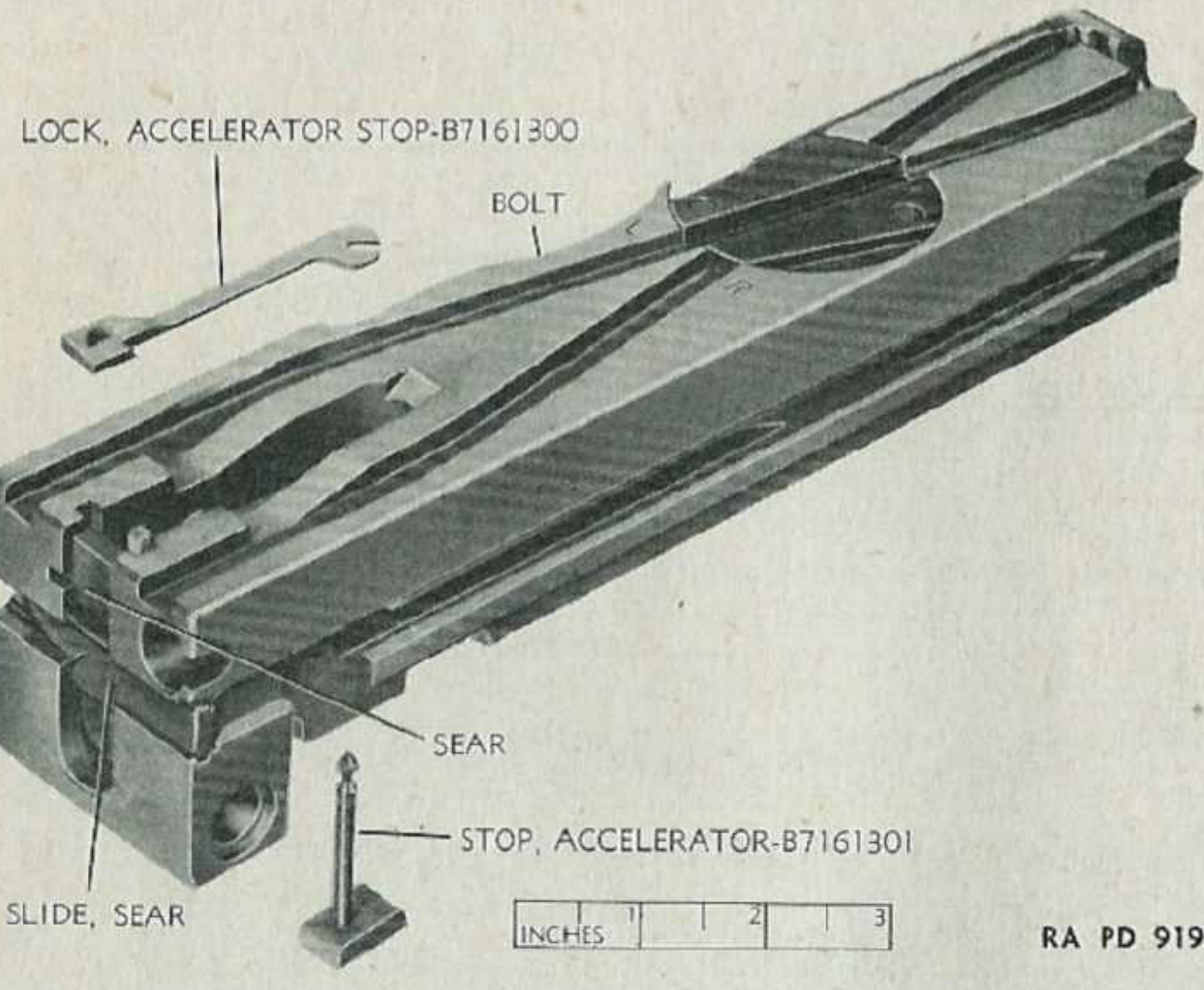


Figure 45—Accelerator Stop Assembly and Bolt—Exploded View

by disengaging it from the bolt in the same manner as the sear stop, and then pulling it to the rear to disengage it from the shank of the stop. The stop is then pushed down out of the bolt. The assembly is installed by reversing the above procedure.

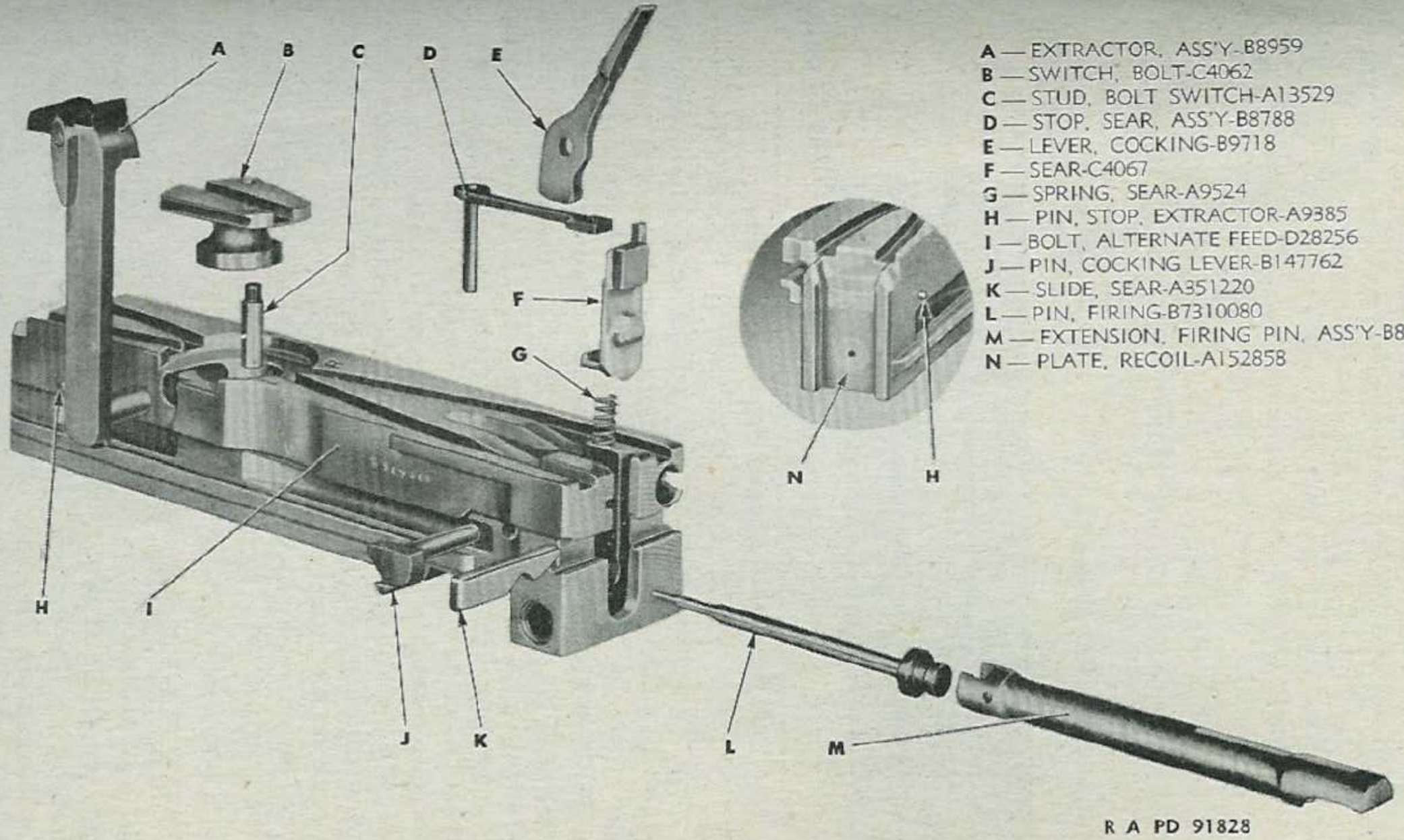
32. ASSEMBLY.

a. Bolt Group. Assemble as explained below. Exploded view of bolt group is shown in figure 46.

(1) If the firing pin extension has been disassembled, it may be assembled by reversing the procedure of disassembly as explained in paragraph 29 **a** (4). Be sure both ends of the stop pin are flush with firing pin extension when assembled.

(2) Engage the firing pin and firing pin extension, and insert them in the bolt with the notch at the rear of the firing pin extension down. Push the extension all the way forward so that the tip of the firing pin protrudes from the face of the bolt.

(3) Locate the sear spring in position and insert the sear in its slot. Press down lightly on the sear, at the same time rocking the



A — EXTRACTOR, ASS'Y-B8959
B — SWITCH, BOLT-C4062
C — STUD, BOLT SWITCH-A13529
D — STOP, SEAR, ASS'Y-B8788
E — LEVER, COCKING-B9718
F — SEAR-C4067
G — SPRING, SEAR-A9524
H — PIN, STOP, EXTRACTOR-A9385
I — BOLT, ALTERNATE FEED-D28256
J — PIN, COCKING LEVER-B147762
K — SLIDE, SEAR-A351220
L — PIN, FIRING-B7310080
M — EXTENSION, FIRING PIN, ASS'Y-B8976
N — PLATE, RECOIL-A152858

Figure 46—Bolt Group—Exploded View

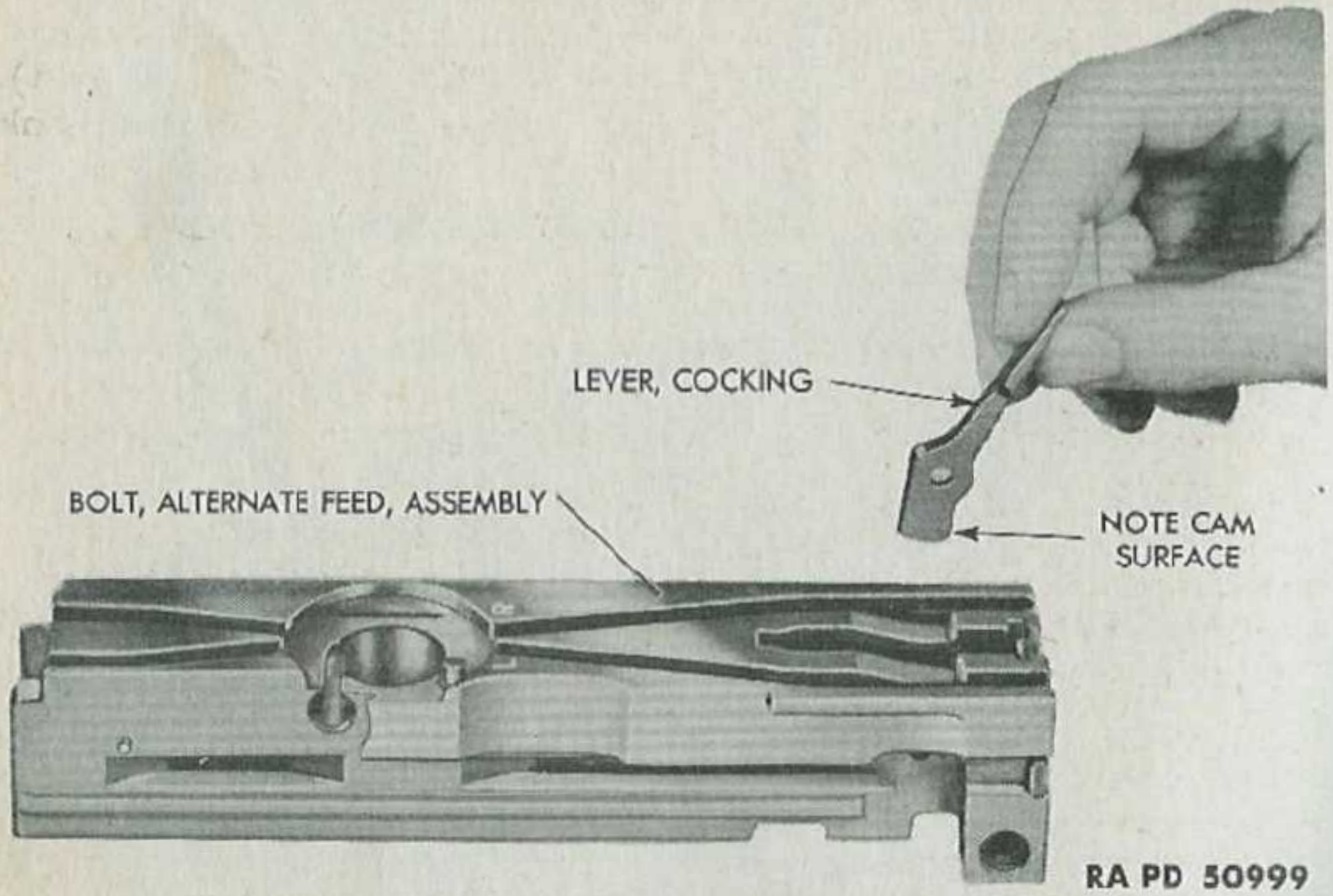


Figure 47—Assembling Cocking Lever

spring held for convenience by the cocking lever (as explained in paragraph 29 a (3)) in both directions to make sure the spring is properly seated both in the recess in the bolt and the recess in the bottom of the sear. Press down on the sear and insert the sear slide. If the gun is to be fired by the trigger bar, the square end of the sear slide may be either to the right or to the left. If the gun is to be fired by a mechanism attached to the side plate, the square end of the slide must be on the side from which the weapon is to be fired. Insert the sear stop assembly in the bolt and push downward on the sear stop pin with the thin end of the cocking lever until it extends through the slot in the firing pin extension. Make certain that the sear stop pin is back of the firing pin spring and not through a coil. Then swing the sear stop into its groove in the left side of the recess. (For assembly of accelerator stop assembly in place of the sear stop assembly see paragraph 31 f.)

(4) Insert the cocking lever in the slot of the bolt with its rounded cam surface to the rear (fig. 47) and insert the cocking lever pin from the left side. Push the cocking lever all the way forward, return it to its extreme rear position, and press downward on the top of the sear. The click of the firing pin will be heard if the assembly is correct. Push the cocking lever all the way forward before assembling the bolt in the gun.

OIL BUFFER GROUP

(5) Insert the bolt switch stud, with the small diameter up, and place the bolt switch over the stud so that the groove marked "L" is continuous if left-hand feed is desired. ("R" for right-hand feed). With the extractor assembly in a vertical position, insert the shank into the bolt (fig. 35). Make sure that as the extractor is rotated forward, the flange on the bottom of the extractor engages behind the shoulder on the bolt, thus locking it in position.

b. **Driving Spring Group** (fig. 43). Assemble as follows: Place inner and then outer driving springs on driving spring rod. Compress springs on rod and install collar. Aline pin holes in rod and collar and insert stop pin so that head is on same side of rod as the retaining pin (a new pin should be used). Push pin fully home and rivet small end securely for retention in rod. Check assembly to see that both springs and collar move freely on the rod when compressed and released.

Section VIII

OIL BUFFER GROUP

33. DISASSEMBLY.

a. Disassemble as follows:

(1) Remove oil buffer assembly from the oil buffer body by pressing on the end of the piston rod with the forefinger. Turn oil buffer body over and place upside down on the table. To remove the tube lock, elevate the tips of the accelerator with the forefinger of the left hand, and press down on the end of the tube lock with the thumb. Using a screwdriver or similar tool in the right hand, raise the rear end of the tube lock so that the protrusion will clear the oil buffer body. Rotate the accelerator rearward and the tube lock will be pushed out of its recess. The left thumb will keep the tube lock from springing out suddenly (fig. 48). With a drift, push out the accelerator pin and remove the accelerator. In most cases the oil buffer body spring lock is staked and not removed in disassembly. An exploded view of the oil buffer body assembly and related parts is shown in figure 49. NOTE: *In the case of the new-type oil buffer tube lock assembly C145325 (fig. 57), it is necessary to raise the rear end of the lock sufficiently to disengage the latch before attempting to move the lock rearward. When moving lock rearward, it should be restrained with the finger from springing out when released, and thus possibly causing injury. Old-type locks are without the latch.*

(2) The oil buffer assembly is not usually disassembled unless repairs or replacement of parts is necessary. If disassembly is neces-

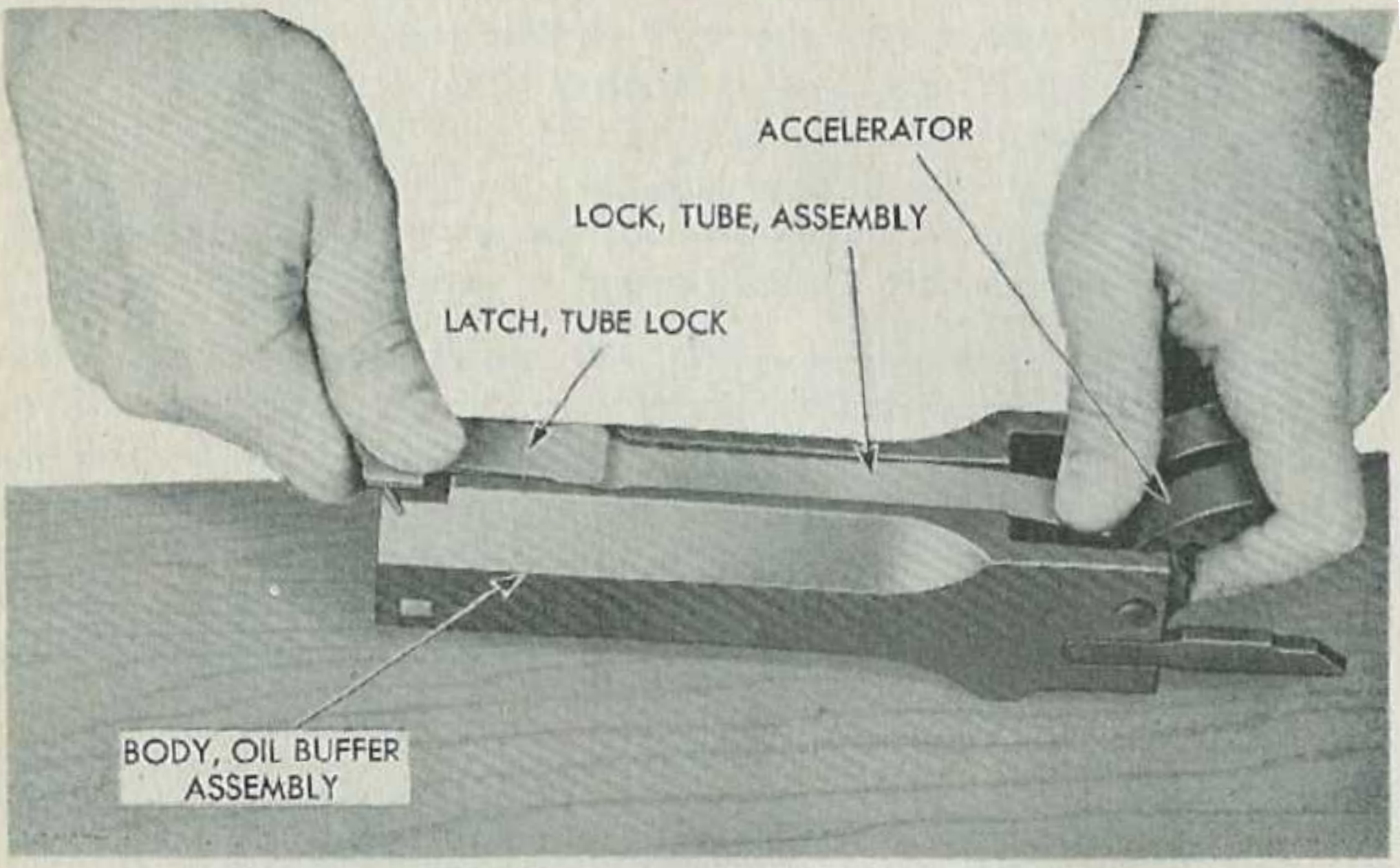


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Figure 48—Removing Oil Buffer Tube Lock

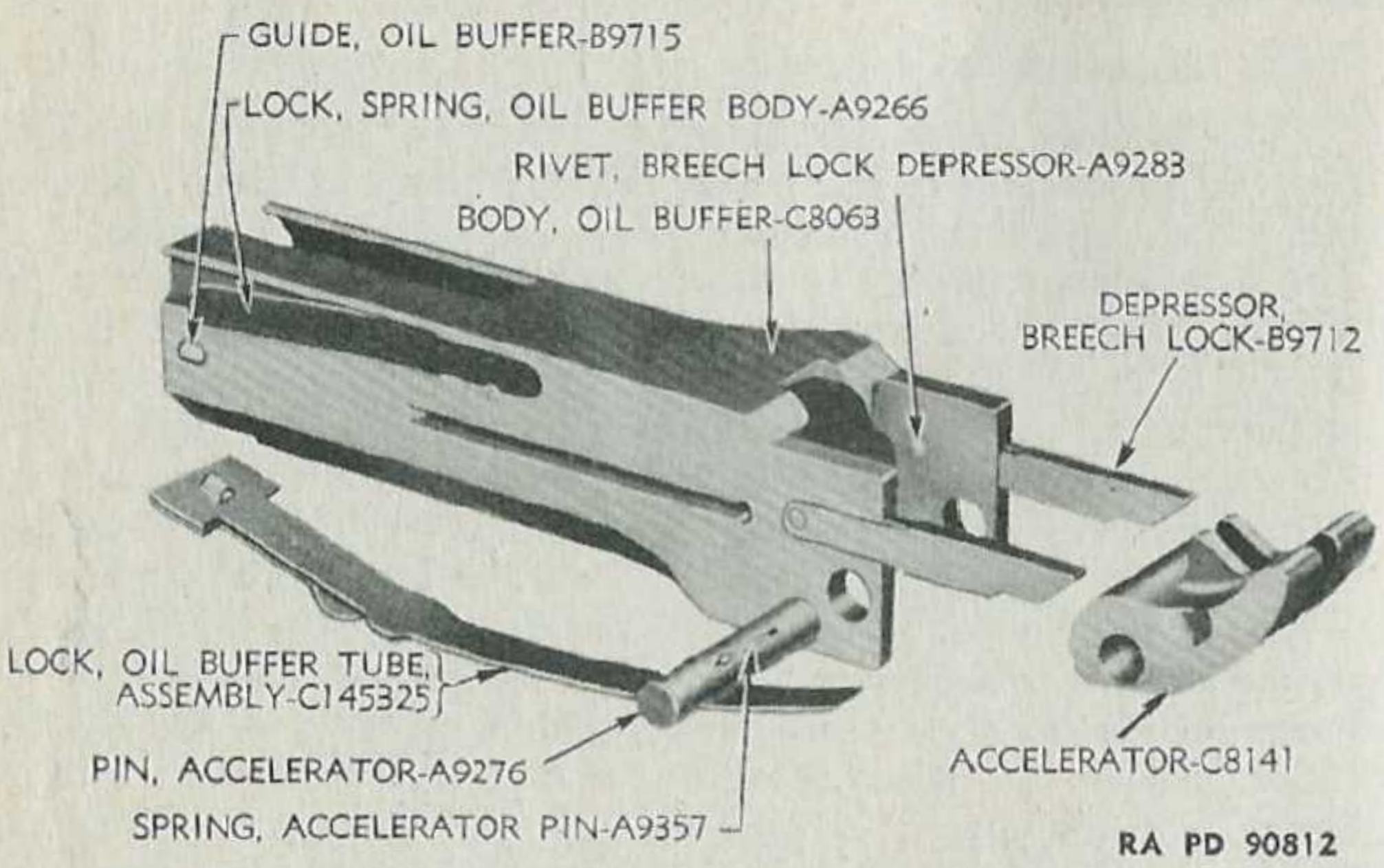

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Figure 49—Oil Buffer Body Group—Exploded View

sary, proceed as follows: Using a vise, open jaws enough to clear end of piston rod. Place spring guide against side or top of jaws (fig. 50), wrap fingers around spring and hold guide firmly against vise. Press in on the oil buffer to compress the spring. Rotate the buffer through 90

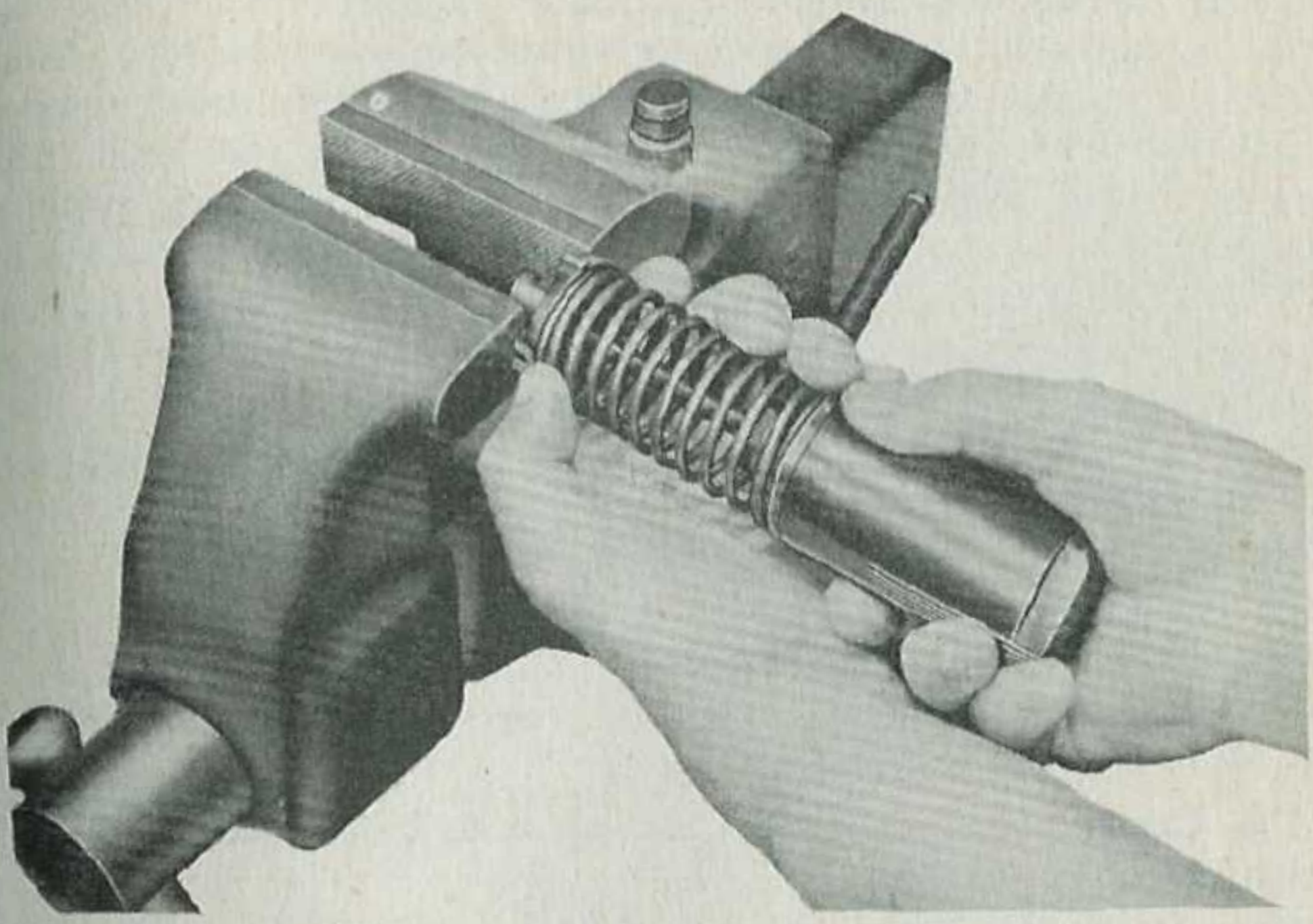

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Figure 50—Using Vise To Remove Oil Buffer Spring

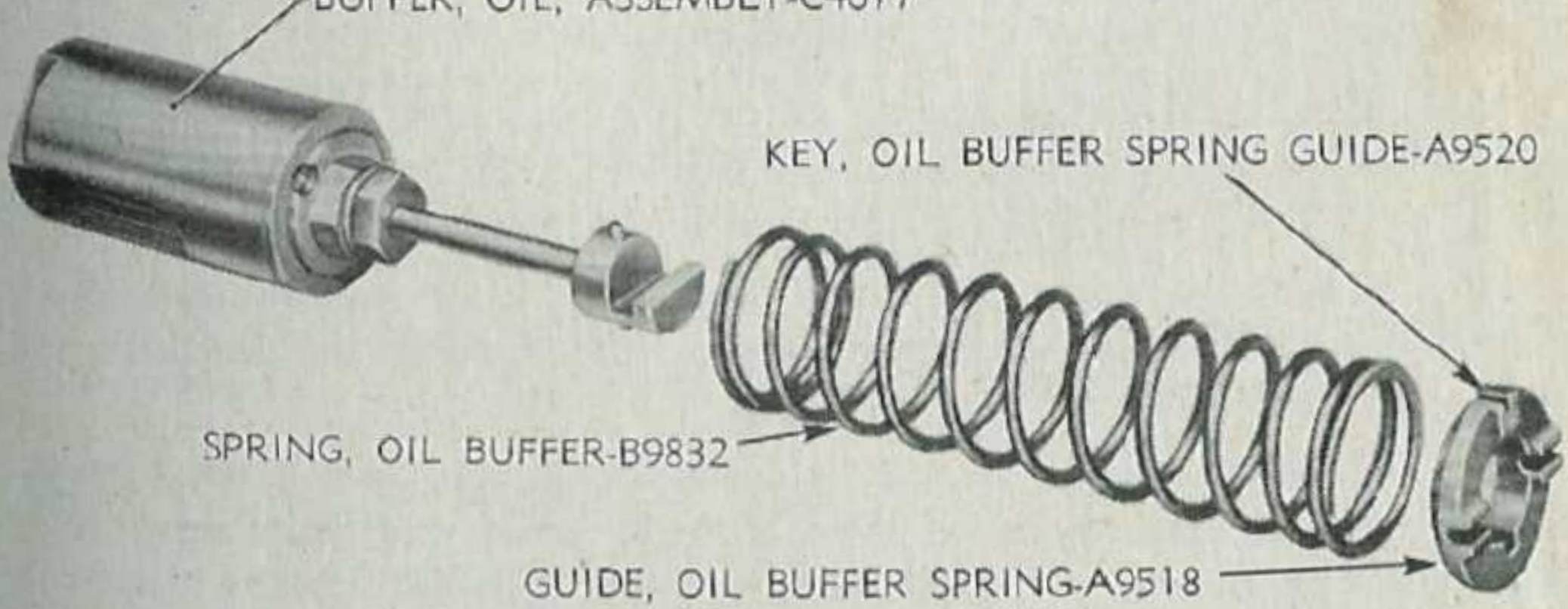

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Figure 51—Oil Buffer Assembly With Spring and Guide

degrees in either direction to aline the piston rod pin with the slots in the guide, release the spring pressure slowly, and remove oil buffer from guide and spring. Exercise care to avoid injury. Figure 51 shows oil buffer spring and guide removed from oil buffer assembly.

(3) Remove the filler screws, using a screwdriver which fits the slots exactly, and drain out the oil. Remove the oil buffer tube

cap with the combination wrench. After removal of the cap, the piston rod and related parts may be withdrawn from the tube. Take out the piston head nut pin and unscrew the piston head nut. Remove the piston valve assembly and unscrew the piston rod head. Unscrew the gland plug from the cap. The oil buffer packing, packing gland ring (or washer, par. 36 a (1)), and packing gland spring can then be taken out. The relief valve and spring may be removed from the cap by removing the screw. An exploded view of the oil buffer assembly is shown in figure 56. CAUTION: *If it is necessary to clamp oil buffer tube in a vise for removal of cap, engage vise jaws with flats on rear end of tube,* not *with body of tube as it will be bent.*

34. INSPECTION

a. Thoroughly clean and inspect all parts with particular attention to the following points:

(1) Check body spring lock for tension, burs, staking, and retention in body.

(2) Check tube lock for wear and burs; weak, short, or worn stud; loose latch; and retention in body (par. 35 **d**).

(3) Check breech lock depressors for deformation, wear, and excessive looseness in body. Should have slight toggle action.

(4) Check accelerator for broken or burred tips, pin for burs and rusting, and broken or missing spring.

(5) Check oil buffer spring guide for burs and missing or loose key. Check spring for rust and set. Spring *B9832* should have from 11¾ to 12¼ coils and minimum free length of 5½ inches.

(6) Check oil buffer for loose or leaking filler screws, and leaks around cap, relief valve, and packing. Check tube for dents, worn serrations, and loose or damaged cap.

(7) Check action of relief valve in cap and for weak spring. Spring *A9393* should have from 5 to 6 coils and minimum free length of twenty-seven sixty-fourths inch. (Relief valve group is omitted in heavy-barrel guns.)

(8) Check oil buffer gland packing and washer for damage, and packing gland spring for weakness. Spring *A153163* should have from 3¾ to 4½ coils, and minimum free length of three-eighths inch. (Gland packing, washer, and spring are omitted in heavy-barrel guns.)

(9) Check piston rod for deformation, wear at point where packing rubs, burred notch and burred or loose pin. Check piston rod head for burs, and valve for burs and missing keys. (Valve assembly is omitted in heavy-barrel guns.)

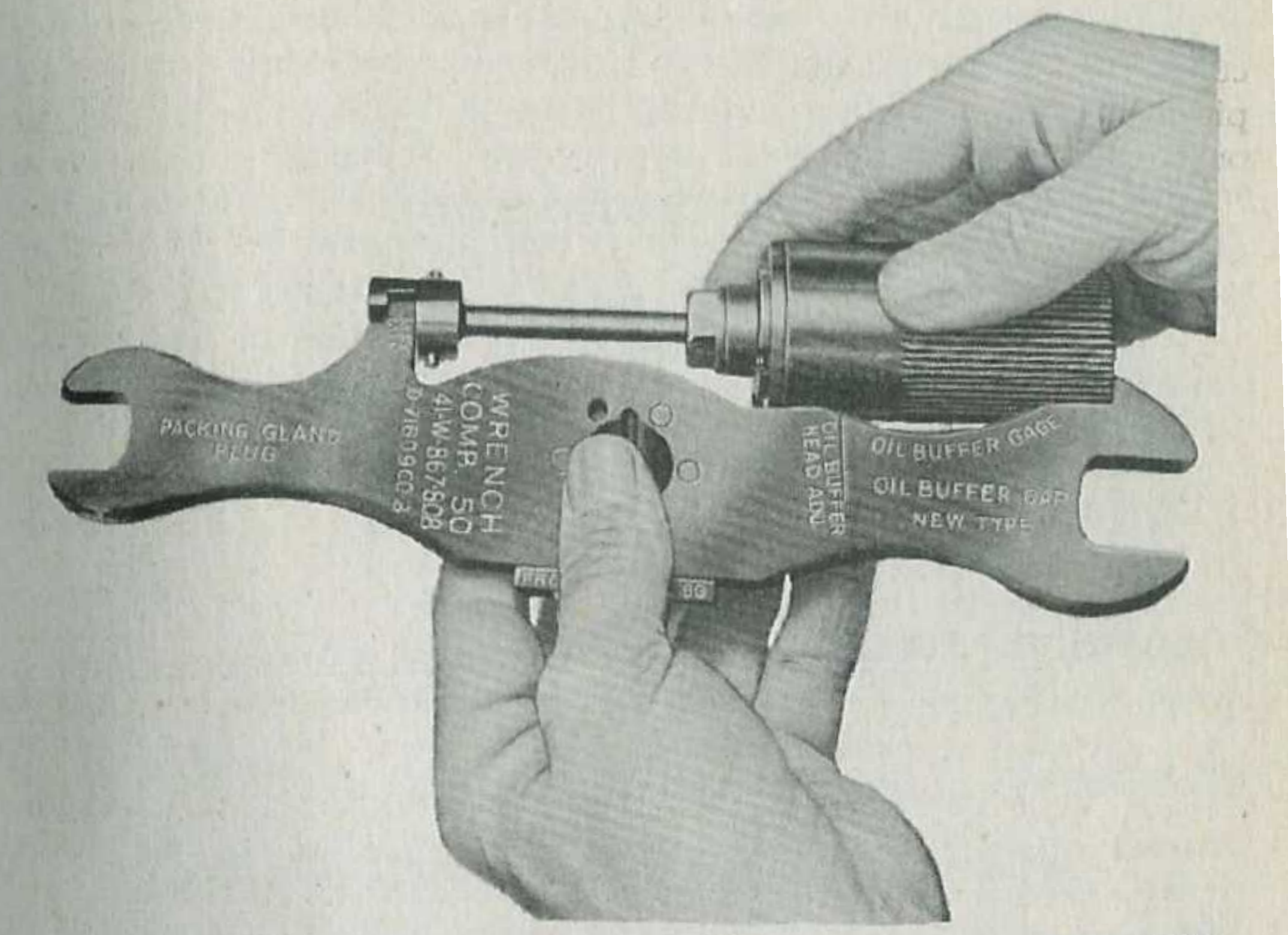


Figure 52—Using Combination Wrench 41-W-867-808 To Check Length of Oil Buffer Assembly

(10) Check assembled length of oil buffer assembly. With piston rod fully extended the length from rear face of tube to extreme forward face of piston rod should be between 6.525 and 6.553 inches, as explained in paragraph 35 **b** (3). Use combination wrench *41-W-867-808* to gage length as shown in figure 52.

(11) See that assembled oil buffer is filled with recoil oil of latest specification. (Oil is omitted for heavy-barrel guns.)

35. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Correction of Short Oil Buffers.

(1) Some oil buffers have insufficient over-all length, thus causing erratic performance. It has been found that a gun equipped with a short oil buffer, even though correctly timed when on the bench, will stop firing after a few rounds if the gun is elevated.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

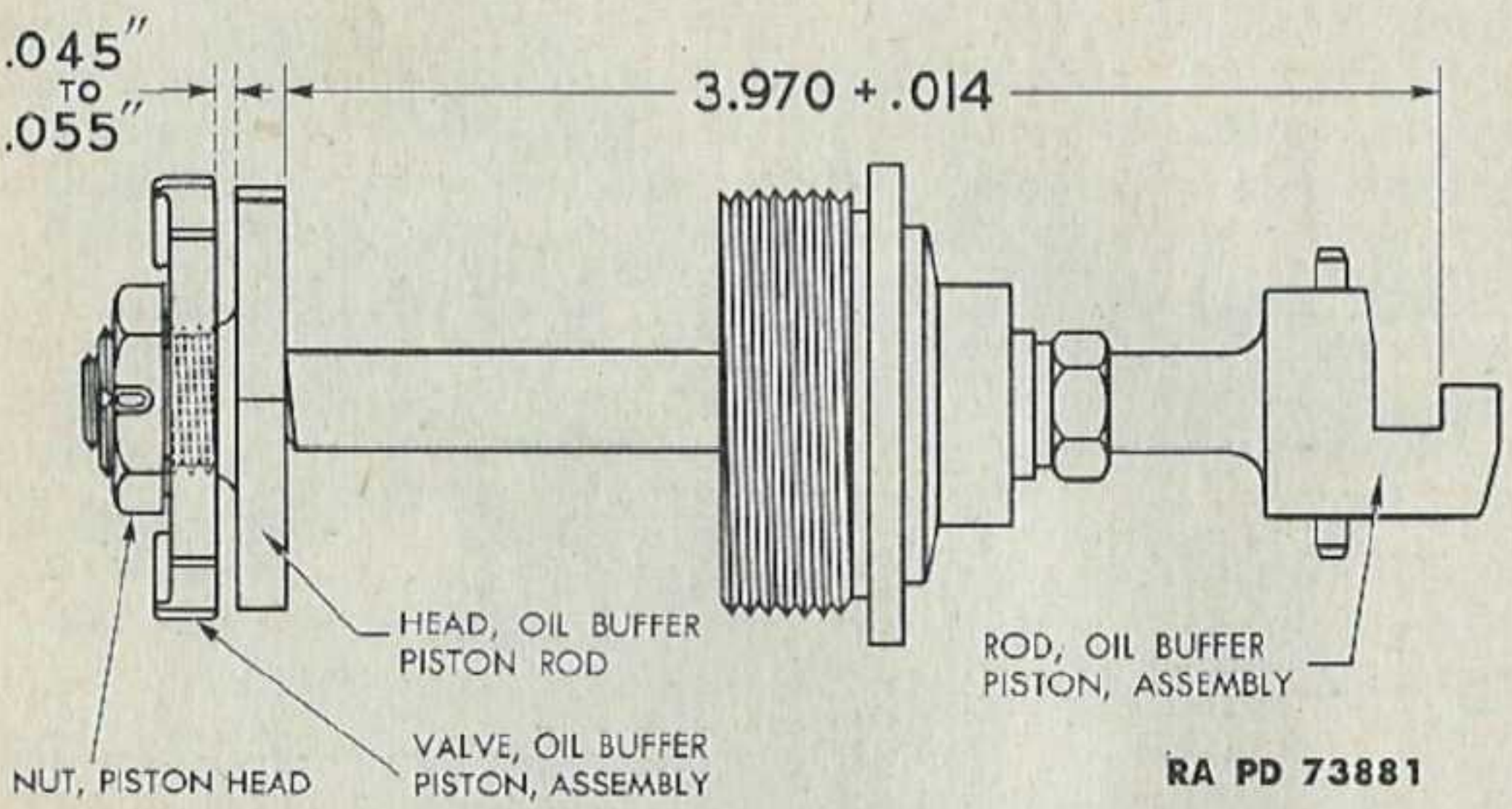


Figure 53—Assembly Dimensions of Oil Buffer

(2) In order to detect a short oil buffer, remove the driving spring from the gun and open the cover. Elevate the gun to 90 degrees and notice if there is a gap between the barrel extension and the trunnion block. There should be no gap between these components. If combination wrench *41-W-867-808* is available, it can be used as a gage (fig. 52).

(3) When a short oil buffer assembly is found, it should be disassembled, and the oil buffer piston rod *B9830* repositioned to increase over-all length of the oil buffer. The over-all length should be between 6.525 and 6.553 inches. If the oil buffer piston rod is such that the pin hole at the rear will not allow insertion of the piston head nut pin after the proper over-all length of the buffer has been obtained, it should be discarded. A new oil buffer piston rod assembly *B8763* should be used. Piston rod assemblies of new manufacture are of the correct length.

(4) If neither of these adjustments proves satisfactory, the entire oil buffer assembly should be discarded and a new assembly *C4077* used in its place.

c. Removal of Oil and Parts From Oil Buffer of Heavy-barrel Gun.

(1) Some heavy-barrel machine guns have been found to operate sluggishly, due to insufficient reserve energy. The insufficient reserve energy may be caused by lack of lubrication, burred parts, or by the

OIL BUFFER GROUP

action of the oil buffer mechanism in the gun. If a heavy-barrel gun delivers the normal rate of fire (450 to 550 rounds per minute), the gun may be considered in good operating condition. If sluggish operation or stoppages are encountered, disassemble the gun and inspect all moving parts for rough surfaces, burs, or insufficient lubrication. If any of these conditions are found, they must be corrected. If the gun still operates sluggishly or if stoppages occur, the oil and the following parts (fig. 56) should be removed from the oil buffer:

Piece Mark	Item	Quantity
A9279A	PACKING, oil buffer gland	1
A9297	RING, oil buffer packing gland	1
A9360	SCREW, oil buffer relief valve	1
A9299	SPRING, oil buffer packing gland	1
A9393	SPRING, oil buffer relief valve	1
A9528	VALVE, relief, oil buffer	1

NOTE A: *Packing A153162 and washer A153161 may be found assembled in place of packing A9279A and ring A9297. These parts should be removed.*

NOTE B: *Previous instructions have directed removal of the oil buffer tube filler screws A9361. These screws are needed to prevent dirt and other extraneous matter from entering the oil buffer tube. Therefore, all oil buffers from which the screws have been removed should be cleaned and the screws replaced.*

(2) The oil buffer packing gland plug *A9277* must be replaced after removing the above components, as it acts as a guide for the oil buffer piston rod. Care must be taken to insure that the oil buffer piston is reassembled to the oil buffer piston rod in the exact position it had prior to disassembly, that is, the piston must be screwed on the piston rod the same number of turns it was originally. The proper adjustment is shown in figure 53.

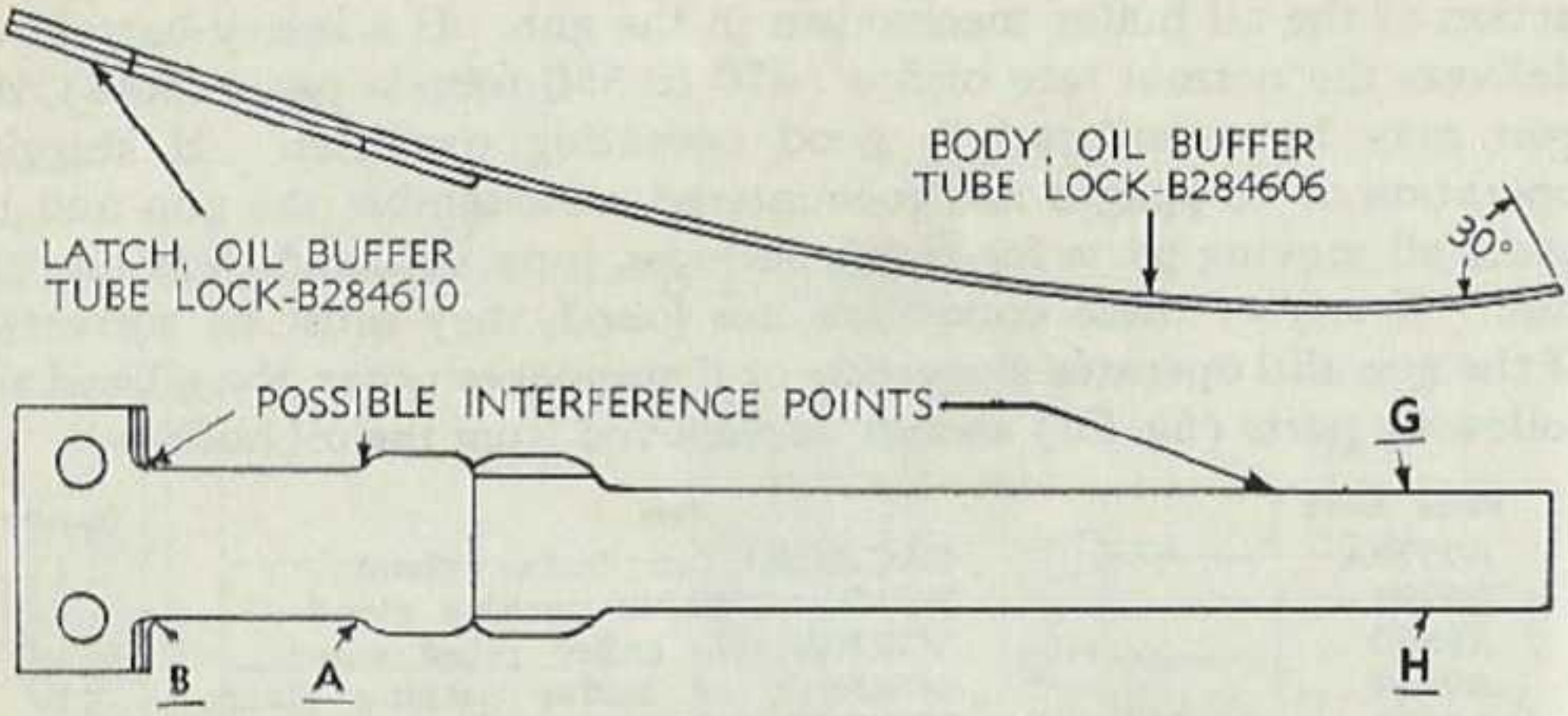
(3) Components removed should be turned in to the local Post Ordnance Officer, who will forward them to Raritan Arsenal.

d. Fitting New Oil Buffer Tube Lock Assembly.

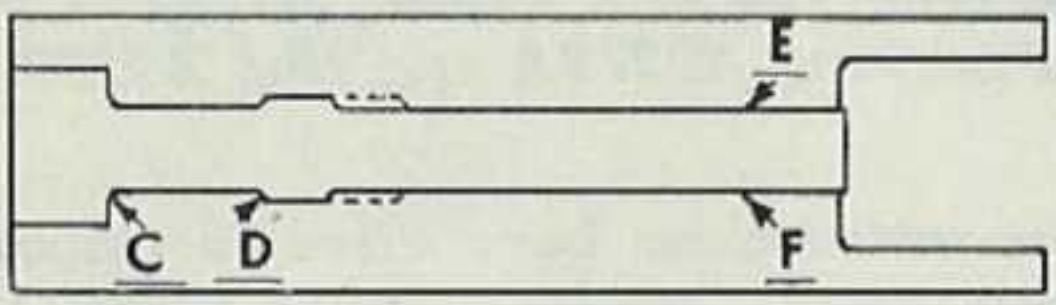
(1) A new oil buffer tube lock assembly *C145325* (fig. 57) has been provided to replace oil buffer tube lock assembly *B8787* or *B8787A*. The old oil buffer tube lock causes stoppage by slipping rearward during the firing of the cal. .50 Browning machine gun, and thus not fully depressing the accelerator. This condition results in accelerator tips jamming in the breech lock slot in the bolt.

(2) The new oil buffer tube lock assembly consists of two components riveted together, namely, oil buffer tube lock latch *B284610*, and oil buffer tube lock body *B284606*. The function of the latch is to prevent the oil buffer tube lock assembly from sliding rearward while the gun is functioning.

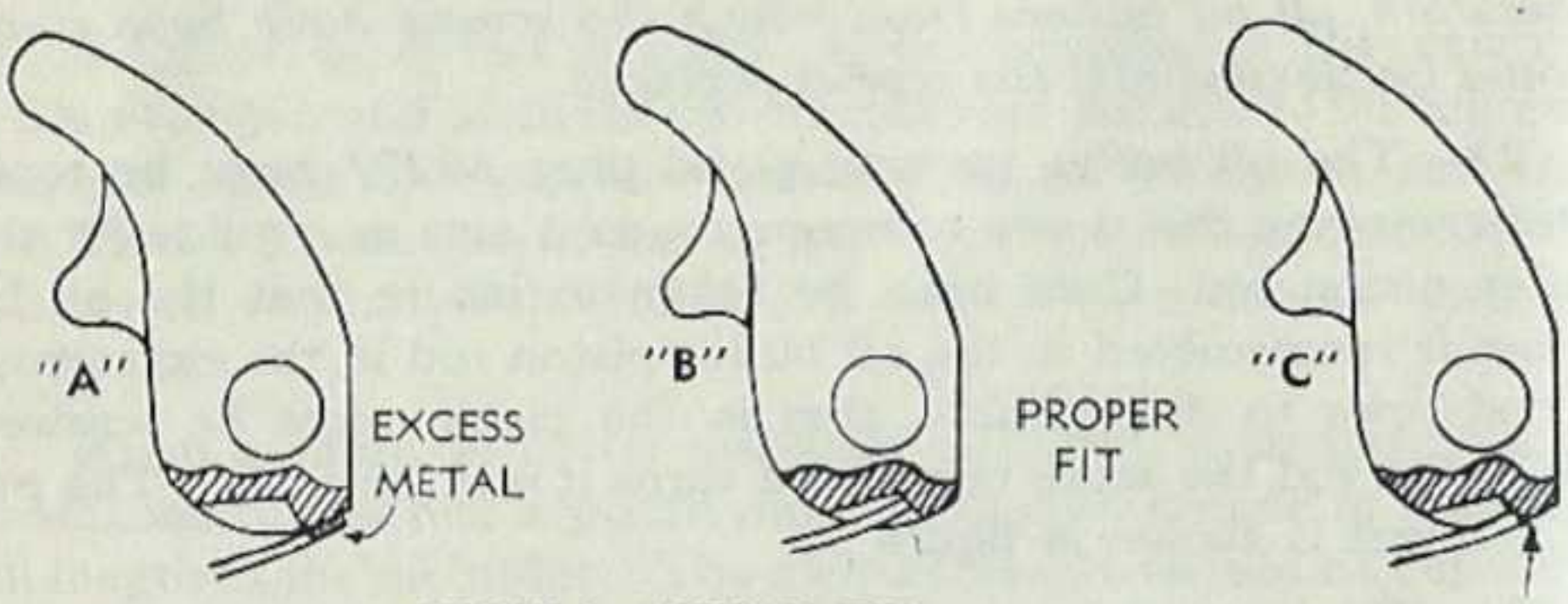
ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



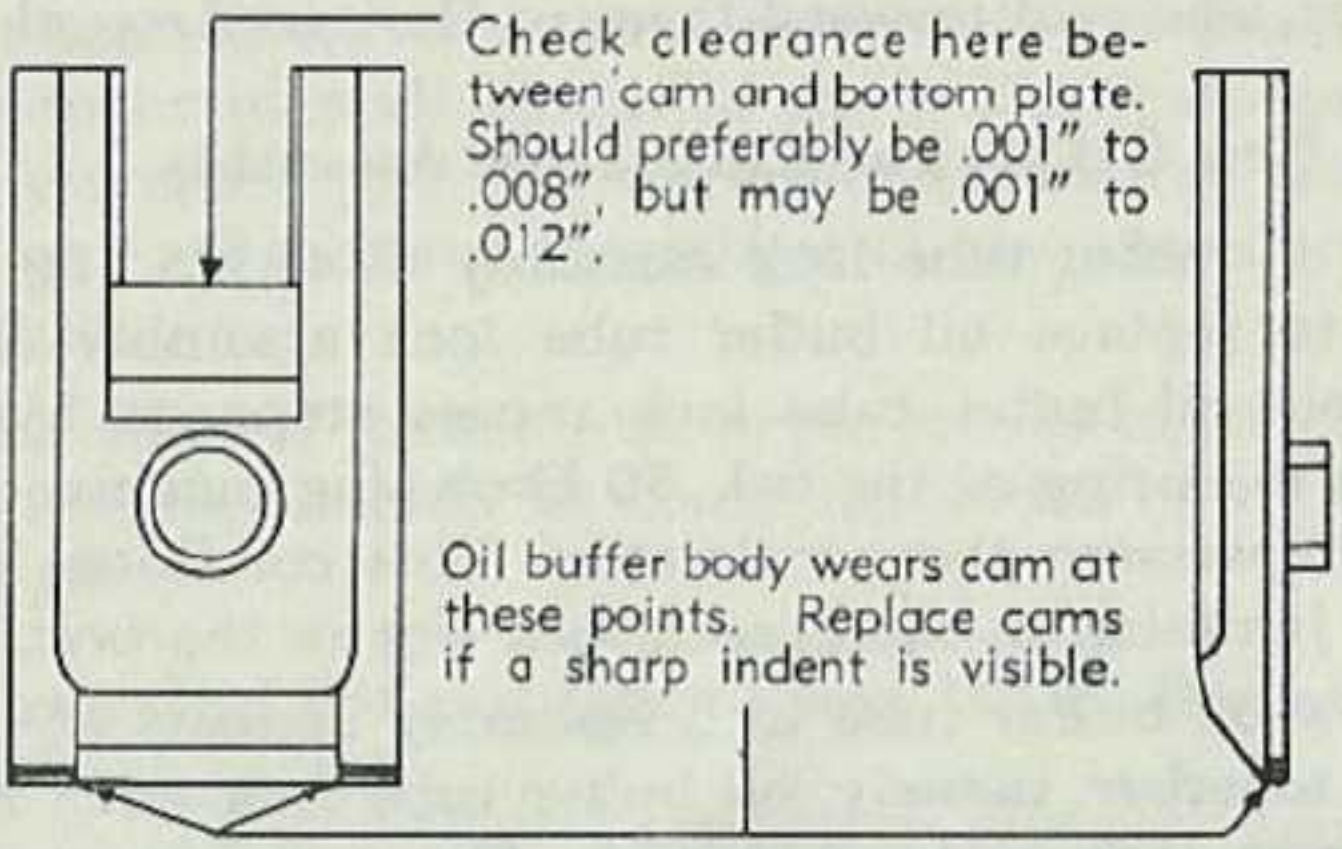
GROUP 1—OIL BUFFER TUBE LOCK ASSEMBLY-C145325



GROUP 2—OIL BUFFER BODY, ASSEMBLY



GROUP 3—ACCELERATOR



The bevel of the lock should be in full contact with bevel on accelerator when lock is pushed all the way to rear of buffer body.

GROUP 4—BREECH LOCK CAM ASSEMBLY

RA PD 91903

Figure 54—Method of Fitting New Oil Buffer Tube Lock Assembly, and Fit of Breech Lock Cam

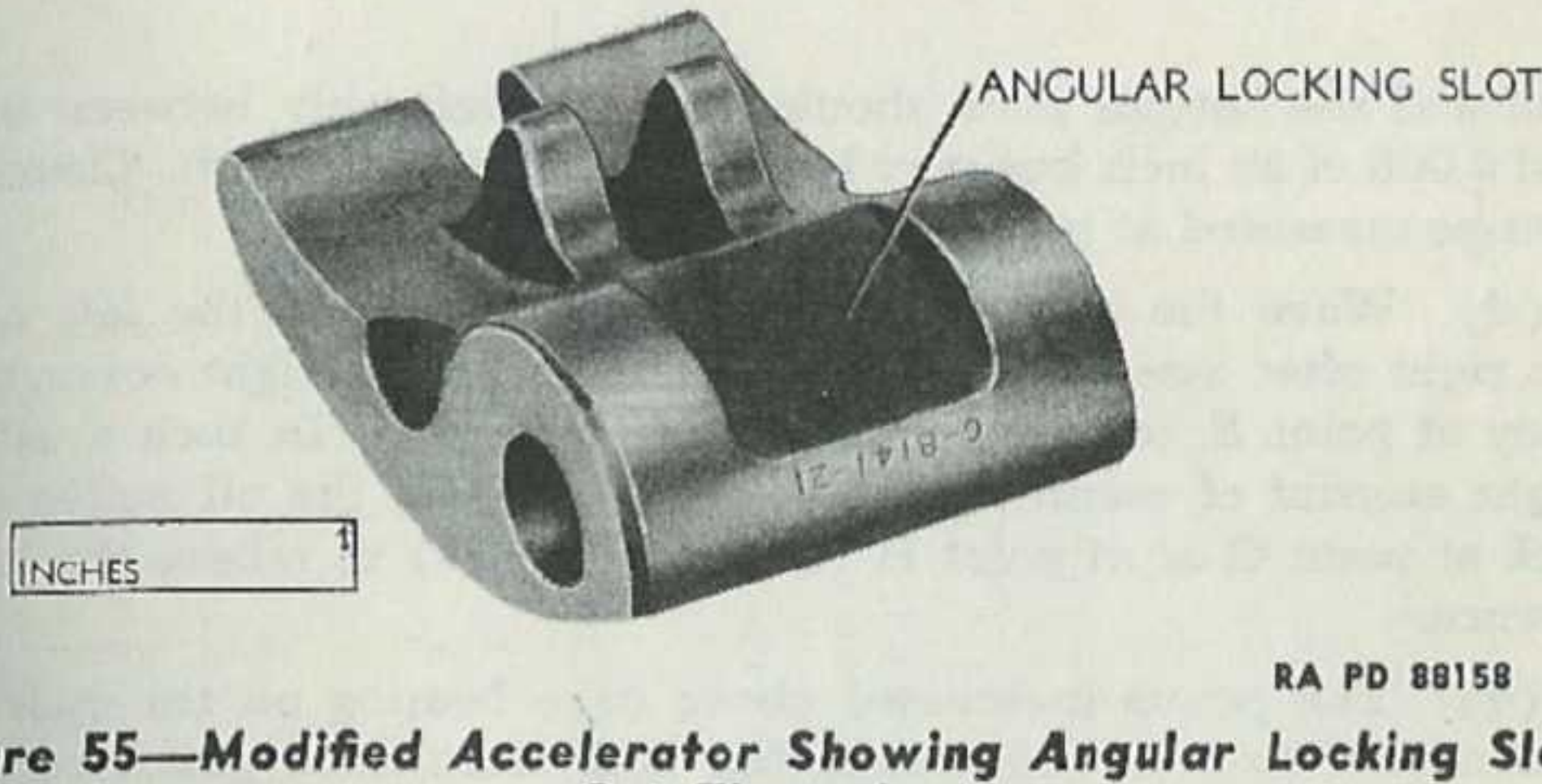


Figure 55—Modified Accelerator Showing Angular Locking Slot Cut Through

(3) When the above trouble occurs, the old oil buffer tube lock should be replaced with the new oil buffer tube lock assembly. The following adjustments to the new oil buffer tube lock assembly may be necessary.

(*a*) When the new oil buffer tube lock assembly (Group 1, fig. 54) is assembled to oil buffer body assembly (Group 2, fig. 54) there is a possibility of interference at point D (Group 2, fig. 54), because of the shape of the latch recess on the oil buffer body. In this event, remove a slight amount of metal from point A (Group 1, fig. 54).

(*b*) The oil buffer tube lock might be too long when assembled to the oil buffer body of early manufacture (A, Group 3, fig. 54). In this event, remove a slight amount of metal from the end of the lock so it will fit in the accelerator. Ideal fit between accelerator and oil buffer tube lock assembly is shown in B, Group 3, figure 54. To determine whether adequate fit is obtained, push the oil buffer tube lock assembly toward the rear of the body as much as the clearance will permit (C, Group 3, fig. 54). If the oil buffer tube lock is fitted as described and the gun is fired a few rounds (approximately 50), the oil buffer tube lock assembly will fit with respect to the accelerator as shown in B, Group 3, figure 54. In a recent modification of the accelerator, the angular locking slot has been cut straight through the accelerator (fig. 55). This however did not entirely eliminate jamming of the accelerator even when the new oil buffer tube lock assembly was used. Recently, jamming of the accelerator has been eliminated by use of the accelerator stop assembly, which is assembled to the bolt in place of the sear stop assembly (par. 31 f and fig. 45).

(c) The oil buffer body produces an indentation at points shown in Group 4, figure 54. A breech lock cam having deep indentations should be replaced. NOTE: *The clearances between the breech lock*

cam and the bottom plate should be held preferably between 0.001 and 0.008 of an inch, but may be from 0.001 to 0.012 inch. Clearance is to be measured at point shown in Group 4, figure 54.

(d) When the oil buffer tube lock is pushed to the left or to the right after assembly to the oil buffer body, it might contact the body at point E, or at point F (Group 2, fig. 54). In such a case, a slight amount of metal should be removed from the oil buffer tube lock at point G or at point H (Group 1, fig. 54) to relieve the interference.

(4) The points mentioned above have bearing on the malfunction caused by a locked accelerator. Therefore, each gun should be checked prior to installation to insure that the conditions desired have been obtained.

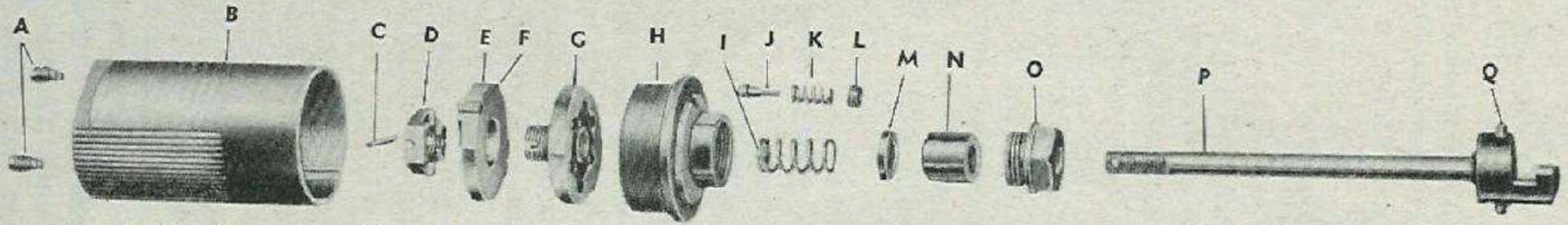
(5) If, in fitting the new-type oil buffer tube lock, an excessive amount of metal has been removed from the front end of the oil buffer tube lock, the spoiled components should be discarded.

(6) It is possible for the new oil buffer tube lock assembly to overlap the accelerator when pushed forward as far as permitted by the clearances present. Such a condition requires no corrective measure, provided the oil buffer tube lock fits as described above, when pushed to the rear as far as it will go.

36. ASSEMBLY.

a. Present manufacture of heavy-barrel guns is omitting the oil buffer gland packing, packing gland ring, packing gland spring, relief valve, relief valve spring, relief valve screw, and oil in addition to the oil buffer piston valve assembly. (Refer to paragraph 35 **c** for details.) An exploded view of oil buffer assembly is shown in figure 56. Disassemble as follows:

(1) Place the packing gland plug, gland packing, gland ring (or washer), gland spring and tube cap on the piston rod in the order named, being sure the bevel on the conical-type packing fits into the gland ring. Cylindrical-type packing *A153162* is assembled in the same order, but with a washer *A153161* and spring *A153163* in place of the gland ring and spring used with the old conical-type packing. Screw gland plug into tube cap and tighten, using combination wrench. Then screw piston rod head on rod, with the shoulder away from the cap, until the end of the threaded shoulder is flush with the end of the rod. The distance from the forward face of the piston rod head to the forward face of the shank engaging notch on the end of the piston rod should not be less than 3.970+0.014 inches (fig. 53). Place valve assembly on the shoulder of the rod head with the flat



A — SCREW, FILLER, OIL BUFFER TUBE, ASSEMBLY-B147888
B — TUBE, OIL BUFFER-C8146
C — PIN, OIL BUFFER PISTON HEAD NUT-A9380
D — NUT, OIL BUFFER PISTON HEAD-A9267
E — VALVE, OIL BUFFER PISTON, ASSEMBLY-B8969
F — KEY-A9784 *(PART OF VALVE ASSEMBLY)*
G — HEAD, OIL BUFFER PISTON ROD-B17169
H — CAP, OIL BUFFER TUBE-B147845
I — SPRING, OIL BUFFER PACKING GLAND-A153163
J — VALVE, RELIEF, OIL BUFFER-A9528
K — SPRING, OIL BUFFER RELIEF VALVE-A9393
L — SCREW, OIL BUFFER RELIEF VALVE-A9360
M — WASHER, OIL BUFFER PACKING GLAND-A153161
N — PACKING, OIL BUFFER GLAND-A153162
O — PLUG, OIL BUFFER PACKING GLAND-A9277
P — ROD, OIL BUFFER PISTON-B9830
Q — PIN, OIL BUFFER PISTON ROD-A9379

RA PD 91830

Figure 56—Oil Buffer Assembly—Exploded View

face toward the rod head. Screw the piston head nut on the rod head allowing a clearance of approximately 0.050 inch between the rod head and valve assembly (fig. 53) as measured by the oil buffer feeler gage. If the gage is not available, a tube lock may be used as an alternate. Adjust, if necessary (par. 35 **b**), to provide this clearance, aline the slots in the nut and shoulder of the rod head with the hole in the rod, insert the piston head nut pin, and bend both ends of the pin.

(2) Insert the rod and its assembled parts into the oil buffer tube with the valve keys riding in the grooves in the tube wall. Tighten the tube cap securely with the combination wrench (CAUTION, par. 33 **a** (3)). In order for the oil buffer spring to function properly in the gun during the complete recoil stroke, the assembled length of the oil buffer assembly must be within the proper dimensions. The distance from the rear of the oil buffer tube to the extreme forward face of the oil buffer piston rod (over-all length) must be within the limits 6.525 inches and 6.553 inches. Proper length may be measured by use of gage on combination wrench *41-W-867-808* (par. 34. **a** (10) fig. 52). Turn the oil buffer assembly so that the openings for the filler screws are on top. Pull the piston rod out of tube as far as possible. With recoil oil (light) flowing freely from the spout of an oilcan, insert the spout in one of the filler holes and fill until the oil flows out of the other filler hole. Insert filler screws. If filler screws *A9361* are being used, tighten securely with a screwdriver which fits the slots exactly. If oil buffer tube filler screw assembly *B147888* with assembled washer is being used, tighten only sufficiently to seat firmly. The washer is assembled to the screw for the purpose of preventing oil leakage. The washer is staked in a groove in the screw and should be free to rotate. If relief valve has been removed, insert valve and spring in cap, and thread in screw. NOTE: *It is necessary that the over-all length of the buffer should be between the above dimensions for proper functioning of the gun, as explained in paragraph* 35 **b** *and figure 53.*

(3) To assemble the spring to the oil buffer assembly, pull the oil buffer piston rod fully forward, place the spring over the piston rod, and place spring guide on the spring. Wrap fingers around spring and place guide against partly opened jaws of vise as for disassembly (par. 33 **a** (2), fig. 50). Press in on the buffer to compress the spring against the guide until the pins on the piston rod pass through the slots in the guide. When clear of the guide turn the buffer 90 degrees until the pins in the piston rod aline with the seating notches in guide, then release the tension slowly until the pins seat squarely in the notches in the guide. Exercise care that parts do not slip and cause injury while assembling.

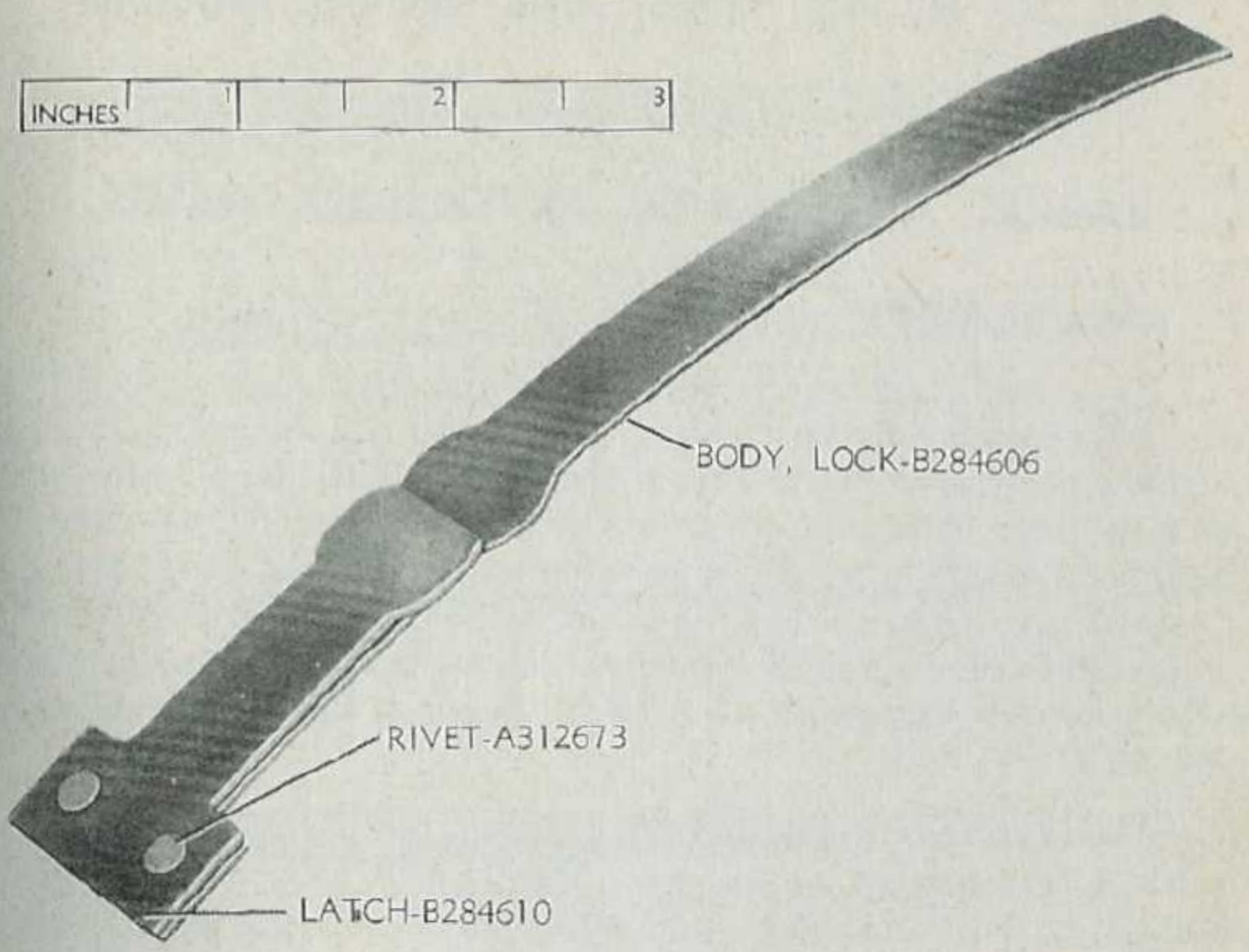


Figure 57—Oil Buffer Tube Lock Assembly *C145325*

(4) Place accelerator in position in oil buffer body, with points curving up and to rear (fig. 49) and insert the accelerator pin through the holes in the oil buffer body and accelerator until flush. Turn the oil buffer body upside down; lay the tube lock on the body with the bowed side away from the buffer body. Depress the tube lock so as to force the projecting ears into the circular recess in the groove in the oil buffer body. Holding the tube lock down in this position, grasp the projecting end of the lock and slide it toward the accelerator, lifting the projecting end slightly so that the lug on the tube lock clears the oil buffer body. The lug should engage in the hole in the bottom of the oil buffer body. If the new-type lock assembly *C145325* is assembled (fig. 57), the lock should be pushed forward until the tube lock latch can be depressed into the circular opening in the tube lock slot in the oil buffer body, and then pushed forward until seated. For possible modifications necessary to fit new-type lock, refer to paragraph 35 **d.**

(5) Slide the spring lock fully into its slot in the side of the oil buffer body and stake in place. Insert the oil buffer in the body with the guide key engaging in the slot in the side of the buffer body.

(6) For adjustment of oil buffer, refer to TM 9-225 or TM 9-226.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

Section IX

BARREL AND BARREL EXTENSION GROUP

37. DISASSEMBLY.

a. In aircraft and water-cooled guns, the barrel is removed from the barrel extension by unscrewing the barrel from the extension after the group has been removed from the gun. In the heavy-barrel guns the barrel must be unscrewed from the extension before the extension is removed from the gun. To save wear, when possible, when unscrewing the barrel, the barrel locking spring should be raised slightly from the notches in the barrel. For removal of rear barrel packing of water-cooled guns, see paragraph 47 p (1). Types of barrels are shown in figure 58.

b. To disassemble the barrel extension, the barrel locking spring is pushed forward out of its seat. The breech lock is removed by pushing out the breech lock pin with a drift. An exploded view of the barrel extension assembly and related parts is shown in figure 59.

NOTE: *The old-type breach lock B8925 had two bevels on the top front edge; lock of later modification has but one bevel. New-type lock B7161302, used in aircraft guns, has one bevel and a slot in the bottom for clearance of the accelerator stop assembly when used in place of the sear stop assembly. New-type lock must be used when accelerator stop assembly is used. Figure 60 shows old type and new type with slot. Modified old type is same as new type but without the slot.*

38. INSPECTION.

a. Barrel Extension. Thoroughly clean and inspect all parts with particular attention to the following points:

(1) Check barrel extension for bent side members; burs on bolt guideways and breech lock slot; and loose, damaged, or burred shank. (When assembled, upper and lower face of shank body must not project beyond corresponding surfaces of extension.) Check barrel locking spring for firm retention in its groove, and for wear, fracture, and burs, especially on nose. Check barrel threads for excessive looseness when screwed to barrel. Should be easy fit but with no shake or play in threads.

(2) Check breech lock for burs and binding, and pin for excessive looseness and wear at point contacted by breech lock depressors. Check pin for broken or missing spring.

BARREL AND BARREL EXTENSION GROUP

BARREL ASSEMBLY D28272 FOR CAL. .50 AIRCRAFT GUN M2

BARREL D35348A FOR CAL. .50 AIRCRAFT GUN M2

BARREL ASSEMBLY D28271 FOR WATER-COOLED GUN M2

BARREL D28253A FOR HEAVY BARREL GUN M2

RA PD 91820

Figure 58—Types of Barrels

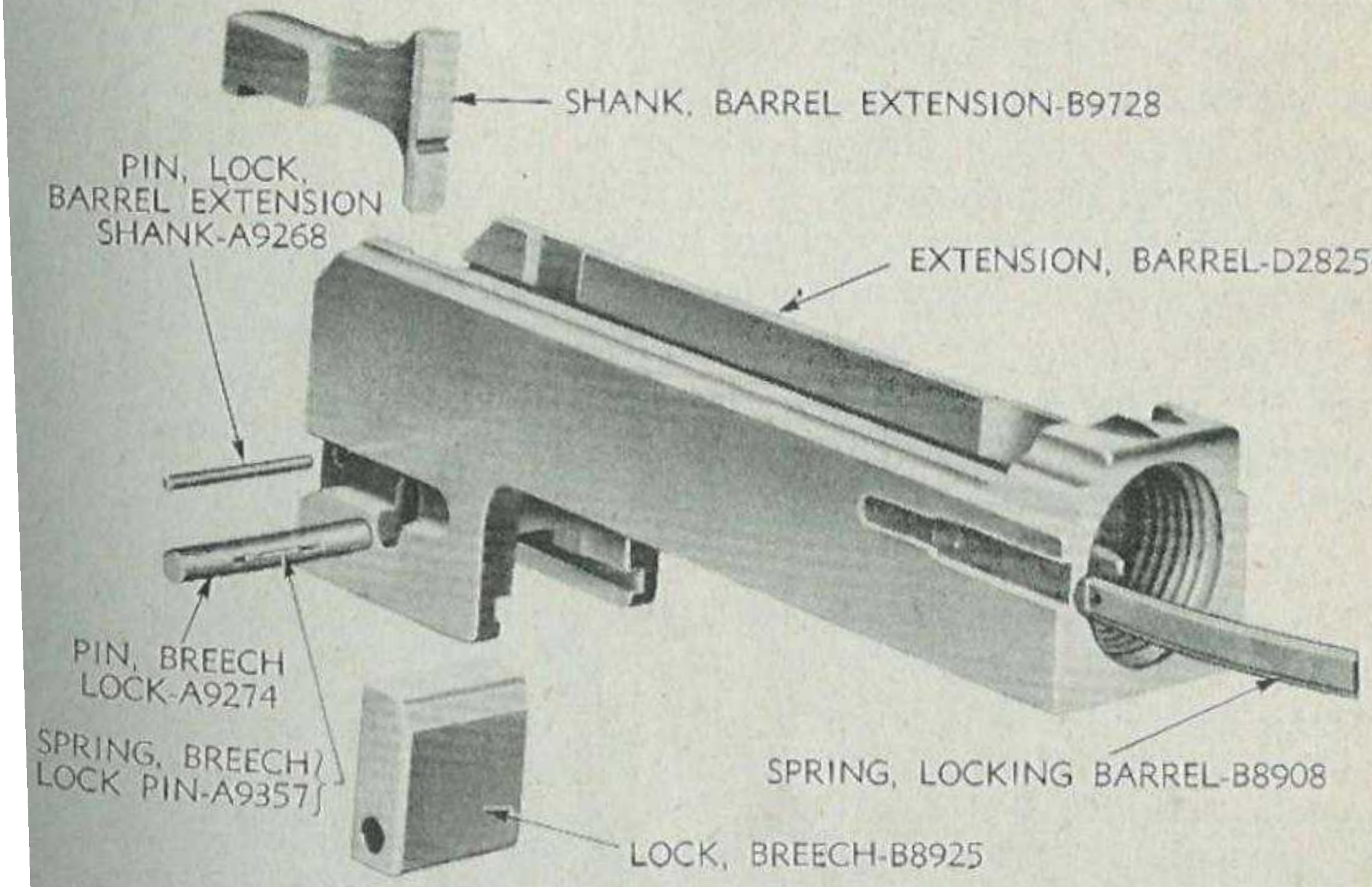


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Figure 59—Barrel Extension Group—Exploded View

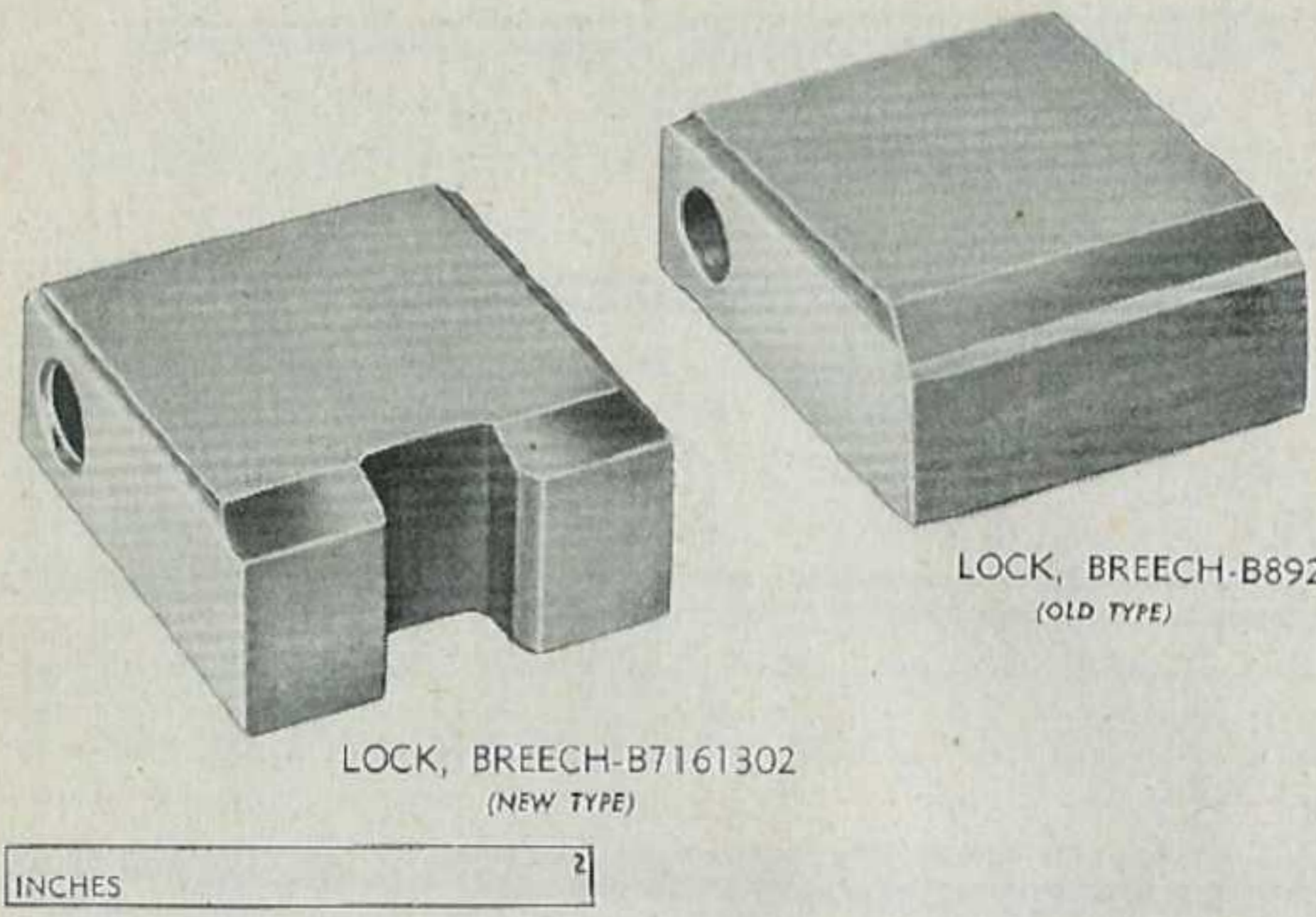

Figure 60—Old-type Breech Lock, and New Type Used With Aircraft Guns

b. Barrel. Thoroughly clean and inspect the barrel as follows:

(1) INSPECT THE BARREL AS A WHOLE FROM THE STANDPOINT OF SERVICEABILITY. Check barrel locking notches for wear or breakdown. (This is very important as worn or damaged notches may permit the barrel to turn during firing, thus allowing head space adjustment to change.) Accuracy of fire is the main point to consider when inspecting a barrel. Accuracy is reduced in varying degrees by bulges, erosion, and pits in the bore. The extent to which these defects will reduce accuracy is determined by two methods: namely, visual inspection and bore gaging. Before inspecting the barrel, all metal and other fouling must be removed and the barrel wiped dry.

(2) VISUAL INSPECTION. Hold the barrel so that its interior is illuminated, and examine the bore from both the muzzle and breech ends. If the barrel is not bent or otherwise deformed, if the bore appears free from bulges and large pits, and if the lands are sharp and uniformly distinct, it is serviceable. Small pits will not render the barrel unserviceable, provided it is in good condition otherwise. Examine the breech end of the bore. If the lands are worn away so that the first 6 or 8 inches of the bore are smooth, the barrel is unserviceable and should be scrapped. If the barrel contains a bulge, it should be scrapped. A bulge is indicated by a shadowy depression or ring in the bore. It may also be detected often by a bulge or

raised ring on the exterior surface. If the barrel is pitted to the extent that the sharpness of the lands is affected, or if it has a pit or pits in the lands or grooves large enough to permit passage of gas around the bullet (pits approximately one-half to three-quarters inch long and the width of one land), the barrel is, or soon will be, too inaccurate for serviceability and should be scrapped. Proper care and cleaning of the barrel usually will prevent such damage to the bore. NOTE: *If an inspector's barrel reflector is used, insert the short tube of the reflector into the chamber of the gun barrel. The reflector has a mirror and an opening through which the reflection of the bore is obtained.*

(3) Bore Gaging With Breech Bore Gage *41-G-30* (fig. 20).

(a) Each barrel inspected and found serviceable by visual test also will be checked by bore gaging. Remove the barrel from the gun and make sure the bore and chamber are thoroughly clean and dry. Examine the breech bore gage *41-G-30* to insure that it is clean and moves freely in its sleeve. The presence of dirt, or any other obstruction, will prevent the sleeve from seating properly in the chamber, thus giving a false indication of the condition of the barrel. CAUTION: *Never attempt to bore gage a hot barrel. As the barrel cools, the barrel will "freeze" on the gage and make it very difficult to remove the gage without damaging either the gage or the barrel.*

(b) With the barrel in a horizontal position, insert the breech bore gage into the chamber with the long side of the sleeve down (fig. 61). Make sure that the sleeve is fully seated in the chamber. When properly seated, the face of the short side of the sleeve should be flush with the face of the barrel. If there is any excess length of chamber, due to stretching or otherwise, the short face of the sleeve will enter beyond the face of the barrel. Rotate the gage so that the figures are uppermost, and slide the gage into the bore until the slightly tapered forward section is in definite contact with the lands of the rifling. The wear of the lands will be indicated by the distance the gage goes forward before contacting the lands. This distance will be indicated in tenths of an inch by the index line opposite the long end of the sleeve.

(c) When the erosion and wear of the barrel result in the gage entering the sleeve so that the red index line (twenty tenths, or 2.0 inches) comes opposite the long end of the sleeve, the resulting initial velocity has dropped approximately 200 feet per second. The barrel may still be fired several thousand rounds; however, considering reduced accuracy, cost of ammunition, etc., the barrel should usually be scrapped when in this condition. Barrels which permit the gage to enter to the thirteenth graduation or beyond, may be used for training but are not to be used in the theater of operations.

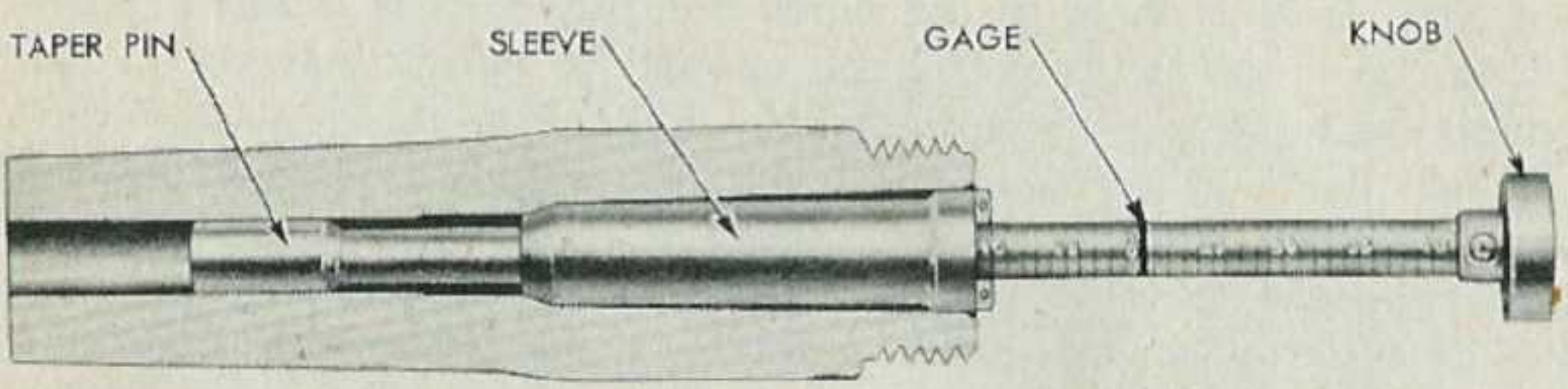

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Figure 61—Breech Bore Gage 41-G-30 in Barrel

(4) BORE GAGING WITH BREECH BORE GAGE *41-G-29-50* (fig. 21).

(a) Each barrel inspected and found serviceable by visual test also will be checked by bore gaging. Remove the barrel from the gun and make sure the bore and chamber are thoroughly clean and dry. Examine the breech bore gage *41-G-29-50* to insure that it is clean. The presence of dirt or any other obstruction will prevent proper seating in the chamber, thus giving a false indication of the condition of the barrel. CAUTION: *Never attempt to bore gage a hot barrel. As the barrel cools, it will "freeze" on the gage, causing damage either to the barrel or the gage by forcing removal of the gage.*

(b) With the barrel in a horizontal position, insert the gage and rotate so that the figures are uppermost, and slide the gage into the bore until the slightly tapered forward section is in definite contact with the lands of the rifling. The wear of the lands will be indicated by the distance the gage goes forward before contacting the lands. The distance will be indicated in tenths of an inch by the index line on the gage.

(c) When the erosion and wear of the barrel result in the gage entering the bore to the red index line (twenty tenths or 2.0 in.) the resulting initial velocity has dropped approximately 200 feet per second. The barrel may still be fired several thousand rounds; however, considering reduced accuracy, cost of ammunition, etc., the barrel should usually be scrapped when in this condition.

(5) Inspect rear barrel packing (water-cooled guns) for condition and wear.

(6) DISPOSITION OF UNSERVICEABLE BARRELS. Unserviceable barrel assemblies which have a sleeve assembled to the muzzle end may be disposed of locally after the sleeves are removed. These sleeves should be forwarded to Springfield Armory for reassembly to new barrels.

BARREL AND BARREL EXTENSION GROUP

39. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Tight Barrel Chambers (All Types).

(1) When extracting a live round by hand-charging, the bullet occasionally separates from the case and remains in the chamber, putting the gun out of action until the bullet and all traces of loose powder are removed. In most cases, this is caused by the following conditions: new barrel with minimum size chamber; maximum round; or loose bullet.

(2) To avoid this malfunction, all cal. .50 machine gun barrels of present manufacture have the bullet seat located forward one-quarter inch in accordance with chamber and rifling drawing *C64348* revised 2 March 1942. To correct barrels now in service, cal. .50 chamber reamers *C121020* have been furnished to all ordnance maintenance personnel. Instructions for the use of the reamers were furnished with them.

(3) Barrels of present manufacture and barrels now in ordnance storage to be modified in accordance with chamber and rifling drawing *C64348* revised 2 March 1942, will be piece-marked as follows:

(a) Aircraft barrels: *D35348A-7* or *D28272-9*, depending on type.

(b) Heavy barrels: *D28269-8*, *D28269-8X* or *D28253-11*, depending on type. Piece mark *D28269-8X* is used on those barrels which are rechambered, as in the eighth revision of the drawing, but whose weight is not reduced from 29.5 pounds to 28 pounds.

(c) Water-cooled barrels: *D28271-13*.

NOTE: *Piece marks including higher revision numbers than those above, also identify satisfactory chambers.*

c. Short Threaded Portion of Barrel (All Types).

(1) Proper head space adjustment cannot be obtained in some Browning Machine Guns, cal. .50, M2, all types, because of the inadequate length of the threaded portion of the barrel from the breech end to the stop shoulder. The barrel drawings for barrels manufactured to date specified that this dimension be 0.777 inch +0.010 inch; however, barrels have been found that were manufactured with this dimension less than the minimum. When barrels are encountered with the above difficulty, they should be corrected as follows:

(a) If a lathe is available, cut the shoulder back until the proper dimension is obtained, as shown in figure 62.

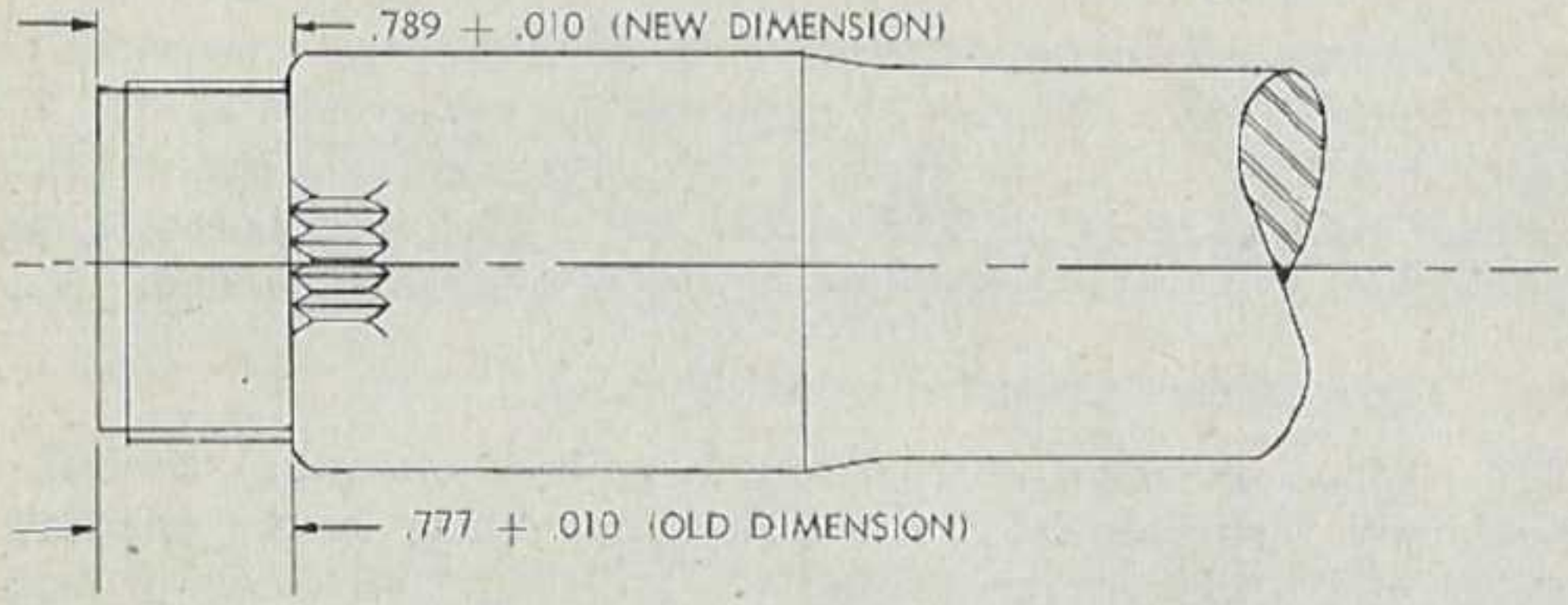


Figure 62—Modification of Barrel

(b) If no lathe is available, the use of a file is authorized to cut this shoulder back. Filed surfaces should be smoothed down with a stone.

(c) If the barrels to be modified have notches cut in a hardened ring, the ring shall be ground to the proper dimension.

(2) Barrels now being manufactured have this dimension changed from 0.777 inch +0.010 to 0.789 inch +0.010 inch to insure sufficient reserve for head space. All barrels manufactured to the 0.777 inch +0.010 inch dimension will not be modified by increasing this dimension to 0.789 inch +0.010 inch, but only those barrels in which the above difficulty is encountered.

40. ASSEMBLY.

a. The breech lock is assembled into the barrel extension with the bevel faces to the front and the double bevel on the top. Insert the breech lock pin, taking care that both ends of the pin are flush with the sides of the barrel extension. The locking spring is replaced in its seat with the protrusion inside and the barrel is screwed into the barrel extension. Head space is adjusted when the weapon is fully assembled. Head space adjustment is explained in the Technical Manual or Field Manual pertaining to the gun in question.

b. In heavy-barrel guns, the barrel is screwed into the extension after the extension has been installed in the gun.

c. Check to see that the rear end of the barrel extends slightly into the extension when screwed all the way in. If it does not, the barrel dimensions are faulty and a true head space adjustment cannot be made.

d. For assembly and adjustment of rear barrel packing in barrels of water-cooled guns, refer to paragraph 47 **p** (1) and **q** (3).

Section X

COVER GROUP

41. DISASSEMBLY.

a. The cover group is removed from the receiver by first closing the cover and removing the cotter pin from the cover pin. Then pull out the cover pin from the receiver, unlatch the cover, and rotate it upward and forward to remove it from the trunnion block.

b. With cover placed flat on a bench, disassemble as follows:

(1) Remove the belt feed lever cotter pin and belt feed lever, taking care that the spring and plunger do not fly out. The belt feed lever plunger and spring are then removed from the hole in the side of the lever.

(2) Remove the belt feed slide from the cover. Push out the belt feed pawl pin and remove belt feed pawl, pawl spring, and belt feed pawl arm. Keep spring from flying out while doing this.

(3) Lift end of cover latch spring out of the groove in the cover (fig. 63) and turn this lifted end slightly so that it rests on the cover extractor spring.

(4) The cover latch spring is then compressed by firm pressure of the thumb, and the spring is slid away from the latch and removed. Pry the end of the cover extractor spring out of the recess in the cover extractor cam (fig. 64) and disengage from the holding stud at the opposite end. Treat this spring with caution since it can spring out and cause injuries. The latch is taken out by removing the shaft cotter pin and washer, turning the latch shaft to the latched position, and withdrawing the shaft from the cover. An exploded view of the cover and related parts for Gun M2 is shown in figure 65.

c. Short Round Devices. Two types of short round devices T1E4 or T13 may be attached to the cover of aircraft guns. For information on these devices, refer to paragraph 43 g.

42. INSPECTION.

a. Thoroughly clean and inspect all parts with particular attention to the following points:

(1) Check cover latch for fracture and burs, spring for rust or weakness, and damaged stud notch. Check cover extractor spring for rust and fracture.

(2) Check extractor cam for wear, burs, fracture, and looseness. Check belt feed slide guideways in cover for wear and burs, and point where feed lever plunger seats on cover for wear.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

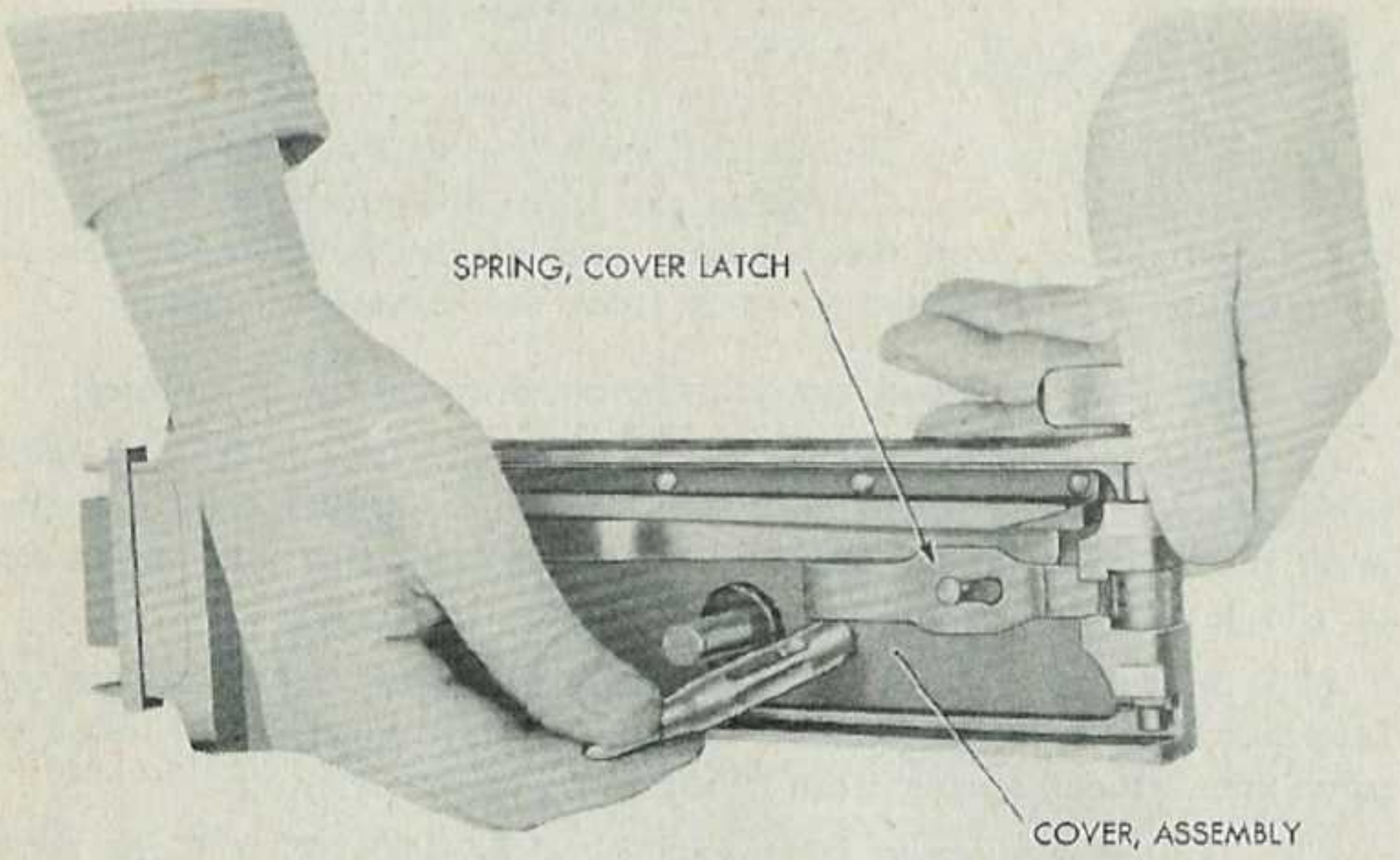


Figure 63—Removing Cover Latch Spring

Figure 64—Removing Cover Extractor Spring

(3) Check belt feed lever for fracture, deformation, and free movement on pivot stud and in cover and slide when assembled (should not bind). Check lugs on ends for wear and burs. Check for missing or burred plunger, and rusted or set spring. Spring *A13516*

should have from 11 to 12 coils and minimum free length of eleven-sixteens inch. Check pivot stud for wear and looseness.

(4) Check belt feed slide for burs and protruding pin when assembled (should be flush). Check pin for broken or missing spring.

(5) Check belt feed pawl for burs and weak spring tension, and bent, burred, or missing pins. Check pawl arm for deformation and wear. Spring *A9351* should have from 7¾ to 9¼ coils and a minimum free length of 1 1/16 inches.

43. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Fitting New Cover to Receiver. When the cover is fitted to the receiver, the latch must be fitted to the top plate notch. A maximum looseness of 0.008 to 0.010 inch is permissible. No metal should be removed from the top plate. The 0.008-inch maximum clearance will be shown from a parallel to the notch in the top plate to a tangent to the latch radius. This can be checked by a feeler gage.

c. Replacing Cover Extractor Cam. When cover extractor cam is found to be broken, drill out cover extractor cam rivets, taking care not to drill off center. Rivet new cover extractor cam in place. Test after repairing, and check for burs.

d. Bent Belt Feed Lever or Worn Stud. Excessive wear on lug on rear end of belt feed lever, belt feed lever pivot stud, and front end of belt feed lever, or a bent belt feed lever, will cause lost motion so that slide and pawl do not force cartridge fully against stops. The extractor will then hit rim of cartridge and drive case onto bullet without engaging groove on base of cartridge. Replace parts, or in emergency, in case of bent lever (if stud is not too worn), straighten lever. After repairing, test as described in paragraph 24 **a.**

e. Modification of Belt Feed Lever Slot in Cover (All Types). Interference sometimes exists between the forward end of the belt feed lever and the sides of the slot in the cover through which the lever operates. This condition results in excessive wear of the belt feed lever diamond and also limits the travel of the belt feed slide. The dimension of this slot in covers now being manufactured is 1.766 inches +0.010 inch. Up until a very recent date, this slot was 1.802 inches +0.010 inch, and prior to that it was 1.691 inches +0.010

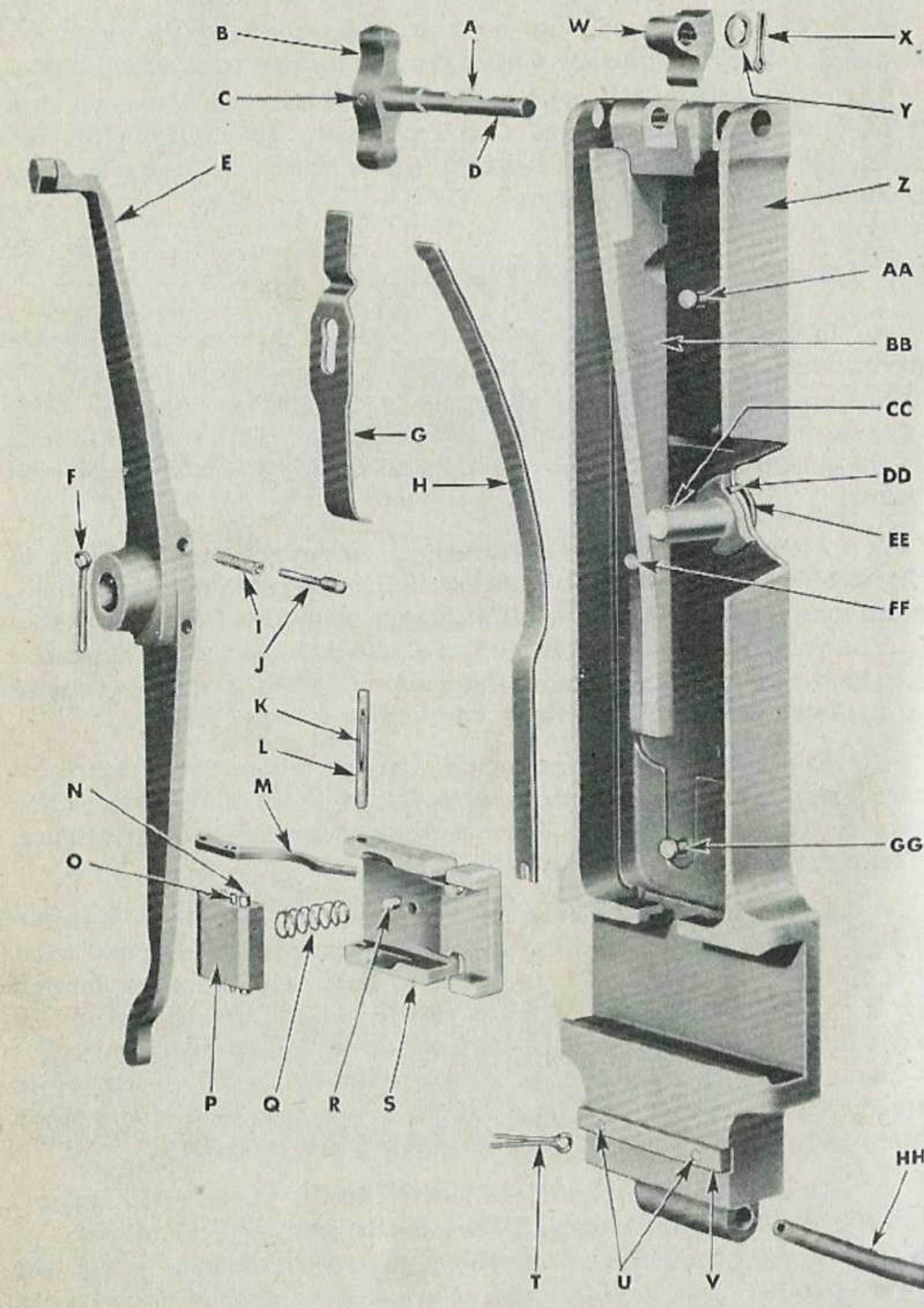


Figure 65—Cover Group—Exploded View

COVER GROUP

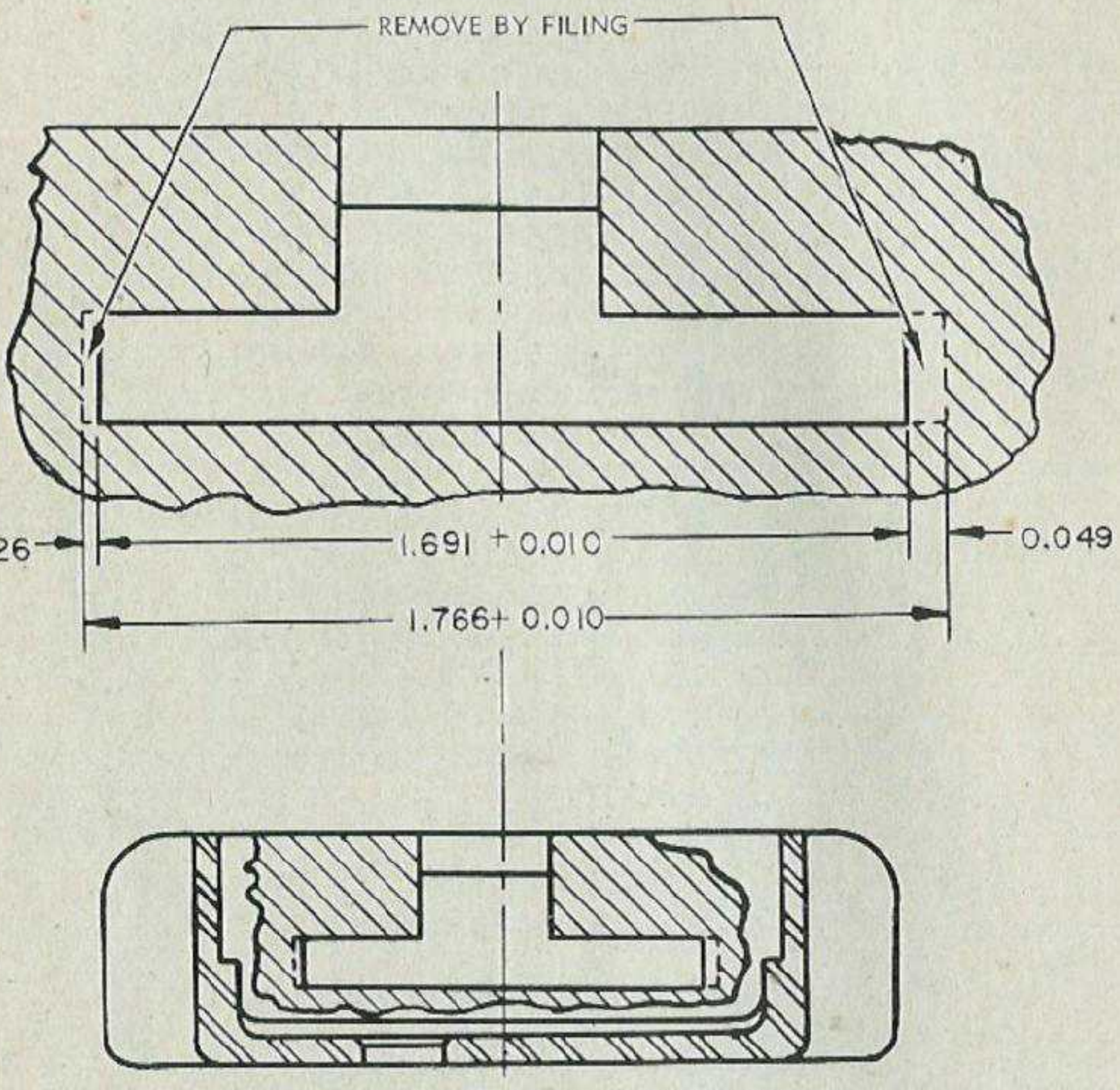
A — KEY, COVER LATCH SHAFT-A13544
B — LEVER, COVER LATCH SHAFT-A13586
C — PIN, COVER LATCH SHAFT LEVER-A13587
D — SHAFT, COVER LATCH-A13587
E — LEVER, FEED, BELT-C64278
F — PIN, COTTER *(3/32" X 3/4")* -103373
G — SPRING, COVER LATCH-B8931
H — SPRING, COVER EXTRACTOR-B9741
I — SPRING, BELT FEED LEVER PLUNGER-A13516
J — PLUNGER, BELT FEED LEVER-A13515
K — SPRING, BELT FEED PAWL PIN-A9357
L — PIN, BELT FEED PAWL-A13519
M — ARM, BELT FEED PAWL-B8914
N — PIN BELT FEED PAWL ARM-A13517
O — PIN, LOCATING, BELT FEED PAWL ARM-A13518
P — PAWL, FEED, BELT-B8913
Q — SPRING, BELT FEED PAWL-A9351
R — STUD, BELT FEED PAWL SPRING-A9363
S — SLIDE, FEED, BELT-B147756
T — PIN, COTTER *(1/8" X 7/8")* -108630
U — RIVET, COVER BRACKET-A152980
V — BRACKET-A152752
W — LATCH, COVER-B8928
X — PIN, COTTER *(1/16" X 7/16")* -137130
Y — WASHER, COVER LATCH SHAFT-A13545
Z — COVER-D28258
AA — STUD, COVER LATCH SPRING-A9366
BB — CAM, EXTRACTOR, COVER-C64279
CC — STUD, PIVOT, BELT FEED LEVER-A9395
DD — PIN, BELT FEED LEVER PIVOT STUD-A9384
EE — WASHER, BELT FEED LEVER PIVOT STUD-A9398
FF — RIVET, COVER EXTRACTOR CAM-A9282
GG — STUD, COVER EXTRACTOR SPRING-A9365
HH — PIN, COVER-A9371

RA PD 91832A

Legend for Figure 65—Cover Group—Exploded View

inch. When covers with narrow slots (1.691 inches) are encountered and interference is noted by a slow rate of fire or binding action, the dimensions should be corrected by filing or machining the ends of the slots so that the length will agree with the present dimension (1.766 inches), as shown in figure 66. This requires removal of 0.026 inch from one side, and 0.049 inch from the other. Metal should not be removed from the belt feed lever diamond in order to eliminate this interference. If, after performing the above modification, the diamond does not aline properly with the camway in the bolt, the diamond can be positioned by manipulating the belt feed slide while closing the cover.

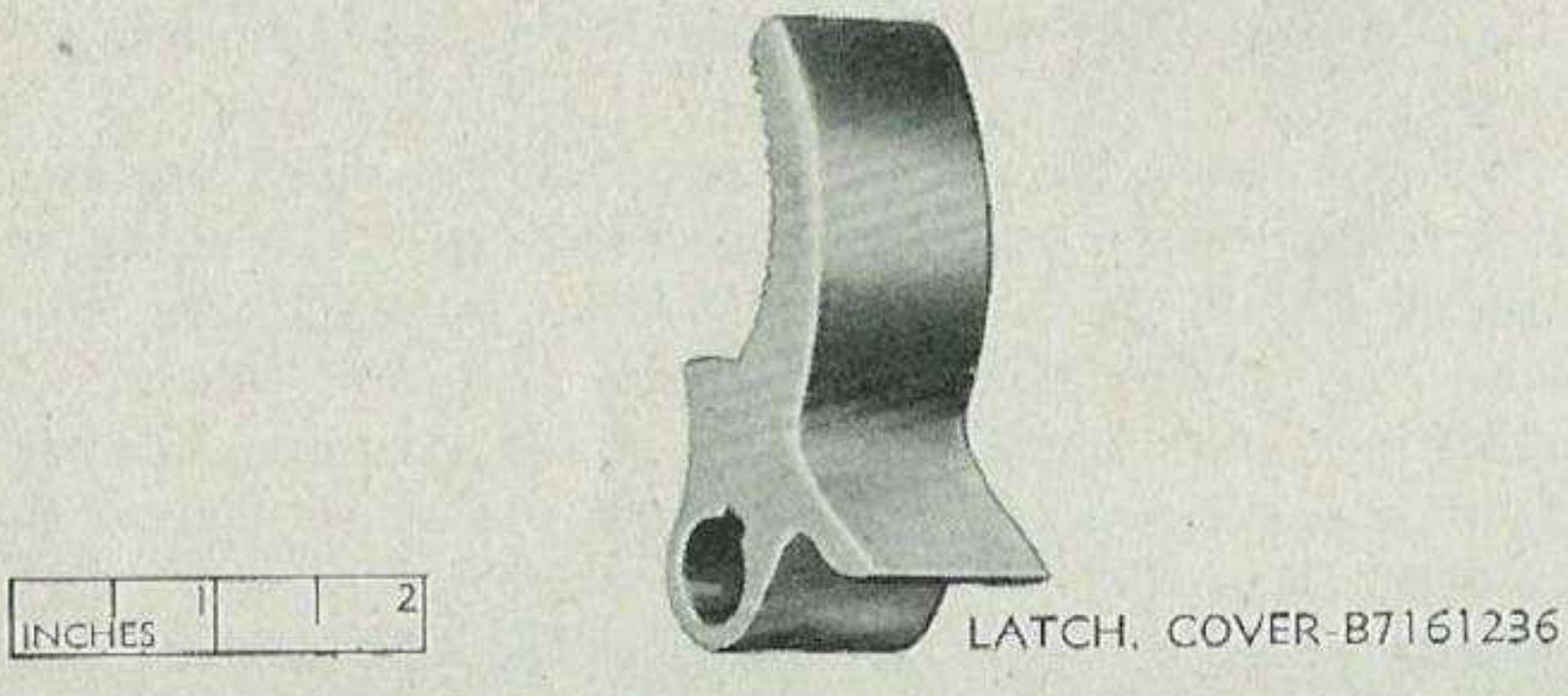
ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



SECTION THROUGH BELT FEED LEVER PIVOT

RA PD 35669

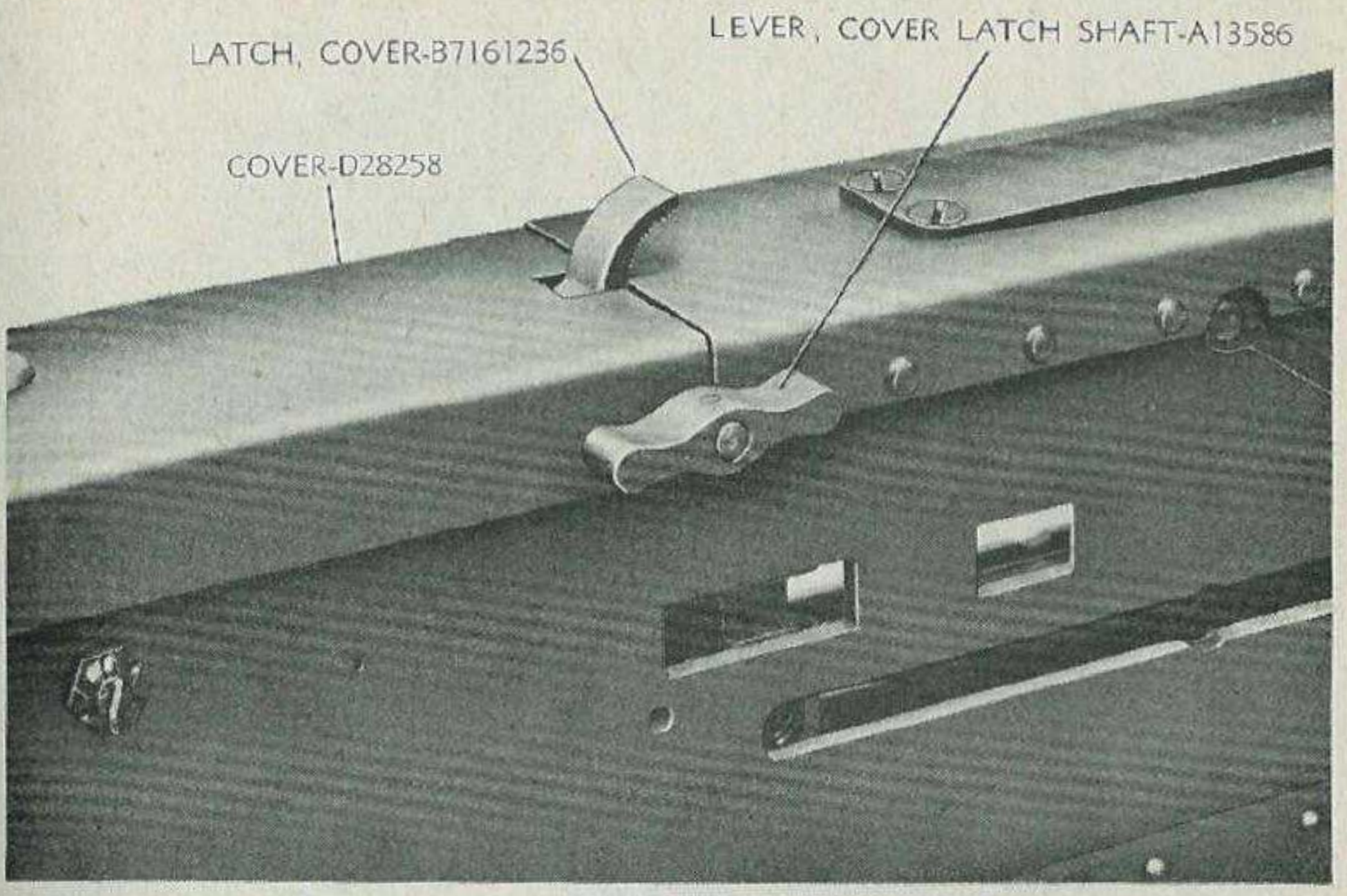
Figure 66—Modification of Belt Feed Lever Slot in Cover



RA PD 88163

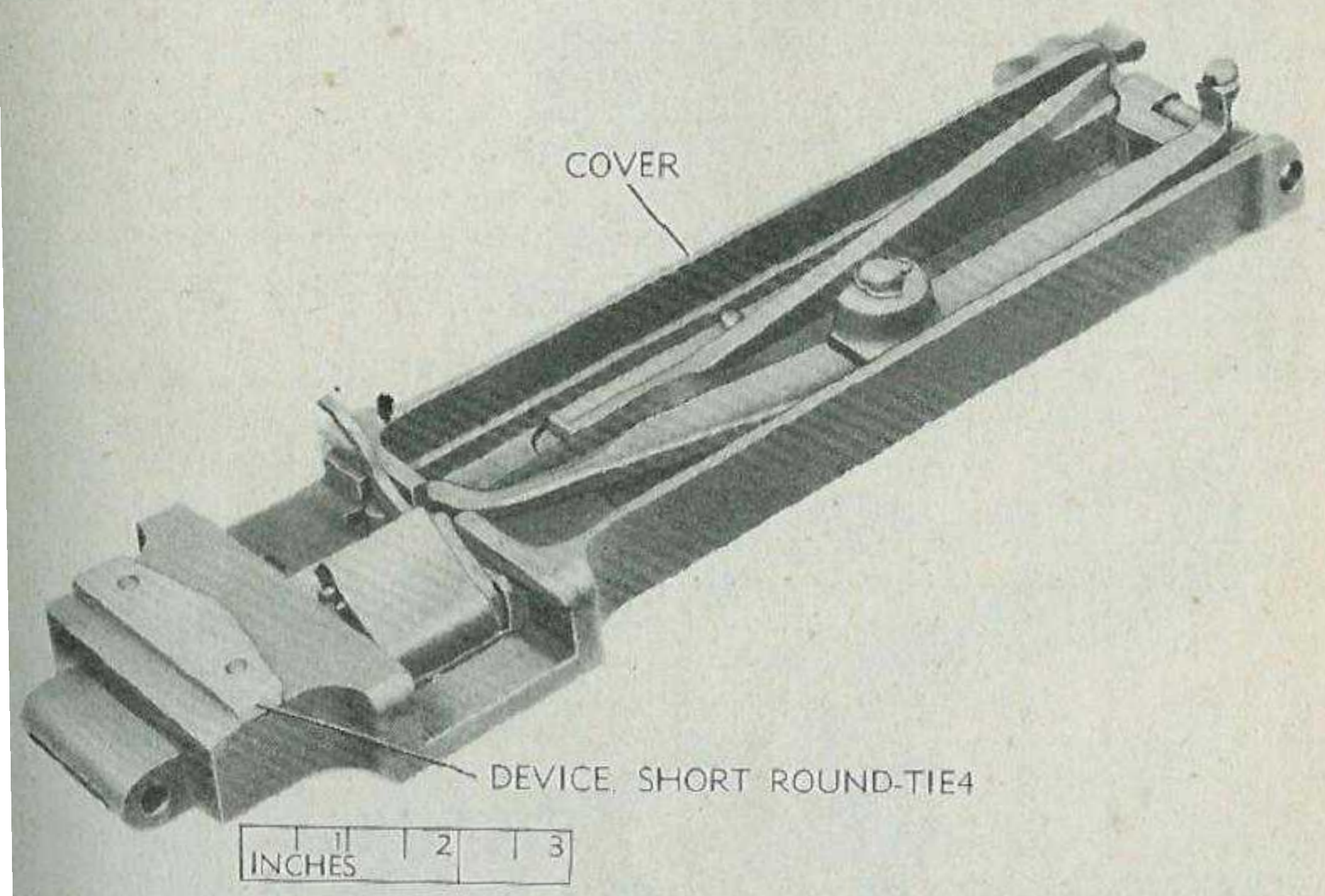
***Figure 67—Special Cover Latch** B7161236*

COVER GROUP



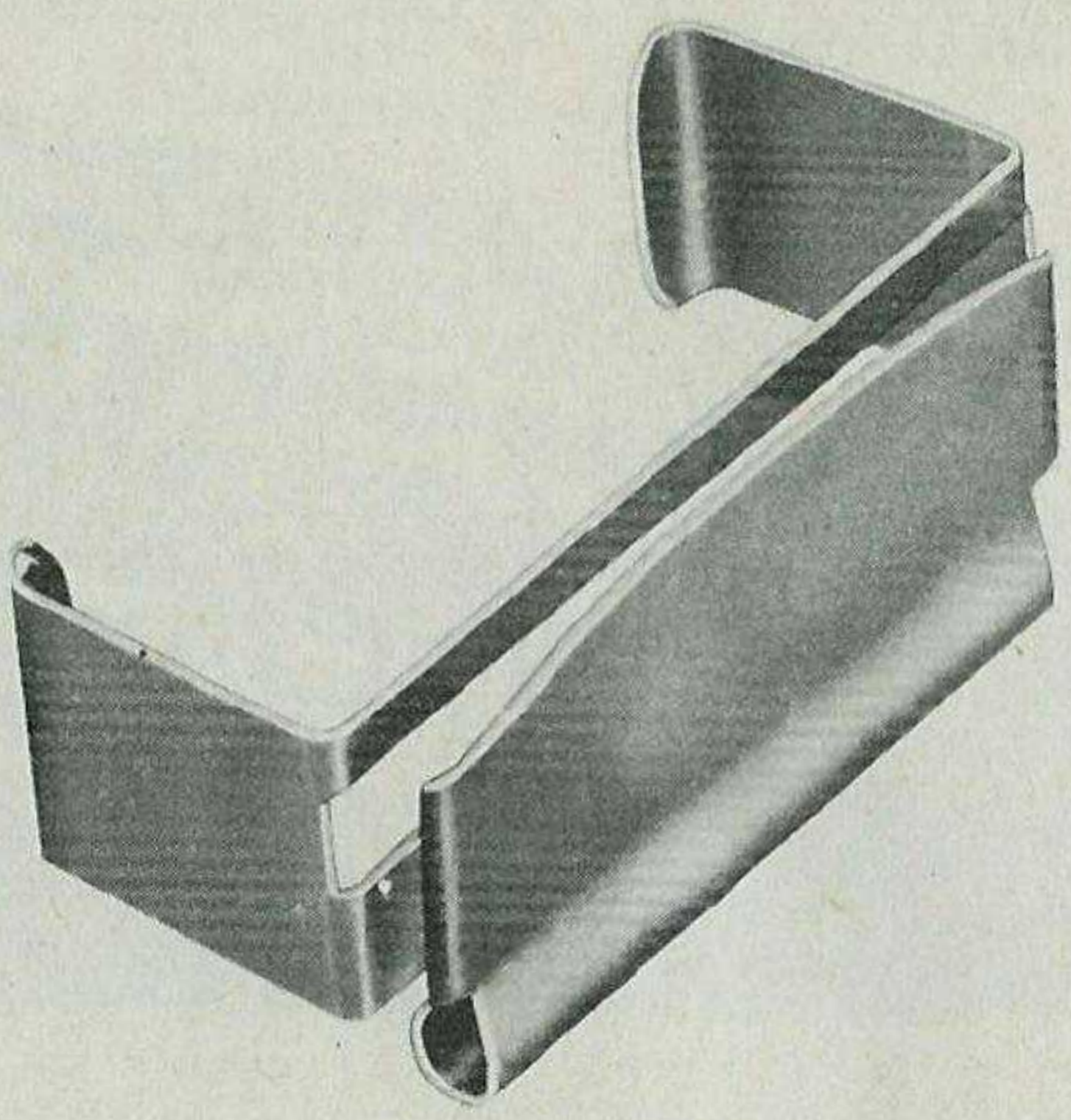
RA PD 88164

Figure 68—Special Cover Latch B7161236 Assembled to Gun



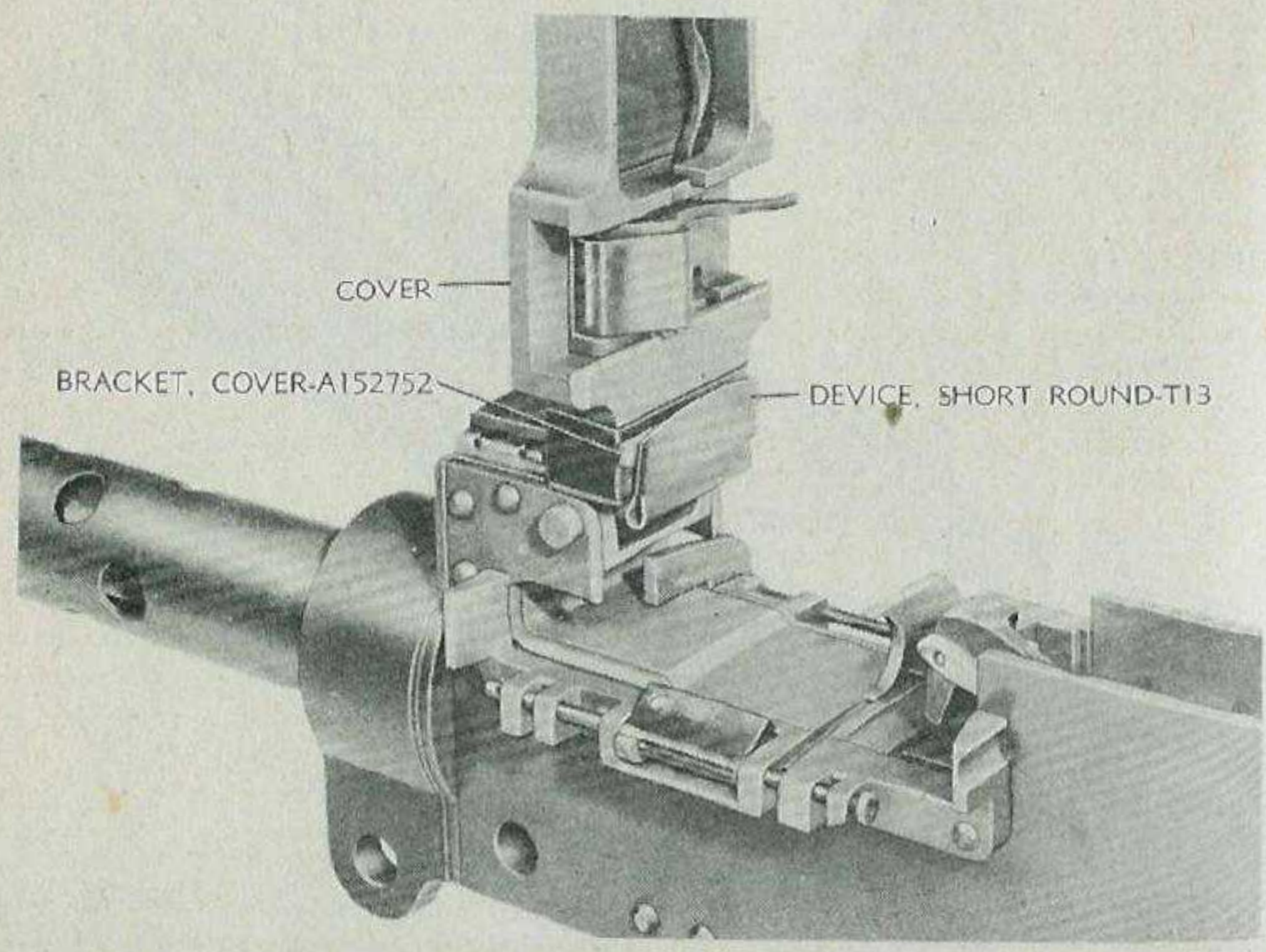
RA PD 88154

Figure 69—Short Round Device T1E4 Installed in Cover



RA PD 88155

Figure 70—Short Round Device T13



RA PD 88156

Figure 71—Short Round Device T13 Assembled to Cover

COVER GROUP

f. Installing Special Cover Latch.

(1) A special cover latch *B7161236* (figs. 67 and 68) is now available for use in guns in some installations. This latch differs from the old latch in that it enables the operator to open the cover by actuating the cover latch itself without removing his gloves, when link jams, etc., occur. The old latch is actuated by turning the cover latch shaft lever which is difficult to reach in some installations without the operator first removing his gloves.

(2) The special cover latch is assembled to the cover latch shaft assembly in place of the old cover latch. A slight amount of fitting may be necessary when assembling the special latch. (See subparagraph **b**, above, for fitting new cover.)

g. Installing Short Round Devices. To aid in eliminating stoppages caused by short rounds from both right- and left-hand fed guns, two types of short round devices have been developed as follows:

(1) SHORT ROUND DEVICE T1E4. A limited number of these devices have been manufactured and installed in the cover of aircraft guns, cal. .50 (fig. 69). This required removal of the cover bracket *A152752* and the permanent installation of the short round device in its place.

(2) SHORT ROUND DEVICE T13 (fig. 70). This device is being issued in limited quantities, is made of spring steel, and can be installed or removed without modifying the cover. The device is clipped readily on the under side of the cover over the bracket *A152752* (fig. 71). The bracket prevents the device from moving to the front or rear, since the clip part of the device is made to fit snugly around the bracket. When the ammunition is pulled into the feedway, the camming edge of the stop part of the device engages the forward edge of the link, cams it to the rear, and holds it in this position until the cartridge is extracted. The stop, being flexible, follows the changes in height of the belt during feeding, and assures positive contact of the camming edge of the stop and the forward end of the link until the cartridge is extracted from the link.

44. ASSEMBLY.

a. Assemble cover group as follows:

(1) The latch is assembled to the cover by placing the latch between the pin bosses on the under side of the cover with the keyway toward the top of the cover and with the projecting wing of the latch against the under side of the cover. The shaft can be installed from either side, but if a retracting slide is used, the shaft lever must be on the opposite side from the slide to provide hand clearance. Insert the latch shaft assembly with the key on the shaft toward the top of the

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

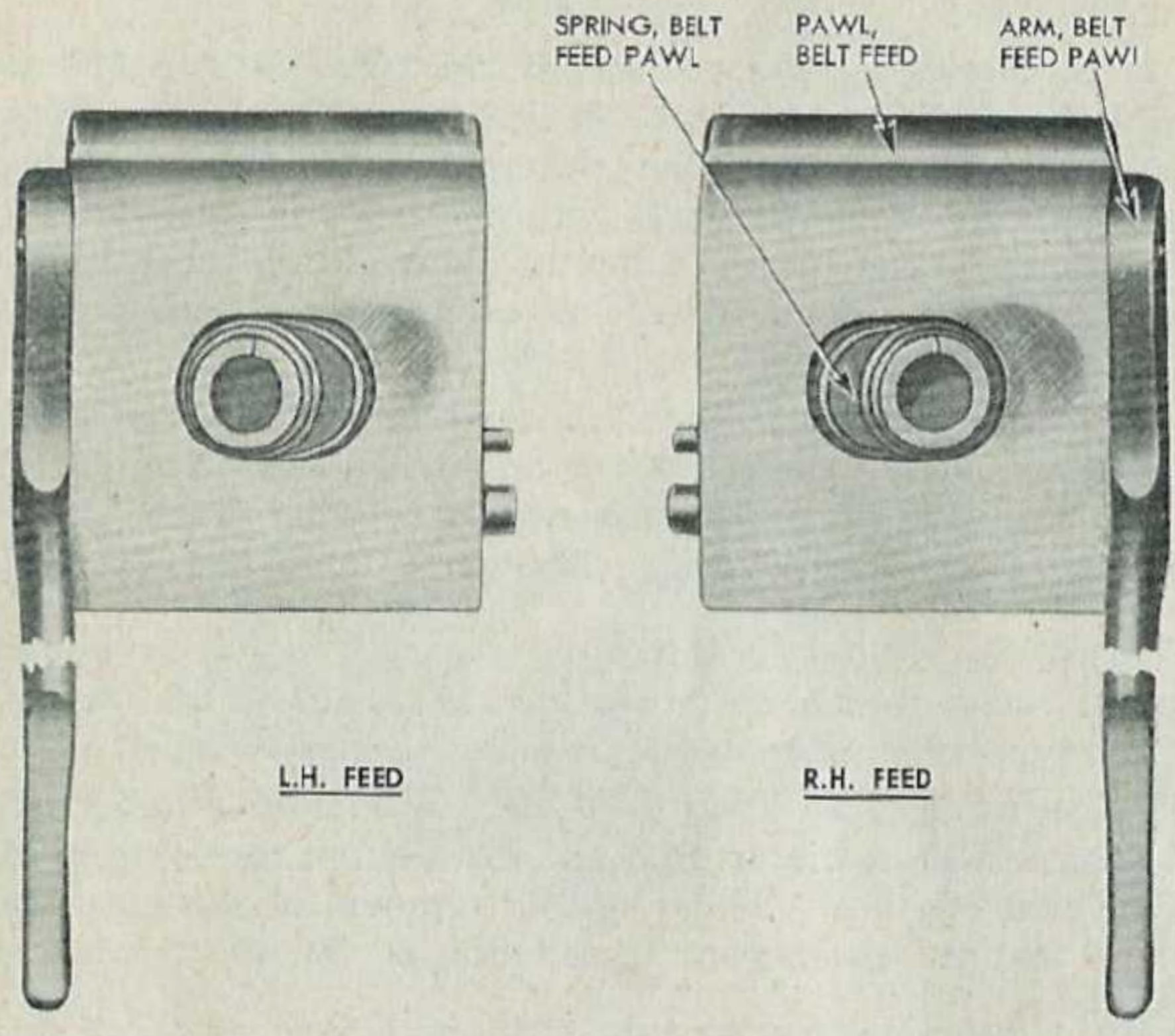


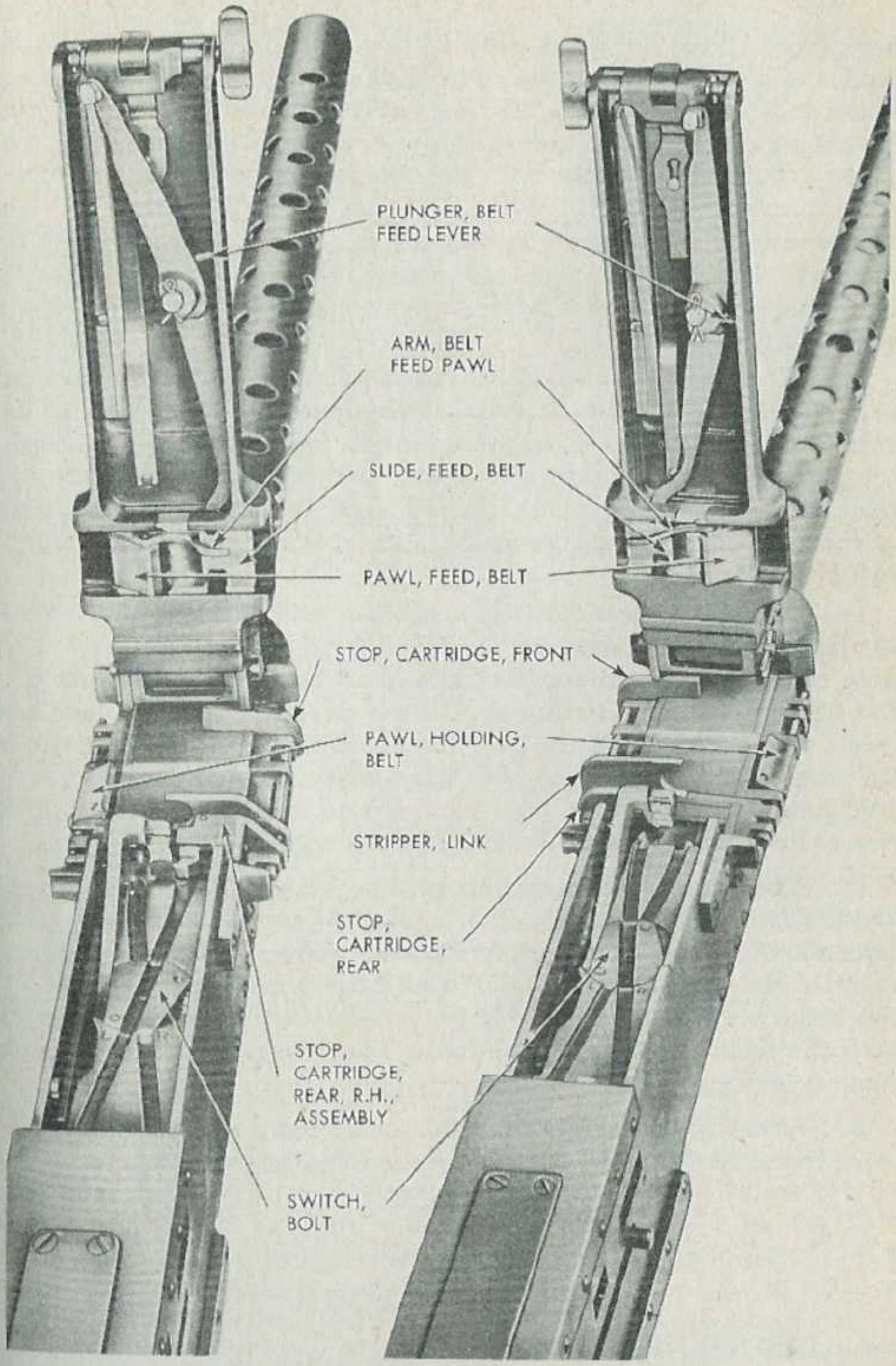
Figure 72—Position of Belt Feed Pawl Spring for Left-hand and Right-hand Feed

cover. Place washer on the shaft and install cotter pin. This should be inserted with the head toward the hinged end of the cover, and the ends must be bent sharply to avoid interference when latching down the cover.

(2) Install the cover extractor spring by hooking the slotted end under the extractor cover spring stud, with the curved end away from the cover. Hold the spring firmly against the stud, press the curved end until it rests on the cover, and then slide the projection of the spring into the recess in the cover extractor cam. Place the cover latch spring inside the cover, with the bent end against the cover and the enlarged hole meshing with the latch spring stud. Depress the spring and, at the same time, slide the spring toward the latch. Make sure that the latch end of the spring rides up over the projecting wing of the latch. Snap the bent end of the spring into the groove in the cover.

(3) When the belt feed slide is assembled for either right- or left-hand feed, the belt feed pawl arm must be placed over the belt feed pawl pin and locating pin so that the arm will be toward the rear when the cover is closed. The pawl and pawl arm, properly assembled,

COVER GROUP



RA PD 51012

Figure 73—Position of Parts for Left-hand and Right-hand Feed

are placed in the belt feed slide with the spring held by the spring stud and recess in the pawl. The spring is depressed to aline the holes, and the pin inserted. The large end of the belt feed pawl spring should be placed in the recess in the pawl with the projecting oval (loop) of the spring *away* from the belt feed pawl arm as assembled for either right-hand or left-hand feed, as shown in figure 72. The belt feed slide is placed in its way, or grooves in the cover with the pawl end of the slide toward the side from which the gun is to be fed. Correct assembly of parts for both right- and left-hand feed is shown in figure 73.

NOTE: *Belt feed slide B261110 is available for all guns to improve feeding operations and insure continuous feeding when a long ammunition belt is used. It also increases the load-lifting capacity of the gun. It is identified by a ⅛-inch hole drilled through the face of the slide, and by the fact that the belt feed lever slots on the two sides of the slide are no longer in line. Detailed information can be found in TM 9-225.*

(4) Insert the belt feed lever plunger and spring in the hole in the belt feed lever toward the latch end for left-hand feed, and in the hole toward the hinge end for right-hand feed. Aline the notch in the belt feed slide with the slot in the cover. Place the belt feed lever, with the shoulder up, over the pivot stud and, after depressing the lever plunger and spring, push the lever completely down on the stud so that the toe of the lever can work to and fro in the slot in the cover. Insert the belt feed lever cotter pin, and spread ends.

b. To install the cover group on the receiver, place the latch end of the cover in position with the latch engaging the top plate. Then force the hinge end downward into position. Use a drift to secure alinement of the pin holes and insert the hinge pin. Insert cotter pin in the hinge pin and make sure it is bent so the ends cannot interfere with the feeding of the ammunition. For fitting new cover, refer to maintenance paragraph.

c. Short Round Devices. For attachment of short round devices to the cover of aircraft guns, refer to paragraph 43 g.

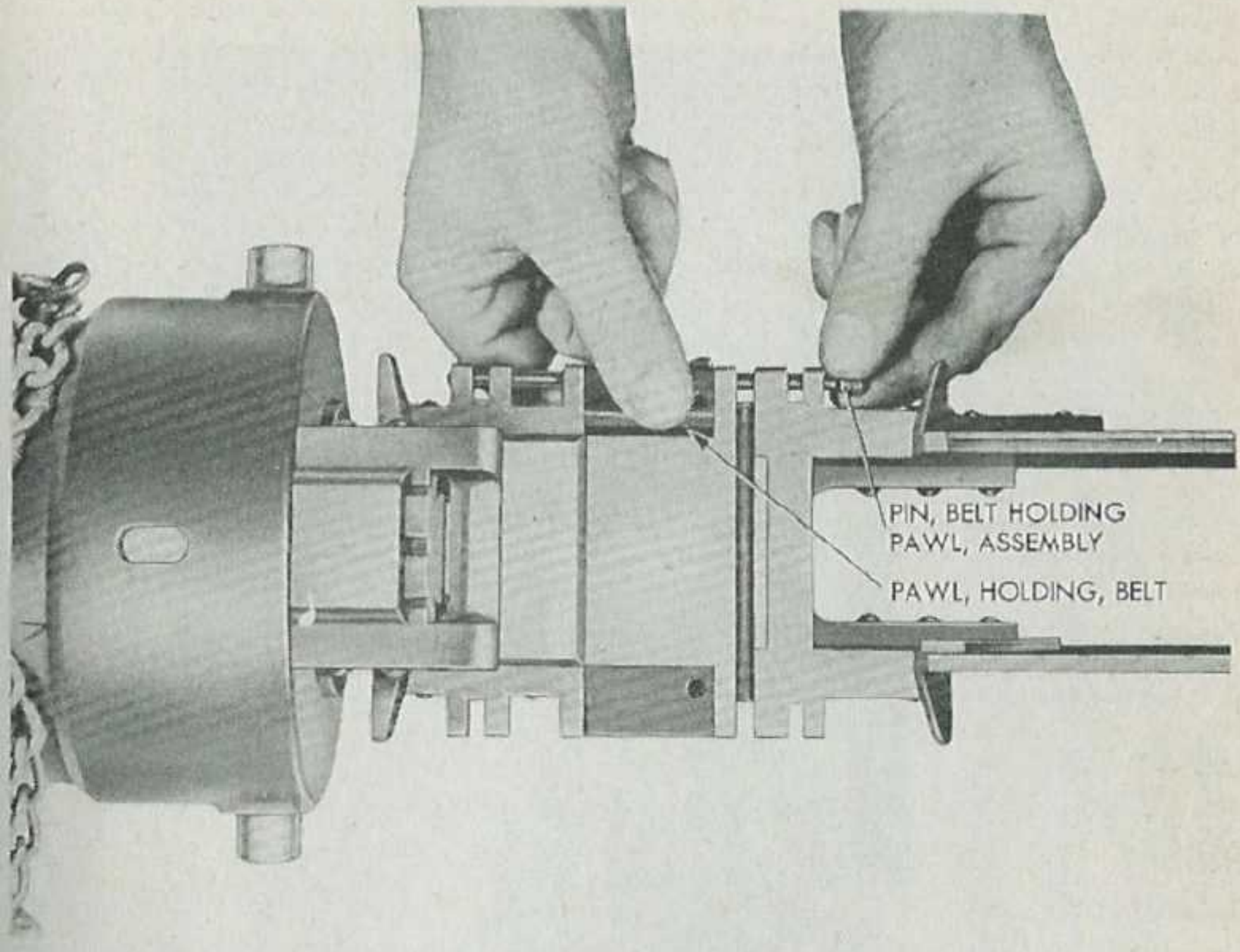
Section XI

CASING GROUP

45. DISASSEMBLY.

NOTE: *The casing group includes the receiver group, together with the barrel jacket, water jacket, barrel support, or other groups which are attached to it to comprise the type of gun in question. An exploded view of the receiver group is shown in figure 100.*

CASING GROUP



RA PD 51013

Figure 74—Removing Belt Holding Pawl

a. Receiver and Barrel Jacket.

(1) Remove the belt holding pawl and spring or springs by withdrawing the belt holding pawl pin, being careful not to lose the springs (fig. 74). NOTE: *In some aircraft guns of present manufacture the split belt holding pawl is used (par. 47* **j**, *fig. 75). Belt holding pawl pin B7160030 has a split front end and a bend in the rear to act as a withdrawing handle (fig. 75).*

(2) If the gun has been set up for left-hand feed and a right-hand rear cartridge stop assembly is used, it is detached by removing the remaining belt holding pawl pin. This also frees the front cartridge stop. The right-hand rear cartridge stop assembly may be dismantled by driving out the pin with a drift. This will free the alining pawl and permit removal of the alining pawl plunger and spring (fig. 76). If the right-hand rear cartridge stop assembly is not used, the rear and front cartridge stop and link stripper are removed by taking out the remaining belt holding pawl pin. NOTE: *For information on blank firing attachment, refer to NOTE in paragraph 75.*

(3) The trunnion block cover is removed by driving out the two pins with a small drift. To remove the cover detent pawl, push the detent pawl forward and take out the cotter pin. The switch and

Figure 75—Split Belt Holding Pawl and Present-type Belt Holding Pawl Pin—Exploded View

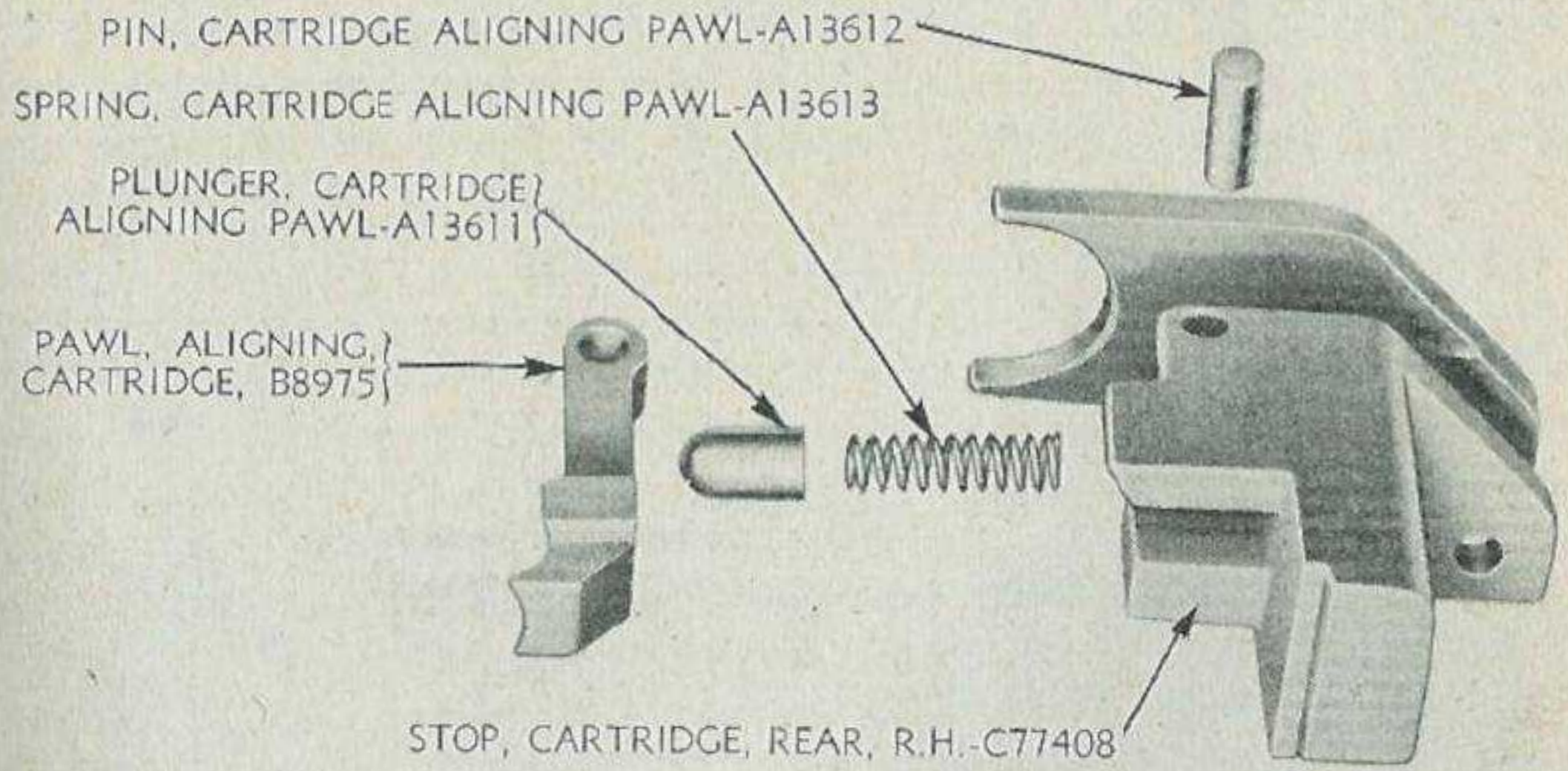


Figure 76—Right-hand Rear Cartridge Stop Assembly—Exploded View

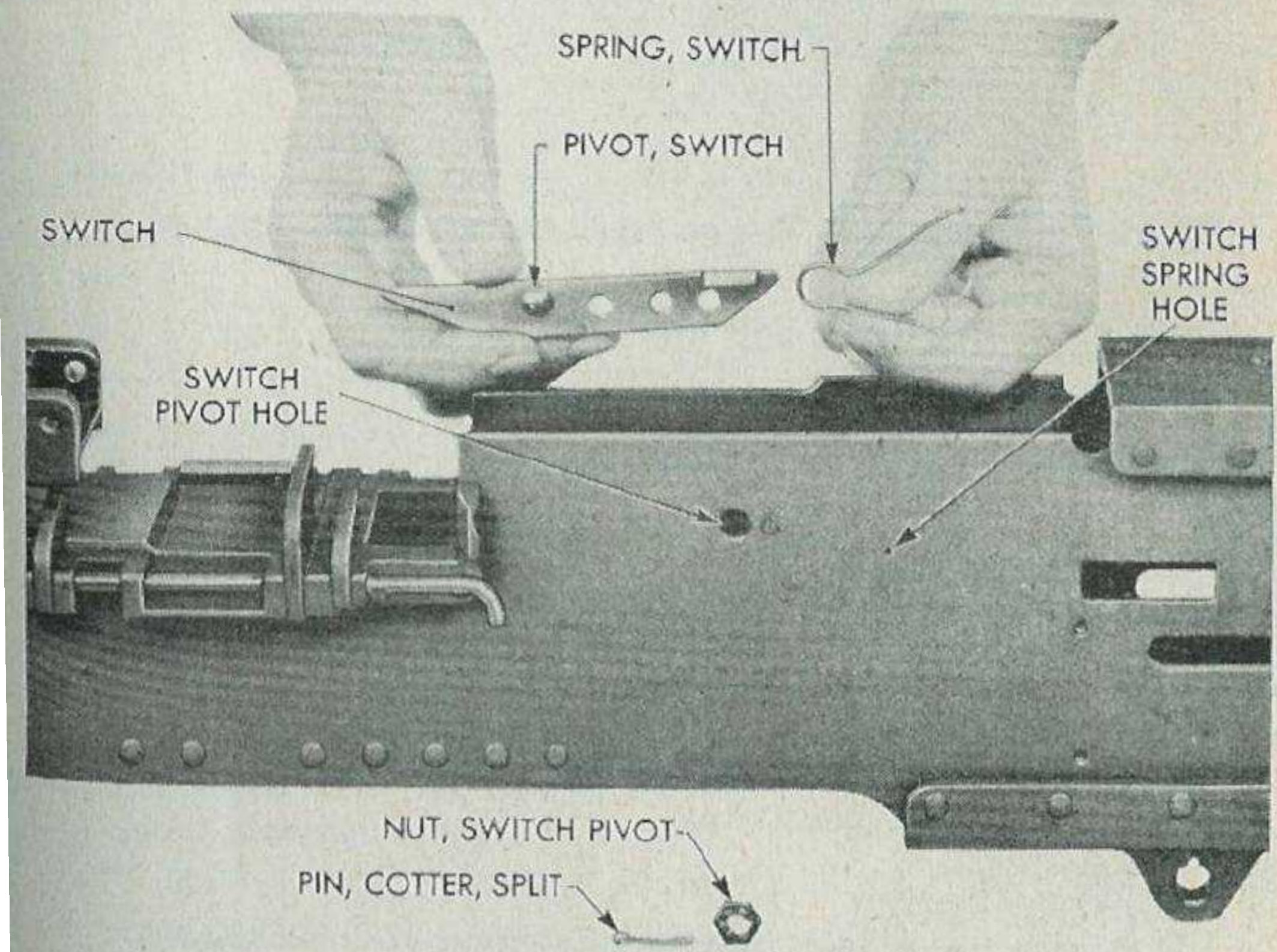
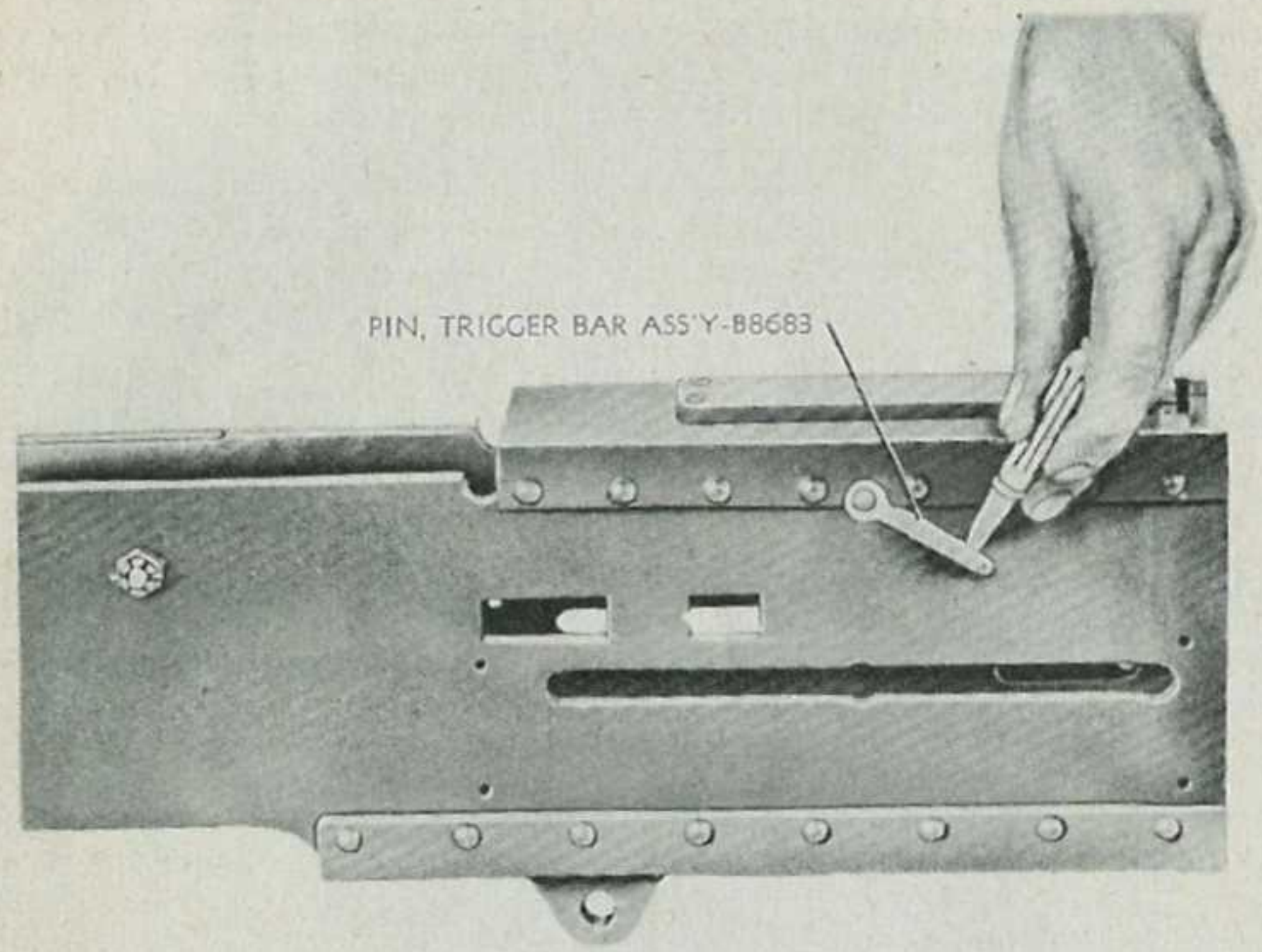


Figure 77—Removing Switch and Switch Spring

switch spring are removed by taking out the cotter pin and taking off the nut on the outside of the left side plate (fig. 77).

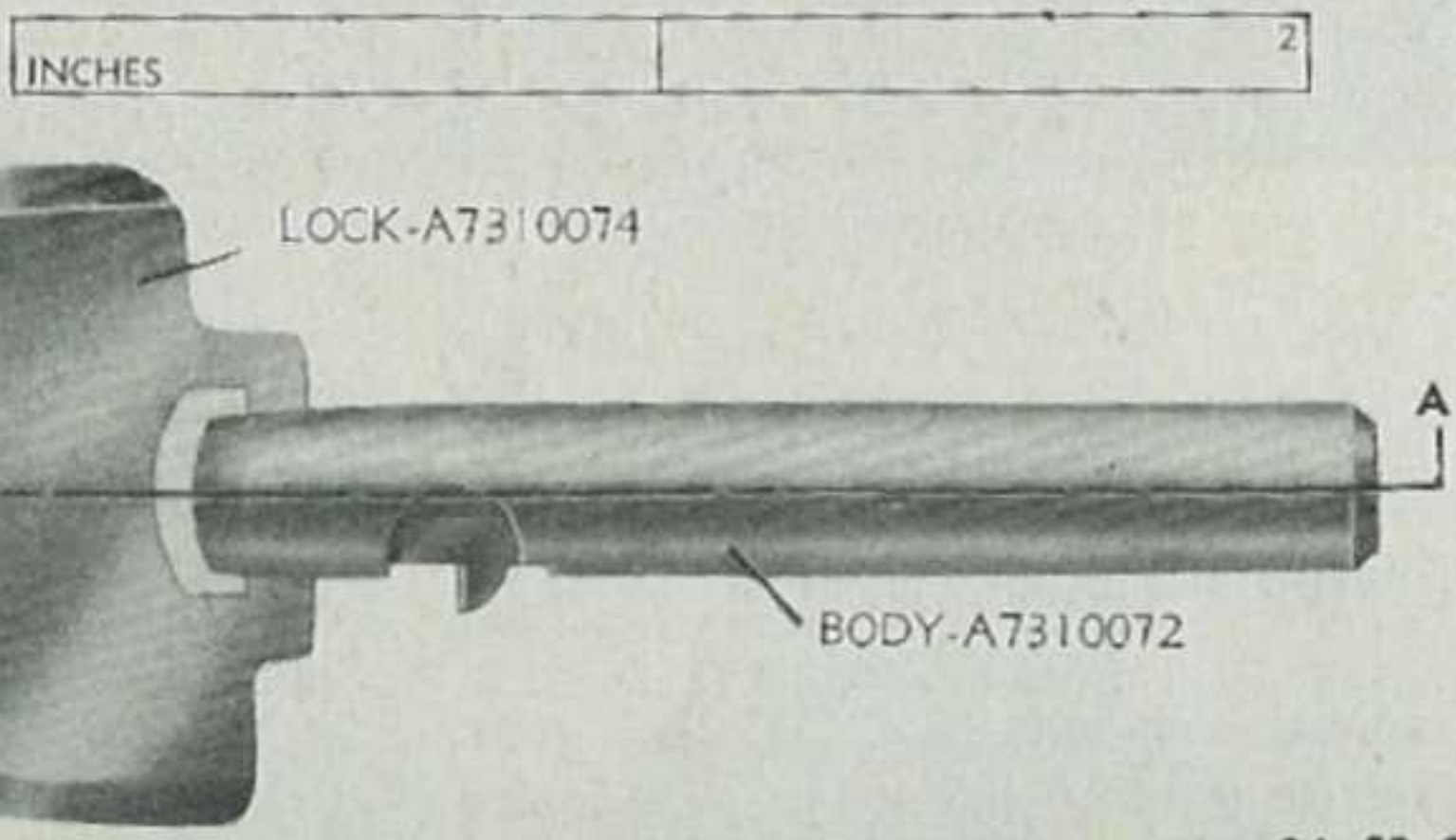
(4) The breech lock cam is removed by taking out the cotter pin



RA PD 91836

Figure 78—Removing Trigger Bar Pin Assembly (Old Type)

SECTION A-A



RA PD 88148

Figure 79—New-type Trigger Bar Pin Assembly *B7310075*

CASING GROUP

on the bottom of the receiver and removing the nut. Take out breech lock cam bolt and cam from inside of the receiver. In some guns of early manufacture, the breech lock cam is attached by a staked screw inserted through the bottom plate.

(5) Remove the trigger bar pin by barely lifting the lock out of the small hole in the left side plate and rotating it downward (fig. 78). If it is rotated slightly forward of a vertical position, the key in the pin will pass through the keyway in the left side plate, and the pin can be removed by pulling out from the gun. This will release the trigger bar. NOTE: *A new-type trigger bar pin assembly B7310075 (fig. 79) has been designed which can be removed without first having to remove the retracting slide, when the retracting slide is assembled to the left side of the gun. This new pin has a hinged, leaf-type lock which is held against the receiver by a ball and spring within the body of the pin. The pin is removed by raising the lock, turning the pin 90 degrees, and pulling from the receiver. It is installed by reversing this operation. The edge of the top plate prevents the pin from turning when the lock is turned down flat against the side plate.*

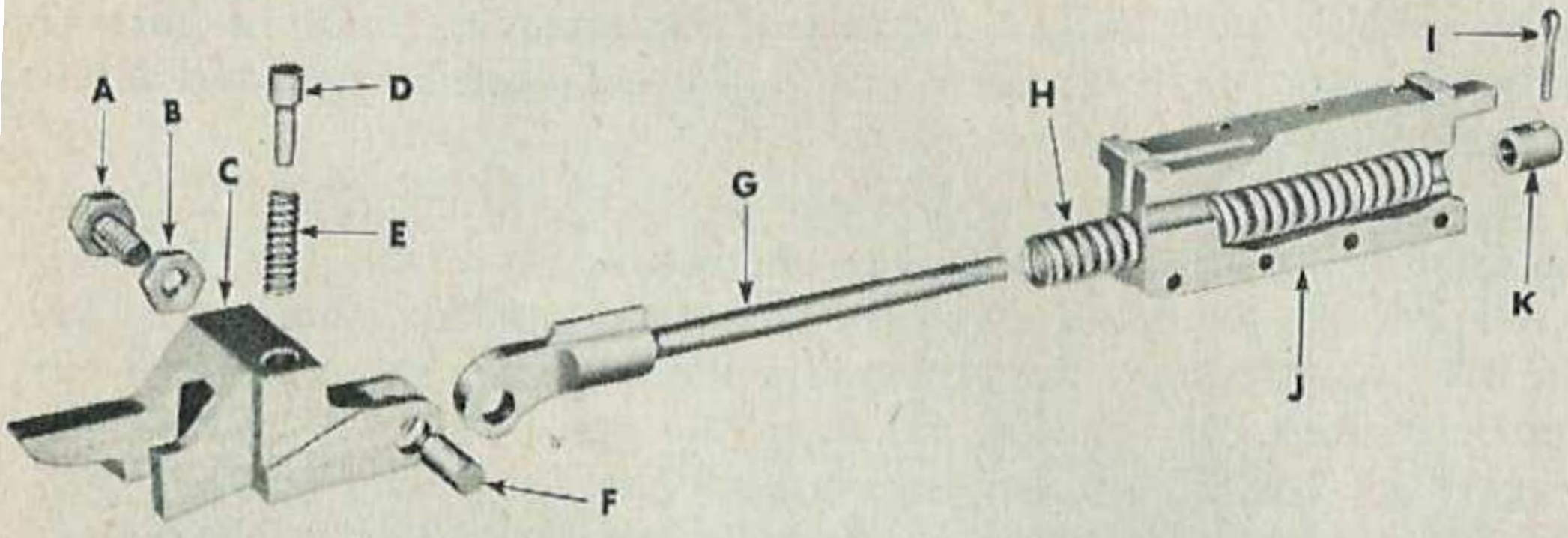
(6) If the gun is equipped with an adjustable trigger bar stop assembly, it may be removed by unstaking and removing the retaining screw from the rear end of the top plate cover plate and sliding the assembly downward off the trigger bar rear stop (pin). The assembly is disassembled by removing the nut and spring (par. 47 **m**, figs. 97 and 98).

(7) If the gun is set up for single-shot, semiautomatic operation (heavy-barrel guns), it will be equipped with a bolt latch. If necessary to disassemble the bolt latch, reach into the rear of the opening in the top of the receiver and withdraw the cotter pin, and slowly unscrew the bolt latch rod nut. Hold the bolt latch assembly firmly from the rear of the receiver while unscrewing the nut. CAUTION: *Great caution must be used to prevent injury to personnel because of the strong spring pressure.* When the nut has been removed, withdraw the bolt latch assembly from the mounting bracket. Be careful not to lose bolt latch plunger and plunger spring. When assembly has been removed, disassemble by pushing out the bolt latch pin. Disassembled parts are shown in figure 80.

(8) To remove the trunnion adapter, pull the trunnion block lock to the rear and give it a quarter turn. This will hold the lock out of engagement. When unscrewing the trunnion adapter with a suitable wrench, the trunnion block (not the receiver) should be rigidly supported. Remove the trunnion adapter shim. Withdraw the cotter pin and remove the trunnion block lock and spring.

(9) The barrel jacket (aircraft guns) is removed by first taking out the breech bearing lock screw from the top of the trunnion and unscrewing the jacket with the combination wrench. The front bear-

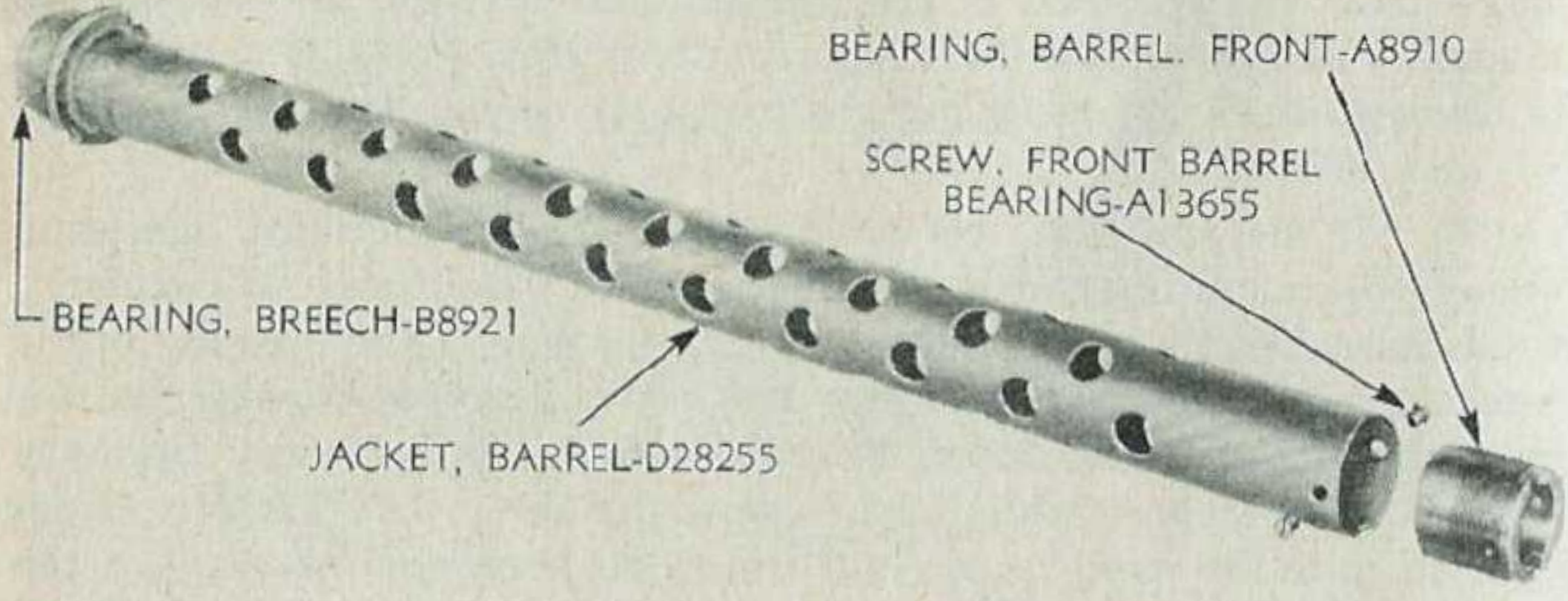
ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



A — SCREW, STOP-A13622
B — NUT, STOP SCREW-A13623
C — LATCH, BOLT-C4060
D — PLUNGER-A13524
E — SPRING, PLUNGER-A13525
F — PIN-A13523
G — ROD-B8919
H — SPRING-A13527
I — PIN, COTTER (3 32" X 3 4") -103373
J — BRACKET-C4061
K — NUT, ROD-A13526

RA PD 91837

Figure 80—Bolt Latch Group—Exploded View



RA PD 91838

Figure 81—Barrel Jacket With Front Bearing Assembly—Exploded View

ing in the jacket ordinarily is not removed since the two screws are staked. It may be removed by unstaking and removing screws, and then unscrewing bearing, using combination wrench. An exploded view of the barrel jacket assembly is shown in figure 81. See figure 100 for an exploded view of the receiver and its related parts.

NOTE: *A blank firing attachment consisting of a muzzle adapter assembled to the barrel jacket and a feedway filler piece assembled to the receiver is sometimes used with aircraft guns in firing blank ammunition; for details, refer to paragraph 75.*

CASING GROUP

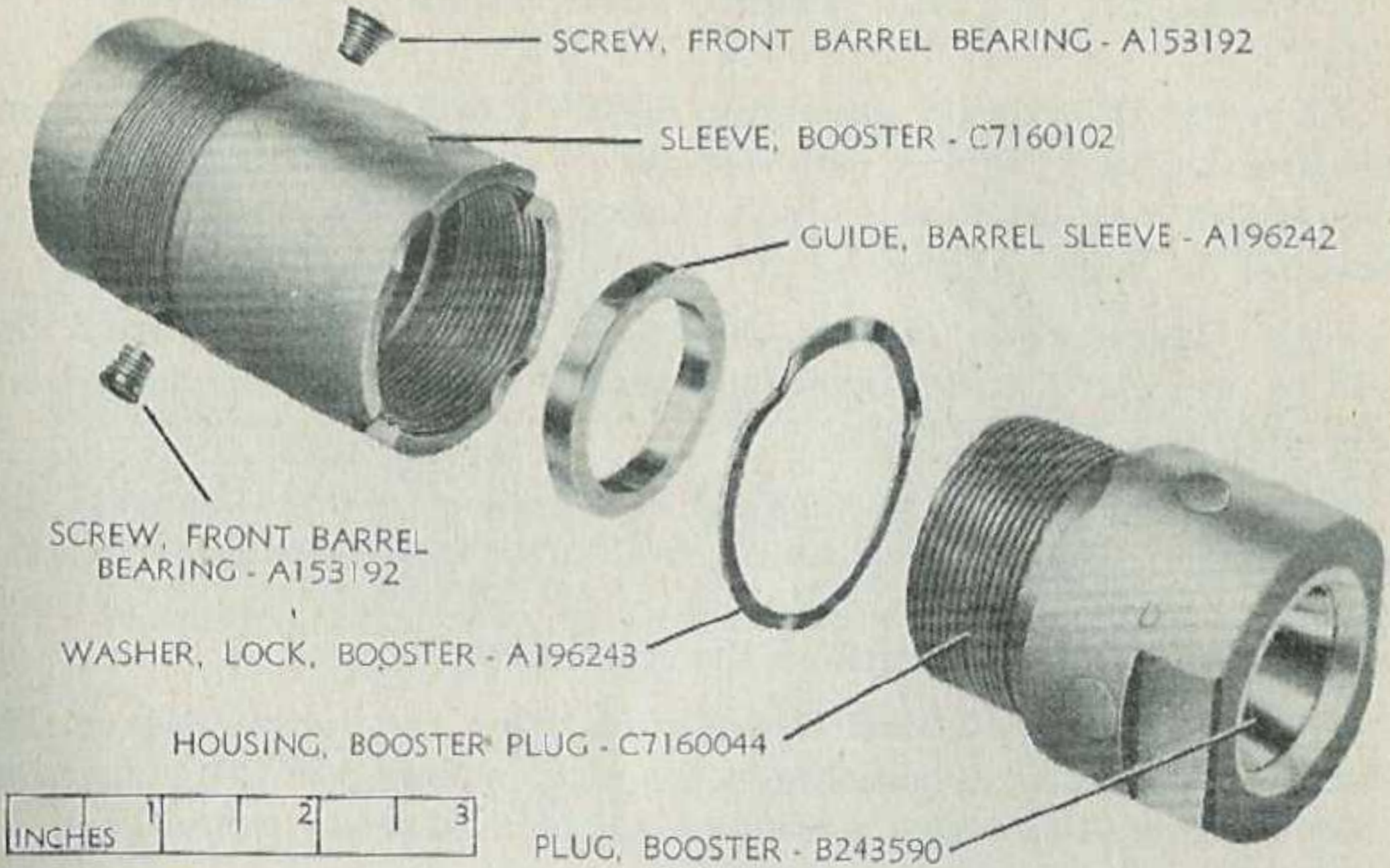


Figure 82—Aircraft Machine Gun Booster, Cal. .50— Exploded View

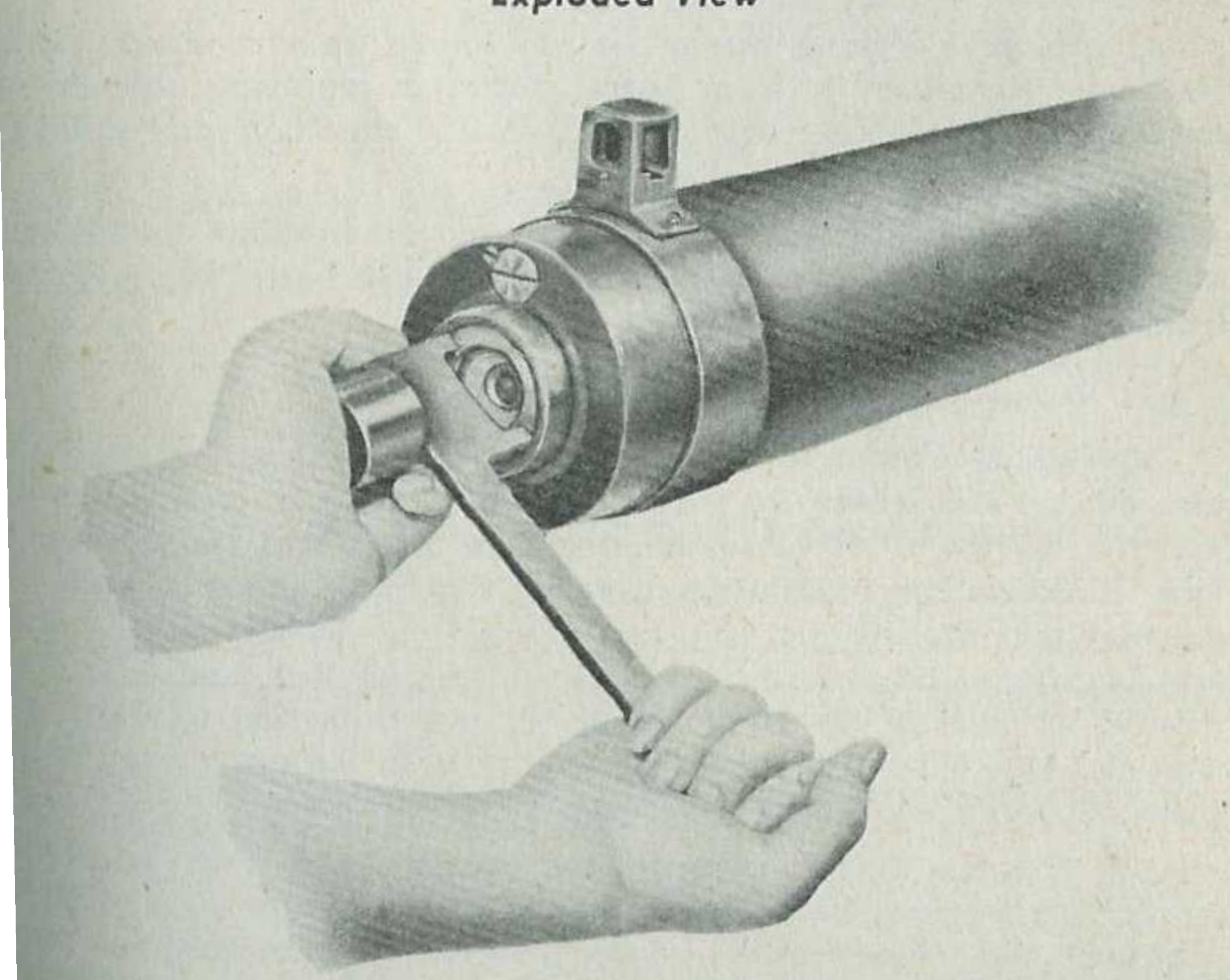


Figure 83—Removing Muzzle Gland With Machine Gun Wrench

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL..50, M2 ALL TYPES, AND GROUND MOUNTS

(10) If the booster assembly *A038-7160043* (fig. 82) is assembled to the barrel jacket (aircraft guns) in place of the front barrel bearing, it may be disassembled as explained below. The booster is covered in detail in TM 9-225.

(a) Unstake and remove the two countersunk screws from the end of the barrel jacket, and then unscrew the booster assembly from the jacket.

(b) Drive the lock washer out of the locking indentations in the booster sleeve and plug housing, and unscrew the sleeve from the housing. This can be accomplished by clamping the housing in a vise and using a spanner wrench on the sleeve.

(c) Remove the barrel sleeve guide from the booster sleeve. No further disassembly is possible as the plug is pinned in the housing at manufacture. A new lock washer should be used when assembling.

(11) If the flash hider *1-H-1765* is assembled to the barrel jacket (aircraft guns) in place of the front barrel bearing, it may be disassembled as explained below. The flash hider is similar in construction to the booster and is covered in detail in TM 9-225.

(a) Remove locking wire from cap screws, remove screws, and then unscrew assembly from barrel jacket by applying wrench to the booster sleeve. The escape hole cover can then be removed from the barrel jacket.

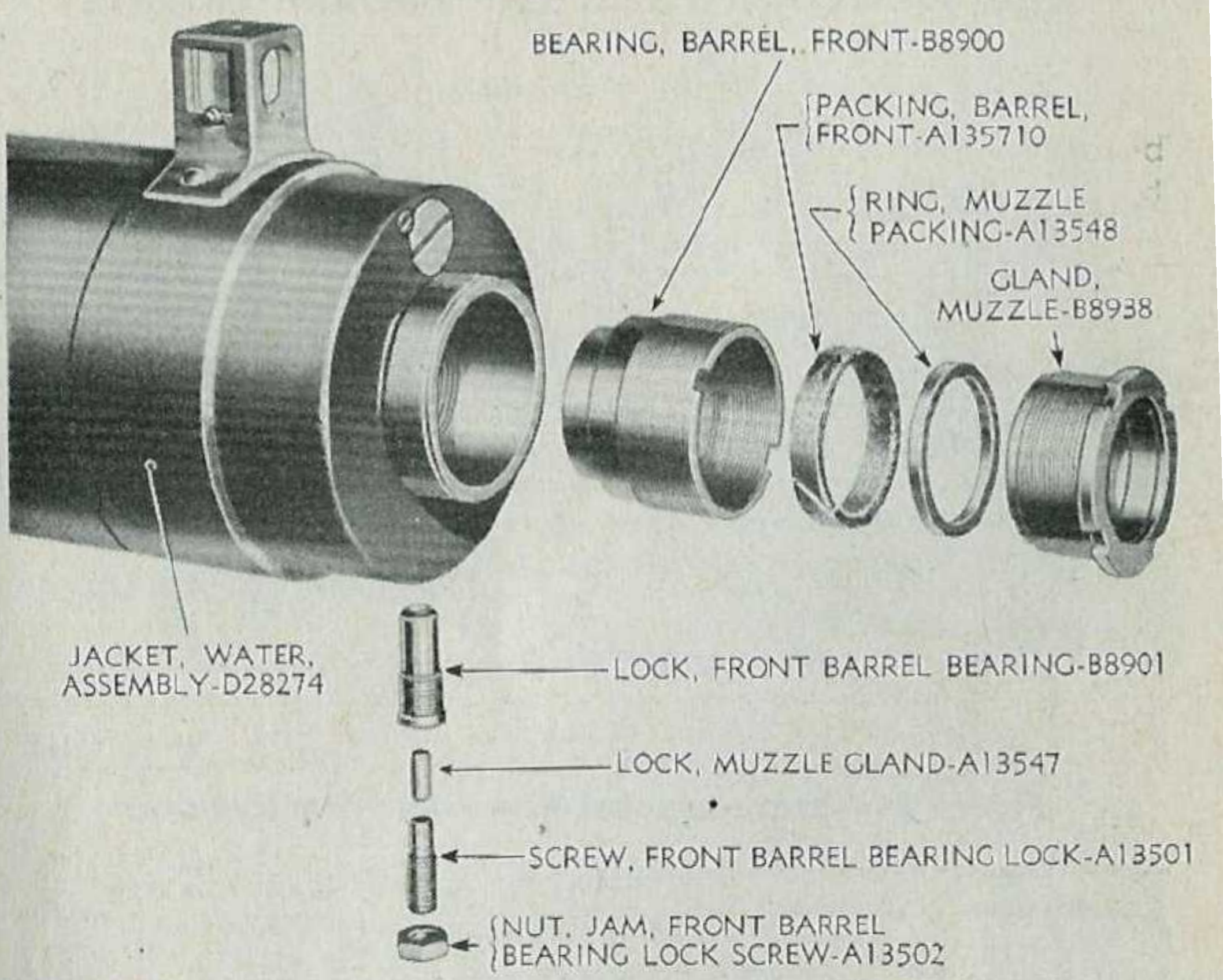
(b) Drive lock washer out of locking indentations in booster sleeve and cone body, unscrew parts, and remove barrel sleeve guide from booster sleeve.

b. Water Jacket (Water-cooled Guns).

(1) Remove the front end cap thread cover. Turn the gun bottom side up and loosen the front barrel bearing lock screw jam nut, and remove the front barrel bearing lock screw and muzzle gland lock. Unscrew the muzzle gland, using the combination wrench or machine gun wrench (fig. 83), and remove the muzzle packing ring and packing. Unscrew the front barrel bearing lock and, after removing it, unscrew the front barrel bearing, using the combination wrench. An exploded view of these parts, with the exception of the thread cover, is shown in figure 84.

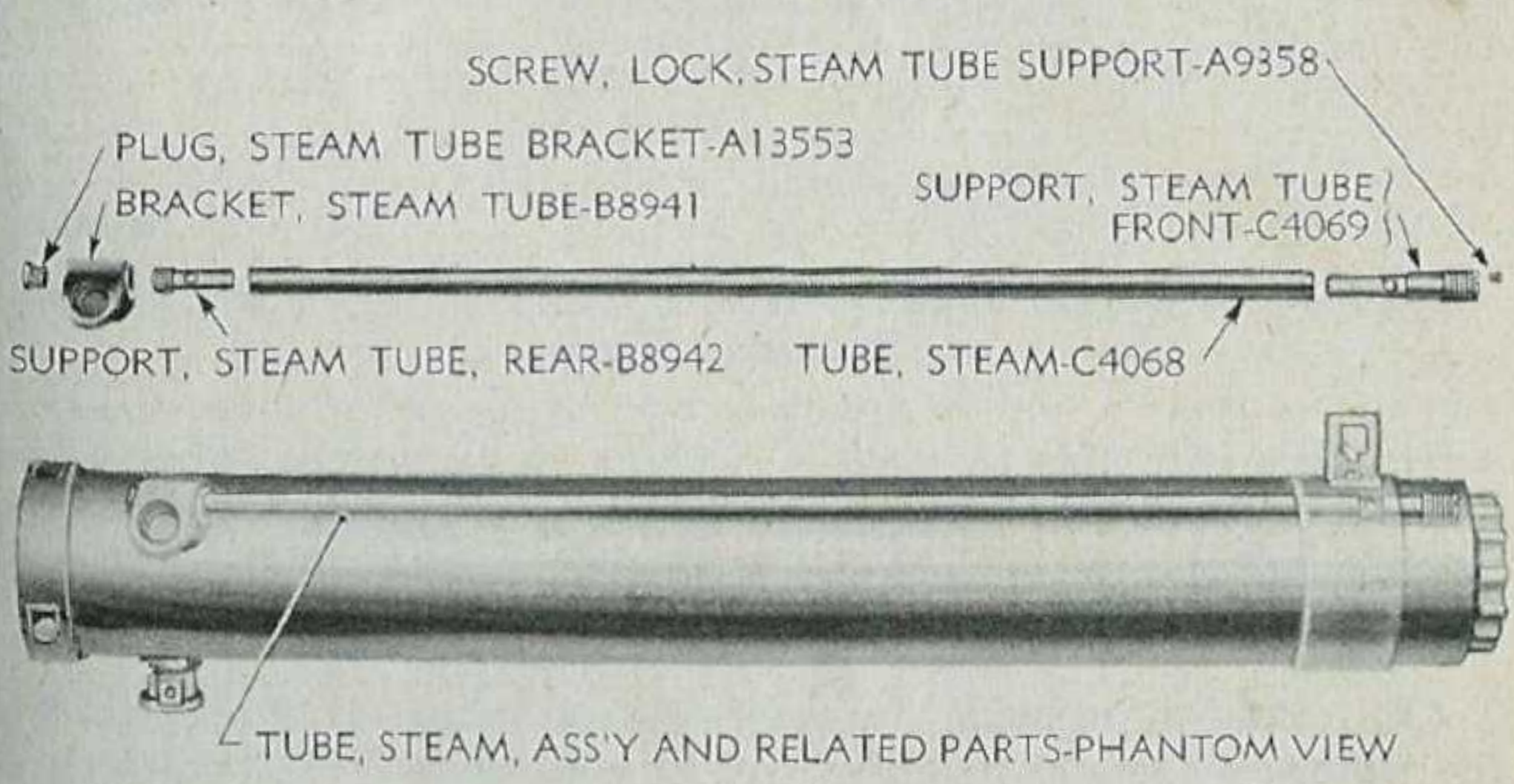
(2) Remove the front steam tube support lock screw. Notch in steam tube support should be noted and placed in the same relative position when reassembled. Loosen the front steam tube support, using the combination wrench, a screwdriver with a broad blade, or an improvised tool. The front of the water jacket should be slanted downward as the front steam tube support is loosened, so that the

CASING GROUP



RA PD 91840

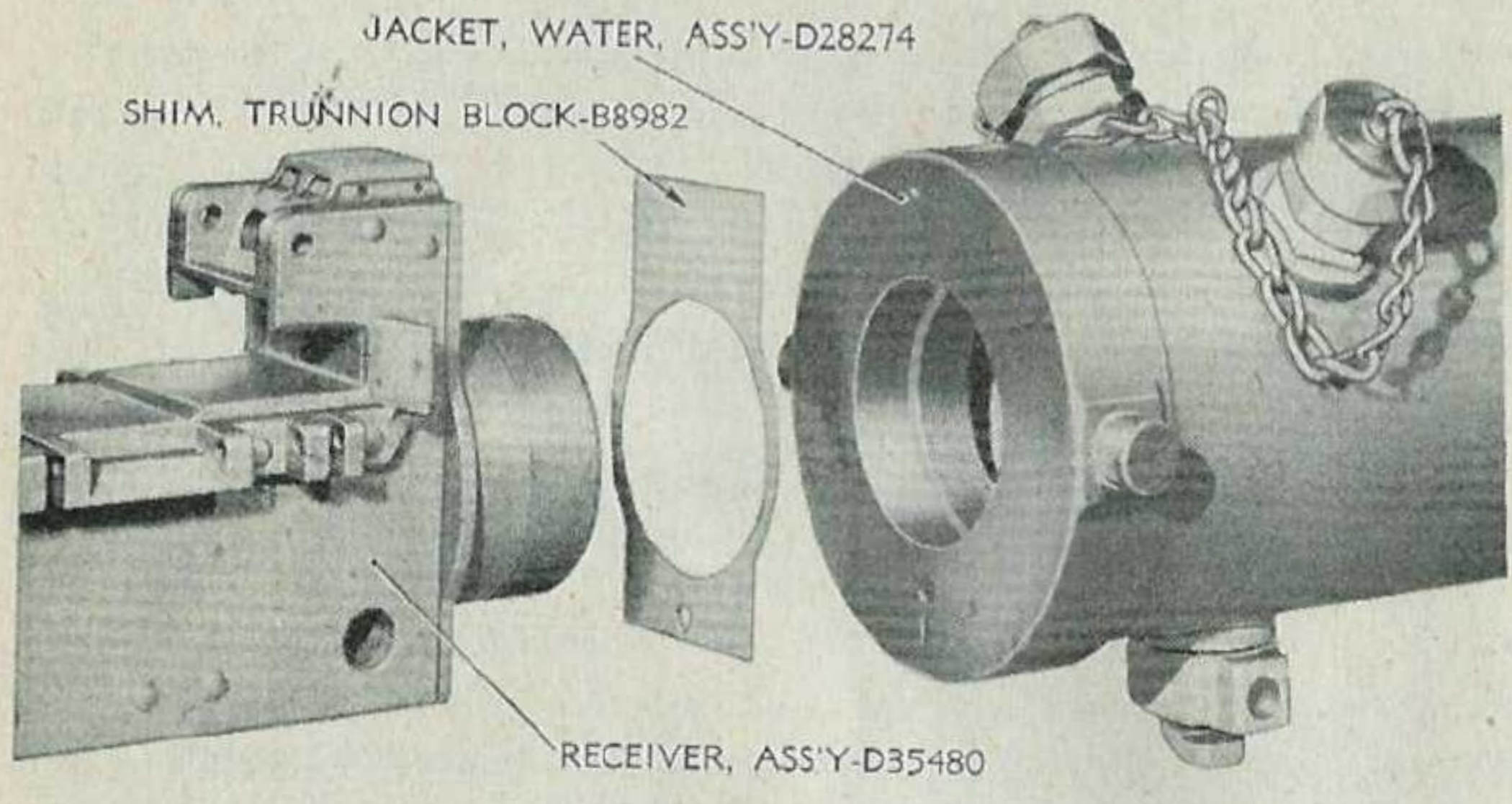
Figure 84—Front Barrel Bearing Group (Water-cooled Guns)—Exploded View



RA PD 91841

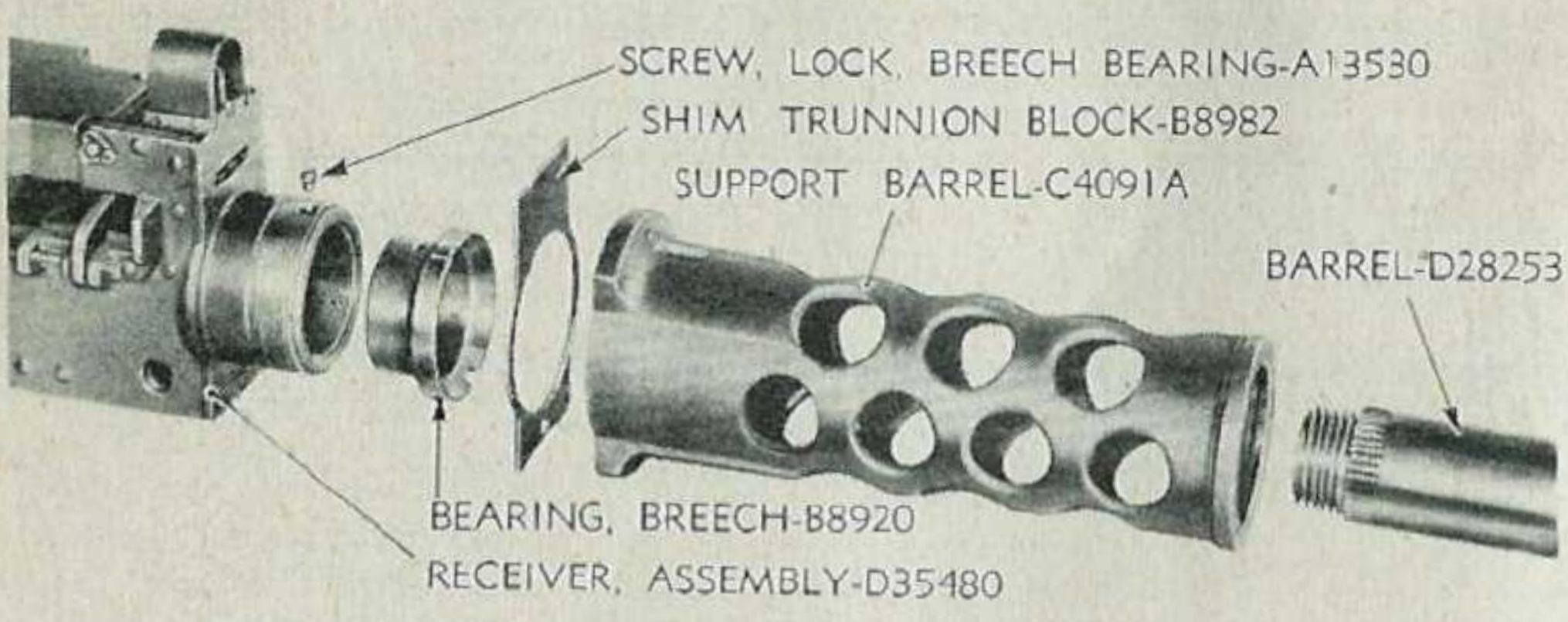
Figure 85—Water Jacket Group and Steam Tube Group—Phantom and Exploded Views

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91842

Figure 86—Water Jacket Removed From Receiver



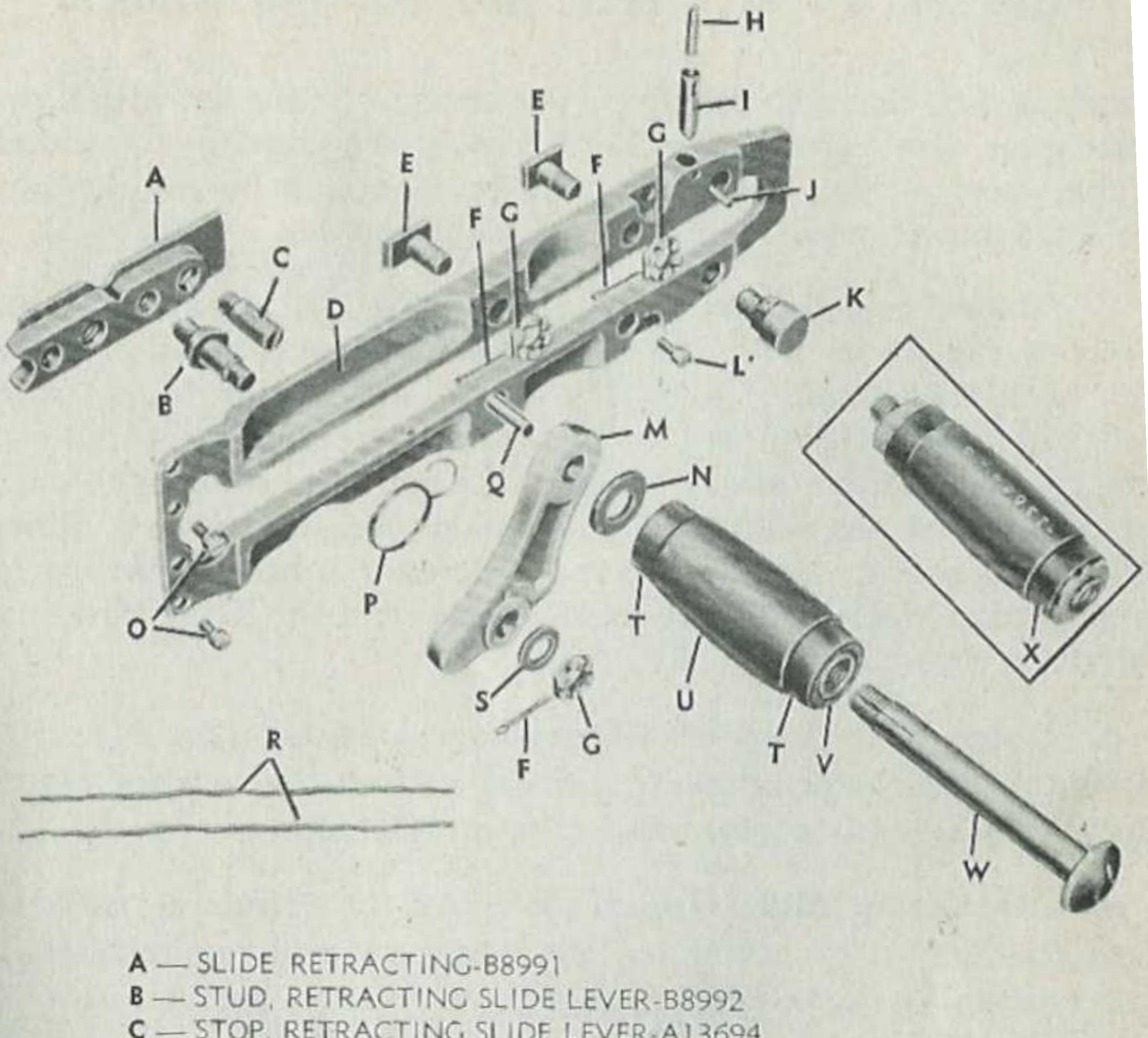
RA PD 91843

Figure 87—Barrel Support Group Removed From Receiver—Exploded View

steam tube will slide forward out of the jacket as the support is removed. An exploded view of the steam tube, together with a phantom view of the water jacket with the steam tube in place, is shown in figure 85.

(3) Before removing the water jacket, make an alining mark on the water jacket and trunnion with a cold chisel. Pull the trunnion block lock to the rear and give it a quarter turn so that the cotter pin will hold it out of engagement. Using combination or strap wrench, unscrew the water jacket from the trunnion. Remove the shim, take out the cotter pin and remove the trunnion block lock and spring.

CASING GROUP



A — SLIDE RETRACTING-B8991
B — STUD, RETRACTING SLIDE LEVER-B8992
C — STOP, RETRACTING SLIDE LEVER-A13694
D — BRACKET, RETRACTING SLIDE-C46029
E — BOLT, RETRACTING SLIDE BRACKET-A13681
F — PIN, COTTER *(1/16" X 3/4")* -103362
G — NUT, RETRACTING SLIDE-A13686
H — SPRING, RETRACTING SLIDE PLUNGER-A13693
I — PLUNGER, RETRACTING SLIDE-B8990
J — PIN, RETRACTING SLIDE PLUNGER-A13687
K — STUD, RETRACTING SLIDE-B8993
L — {SCREW, RETRACTING SLIDE
{BRACKET, FRONT-A13419D
M — LEVER, RETRACTING SLIDE-B147085
N — WASHER, RETRACTING SLIDE GRIP-A13696
O — {SCREW, RETRACTING SLIDE
{BRACKET, REAR-A13419E
P — {SPRING, RETRACTING SLIDE
{LEVER, R.H.-A13692
Q — PIN, TAPER *(NO. 4 X 3/4")* -103603
R — WIRE, LOCKING *(24 IN.)* -A7310038
S — WASHER, RETRACTING SLIDE LEVER STUD-A13697
T — FERRULE, RETRACTING SLIDE GRIP-A9517
U — GRIP, RETRACTING SLIDE-A13684
V — TUBE, RETRACTING SLIDE GRIP-A13695
W — BOLT, RETRACTING SLIDE GRIP, ASS'Y-B147597
X — HANDLE, RETRACTING SLIDE, ASS'Y *(NEW TYPE)*-B313800

RA PD 91844

Figure 88—Retracting Slide Group—(Right-hand Assembly)—Showing Alternate New-type Handle Assembly—Exploded View

Water jacket disassembled from the receiver is shown in figure 86. Some guns have a steam tube that is rigidly and permanently mounted in the water jacket. Such guns may be identified by the absence of the front steam tube support on the front end cap.

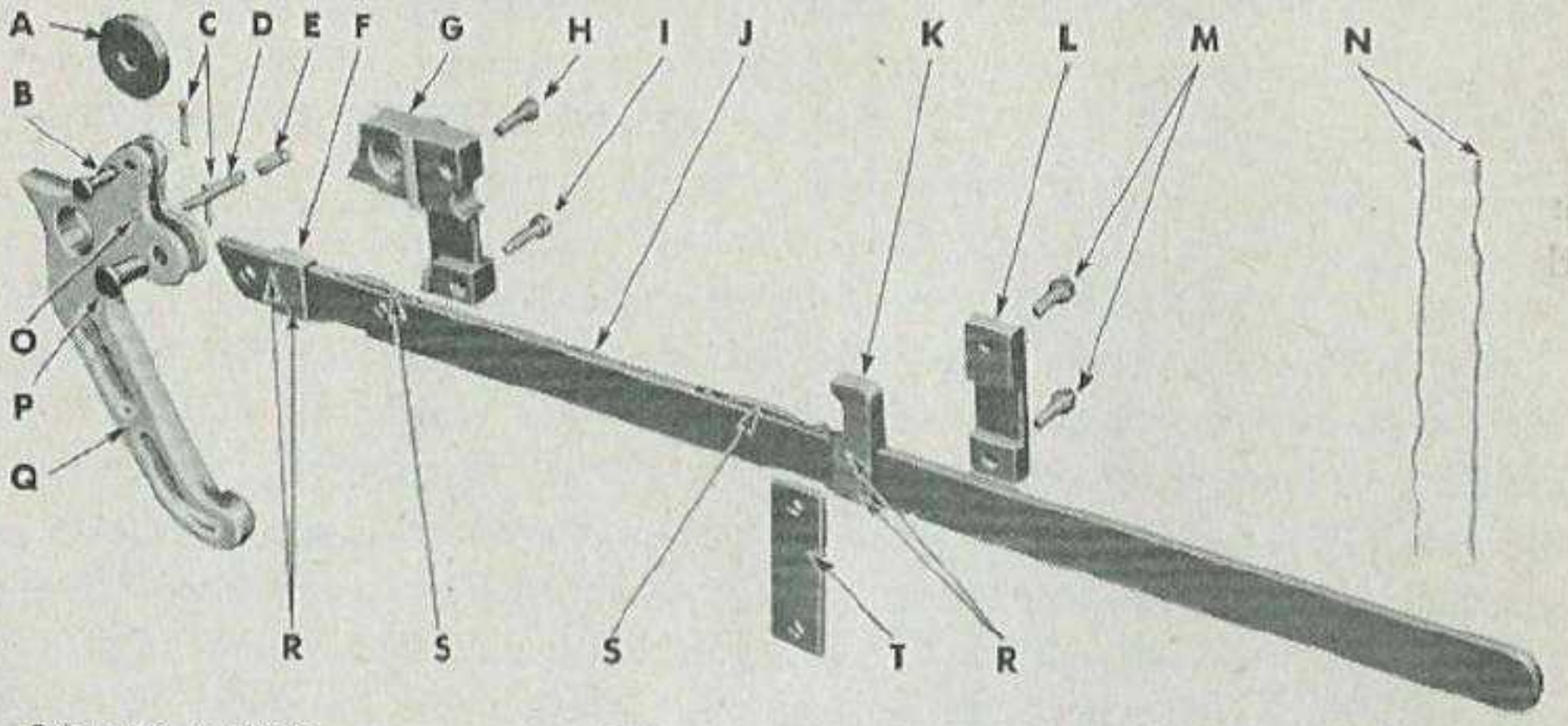
c. Barrel Support and Breech Bearing (Heavy-barrel Guns). Unscrew the barrel from the barrel extension and move it forward. Pull back the trunnion block lock and give it a quarter turn so that the cotter pin holds it out of engagement. Using the combination wrench, unscrew the barrel support. Remove the shim, take out the cotter pin, and remove the trunnion block lock and spring. Remove the breech bearing lock screw, and unscrew the breech bearing from the trunnion block, using the combination wrench. The disassembled parts are shown in figure 87.

d. Edgewater Adapter (Heavy-barrel Guns) (fig. 8). To remove the Edgewater adapter, unscrew it from the receiver trunnion block. Disassembly of the adapter is prohibited.

e. Retracting Slide Group. Remove the retracting slide lever from the bracket by taking out the cotter pin and removing the nut and washer. In some cases, the grip and related parts are attached to the lever by means of a solid bolt staked in place, or the retracting slide handle assembly *B313800* is used. In those cases, these parts are removed by unscrewing the bolt with a large screwdriver or wrench. Sometimes, the grip is attached by means of a hollow bolt with a split, threaded end into which a tapered pin is fitted. In such cases, before the bolt is unscrewed, a slender pin must be inserted in the hole in the bolt, and the tapered pin driven out. Take out the cotter pins, remove nuts from retracting slide bracket bolts, and remove the bolts. Take out locking wires and remove three retracting slide bracket screws. Retracting slide bracket and slide assembly may then be removed and the slide assembly lifted out of the bracket. (The assembled retracting slide group may be removed by removing the bracket bolt nuts and screws.) An exploded view is shown in figure 88.

f. Operating Slide Group. To remove the slide from the gun, take out the locking wires and remove the operating slide guide screws and operating slide guides, front and rear. Withdraw cotter pin from operating slide roller pin, push out roller pin, and remove roller. Remove the cotter pin from the operating slide handle hinge pin, push out the hinge pin, and remove the slide handle, handle plunger, and plunger spring. See figure 89 for an exploded view of parts.

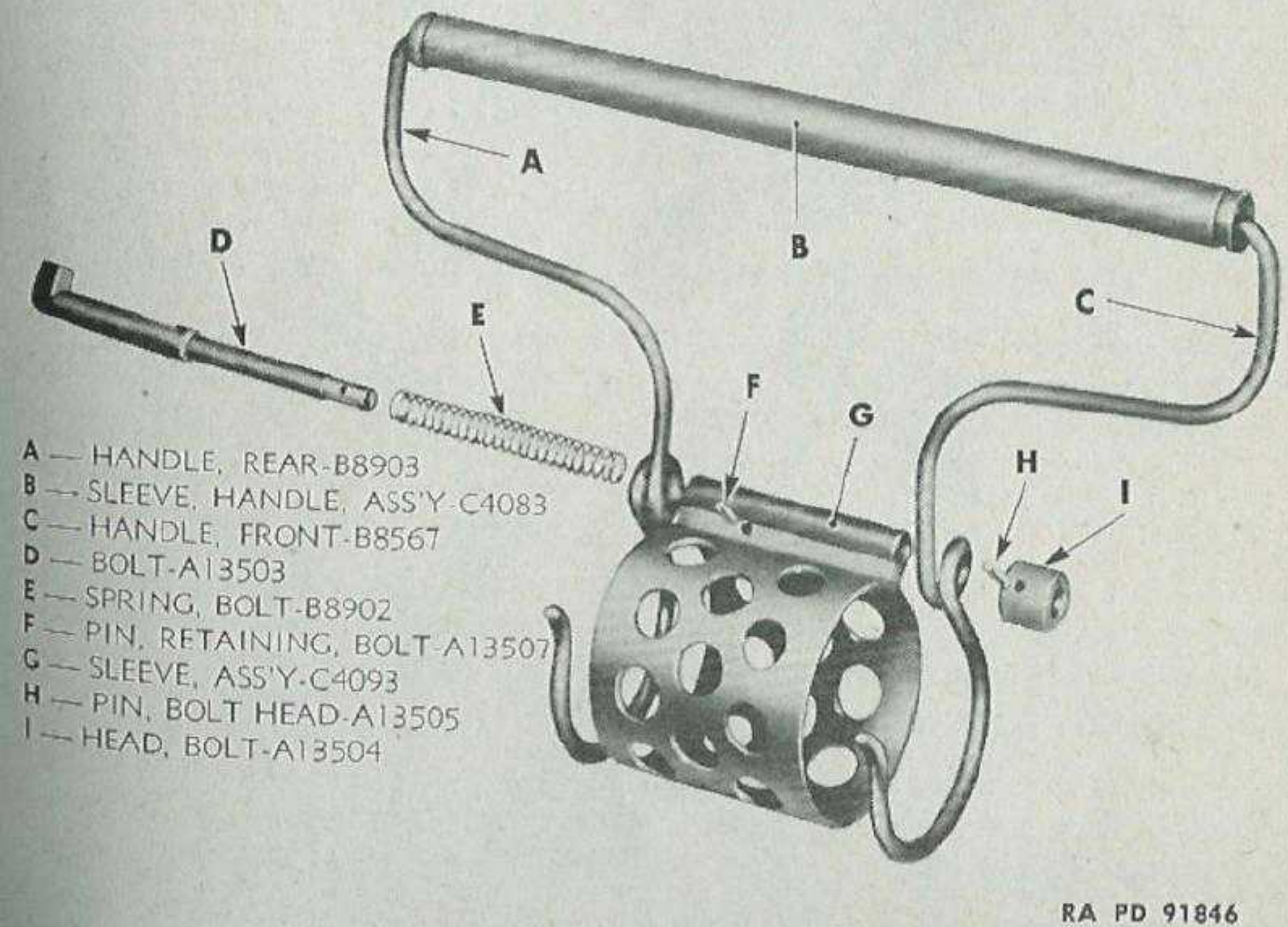
CASING GROUP



A — ROLLER-A13425
B — PIN, ROLLER-A13415
C — PIN, COTTER (1 16"X 7 16")-137130
D — SPRING, PLUNGER-A13423
E — PLUNGER, HANDLE-A13417
F — STOP-A13420
G — GUIDE-B8745
H — SCREW, GUIDE, REAR, UPPER-A13419B
I — SCREW, GUIDE, REAR, LOWER-A13419C
J — BAR-C3946
K — HOOK-A13422
L — GUIDE, FRONT-A13421
M — SCREW, GUIDE, FRONT-A13419A
N — WIRE, S.-BFWX1A
O — PIN, STOP, HANDLE-A13418
P — PIN, HINGE, HANDLE-A13416
Q — HANDLE-C3945
R — RIVET, S., CK-HD., 1 8"X 3 8",
S — SPRING-A9804
T — PIECE, BACK, GUIDE-A13609

RA PD 91845

Figure 89—Operating Slide Group Assembly—Parts Arranged for Assembly to Left Side Plate—Exploded View



A — HANDLE, REAR-B8903
B — SLEEVE, HANDLE, ASS'Y-C4083
C — HANDLE, FRONT-B8567
D — BOLT-A13503
E — SPRING, BOLT-B8902
F — PIN, RETAINING, BOLT-A13507
G — SLEEVE, ASS'Y-C4093
H — PIN, BOLT HEAD-A13505
I — HEAD, BOLT-A13504

RA PD 91846

Figure 90—Barrel Carrier Assembly—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

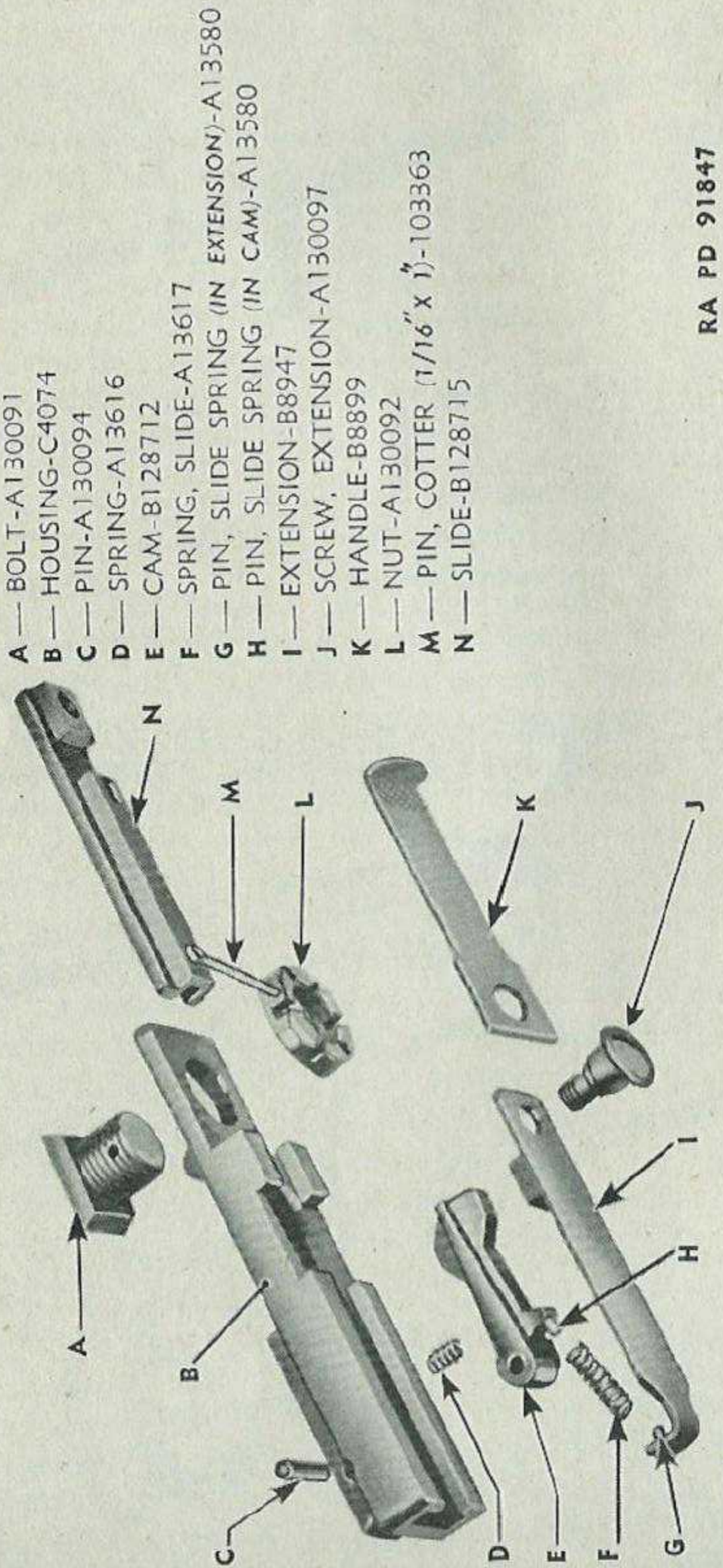


Figure 91—Side Plate Trigger Assembly—Exploded View

CASING GROUP

g. Barrel Carrier Assembly (Heavy-barrel Guns). Unscrew the barrel and remove it from the gun. Drive out the barrel carrier bolt head pin and remove the head. Remove the bolt retaining pin from the bolt sleeve. This pin holds the bolt against the pressure of the bolt spring and also keeps the bolt from rotating. Now rotate the bolt one-half turn so that the lug on the end of the bolt is turned away from the barrel, and slide the bolt from its sleeve. This action frees the wire handles, and the hooked ends can be forced out of the retaining grooves in the barrel. If necessary to replace a handle, turn the two handles in opposite directions and they will unscrew from the special nut contained within the handle sleeve assembly. The sleeve assembly can now be removed from the barrel. The disassembled parts of the carrier are shown in figure 90. NOTE: *The barrel carrier is used only with heavy-barrel, flexible guns.*

h. Side Plate Trigger Assembly *A037-02-01930.* Although this assembly is a part of the antiaircraft mounts, for convenience it is covered with the gun. Disassemble as follows:

(1) Loosen the side plate trigger nut and disengage the trigger bolt head from the side plate of the receiver. Remove the nut and bolt from the trigger.

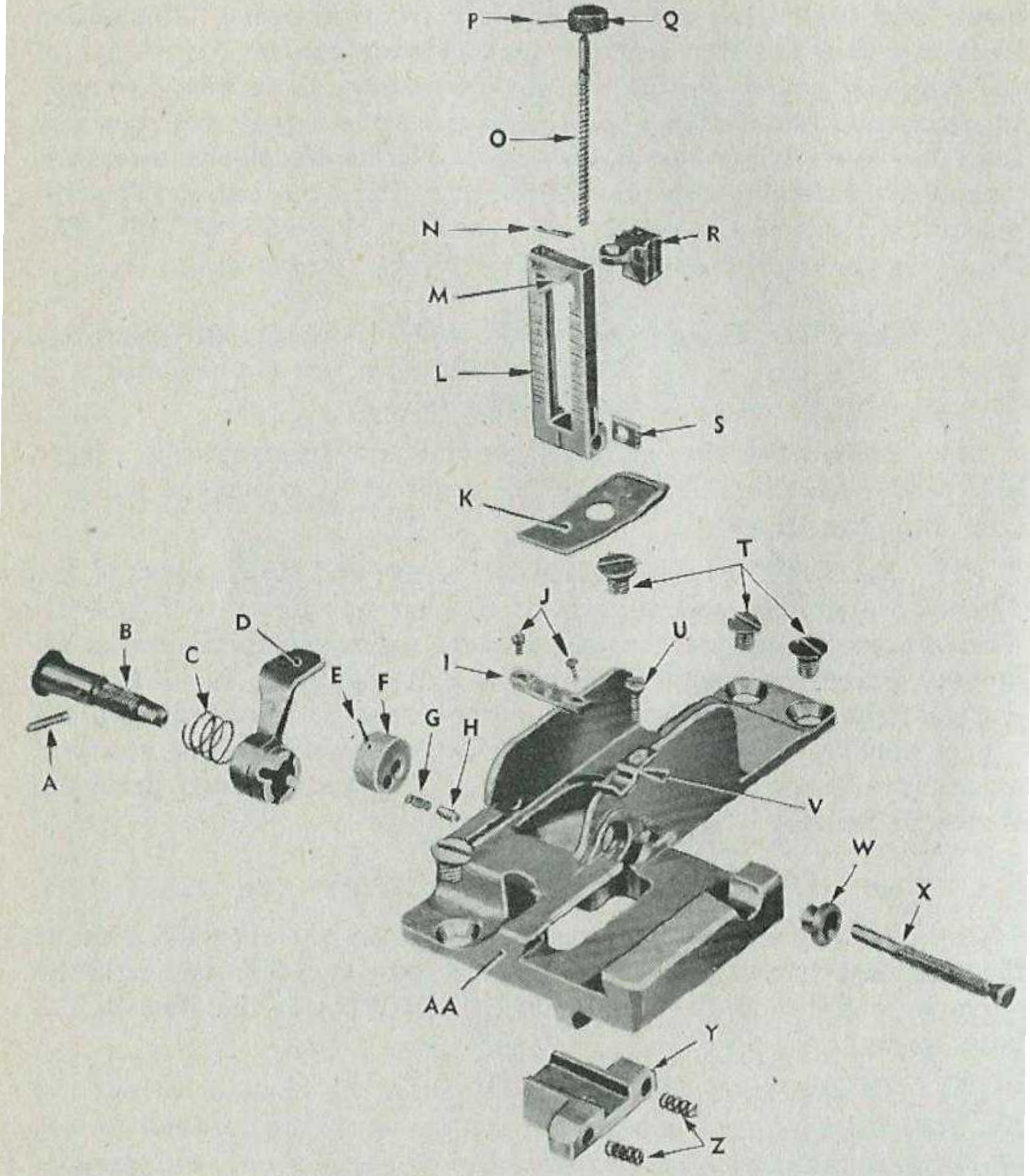
(2) Remove the trigger extension screw, and lift this end of the extension assembly and slide it to the left as viewed in figure 91. This action will release the trigger slide spring which should be removed. Force the trigger slide to the extreme right. It will be disengaged from the cam assembly and then can be removed from the trigger housing. Press out the trigger pin which will release the cam assembly and spring from the housing. The disassembled parts are shown in figure 91.

i. Rear Sight Group (Heavy-barrel Guns) (fig. 92).

(1) To remove the rear sight group from the receiver, remove the four base screws and lift group from receiver. The leaf must be elevated and the center screw unscrewed through the hole in the base spring.

(2) To remove the leaf assembly from the base, drive out the pin from the windage knob and remove knob, taking care not to lose spring and plunger in knob. Unscrew windage screw and remove leaf assembly from base. The base spring may be removed by driving out to the rear, and the windage scale by removing the retaining screws.

(3) To disassemble the leaf assembly, drive out the elevating screw retaining pin from the top of the leaf and remove screw and other parts, noting position for reassembly.



RA PD 91848

Figure 92—Rear Sight Group for Heavy-barrel Guns—Exploded View

CASING GROUP

A — PIN, RETAINING, TELESCOPIC SIGHT CLAMP SCREW-A152409
B — SCREW, CLAMP, TELESCOPIC SIGHT-A152410
C — SPRING, TELESCOPIC SIGHT CLAMP SCREW-A152411
D — HANDLE, TELESCOPIC SIGHT CLAMP SCREW-A152408
E — PIN, REAR SIGHT WINDAGE KNOB-A13700
F — KNOB, REAR SIGHT WINDAGE SCREW-B8809
G — SPRING, REAR SIGHT WINDAGE CLICK PLUNGER-A13154
H — PLUNGER, REAR SIGHT WINDAGE CLICK-A13155
I — SCALE, WINDAGE, REAR SIGHT-A13607
J — SCREW, REAR SIGHT WINDAGE SCALE-A13167
K — SPRING, REAR SIGHT BASE-A13619
L — LEAF, REAR SIGHT-D28281
M — PIN, RETAINER, REAR SIGHT ELEVATING SCREW-A13162
N — CLICK, REAR SIGHT ELEVATING KNOB-A13161
O — SCREW, ELEVATING, REAR SIGHT-B8973
P — PIN, REAR SIGHT ELEVATING KNOB-A13166
Q — KNOB, REAR SIGHT ELEVATING SCREW-A13610
R — SLIDE, REAR SIGHT-C4096
S — NUT, HALF, REAR SIGHT-B8974
T — SCREW, REAR SIGHT BASE-A153191
U — SCREW, REAR SIGHT COVER PLATE-A152658
V — PLATE, COVER, REAR SIGHT-A152412
W — STOP, REAR SIGHT LEAF-A13253
X — SCREW, WINDAGE, REAR SIGHT-A13160
Y — CLAMP, TELESCOPIC SIGHT-B8584
Z — SPRING, TELESCOPIC SIGHT CLAMP-A13620
AA — BASE, REAR SIGHT, ASSEMBLY-D28338

RA PD 91848A

Legend for Figure 92—Rear Sight Group for Heavy-barrel Guns—Exploded View

(4) To remove telescopic sight clamp, pull out on handle of clamp screw and remove screw. Then push clamp down out of sight base, taking care not to lose springs. The handle and spring may be removed from the screw by driving out pin from screw.

j. Front Sight Group (Heavy-barrel Guns). The front sight cover and blade may be removed from the trunnion block by driving out the two cross pins.

46. INSPECTION.

a. Thoroughly clean and inspect all parts with special attention to the following points:

(1) Inspect receiver for loose rivets, loose or missing bolt stop, loose or bent belt holding pawl brackets, and loose bolt latch bracket.

(2) Check side plates for deformation, cracks at back plate grooves, and clearance for free movement of bolt and bolt stud. The total clearance between bolt and side plate, with bolt in battery position, and measured at rear of bolt, should be between 0.012 and 0.24 inch. This dimension applies only to guns that are to be fired by a side plate trigger motor. For aircraft guns, this means all synchronized installations. For guns fired by other means (side plate solenoid, back plate solenoid, and flexible back plate), this dimension may increase to 0.030 inch maximum without affecting gun functioning.

(3) Check right-hand side plate for clearance cut at top edge and extending back 4¼ inches from feedway for belt feed lever (par. 47 **b**).

(4) Check movement of switch, spring tension, and condition of threads on switch and nut.

(5) Check breech lock cam for burs, wear, and adjustment with regard to bottom plate (par. 35 **d** (3) *(c)*). It should have slight float and preferable clearance with bottom plate of 0.001 to 0.008 inch, but may have clearance of 0.001 to 0.012 inch measured at forward end (fig. 54). Check for dirt under cam, and its security on bottom plate.

(6) Check trigger bar for deformation, wear, and burs on camming surfaces. Check for timing when assembled. Bar should not drag on bolt. Check trigger bar pin for burs or broken lock.

(7) Check adjustable trigger bar stop assembly (if used) for looseness on receiver, loose or projecting positioning pin, worn serrations in nut, and for weak, bent, or broken spring.

CASING GROUP

(8) Check cartridge stops and link stripper for position and condition. Check right-hand rear cartridge stop for condition and operation, burs on plunger, and weak alining pawl spring (pars. 47 **h** and **r**). Spring *A13613* should have from 11¼ to 12¾ coils and minimum free length of forty-seven sixty-fourths inch.

(9) Check belt holding pawl for burs, wear, and dirt in spring seats, and spring or springs for weakness. Old-type single spring *A9522* used with pawl *B8916*, should have 10½ coils and minimum free length of twenty-three thirty-seconds inch. New-type, cadmium-plated, twin springs *A153146* used with pawl *B261098*, should have 11½ coils and minimum free length of fifty-one sixty-fourths inch. (Do not confuse these twin springs with springs *B7160628* used with new-type split pawl; these springs have 10 coils, and free length of ¾ ± 1/32 inch.)

(10) Check cover detent pawl for burs and movement when assembled; it should not bind. Check spring for rust and weakness. Spring *A13520* should have 8¼ to 9¾ coils and minimum free length of thirteen-sixteenths inch.

(11) Check trunnion block lock for burs and spring for weakness. Spring *A13566* should have 11¼ to 12¾ coils and minimum free length of twenty-five thirty-seconds inch.

(12) Check front sight (heavy-barrel guns) for looseness or missing pins, and for alinement. Check rear sight (heavy-barrel guns) for loose or missing base screws, action of elevating and windage knobs, tension of base spring, and action of telescopic sight clamp.

(13) Check action of side plate trigger (mount component) slide, and check for burs on cam and lug and for kinked or weak spring.

(14) Check barrel jacket (aircraft gun) for security on receiver deformation, dents, and rust. Barrel must not bind in jacket when assembled. Check jacket for excessive amount of weld metal at breech bearing (par. 47 **f**). Check front barrel bearing for burs, carbon, or missing screws. Check booster or flash hider (aircraft guns) for carbon, loose lock washer, loose parts, or loose attachment to barrel jacket (par. 45 **a** (10) and 47 **k**).

(15) Check barrel support (heavy-barrel guns) for security to trunnion block, deformation, and binding with barrel when assembled; there should be no binding.

(16) Check alinement of water jacket (water-cooled guns) with receiver and make sure trunnion block lock seats in recess in rear end cap when assembled. Test operation of drain valve, check threads on reducing bushings, and check for leaks and missing covers. Check for burred threads on front end cap and missing thread cover, missing

or loose front barrel bearing lock screw jam nut, and loose front barrel bearing lock screw. Remove muzzle gland and check for burred threads. Inspect front and rear (in barrel) barrel packing but do not remove except for replacement. Test free sliding of steam tube on supports by tipping jacket and listening for sliding of tube. Check for missing front steam tube support lock screw. Some guns have a fixed steam tube, and can be identified by the absence of the front steam tube support in the front end cap.

(17) Check retracting slide for damaged threads on nuts and attaching screws, for loose screws, for weak lever spring and plunger spring, and for burred plunger. Check for loose or damaged handle bolt and lever stud, and for cracked handle grip.

(18) Check operating slide for damaged or loose guide screws, bent slide bar, burs, loose hook, or weak slide springs.

47. MAINTENANCE AND REPAIR.

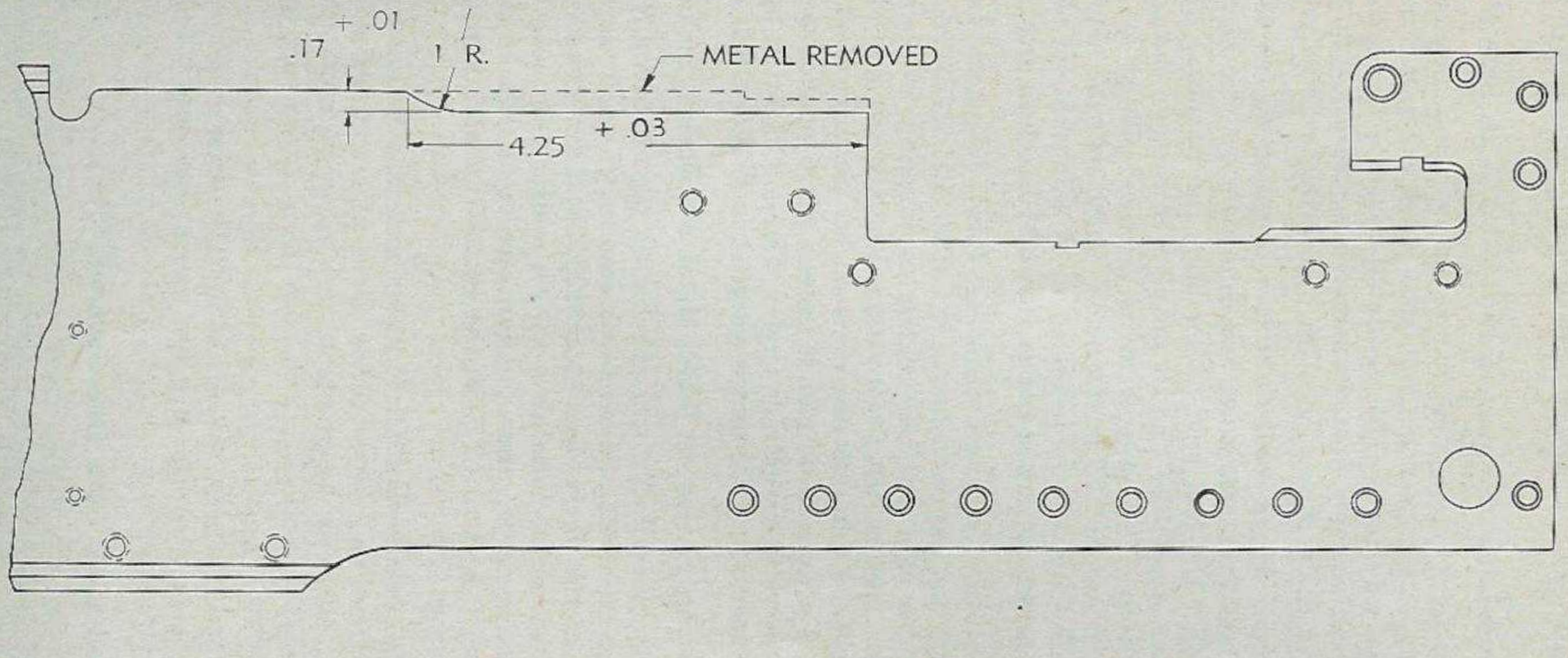
a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-225, TM 9-226, or FM 23-65 pertaining to the gun in question. Major repairs and modifications are explained below.

b. Providing Clearance for Belt Feed Lever With Side Plate.

(1) When Browning Machine Guns, Cal. .50, M2 are arranged to feed from the left, the belt feed lever may strike the side plate. This difficulty may be overcome by milling away a portion of the metal (from the top of the right-hand side plate) immediately to the rear of the feedway. The cut should be 4.25 inch +0.03 inch long and 0.17 inch +0.01 inch deep. The cut should be taken from front to rear, terminating with a 1-inch radius or less. The metal to be removed is shown in figure 93.

(2) If facilities for milling the side plate are not available, grind away a small amount of metal from the belt feed lever. Only enough metal should be removed to overcome the interference. Guns now being manufactured have metal removed from the top of the right-hand side plate and interference will not be experienced. Only guns in which interference is encountered should be corrected.

c. Relieving Binding of Switch on Side Plate. If the switch of new guns cannot be properly adjusted, the inside of the switch nut should be countersunk one thirty-second inch by 60 degrees with the point of a drill. This will allow the proper adjustment to be made.



RA PD 33305

Figure 93—Modification of Right-hand Side Plate

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

d. Relieving Interference of Bolt Stud With Side Plate.

(1) In several cases, due to an unfavorable combination of manufacturing tolerances, the bolt stud rides the lower portion of the slot in the side plate. This condition causes a bur to be set up at the bolt stud insertion hole. In some cases, the bur will cause the bolt to bind in the receiver. In other cases, the bolt stud will break.

(2) On guns where the bolt stud is dragging on the lower portion of the slot in the side plate, the side plate may be filed until it does not contact the bolt stud. After filing for clearance, the inside edge of the slot should be slightly beveled, to remove the possibility of burs recurring. The amount to be removed should in all cases depend on the amount of interference. Only enough metal should be removed to eliminate the interference of bolt stud and side plate. The amount removed should not exceed 0.010 inch in any case.

e. Modification of Belt Holding Pawl Brackets for Twin Springs. Belt holding pawl brackets *C4059* and *B128730* are now being modified to seat two belt holding pawl springs in place of one. The new-type springs used with this modification are cadmium-plated to easily distinguish them from the old-type single spring, and they exert a force of 7 pounds instead of 16 pounds when compressed to minimum operating height. The modification applies to the Aircraft Basic Gun M2 and is covered in MWO ORD A38-W9.

f. Removing Excessive Weld Metal on Barrel Jacket.

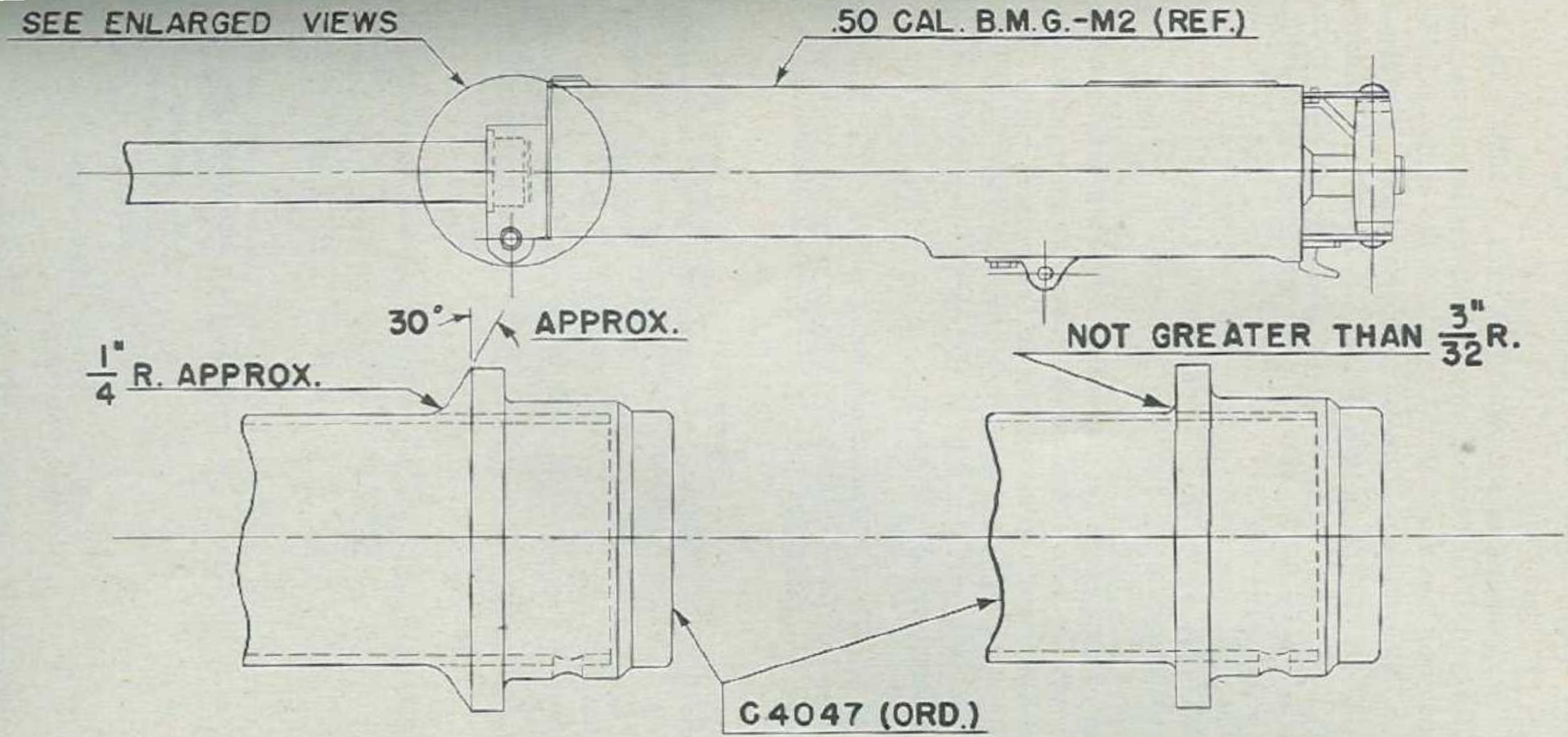
(1) During manufacture of the barrel jacket assembly for the Aircraft Basic Gun M2, an excessive amount of weld metal is left at the joint of the barrel jacket *D28255*, and the breech bearing *B8921*. This excess of metal does not in most cases cause difficulty in installation; however, when the guns are to be used in Air Corps adapters, types E-8, E-10, or E-12, the excessive metal interferes with proper mounting.

(2) Figure 94 shows a barrel jacket assembly before correction, as outlined herein, and the condition of the fillet as it should be after correction. If facilities are available, the excessive metal should be removed in a lathe; however, in an emergency, it can be removed by grinding or filing.

(3) Correction should be made to this materiel only in cases where the existence of the excessive metal will cause difficulty in installation.

g. Breech Lock Cam Replacement.

(1) The breech lock cam used on Browning Machine Gun, Cal. .50, M2 was revised 12 June 1940 by increasing the width of the



WELD ON BARREL JACKETS OF SOME B.M.G. CAL.. 50, M2 AC

REWORK NECESSARY FOR USE WITH E-8-E10 OR E-12 ADAPTERS

RA PD 7760

Figure 94—Excessive Weld Metal on Barrel Jacket

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

lug that fits into the bottom plate from 0.740 inch —0.005 inch to 1.505 inches —0.005 inch. This necessitated increasing the breech lock cam cut in the bottom plate from 0.763 inch +0.005 inch to 1.533 inches +0.005 inch. Due to this change, breech lock cams of present manufacture will not fit bottom plates of early manufacture. Therefore, when breech lock cams with this larger lug are issued for assembly to bottom plates with the smaller cut, the following modification is necessary and authorized:

(a) File, grind, or mill the breech lock cam cut in the bottom plate to the dimension given in step (2), below.

(b) This modification is to be applied only when breech lock cams with larger lugs are issued for replacement on guns manufactured with the smaller breech lock cam cut in the bottom plate. Replacements will be made, as far as possible, with the same type cam as originally used on the gun. Revision of the cam cut in the bottom plate will be made only when necessary.

(2) The following are the dimensions and piece marks of the breech lock cam lugs and bottom plate recesses that have been used on all cams manufactured to date:

Piece Mark	Item	Dimension		Remarks
B8956	CAM, breech lock, assembly	0.624 in. x 0.740 in.	—0.005 in. —0.005 in.	Some were incorrectly stamped C4063 (B, fig. 95); superseded by B147545.
B147545	CAM, breech lock, assembly	0.626 in. x 1.505 in.	—0.001 in. —0.005 in.	Some were incorrectly stamped B8956 (A and C, fig. 95); superseded by B147583.
B147583	CAM, breech lock, assembly	0.625 in. x 1.505 in.	—0.002 in. —0.005 in.	Latest type; some were incorrectly stamped B8956 and others B147545-0 (D, fig. 95).
B147583A	CAM, breech lock	0.625 in. x 1.505 in.	—0.002 in. —0.005 in.	Same as cam assembly B147583 except that it is made of malleable pearlitic iron and is made in one piece.
D28257	PLATE, bottom	0.626 in. x 0.763 in.	+0.002 in. +0.005 in.	Early type.
D28257	PLATE, bottom	0.626 in. x 1.533 in.	+0.002 in. +0.005 in.	Present type.

RA PD 5903

Figure 95—Types of Breech Lock Cams

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

h. Fit of Cartridge Stops and Link Stripper or Right-hand Rear Cartridge Stop Assembly. These parts must have a free fit in the trunnion block (subparagraph r, below). Play of 0.001 inch is desired. If the fit is snug, the right-hand rear cartridge stop may be filed until the desired freedom is obtained. In some cases the link stripper will bind due to dirt or burs in its groove in the trunnion block. All sharp edges and burs should be removed from the slot and the feedway. The bottom of the lower prong of the link stripper must not extend above the rib in the trunnion block. CAUTION: *The trunnion block must not be filed.*

i. Incorrect Serial Numbers and Necessary Modifications to Aircraft Guns.

(1) The first Browning Machine Guns, Cal. .50, M2, aircraft, manufactured by the High Standard Manufacturing Company, are marked as shown below:

Colt Aircraft Machine Gun
Browning Type
Model MG 53-2 Caliber .50

This marking is erroneous, and the guns should be carried on records as:

GUN, Machine, Cal. .50, Browning, M2, Aircraft, Basic

The serial numbers of guns marked erroneously are 151125 to 162799, both numbers inclusive. When any of the above guns are received in an ordnance shop for overhaul, the markings should be changed by eliminating the superfluous wording and adding the designation "M2" as shown below:

Machine Gun
Browning
Caliber .50 M2

(2) It has also been found in a good many of these guns that the trigger bar pin hole in the top plate bracket *C4070* was not finish-reamed to 0.267 +0.002 inch at assembly as required. Also, shoulder on top plate bracket stud *A9367* is improperly located, which decreases space between bracket *C4070* and head of stud sufficiently to prohibit assembly of trigger bar. This dimension should be 0.190 inch. If these guns are used in flexible installations, the trigger bar pin hole in top plate bracket must be reamed to 0.267 +0.002 inch, and head of top plate bracket stud must be filed to provide space of 0.190 +0.005 inch. These guns can be used for fixed installations without reaming or filing, and should be so installed where practicable.

CASING GROUP

The affected guns are numbered from 151125 to 159024. Requisitions for the reamers should be submitted to Springfield Armory.

j. Use of Split-type Belt Holding Pawl. A split type of belt holding pawl is now being installed in aircraft guns in certain installations (P-51 series). This pawl assembly consists of right-hand belt holding pawl *B7160625*, a left-hand belt holding pawl *B7160626*, a belt holding pawl sleeve *B7160627;* and two belt holding pawl springs *B7160628*. In some instances, due to excessive loads, the front end of the cartridge case swings outward and the belt holding pawl fails to hold the belt. This split-type pawl aids in elimination of this trouble. A view of pawl exploded from receiver is shown in figure 75.

k. Removing Carbon From Booster Assembly *A038-7160043* **(Aircraft Guns).** Carbon deposits may form in the booster and decrease the rate of fire of the gun. The booster should be checked for carbon deposits between the booster plug and the barrel sleeve guide after each flight, or each time the gun has been fired three or four thousand rounds. Carbon can best be removed by removing the plug housing (with plug) from the booster sleeve and scraping the carbon out of the booster. A disassembled view of booster is shown in figure 82. CAUTION: *The barrel sleeve guide has sharp edges which act as a scraper and help keep the carbon from the barrel sleeve. When cleaning the carbon from the booster, the edges of the barrel sleeve guide should not be burred or dulled.*

l. Correcting Bent Trigger Bar.

(1) If trigger bar is sprung down, so that it drags on the bolt when the trigger is depressed and the bolt is retracted, or if there are burs on beveled face of trigger bar, or on sear, the gun may revert to uncontrolled automatic fire. With bolt retracted, check with feeler gage. There should be 0.005-inch clearance between forward end of trigger bar and top of bolt. In this case replace parts, or in emergency, straighten bar and stone off burs. After repairing, check timing as described in TM 9-225, TM 9-226, or FM 23-65.

(2) Trigger bar *B257592* (revisions 5 to 8) (fig. 96) is now in production. This trigger bar has two principal points of improvement. It has a slight offset, which insures better contact with the G11 back plate solenoid; and its stiffer construction eliminates flexibility, which caused variation in timing and possibility of riding on top of the bolt.

NOTE: *The early design trigger bar B8944, modified design B257592 (revision 3), and present design B257592 (revision 5) are shown for comparison in figure 96. The modified-design bar designated as B257592 (revisions 1 to 4) should not be confused with the present- or new-design bar B257592 (revisions 5 to 8) which is easily*

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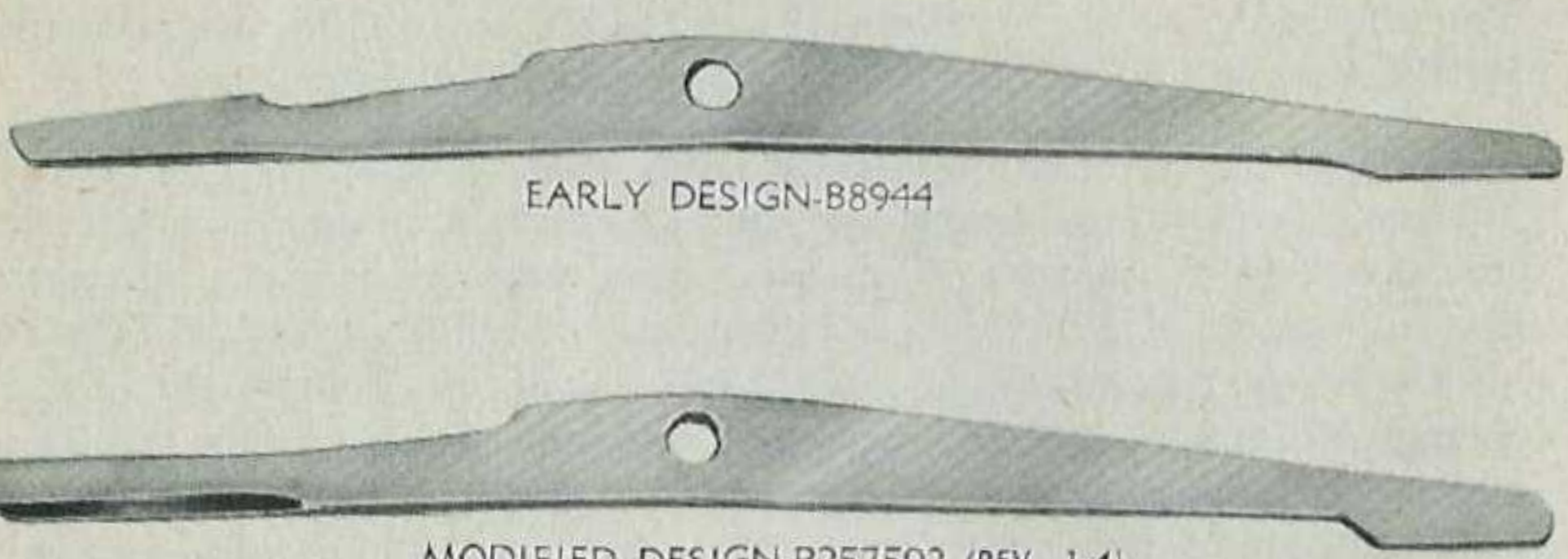

Figure 96—Trigger Bars of Early and Present Manufacture, Showing Differences in Design

identified by greater depth, the notch in the top forward edge, and the offset rear end.

m. Installation of Adjustable Trigger Bar Stop Assembly *A037-7312031* in Machine Guns, Cal. .50, M2 (All Types).

(1) An adjustable trigger bar stop assembly (fig. 97) has been standardized for the Machine Gun, Cal. .50, M2 (all types), and is being installed in guns of current production. This assembly consists of the following components:

Piece Mark	Item	Quantity
B7312031	Stop, adjustable trigger bar, assembly	1
	(Composed of:	
	one B7312030 Body, adjustable trigger bar stop	
	one A7312027 Nut, adjusting trigger bar stop	
	one B7312029 Spring, trigger bar stop, adjusting nut)	
A7312028	Screw, retaining	1

NOTE: *In future, retaining screw A7312028 will be included in the assembly, which will have drawing number B7312031.*

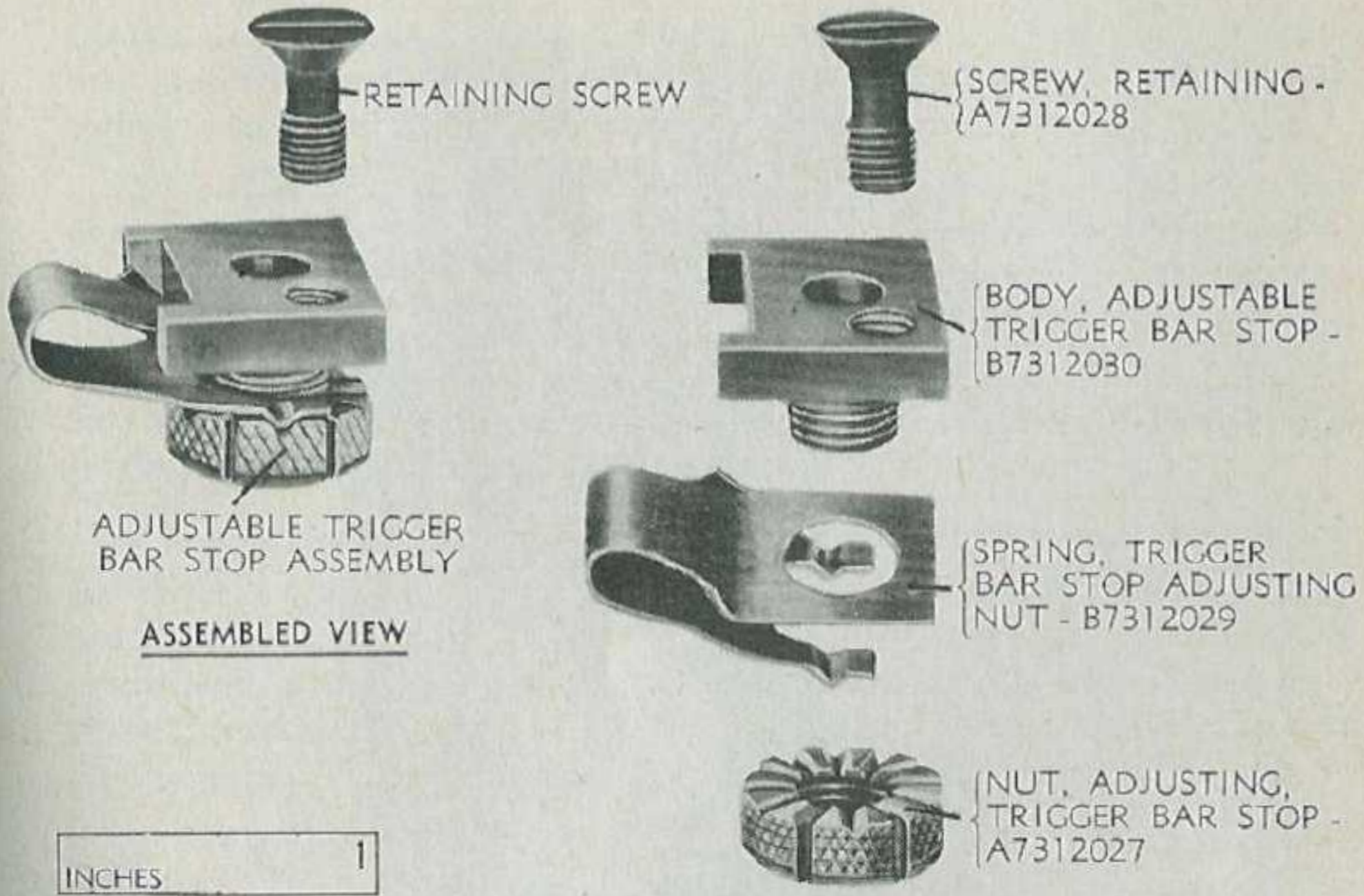

Figure 97—Adjustable Trigger Bar Stop Group

(2) The adjustable stop eliminates difficulty in timing guns when it is necessary to replace or interchange trigger bars. The rear trigger bar stop *A9390*, which is riveted in the top plate, is still utilized but acts merely as a locating pin for the new adjustable trigger bar stop body. The body is held in the receiver by removing the rear top plate cover screw and inserting and staking the retaining screw. An adjusting nut with retention spring screws onto the under side of the body, so that the nut actually forms a stopping surface for the rear end of the trigger bar.

(3) The spring and nut are so designed that in rotating the nut, definite click positions can be noticed. To secure later timing, that is, to make the gun fire nearer battery position, the adjusting nut should be turned to the left. To secure earlier timing, the nut should be turned to the right. In the latter instance, however, care should be taken to prevent the toe of the trigger bar from touching the top of the bolt. One notch of adjustment is equal to approximately 0.004-inch change between the toe of the trigger bar and the top of the bolt.

(4) It is not contemplated that these adjustable stops will be installed in all guns already in the field. They are available for those guns in which difficulty in timing is experienced, and will be requi-

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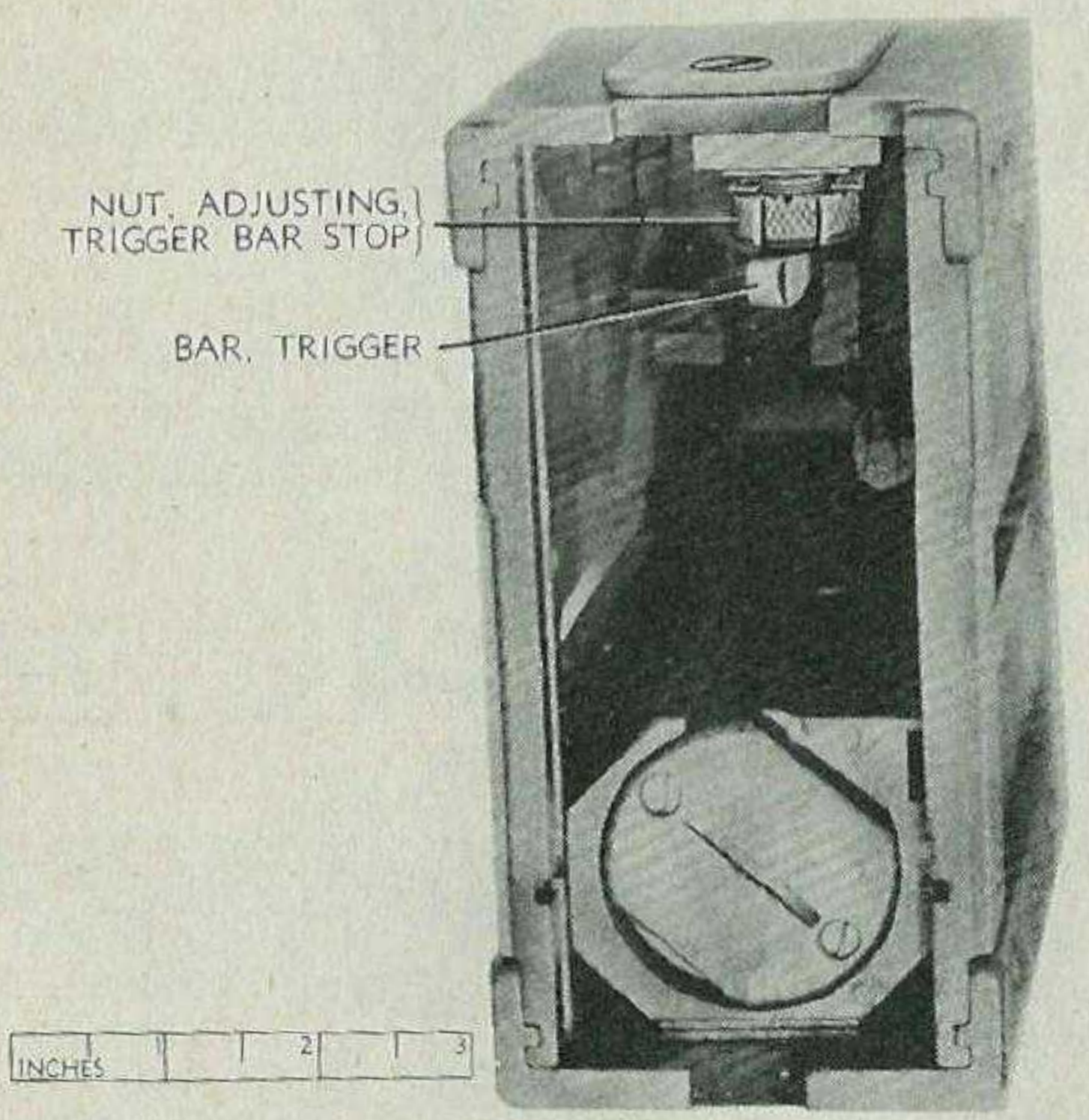

Figure 98—Adjustable Trigger Bar Stop Assembly, Assembled in Receiver of Heavy-barrel Gun M2

sitioned under the nomenclature and drawing numbers listed in step (1), above.

(5) To install the adjustable stop (fig. 98), remove the back plate and operating groups and file off the trigger bar stop to change dimension from 0.592 to 0.480 —0.040 inch. Remove the rear cover plate screw, insert the adjustable stop assembly into the receiver over the trigger bar stop, fasten with retaining screw, and stake in place. Adjustment of timing can then be made by rotating the adjusting nut on the stud of the body as described above. The spring merely prevents the nut from rotating after the gun is once properly timed. NOTE: *If when assembled, the retaining screw projects through the body so as to depress the corner of the spring, file screw off so that it will be flush with body when assembled. To prevent the screw loosening, it should be staked to body after having been filed flush.*

n. Repairing Water Jacket Leaks (Water-cooled Guns).

(1) When leaks are due to porous metal or small seams, clean the surface with a fine file (or open seam slightly) and solder carefully with hard solder. Clean and paint surface affected to prevent

rusting. In case of damaged threads of reducing bushings, necessitating replacement of bushing, heat with torch before attempting to remove, as these bushings are usually sweated in.

(2) If a leak develops at the threaded connection between the water jacket and the trunnion, it will be necessary to disassemble these parts. After disassembly, the threads should be thoroughly cleaned and coated with white lead. Reassemble parts. It may be necessary to use a thicker shim between the water jacket and the trunnion block, to insure that the parts are tight when the trunnion block lock engages in its recess.

o. Repairing Sticking Steam Tube (Water-cooled Guns). In water-cooled guns which embody a sliding steam tube, the tube must move easily for proper functioning of the gun. If the tube sticks and fails to slide easily on the tube supports when the gun is tipped, remove the assembly from the water jacket; disassemble and clean the tube and supports; and assemble and reinstall.

p. Replacing Front and Rear Barrel Packing (Water-cooled Guns). The packing used on Water-cooled Gun M2 is formed to dimensions. Inside diameter of rear packing *A152638* is 1.45 inches ±0.010 inch and of the front packing *A135710*, 1.575 inches ±0.010 inch. Remove barrel assembly from the gun before packing.

(1) To Pack Breech End. Unscrew packing adjusting ring on the barrel, using packing ring adjusting wrench *41-W-3242-500*, and remove the old rear barrel packing. Clean the recess in the barrel and insert new rear barrel packing *A152638*. Smooth barrel packing until the ends meet. This can be done with a piece of flat metal wide enough to span the packing recess. Never cut off any of the packing, as the entire amount of formed packing must be used to insure against water leaks. Screw the packing adjusting ring lightly against the packing to hold it in place.

(2) To Pack Muzzle End. Unscrew the front barrel bearing lock screw jam nut and front barrel bearing lock screw from the water jacket. Unscrew and remove muzzle gland using combination wrench. Remove muzzle packing ring and old front barrel packing. Clean out inside of the front barrel bearing. Insert new front barrel packing *A135710* and replace muzzle packing ring and muzzle gland. Screw muzzle gland lightly against the ring and packing, as the gland will be adjusted and locked in place after the barrel is reassembled in the gun. Reassemble the barrel assembly into the gun, being careful not to injure the barrel packing.

(3) Adjust the front and rear barrel packing, following the instructions given in subparagraph **q**, below. New packing may have to be readjusted after gun has been fired.

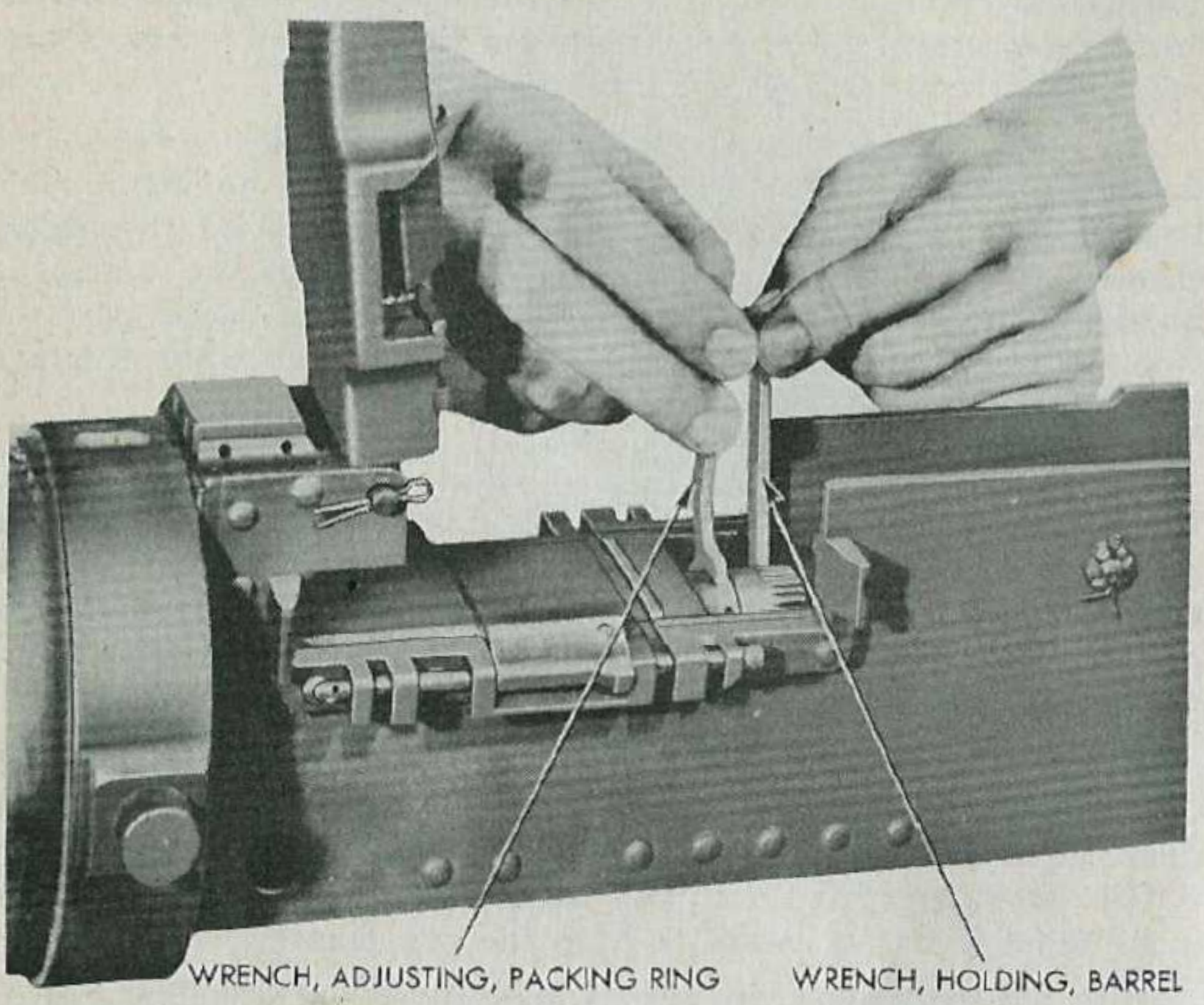

Figure 99—Adjusting Rear Barrel Packing

q. Adjusting Front and Rear Barrel Packing (Water-cooled Guns).

(1) When leakage occurs at the front or rear barrel packing, the packing should be adjusted. If this fails to stop the leakage, the barrel will have to be repacked. This refers to water-cooled Gun M2.

(2) Adjust the front barrel packing (muzzle packing) by loosening the front barrel bearing lock screw jam nut and front barrel bearing lock screw. Use combination or machine gun wrench to loosen or tighten the muzzle gland as required. Packing should not bind. Tighten the front barrel bearing lock screw and front barrel bearing lock screw jam nut.

(3) Adjust the rear barrel packing (breech packing) by tightening or loosening the packing adjusting ring. To do this, the barrel is drawn backward only enough to expose the barrel locking notches, leaving the packing still within the trunnion. The barrel holding wrench *41-W-530* is inserted between the barrel and the receiver side plate so as to engage the barrel locking notches and keep the

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barrel from turning (fig. 99). The packing ring adjusting wrench *41-W-3242-500* is then engaged in the holes in the packing ring to turn the ring. Turning the ring in a clockwise direction when facing the breech end of the barrel tightens the ring against the packing. Do not tighten the ring too tightly as it will cause the packing to bind.

r. Short Recoil. If difficulty is encountered with short recoil, a common type of stoppage usually caused by poor adjustment of timing, head space, or by uncalculated loads, check the following:

(1) Rear right-hand cartridge stop assembly or rear cartridge stop and link stripper should be free to move in trunnion block (subparagraph **h**, above).

(2) Breech lock cam should be free to move in bottom plate.

(3) Trigger bar must not drag on bolt.

(4) Bolt latch should not drag on bolt.

(5) Ammunition should be fed into gun with end of belt having double loop entering gun first.

(6) Oil buffer adjustment on Aircraft or Water-cooled Gun M2 must be correct. (For adjustment, see TM 9-225 and TM 9-226.)

48. ASSEMBLY.

a. Receiver and Barrel Jacket. If the barrel jacket (aircraft guns) or water-jacket (water-cooled guns) have been disassembled from the receiver they should be assembled before the receiver is further assembled. An exploded view of the receiver is shown in figure 100.

(1) Screw the barrel jacket (aircraft guns) into the trunnion and tighten with the combination wrench until the holes for the breech bearing lock screw are in alinement. If a new jacket is being installed, tighten firmly into the trunnion; then drill a hole in the jacket for the breech bearing lock screw, with a No. 7 drill, by mating through the hole in the top of the trunnion. Insert the breech bearing lock screw.

NOTE: *For information on blank firing attachment, refer to paragraph 75.*

(2) If the booster assembly *A038-7160043* (aircraft guns) (fig. 82) is to be assembled to the barrel jacket in place of the front barrel bearing (fig. 81), it may be assembled as explained below. Before assembly, remove carbon, and clean and lightly oil parts using preservative lubricating oil (special). Assemble as follows:

(a) Place barrel sleeve guide squarely in its seat in the booster sleeve, and place a *new* lock washer on the plug housing.

(b) Screw plug housing into booster sleeve observing care that barrel sleeve guide seats level when assembled. Tighten parts using

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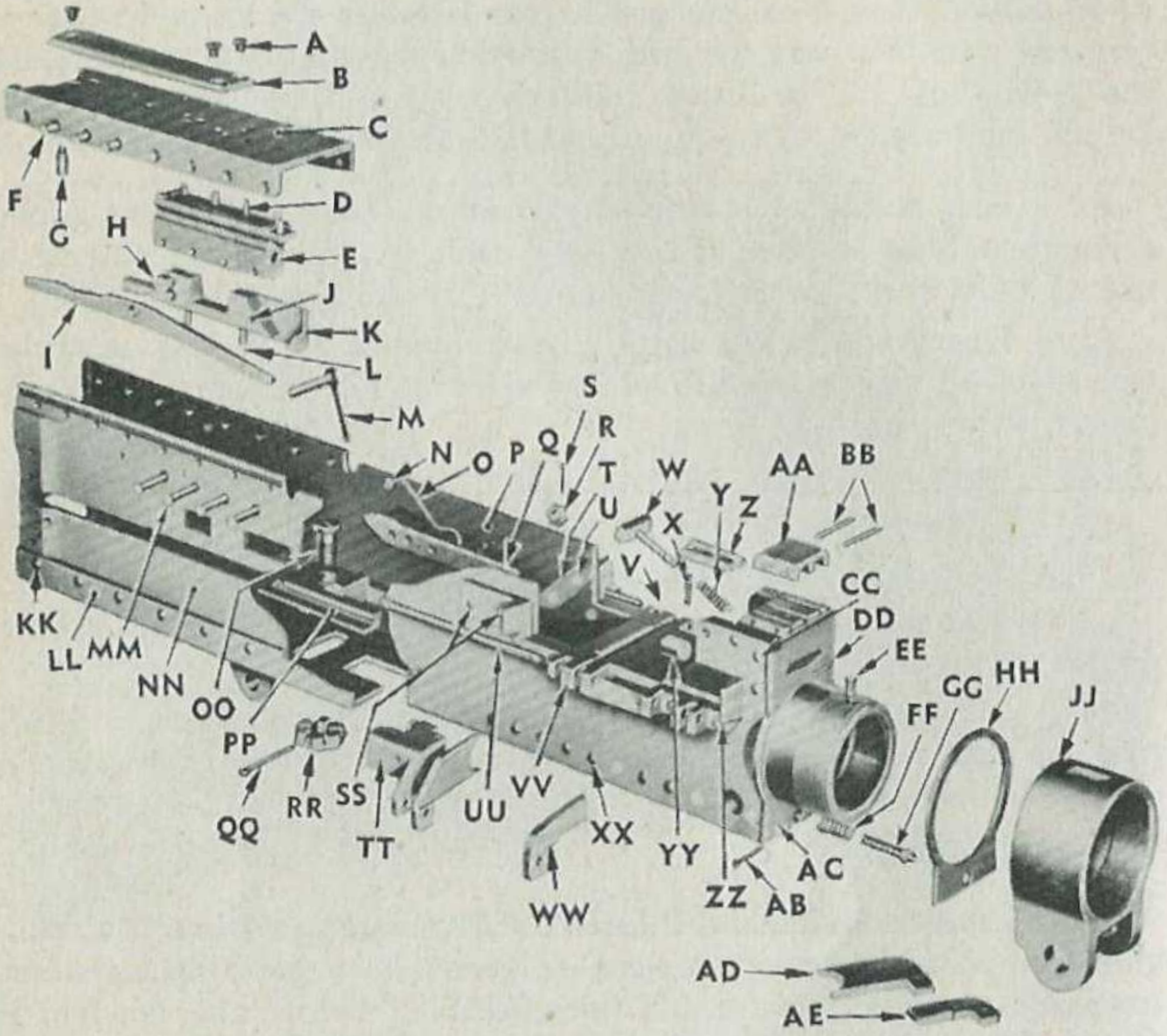

Figure 100—Receiver Group—Exploded View

vise and spanner wrench, as in disassembly, and then stake lock washer into indents in booster sleeve and plug housing.

(c) Screw booster thus assembled into barrel jacket, using spanner wrench, until screw holes aline, and then install and stake screws securely.

(3) If the flash hider *1-H-1765* (aircraft guns) is to be assembled to the barrel jacket in place of the front barrel bearing, it may be assembled as follows:

(a) Assembly is similar to that described for the booster in step (2), above, except that the escape cover must be placed on the barrel jacket with large diameter forward before the assembled flash hider is screwed into the barrel jacket, by applying wrench to booster sleeve. Use *new* lock washer when assembling cone body to booster sleeve.

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A — SCREW, TOP PLATE COVER (3)-A13608
B — COVER, TOP PLATE-B8939
C — PLATE, TOP-D28263
D — RIVET, BOLT LATCH BRACKET, SHORT (5)-A13522
E — BRACKET, BOLT LATCH-C4061
F — RIVET, TOP PLATE (16)-A9500
G — STOP, TRIGGER BAR, REAR-A9390
H — STUD, TOP PLATE BRACKET-A9367
I — BAR, TRIGGER-B257592
J — STOP, TRIGGER BAR, FRONT-A9391
K — BRACKET, TOP PLATE-C4070
L — RIVET, TOP PLATE BRACKET (2)-A9292
M — PIN, TRIGGER BAR, ASSEMBLY-B8683
N — STOP, BOLT-A9392
O — SPRING, SWITCH-B8943
P — PLATE, SIDE, L.H.-D28262
Q — SWITCH-B147461
R — NUT, SWITCH PIVOT-A13556
S — PIN, COTTER *(1/16" X 3/4")* -103362
T — CAM, EXTRACTOR-A9373
U — RIVET, EXTRACTOR CAM (2)-A9501
V — BRACKET, BELT HOLDING PAWL, L.H.-C4095
W — PAWL, COVER DETENT, ASSEMBLY-B8515
X — SPRING, BELT HOLDING PAWL-A153146
Y — SPRING, COVER DETENT PAWL-A13520
Z — PAWL, HOLDING, BELT-B261098
AA — COVER, TRUNNION BLOCK-A13588
BB — PIN, TRUNNION BLOCK COVER-A13546
CC — RIVET, TRUNNION BLOCK L.2.52"(4)-A13558
DD — PIN, COTTER *(1/16" X 3/4")* -103362
EE — SCREW, LOCK, BREECH BEARING-A152829
FF — SPRING, TRUNNION BLOCK LOCK-A13566
GG — LOCK, TRUNNION BLOCK-A13565
HH — SHIM, TRUNNION BLOCK-B8951 (A TO M)
JJ — ADAPTER, TRUNNION-C4052
KK — RIVET, BOTTOM PLATE (16)-A9387
LL — PLATE, BOTTOM-D28257
MM — RIVET, BOLT LATCH BRACKET, LONG (4)-A13521
NN — PLATE, SIDE, R.H.-D28261
OO — BOLT, BREECH LOCK CAM-A152938
PP — CAM, LOCK, BREECH, ASSEMBLY-B147583
QQ — PIN, COTTER *(1/8" X 1-1/2")* -103387
RR — NUT, BREECH LOCK CAM BOLT-A152939
SS — RIVET, BELT HOLDING PAWL BRACKET, SHORT (2)-A13698
TT — STOP, CARTRIDGE, REAR, R.H., ASSEMBLY-C77409
UU — PIN, BELT HOLDING PAWL, ASSEMBLY-B8963
VV — BRACKET, BELT HOLDING PAWL, R.H.-B128730
WW — STOP, CARTRIDGE, FRONT-A13539
XX — RIVET, TRUNNION BLOCK, L. 0.605" (18)-A9799
YY — PLUG, BUNTER-A13572
ZZ — RIVET, BELT HOLDING PAWL BRACKET, LONG (6)-A13598
AB — PIN, COTTER *(3/32" X 3/4")* -103373
AC — BLOCK, TRUNNION-D28264
AD — STRIPPER, LINK-A13541
AE — STOP, CARTRIDGE, REAR-A13540

RA PD 91839A

Legend for Figure 100—Receiver Group—Exploded View

(b) Aline screw holes in barrel jacket, escape hole cover, and booster sleeve, and install cap screws. Then pass locking wire through screw heads and wrap one end of wire around each screw clockwise (tending to tighten screw) and pass ends around so that wire encircles escape hole cover. Twist ends tightly together and bend down flat to cover.

(4) In assembling the trunnion adapter to the trunnion, place the spring over the trunnion block lock and insert it from the front of the trunnion. Force the lock rearward and insert the cotter pin, and spread prongs only enough for proper retention. Then give the lock one-quarter turn in either direction and lock will be held to the rear. When a gun is reassembled, a shim of the next larger number than that previously used will generally be required to provide a tight fit between the trunnion and adapter when the parts are in alinement. Place the shim on the trunnion and screw on the trunnion adapter, drawing it tight. If the parts are not in alinement when drawn tight, use a shim of different thickness to obtain this condition. Give the trunnion block lock a quarter turn to release it and make sure that it seats properly. NOTE: *A new cotter pin should be used when assembling the trunnion lock. Spread sufficiently for retention but do not wrap around the lock. If cotter pin breaks or cams out, the lock cannot be disengaged.*

(5) If a bolt latch is being used (heavy-barrel guns) (fig. 80), it must be assembled before the trigger bar is installed. Assemble the bolt latch and rod, and insert the bolt latch pin. Insert the bolt latch spring into the bracket attached to the top plate as far as it will go. Next put the bolt latch rod into the spring as far as it will go without trying to compress the spring. Allow the bolt latch to hang downward in the empty receiver. The force necessary to compress the spring can be applied by placing a 6-inch section of a wooden "two by four" into the receiver against down-hanging latch and, with muzzle end of the gun against a solid support, press on the wooden block. If the rod is properly alined so that the key on the rod enters the slot in the top plate bracket, the threaded end will protrude from the front end of the bracket. Start the nut about two turns on the rod and release the pressure on the bolt latch. Insert the plunger and plunger spring in the latch and raise it until it clears the extension of the top plate bracket, and until the plunger spring is compressed. If necessary, back off slightly on the bolt latch rod nut if the latch will not clear the top plate bracket. After the latch is up in place, again apply pressure with the wooden block and tighten up on the nut until a cotter pin can be inserted.

(6) If the gun is equipped with an adjustable trigger bar stop assembly, it may be installed by positioning the assembly with the

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spring facing forward on the trigger bar stop (pin) in rear, under side of the top plate. Then secure the assembly with the retaining screw, which first passes through the top plate cover plate, and stake the screw. If the assembly has been disassembled, be sure to place the spring so that its shoulders fit in the notch in the forward face of the body, and the click projections on the forked ends will register with notches in upper face of nut for positive retention (par. 47 **m**, figs. 97 and 98).

(7) The trigger bar, with the long end forward and the bowed surface upward, is placed between the top plate bracket and the bolt latch bracket and held upward firmly. The trigger bar should project approximately five-sixteenths inch beyond the rear trigger bar stop. With the trigger bar held in that position, insert the trigger bar pin, taking care to match the key on the pin with the keyway in the left side plate. After insertion, hold the pin assembly firmly against the side plate and rotate the lock rearward until the projection seats in the small hole in the side plate (NOTE, par. 45 a (5)).

(8) The breech lock cam is installed with the beveled surface up and to the rear. Place the lower projection of the cam through the hole in the bottom plate, and insert the breech lock cam bolt from the top. See paragraph 47 **q** for details of various breech lock cams. Screw the castellated nut on the bolt, with the notches up toward the bottom plate, and draw it tight. Back it off, only as necessary, to install a cotter pin. When so assembled, the breech lock cam should move or "float" slightly. Measured at the base of the U-shaped opening at the front of the cam, the clearance between the cam and the bottom plate should preferably be between 0.001 inch and 0.008 inch, but may be between 0.001 and 0.012 inch. If the cam is attached with a screw, insert the screw from below, adjust float as stated above, and stake the screw.

(9) The switch (fig. 77) is installed by first inserting the bent end of the hairpin spring into the small hole in the switch recess of the left side plate. The spring is snapped into the recess. Slip the back end of the switch back into the recess, holding the switch firmly against the side plate and making sure the lug on the back of the switch rides on top of the spring. Push the threaded protrusion through the hole in the side plate and secure it with nut and cotter pin. Bend cotter pin prongs around nut. The threaded stud is shouldered to prevent the nut from being drawn so tight as to cause the switch to bind against the side plate. Try the switch to see that it pivots and snaps back into position.

(10) The cover detent pawl spring is slipped over the detent pawl guide and both are then inserted in the hole in the trunnion from the rear.

(11) The trunnion block cover is set in place and secured with two pins.

(12) If the gun is to be equipped for left-hand feed, install a rear right-hand cartridge stop assembly and front cartridge stop on the right side of the receiver. The regular rear cartridge stop and link stripper can be used in place of the rear right-hand cartridge stop assembly. These are secured by inserting a belt holding pawl pin assembly. For left-hand feed, the belt holding pawl is placed in position on the left side of the receiver, the spring is seated and depressed, and the remaining belt holding pawl pin assembly is inserted. To equip the gun for right-hand feed, a front cartridge stop, link stripper, and rear cartridge stop are installed on the left side of the receiver, and the belt holding pawl is installed on the right side. A cotter pin may be inserted in belt holding pawl pin used in the aircraft gun to prevent the belt holding pawl pin from working out of the gun. This practice is not harmful if the cotter pin is properly assembled and wrapped around the belt holding pawl pin so as not to interfere with feeding. Figure 73 shows gun assembled for left-hand and right-hand feed. NOTE: *Guns of recent manufacture have twin belt holding pawl springs instead of a single spring. These twin springs differ from the single spring and care should be observed when replacing to use the correct spring or springs. Some guns of recent manufacture have a split belt holding pawl and twin springs* (fig. 75 and NOTE, par. 45 **a** (1)).

NOTE: *For information on blank firing attachment, refer to paragraph 75.*

b. Water Jacket (Water-cooled Guns) (figs. 84, 85, and 86).

(1) Place the trunnion block lock spring over the lock and insert the lock in the hole in the trunnion from the front. Push the lock backward and insert a cotter pin (NOTE, subpar. **a** (4), above). Then give the lock a quarter turn in either direction, and the cotter pin will hold the lock in rearward position. When a gun is reassembled it is usually necessary to use a shim of the next higher number than the one previously used. After placing the proper shim in position against the trunnion, apply an even coating of white lead pigment to the threaded section of the trunnion. Screw on the water jacket and tighten it with the combination wrench. If the parts are not in alinement (as shown by the index mark) when screwed tightly together, disassemble and reassemble with proper thickness shim to obtain this condition. Give the trunnion block lock a quarter turn to release it and make sure that it seats properly.

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(2) Place the gun in a vertical position with the front end up, and carefully insert the steam tube so that its lower end slips over the rear steam tube support. If a rod is available, it can be used to guide the tube into position. Insert the front steam tube support into position inside the steam tube and screw it tightly into the front end cap, using the combination wrench or screwdriver with broad blade. When the notch in the support is properly positioned, insert the front steam tube support lock screw.

(3) Screw the front barrel bearing into the end cap until the hole in the bearing lines up with the hole for the front barrel bearing lock. (If a new bearing is being used, the hole must be drilled in the bearing after the bearing is properly screwed into position.) Then insert the front barrel bearing lock and set it tight. Insert the front barrel packing, pressing it firmly against its seat, and insert the muzzle packing ring. Screw the muzzle gland firmly against the ring, using the combination or machine gun wrench (fig. 83). Then insert the muzzle gland lock and the front barrel bearing lock screw into the front barrel bearing lock, and screw in tightly, locking it with the front barrel bearing lock screw jam nut. Screw on the front end cap thread cover. For adjustment of packing, see paragraph 47 q. NOTE: *Some water cooled guns were manufactured with an alternate design of front end cap as explained in TM 9-226.*

c. Barrel Support (Heavy-barrel Guns) (fig. 87). Screw the breech bearing into the trunnion block and pull up tightly with the combination wrench so that the hole in the bearing lines up with the hole in the trunnion block. If a new bearing is being installed, screw it tightly into place and then drill a hole for the lock screw by drilling down through the hole in the trunnion block with a No. 7 drill. Then insert the breech bearing lock screw. Place the spring over the trunnion block lock and insert it from the front; compress the spring, and give it a quarter turn so the cotter pin will hold it rearward (NOTE, subpar. a (4), above). When a gun is reassembled, it is usually necessary to use a shim of the next higher number than was used previously. With the shim in place, put the barrel support on the trunnion block and draw it tight, using the combination wrench. If the parts are not in alinement when screwed tightly together, disassemble and reassemble, using shim of proper thickness to obtain this condition. Release the trunnion block lock and make sure that it seats properly.

d. Edgewater Adapter (Heavy-barrel Guns). To reinstall the Edgewater adapter, screw it onto the receiver trunnion block.

e. Retracting Slide Group (fig. 88).

(1) Place the slide assembly in its way in the bracket with the plunger engaging in the V-notch in the slide. Assemble grip and re-

lated parts to the lever by inserting the grip bolt. If a hollow bolt is being used which is split at the threaded end, draw up the bolt, but allow the handle to turn readily; then insert the tapered pin and drive it securely into place. If bolt with solid end is being used, stake bolt in place when assembled. If retracting slide handle assembly *B313800* is being used, screw assembly tightly into lever with wrench applied to flats on bolt, and stake securely.

Place assembled lever and spring on lever stud with small loop of spring around stop and bent end in hole in lever. Secure tightly with nut and cotter pin. Position of parts for right-hand assembly is shown in figure 88. When assembled to left side of receiver, the grip is reversed on the lever and the left-hand lever spring is used.

NOTE: *The handle groups of early design are now being modified to the new handle assembly by removing the grip bolt and tube from the grip and assembling the new design handle bolt B313799 and washer A377961. A stronger lever stud B313822 is also being assembled to the slide in place of the stud of early design. This modification necessitates redrilling and tapping the slide of early design. The modifications are for the purpose of strengthening the parts concerned, and are covered in MWO A37-W181, MWO A38-W8, and MWO A39-W12.*

(2) A new-type retracting slide lever spring, right-hand and left-hand, has been standardized. This modification eliminates the breakage of the retracting slide grip bolt caused by vibration of the lever. In the new-type spring, the number of coils has been reduced from 2⅛ to 1⅝. A stronger steel is now being used to allow for this reduction in coils and to strengthen the spring. In consequence, this stronger spring is more difficult to assemble. Assembly is best accomplished by removing the retracting slide lever stop and assembling the spring to the retracting slide lever stud and lever, and the lever to the slide with nut and cotter pin. The free end of the spring is then hooked to the side of the bracket and the lever revolved until clear of the stop hole in the retracting slide. The stop is then assembled to the slide and the end of the spring lifted and allowed to snap around the stop. The free end of the spring should be held in position while rotating the lever (fig. 101) and lever and spring held while assembling the stop. The latter operation can be accomplished with the thumb and fingers of the left hand. The slide bracket should be secured to a flat bench during assembly.

(3) Place assembled group in position on the side of the receiver with the front and rear bracket bolts properly inserted in the openings in the side plate. Make sure that the beveled surface on the head of the retracting slide bracket rear bolt is to the rear, and the front bolt

CASING GROUP

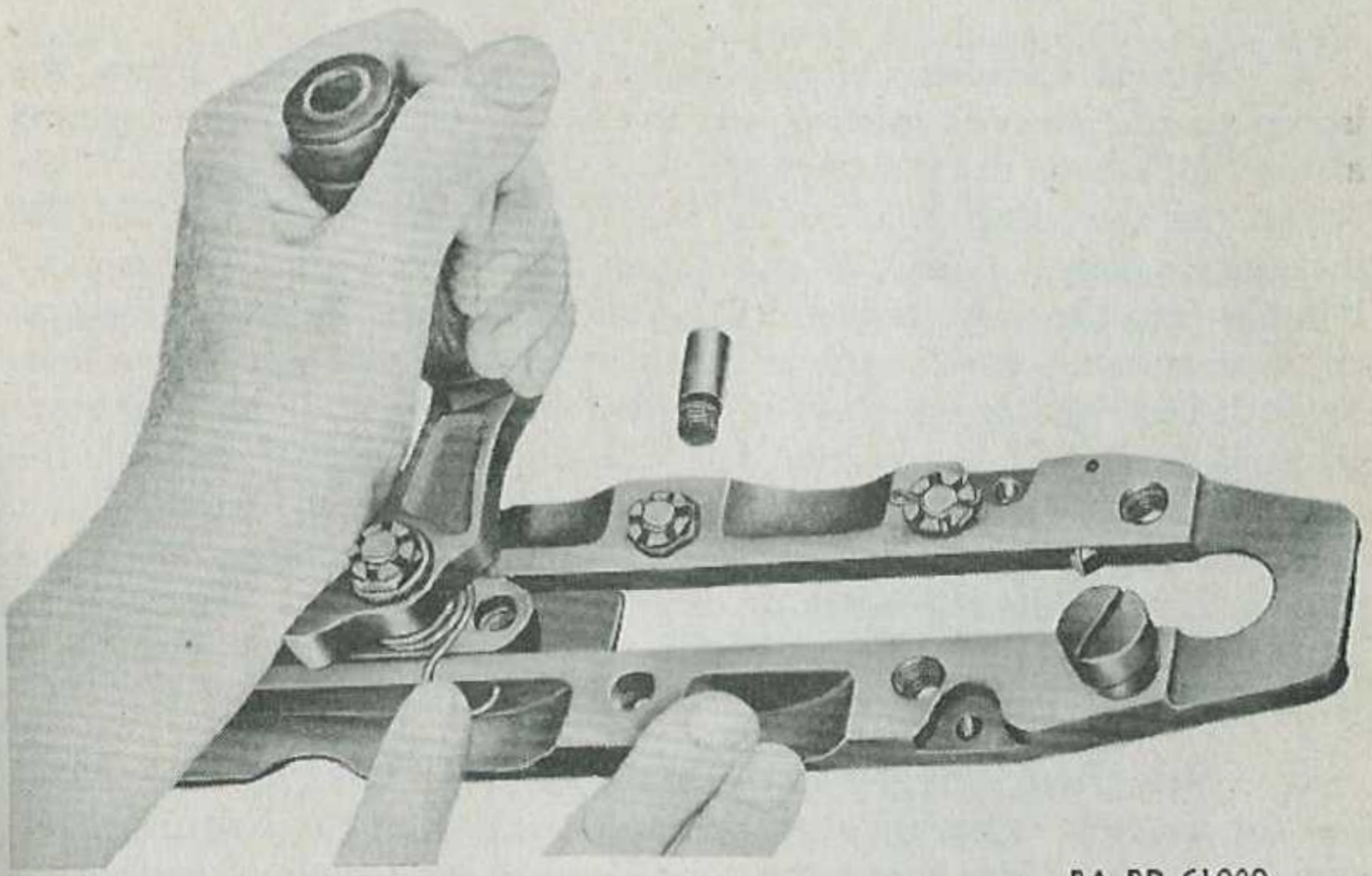


Figure 101—Assembling New-type Retracting Slide Lever Spring

head bevel is to the front. Insert the two short retracting slide bracket screws in the rear mounting holes of the bracket, and the long screw in the front mounting hole. Draw the screws up tight, secure them with locking wire, tighten the bracket bolt nuts, and insert cotter pins.

NOTE: *The retracting slide group assembly D28300A now comes from the manufacturer assembled, but with no parts staked in place. Firmly stake the following parts before final assembly on the gun: retracting slide lever stop B13694, retracting slide lever stud B8992, and retracting slide stud B8993.*

f. **Operating Slide Group** (fig. 89). Install operating slide handle plunger spring, handle plunger, and handle, and insert hinge pin and cotter pin. Place the operating slide roller in position; insert the roller pin and cotter pin. All parts of the operating slide are interchangeable, permitting installation of the slide on either the right-hand or left-hand side of the gun. Place the slide in position on the receiver side plate, assemble the front and rear guides over the slide, and insert the operating slide guide screws.

NOTE: *The two short screws are used in the front guide, the medium length screw in the bottom hole of the rear guide, and the longest screw in the top hole of the rear guide. Lock the screws with safety wire.*

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

g. Barrel Carrier (Heavy-barrel Guns) (fig. 90). Place the barrel carrier sleeve assembly on the barrel with the large opening in the bolt sleeve toward the breech of the barrel, and position it between the two deep grooves cut into the barrel. Assemble handles in handle sleeve assembly and force the hooked part of the two handles into the two grooves in the barrel. Place the bolt spring on the bolt, turn the carrier sleeve assembly so that the bolt sleeve lines up with the circular openings in the wire handles, and, working from the breech end of the carrier, slip the bolt and spring through the rear wire handle into the bolt sleeve and on through the front handle. Turn the lug on the bolt until it enters one of the notches cut in the barrel. Then insert the retaining pin in the bolt sleeve. Place the head on the bolt, turn it until the holes in the head line up with the hole through the end of the bolt and insert the holding pin.

h. Side Plate Trigger Assembly *A037-02-01930* (fig. 91). Place the trigger cam assembly and spring in position in the housing, compress the spring, and insert the pin. Be sure both ends of spring are securely seated. Start the slide into the housing and force it over the cam assembly until the cam surface fits into its proper space in the slide. At this point the threaded hole in the slide will be directly over the small round hole in the housing. Place one end of the slide spring on the pin inserted in the cam assembly, engage the other end with the pin on the extension, move the extension to compress the spring, and press down on the opposite end until the protrusion on the bottom of the extension fits into the notch in the slide. Insert the extension screw, draw it up tightly, and stake it in position. Force the slide to the right as far as it will go, and note that the cam surface is being moved and that the slide returns to the original position. The side plate trigger is now ready for installation on the receiver. Installation of the trigger is covered in TM 9-226.

i. Rear Sight Group (Heavy-barrel Guns) (fig. 92).

(1) If telescopic sight clamp has been disassembled, assemble spring and handle to screw. Insert clamp springs in clamp and insert these parts in sight base from bottom and secure with clamp screw. Hold handle against spring when threading in screw. Handle should point to rear when assembled.

(2) Drive base spring to rear into dovetail in base, so that free end curves upward and hole alines with screw hole in sight base. Center sight base screw must be inserted in base before spring is assembled. Assemble windage scale to base with windage scale screws.

(3) If leaf assembly has been disassembled, assemble slide and other parts in leaf, thread elevating screw into top of leaf to secure parts, and insert retaining pin through leaf and groove in top of screw.

(4) Assemble leaf assembly into base and secure with windage screw. Then insert spring and plunger in windage knob and secure to end of screw with windage knob pin.

(5) Place sight group on receiver and secure with four base screws. Raise leaf to thread in center base screw.

j. Front Sight Group (Heavy-barrel Guns). Place blade and cover in grooves in trunnion block and drive in the two cover pins.

Section XII

WATER CHEST, CAL. .50, M3

49. DISASSEMBLY.

a. Removal of Pump.

(1) Remove the pump hood cover (fig. 102) by inserting the two index fingers into the 1-inch holes and pulling out.

(2) Remove hose connections from chest (fig. 103) by unscrewing union couplings from intake and outlet port nipples.

(3) Remove the pump and chest screws from pump body with a $^{3}/_{16}$-inch hexagonal socket-head set screw wrench (fig. 104). Withdraw the pump together with crank arm and handle and sump pipe from the chest (fig. 105). Take care not to damage pump gasket.

b. Disassembly of Pump.

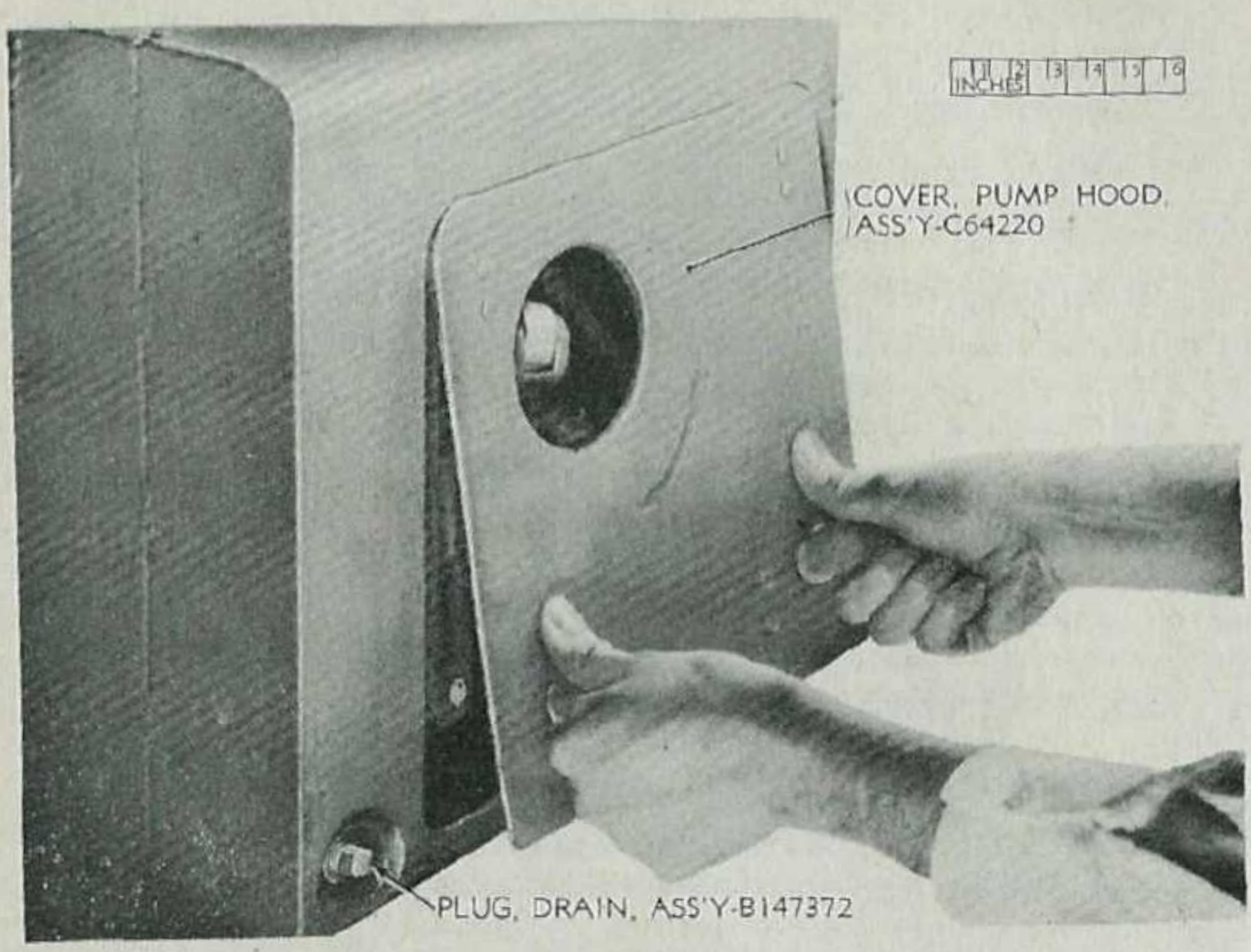
(1) Withdraw cotter pins from headless steel pin and drive out pin with punch (fig. 106). Remove crank arm and handle. Take care that crank detent plungers and spring do not fly out and become lost during the afore-mentioned operation. Remove crank detent plungers and spring (fig. 107).

(2) Remove crank handle grip and ferrule by punching out staking in crank arm handle screw and removing screw.

(3) Unscrew sump pipe group from pump body, using pipe wrench (fig. 108). Remove wire which secures strainer to pipe and withdraw block strainer.

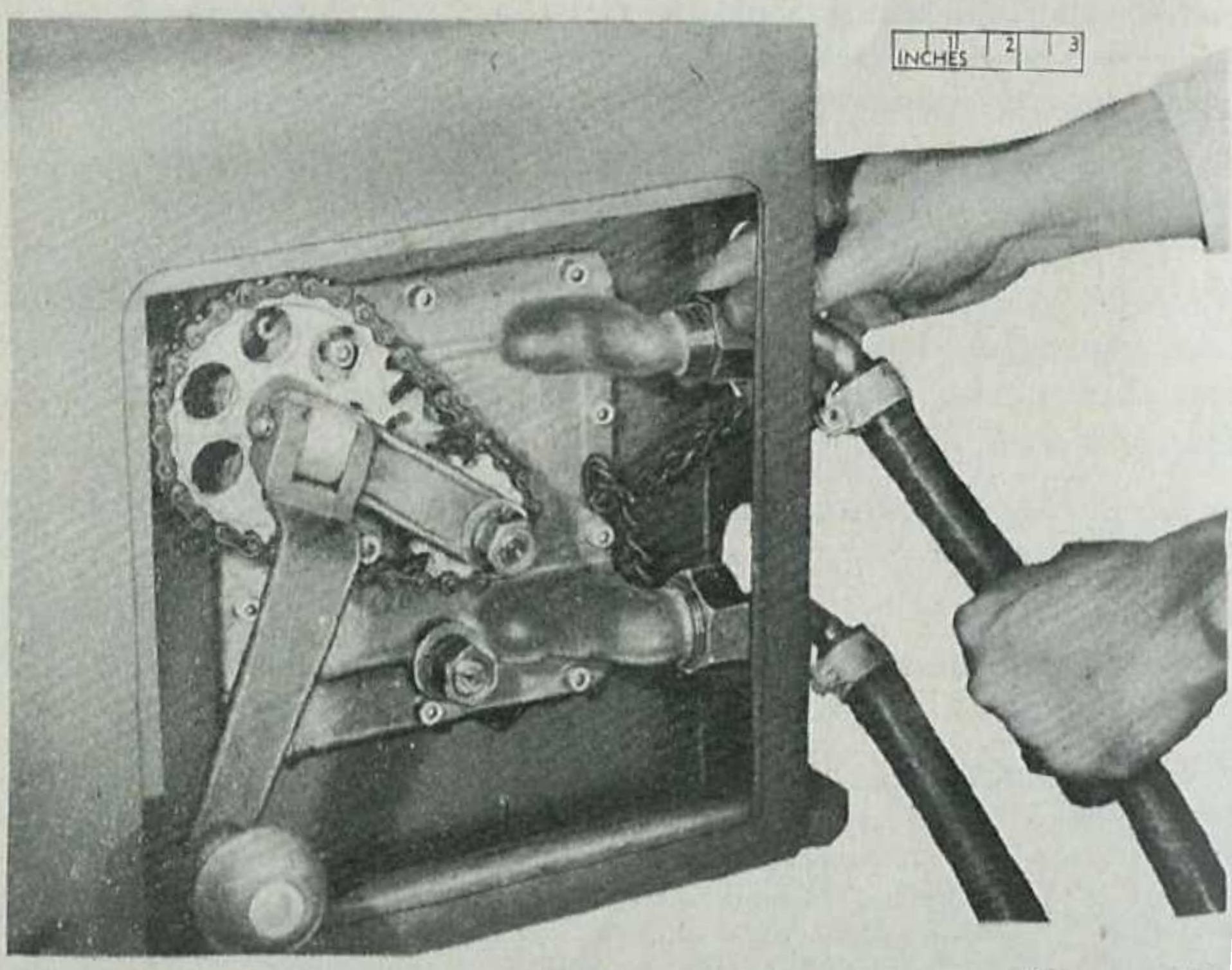
(4) Remove connecting link from single roller chain by inserting screwdriver blade in clip (fig. 109). Remove chain from sprockets.

(5) Withdraw cotter pin from pump shaft nut, unscrew the nut, using a $^{13}/_{16}$-inch open-end wrench (fig. 110). Remove the 4 short bracket screws and chain drive bracket; then lift the bracket and large sprocket (fig. 111) from the pump body and pump shaft.



RA PD 91849

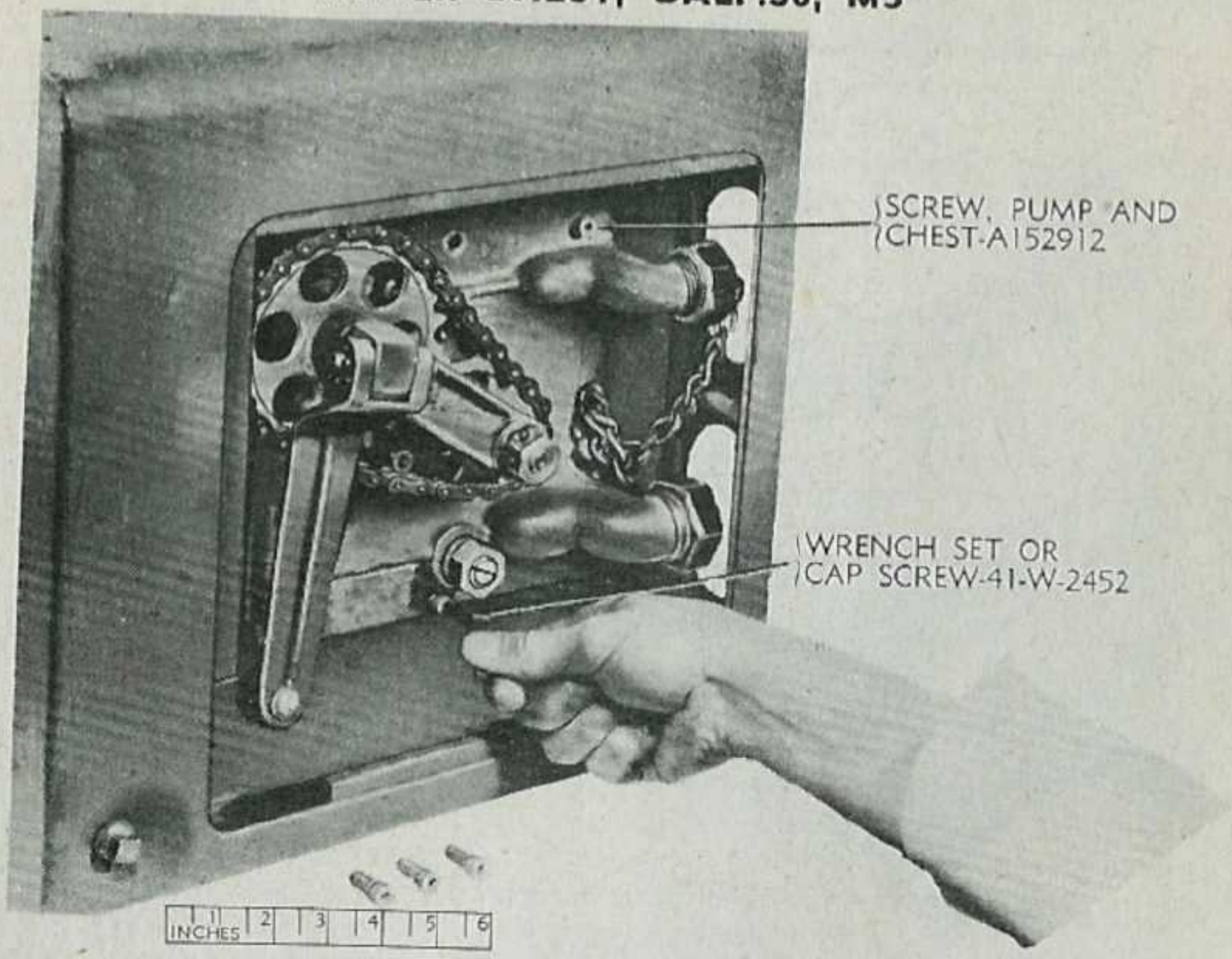
Figure 102—Removal of Pump Hood Cover



RA PD 91850

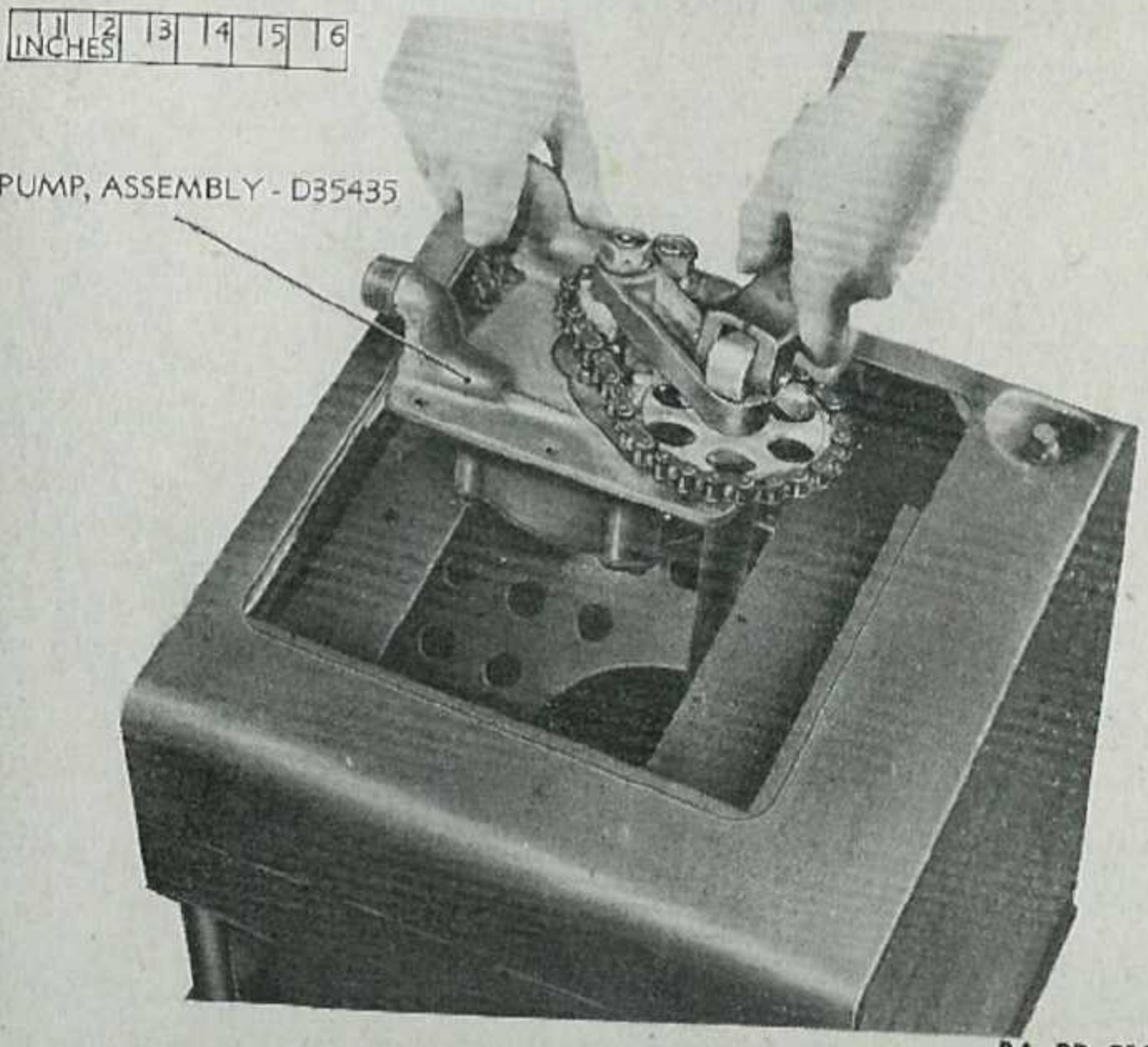
Figure 103—Removal of Hose Connection

WATER CHEST, CAL. .50, M3



RA PD 91851

Figure 104—Removal of Pump and Chest Screws



RA PD 91852

Figure 105—Removal of Pump Assembly

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

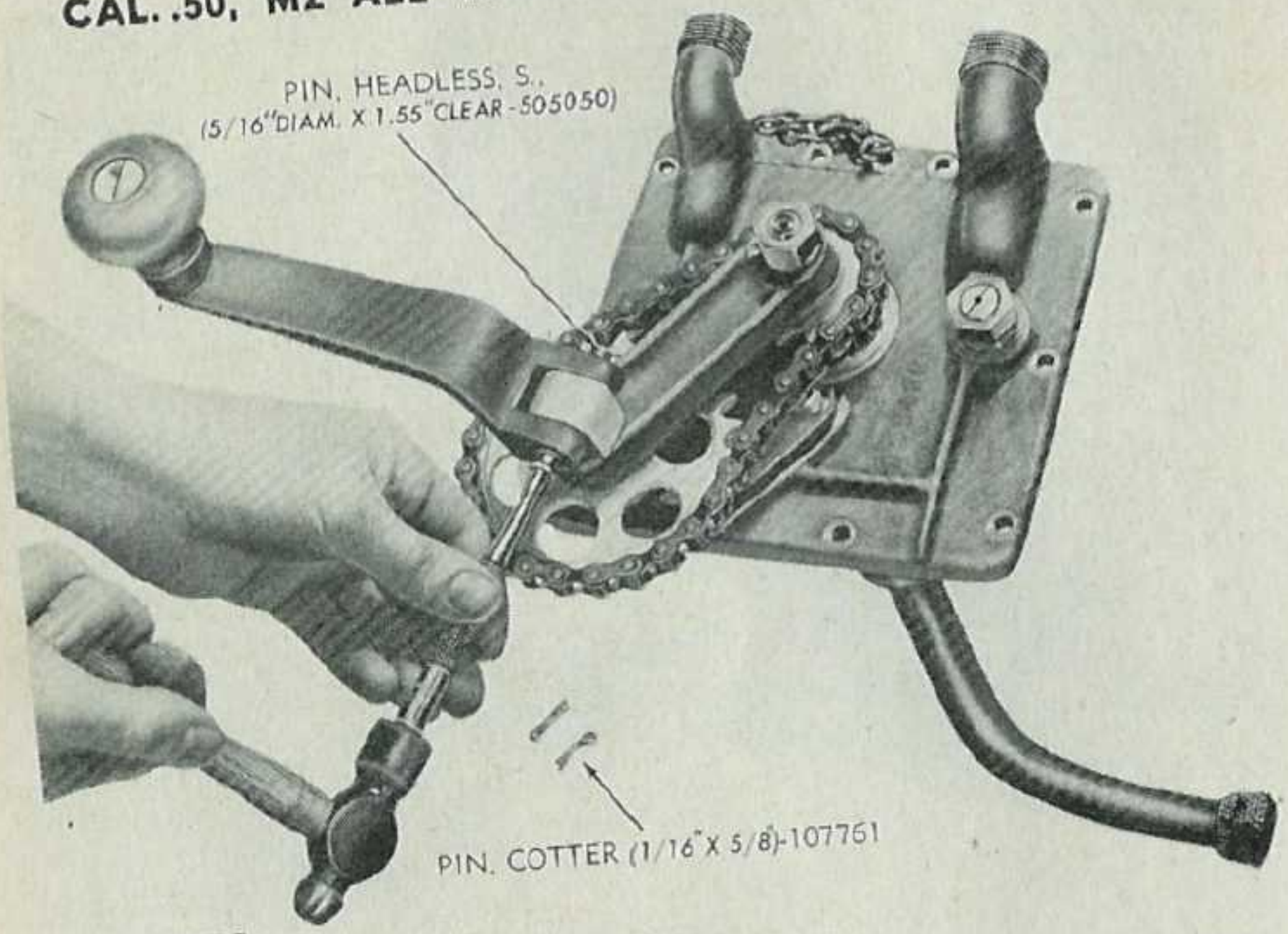


Figure 106—Removal of Headless Steel Pin and Cotter Pins

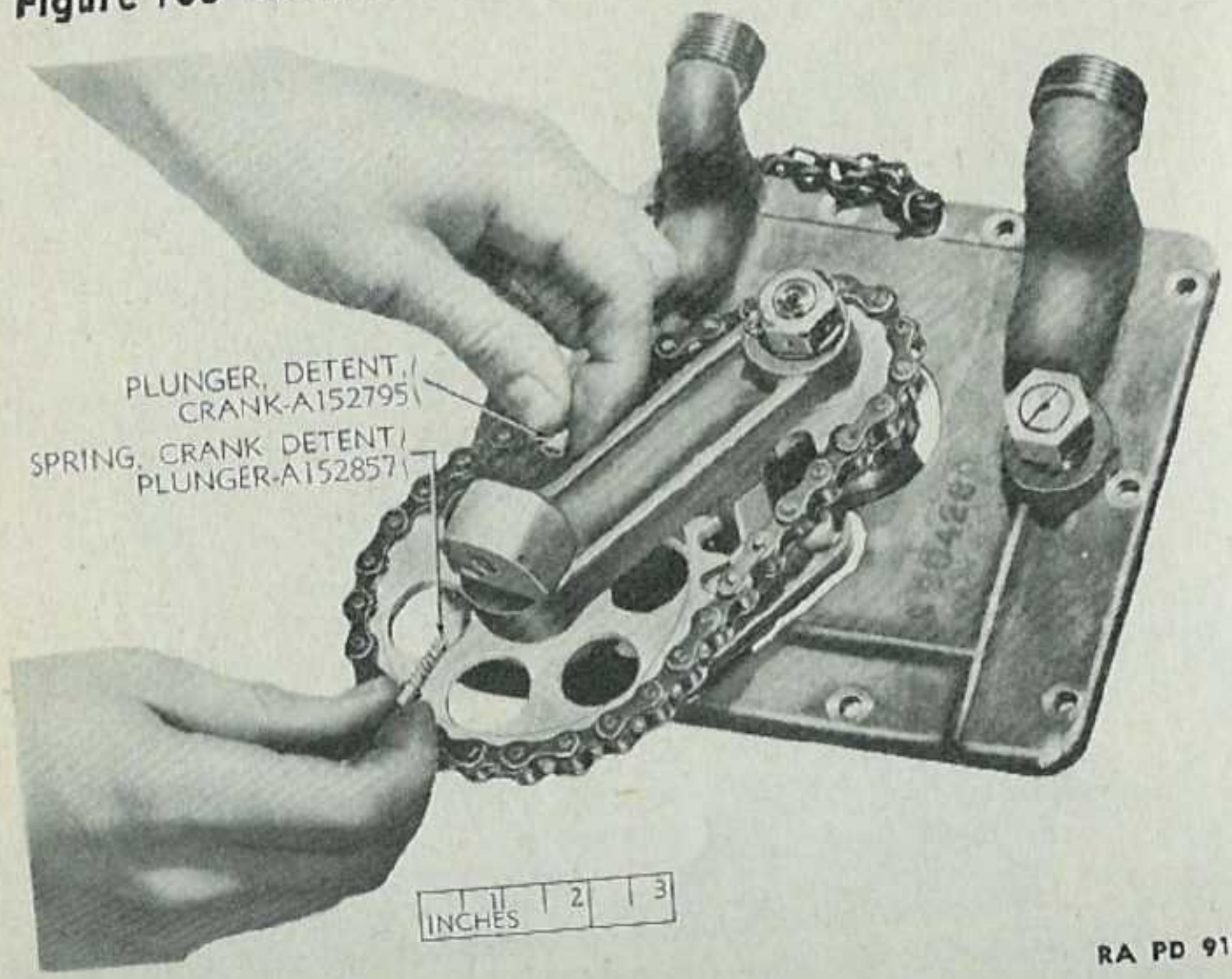


Figure 107—Removal of Crank Detent Plungers and Spring

WATER CHEST, CAL. .50, M3

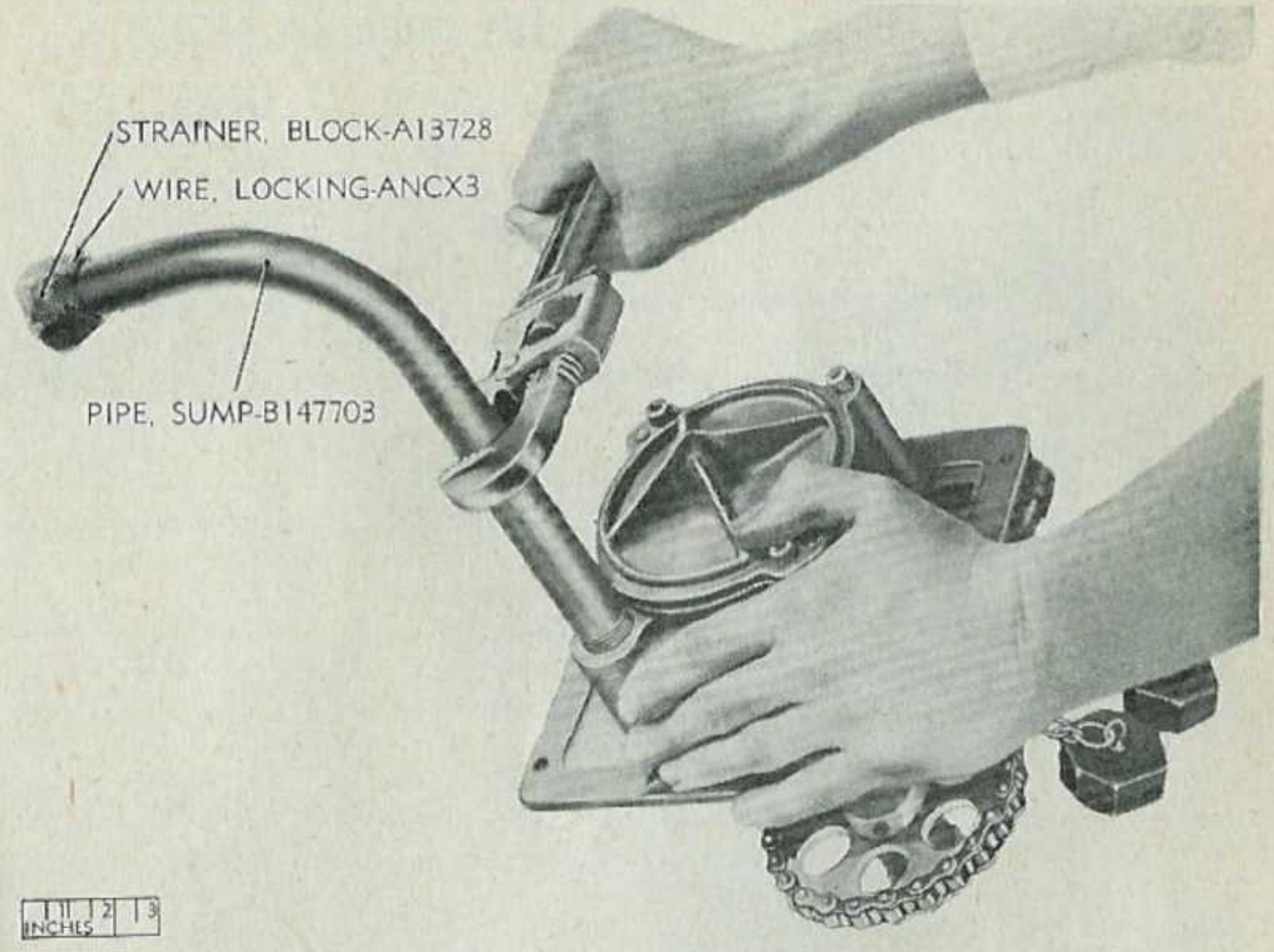


Figure 108—Removal of Sump Pipe

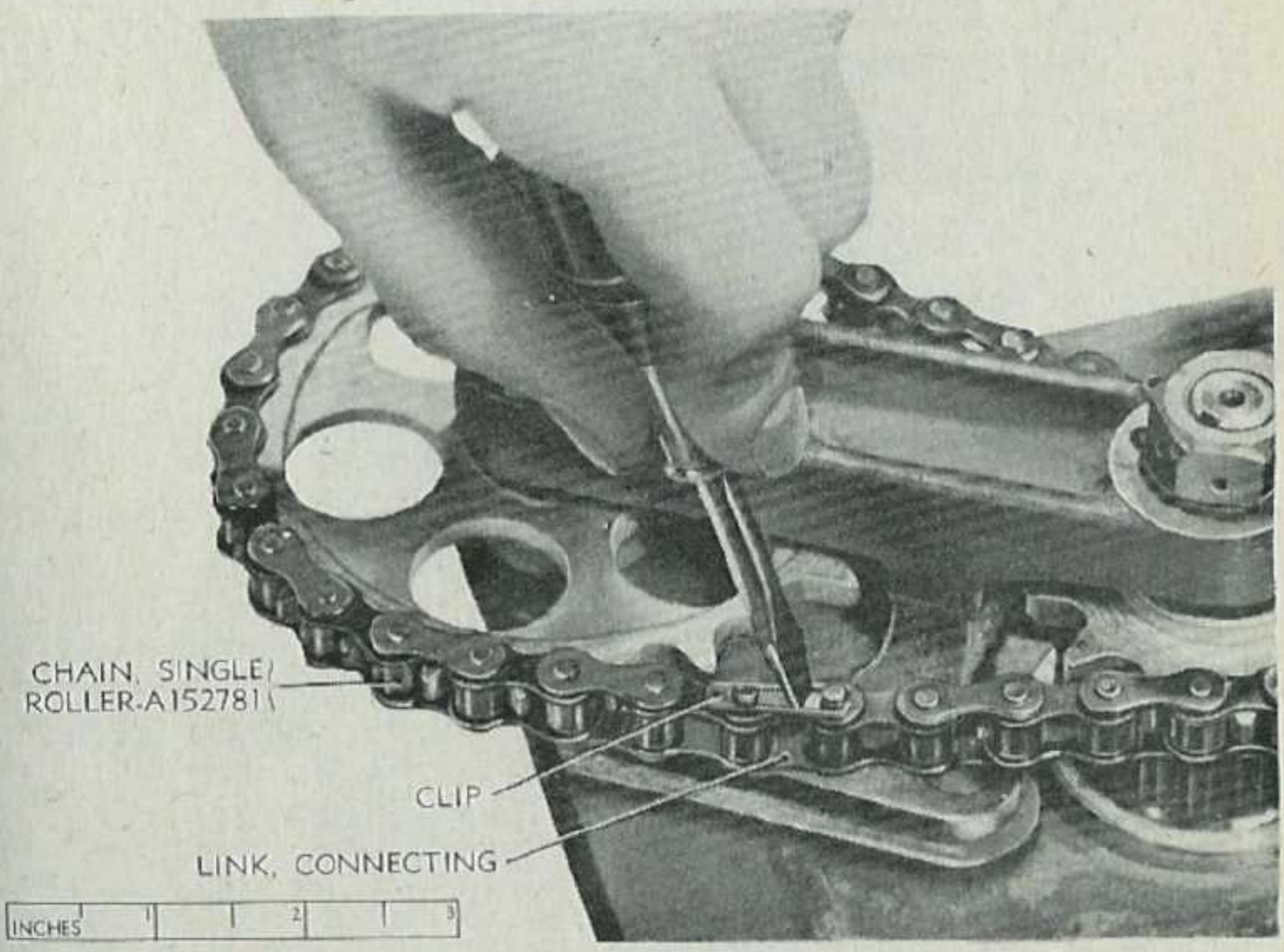
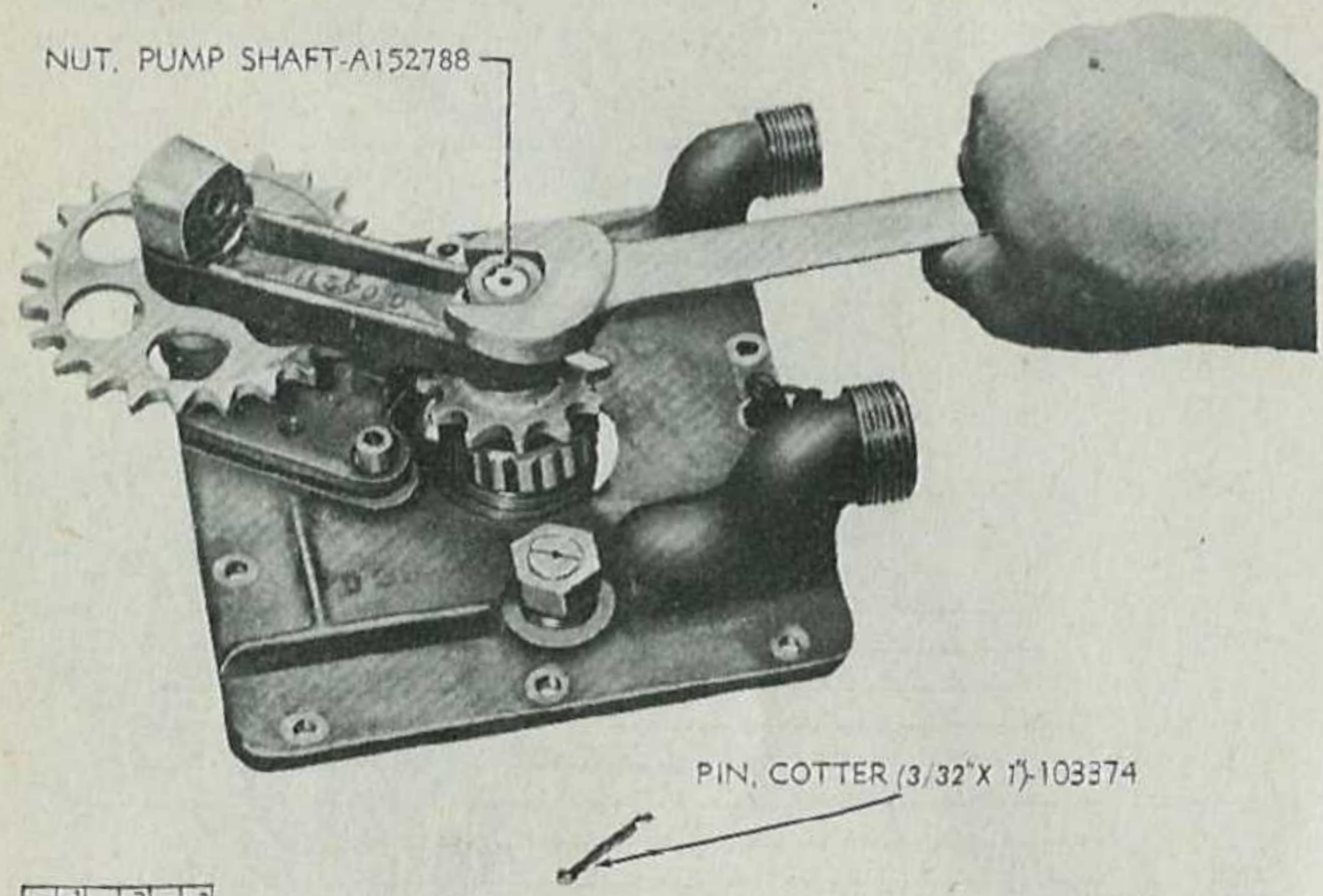


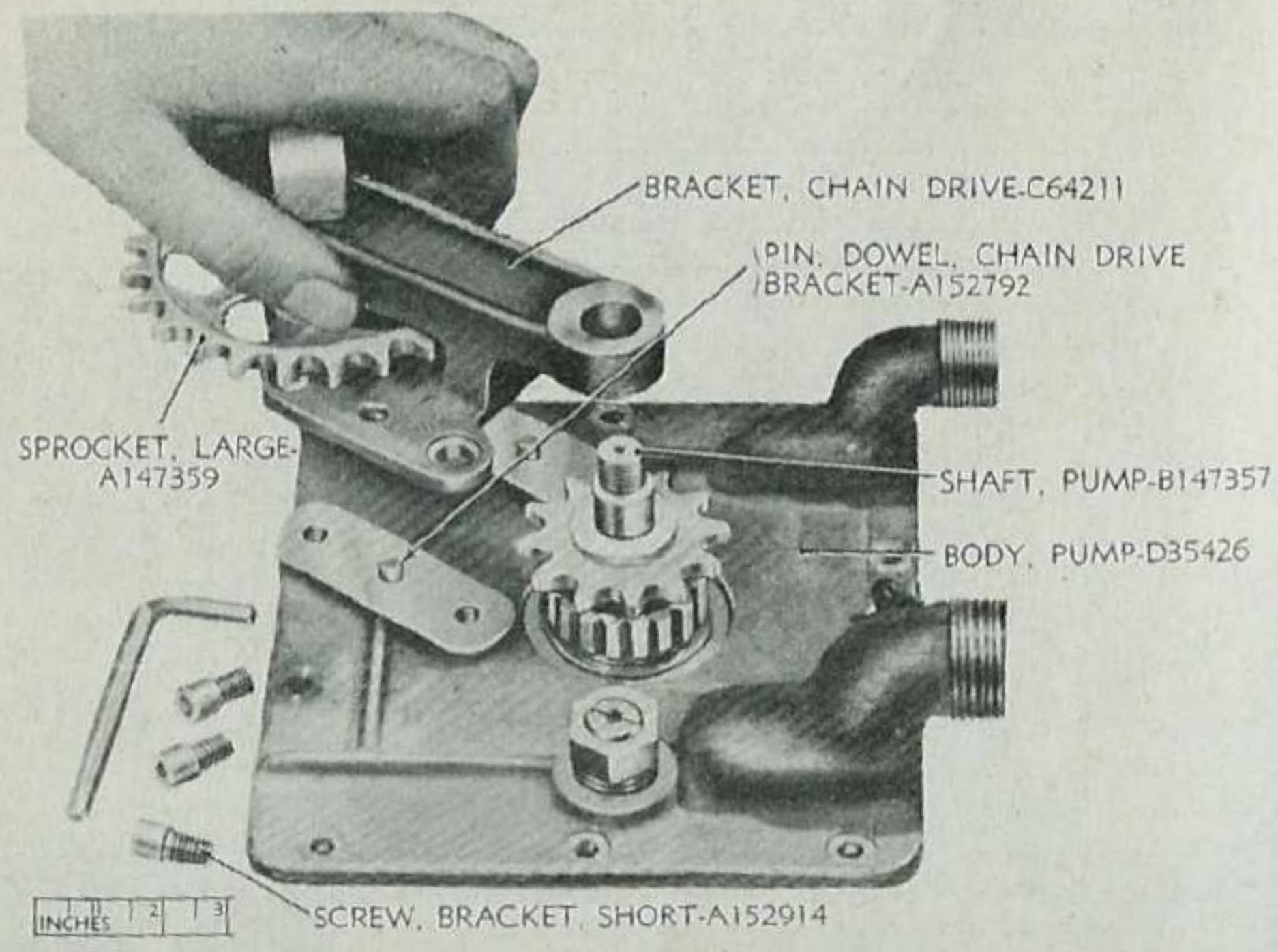
Figure 109—Removal of Clip and Connecting Link From Single Roller Chain

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91857

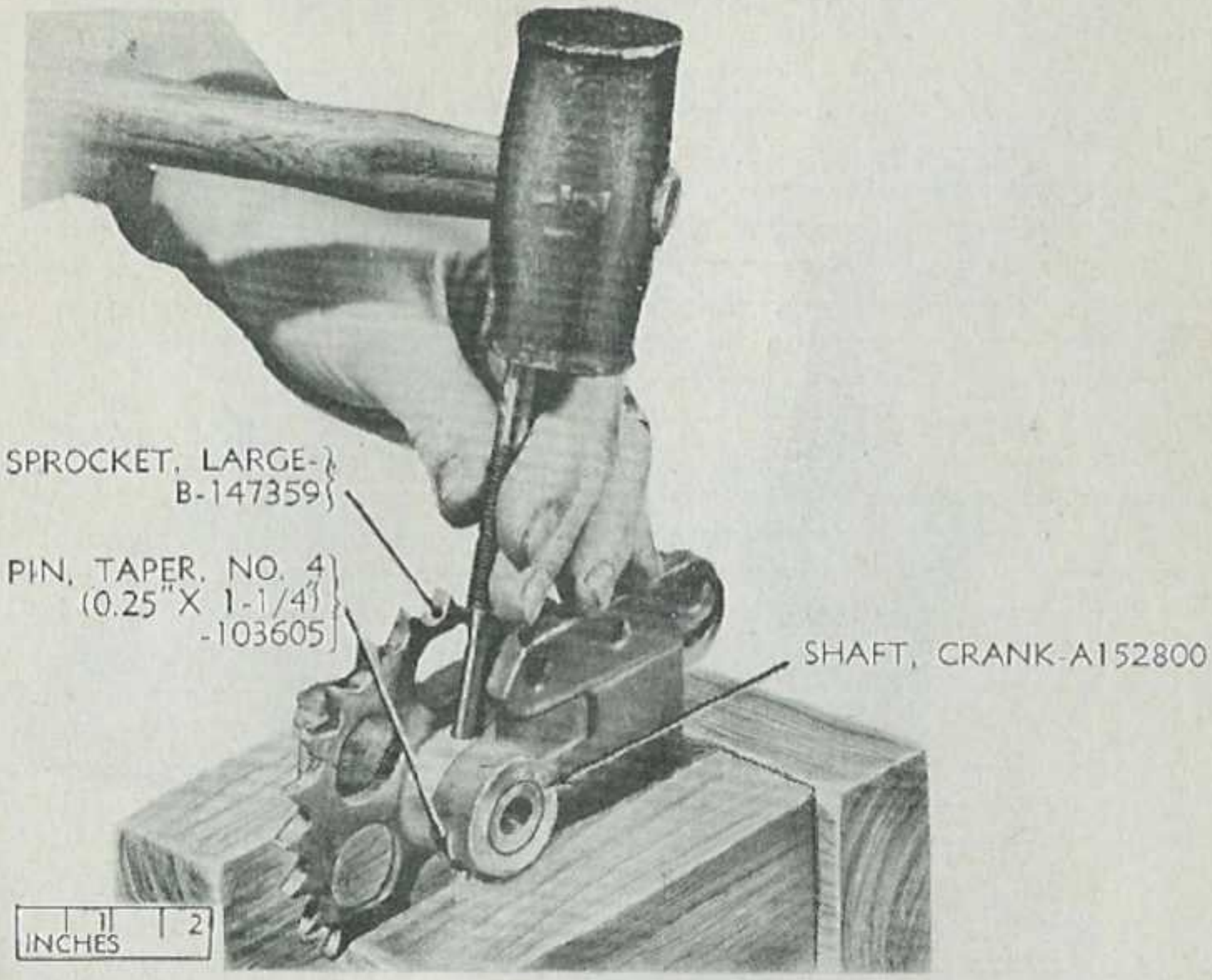
Figure 110—Removal of Pump Shaft Nut



RA PD 91858

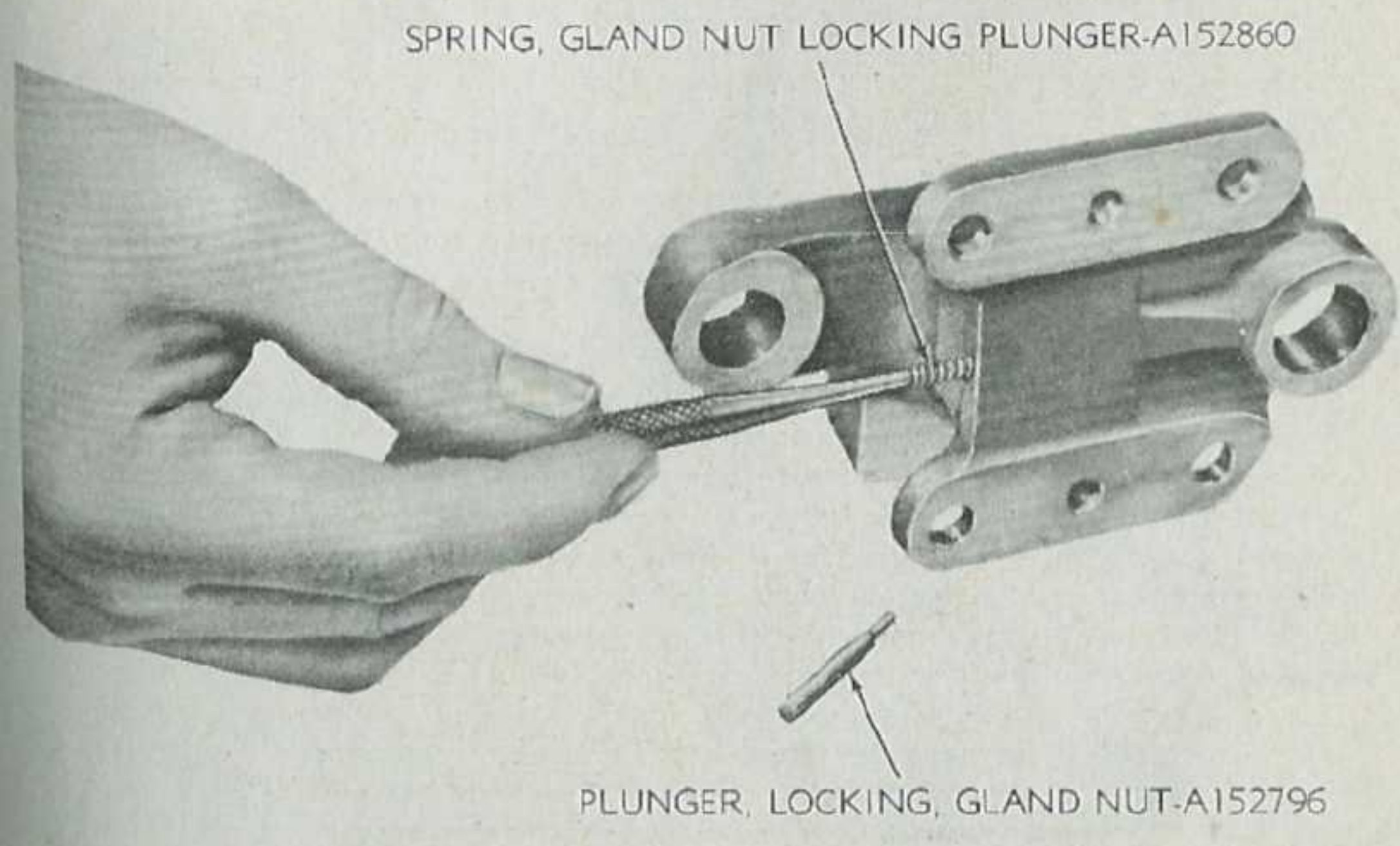
Figure 111—Removal of Chain Drive Bracket

WATER CHEST, CAL. .50, M3



RA PD 91859

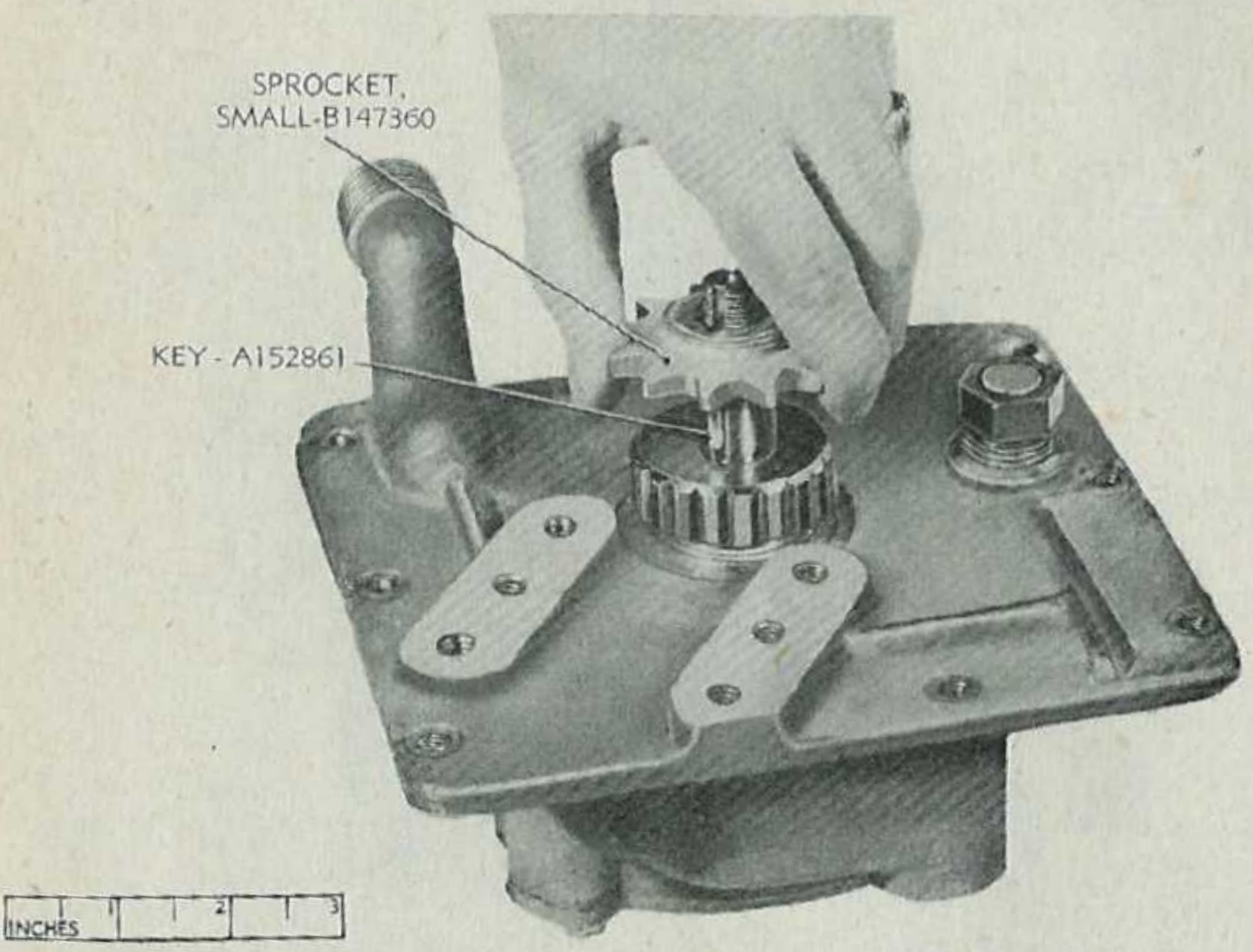
Figure 112—Removal of Taper Pin From Large Sprocket



RA PD 91860

Figure 113—Removal of Gland Nut Locking Plunger and Spring From Chain Drive Bracket

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



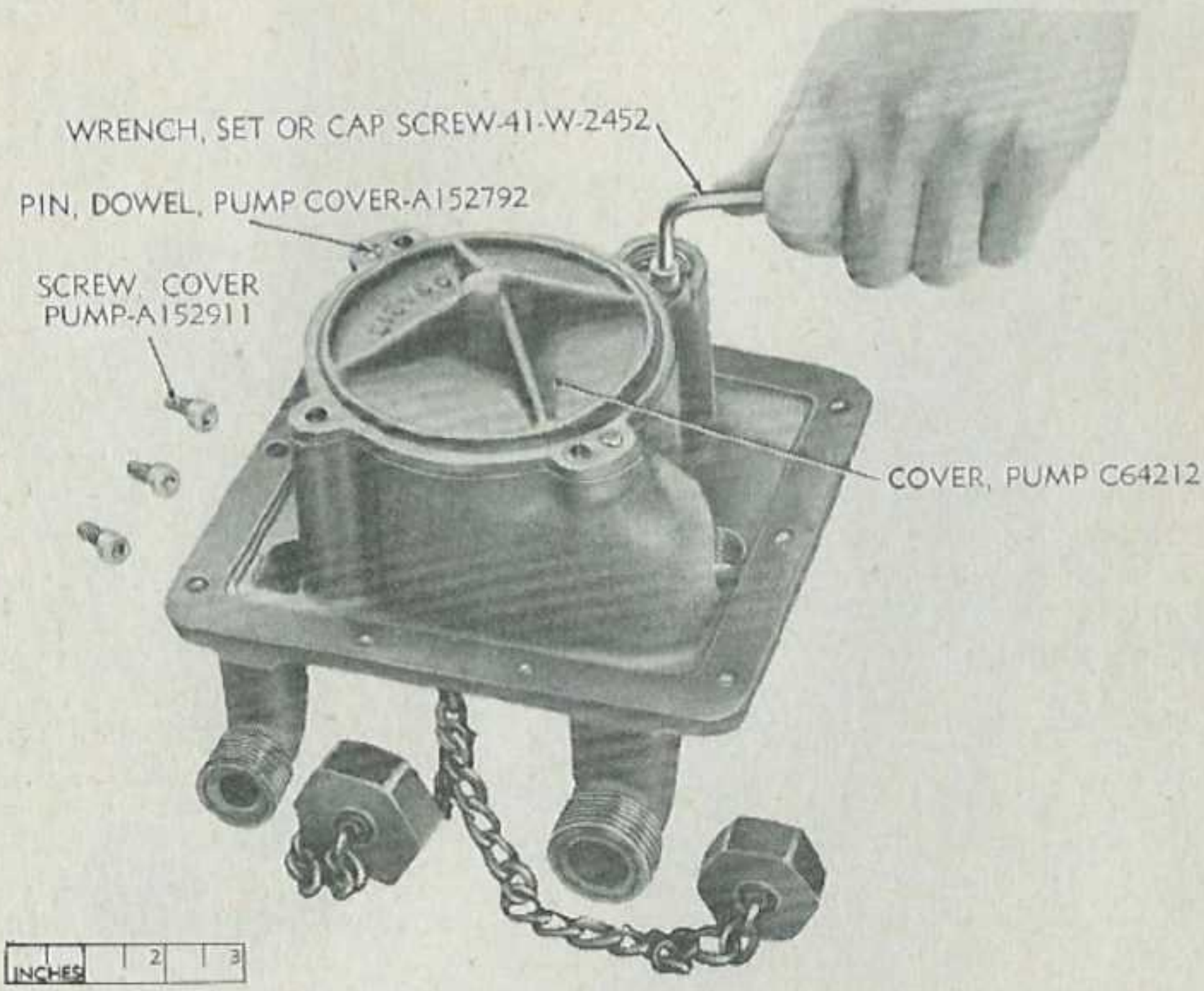
RA PD 91861

Figure 114—Removal of Small Sprocket From Pump Shaft

RA PD 91862

Figure 115—Removal of Vent and Drain Plug

WATER CHEST, CAL. .50, M3



RA PD 91863

Figure 116—Removal of Pump Cover

(6) Drive out the taper pin which secures the large sprocket to the crank shaft (fig. 112).

(7) Remove gland nut locking plunger and gland nut locking plunger spring from seat in bracket (fig. 113). To remove spring, insert a ⅛-inch point punch into seat, force into spring, then remove.

(8) Pull the small sprocket off the pump shaft and remove the key from shaft (fig. 114).

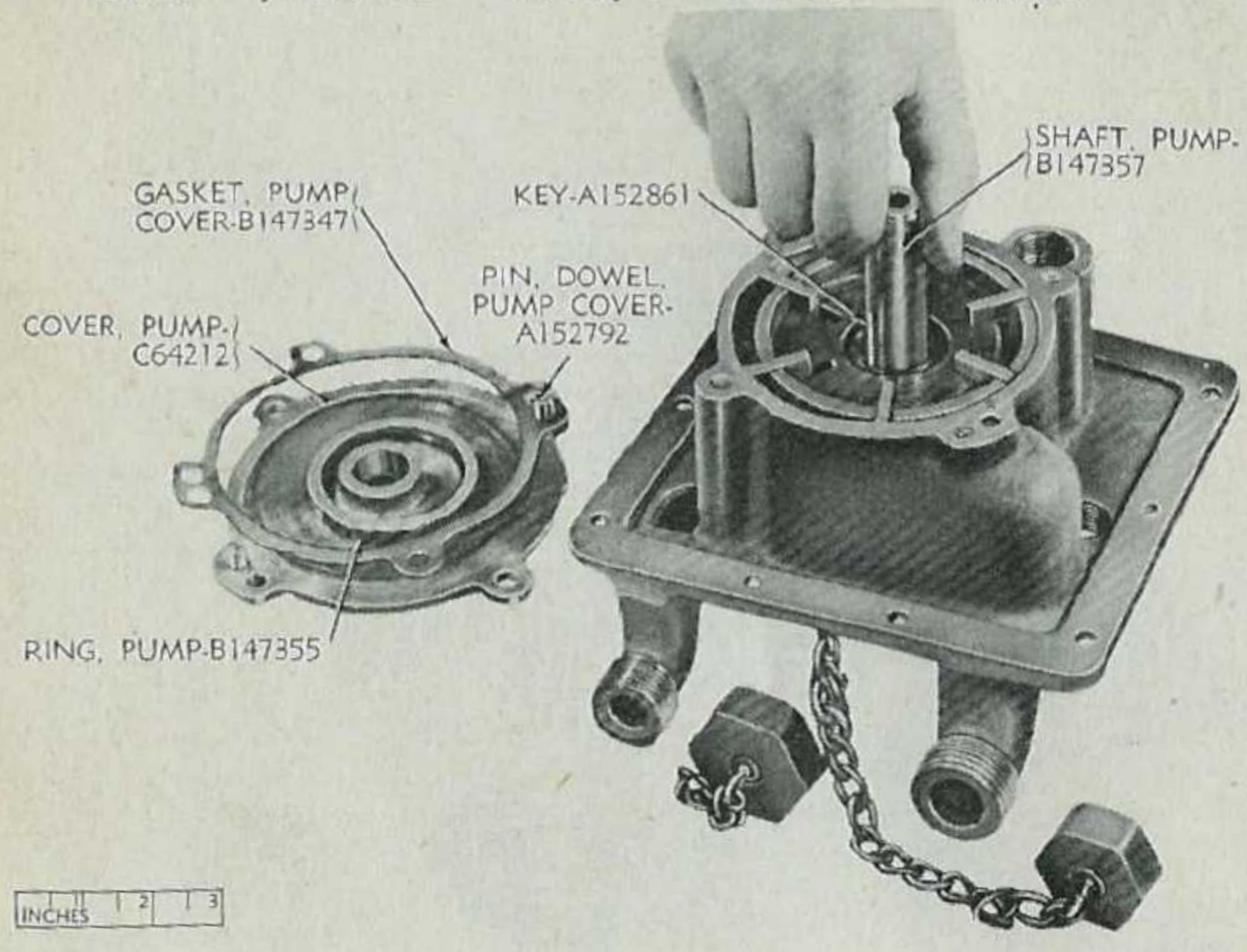
(9) Remove vent screw (fig. 115), vent spring, and vent ball from drain and vent plug. Take care not to let spring fly out. Remove drain and vent plug from pump body (fig. 115).

(10) Remove pump cover screws, with a 3/16-inch hexagonal socket-head set screw wrench, from pump cover (fig. 116). Loosen the cover, and pull evenly or twist from pump shaft. Take care not to damage pump cover gasket. Remove dowel pins.

(11) Remove pump shaft (fig. 117). Remove key from shaft.

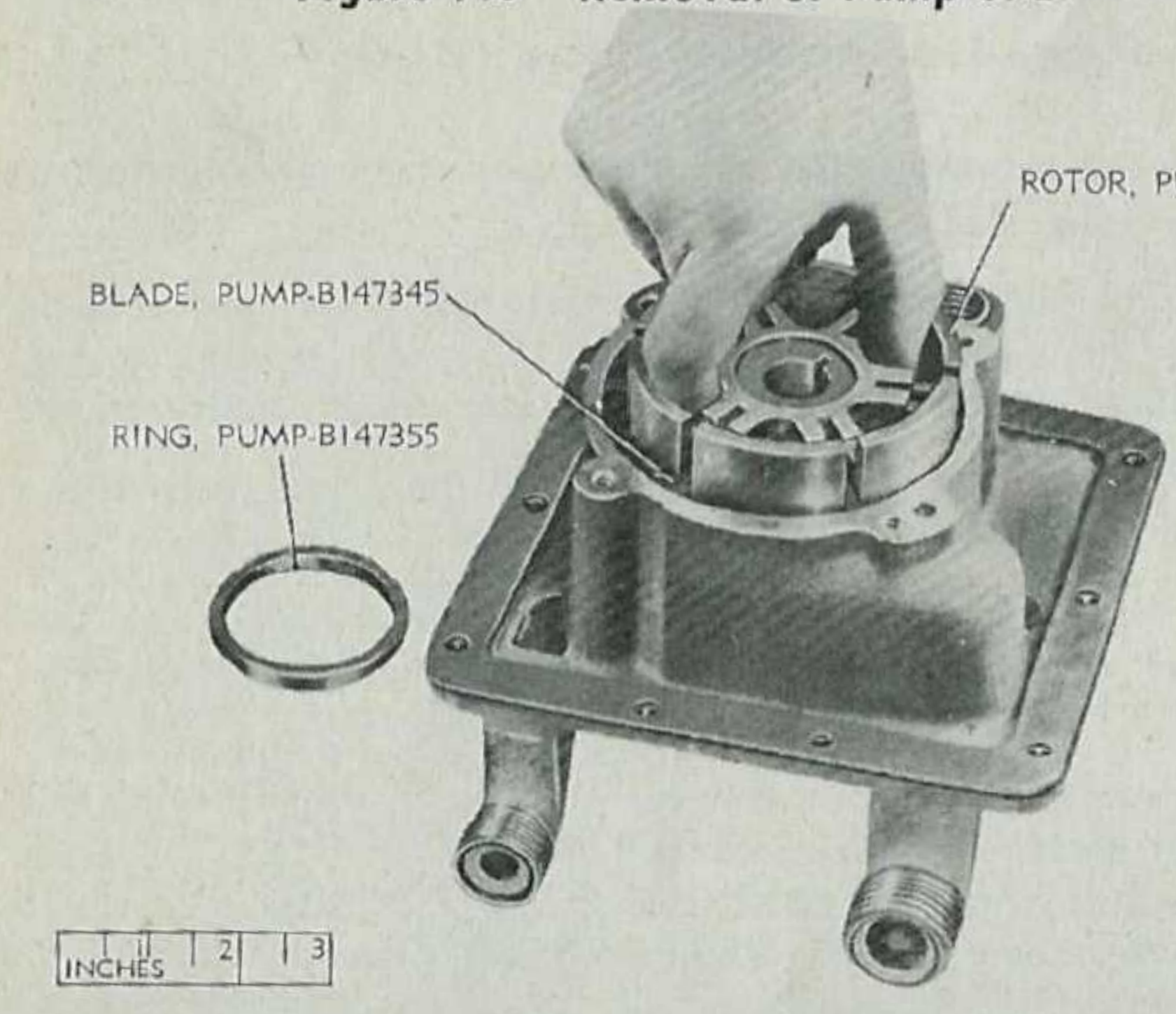
(12) Remove pump ring (fig. 117) (ring may stick to inner side of pump cover).

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91864

Figure 117—Removal of Pump Shaft



RA PD 91865

Figure 118—Removal of Pump Rotor From Pump Shaft

WATER CHEST, CAL. .50, M3

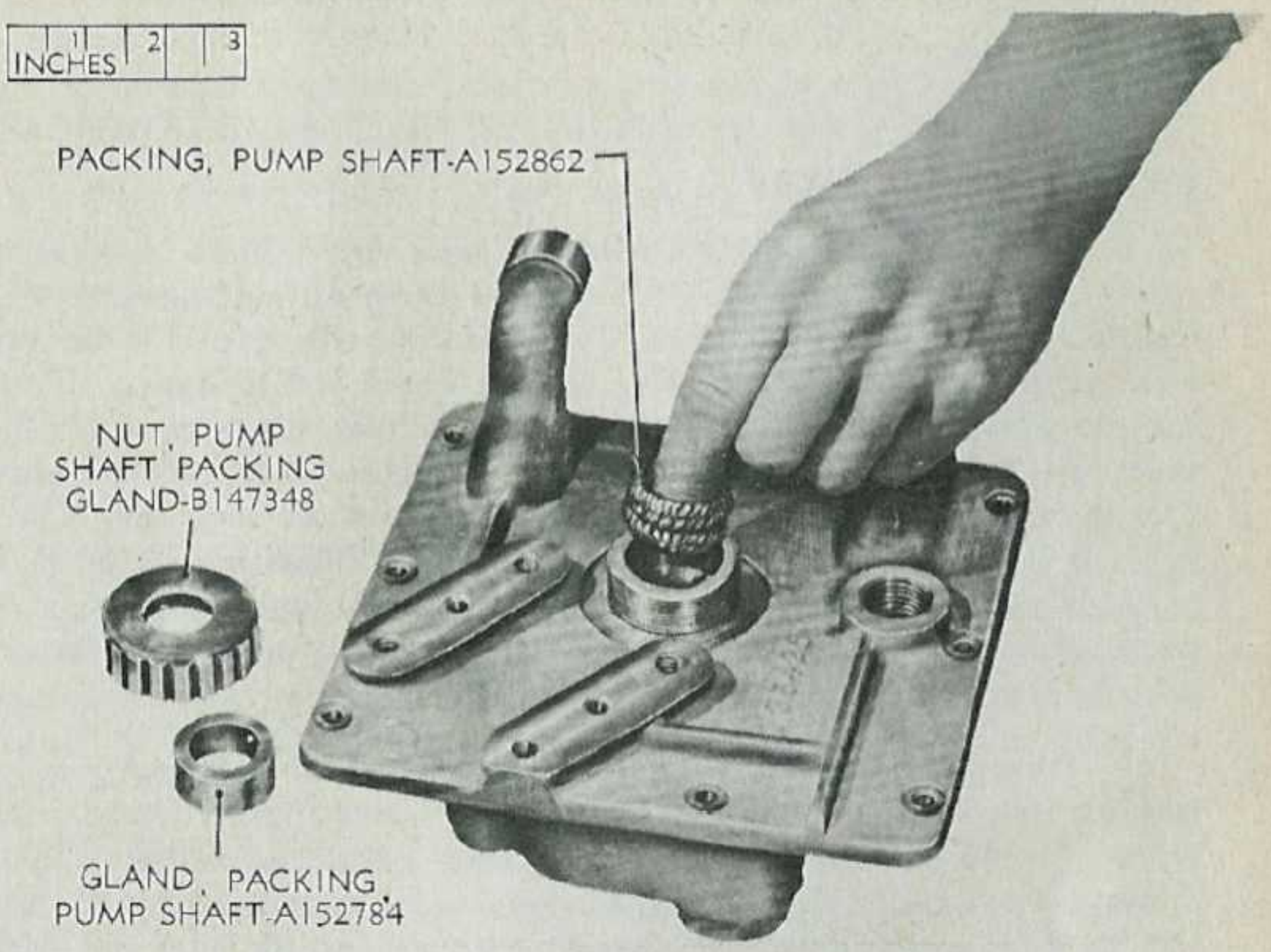


Figure 119—Removal of Pump Shaft Packing

(13) Remove pump rotor from pump body (fig. 118) and remove blades.

(14) Back off pump shaft packing gland nut and remove the nut, pump shaft packing gland, and pump shaft packing (fig. 119).

c. Disassembly of Casing.

(1) Unscrew filler cap from casing and remove cap, packing, and strainer.

(2) Remove drain plug (fig. 102).

(3) Do not remove handles from casing.

50. INSPECTION.

a. Casing Group. Check hand-hole cover for seating, and cover screws for looseness, burs, and damaged threads. Check filler cap threads for burs and cap packing for serviceability. Check strainer for clogged or damaged wire mesh. Check handles for looseness in casing. Check seating of hood in casing and condition of gasket. Check drain plug and chain for burs and wear. Check intake and outlet port union nipples and caps for burs, and cap packing for

serviceability. Check cap retaining chains and eyebolts for security. Check cap washers for serviceability. Check condition of paint (red lead) on inside of casing.

b. **Driving Mechanism Group.** Check drive chain bracket for cracks, and attaching screws for looseness, burs, and damaged threads. Check action of sprockets and drive chain. Check sprockets for line, wear of teeth, and burs. Check driving chain for looseness in link rollers, and connecting link for security. Check large sprocket hub taper pin for looseness, and sprocket for looseness on crank shaft. Check small sprocket for looseness on pump shaft and key. Check key for looseness in keyway of pump shaft. Check action of gland nut locking plunger, spring tension of plunger spring, and plunger for worn nose. Check pump shaft nut for burs, damaged threads, and missing cotter pin.

c. **Pump Body Group.** Check pump body for cracks and attaching screws for looseness and burs. Check pump body cover screws for looseness and burs. Check cover gasket for breaks. Check pump shaft packing gland nut for looseness, burs, and wear in threads and locking plunger grooves. Check packing gland for burs and packing for condition. (If pump leaks at packing, screw down gland nut. If compression binds shaft, repack.)

d. **Pump Rotor Group.** Check pump rotor for burs and looseness on shaft and key. Check pump shaft keyway and key for wear or burs. Check rotor blades for burs and looseness in rotor slots. Check rings for trueness, wear, and burs.

e. **Crank Group.** Check function of crank detent plunger, hinge action of crank arm, and looseness of arm on pivot. Check nose of plungers for wear. Check plunger spring tension. Check crank arm pivot pin for wear, looseness of pin in large sprocket shaft, burs, and missing cotter pins. Check crank arm for distortion, and handle for cracks. Check handle screw for looseness, burs and staking to crank arm base.

f. **Vent Plug.** Check pump body vent plug and screw for looseness and burs. Test vent plug ball retaining spring for tension. Check ball for burs, and ball seat in plug for wear and burs.

g. **Hose Connections.** Check hose connection nipple union nuts for burs, loose threads, and worn shoulders. Check hose clamps for cracks. Check clamp screws and nuts for burs, looseness, and stripped threads. Check hose for leaks, porousness, and cracking. Check connecting tubes for dents, splits, and wear at coupling end which would prevent proper union.

WATER CHEST, CAL. .50, M3

51. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in TM 9-226. Major repairs are explained below.

b. Burs on Sprocket Teeth. Remove burs with fine sharpening stone (teeth are case-hardened).

c. To Repack Pump. In case of water leakage at the packing gland of the pump, the gland nut should be tightened up, but care should be taken to avoid tightening it enough to cause binding. When leakage cannot be stopped in this way, the packing should be replaced. The pump can be repacked without removing it from the chest, as follows:

(1) Remove pump hood cover and crank.

(2) Remove driving chain and driving bracket with large sprocket.

(3) Pull small sprocket from shaft.

(4) Remove packing gland nut, gland, and old packing.

(5) Wind new packing (2⅞-inch braided asbestos, lubricated) around pump shaft.

(6) Replace gland and gland nut, and screw down nut until it will clear under surface of small sprocket hub when sprocket is in place. If this necessitates too much compression of packing for proper pump shaft rotation, remove part of packing.

d. Care and Preservation.

(1) All outside painted surfaces that have become checked, will be repainted with olive-drab lusterless, synthetic enamel. Refer to TM 9-226 for detailed procedure. Remove rust from polished metal surfaces with crocus cloth, or from unfinished metal surfaces with aluminum oxide abrasive cloth.

(2) Upon removal of water pump shaft packing, inspect and, if worn or broken, replace with new water pump packing. Clean the single roller chain with dry-cleaning solvent; dry and lubricate with preservative lubricating oil (special). Water-pump grease will be used for lubricating the working parts of the pump mechanism.

(3) The strainer, which is attached to the brass sump pipe within the water chest, should be cleaned. This operation is accomplished by rubbing a brush across the face of the strainer.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

52. ASSEMBLY.

a. Assembly is in reverse order of disassembly. Prior to assembly, all parts must be free of rust, dirt, or other extraneous matter. Replace all damaged parts and, in particular, do not use a damaged gasket.

CAUTION: *In replacing pump in chest, the 10 pump body cap screws should be screwed down gradually and evenly, to avoid distortion of pump body and consequential misalinement of pump rotor.*

Section XIII

AMMUNITION CHEST, CAL. .50, M2

53. DISASSEMBLY.

a. To remove reel, first unscrew and remove the two crank keys (screws) from the drum of the reel, and then unscrew the axle spindles, in the right and left side of the upper half of the chest, from the drum. The bushings and spacers can then be removed.

b. To remove the upper and lower rollers from the chest, unscrew the nuts from the end of the shafts and then drive out the roller shafts. The rollers, cartridge stop, and spring can then be removed.

c. To remove the click (plunger), unscrew the click tube adjusting screw seated in its hole in the right side of the reel hub, and remove click spring and click. Be careful when removing screw as it is under pressure from the spring.

d. To remove the belt stop from the inside top of the upper half of the chest, unscrew nut from one end of belt stop rod and drive out rod. The sleeve, spacers, stop, and spring can then be removed.

e. The upper half of the chest can be removed by driving out the hinge pin.

54. INSPECTION.

a. Check hinge and latches for operation and looseness. Check tension of latch springs.

b. Check action of removable crank. Check crank handle stud for looseness, and crank arm for distortion.

AMMUNITION CHEST, CAL. .50, M2

c. Check position and functioning of reel (should be so located that flanges are same distance from inside walls of chest). Check reel spacers for position.

d. Check action of click mechanism, and tension of click spring.

e. Check action of rollers for smoothness and looseness. Check staking of roller shaft nuts.

f. Check spindle tension. For adjustment, refer to TM 9-226.

g. Check all screws, studs, and pins for position, looseness, and burs.

55. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. Repaint all painted surfaces that have become checked, as prescribed in TM 9-226. When assembling, clean, oil all unpainted metal parts for rust prevention, and lubricate as prescribed in TM 9-226. Operation and adjustment of the chest is explained in TM 9-226.

b. Clean inside of chest carefully so that dirt or grit will not get into reel mechanism, or on cartridges when being loaded.

c. Check action of reel click and, if faulty, replace click spring or other faulty parts if necessary.

d. Check action of belt stop, cartridge stop, and upper and lower rollers and, if necessary, replace cartridge stop spring and roller bushings.

e. If reel is faulty in action, check axle spindle and bushing and replace spindle bushing if necessary, or spindle and bushing.

56. ASSEMBLY.

a. Assemble by reversing procedure of disassembly. Stake roller shaft nuts when assembled. The reel must be evenly spaced with regard to the sides of the chest when assembled. Check stops for proper operation and spring action, and rollers for free movement. The slots in the axle spindle must be alined with crank key holes in drum of reel when assembled, as keys lock spindle in place. Adjustment of click for tension is explained in TM 9-226.

Section XIV

MACHINE GUN TRIPOD MOUNT, CAL. .50, M3 AND ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1

57. DISASSEMBLY.

a. Tripod Mount M3.

(1) REMOVAL OF MACHINE GUN. Remove cotter pin, pintle bolt nut, and pintle bolt to disconnect gun from gun pintle. Withdraw elevating screw joint pin and remove gun from mount.

(2) DISASSEMBLY OF ELEVATING MECHANISM (fig. 120).

(a) Release traversing slide lock lever and remove elevating mechanism. Remove traversing slide stop screw and rotate traversing slide about 90 degrees until undercut on slide is disengaged from its seat. To disassemble the slide, unscrew the traversing slide lock lever screw, remove the washer, lever, and spring, and then unscrew the traversing slide locking screw. On recent models of elevating mechanisms, the traversing slide is integral with the elevating sleeve and is not removable.

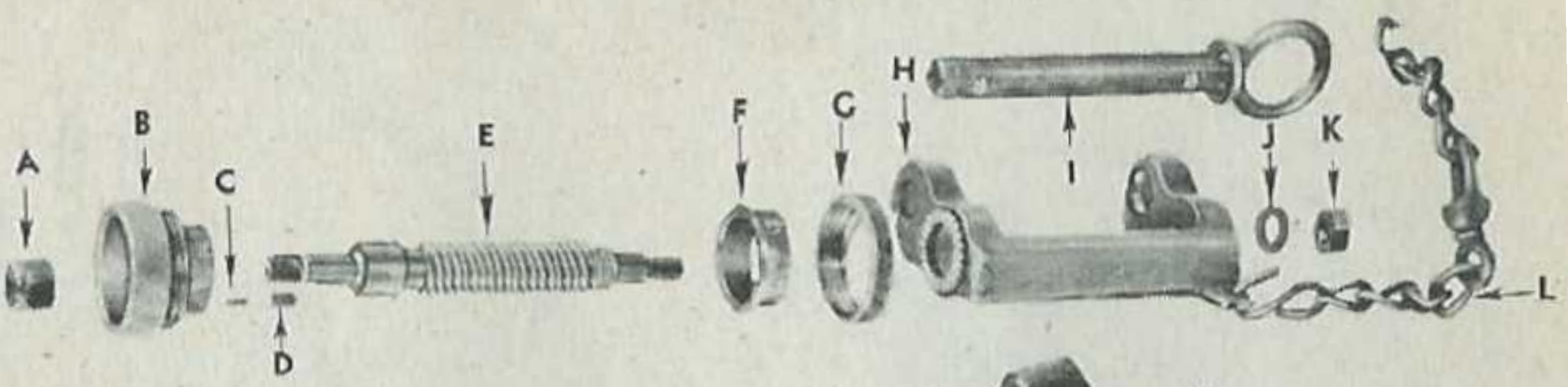
(b) Pull back top of elevating mechanism stop spring to disengage lower elevating screw stop pin from the notch, and drive out the spring through the lower end.

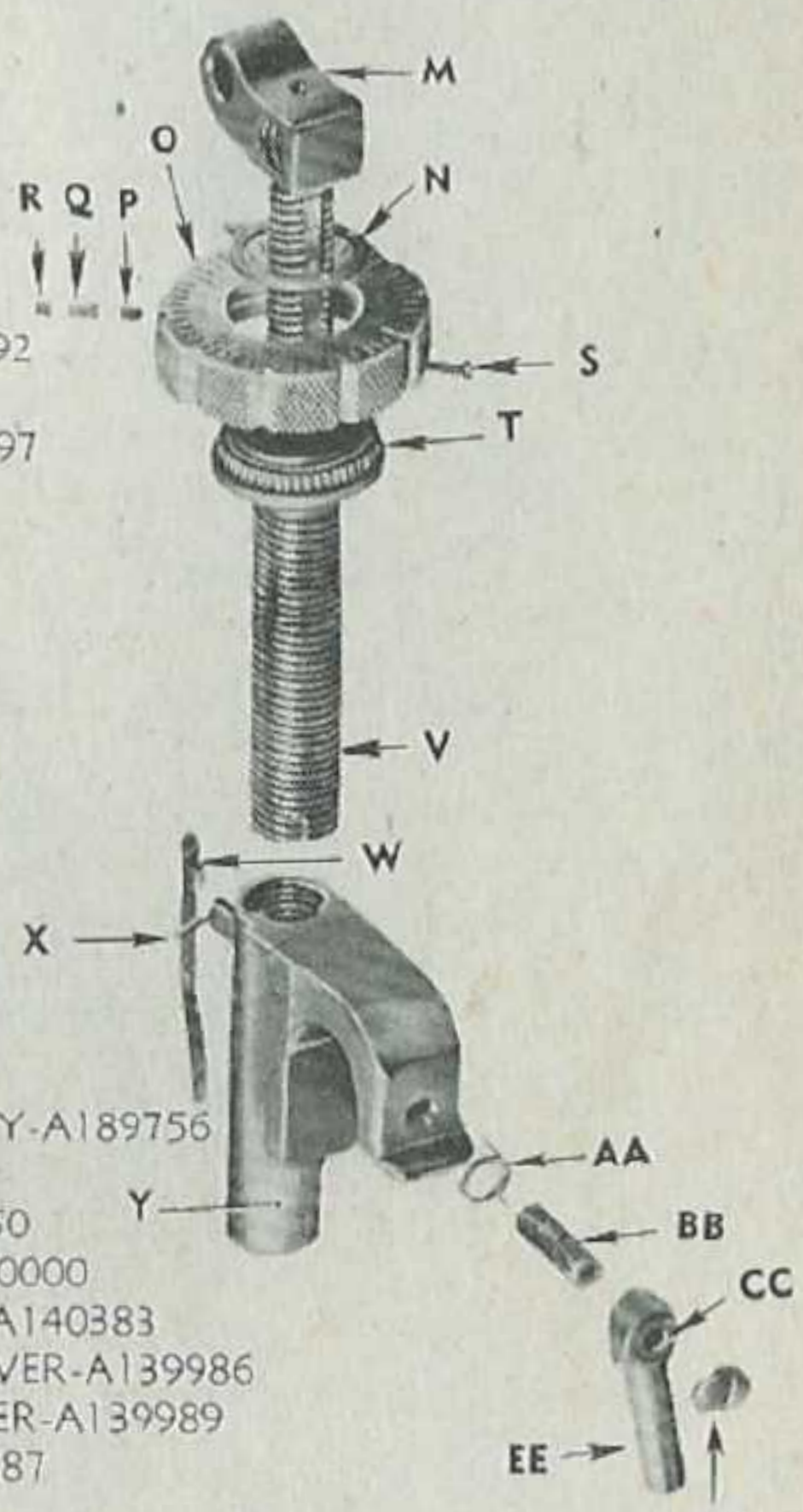
(c) Unscrew the elevating mechanism sleeve from the rest of the mechanism. Remove the upper elevating screw assembly stop by unscrewing stop screw. Remove the upper elevating screw. Remove the elevating handwheel lock screw by unscrewing it from the elevating handwheel. Remove the retainer screw. Lift the lower elevating screw out of the elevating handwheel. Pry up the elevating indicator from its seat on the handwheel and remove. Press the handwheel elevating click ring from the elevating handwheel, making sure the indexing pawl and spring do not fly out. Remove the indexing pawl and spring.

(d) Remove the two end nuts from the traversing screw and traversing washer. Remove the traversing handwheel and scale with scale locking nut, taking care not to lose the Woodruff key, click pin, and spring. Remove the traversing screw from upper elevating screw yoke. Detach chain assembly and remove elevating screw joint pin.

(3) DISASSEMBLY OF TRIPOD LEG AND HEAD GROUPS (figs. 121 and 122).

MACHINE GUN TRIPOD MOUNT, CAL. .50, M3 AND ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1





A — NUT, SAFETY, (5/16")-503344
B — HANDWHEEL, TRAVERSING-B158375
C — SPRING, CLICK PIN-A172237
D — PIN, CLICK-A171495
E — SCREW, TRAVERSING-A174125
F — SCALE, TRAVERSING MECHANISM-A171492
G — NUT, LOCKING-A171491
H — YOKE, UPPER ELEVATING SCREW-B166497
I — PIN, JOINT, ASS'Y-A174113
J — WASHER, TRAVERSING SCREW-A174192
K — NUT, SAFETY (1/4)-503376
L — CHAIN, ASS'Y-A141460
M — SCREW, ELEVATING, UPPER-B166552
N — INDICATOR, ELEVATING-A139982
O — HANDWHEEL, ELEVATING-B108211
P — PAWL, INDXING-A139983
Q — SPRING, INDEXING PAWL-A139999
R — PLUG, HANDWHEEL-A139995
S — SCREW- LOCK-A140612
T — RING, CLICK-A140137
V — SCREW, ELEVATING, LOWER-B108317
W — STOP, ELEVATING SCREW, LOWER, ASS'Y-A189756
X — PIN, STGHT., (3/32"X 5/8")-505476
Y — SLEEVE, ELEVATING MECHANISM-B195550
AA — SPRING, TRAVERSING SLIDE LOCK-A140000
BB — SCREW, LOCKING, TRAVERSING SLIDE-A140383
CC — WASHER, TRAVERSING SLIDE LOCK LEVER-A139986
DD — SCREW, TRAVERSING SLIDE LOCK LEVER-A139989
EE — LEVER, TRAVERSING SLIDE LOCK-A139987

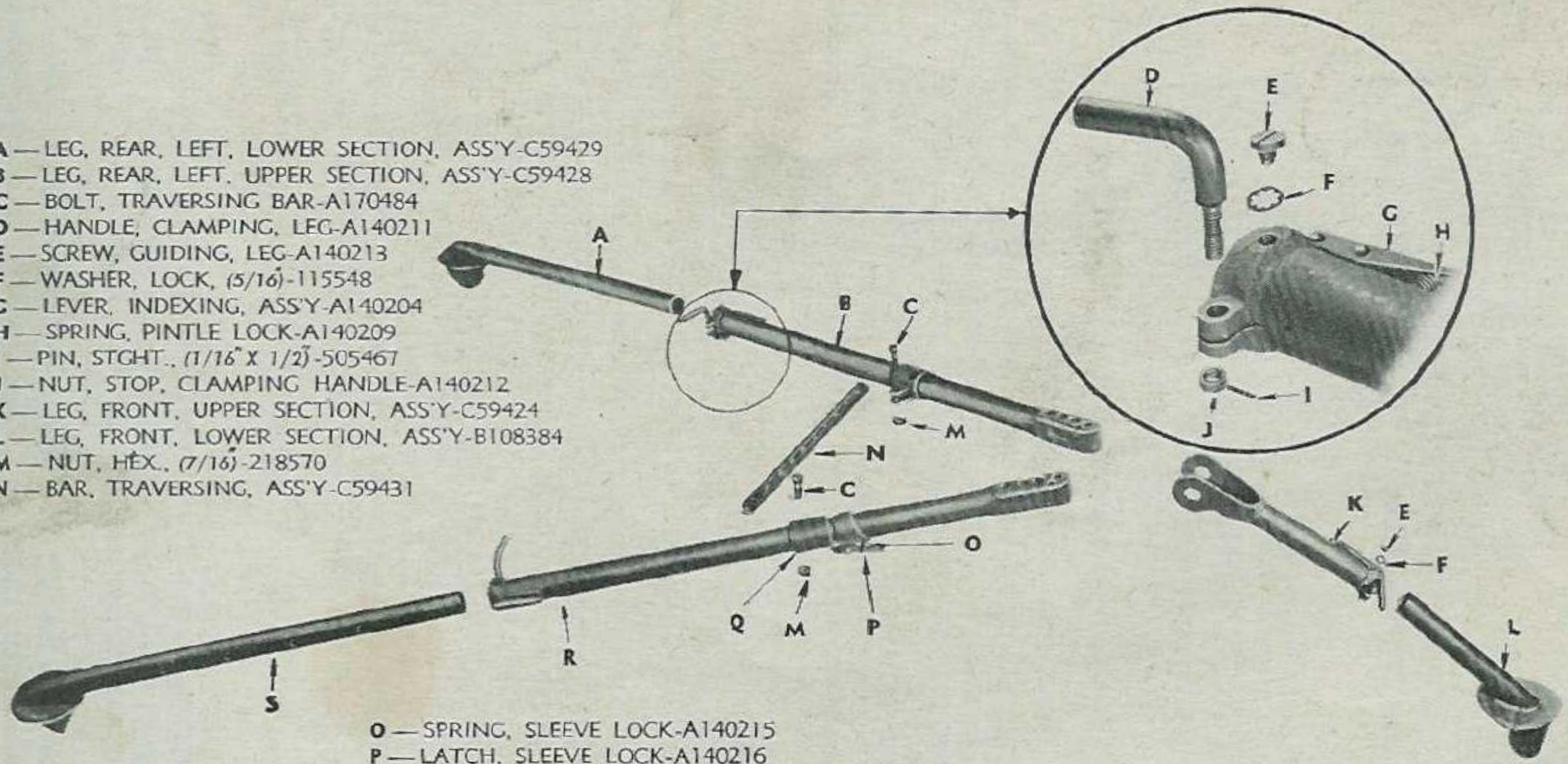
RA PD 91867

Figure 120—Elevating Mechanism Parts for Machine Gun Tripod Mount, Cal. .50, M3—Exploded View

(a) Remove traversing bar bolts and nuts, and withdraw traversing bar.

(b) Remove right and left rear legs from tripod head by removing the tripod head bolts. Drive out pin, unscrew front leg clamp nut with clamp screw handle, and remove front leg clamp screw. Drive out the pin from clamp screw handle to remove handle from clamp screw nut. Spring the yoke end of the front leg sufficiently to free it from serrated plates and withdraw the leg. Remove leg guiding screw and washer from each leg. Release leg clamping handle,

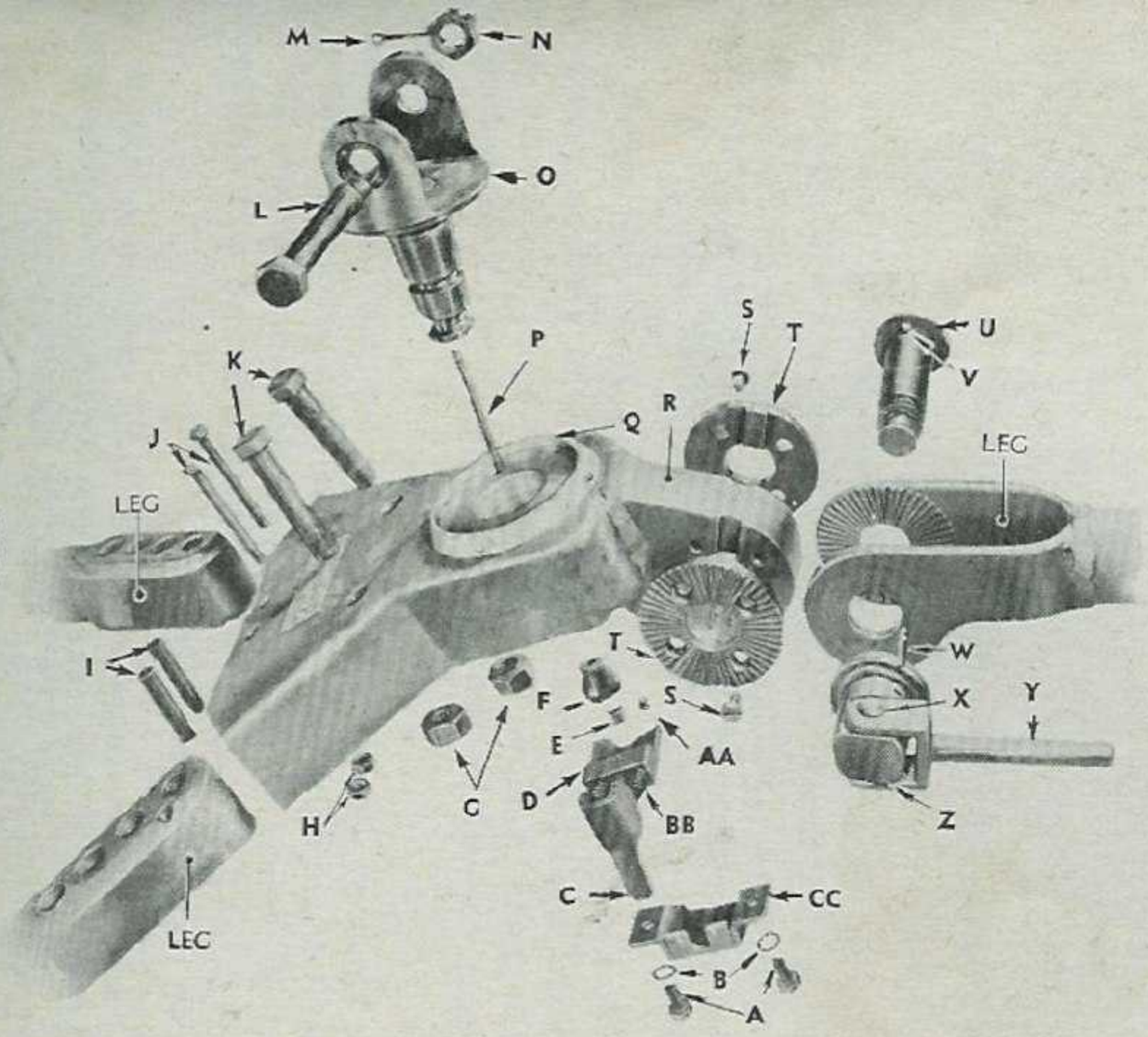
A — LEG, REAR, LEFT, LOWER SECTION, ASS'Y-C59429
B — LEG, REAR, LEFT, UPPER SECTION, ASS'Y-C59428
C — BOLT, TRAVERSING BAR-A170484
D — HANDLE, CLAMPING, LEG-A140211
E — SCREW, GUIDING, LEG-A140213
F — WASHER, LOCK, (5/16)-115548
G — LEVER, INDEXING, ASS'Y-A140204
H — SPRING, PINTLE LOCK-A140209
I — PIN, STGHT., (1/16" X 1/2")-505467
J — NUT, STOP, CLAMPING HANDLE-A140212
K — LEG, FRONT, UPPER SECTION, ASS'Y-C59424
L — LEG, FRONT, LOWER SECTION, ASS'Y-B108384
M — NUT, HEX., (7/16)-218570
N — BAR, TRAVERSING, ASS'Y-C59431



O — SPRING, SLEEVE LOCK-A140215
P — LATCH, SLEEVE LOCK-A140216
Q — SLEEVE, SLIDING, REAR RIGHT LEG-B108391
R — LEG, REAR, RIGHT, UPPER SECTION, ASS'Y-C59425
S — LEG, REAR RIGHT, LOWER SECTION ASS'Y-C59426

RA PD 91868

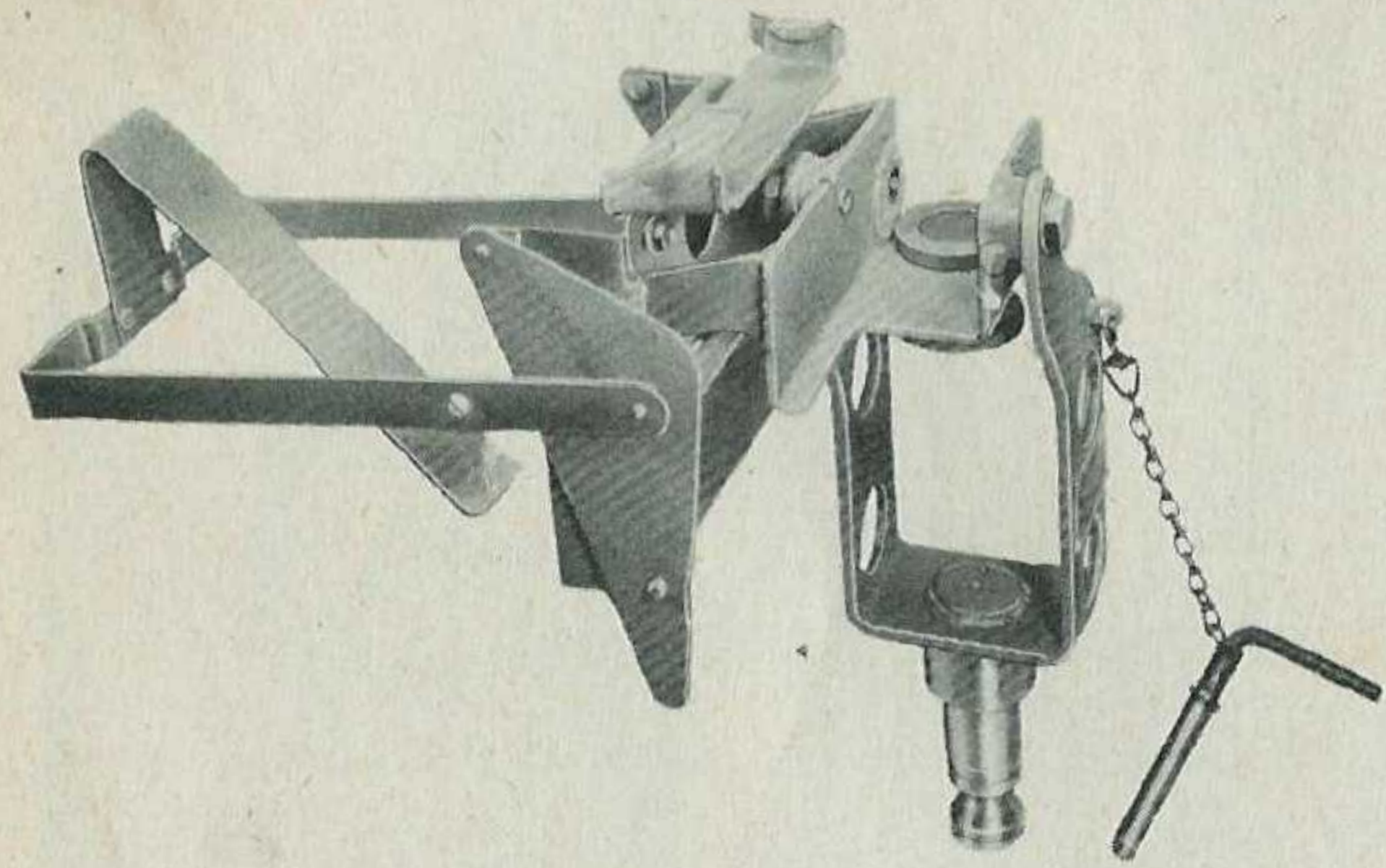
Figure 121—Tripod Leg Parts for Machine Gun Tripod Mount, Cal. .50, M3—Exploded View



A — SCREW, PINTLE LOCK HOUSING-A141950
B — WASHER, LOCK-115547
C — CAM, RELEASE, PINTLE LOCK-A141080
D — LOCK, PINTLE-A140225
E — STOP, DIAL LOCKING KNOB-A140001
F — KNOB, LOCKING DIAL-A139961
G — NUT, *(HEX., 1/2")*-218571
H — NUT, *(HEX., 1/4")*-218563
I — SPACER, TRIPOD HEAD-A140219
J — BOLT, TRIPOD HEAD, SMALL-A170485
K — BOLT, TRIPOD HEAD, LARGE-A170486
L — BOLT, PINTLE-A139973
M — PIN, COTTER, *(1/8" X 1/4")*-103386
N — NUT, PINTLE BOLT-A139964
O — PINTLE, GUN-C59332
P — SCREW, LOCKING, DIAL-A140228
Q — DIAL, TRAVERSING-B108200
R — HEAD, TRIPOD-C59419
S — SCREW, CLICK, ELEVATING HANDWHEEL-A140237
T — PLATE, SERRATED-B108396
U — SCREW, CLAMP, FRONT LEG, ASS'Y-B108395
V — PIN, STGHT., *(3/16" X 1")*505513
W — PIN, STGHT., *(1/8" X 1-1/4")*-505577
X — PIN, STGHT., *(3/8" X 1-3/4")*-103775
Y — HANDLE-A140223
Z — NUT, FRONT LEG CLAMP SCREW-B108401
AA — SCREW, *(SET, HDLS., FL-PT.)*-540896
BB — SPRING, PINTLE LOCK-R140209
CC — HOUSING, PINTLE LOCK-B153118

RA PD 91869

Figure 122—Tripod Head Parts for Machine Gun Tripod Mount, Cal. .50, M3—Exploded View



RA PD 16958

Figure 123—Cradle Group—Antiaircraft Elevator Cradle, Cal. .50, M1

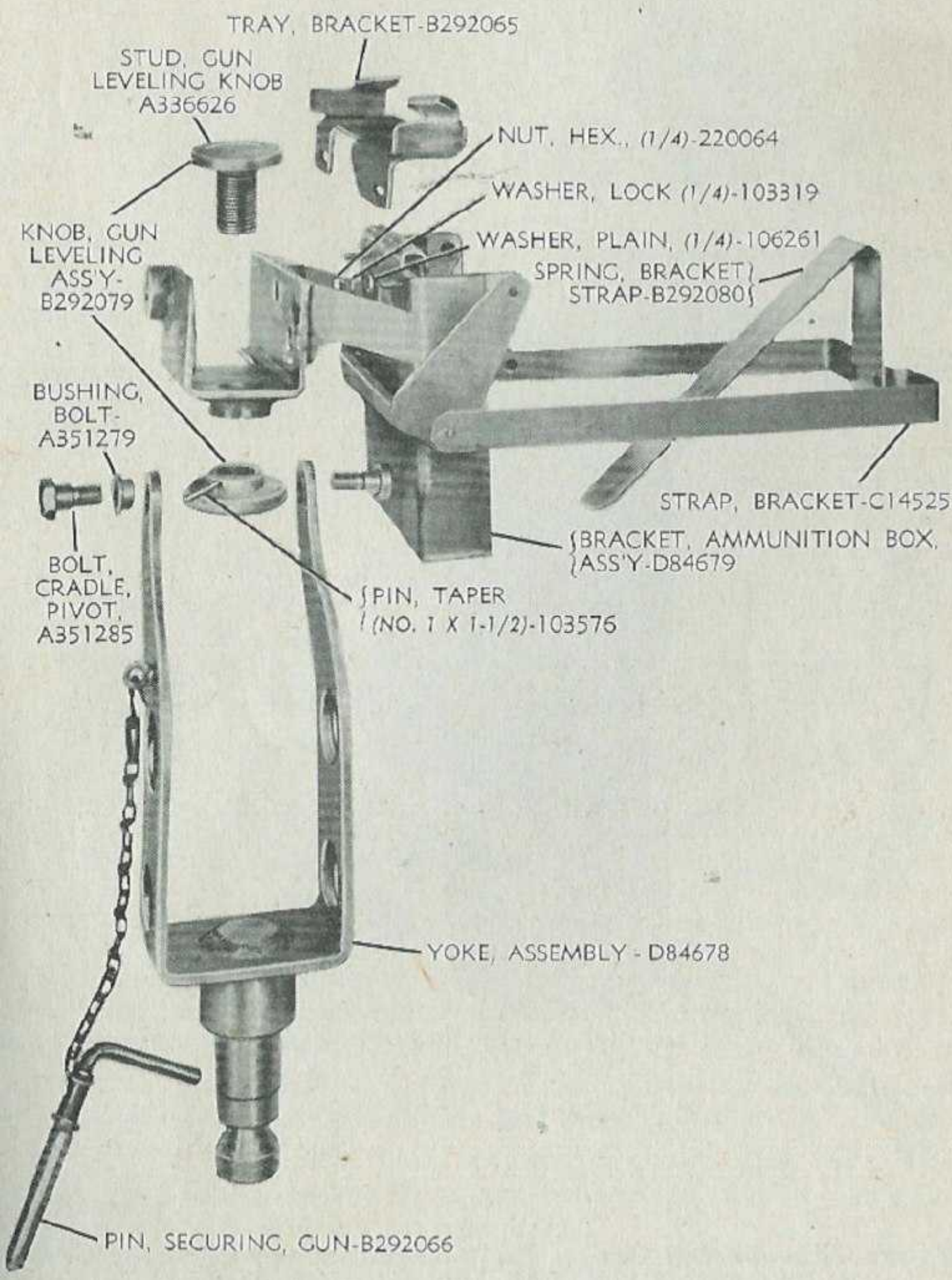
raise indexing lever, and withdraw the leg extension from each leg. Drive out pin and remove leg clamping handle nut and handle. Drive out indexing lever pivot pin and remove indexing lever and spring. Drive out sleeve lock pin, and remove sleeve lock latch and sleeve lock spring from rear right leg.

(c) Release pintle lock and remove gun pintle from tripod head. Remove the two pintle lock housing screws and washers, and remove the pintle lock. Remove the riveted pin which secures the pintle lock release cam to the pintle lock spacing collar. Remove lock and springs.

(d) Unscrew dial locking knob stop and dial locking knob and remove dial locking screw. To remove serrated plates, remove the serrated plate screws. On mounts of recent manufacture, the traversing dial, dial locking knob, dial locking screw, and dial locking knob stop have been eliminated.

(e) Remove the staked set screw from under side and, using a piece of hardwood, drive out the pintle bushing from the bottom. Remove traversing dial from its seat on pintle bushing.

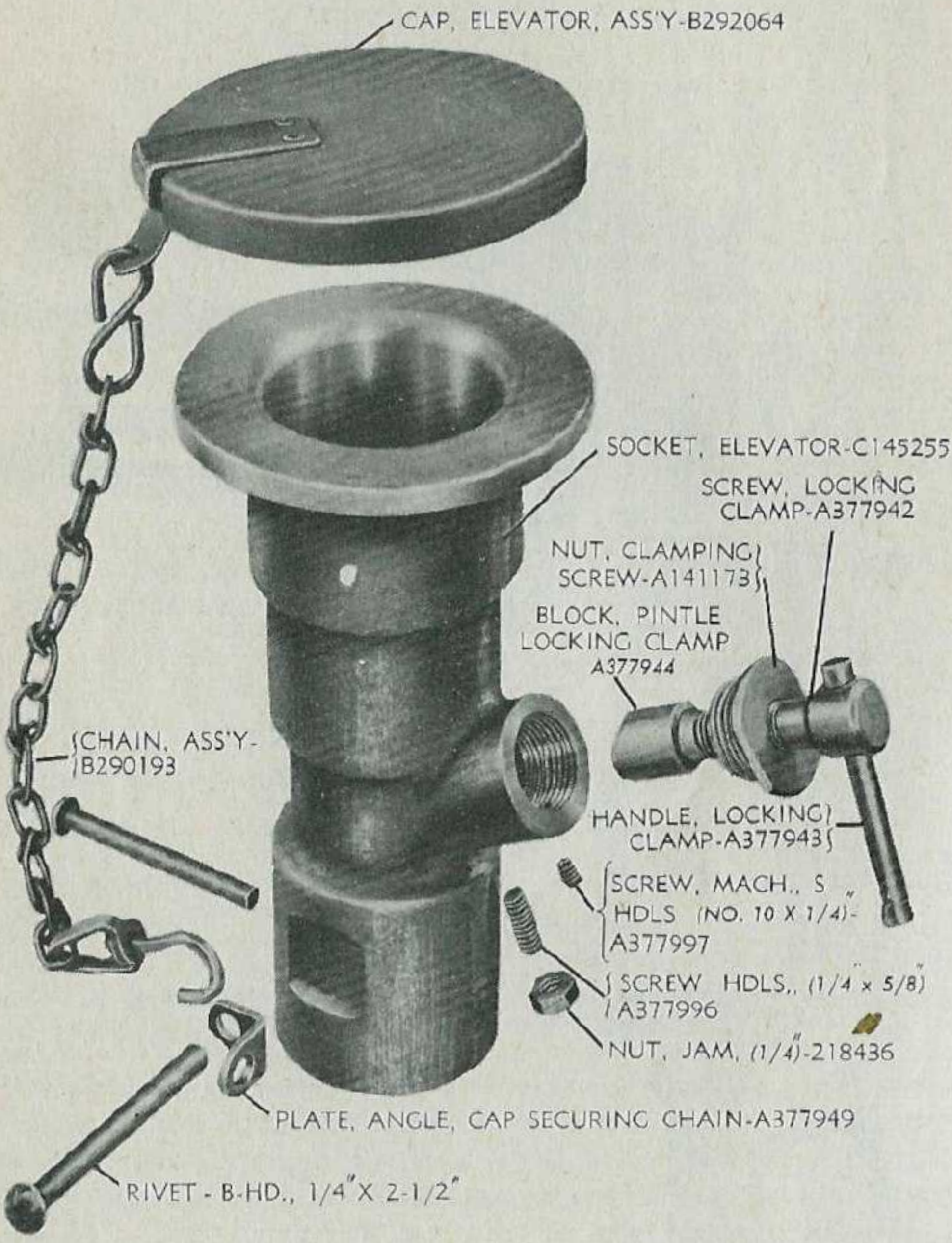
MACHINE GUN TRIPOD MOUNT, CAL. .50, M3 AND ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1



RA PD 91893

Figure 124—Cradle Group Parts—Antiaircraft Elevator Cradle, Cal. .50, M1—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91894

Figure 125—Socket Group Parts—Antiaircraft Elevator Cradle, Cal. .50, M1—Exploded View

b. Antiaircraft Elevator Cradle M1.

(1) CRADLE GROUP (figs. 123 and 124).

(a) Release the pintle locking clamp and remove the cradle from the tripod.

MACHINE GUN TRIPOD MOUNT, CAL. .50, M3 AND ANTIAIRCRAFT ELEVATOR CRADLE, CAL. .50, M1

(b) Remove the two nuts and washers and disconnect the ammunition box bracket tray from the cradle. The screws which secure the tray to the ammunition box bracket are welded over on the heads.

(c) Unstake the cradle pivot bolts and unscrew the bolts to remove cradle from the yoke.

(d) Drive out the pin which secures the gun leveling knob and remove the knob from the stud. The stud is welded to the cradle body.

(e) Further disassembly of the cradle is possible by removing the riveted-over pins which secure the various components of the ammunition box bracket.

(2) ELEVATOR GROUP. Unscrew the headless machine screws and the nut from the pintle socket. Unscrew the pintle locking clamp (fig. 125).

(3) AUXILIARY LEGS. Disassembly of the legs requires removal of rivets.

58. INSPECTION.

a. Tripod Mount M3.

(1) TRIPOD HEAD AND PINTLE GROUP (fig. 122).

(a) Check pintle bolt and nut for wear, damaged threads, burs, and missing cotter pin.

(b) On old-type mounts, check traversing dial for position (setting). Check traversing dial lock knob for functioning and looseness. Check dial locking screw for looseness.

(c) Check tripod head for cracks, wear, and burs.

(d) Check functioning of pintle and pintle lock by removing pintle from bushing and replacing, with lock in locked position. Check pintle for wear in locking groove (or in lock) by vertical motion with lock in locked position. Check pintle bushing for wear and burs, and set screw for staking and burs.

(e) Check pintle lock for functioning and looseness, wear, and burs on nose. Check tension of pintle lock springs. Check lock cam for wear and burs, and pin for looseness.

(f) Check pintle lock housing screws for looseness and burs.

(2) LEGS (fig. 121).

(a) Inspect tripod legs for distortion, dents, and burs. Check telescoping function of upper and lower sections. Check functioning of indexing lever, tension of (or missing) springs, and for loose pins. Check condition of indexing pin, and check holes in tubing of lower

leg section. Check functioning of leg clamping handle, and check threads for looseness and burs. Check lower leg sections for rust.

(b) Check functioning of *front leg* clamp. Check serrations of front leg yoke and head plates for wear or burs. Serrations must be clear when adjusting the legs and must be in proper alinement to insure an even spread of the legs when clamped. Check threads of front leg clamp screw and nut for missing pin. Check handle for looseness or loose pin. Check screws of serrated head plates for looseness and burs.

(c) Check functioning of hinge on rear legs. Check tripod head spacers (rear leg hinges), bolts, and nuts for looseness and burs. Check functioning of sliding sleeve on right rear leg, and sleeve lock latch. Check leg for rust. Check traversing bar for distortion and dents, and traversing bar bolts and nuts for looseness, wear, and burs. Check spades for cracks, dents, and condition of welding.

(d) The rear legs, when in firing position, must be slightly forced apart by the traversing bar to insure rigidity of the mount. With the tripod legs in contact with the sides of the head and with the sleeve on the left leg in contact with the collar, the sleeve and collar on the right leg must be $\frac{3}{4} \pm \frac{1}{16}$ inch apart, requiring a slight force to have the sleeve engage the latch. With the latch engaged, there must be not more than 0.013-inch clearance between the sleeve and collar. When open, the front tripod leg must contact the tripod head.

(3) ELEVATING MECHANISM (fig. 120).

(a) Inspect elevating mechanism for condition, dents, and burs. Disconnect elevating mechanism from gun by removal of elevating screw joint pin assembly. Test smoothness of elevating screw action for upper and lower limits, and for excess play in threads of upper and lower elevating screws. Check elevating screw joint pin for looseness and burs, nut for burs and missing cotter pin, and locking spring and screw for functioning, looseness, and burs. Check for missing plug in lower end of elevating mechanism sleeve. Check functioning of lower elevating screw stop pin, tension of elevating mechanism stop pin spring, and fit of spring in dovetailed spring seat. Remove elevating mechanism stop pin and spring by springing pin from hole in casing and lifting spring from dovetailed spring seat, and examine nose of pin for wear and burs. Check pin, limiting action of stop pin spring for looseness. See that elevating mechanism stop pin seats fully in slot in lower end of thread of lower elevating screw.

(b) Check elevating handwheel lock screw, and retaining screw, for looseness and burs. Check handwheel plug for looseness and click function of indexing pawl. (If click does not function properly, re-

move handwheel plug and check spring and nose of pawl.) Check setting of handwheel with indicator.

(4) TRAVERSING SLIDE. With elevating mechanism disconnected from gun, test smoothness of functioning of traversing slide on traversing bar, and pivoting motion of slide. Check locking of traversing slide to elevating mechanism sleeve for looseness. Check traversing slide stop screw for functioning and staking. Check functioning of traversing slide lock, spring tension, and action of serrated joint. If action of serrated joint is not positive, remove traversing slide lock lever screw and examine serrations of joint for wear.

b. Antiaircraft Elevating Cradle M1 (figs. 14, 123, 124, and 125).

(1) Check legs for straightness and security in clamp, and for loose rivets, action of clamp, and damaged threads on clamp screw.

(2) Check pintle and socket on body for wear and burs, pintle clamp assembly for operation, and worn threads or missing screws and burred block.

(3) Check cap for security when assembled to socket, and chain for security to cap and body.

59. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. When assembling, clean, oil all parts for rust prevention, and lubricate as prescribed in FM 23-65. Major repairs are explained below.

b. Tripod Mount M3.

(1) ELEVATING MECHANISM.

(a) Replace traversing slide lock spring if traversing slide fails to operate.

(b) If traversing screw shows end play, adjust the nut on right end of screw to eliminate end play.

(c) If clicks are not distinctly perceptible to the end, replace the indexing pawl spring and/or click pin spring.

(d) If the elevating and traversing screws operate sluggishly or bind, clean or chase out the threads.

(e) If Woodruff key is damaged, it should be replaced.

(2) TRIPOD.

(a) If pintle lock fails to lock the gun pintle, replace the pintle lock springs.

(b) Replace serrated plates if worn or damaged.

(c) If indexing lever fails to function, replace the spring.

(d) If sleeve lock latch does not function properly, replace the sleeve lock spring.

c. Antiaircraft Elevator Cradle M1. Maintenance and repair are similar to that of the Tripod Mount M3, where pertinent.

60. ASSEMBLY.

a. Tripod Mount M3. Assembly is in the reverse order of disassembly. Prior to assembly, all parts must be free of dirt, rust, and other extraneous matter. Damaged parts will be replaced. Metal parts in contact must be covered with a light film of preservative lubricating oil (special).

b. Antiaircraft Elevator Cradle M1. To assemble, proceed in reverse order of disassembly.

Section XV

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M2A1

61. DISASSEMBLY.

a. Removal of Sight and Shields (figs. 15, 16, and 126).

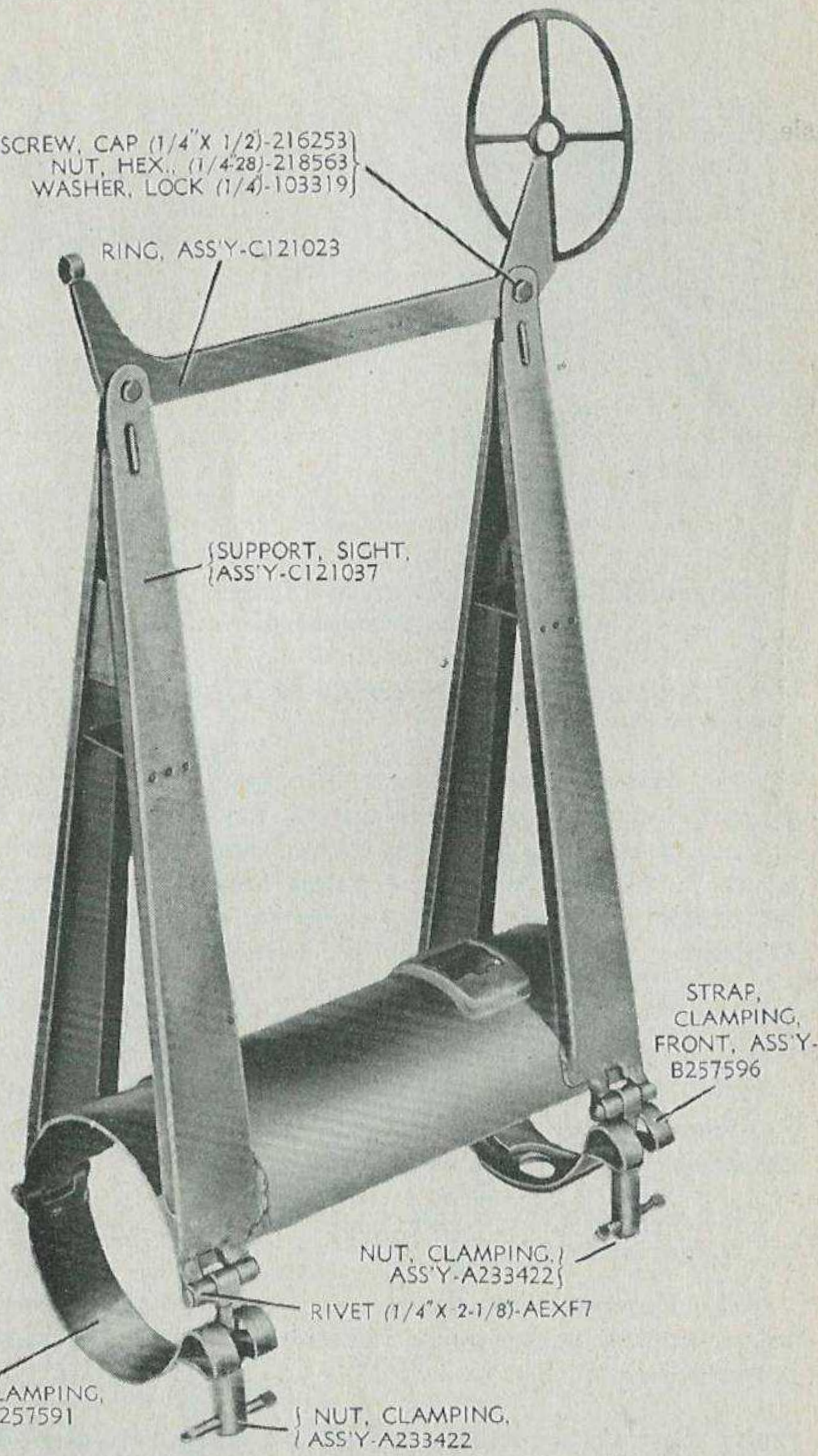
(1) To remove the sight, disengage the hinged clamping straps by unscrewing the wing nuts and swinging the toggle bolts out of engagement with the straps. Then lift sight from water jacket of gun.

(2) To remove the upper armor shield, loosen the left and right clamp bolt plates by turning the left and right clamp bolts counterclockwise. Lift upper armor shield past the water jacket and slide off machine gun muzzle.

(3) To remove the lower armor shield, loosen and remove screw and lock washer from the lower armor shield support plate nut. Lift and withdraw the lower armor shield from the two lower armor shield support studs. Loosen and remove the two screws and lock washers which secure the lower armor shield yoke clamping plate and lower armor shield support yoke to the cradle pintle. Remove the lower armor shield support yoke and withdraw the lower armor shield yoke clamping plate.

b. Removal of Back Rest and Counterbalance. Loosen three screws of the back rest bracket and withdraw back rest assembly. Drive out pin which secures the small back rest end and remove end. Pour the 23 pounds of counterbalance lead shot into a bag.

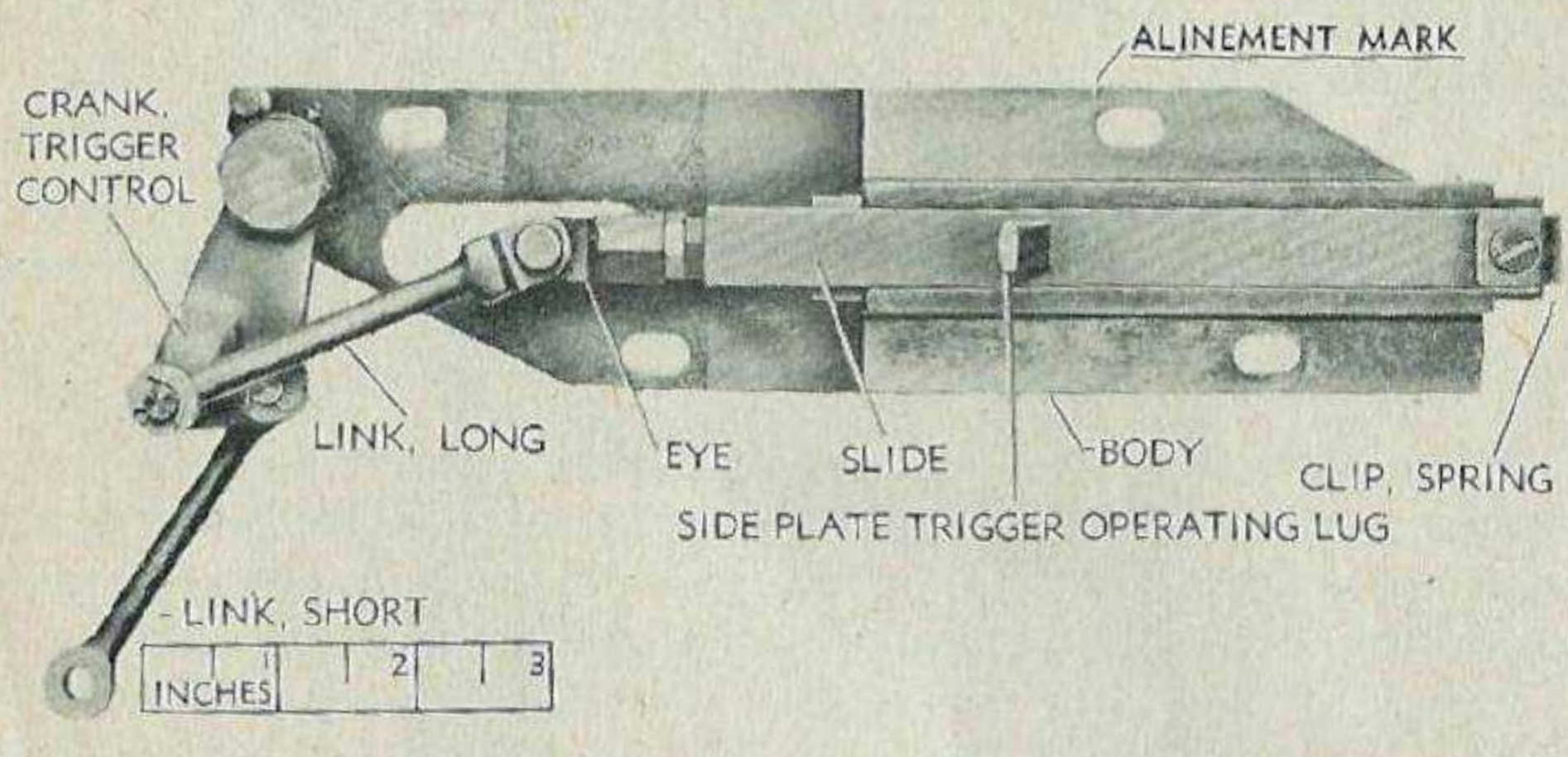
MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M2A1



RA PD 91871

Figure 126—Antiaircraft Sight M1—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91870

Figure 127—Trigger Control (Slide) Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

c. Removal and Disassembly of Trigger Control Slide Group (figs. 127 and 128).

(1) With the mechanism in disengaged position, withdraw cotter pin and washer from trigger control link pin. Remove the pin and disconnect short trigger control link from trigger control hand lever. Similarly disconnect the short and long trigger control link from mechanism. Remove the nuts, screws, and washers which connect mechanism to plate. Withdraw mechanism.

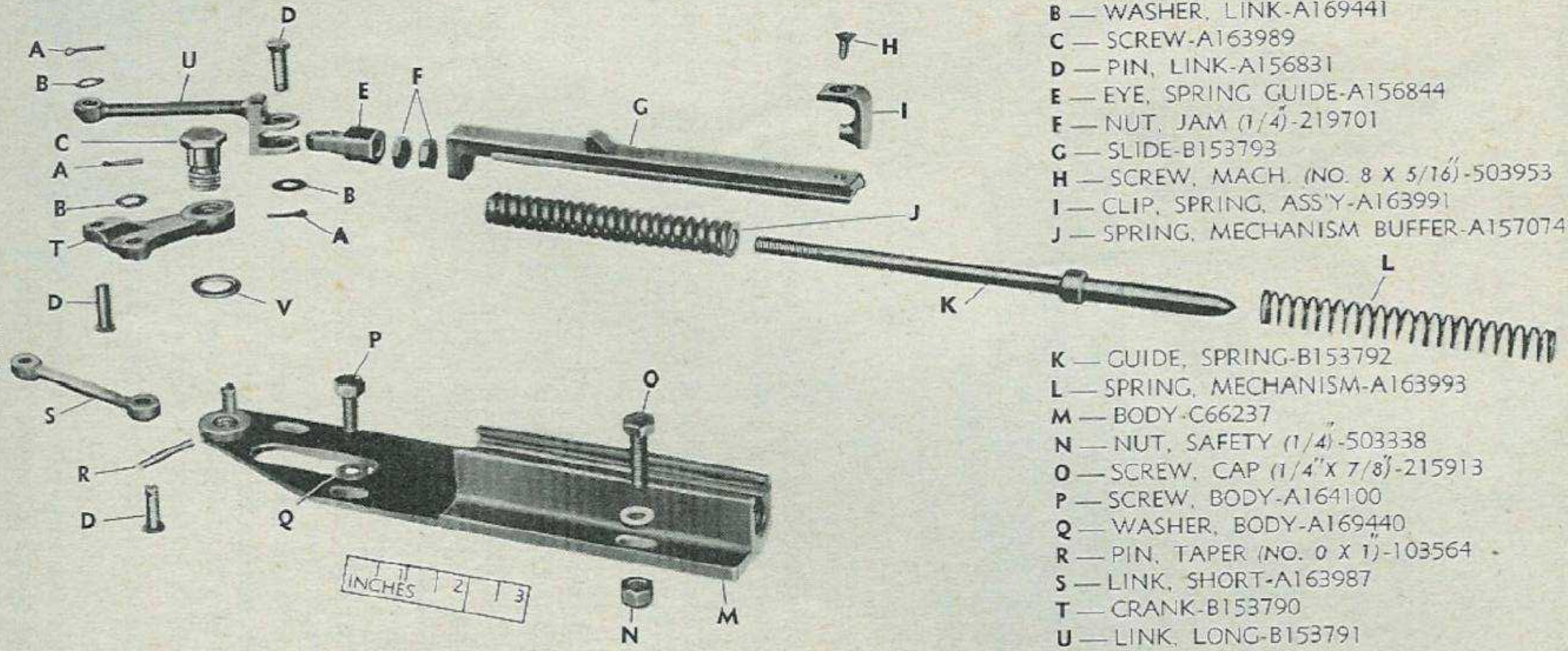
(2) Drive out taper pin from trigger control crank screw and remove screw, washer, and crank.

(3) Unscrew the screw which secures the trigger control spring clip while holding the clip against the spring force. Remove the clip and trigger control mechanism spring.

(4) Remove the trigger control slide with its components from the trigger control body.

(5) Unscrew the trigger control eye and the two nuts from the trigger control spring guide. Remove guide and trigger mechanism buffer spring.

d. Removal and Disassembly of Trigger Control Hand Lever Group (figs. 129 and 130). Remove the cotter pin, pull out the trigger control lever pin, and withdraw the trigger control hand lever and spring. Remove the nut and screw which secure the trigger control clamp to back rest bracket and slide the clamp off the back rest

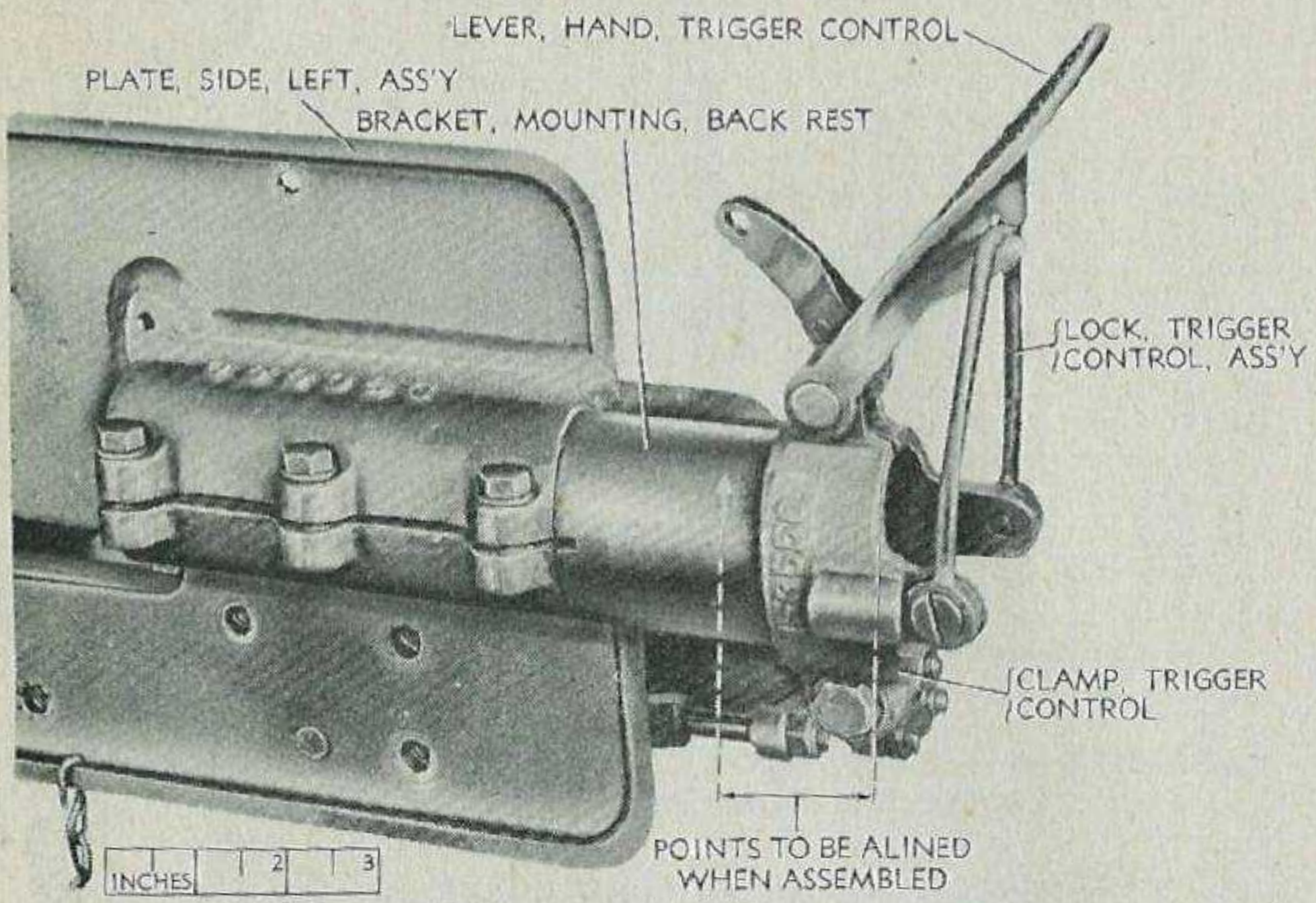


A — PIN, COTTER (1/16" X 7/16")-137130
B — WASHER, LINK-A169441
C — SCREW-A163989
D — PIN, LINK-A156831
E — EYE, SPRING GUIDE-A156844
F — NUT, JAM (1/4")-219701
G — SLIDE-B153793
H — SCREW, MACH. (NO. 8 X 5/16")-503953
I — CLIP, SPRING, ASS'Y-A163991
J — SPRING, MECHANISM BUFFER-A157074
K — GUIDE, SPRING-B153792
L — SPRING, MECHANISM-A163993
M — BODY-C66237
N — NUT, SAFETY (1/4")-503338
O — SCREW, CAP (1/4"X 7/8")-215913
P — SCREW, BODY-A164100
Q — WASHER, BODY-A169440
R — PIN, TAPER (NO. 0 X 1")-103564
S — LINK, SHORT-A163987
T — CRANK-B153790
U — LINK, LONG-B153791
V — WASHER-A163990

RA PD 91872

Figure 128—Trigger Control (Slide) Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91873

Figure 129—Trigger Control Hand Lever Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

bracket. Remove the two trigger control lock screws to release the trigger control lock. Withdraw the trigger control lock plunger and spring.

e. Removal and Disassembly of Lower Recoil Mechanism Group (figs. 131, 132, 133, and 134).

(1) Drive out taper pin from the recoil mechanism slide stop handle. Remove handle and recoil mechanism slide stop spring. Drive out taper pin from recoil mechanism slide stop, and remove stop and shaft.

(2) Remove the two pins and the three screws and washers which secure each adjusting rack guide bar to the cradle plates. Remove the two pins and six screws and washers which secure each side of the recoil mechanism to the cradle plates. Remove the frame with racks from the cradle. Location marks should be made on racks with center punch so that reassembly can be accomplished easily.

(3) To disassemble the lower recoil mechanism group, proceed as follows:

(a) Unscrew the nuts which secure the racks to the recoil mechanism adjusting head. Remove the racks.

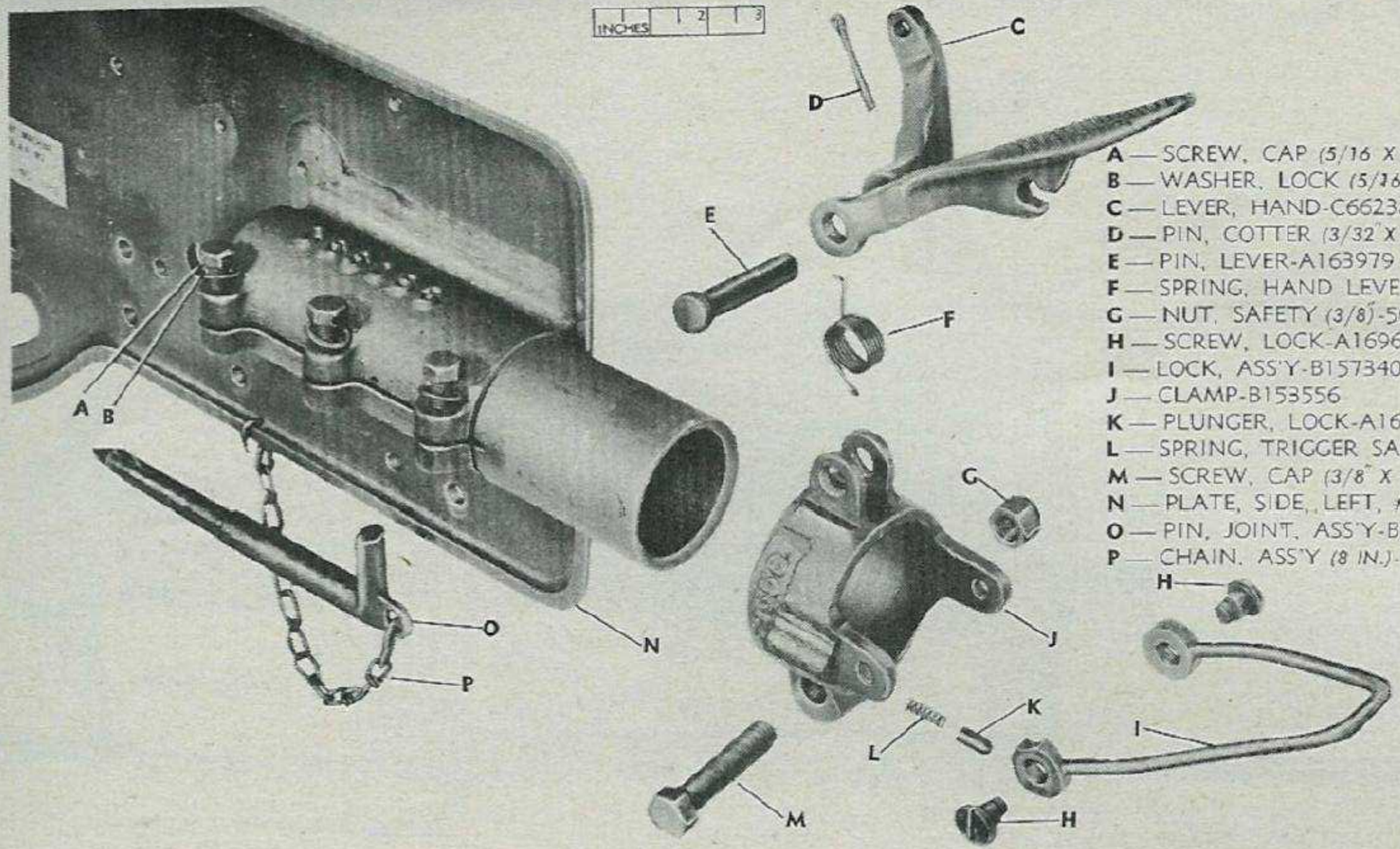


Figure 130—Trigger Control Hand Lever Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

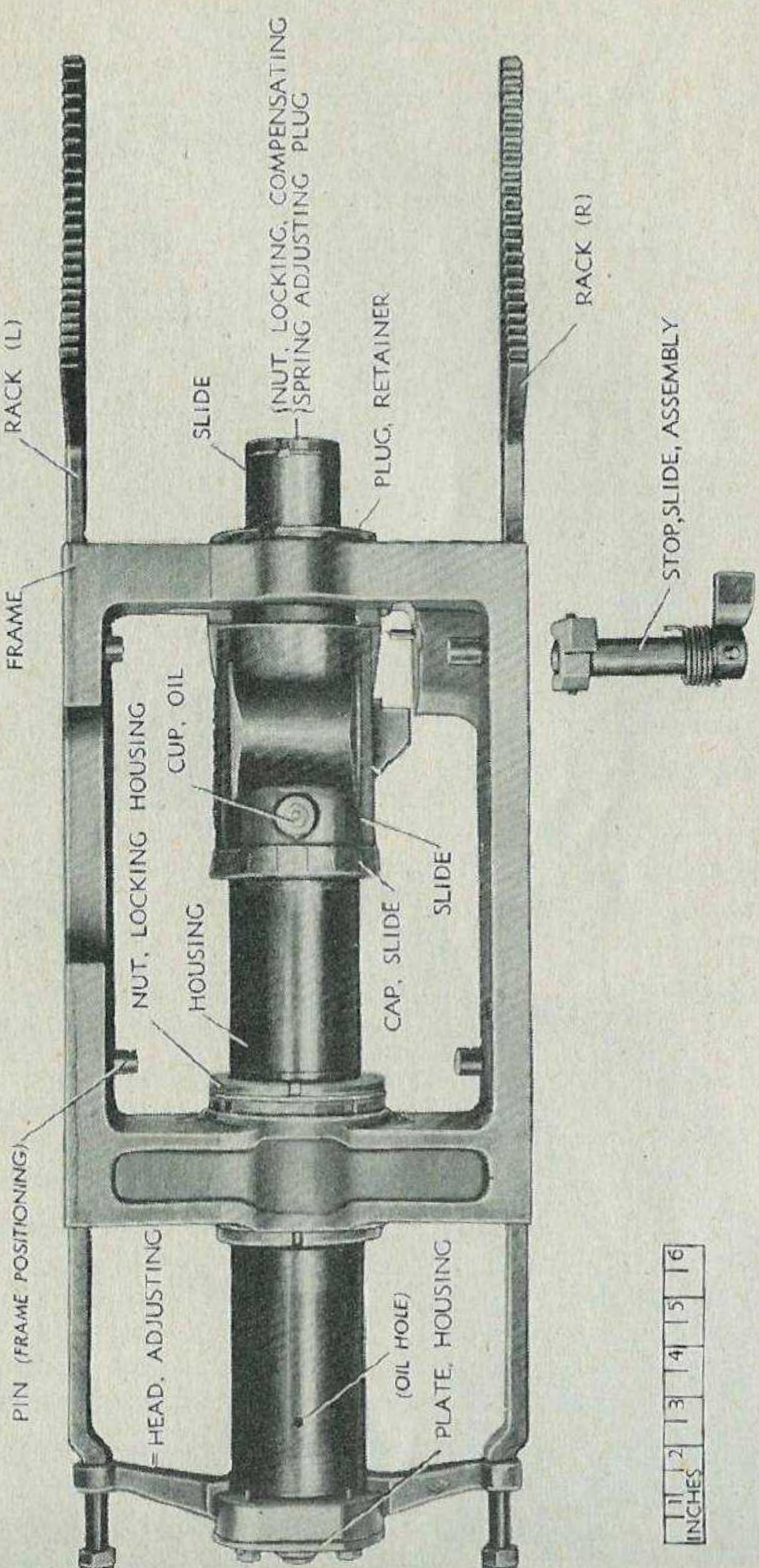


Figure 131—Lower Recoil Mechanism Group With Slide Stop Removed—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

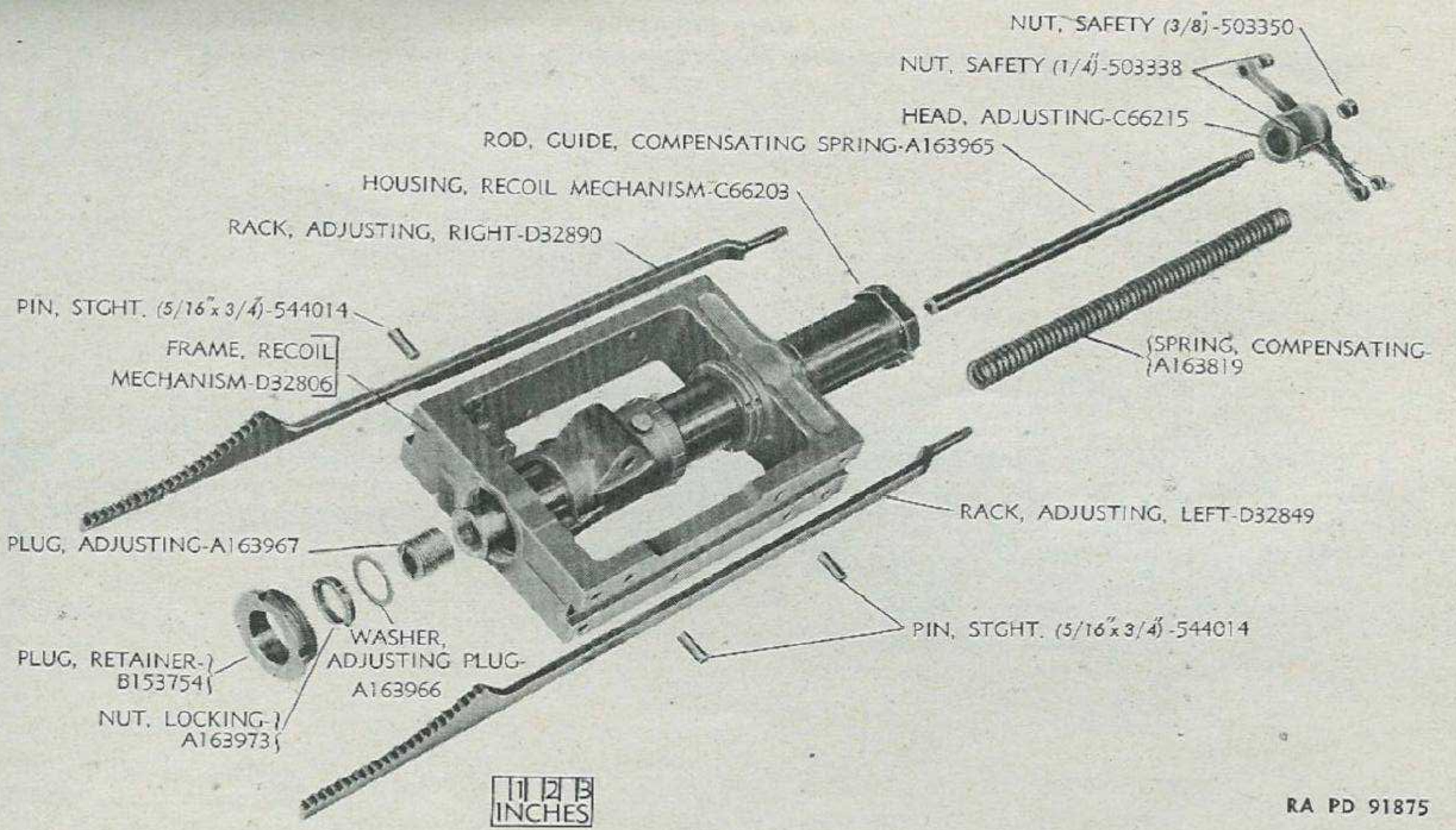


Figure 132—Compensating Spring Mechanism Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

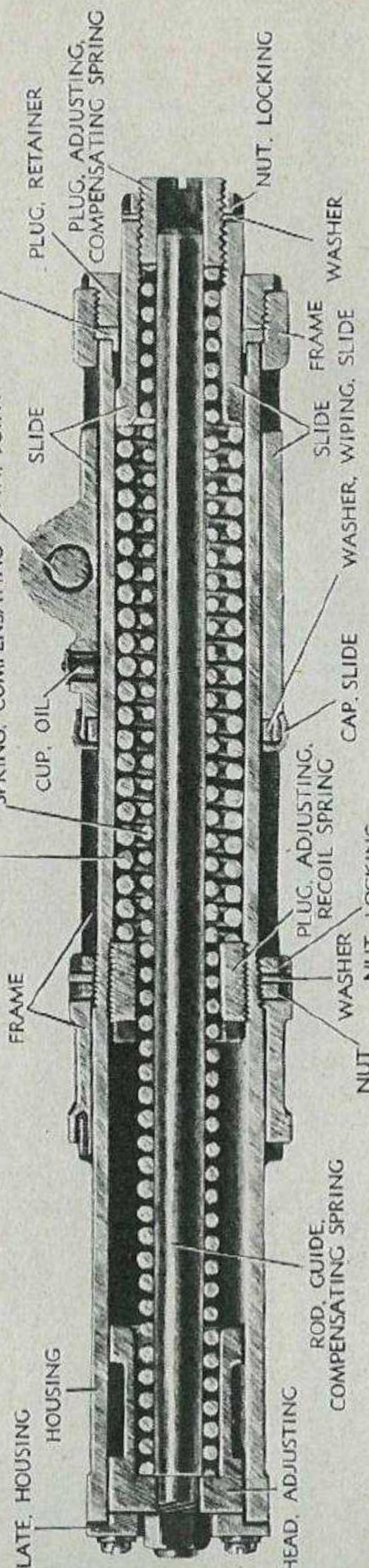


Figure 133—Lower Recoil Mechanism Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Sectional View

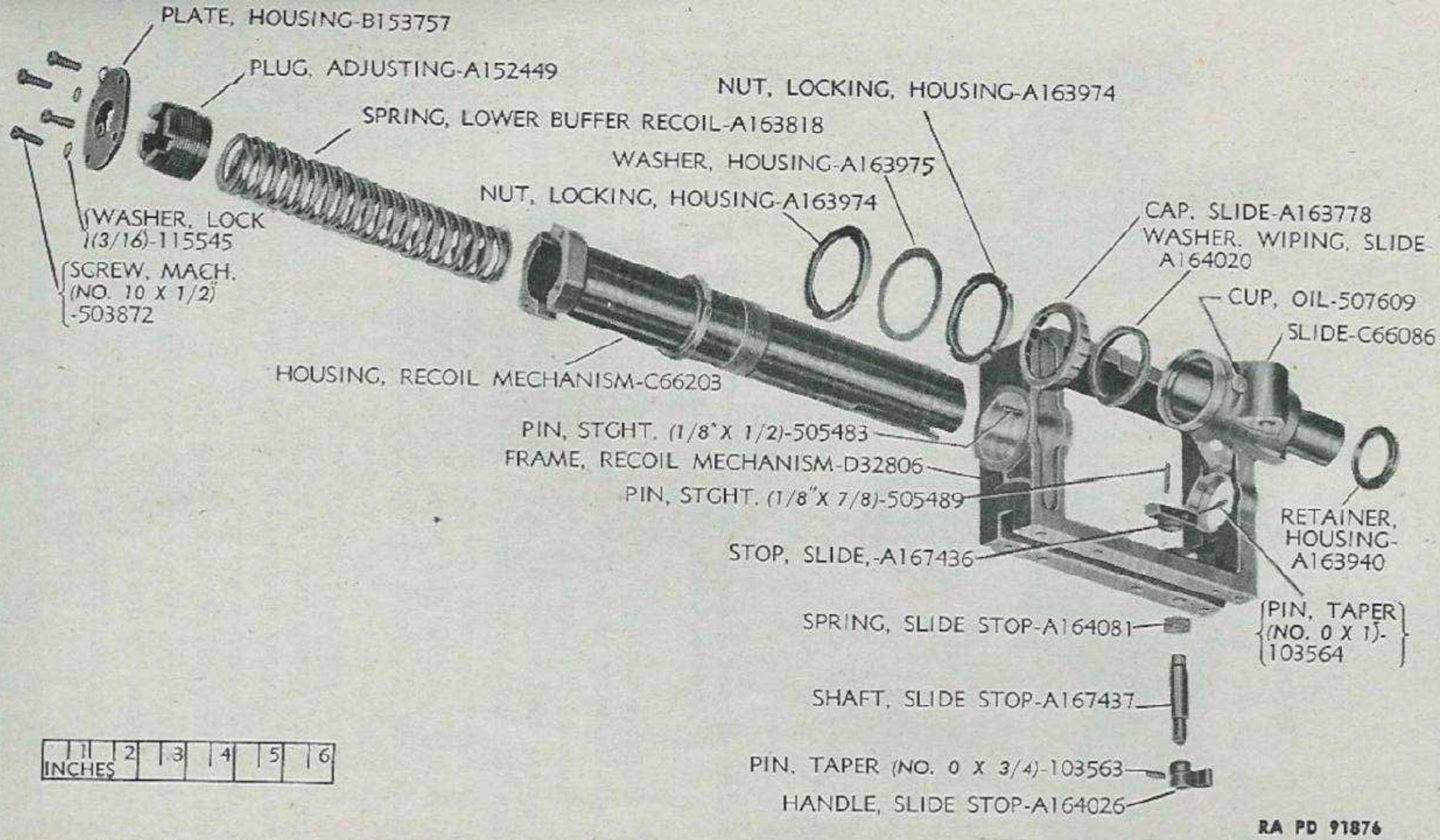


Figure 134—Recoil Spring Mechanism Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

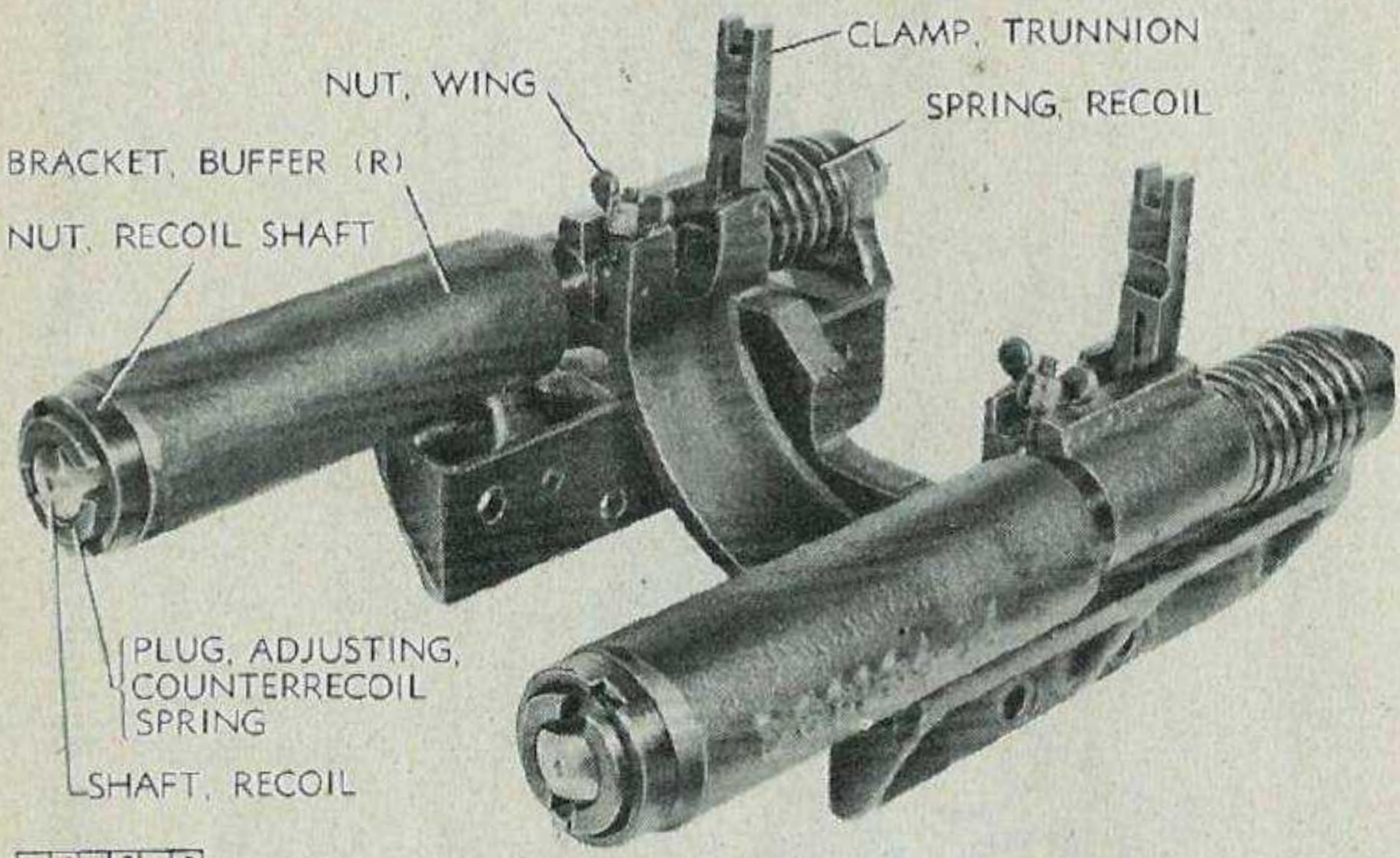


Figure 135—Upper Buffer Recoil Mechanism Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

(b) Remove the four screws and washers which secure the recoil mechanism housing plate to the recoil mechanism housing.

(c) Remove the housing plate and adjusting head with compensating spring and adjusting rod. Remove the spring. Unscrew the nut from the rod and remove rod from head.

(d) Insert a spanner wrench into the recoil mechanism housing and gradually unscrew the recoil spring adjusting plug, holding the wrench against the force of the spring. Remove the lower buffer recoil spring.

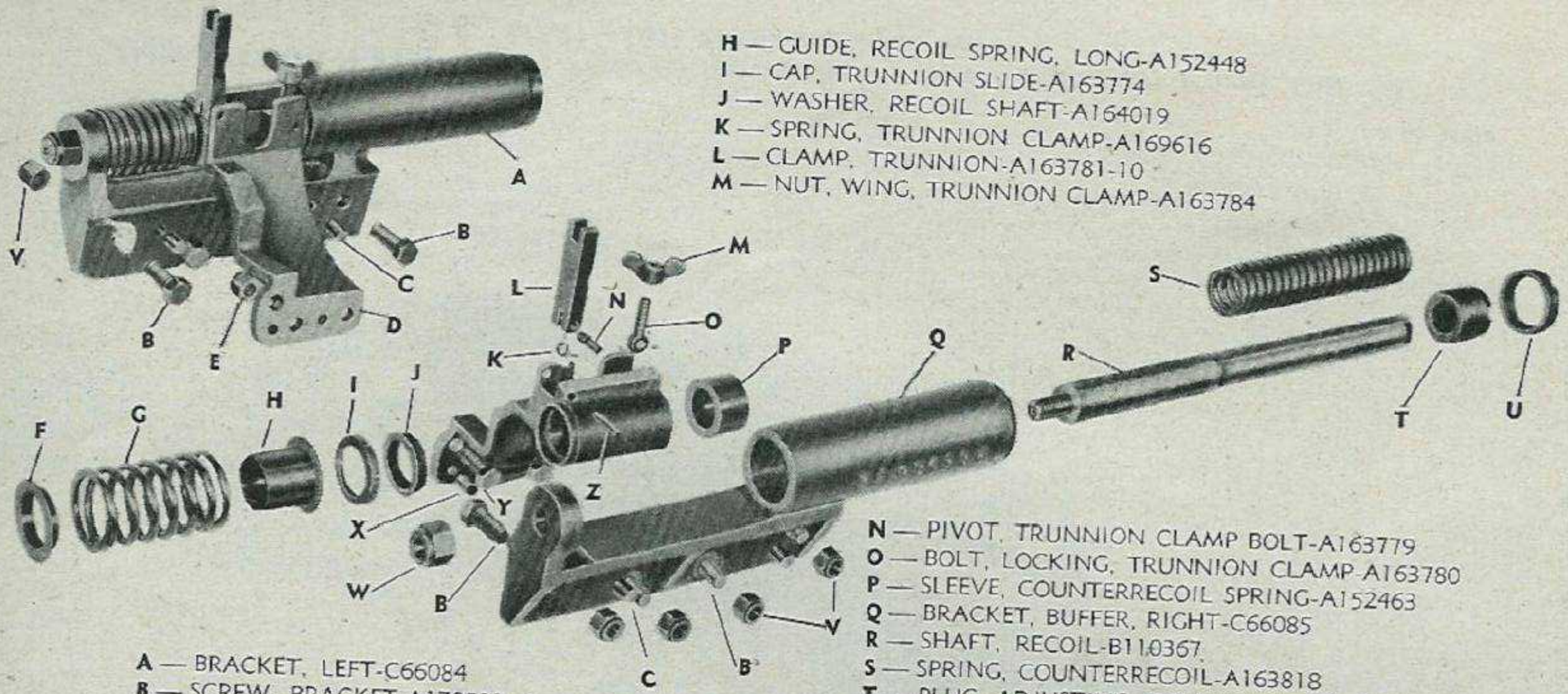
(e) With a spanner wrench, unscrew the compensating spring adjusting plug locking nut. Remove compensating spring adjusting plug washer. Unscrew compensating spring adjusting plug.

(f) With a spanner wrench, unscrew the recoil mechanism housing retainer plug and withdraw the retainer.

(g) Back off the two recoil mechanism housing lock nuts and washer. Remove the lining pin.

(h) Remove the housing from the recoil mechanism slide and frame.

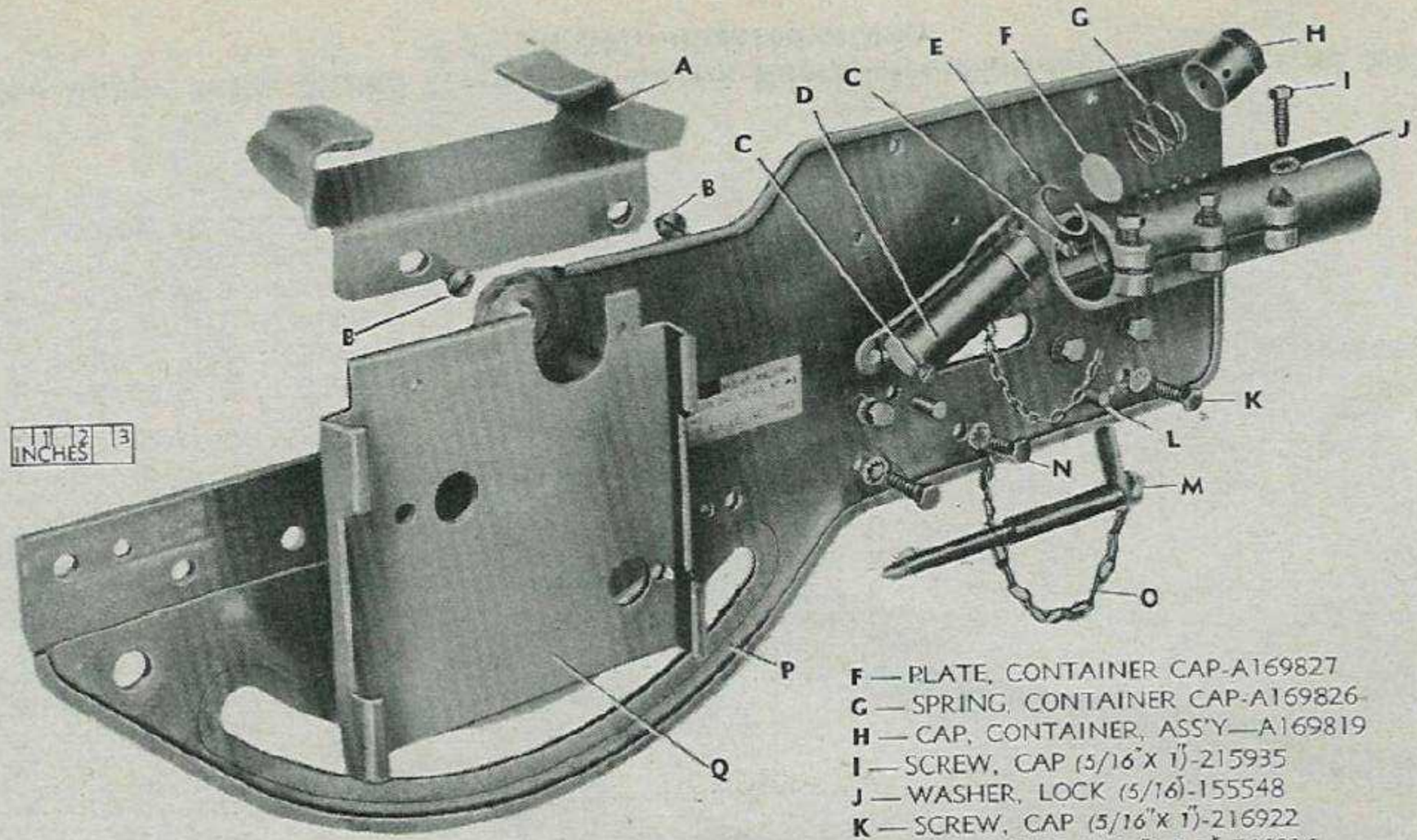
(i) Spring the recoil mechanism slide cap from the slide and remove the recoil mechanism slide wiping washer.



A — BRACKET, LEFT-C66084
B — SCREW, BRACKET-A170599
C — PIN, STGHT. (5/16" X 1/2")-505591
D — SLIDE, TRUNNION, LEFT-C66087
E — NUT, SAFETY (5/16")-503344
F — GUIDE, RECOIL SPRING, SHORT-A152466
G — SPRING, RECOIL-A152450
H — GUIDE, RECOIL SPRING, LONG-A152448
I — CAP, TRUNNION SLIDE-A163774
J — WASHER, RECOIL SHAFT-A164019
K — SPRING, TRUNNION CLAMP-A169616
L — CLAMP, TRUNNION-A163781-10
M — NUT, WING, TRUNNION CLAMP-A163784
N — PIVOT, TRUNNION CLAMP BOLT-A163779
O — BOLT, LOCKING, TRUNNION CLAMP-A163780
P — SLEEVE, COUNTERRECOIL SPRING-A152463
Q — BRACKET, BUFFER, RIGHT-C66085
R — SHAFT, RECOIL-B110367
S — SPRING, COUNTERRECOIL-A163818
T — PLUG, ADJUSTING, COUNTERRECOIL SPRING-A152465
U — NUT, RECOIL SHAFT-A152462
V — NUT, SAFETY (3/8")-503350
W — NUT, SAFETY (1/2")-503322
X — PIN, STGHT. (1/4"X 1/2")-544002
Y — SCREW, CAP (5/16" X 1")-215935
Z — PIN, STGHT. (3/16"X 1-1/8")-505514

RA PD 91877

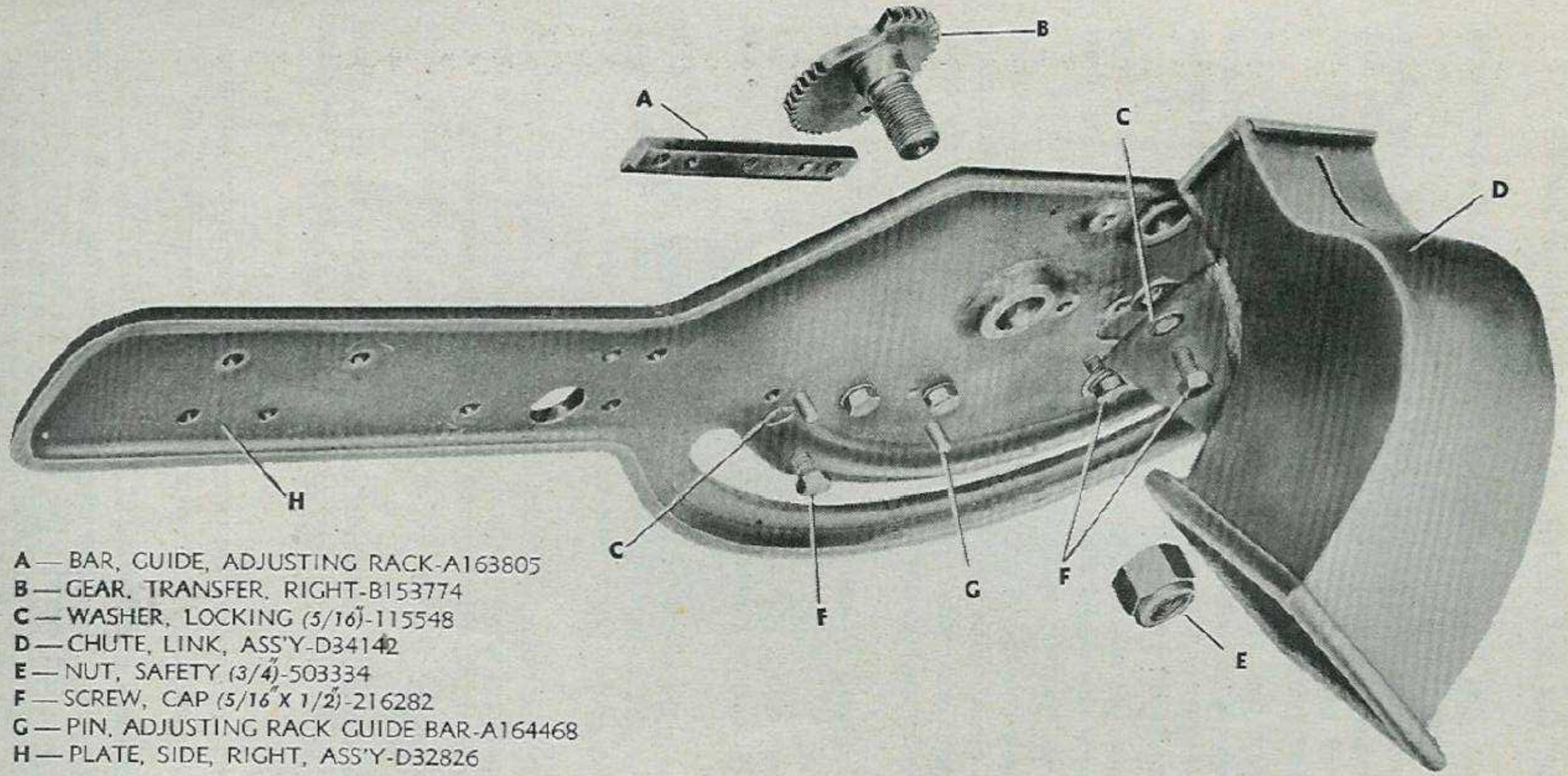
Figure 136—Upper Buffer Recoil Mechanism Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View



A — TRAY, AMMUNITION FEED-C68009
B — SCREW, CLAMPING, TRAY-A169455
C — SCREW, MACH. (NO. 10 X 5/16")-503962
D — CYLINDER, SIDE PLATE TRIGGER CONTAINER, ASS'Y-A169818
E — WIRE, CONTAINER, CAP-A169825
F — PLATE, CONTAINER CAP-A169827
G — SPRING, CONTAINER CAP-A169826
H — CAP, CONTAINER, ASS'Y—A169819
I — SCREW, CAP (5/16"X 1")-215935
J — WASHER, LOCK (5/16")-155548
K — SCREW, CAP (5/16"X 1")-216922
L — PIN, STGHT. (5/16"X 3/4")-544014
M — PIN, JOINT, ASS'Y-B144239
N — SCREW, CAP (5/16"X 3/4")-216920
O — CHAIN, ASS'Y (8 IN.)-SDBX2BD
P — PLATE, SIDE, LEFT, ASS'Y-D32837
Q — SUPPORT, AMMUNITION BOX, ASS'Y-C66204

RA PD 91878

Figure 137—Left-hand Cradle Plate Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Left Side—Exploded View



A — BAR, GUIDE, ADJUSTING RACK-A163805
B — GEAR, TRANSFER, RIGHT-B153774
C — WASHER, LOCKING (5/16")-115548
D — CHUTE, LINK, ASS'Y-D34142
E — NUT, SAFETY (3/4")-503334
F — SCREW, CAP (5/16" X 1/2")-216282
G — PIN, ADJUSTING RACK GUIDE BAR-A164468
H — PLATE, SIDE, RIGHT, ASS'Y-D32826

RA PD 91879

Figure 138—Right-hand Cradle Plate Group—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Right Side—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

f. Removal and Disassembly of Upper Buffer Recoil Mechanism Group (figs. 135 and 136).

(1) Remove the four screws and washers and two pins which secure each buffer bracket to the cradle plates and remove the left and right buffer brackets. Separate the brackets by removing the three screws and nuts and two pins.

(2) Unscrew the upper buffer recoil shaft nut and unscrew the counterrecoil spring adjusting plug gradually because of the force of the compressed spring. Remove the upper buffer counterrecoil spring and the counterrecoil spring sleeve.

(3) Remove the nut on the other end of the upper buffer recoil shaft and remove the shaft. Remove upper buffer recoil spring, short and long guides, washer, and cap. Remove the trunnion slide.

(4) Remove the pin from trunnion clamp on slide and remove trunnion slide clamp with spring. Remove trunnion clamp bolt pivot and remove bolt and wing nut. Remove trunnion slide cap, upper buffer recoil shaft washer, and counterrecoil spring sleeve.

g. Removal and Disassembly of Cradle Plates (figs. 137 and 138).

(1) Unscrew the nut from the cradle clamping bolt and remove washer, handle, collar, and bolt. Remove the nuts and the cradle spacer.

(2) Remove the ammunition feed tray and the ammunition link chute. Remove the nuts which secure plates to cradle pintle gears. Remove cradle plates from pintle, taking care not to damage the gears.

(3) To disassemble left side cradle plate, unstake screws on trigger container and remove them. Open the container, remove container cap wire, and withdraw container cap plate and spring.

NOTE: *Refer to section XI for disassembly of the side plate trigger.*

(4) To disassemble right side cradle plate, remove the link chute by removing the screws and washers securing the chute to the plate.

h. Pintle.

(1) Release pintle lock on pedestal and lift pintle from pedestal.

(2) To remove gears from pintle, remove screws and pins.

i. Tripod Legs and Pedestal (figs. 139 and 140).

(1) Unscrew leg clamping ring. Release the leg head bolt nuts by screwing them out against the stops on the leg head bolts. Slide out the tripod legs from the base ring.

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M2A1

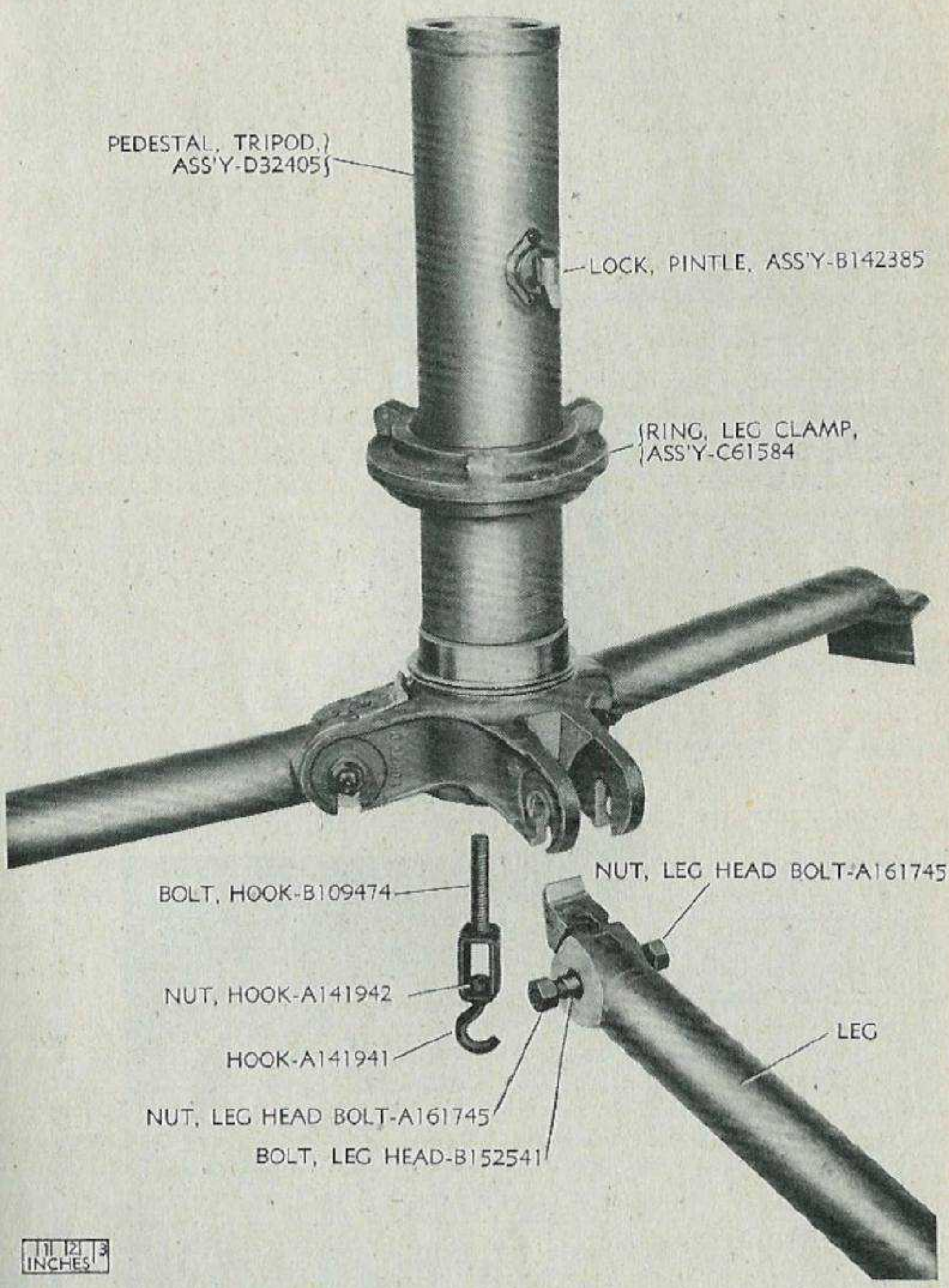


Figure 139—Pedestal and Leg Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1

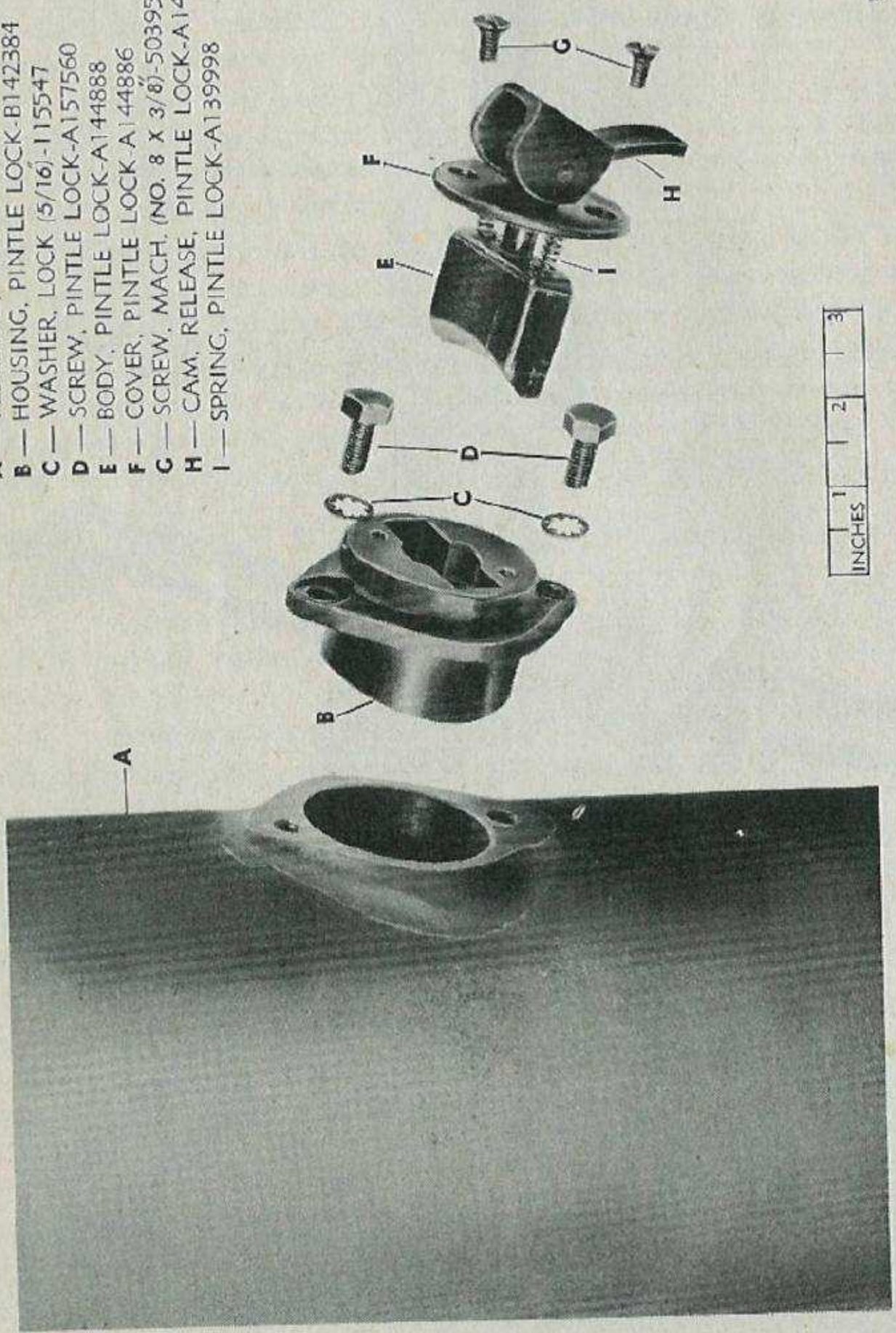


Figure 140—Pintle Lock Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M2A1—Exploded View

(2) To remove leg head bolt, file off riveting on one end of bolt and remove nut. File off riveted end of bolt retaining pin and drive out pin and remove bolt.

(3) To disassemble the pintle lock, remove the two screws from the pintle lock cover, then remove the two pintle lock screws and withdraw all the components.

62. INSPECTION.

a. Pedestal (figs. 139 and 140).

(1) Check threads of base ring and of clamping ring.

(2) Check tapered ring for distortion and burs, and the retainers for looseness.

(3) Test functioning of pintle lock; check tension of pintle lock spring. Examine pintle lock cam for wear and burs, the lever for looseness, and the lock nose for wear.

(4) Check mating slots in base ring for wear and burs. Check removable hook for condition and looseness.

b. Legs (fig. 139).

(1) Inspect legs for straightness and dents, and the spades and splines for burs and cracks.

(2) Check leg head, mating lug bolts, nuts, and bolt locking pins for burs and looseness.

(3) With the tripod legs locked, the clamp ring must show a full bearing on all three legs, and the nuts a full bearing in the countersink provided.

c. Pintle.

(1) Test action of pintle in pedestal bushing. Check for wear of locking groove. Check pintle gears for looseness and teeth for burs and wear.

(2) With the body of the pintle lock (fig. 140) engaged, there must be not more than 0.006 inch vertical movement of the pintle when checked with a feeler gage inserted between top of pedestal and shoulder of the pintle and the latter raised with a pry.

d. Cradle (figs. 137 and 138).

(1) Inspect cradle plates for alinement. Check for dents and burs in cradle plate slots.

(2) Check functioning of clamping handle. Examine components of handle for wear and burs.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

(3) Check ammunition chest support, tray, and link chute for looseness.

(4) Check recoil mechanism for looseness in cradle.

(5) Check spacer and bolt for looseness, and nut for burs.

(6) Check side plate trigger container for looseness, and test functioning of container cap.

(7) Check transfer gear stud and nut for looseness, and gear teeth for burs and wear.

(8) Check for looseness of trigger control mechanism and of side plate trigger container on cradle plate.

e. Antiaircraft Sights. Examine the ring sights for bent, broken, or loose parts. Check fit of sight to water jacket of barrel (small ring should be at rear).

f. Trigger Control Mechanism (figs. 127 and 128).

(1) Test functioning of the mechanism for smoothness and looseness of parts. Examine links for distortion and for missing pins and cotter pins. Check for missing or loose trigger control (crank attachment) screw taper pin.

(2) Check buffer spring guide jam nuts and eye for looseness, and burs and clip for distortion.

(3) Check for angle of contact and wear of lugs on trigger control slide and side plate trigger slide.

(4) Check spacer for looseness on slide body of trigger control mechanism.

(5) Check hand lever bracket for cracks, and clamping screws for worn threads. Check recoil and buffer spring tension. Test functioning of hand lever safety lock. Check safety lock hook on hand lever for wear. Check tension of safety lock plunger spring. Check safety lock plunger for wear, and screw for burs. Check tension and functioning of hand lever spring.

g. Lower Recoil Mechanism Group (figs. 131, 132, 133, and 134).

(1) GROUP AS A UNIT. Inspect the group as a unit for condition, looseness of frame in cradle, smoothness of functioning, and spring tension.

(2) FRAME GROUP. Check frame for burs, dents, and cracks. Test functioning of slide stop assembly. Check slide stop handle and pins for looseness and wear. Check slide stop spring tension. Check face of stop for burs and wear. Check housing locking nuts, lining pin, and retainer plug for looseness. Check for burred or missing retainer.

(3) HOUSING GROUP. Check compensating spring adjusting plug and locking nut for burs and worn slot. Check retainer plug, housing plate, and screws for looseness and burs. Check action (free) of slide and adjusting head, and lug on slide, for wear. Check recoil spring adjusting plug for looseness, and damaged wrench slot. Check compensating spring guide rod nut, and rack nuts, for looseness and burs. Check racks for straightness, burs, and condition of teeth. Check rear gun joint pin hole in slide lug for burs and wear. Check slide oiling cap for looseness and clogged vent. Check wiping washer for serviceability and cap for looseness and retention.

h. Upper Buffer Recoil Mechanism Group (figs. 135 and 136).

(1) GROUP AS A UNIT. Inspect the group as a unit for burs, dents, and cracks, looseness of brackets on cradle, smoothness of functioning, and spring tension.

(2) BRACKET GROUP. Check counterrecoil adjusting plug for burs, looseness, and wear in plug slot. Check recoil spring guides (short and long) for wear, looseness, and burs. Check counterrecoil spring sleeve for looseness. Check counterrecoil shaft for burs and straightness, and threads on end for burs. Check shaft nut for looseness and burs. Check trunnion seat for wear.

(3) SLIDE AND TRUNNION CLAMP GROUP. Check slide action (free) for smoothness, and slide for burs. Check trunnion clamp caps and hinge for function and wear. Test trunnion clamp spring tension, and action on trunnion clamp. Check threads of trunnion clamp bolt and wing nut, and pivot, for looseness and wear.

63. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. Repaint all painted surfaces that have become checked, as prescribed in TM 9-226. When assembling, clean, oil all unpainted parts for rust prevention, and lubricate as prescribed in TM 9-226. Adjustments of the mount are explained in TM 9-226.

b. Cradle Group.

(1) If lower buffer recoil spring or compensating spring is weak, kinked, or broken, replace spring.

(2) If upper buffer recoil or counterrecoil spring is weak or broken, replace spring.

(3) If trigger control mechanism spring or trigger mechanism buffer spring is weak, kinked, or broken, replace spring.

(4) If trigger control hand lever does not function properly, and spring is found to be at fault, replace spring.

(5) If cradle pintle gears or transfer gears are worn or damaged so as to have lost motion, or affect their proper functioning with the adjusting racks, replace the gears.

(6) If the adjusting racks are bent or teeth worn, replace them.

(7) If lug on trigger control slide is worn so as to affect its proper, level contact with side plate trigger slide (when assembled), replace slide.

(8) If (side plate trigger) container cap does not lock properly, examine spring and, if necessary, replace spring.

(9) See that pintle is clean, smooth, and free of burs. If necessary, polish with crocus cloth. See that pintle lock groove is free of dirt and burs. Lubricate when assembling.

(10) If gun securing pins are worn so as to cause lost motion, replace them.

c. Pedestal Group.

(1) See that pintle lock body is free of burs. If badly worn or if springs are weak or rusted, replace damaged parts.

(2) See that pedestal body bushing is clean and smooth. Use crocus cloth if necessary. Lubricate when assembling.

(3) If leg head bolts are badly worn or threads damaged, replace them.

64. ASSEMBLY.

a. Assembly is in the reverse order of disassembly. Prior to assembly, all parts must be free of dirt, rust, and other extraneous matter. Metal parts in contact must be covered with a light film of preservative lubricating oil (special). Refer to TM 9-226 for adjustments, functioning, and operation.

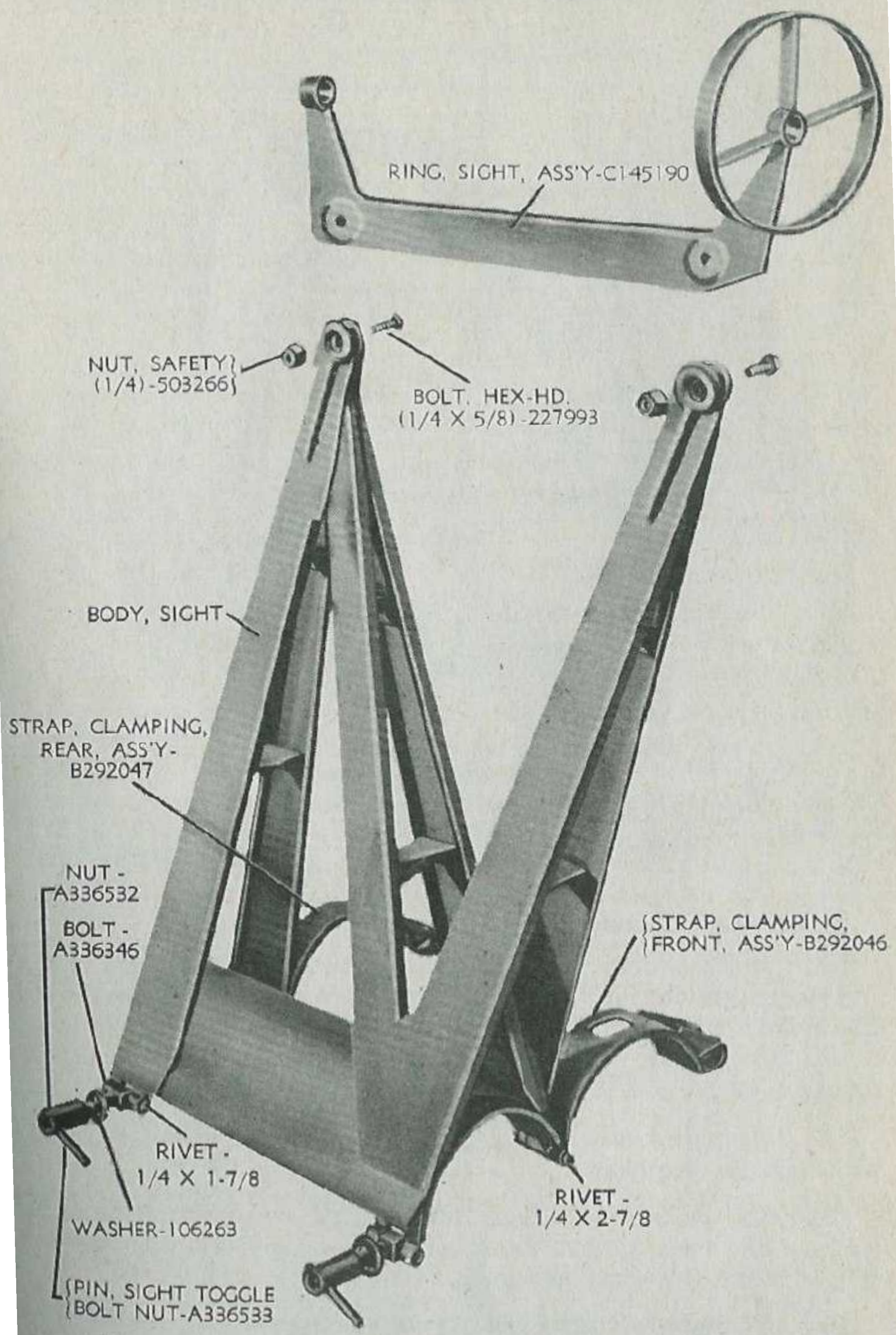
Section XVI

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3

65. DISASSEMBLY.

a. Shields, Sight, and Gun. Loosen the upper shield clamping bolts and remove upper shield. Loosen the straps and remove the sight from gun (fig. 141). Remove cotter pins and the lower shield plate nuts, and remove lower shield. Withdraw gun securing pins and remove gun from mount.

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3



RA PD 91882

Figure 141—*Antiaircraft Sight D84680*—Machine Gun Antiaircraft Mount, Cal. .50, M3

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

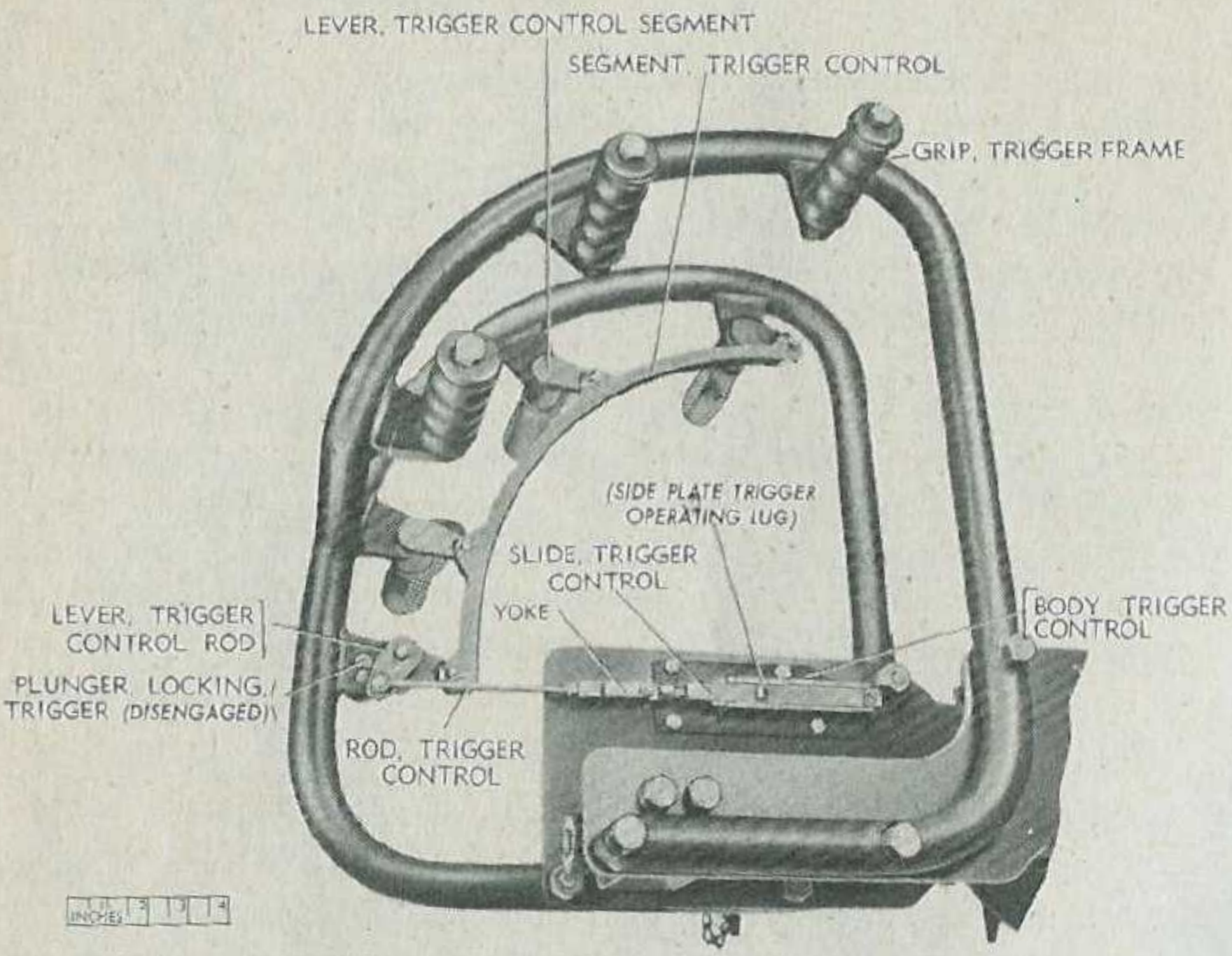


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Figure 142—Trigger Control Mechanism and Trigger Frame Groups Attached to Rear End of Cradle—Right Side View—Machine Gun Antiaircraft Mount, Cal. .50, M3

b. Trigger Frame Group (figs. 142 and 143).

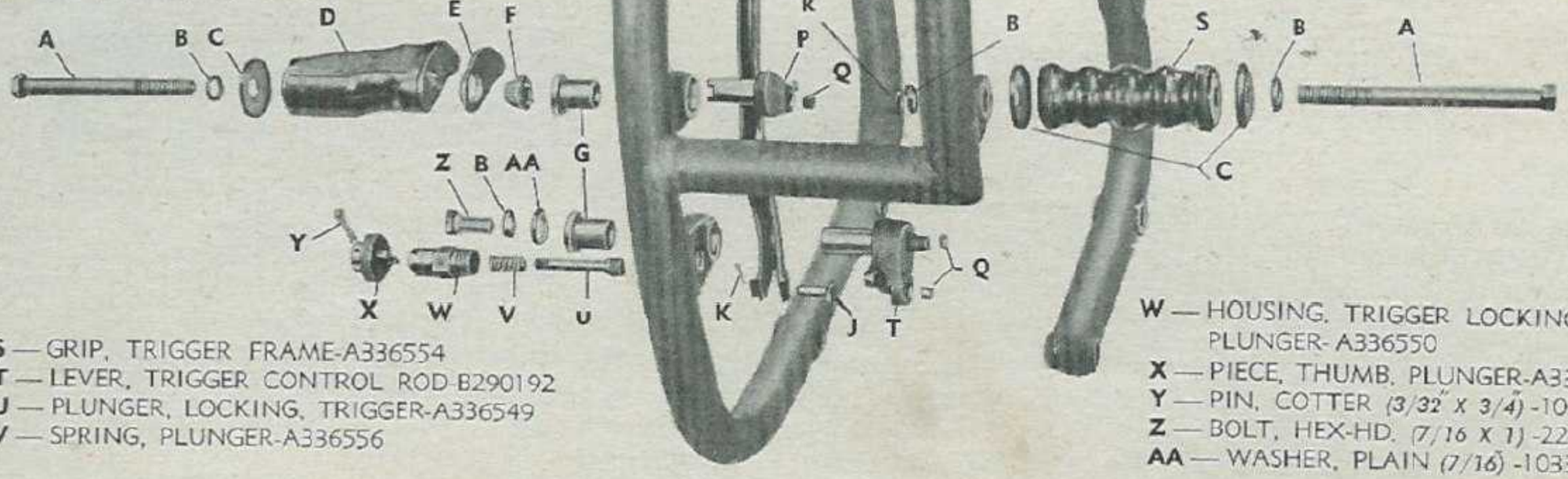
(1) Remove cotter pin and trigger control rod lever pin to disconnect trigger control rod from trigger control rod lever, then remove the nuts with washers and the bolts which secure the trigger frame to the cradle side plates. Rotate the frame backwards about 180 degrees and remove it from the cradle.

(2) Remove cotter pins and trigger control segment pins, and withdraw the segment.

(3) To remove the trigger frame grips, unscrew the nuts and washers and then remove the trigger frame grip bolts with washers, trigger frame grip caps, and grips.

(4) To remove trigger control grips, unscrew the trigger frame grip bolts and remove the washers, trigger frame grip caps, trigger control grips, trigger control grip caps, trigger control segment levers, and trigger control grip adjusting bushing.

A — BOLT, GRIP-A336573
B — WASHER, LOCK (7/16") -110405
C — CAP, TRIGGER FRAME GRIP-A336553
D — GRIP, TRIGGER CONTROL-B290191
E — CAP, TRIGGER CONTROL GRIP-A336557
F — BUSHING, ADJUSTING, GRIP-A336547
G — BUSHING-A336558
H — FRAME, TRIGGER, ASS'Y-D82381
J — PIN, SEGMENT-A336551
K — PIN, COTTER (1/16" X 1 1/2) -103361
L — NUT, LOWER SHIELD PLATE-A336572
M — PIN, COTTER (1/16" X 1") -103363
N — SEGMENT, TRIGGER CONTROL-C145189
P — LEVER, SEGMENT-B290190
Q — BUSHING, SEGMENT LEVER-A336559
R — NUT, JAM (1/4) -219704



S — GRIP, TRIGGER FRAME-A336554
T — LEVER, TRIGGER CONTROL ROD-B290192
U — PLUNGER, LOCKING, TRIGGER-A336549
V — SPRING, PLUNGER-A336556

W — HOUSING, TRIGGER LOCKING PLUNGER-A336550
X — PIECE, THUMB, PLUNGER-A336562
Y — PIN, COTTER (3/32" X 3/4") -103373
Z — BOLT, HEX-HD, (7/16 X 1) -223609
AA — WASHER, PLAIN (7/16) -103342

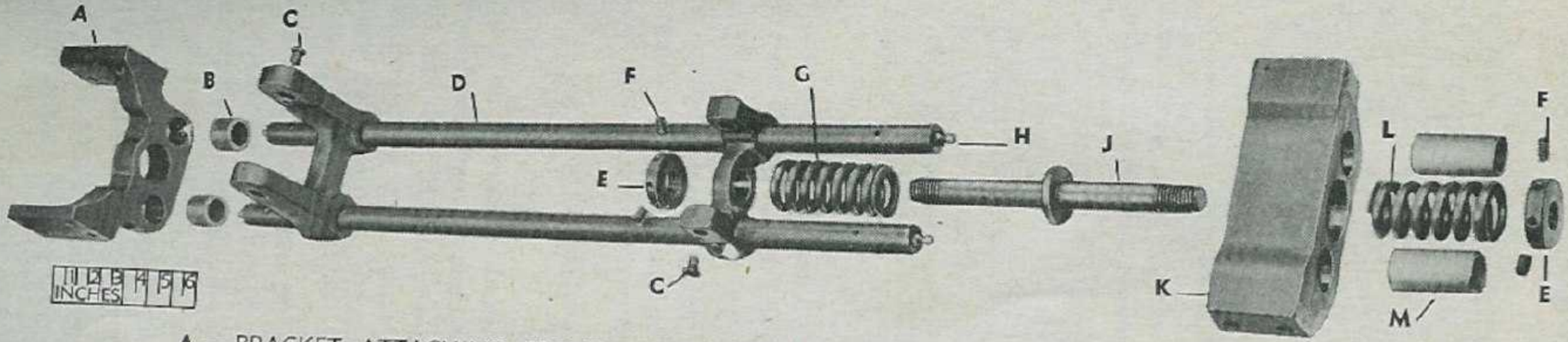
RA PD 91884

Figure 143—Trigger Frame Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

A — SPACER, SPRING-A336662
B — SCREW, MACH. (NO. 6 X 3/16)-117339
C — BODY, ASS'Y-B292041
D — SCREW, CAP (1/4"X 7/8")-215913
E — NUT, HEX. (1/4)-218563
F — WASHER, LOCK (1/4)-113114
G — SPRING, BUFFER-A157074
H — GUIDE, SPRING-B292034
J — PIN, ROD END (1/4" DIAM.)-114783
K — NUT, JAM (1/4)-219701
L — ROD-B290186
M — PIN, ROD LEVER-A336552
N — PIN, COTTER (1/16"X 1/2")-103361
P — YOKE, ROD END (1/4)-104036
Q — PIN, COTTER (3/32"X 7/8")-108629
R — EYE, SPRING GUIDE-A156844
S — SLIDE, ASS'Y-B292040
T — WASHER, SPRING GUIDE-A336664
U — SPRING, MECHANISM-A163993

RA PD 91885

Figure 144—Trigger Control Mechanism Group Parts—*Machine Gun Antiaircraft Mount*, Cal. .50, M3—Exploded View



A — BRACKET, ATTACHING, FRONT, ASS'Y-C145235
B — BUSHING, ATTACHING BRACKET, FRONT-A336571
C — SCREW, RETAINING, GUN SECURING PIN-A336543
D — GUIDE, ASS'Y-D84201
E — NUT, RECOIL, SPRING GUIDE-A336570
F — SCREW, RECOIL SPRING GUIDE NUT-A336577
G — SPRING, RECOIL-A336568
H — FITTING, GREASE-A336566
J — GUIDE, RECOIL SPRING-B290194
K — BRACKET, ATTACHING, REAR, ASS'Y-B292039
L — SPRING, BUFFER, COUNTERRECOIL-A336569
M — BUSHING, ATTACHING BRACKET, REAR-A336542

RA PD 91886

Figure 145—Recoil Mechanism Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

(5) Unscrew the trigger locking plunger housing with all the assembled parts. Remove cotter pin and drive out trigger locking plunger to remove trigger locking plunger spring, housing, and thumbpiece.

(6) Unscrew bolt and remove the two washers and the trigger control rod lever.

(7) Drive out the trigger frame bushings from the trigger frame.

c. Trigger Control Mechanism Group (fig. 144).

(1) Unscrew the nuts and screws with washers which secure the mechanism to the cradle side plate. Remove the mechanism.

(2) Unscrew trigger control rod from the rod end yoke, taking care not to lose the nut on the rod.

(3) Remove cotter pin and pin which secure the yoke to the trigger control spring eye. Remove the yoke.

(4) Hold the two nuts on the trigger control spring guide so as to prevent them from turning, and unscrew the trigger control spring eye, then unscrew the two nuts.

(5) Unscrew the two screws which secure the trigger control spring spacer to the trigger control body. Remove the spacer.

(6) Remove the trigger control slide assembly with the parts assembled. Compress the trigger control mechanism spring so as to disengage it from the pin and remove it from the guide. Remove the trigger control spring guide washer. Remove the guide with the trigger mechanism buffer spring.

d. Recoil Mechanism (fig. 145).

(1) Make certain the cradle is locked. Remove the four screws and washers which secure the recoil mechanism rear attaching bracket to the cradle. Slide the recoil mechanism out through the rear. Remove the eight screws and washers which secure the recoil mechanism front attaching bracket to the cradle. Remove the bracket and drive out the bushings from it.

(2) Unscrew the recoil spring guide nut screws and slowly unscrew the recoil spring guide nut on rear end of mechanism. Remove the counterrecoil buffer spring. Slide off the attaching bracket and drive out the bushings from it, then unscrew the screws from the other recoil spring guide nut, gradually unscrew the nut, and remove the recoil spring guide and recoil spring (springs are under pressure).

(3) To disassemble the recoil mechanism guide assembly, drive out the pins which secure the brackets to the guides and remove the brackets.

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3

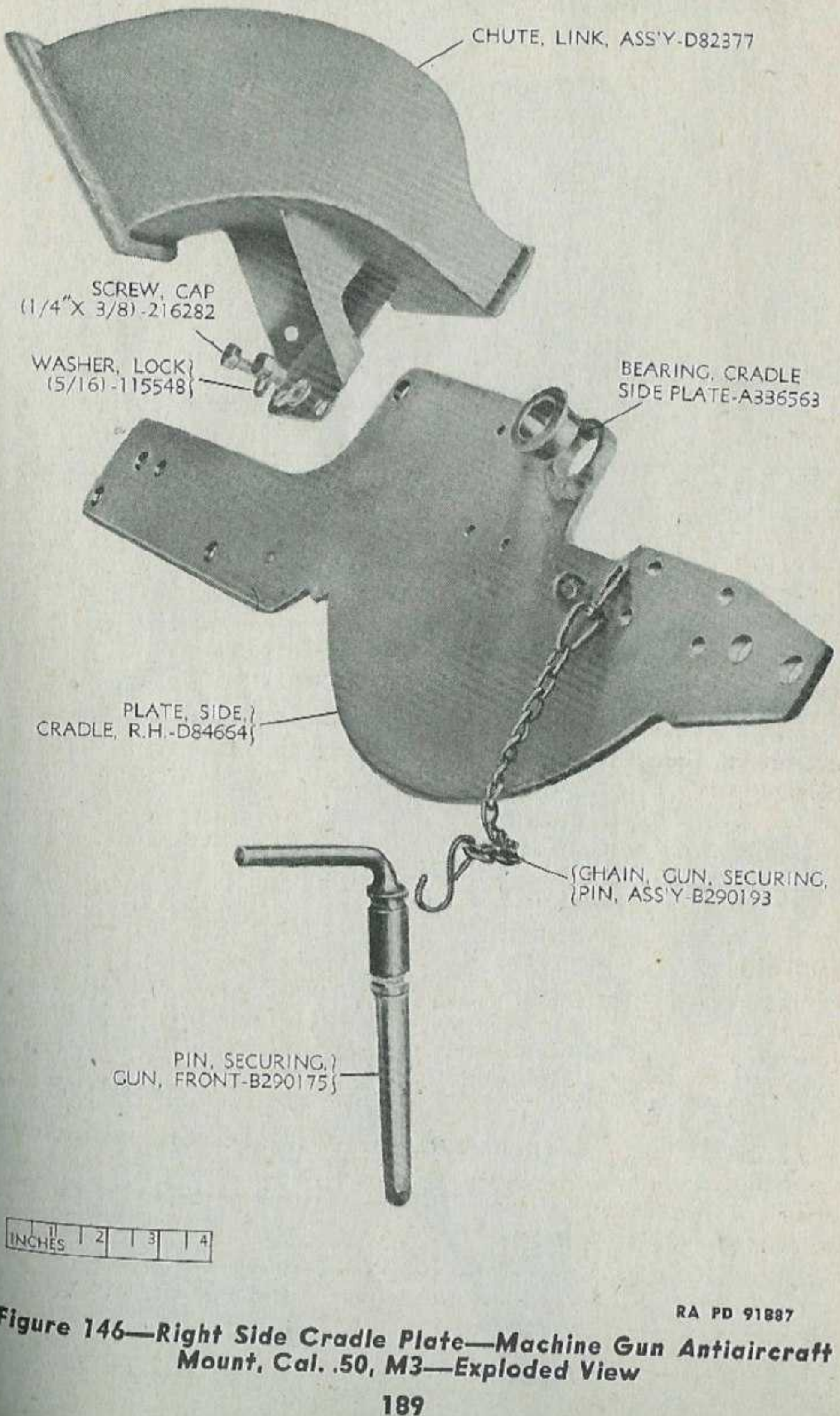


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Figure 146—*Right Side Cradle Plate—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View*

L — WIRE, CONTAINER CAP-A169825
M — SCREW, MACH. (NO. 10 X 5/16")-112878
N — CYLINDER, SIDE PLATE TRIGGER CONTAINER, ASS'Y-A169818
P — PLATE, SIDE, CRADLE, L.H., ASS'Y-D84665
Q — WASHER, LOCK (1/4")-113114
R — SCREW, CAP (1/4" X 3/8")-216251

A — TRAY, AMMUNITION FEED-B290181
B — BEARING, CRADLE SIDE PLATE-A336563
C — BRACKET, AMMUNITION BOX SUPPORT, ASS'Y-C145221
D — CHAIN, GUN SECURING PIN, ASS'Y-B290193
E — PIN, SECURING, GUN, REAR-B290174
F — CHAIN, CONTAINER CAP-A169828
G — PIN, COTTER (1/16"X 1/2")-103361
H — CAP, W/CHAIN, ASS'Y-B193960
J — SPRING, CONTAINER CAP-A169826
K — PLATE, CONTAINER CAP-A169827

Figure 147—Left Side Cradle Plate—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

A — HANDLE, CLAMPING, CRADLE-B221054
B — SPRING, COMPRESSION-506554
C — PIN, HDLS. (5/8" X 1.8")-505142
D — PIN, COTTER (3/32" X 7/8")-108629
E — PIN, TAPER (NO. 6 X 1-1/4")-103625
F — NUT, CRADLE CLAMPING HANDLE-B290184
G — SHAFT, CRADLE CLAMP-B290185
H — BLOCK, CLAMPING, CRADLE SIDE PLATE RIGHT, ASS'Y-A336668
J — BOLT, CLAMPING, UPPER SHIELD, ASS'Y-B292038
K — BOLT, CLAMPING, TRUNNION BRACKET, ASS'Y-B292037
L — BLOCK, CLAMPING, CRADLE SIDE PLATE, LEFT, ASS'Y-A336669
M — NUT, STOP, CRADLE CLAMPING SHAFT-A336574
N — PIN, TAPER (NO. 2 X 1-1/4")-103585
P — BALL (1/4")-104918
Q — BRACKET, TRUNNION, CRADLE-D82374

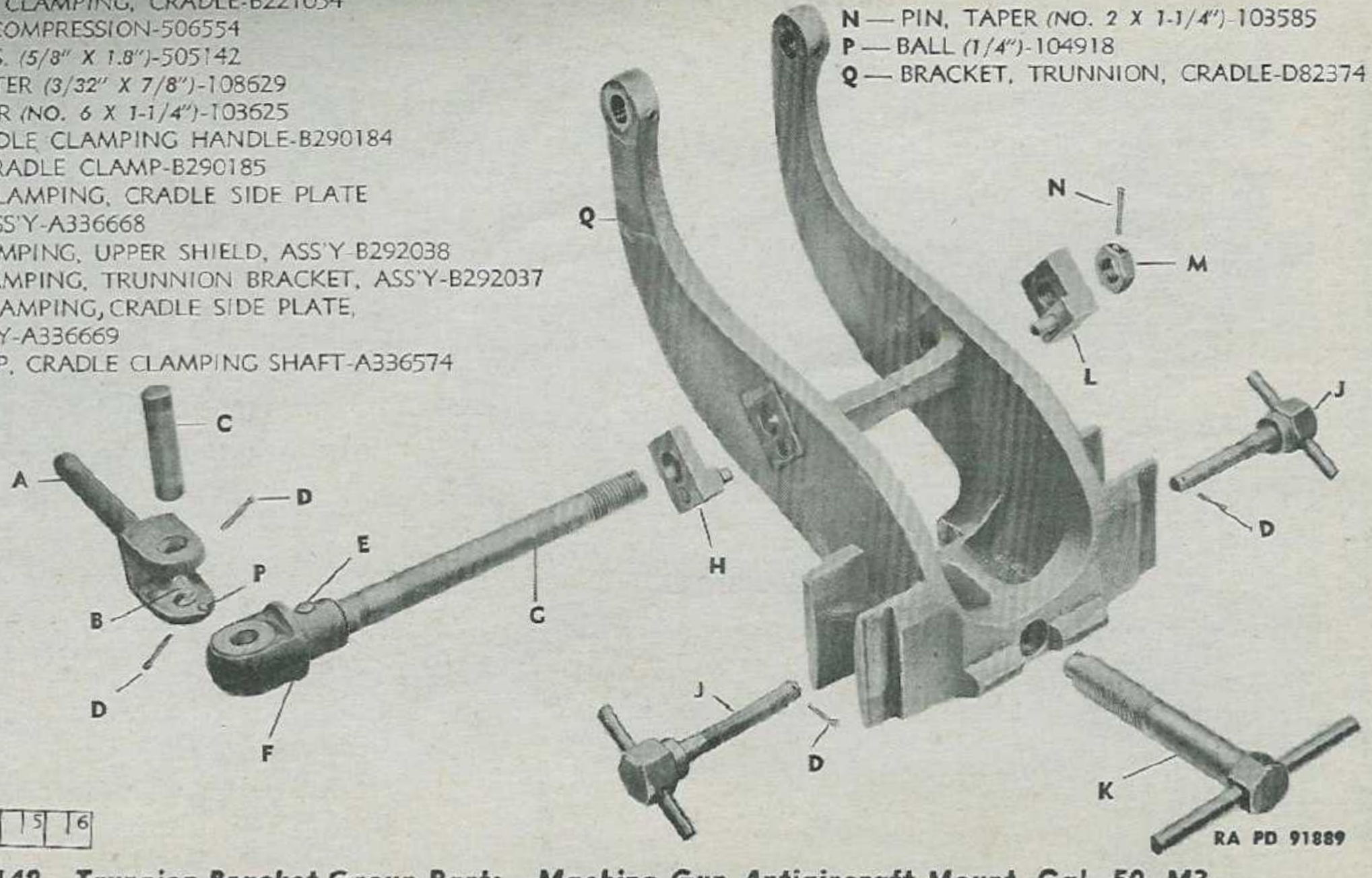
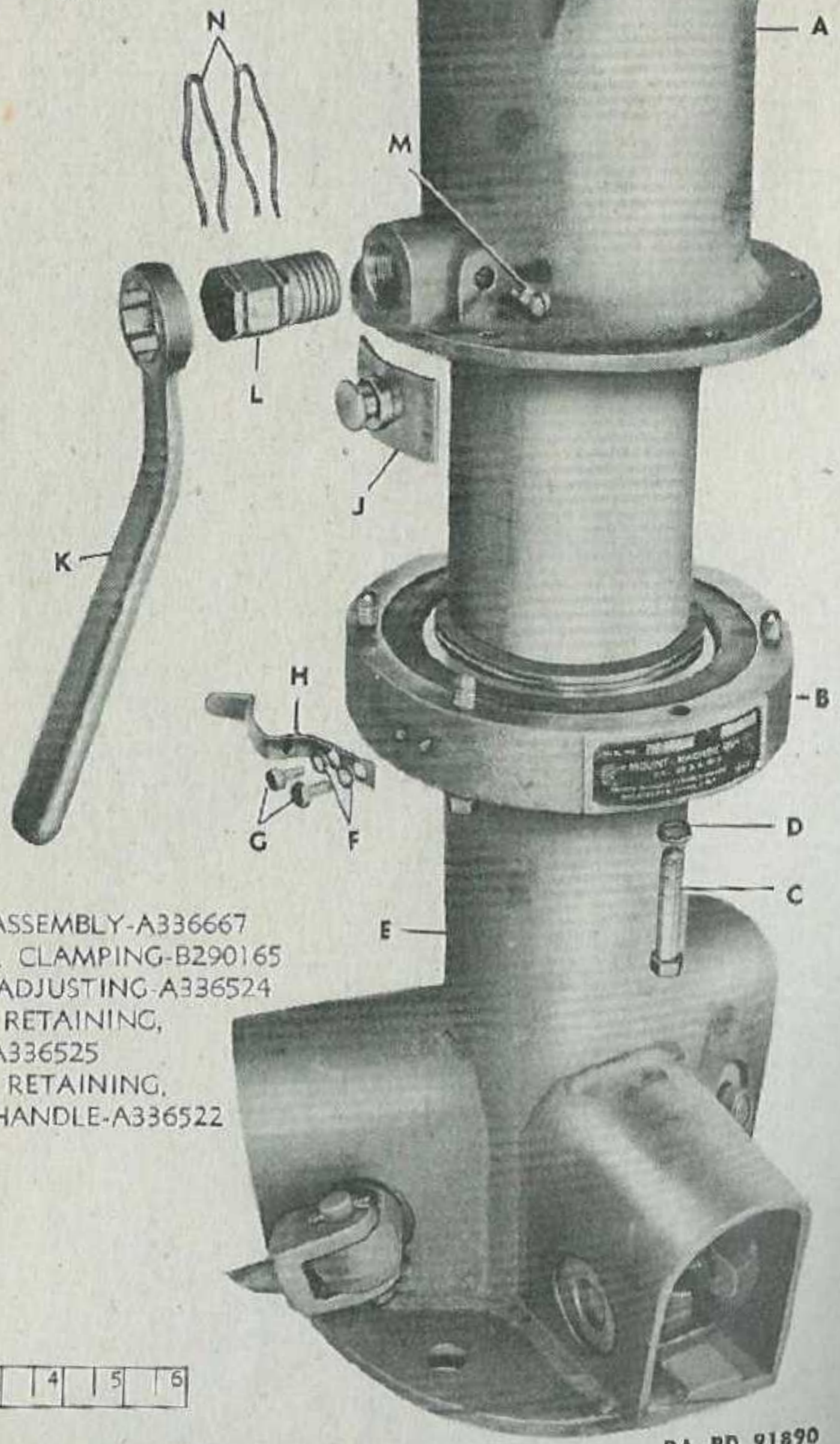


Figure 148—Trunnion Bracket Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

A — SOCKET, TRUNNION, BRACKET-D82363
B — HOUSING, BALL BEARING-B290155
C — SCREW, CAP (3/8" X 2-1/4")-217024
D — WASHER, LOCK 3/8)-110730
E — BODY, PEDESTAL-D82362
F — WASHER, LOCK (1/4")-113114
G — SCREW, CAP (1/4" X 1/2")-193982
H — CLIP, RETAINING, CLAMPING HANDLE-B290164



J — BRAKE, ASSEMBLY-A336667
K — HANDLE, CLAMPING-B290165
L — SCREW, ADJUSTING-A336524
M — SCREW, RETAINING, BRAKE-A336525
N — SPRING, RETAINING, BRAKE HANDLE-A336522

INCHES 1 2 3 4 5 6

RA PD 91890

Figure 149—Pedestal, Showing Brake Shoe Group—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

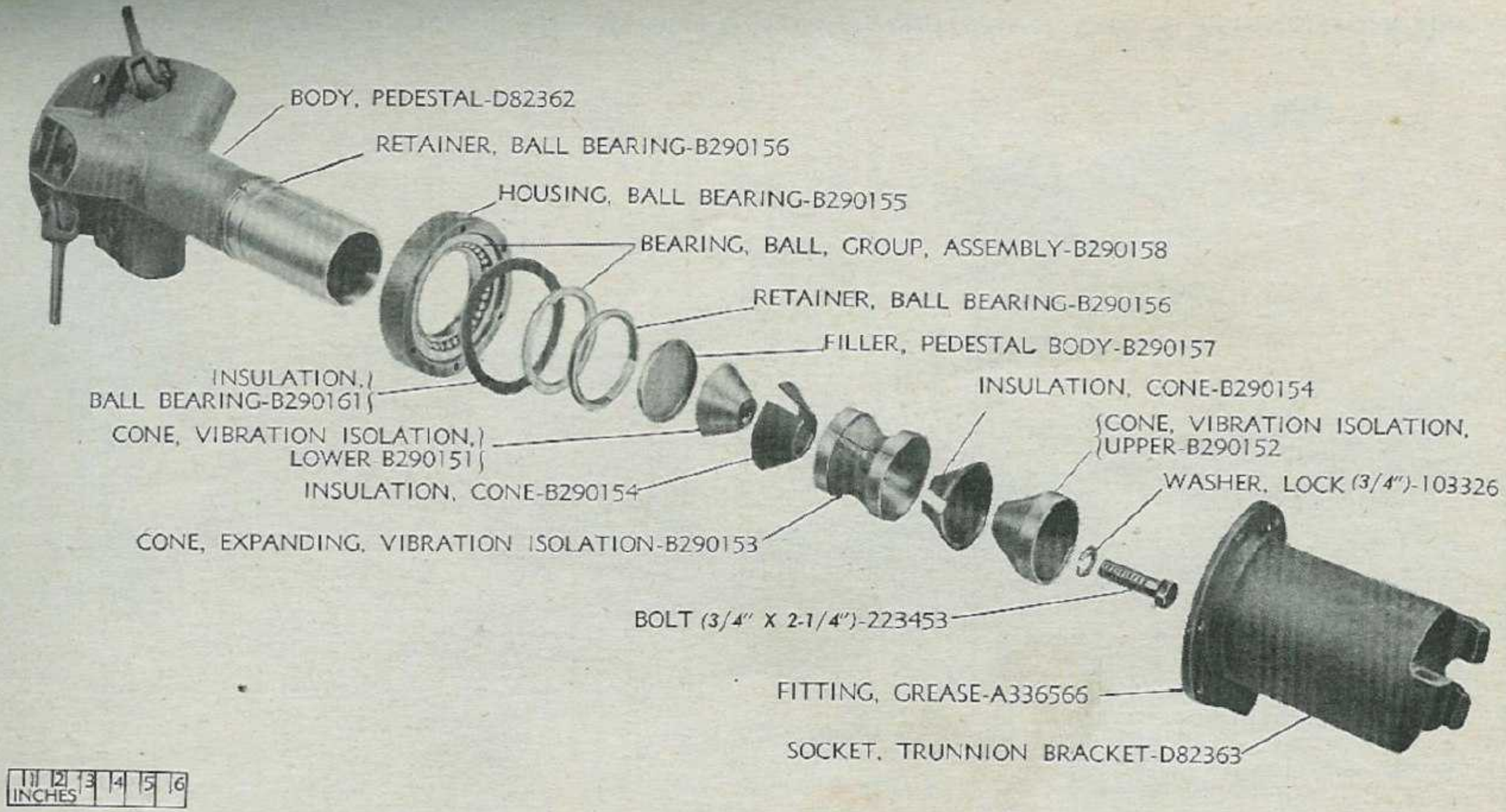


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Figure 150—Pedestal Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

A — PIN, TAPER (NO. 1 X 1)-103574
B — COLLAR, CLAMPING BOLT-A336519
C — JAW, CLAMPING-B290149
D — LEG, ASS'Y-D82364
E — BODY, PEDESTAL, ASS'Y-D82362
F — JAW, CLAMPING-B290148
G — BOLT, CLAMPING-B290150
H — BALL (1/4)-104918
J — SPRING, COMPRESSION-506554
K — PIN, HDLS. (5/8" X 1.8)-505142
L — PIN, COTTER (3/32" X 7/8)-108629
M — HANDLE, CLAMPING-B221054

RA PD 91892

Figure 151—Leg Clamping Group Parts—Machine Gun Antiaircraft Mount, Cal. .50, M3—Exploded View

e. Cradle (figs. 146 and 147). Drive out the taper pins and unscrew the cradle pivot bolts. Remove the cradle plates. Drive out the bearings from the side plates. To separate ammunition feed tray from left side plate, remove the two screws and washers.

f. Link Chute (fig. 146). Remove the two screws and washers which secure link chute to the cradle and withdraw the link chute.

g. Side Plate Trigger Container (fig. 147). Remove the screws which secure container to the cradle side plate. Open the container. Remove the container cap wire from the cap and withdraw container cap plate and spring.

NOTE: *Refer to section XI for disassembly of the side plate trigger.*

h. Trunnion Bracket Group (fig. 148).

(1) Loosen the trunnion bracket clamp bolt and remove the trunnion bracket from the trunnion bracket socket.

(2) Remove cotter pins and unscrew the two upper shield clamping bolts. Drive out the pin and unscrew the cradle clamping shaft stop nut. Remove the left cradle side plate clamping block. Withdraw the cradle clamping handle with parts assembled. Remove cotter pins and withdraw the pin which secures the handle to the shaft. Remove the handle, taking care not to lose the ball and spring. To remove the shaft from the cradle clamping handle nut, drive out the pin.

i. Trunnion Bracket Socket (fig. 149).

(1) Remove the six screws and washers which secure the socket to the housing. Remove the socket.

(2) Remove the two brake handle retaining springs and remove the brake handle. Unscrew the brake shoe adjusting screw, then the brake retaining screw, and remove the brake.

j. Bearing Housing and Cones (fig. 150).

(1) Loosen the bolt on top of the upper vibration isolation cone. Remove the cone with parts assembled. Remove the bolt from the cone and disassemble the cone components.

(2) Pry open the ball bearing retainer and remove it.

(3) Remove the bearing housing with all its components. Remove the bearing balls. Remove the screws and washers which secure the brake shoe clamping handle retaining clip. Do not disassemble the bearing housing any further.

k. Tripod (fig. 151).

(1) Support the pedestal body on a block, loosen the leg clamping handles, and remove the legs. Remove the cotter pins and withdraw the pins which secure the handles to the leg clamping bolts. Remove the handles, taking care not to lose the balls and springs.

(2) Screw the leg clamping bolts in all the way. Drive out the pins from the leg clamping bolt collars. Unscrew the collars and remove the bolts and the leg clamping jaws.

66. INSPECTION.

a. Cradle Group (figs. 142 to 148).

(1) Inspect cradle generally for bent plates, burs, and condition; security of trigger frame and trigger control mechanism on cradle; and security of recoil mechanism in cradle. Check security of cradle in trunnion bracket socket, when mounted.

(2) Check trigger frame for distortion, and grips and trigger control mechanism operating parts for wear, looseness, and lost motion. Test action of trigger locking plunger, and check condition of linkage of trigger control rod lever to trigger control mechanism.

(3) Check trigger control mechanism generally as for Mount M2A1, as it is similar in construction. Adjustment of trigger control mechanism is explained in TM 9-226.

(4) Check recoil mechanism guide for straightness, burs, and rust. Check brackets and gun securing pins for condition, and pins for locking.

(5) Check recoil and counterrecoil springs for cracks and rust; and guide, guide nuts, and securing screws for condition and wear of threads. Check grease fittings for security and clogged holes.

(6) Check action and condition of cradle clamping handle and block, and contacting surface on side plates for wear and burs. Check threads of upper shield clamping bolts and trunnion bracket clamping bolt for wear and burs.

b. Pedestal Group (figs. 149 to 151).

(1) Check rotation of trunnion bracket socket in pedestal and note any roughness which might be due to damaged or dirty bearing.

(2) Check action of brake shoe clamping handle, and for missing retaining springs and worn or burred parts.

(3) Inspect bearing for dirt or cracked balls, and vibration isolation cones and cone insulations for condition; inspect also ball bearing insulations.

(4) Check action of leg clamping handles, and bolts and jaws for burs and wear. Check leg centering pin in socket for security and wear.

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M3

67. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn, or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. Repaint all painted surfaces that have become checked, as prescribed in TM 9-226. When assembling, clean, oil all unpainted parts for rust prevention, and lubricate as prescribed in TM 9-226. Adjustments of the mount are explained in TM 9-226.

b. Cradle Group.

(1) Due to vibration caused by firing, the recoil spring guide nuts have a tendency to work loose. When present nut (set) screws fail to prevent nuts from working loose, replace screws with a cup-point, headless ¼-inch set screw one-half inch long *102707 (BCUX4)* and lock in place with a jam nut *218436.* File or grind a flat on the guide nut so that the jam nut is flush with the top of the screw when assembled.

(2) A recent modification has added a trigger release spring *A7100105* which is held in position by the trigger locking plunger housing on the lower rear end of the left-hand trigger frame. When assembled, the spring bears upon the trigger control rod lever and serves, by its spring action, to insure the return of the trigger control mechanism to the normal position when the grips are released. This modification is covered in MWO A37-W17. If the spring is missing, bent, or cracked so as to fail in its function, replace it.

(3) If trigger control lock does not function properly, replace the trigger locking plunger spring.

(4) If (side plate trigger) container cap does not lock properly, examine spring and, if necessary, replace spring.

(5) If lug on trigger control slide is worn so as to affect its proper, level contact with side plate trigger slide (when assembled), replace slide.

(6) If gun securing pins are worn so as to cause lost motion, replace them.

c. Pedestal Group.

(1) If pedestal group is disassembled, thoroughly clean ball bearing and check for damaged races or balls, and pack bearing with grease when assembling (par. 68 a).

(2) If upper, lower, or side ball bearing insulations are damaged, replace them.

(3) If upper or lower cone insulations are damaged, replace them.

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS

68. ASSEMBLY.

a. Prior to assembly, all parts must be free of dirt, rust, and other extraneous matter. Metal parts in contact must be covered with a light film of preservative lubricating oil (special). The pedestal socket bearing and cradle pivot bolt bearings should be repacked with O.D. grease, No. 0 above +32 F, or No. 00 below +32 F, before assembly. The recoil mechanism guide rods require coating with a light film of grease prior to assembly. Assembly is in the reverse order of disassembly. However, the following instructions pertaining to certain assembly operations should be noted:

(1) In assembling the cradle plates to the trunnion bracket, do not interchange the left and right cradle pivot bolts; the bolts are not interchangeable because the holes for the taper pins are drilled at assembly.

(2) In assembling the tripod, do not interchange the collars and bolts; they are not interchangeable because the noles for the pins are drilled at assembly.

(3) Always support the bearing housing with the supporting tool when the socket is being assembled.

(4) In assembling the bearing retainers, press the retainer into proper position.

(5) In assembling the (side plate) trigger control mechanism, proceed as follows:

(a) Assemble the trigger mechanism buffer spring onto the trigger control spring guide, and then assemble the trigger control spring washer with the round surface toward the flange on the guide.

(b) Insert the guide into position on the trigger control slide. Secure the slide firmly and compress the spring. Replace the two nuts on the guide. Remove the slide and replace the trigger control mechanism spring. Replace the spacer and secure it with the two screws.

b. Refer to TM 9-226 for adjustments, functioning, and operation.

Section XVII

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63

69. DISASSEMBLY.

a. **Gun.** See that the cradle is locked in the horizontal position. Remove the two gun locking pins which lock the gun to the cradle. Carefully lift the gun from the cradle, taking care not to damage the trigger control mechanism or the side plate trigger.

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63

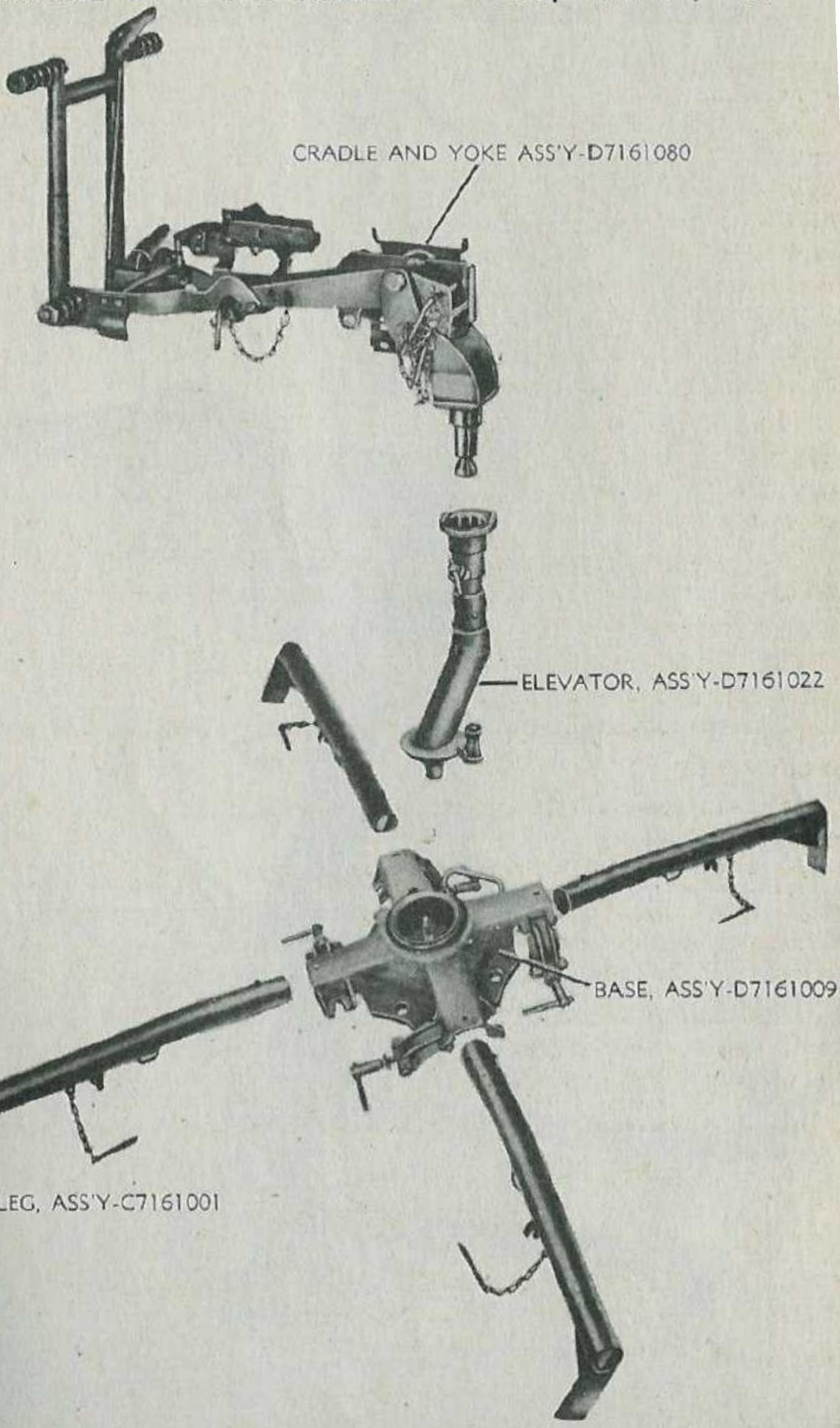

Figure 152—Component Groups and Assemblies of Machine Gun Antiaircraft Mount, Cal. .50, M63

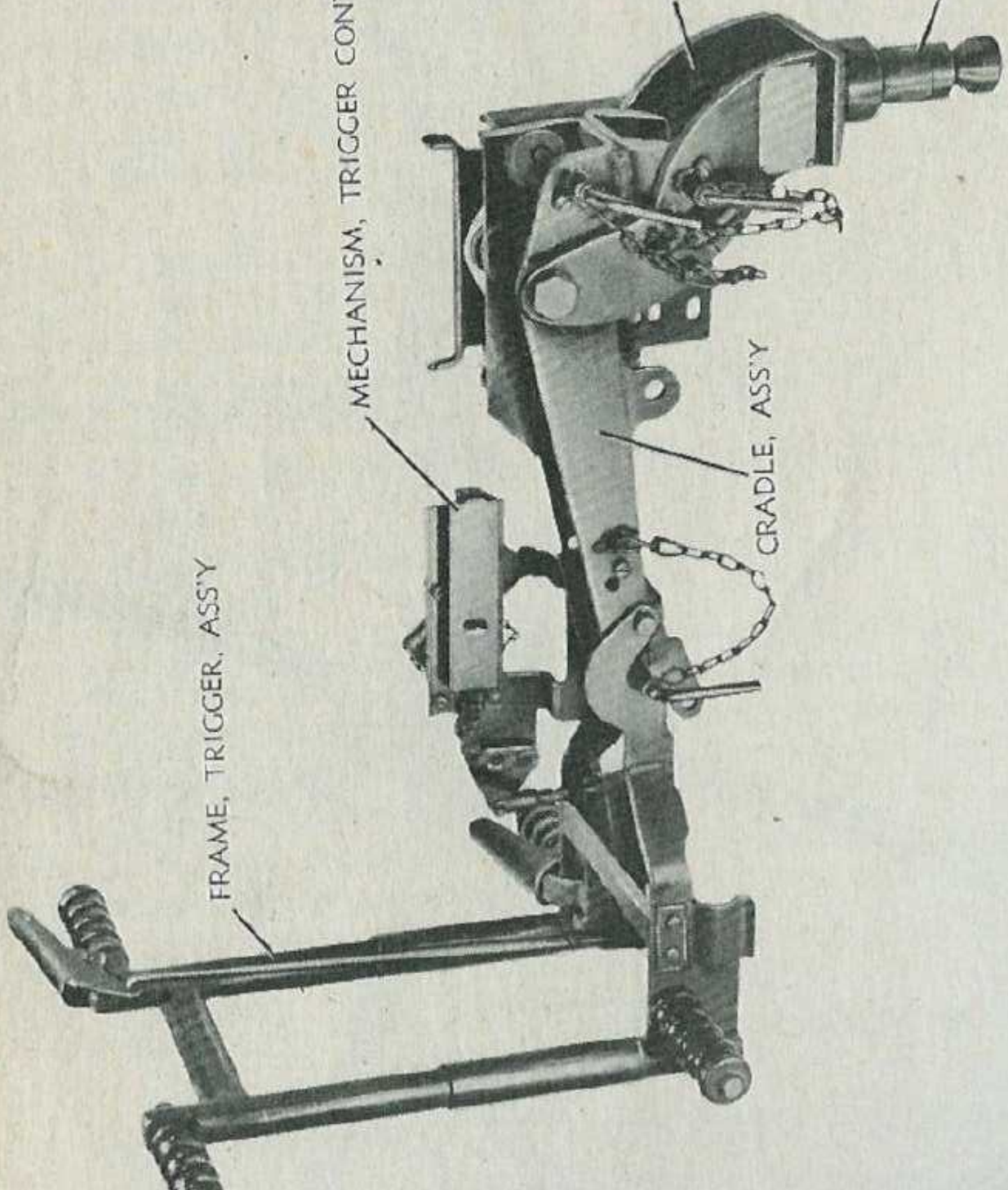

Figure 153—Cradle and Yoke Group—Machine Gun Antiaircraft Mount, Cal. .50, M63

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63

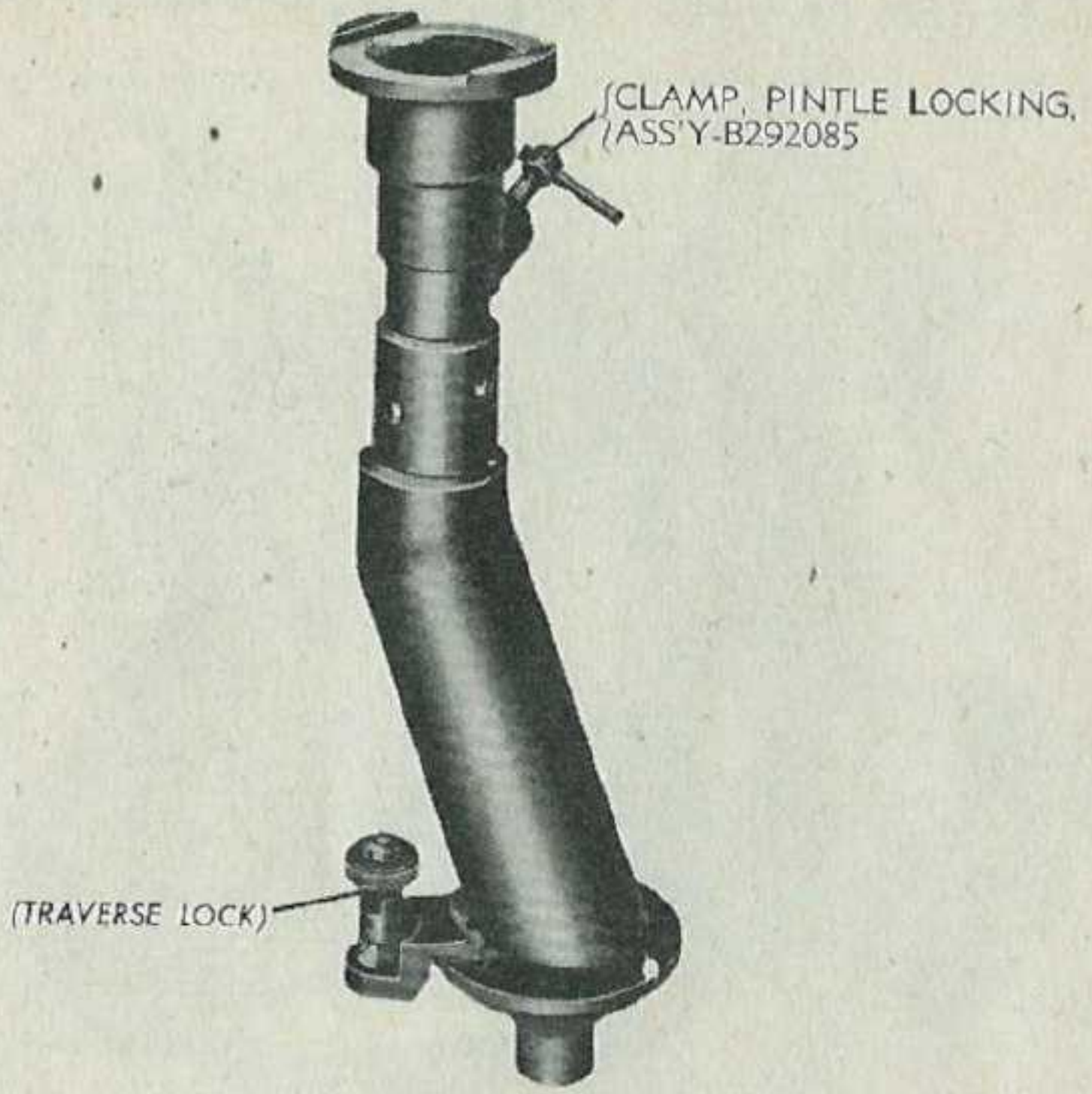

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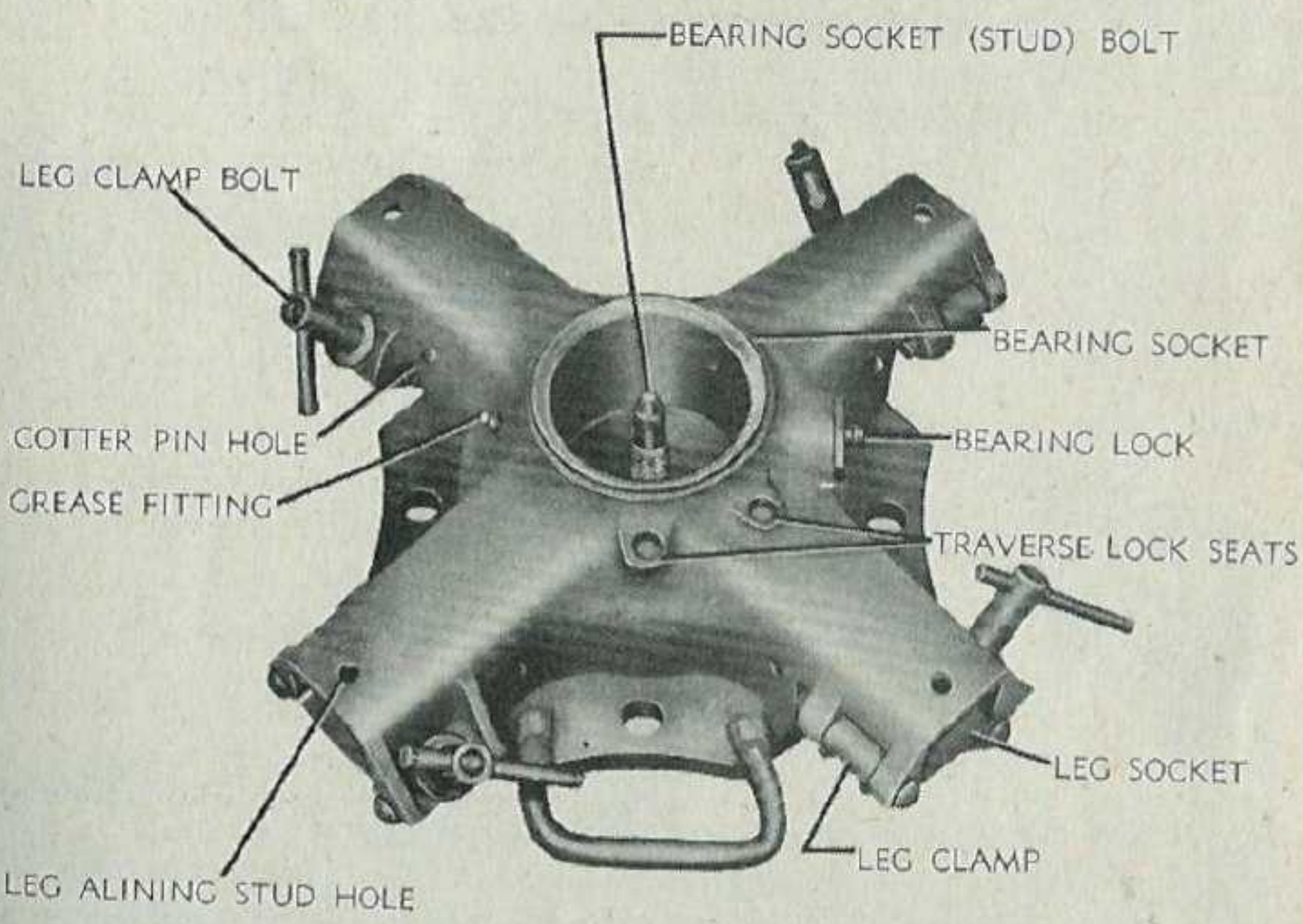
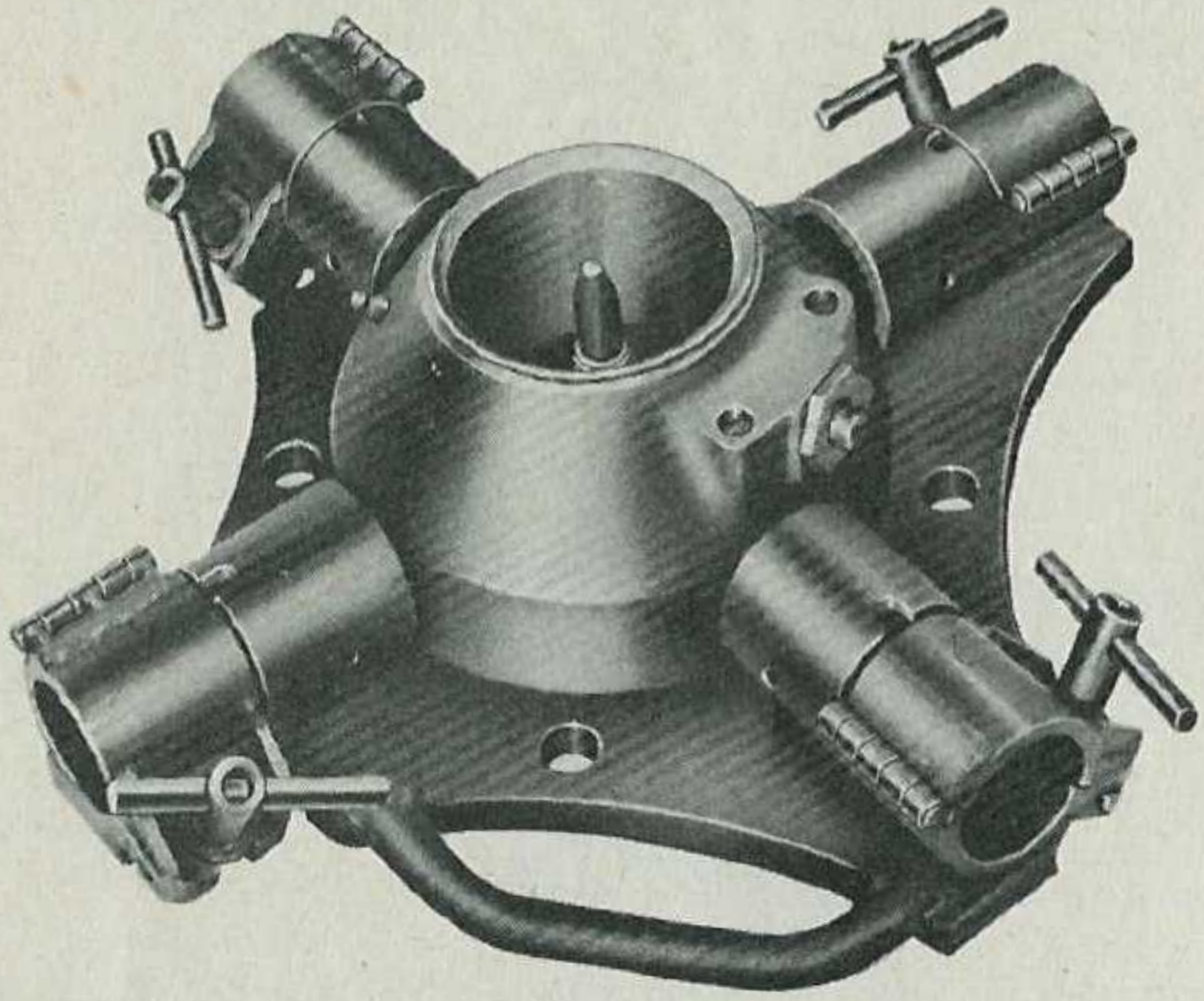
Figure 154—Elevator Assembly—Machine Gun Antiaircraft Mount, Cal. .50, M63



RA PD 60285

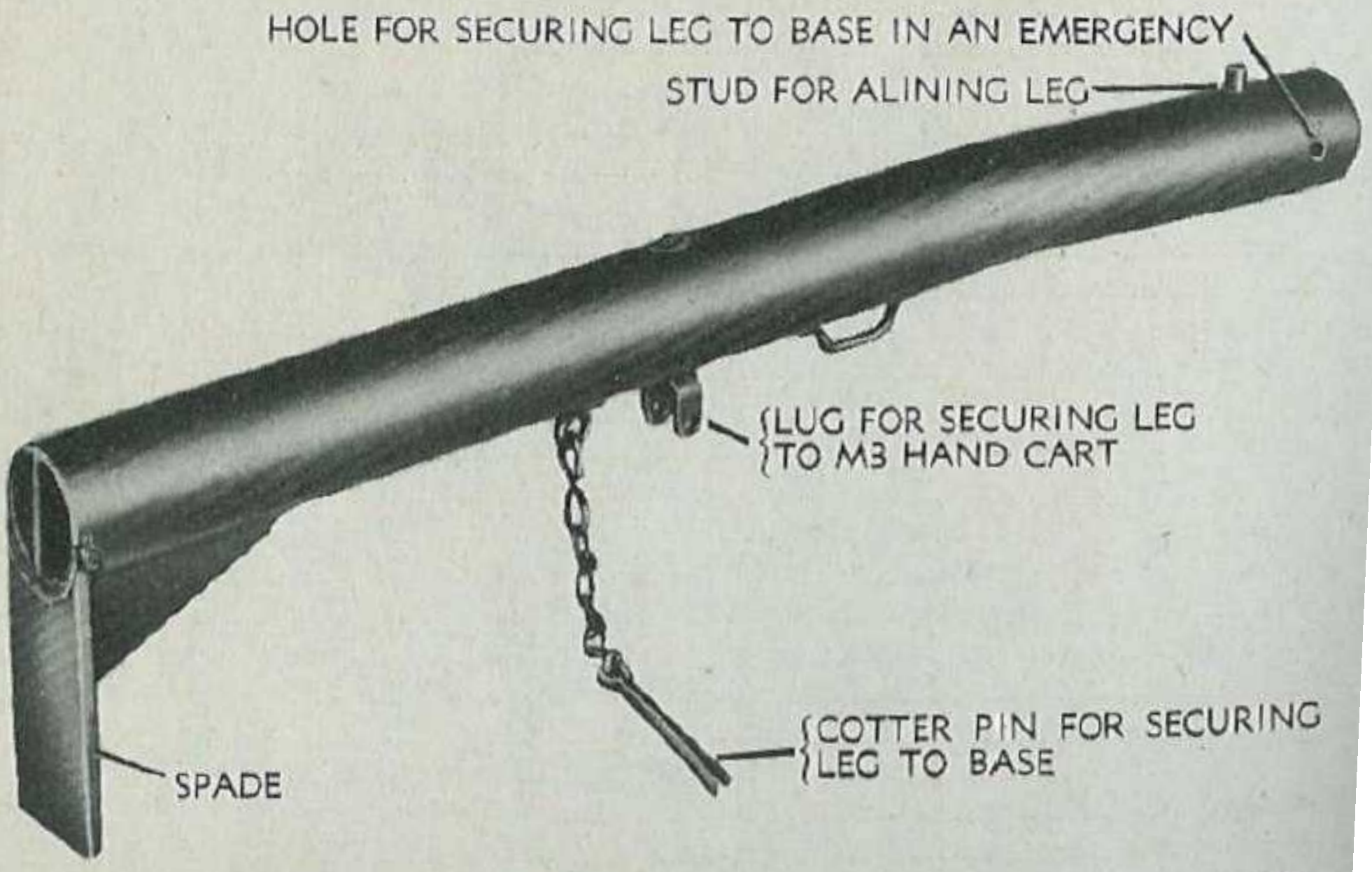
Figure 155—Base Assembly (New Type)—Machine Gun Antiaircraft Mount, Cal. .50, M63

ORDNANCE MAINTENANCE—BROWNING MACHINE GUN, CAL. .50, M2 ALL TYPES, AND GROUND MOUNTS



RA PD 91896

Figure 156—Base Assembly (Old Type)—Machine Gun Antiaircraft Mount, Cal. .50, M63



RA PD 22780

Figure 157—Leg Assembly—Machine Gun Antiaircraft Mount, Cal. .50, M63

MACHINE GUN ANTIAIRCRAFT MOUNT, CAL. .50, M63

b. Cradle and Yoke. Loosen the pintle locking clamp on the elevator, and lift out the cradle with the pintle.

NOTE: *Side plate trigger is covered in section XI.*

c. Elevator. Loosen the traverse lock on the elevator. Push in on the bearing lock on the base to lock the bearing and unscrew the elevator from the base.

d. Legs and Base. Loosen the leg clamps and remove the legs from the base.

e. The disassembled components of the mount are shown in figure 152.

70. INSPECTION.

a. Cradle and Yoke Group (fig. 153).

(1) Check free movement of cradle in yoke, security of pivot bolts, and fit and locking of gun and cradle locking pins (should have no play). Check pintle for burs and rust.

(2) Check security of rear end of cradle and handle frames to cradle. Check handles for looseness and cracks, and firing levers for operation and smooth action. Check action of firing levers, check linkage on trigger control mechanism, and test operation of safety.

(3) Check position and security of trigger control mechanism on cradle bracket, and check mechanism generally as for Mount M2A1. Function and adjustment of mechanism is explained in TM 9-226.

(4) Check security of ammunition chest support and side plate trigger container, and test retention of retainer cover.

b. Elevator Assembly (fig. 154).

(1) Check pintle socket for rust and burs, and pintle locking clamp for action and worn or burred threads..

(2) Check traverse lock for positive spring action by pressing down. It should rise freely when released.

(3) Check elevator body for dents, and cone (which seats in base) and bolt threads for burs and wear.

c. Base Group Assembly (figs. 155 and 156).

(1) Check bearing socket for free movement with bearing and note any roughness which might indicate dirt or damaged bearing. Check socket (stud) bolt for worn or burred threads.

(2) Check leg clamps for security on base, and bolts for worn or burred threads. Check grease fitting leading to bearing for clogged hole. Check handle for cracked welding.

d. **Leg Assembly** (fig. 157). Check legs for dents, missing or bent securing lugs and cotter pins, and bent or loose spades. Check alining studs for wear and looseness.

71. MAINTENANCE AND REPAIR.

a. Replace all broken, badly worn or otherwise unserviceable parts. Remove burs and rust as explained in paragraphs 22 and 23. Repaint all painted surfaces that have become checked, as prescribed in TM 9-226. When assembling, clean, oil all unpainted parts for rust prevention, and lubricate as prescribed in TM 9-226. Adjustments of the mount are explained in TM 9-226.

b. Cradle and Yoke Group.

(1) If firing levers or linkage are worn so as to cause lost motion, replace worn parts.

(2) If safety does not function properly, replace it.

(3) If (side plate trigger) container cap does not lock properly, examine spring and, if necessary, replace spring.

(4) If lug on trigger control slide is worn so as to affect its proper, level contact with lug on side plate trigger slide (when assembled), replace slide.

(5) If gun securing pins are worn so as to cause lost motion, replace pins.

c. Elevator Assembly.

(1) If pintle locking clamp and traverse lock do not function properly, examine and replace damaged parts.

(2) If threads in elevator are stripped or loose enough to cause lost motion, replace elevator assembly.

d. Base Assembly.

(1) If threads on (stud) bolt in base which secures elevator to base are stripped or badly worn, the bolt or group parts should be replaced, or base assembly replaced.

(2) If toggle bolt assemblies are badly worn or threads damaged, replace assembly.

72. ASSEMBLY.

a. **Legs and Base** (figs. 155, 156, and 157). Insert the legs into the leg sockets of the base, alining each leg by means of the stud on the leg. Lock the legs in position by tightening the leg clamps.

b. **Elevator** (fig. 154). Insert the elevator into the base, push in the bearing lock to lock the bearing, and screw the elevator into

position. Do not use too much force as it will strip the threads. The traversing bearing has a play of 0.002 inch and any additional tightening of the elevator to the base will not eliminate this clearance. Lock the elevator to the base in either the 45-degree or 90-degree position in azimuth by means of the traverse lock.

c. Cradle and Yoke (fig. 153). Insert the pintle of the yoke into the pintle socket of the elevator so that the cradle is on the *same* side as the bend in the elevator. Secure with pintle locking clamp.

d. Gun. See that the cradle is locked in the horizontal position. Carefully replace the machine gun in the cradle, taking care that the side plate trigger and (side plate) trigger control mechanism are properly engaged. Secure the gun to the cradle by means of the two gun locking pins.

NOTE: *Adjustment of the (side plate) trigger control mechanism is explained in TM 9-226.*

Section XVIII

ACCESSORIES

73. LINK-DELINKING MACHINE, CAL. .50, M7, *1-M-72-625* (fig. 11).

a. Disassembly. This machine is assembled for the most part by means of pins held in place by cotter pins. The groups may be removed by withdrawing cotter pins and then retaining pins. The loading slide stops and springs can be removed from the sides of the base by driving out the retaining pins. The cartridge link stop on the front of the base can be removed by removing the three retaining screws.

b. Inspection. Check all parts for burs and rust. Check pivot pins for wear and cotter pins for breaks. Operate machine and see that parts move smoothly. See that loading slide stops have smooth spring action and that springs are not broken and hold stops projected. See that guide pins in base are neither loose nor bent, and that cartridge link stop is secure on base.

c. Maintenance and Repair.

(1) Replace damaged or broken cotter pins and badly worn pivot pins. Remove burs and replace worn, bent, or broken parts. Replace pins in base if loose or bent.

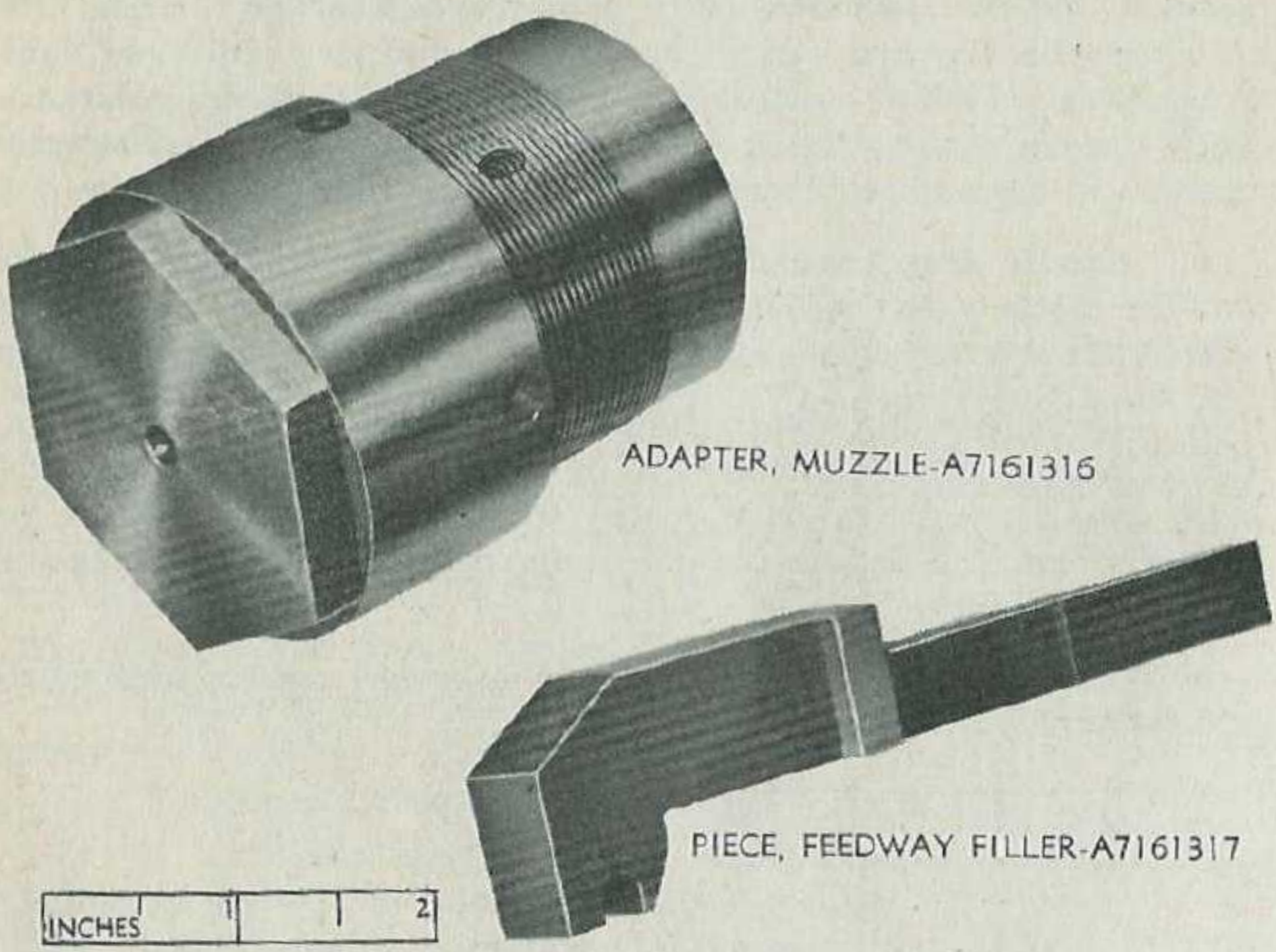


Figure 158—Blank Firing Attachment

(2) Oil machine lightly to prevent rusting, and occasionally oil slide and pivot pins to insure smooth action and to prevent wear. Such oiling should be light so that oil will not get on cartridges when loading into belt.

d. Assembly. Install the parts removed, by reversing procedure of disassembly. Use new cotter pins when assembling.

74. HAND LINKER-DELINKER, CAL. .50, M12, *41-L-1604* (fig. 12).

a. Disassembly.

(1) The parts comprising the linker-delinker are for the most part retained by pins held in place by spring washers retained by locking rings. Parts should not be disassembled unless necessary for repair. Parts may be removed by first removing locking ring, and then washer and pin. Method of disassembly should be noted to aid in reassembly.

(2) The extension spring may be removed by unhooking the ends from the retaining posts.

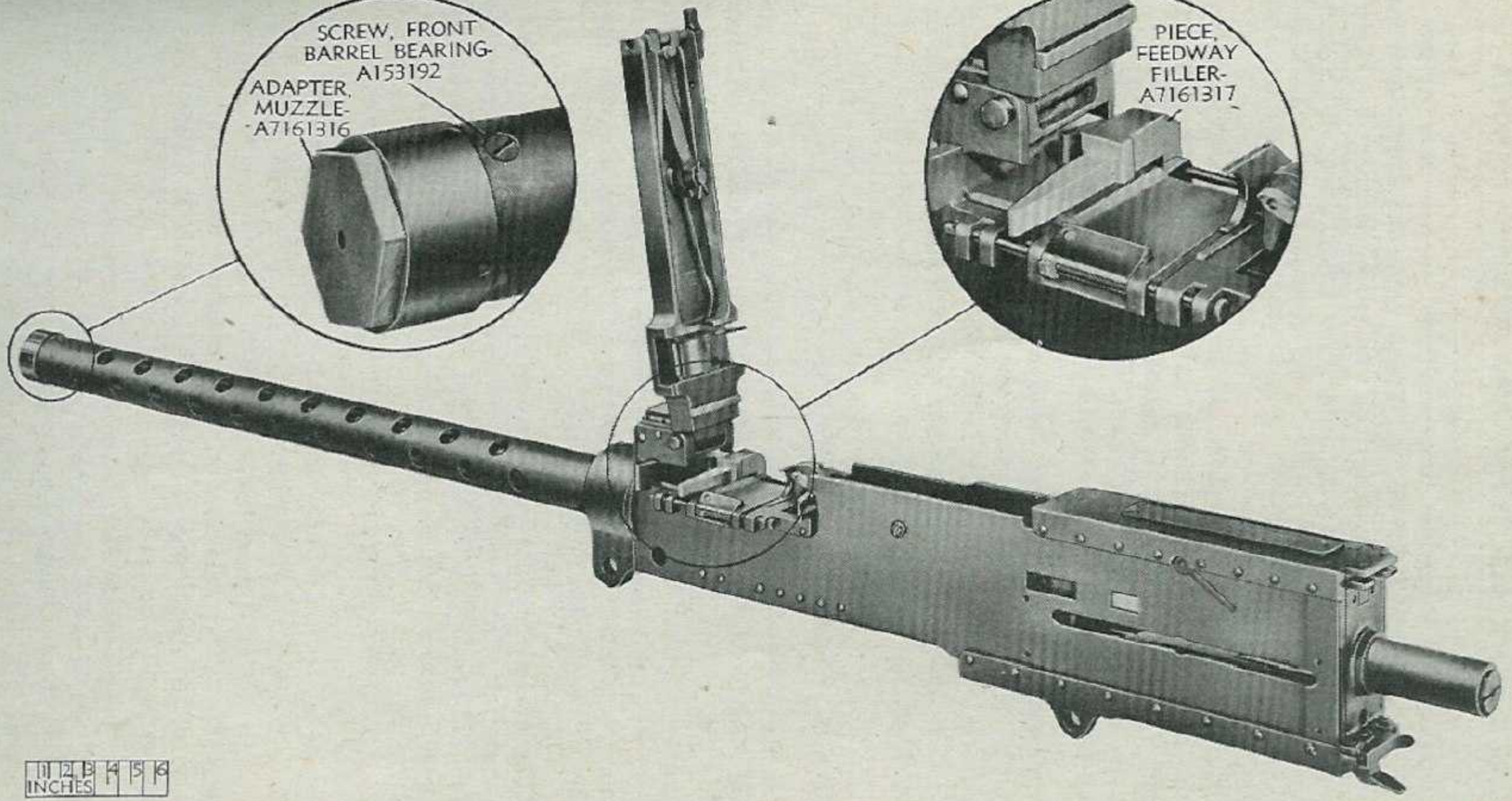


Figure 159—Blank Firing Attachment Assembled to Gun

b. Inspection. Operate linker-delinker to see that action is smooth, and that spring functions. Check parts for burs, distortion, and breaks. See that all locking rings and spring washers are secure, and check pins for wear. Check operation, using links and dummy cartridges, to see that cartridge can be extracted and fully seated in link.

c. Maintenance and Repair. Linker-delinker should be kept clean and all burs removed. Damaged, bent, or broken parts should be replaced if available, or linker-delinker replaced as a unit. Pivot pins should be lightly oiled to prevent wear, and all excess oil should be wiped off to prevent its getting on cartridges when loading in links.

d. Assembly. Install parts removed, by reversing manner of disassembly. Be sure spring washers are securely locked in place by locking rings, and rings are fully seated and locked in their grooves in pins. The extension spring is assembled by securing end loops on retaining posts.

75. BLANK FIRING ATTACHMENT.

a. A blank firing attachment has been designed for the Aircraft Gun, Cal. .50, M2 consisting of a muzzle adapter *A7161316* and a feedway filler piece *A7161317* (fig. 158). When attached to the gun (fig. 159), belts of linked cal. .50 blank cartridges can be fired automatically. Belts of regular cal. .50 cartridges cannot be fired with the attachment in place because the feedway filler piece prevents them from being drawn into the feedway.

b. The muzzle adapter is assembled to the barrel jacket in place of the front barrel bearing. The feedway filler piece is assembled over the belt holding pawl pin on the opposite side from the belt holding pawl, and is held in place by the cover when closed.

Section XIX

REFERENCES

76. 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. Index (index to SNL's) ..... ASF Cat. ORD 2 OPSI

b. List of Publications for Training (Listing MR's, MTP's, FM's, TM's, TR's, TB's, MWO's, SB's, WDLO's, and FT's) ..... FM 21-6

c. List of Training Films, Film Strips, and Film Bulletins (listing TF's, FS's, and FB's by serial number and subject) ..... FM 21-7

d. Military Training Aids (listing graphic training aids, devices, and displays) ..... FM 21-8

77. STANDARD NOMENCLATURE LISTS.

a. **Cleaning, Preserving, And Repair.**

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

Soldering, brazing and welding material, gases and related items ..... SNL K-2

b. **Gun Materiel.**

Gun, machine, cal. .50, Browning, AN-M2, aircraft, basic ..... SNL A-38

Gun, machine, cal. .50, Browning, M2, heavy barrel, fixed and flexible; and ground mounts SNL A-39

Gun, machine, cal. .50, Browning, M2, heavy barrel, turret type ..... SNL A-59

Gun, machine, cal. .50, Browning, M2, water cooled, flexible; and mounts ..... SNL A-37

Mounts, small arms, for motor vehicles ..... SNL A-55

Set, control equipment, automatic gun, AA, M1 (for cal. .50 AA machine gun and 37-mm automatic gun) ..... SNL F-182

Sight, telescopic, M1 and T3 (for cal. .50 machine guns) ..... SNL F-195

c. Tools, maintenance, for repair of automatic guns, automatic gun antiaircraft materiel, automatic and semiautomatic cannon, and mortars ..... SNL A-35

d. Truck, 2½-ton, 6 x 6, small arms repair, M7 and M7A1 ..... SNL G-138

78. EXPLANATORY PUBLICATIONS.

a. Cleaning, Preserving, Lubricating, and Repair.

Cleaning, preserving, sealing, lubrication, and related materials issued for ordnance materiel ..... TM 9-850
Small arms: General instructions for care, preservation, and lubrication ..... WDTB 9-2835-8

b. Gas Attack.

Decontamination ..... TM 3-220
Defense against chemical attack ..... FM 21-40
Military chemistry and chemical agents ..... TM 3-215

c. Gun Materiel.

Browning machine gun, cal. .50, M2, aircraft, basic ..... TM 9-225
Browning machine gun, cal. .50, HB, M2, ground ..... FM 23-60
Browning machine gun, cal. .50, HB, M2 (mounted in combat vehicles) ..... FM 23-65
Browning machine gun, cal. .50, M2, water-cooled, and mounts ..... TM 9-226
Machine gun mounts for trucks ..... TM 9-224
Machine gun mounts for boats ..... TM 9-230
Set, control, equipment, M1 automatic gun, AA, M1 ..... TM 9-1605
Telescope sights M1 and T3 ..... TM 9-1581

d. Inspection and Maintenance.

Ammunition inspection guide ..... TM 9-1904
Basic maintenance manual ..... TM 37-250
Inspection of ordnance materiel ..... TM 9-1100
Maintenance of materiel in the hands of troops OFSB 4-1

e. Miscellaneous.

Dictionary of United States Army Terms ..... TM 20-205
Small arms ammunition ..... TM 9-1990

f. Ordnance Storage And Shipment.

Army-Navy general specifications for packaging and packing for overseas shipment.... No. 100-14A
Ordnance storage and shipment chart—group A—major items ..... OSSC A

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PUBLICATIONS DEPARTMENT - RARITAN ARSENAL