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10-3530-202-24

TM 10-3530-202-24

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL AND FIELD MAINTENANCE MANUAL

SEWING MACHINES FOR THE REPAIR OF
PARACHUTES AND ALLIED EQUIPMENT,
SINGER MODELS 112W116 (FSN 3530-171-2123),
131W113 (FSN 3530-222-3422), 7-33 (FSN 3530-171-1730),
97-10 (FSN 3530-171-2095), 17W15 (FSN 3530-288-5936),
55-5 (FSN 3530-222-3428), 111W155 (FSN 3530-359-8856)

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 10 April 1967

Organizational and Field Maintenance Manual

**SEWING MACHINES FOR THE REPAIR OF PARACHUTES AND ALLIED EQUIPMENT
SINGER MODELS 112W116 (FSN 3530-892-4636), 131W113 (FSN 3530-222-3433),
7-33 (FSN 3530-892-4651), 97-10 (FSN 3530-241-3282), 17W15
(FSN 3530-892-4646), 55-5 (FSN 3530-892-4643), 111W155
(FSN 3530-359-8856), 111W151 (FSN 3530-892-4629)**

TM 10-3530-202-24, 17 June 1964, is changed as follows:

The cover page and title page are changed as shown above.

Page 2. Paragraph 4 is superseded as follows:

4. Reporting of Equipment Manual Improvements

DA Form 2028 (Recommended Changes to

Publications) will be used for reporting discrepancies and recommendations for improving this equipment publication. This form will be completed by the individual using the manual and forwarded direct to Commanding General, U.S. Army Mobility Equipment Command, AMSME-MPD, 4300 Goodfellow Blvd., St. Louis, Mo. 63120.

Page 179. Appendix II is superseded as follows:

APPENDIX II

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance operations on the identified end item or component. The implementation of the maintenance tasks upon the end item or component will be consistent with the assigned maintenance operations.

c. Section III lists the special tools and test

equipment required for each maintenance operation as referenced from Section II.

d. Section IV contains supplemental instructions, explanatory notes and/or illustrations required for a particular maintenance function.

2. Explanation of Columns in Section II

a. *Functional Group Number.* The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from TR 750-93-1, Functional Grouping Codes) are listed on the

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MAC in the appropriate numerical sequence. These indexes are normally set up in accordance with their function and proximity to each other.

b. Component Assembly Nomenclature. This column contains a brief description of the components of each functional group.

c. Maintenance Functions and Maintenance Categories. This column lists the various maintenance functions (A through K) and in-

dicates the lowest maintenance category authorized to perform these operations. The symbol designations for the various maintenance categories are as follows:

- C—Operator or crew
- O—Organizational maintenance
- F—Direct support maintenance
- H—General support maintenance
- D—Depot maintenance

The maintenance functions are defined as follows:

- A—Inspect:** Verify serviceability and detect incipient electrical or mechanical failure by close visual examination.
- B—Test:** Verify serviceability and detect incipient electrical or mechanical failure by measuring the mechanical or electrical characteristics of the item and comparing those characteristics with authorized standards. Tests will be made commensurate with test procedures and with calibrated tools and/or test equipment referenced in the MAC.
- C—Service:** Operations required periodically to keep the item in proper operating condition, i.e., to clean, preserve, drain, paint, and replenish fuel, lubricants, hydraulic, and deicing fluids or compressed air supplies.
- D—Adjust:** Regulate periodically to prevent malfunction. Adjustments will be made commensurate with adjustment procedures and associated equipment adjustment specifications.
- E—Align:** Adjust two or more components of an electrical or mechanical system so that their functions are properly synchronized or adjusted.
- F—Calibrate:** Determine, check, or rectify the graduation of an instrument, weapon, or weapons system or components of a weapons system.
- G—Install:** Remove and install the same item for service or when required for the performance of other maintenance operations.
- H—Replace:** Substitute serviceable components, assemblies and subassemblies for unserviceable counterparts.
- I—Repair:** Restore to a serviceable condition by replacing unserviceable parts or by any other action required using available tools, equipment and skills, including welding, grinding, riveting, straightening, adjusting and facing.
- J—Overhaul:** Restore an item to a completely serviceable condition (as prescribed by serviceability standards developed and published by the commodity commands) by employing techniques of "Inspect and Repair Only As Necessary" (IROAN). Maximum use of diagnostic and test equipment is combined with minimum disassembly during overhaul. "Overhaul" may be assigned to any level of maintenance except organizational, provided the time, tools, equipment, repair parts authorization, and technical skills are available at that level. Normally, overhaul as applied to end items, is limited to depot maintenance level.
- K—Rebuild:** Restore to a condition comparable to new by disassembling to determine the condition of each component part and reassembling using serviceable rebuilt, or new assemblies, subassemblies, and parts.

d. Reference Note. This column, subdivided into columns L and M, is provided for referencing the Special Tool and Test Equipment Requirements (Sec. III) and Remarks (Sec. IV) that may be associated with maintenance functions (Sec. II).

3. Explanation of Columns in Section III

a. Reference Code. This column consists of a number and a letter separated by a dash. The number references the T and TE requirements column on the MAC. The letter represents the specific maintenance function the item is to be used with. The letter is representative of columns A through K on the MAC.

b. Maintenance Category. This column shows the lowest level of maintenance authorized to use the special tool or test equipment.

c. Nomenclature. This column lists the name or identification of the tool or test equipment.

d. Tool Number. This column lists the manufacturer's code and part number, or Federal stock number of tools and test equipment.

5. Explanation of Columns in Section IV

a. Reference Code. This column consists of two letters separated by a dash, both of which are references to Section II. The first letter references column M and the second letter references a maintenance operation, columns A through K.

b. Remarks. This column lists information pertinent to the maintenance operation being performed, as indicated on the MAC Section II.

Section II. MAINTENANCE ASSIGNMENT

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild	Tools and equipment	Remarks
40	ELECTRIC MOTORS													
4000	Motors Electric								O	F	H			
4001	Rotor Assemblies		F						F					
4002	Stator Assemblies	F							F					
4003	Brush Holders:													
	Holder, brush	F							F					
	Brush, electrical	O							O					
4004	Ventilating System	F							F					
4005	Frame Support, and Housings	F							F					
4007	Drive Components	O							O					
4012	Switches	O							O					
46	REPAIR EQUIPMENT													
4603	Repair Equipment (Clothing)													
	Machine arm assembly:													
	Shaft, arm; pulley, balance wheel; eccentric, feed driving	F							F					
	Thumbnuts, thread tension; control thread; guides, thread	O			O				O					
	Lever, knee lifter connection	O			O				O					
	Regulator, feed	F			O				F					
	Machine head assembly	F			O					F	H			

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild	Tools and equipment	Remarks
4603	Repair Equipment (Clothing) Machine Arm Assembly— Continued													
	Plate, face; bar, needle; frame, needle rock	F			O					F				
	Bar, presser foot; foot, presser	O			O					O				
	Clutch, presser bar	O			O					O				
	Bushing, machine	F							F					
	Bed and column: Screw, oscillating rock shaft	F							F					
	Hinge pin													
	Bobbin winder assembly	O			O					O				
	Oil cup assembly	O		C						O				
	Gear, needle bar frame	F			F				F					
	Connection, needle bar pitman	O			O				O					
	Regulator, needle bar	O			O				O					
	Holder, spool	O			O				O					
	Machine bed assembly: Hook, saddle; hook, driving	F			F					F				
	Bobbin; bobbin case	O		C	O					O				
	Feed driving; feed lifting	F			F				F	F				
	Roll, feed; upper and lower Plate, throat; slides, bed; dog	O			O				O					
	Cylinder, machine bed	O							O					

Section III. SPECIAL TOOL AND SPECIAL TEST EQUIPMENT REQUIREMENTS

Reference code	Maintenance level	Nomenclature	Tool number
		No special tools or test equipment required.	

Section IV. REMARKS

Reference code	Remarks
	None.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

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Major General, United States Army,
The Adjutant General.

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CC-E (1)
Dir of Trans (1)
USCONARC (2)
USAMC (12)
USAWECOM (5)
USAMICOM (5)
USAMUCOM (5)
USAECON (5)
USATECOM (5)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (3)
LOGCOMD (1)
MDW (1)
Armies (5)
NLABS (4)
USAMEC (46)
USMA (1)
Svc Colleges (2)
Br Svc Sch (2) except
USAQMS (10)

USAQMCENFEL (4)
USACDCEC (10)
Army Dep (4)
POE (2)
USA Tml Comd (2)
Army Tml (2)
Arsenals (2)
PG (2)
Instl (2)
QM FLDMS (2)
Ft Knox FLDMS (10)
Units org under fol TOE
(cys each):
10-22
10-105
10-107
10-445
10-448
10-337
10-407
10-417
10-500(HF,HG,HM,HI)
10-521
29-207
29-216
29-217

NG: State AG (3).

USAR: Same as active Army except allowance is one copy to each unit.

For explanation of abbreviations used see AR 320-50.

TECHNICAL MANUAL
No. 10-3530-202-24

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 June 1964

Organizational and Field Maintenance Manual

SEWING MACHINES FOR THE REPAIR OF PARACHUTES AND ALLIED EQUIPMENT, SINGER MODELS 112W116 (FSN 3530-171-2123), 131W113 (FSN 3530-222-3422), 7-33 (FSN 3530-171-1730), 97-10 (FSN 3530-171-2095), 17W15 (FSN 3530-288-5936), 55-5 (FSN 3530-222-3428), 111W155 (FSN 3530-359-8856)

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*This manual supersedes so much of TM 10-591, 19 January 1953, as pertains to organizational and field maintenance.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

These instructions are published for use of personnel who are responsible for the organizational (second-echelon) and field (third- and fourth-echelon) maintenance of sewing machines for the repair of parachutes and allied equipment Singer models 112W116 (FSN 3530-171-2123), 131W113 (FSN 3530-222-3422), 7-33 (FSN 3530-171-1730), 97-10 (FSN 3530-171-2095), 17W15 (FSN 3530-288-5936), 55-5 (FSN 3530-222-3428), 111W155 (FSN 3530-359-8856).

2. Appendixes

Appendix I is a list of applicable references, Appendix II contains the maintenance allocation chart.

3. Maintenance Forms and Records

The maintenance forms and records to be used in the second-, third-, and fourth-echelon maintenance of the sewing machines are listed and described in TM 38-750.

4. Reporting of Equipment Manual Improvements

The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended changes to DA technical manual parts lists or supply manual 7, 8, or 9) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen, or typewriter. The original and one copy will be forwarded direct to the Commanding Officer, U.S. Army Mobility Support Center, ATTN: SMOMS-MV1, Columbus, Ohio, 43216. One information copy will be provided to the individual's immediate supervisor (officer, noncommissioned officer, supervisor, etc.).

5. Orientation

Throughout this manual, the words *front*, *rear*, *right*, and *left* indicate directions from the viewpoint of the operator sitting or standing in the operating position with the balance wheel on his right.

Section II. DESCRIPTION AND DATA

6. Description

Refer to the operator's manual (TM 10-3530-202-10) for descriptions of the sewing machines.

7. Tabulated Data

Refer to the operator's manual (TM 10-3530-202-10) for tabulated data relating to sewing machines.

CHAPTER 2

SERVICE UPON RECEIPT OF SEWING MACHINES

8. General

When either a new or used sewing machine is received by an organization, it must be serviced as described in paragraphs 9 and 10 to prepare it for operation. These services will be performed by second-echelon maintenance personnel.

9. Removal of Preservatives

a. Remove the tape, paper, or other packing. Use extreme care when unpacking and installing separately packaged components.

b. Remove with SD (solvent, drycleaning) the preservative compound that has been sprayed on all metal surfaces. Because this compound is not a lubricant, take special care to see that it is completely removed from all wearing surfaces.

10. Maintenance Services

The organization mechanic will perform the services that are described in paragraph 16. The services performed at this time will begin the cycle of regularly scheduled preventive maintenance services.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. ORGANIZATIONAL TOOLS AND EQUIPMENT

11. Repair Parts and Special Tools

a. The repair parts that are authorized for use in second-, third-, and fourth-echelon maintenance of sewing machines are listed and illustrated in TM 10-3530-202-24P.

b. There are no special tools required for use in

second-, third-, and fourth-echelon maintenance of sewing machines.

12. Common Tools

The common tools used in second-, third-, and fourth-echelon maintenance of sewing machines are listed in the appropriate tables of allowances.

Section II. LUBRICATION

13. General

The lubrication of sewing machines is the responsibility of the using organization.

14. Lubrication Instructions

The operator will lubricate all oil can points as

prescribed on the lubrication charts in TM 10-3530-202-10. All other lubrication is accomplished by second-echelon maintenance personnel. Compliance with these instructions is mandatory.

Section III. PREVENTIVE MAINTENANCE SERVICES

15. General

Preventive maintenance services are the minimum inspections which are performed to insure that defects may be discovered and corrected before they result in serious damage to or failure of the equipment. When defects are discovered during operation of the equipment, they must be corrected as soon as operation has ceased. If continued operation would result in damage to the equipment, the defects must be corrected at once. All deficiencies and shortcomings that are discovered and all corrective action that is taken will be recorded on DA Form 2404 (Equipment In-

spection and Maintenance Work-Sheet) as soon as possible.

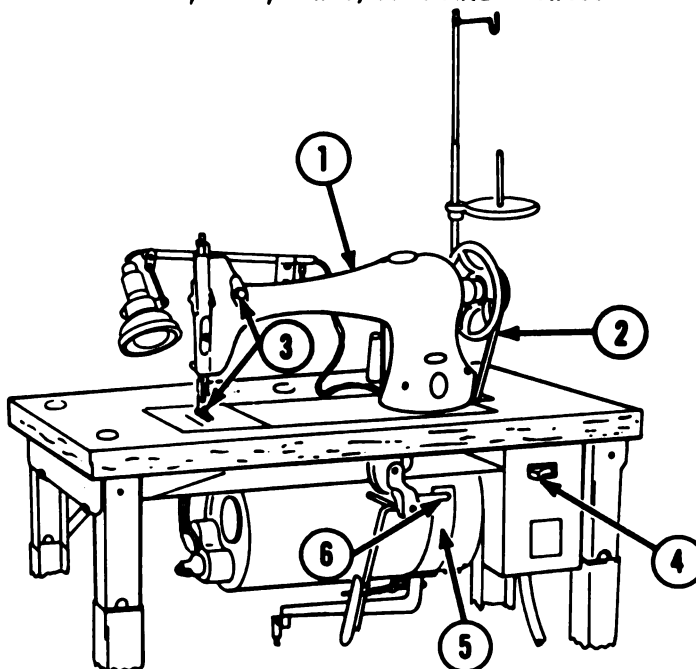
16. Quarterly Preventive Maintenance Services

The preventive maintenance services listed on figures 1 and 2 are the minimum quarterly inspections to be performed by second-echelon maintenance personnel. The quarterly interval is equal to 3 calendar months or 250 hours of operation, whichever occurs first. The services will be performed in the sequence in which they are numbered.

PREVENTIVE MAINTENANCE SERVICES QUARTERLY

TM 10-3530-202-24

MACHINES, SEWING
MACHINES, SEWING, INDUSTRIAL, SINGER MODELS 112W116,
131W113, 7-33, 17W15, 55-5 AND 111W155



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR. REF
1	<u>SEWING MACHINE.</u> Inspect the sewing machine for damaged, broken, and missing parts and check the components for secure mounting.	
2	<u>DRIVE BELT.</u> Inspect the drive belt for unusual wear, deterioration, and for 1/4 inch deflection between the pulleys.	
3	<u>THREADING.</u> Inspect the machine for proper threading with left-twist thread.	

Figure 1. Preventive maintenance services to be performed quarterly on Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155.

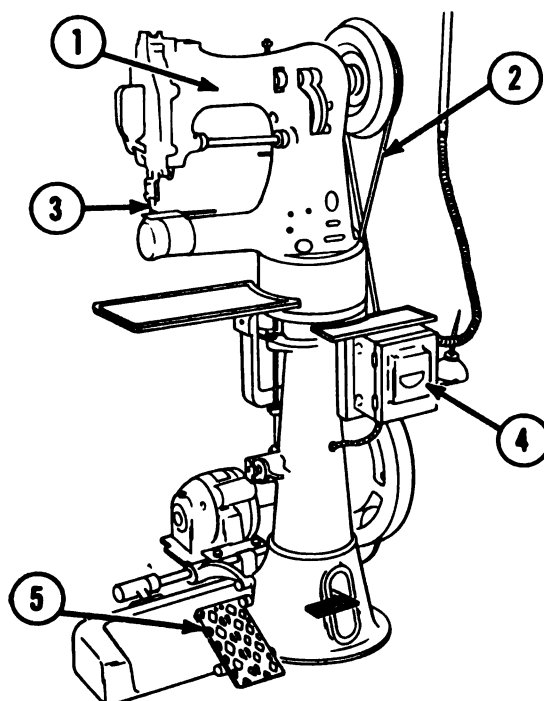
ITEM		PAR. REF
4	<u>MOTOR SWITCH.</u> Turn on motor switch and allow the motor to reach maximum revolutions per minute before engaging the clutch; then sew a test patch.	
5	<u>CLUTCH.</u> During operation, see that the clutch properly engages and disengages the pulley from the motor.	
6	<u>BRAKE.</u> During operation, check to see that the brake stops the machine head.	
	<u>NOTE:</u> During operation, observe for any unusual noise or vibration, and make all necessary adjustments.	

Figure 1—Continued.

PREVENTIVE MAINTENANCE SERVICES QUARTERLY

TM 10-3530-202-24

MACHINE, SEWING,
INDUSTRIAL, SINGER
MODEL 97-10



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR. REF
1	VERY-HEAVY-DUTY SEWING MACHINE. Inspect the machine for damaged, broken, and missing parts and check the components for secure mounting.	
2	DRIVE BELTS. Inspect drive belts for excessive wear, splitting at the ends, and for 1/2 inch deflection between pulleys.	
3	THREADING. Inspect the machine for proper threading with left-twist thread.	
4	MOTOR SWITCH. Turn on motor switch, and allow the motor to reach maximum revolutions per minute; then sew a test patch.	

Figure 2. Preventive maintenance services to be performed quarterly on Singer Model 97-10 sewing machine.

ITEM		PAR. REF
5	<u>FOOT TREADLE.</u> Press on the foot treadle and see that clutch pulley moves toward motor and starts the sewing machine, and release the foot treadle and see that the machine stops.	
	<u>NOTE:</u> During operation, observe for any unusual noise or vibration, and make all necessary adjustments.	

Figure 2—Continued.

Section IV. TROUBLESHOOTING

17. General

This section contains information that will aid in the diagnosis and correction of common troubles. The troubles are limited to those which can be detected and corrected by the organization mechanic with facilities of the using organization. The importance of questioning the operator to ob-

tain as many definite symptoms as possible must not be overlooked.

18. Troubleshooting Chart

In table I, each symptom of trouble is followed by a list of probable causes and a suggested procedure for locating and remedying the trouble.

Table 1. Troubleshooting Chart

Trouble	Probable cause	Remedy
Needle breaks.....	Operator is pulling on fabric.....	Do not pull or push fabric while sewing.
	Lifting presser foot is loose or out of line.....	Straighten presser foot or tighten presser foot screw.
	Sewing hook is too close to needle.....	Move sewing hook according to setting adjustment for that model machine.
	Needle is loose.....	Tighten needle clamp screw.
Needle thread breaks..	Needle is too light for fabric.....	Select needle of correct size.
	Needle is incorrect class or variety.....	Select correct needle.
	Needle is too light for fabric.....	Select needle of correct size.
	Machine is not threaded correctly.....	Rethread machine.
	Tension is too tight.....	Adjust tension according to thread tension.
	Right-twist thread is being used.....	Replace it with left-twist thread.
	Thread is damp or defective.....	Replace it with dry, smooth thread.
	Needle is not set correctly.....	Reset needle in holder.
	Sharp edges are on hook, bobbin case, or thread controller.	Smooth rough edges with emery cloth.
	Needle rubs against presser foot.....	Align presser bar and tighten set screws.
Bobbin thread breaks..	Needle rubs against throat plate.....	Adjust needle in needle holder.
	Needle is defective, bent, or blunt.....	Replace needle.
	Bobbin case is not threaded correctly.....	Rewind bobbin case.
	Bobbin is wound too fully to turn freely.....	Unwind thread down to rim of bobbin. Adjust bobbin winder.
	Sewing hook assembly is sticky or gummy with oil or dirt.	Clean and lubricate sewing hook assembly.
	Bobbin tension is too tight.....	Adjust bobbin tension.
	Thread is damp or defective.....	Replace with dry, smooth thread.
	Sharp edges are on bobbin, bobbin case, or sewing hook.	Smooth rough edges with emery cloth.
Stitches skip or fail to lock.	Setting or timing of needle and sewing hook are out of adjustment.	Reset needle and shuttle according to setting and timing instructions for that model machine.
	Sewing hook is too far from needle.....	Reset sewing hook with needle according to instructions for that model machine.
	Needle is incorrectly set in needle holder.....	Reset needle according to instructions for that model machine.
Stitches are uneven or piled up.	Presser foot pressure is too weak.....	Adjust pressure foot pressure.
	Feed dog is too low.....	Adjust height of feed dog according to instructions for that model machine.

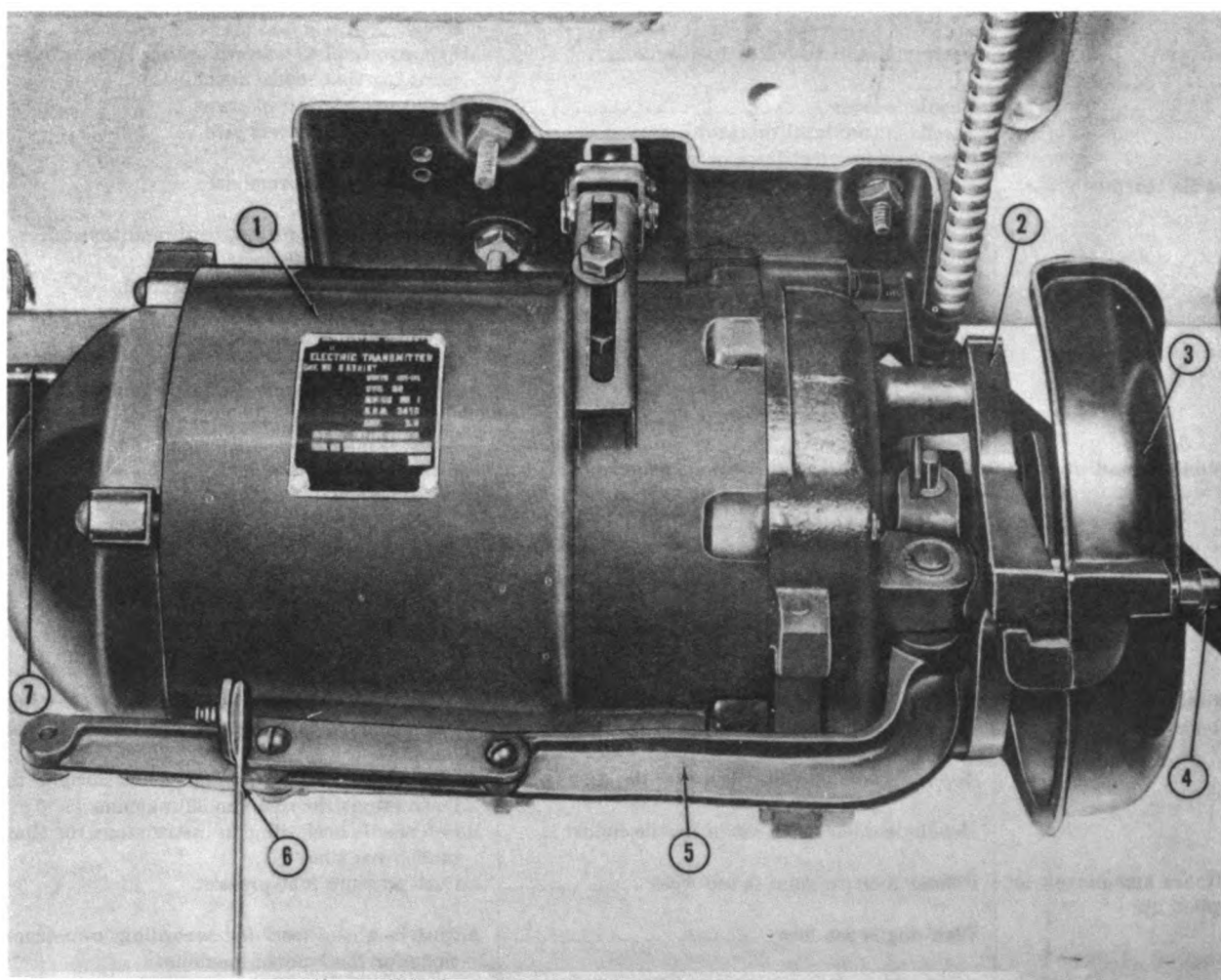
Section V. SECOND-ECHELON MAINTENANCE ALLOCATION, ELECTRIC MOTORS (GROUP 30)

19. Electric Motor for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal.

- (1) Disconnect lead cord from electrical source.
- (2) Slide drive belt off balance wheel and off drive pulley, and remove belt.
- (3) Remove machine head from tabletop, and invert table and stand.
- (4) Remove nut on ball joint that attaches upper pitman rod (6, fig. 3) to actuating lever (5), and slide ball joint from lever.
- (5) Remove screws that attach terminal box cover plate to box (7), and remove cover plate.
- (6) Disconnect and tag wiring in terminal box.
- (7) Remove nuts on carriage bolts that attach electric motor to underside of tabletop, and remove electric motor.

b. Installation. Reverse procedure in a above, referring to wiring diagram (fig. 4).



- 1 Motor, electric
- 2 Bracket, belt guard
- 3 Guard, belt
- 4 Pin, belt guard latch

- 5 Lever, actuating, motor clutch
- 6 Rod, upper pitman
- 7 Box, terminal, motor

Figure 3. Electric motor, mounted.

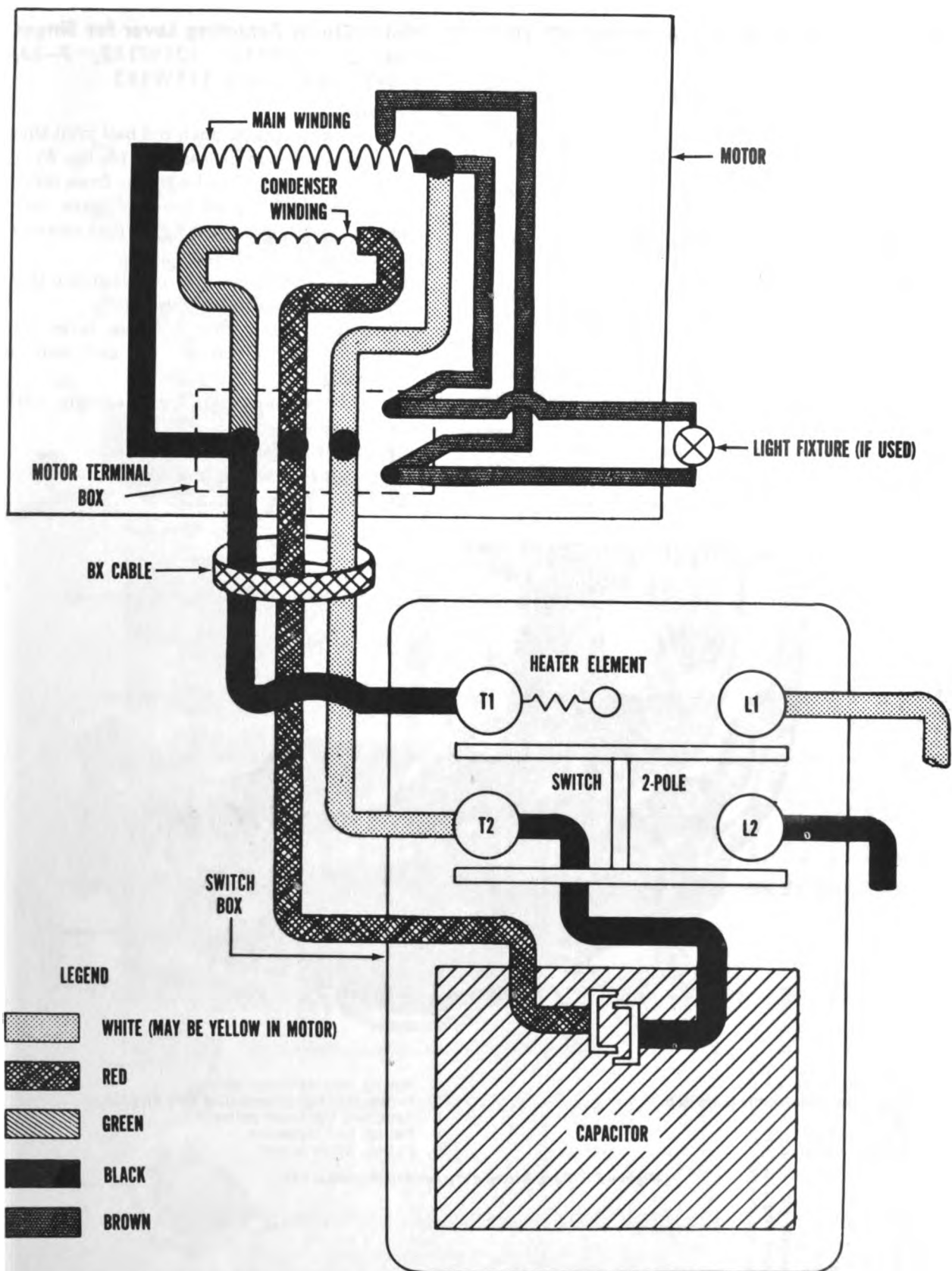


Figure 4. Wiring diagram for motor and switch box.

20. Electric Motor for Singer Model 97-10

a. Removal.

- (1) Disconnect sewing machine from power supply.
- (2) Push down on arm (8, fig. 5) and slide belt (1) from pulley (10).
- (3) Remove screw that attaches junction box cover to box (4), and remove cover.
- (4) Disconnect and tag lead-in wires in junction box.
- (5) Remove locknut that attaches cable elbow connector to junction box, and remove cable and wires.
- (6) Remove screws (5) and flat washers that attach motor (3) to base, and remove motor.
- (7) Remove setscrew that attaches pulley (10) to motor shaft, and remove pulley.

b. Installation. Reverse procedure in a above.

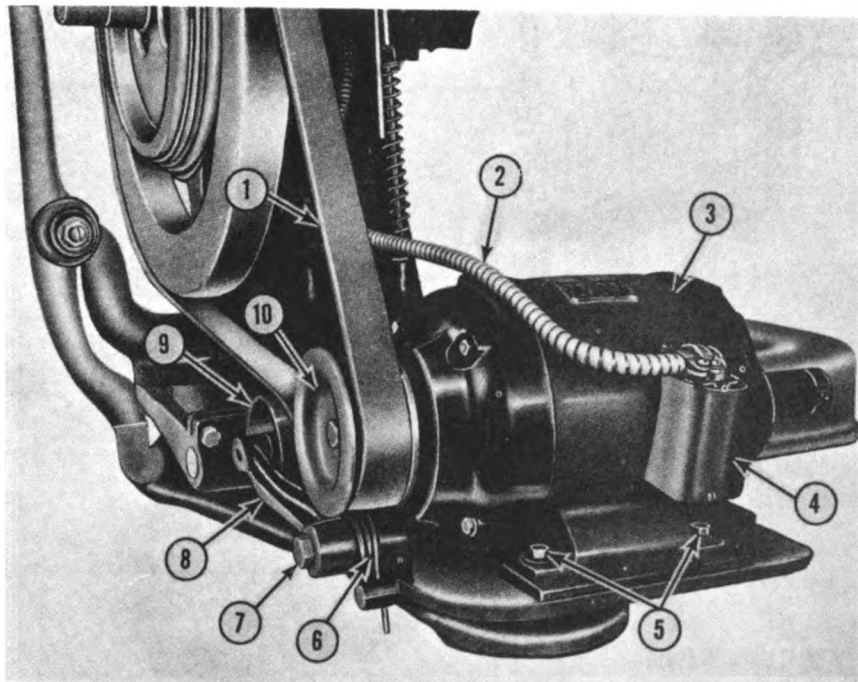
21. Motor Clutch Actuating Lever for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal.

- (1) Remove nut on pitman rod ball joint that attaches upper pitman rod (6, fig. 8) to lever (5), and slide ball joint from lever.
- (2) Remove belt guard bracket (para. 24).
- (3) Remove setscrew (20, fig. 6) that attaches hinge pin (8) to lever (24).
- (4) Remove retainers (19) on hinge pin that attaches lever to end cover (9).
- (5) Remove screw that attaches lever pin spring to end cover (9), and remove spring.
- (6) Slide bearings (26) and lever pin (25) out lever.
- (7) Remove lever from end cover.

b. Cleaning, Inspection, and Repair.

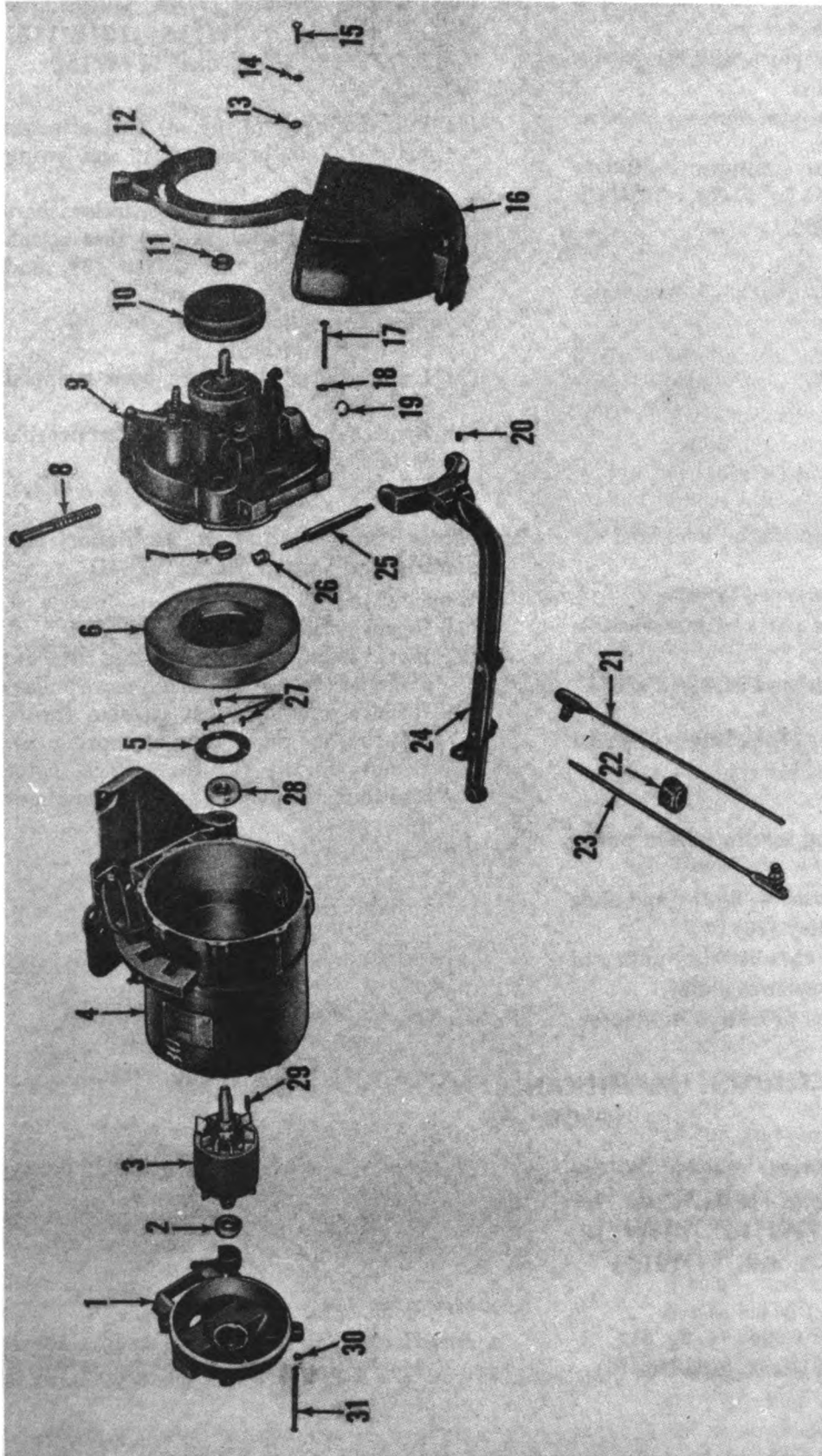
- (1) Clean parts with SD.



- 1 Belt, flat, leather
- 2 Cable, machine motor to switch
- 3 Motor
- 4 Box, junction
- 5 Screws, motor

- 6 Spring, belt tightener pulley
- 7 Screw, belt tightener pulley arm and hinge
- 8 Arm, belt tightener pulley
- 9 Pulley, belt tightener
- 10 Pulley, drive motor

Figure 5. Very-heavy-duty sewing machine, base.



- 11 Nut, self-locking, drive pulley
- 1 Cover, end, terminal box end
- 2 Bearing, ball, shaft, opposite drive end
- 3 Rotor
- 4 Housing, motor
- 5 Plate, retaining, pulley end ball bearing
- 6 Flywheel, motor
- 7 Nut, rotor shaft
- 8 Pin, hinge, motor clutch actuating lever
- 9 Cover, end, pulley end
- 10 Pulley, drive

- 12 Bracket, belt guard
- 13 Washer, flat, bracket screw
- 14 Lockwasher, bracket screw
- 15 Screw, belt guard bracket
- 16 Guard, belt
- 17 Screw, end cover, pulley end
- 18 Lockwasher, screw, end cover, pulley end
- 19 Retainer, pin, lever
- 20 Setscrew, actuating lever hinge pin
- 21 Rod with ball joint and nut, upper pitman

- 22 Clamp with setscrew, pitman rod
- 23 Rod with ball joint and nut, upper pitman
- 24 Lever, actuating, motor clutch
- 25 Pin, sleeve, lever
- 26 Bearing, lever sleeve pin
- 27 Screws, retaining plate
- 28 Bearing, ball, shaft, drive end pulley
- 29 Key, motor flywheel
- 30 Lockwasher, screw, end cover, terminal box end
- 31 Screw, end cover, terminal box end

Figure 6. Electric motor, exploded view.

- (2) Inspect parts for bends, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts, as authorized.

c. Installation. Reverse procedure in *a* above.

22. Drive Pulley for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal.

- (1) Slide drive belt off balance wheel and off drive pulley.
- (2) Pull out pin (4, fig. 3) and swing guard (3) to the rear.
- (3) Remove nut that attaches drive pulley to clutch shaft, and remove pulley.

b. Cleaning, Inspection and Repair.

- (1) Clean parts with SD.
- (2) Inspect pulley for cracks, burs, and excessive wear.
- (3) Inspect nut for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

23. Motor Drive Pulley for Singer Model 97-10

a. Removal.

- (1) Disconnect sewing machine from power supply.
- (2) Push down on arm (8, fig. 5) and slide belt (1) from pulley (10).
- (3) Remove setscrew that attaches pulley to motor shaft, and remove pulley.

b. Installation. Reverse procedure in *a* above.

24. Belt Guard Bracket With Guard for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal.

- (1) Pull latch pin (4, fig. 3) that attaches guard (3) to bracket (2), and swing guard back.
- (2) Remove screws (15, fig. 6), lockwashers (14), and flat washers (18) that attach bracket (12) to end cover (9), and remove bracket with guard.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts, as authorized.

c. Installation. Reverse procedure in *a* above.

25. Motor Base and Belt Tightener Assembly for Singer Model 97-10

a. Removal.

- (1) Remove electric motor (para. 20).
- (2) Remove screw (8, fig. 7) that attaches pulley (5) to arm (6), and remove pulley.
- (3) Remove screw (7) that attaches arm to base (3), and remove arm and spring (4).
- (4) Remove screws (2) that attach motor base to machine base, and remove motor base.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, splits, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

Section VI. SECOND-ECHELON MAINTENANCE ALLOCATION, ELECTRICAL FITTINGS (GROUP 36)

26. Sewing Machine Motor Switch, Switch Box, Capacitor, and Lead Cord for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal.

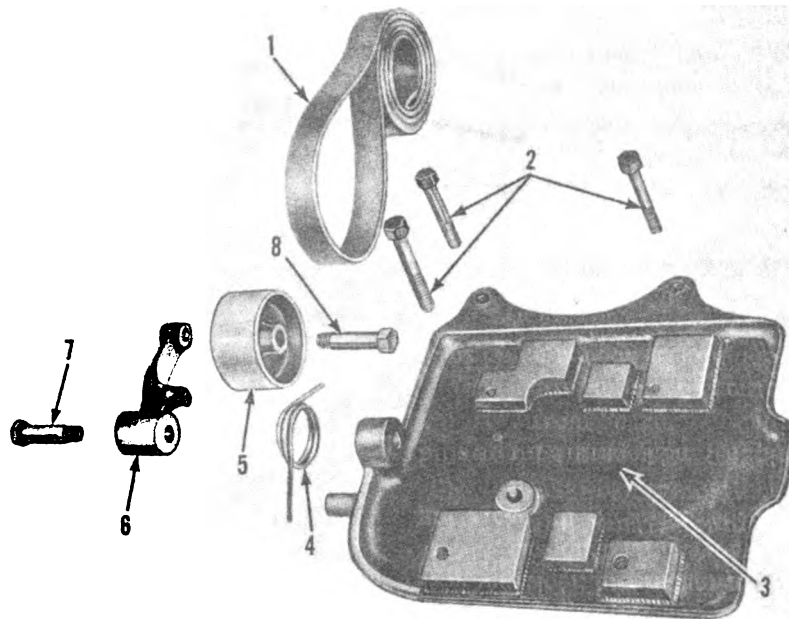
- (1) Swing open cover to box (4, fig. 8).
- (2) Remove clamp (2) from capacitor (3).

- (3) Remove screws that attach switch to box, and pull switch from box.

- (4) Remove and tag wiring to switch, and remove switch capacitor, and lead cord.

b. Repair. Replace defective items with serviceable ones.

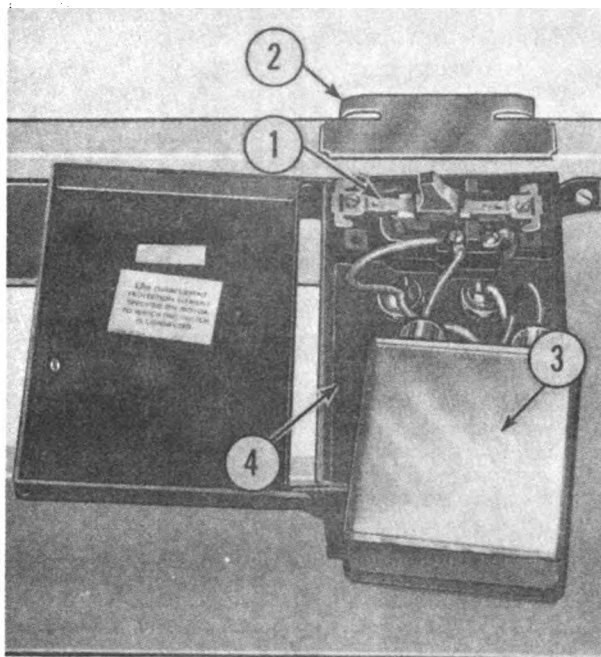
c. Installation. Reverse procedure in *a* above, using wiring diagram (fig. 4).



- 1 Belt, flat
- 2 Screws, motor base
- 3 Base, motor
- 4 Spring, belt tightener pulley

- 5 Pulley, belt tightener
- 6 Arm, belt tightener pulley
- 7 Screw, belt tightener pulley arm
- 8 Screw, belt tightener pulley hinge

Figure 7. Motor base, belt tightener pulley, and related parts, exploded view.



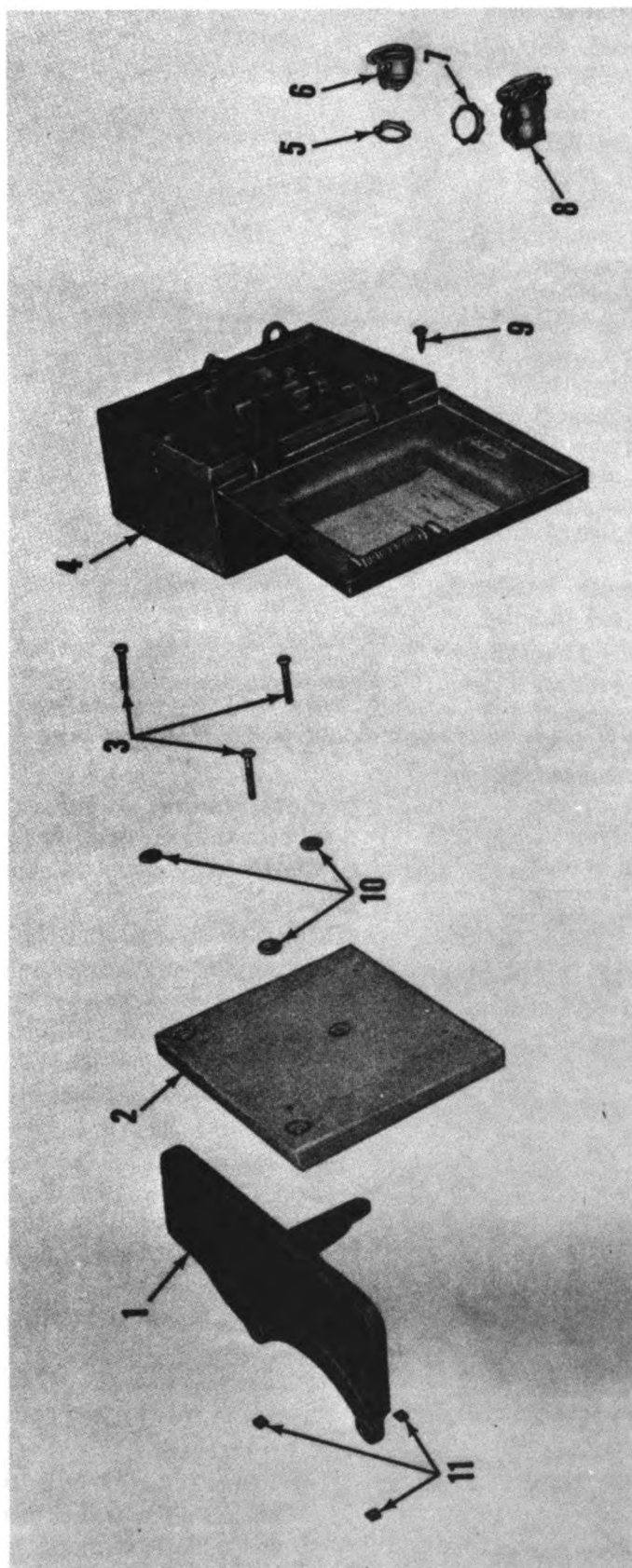
1. Switch, sewing machine
- 2 Clamp, capacitor
- 3 Capacitor, switch, sewing machine
- 4 Box, switch

Figure 8. Switch box, partially exploded view.

27. Motor Starting Switch, Switch Box, Board, and Table Tray for Singer Model 97-10

a. Removal.

- (1) Disconnect sewing machine from power supply, and remove fuses from switch.
- (2) Open switch box (4, fig. 9).
- (3) Disconnect motor lead wires from switch at bottom of switch box.
- (4) Remove screw and flat washer that attach shield to switch, and remove shield.
- (5) Disconnect line wires from switch, remove nuts and screws that attach switch to box, and remove switch.
- (6) Remove locknuts (5 and 7) that attach connectors (6 and 8) to switch box, and remove cables and wire clamps from switch box.
- (7) Remove screws (9) that attach switch box to board (2), and remove switch box from board.
- (8) Remove nuts (11), bolts (3), and washers (10) that attach board to tray (1), and remove board.



- | | | | | | |
|---|-----------------------------------|---|----------------------------------|----|---------------------------------------|
| 1 | Tray, table | 5 | Locknut, straight connector | 9 | Screw, wood, switch box |
| 2 | Board, motor starting box | 6 | Connector, straight, armored | 10 | Washer, motor starting box board bolt |
| 3 | Bolt, motor starting box board | 7 | Locknut, elbow connector | 11 | Nut, motor starting box board bolt |
| 4 | Box with switch and fuses, switch | 8 | Connector, elbow, armored, motor | | |

Figure 9. Switch box, board, tray, and related parts, exploded view.

- (9) Remove screw and nuts that attach tray to machine head, and remove tray.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, bends, stripped threads, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

28. Lamp With Bracket for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal and Disassembly.

- (1) Loosen wingnut that attaches bracket (1, fig. 10) to fixture (2), and remove fixture.
- (2) Remove nut and washer that attach bracket to stud, and remove bracket.

- (3) Remove screws that attach cover to motor terminal box, and remove cover.

- (4) Disconnect lamp wiring at motor terminal box, and remove lamp from machine.

- (5) Remove ring (6) that positions lens (5) in fixture, and remove lens.

- (6) Twist bulb (4) and remove it from fixture.

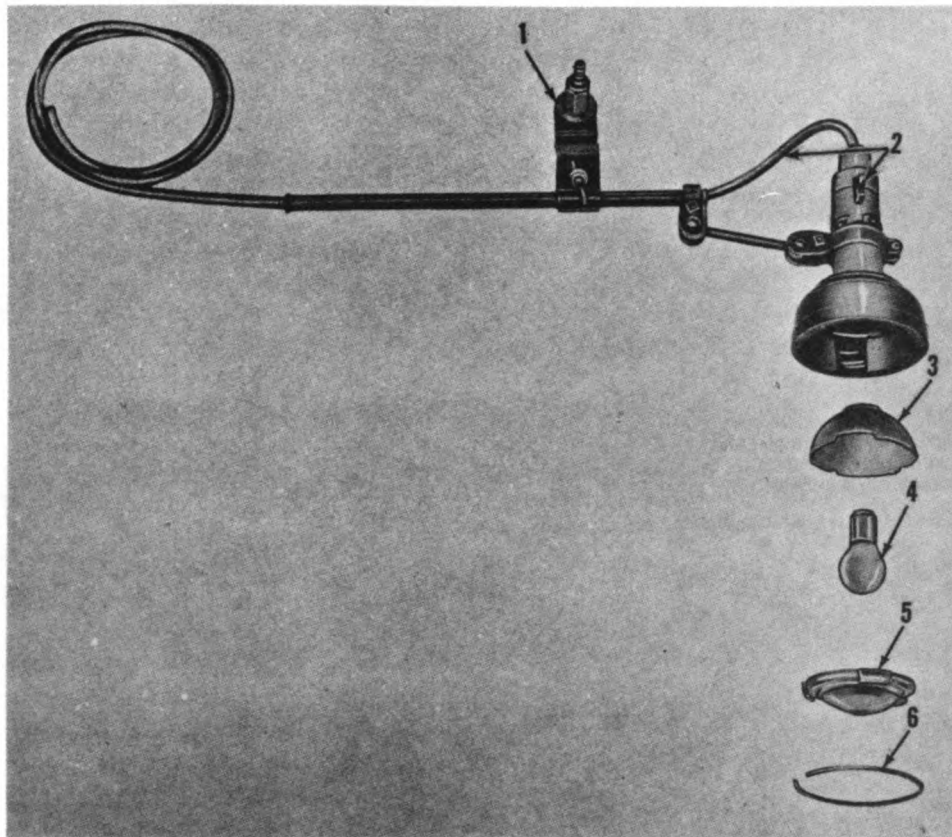
- (7) Remove reflector (3) from fixture.

b. Inspection and Repair.

- (1) Inspect parts for bends, cracks, and excessive wear.

- (2) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



- 1 Bracket, lamp
- 2 Fixture, light
- 3 Reflector, sewing machine lamp

- 4 Bulb, sewing lamp
- 5 Lens, sewing machine lamp
- 6 Ring, retaining, lamp lens

Figure 10. Lamp with bracket, exploded view.

29. Stand Assembly (Singer Model 7-33)

a. Removal and Disassembly.

- (1) Remove nut, washer, and bolt that attach lamp bracket to rod (1, fig. 11), and remove lamp assembly with bracket.
- (2) Remove screws (3) that attach stand (4) to table top, and remove stand assembly.
- (3) Remove setscrews (2) that attach rod (1) to stand, and remove rod.

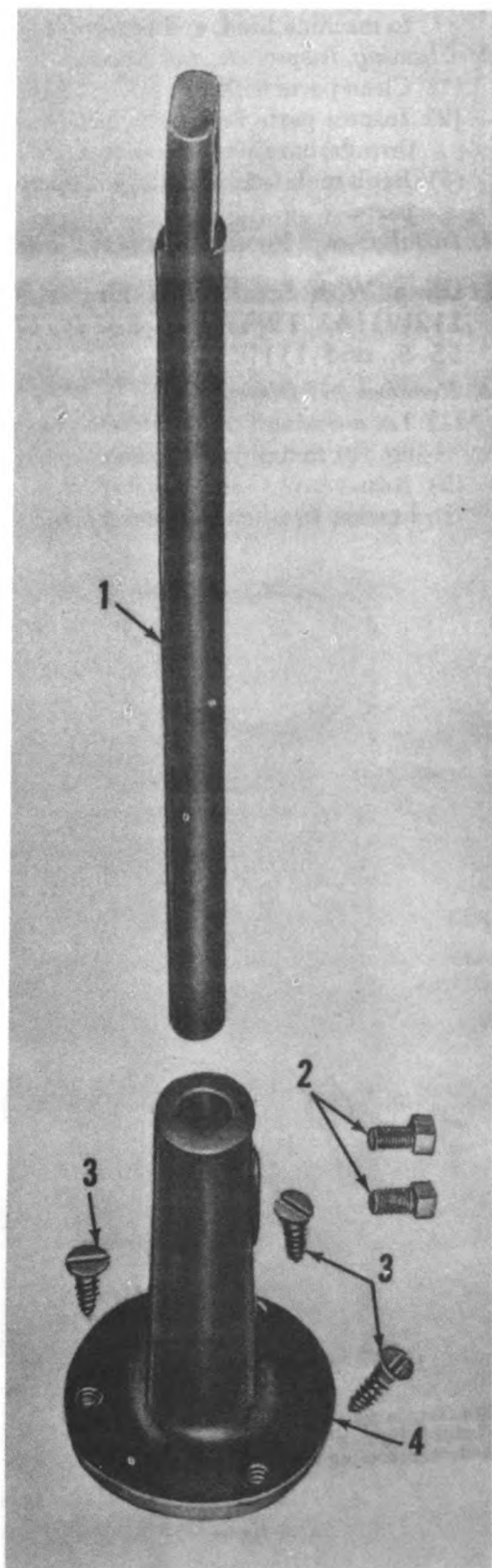
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burrs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in a above.

- 1 Rod, supporting, sewing lamp
- 2 Setscrews, rod, sewing lamp
- 3 Screws, wood
- 4 Stand, sewing machine lamp

Figure 11. Stand assembly, exploded view.



Section VII. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), TWO-NEEDLE SEWING MACHINE (SINGER MODEL 112W116)

30. Arm Cap

a. Removal. Remove screw and washer that attach arm cap (7, fig. 12) to machine arm, and remove cap.

b. Installation. Reverse procedure in *a* above, using serviceable arm cap.

31. Drive Pulley with Balance Wheel

a. Removal.

- (1) Slide round belt off drive pulley.
- (2) Unscrew feed regulator spindle from pulley end of arm shaft.
- (3) Remove position screw and setscrew that

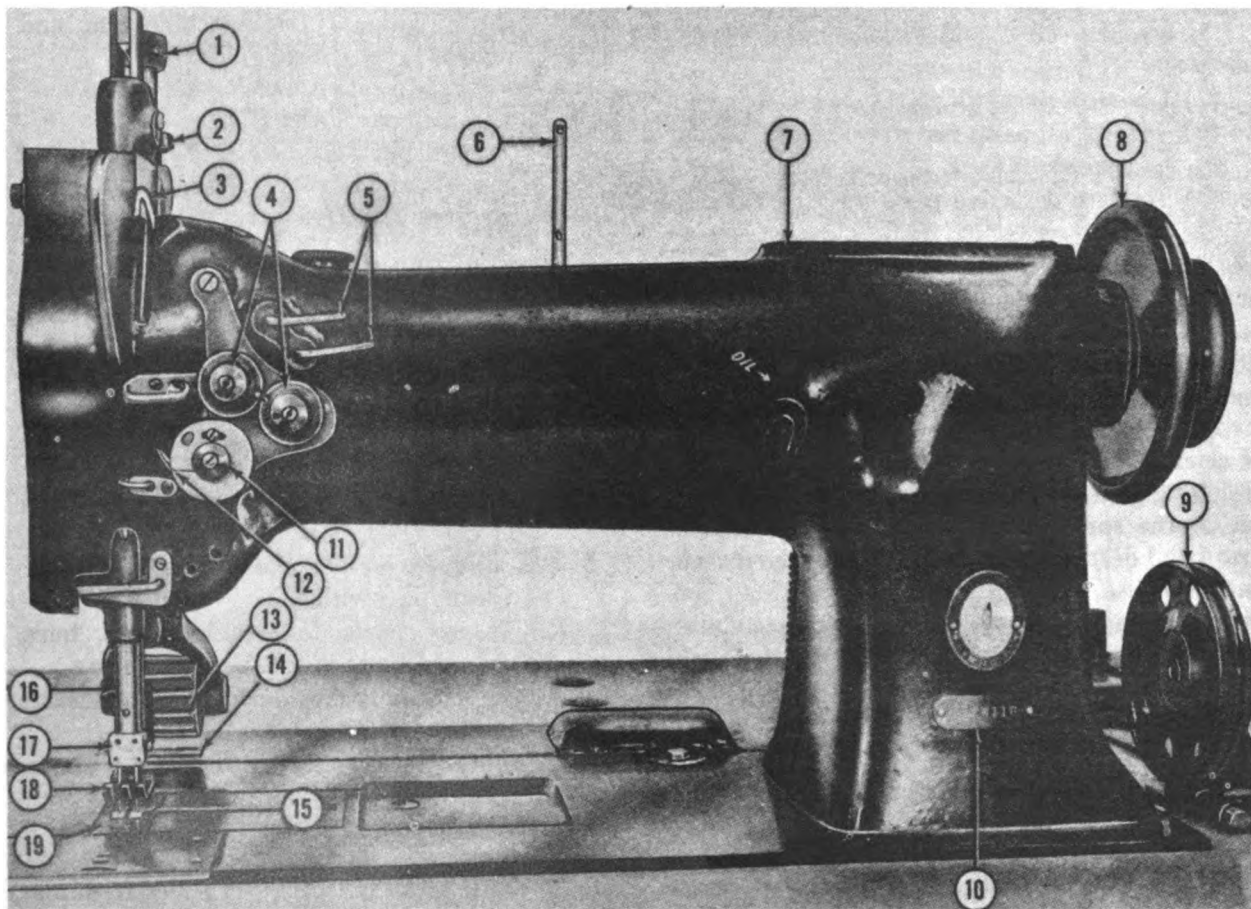
attach drive pulley (8, fig. 12) to arm shaft, and remove drive pulley with balance wheel.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect drive pulley with balance wheel for cracks, burs, and chipped places.
- (3) Inspect position screw and setscrew for stripped threads and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed regulator spindle (TM 10-3530-202-10).



- 1 Lever, puller feed roll upper bar position
- 2 Thumbscrew, puller feed roll, upper
- 3 Lever, takeup
- 4 Disks, tension
- 5 Retainers, thread, machine arm
- 6 Guide, thread
- 7 Cap, arm
- 8 Pulley with balance wheel, drive
- 9 Pulley, bobbin winder
- 10 Plate, model number

- 11 Thumbscrew, adjusting, thread tension and control disk
- 12 Spring, helical, compression, thread controller
- 13 Roll, puller feed, upper, corkfaced
- 14 Roll, puller feed, lower
- 15 Dog, feed
- 16 Bar, needle
- 17 Holder, needle
- 18 Presserfoot
- 19 Plate, throat

Figure 12. Two-needle sewing machine, head, front view.

32. Thread Tension Assembly

a. Removal.

- (1) Remove thumbscrew (13, fig. 13), disk screw (7), and thread controller disk (6) off stud (4).
- (2) Remove screw that attaches bracket (5) to machine arm, and remove bracket.
- (3) Remove controller stud (4), lever rod (18), spring (16), and spring stop (14) from machine arm.

b. Disassembly.

- (1) Remove screws (1 and 2) from tension bracket, and remove lever (3).
- (2) Remove tension release plungers (17) from tension bracket.
- (3) Unscrew thumbscrews (12) from tension bracket, and remove springs (11), washers (10), and disks (8 and 9).

c. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect all parts for cracks, nicks, bends, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

e. Adjustments. The tension assembly consists of a thread controller spring and a thread controller disk. As the needle bar moves downward, the thread controller spring pulls back on the slack thread to prevent the thread from becoming tangled around or under the needle. Tension on the spring may be increased for coarse thread and decreased for fine thread. The thread controller disk, which must revolve to permit the proper feeding of the needle thread, helps to maintain a tension on the thread through friction. Adjust the controller action of the thread controller spring and tension of the controller disk as follows:

(1) *Thread controller spring adjustment.*

- (a) Loosen thread controller spring stop screw (15).
- (b) Turn thread controller spring stop (14), located behind tension bracket, right to increase tension and left to decrease tension.
- (c) Tighten stop screw securely after adjustment.

(2) *Tension of thread controller disk.*

- (a) Loosen thread controller stud setscrew.

- (b) Place a screwdriver into split end of thread controller stud (4) and turn the stud left to increase tension and right to decrease tension.

33. Thread Guide Assemblies

a. Removal.

- (1) Remove setscrews that attach retainers (1 and 2, fig. 14) to machine arm, and remove retainers.
- (2) Remove screw (3) that attaches intermediate thread guide (4) to machine arm, and remove guide.
- (3) Remove screws (5 and 9) that attach upper thread guide (6) to machine arm, and remove upper thread guide.
- (4) Remove screw (8) that attaches lower thread guide (7) to machine arm, and remove lower thread guide.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly. Reverse procedure in *a* above.

34. Throat Plate

a. Removal.

- (1) Remove screw that attaches throat plate (19, fig. 12) to machine bed, and remove throat plate.
- (2) Pull throat plate position pin from machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, nicks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

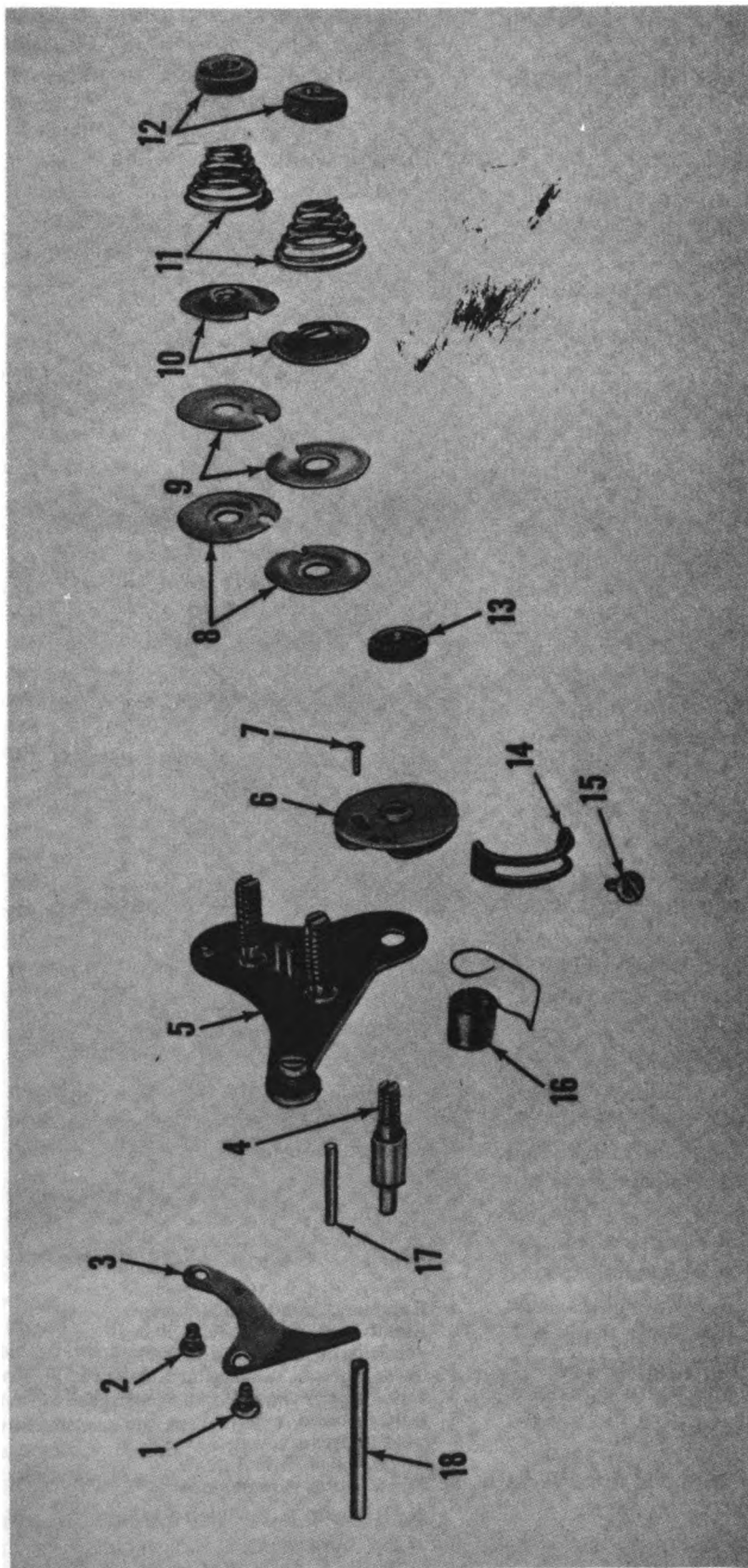
35. Front and Back Bed Slides

a. Removal and Disassembly.

- (1) Pull front and back bed slides from machine bed.
- (2) Remove bed slide back stop and spring from back bed slide.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, nicks, and excessive wear.



- 1 Screw, tension release lever
- 2 Screw, tension release lever
- 3 Lever, tension release
- 4 Stud, controller
- 5 Bracket, tension
- 6 Disk, thread controller
- 7 Screw, thread controller disk
- 8 Disks, tension
- 9 Disks, tension
- 10 Washers, tension release

- 11 Springs, helical, compression, tension
- 12 Thumbscrews, adjusting, thread tension and control disk
- 13 Thumbscrew, adjusting, thread tension and control disk
- 14 Stop, thread controller spring
- 15 Screw, thread controller spring stop
- 16 Spring, helical, compression, thread controller
- 17 Plunger, tension release
- 18 Rod, tension release lever

Figure 13. Thread tension assembly, exploded view.

- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

36. Sewing Hook Assembly

a. Removal and Disassembly.

- (1) Pull front and back bed slides from sewing hooks and bobbins.
- (2) Remove the bobbin.
- (3) Remove screws (1, fig. 15) from thread hook (4) and lift the hook gib (2) from the machine head.
- (4) Remove bobbin case (3).
- (5) Tilt the machine back to expose the bed assemblies.
- (6) Remove setscrew from hook driving pinion (10).
- (7) Holding pinion and thread hook that goes through it, remove thread hook.
- (8) Tilt machine bed back to its operating position.
- (9) Remove link (5) and separate hinge stud (7) from link.
- (10) Remove opener (6) from lever (8).
- (11) Remove bobbin case opener lever from hook saddle (9).

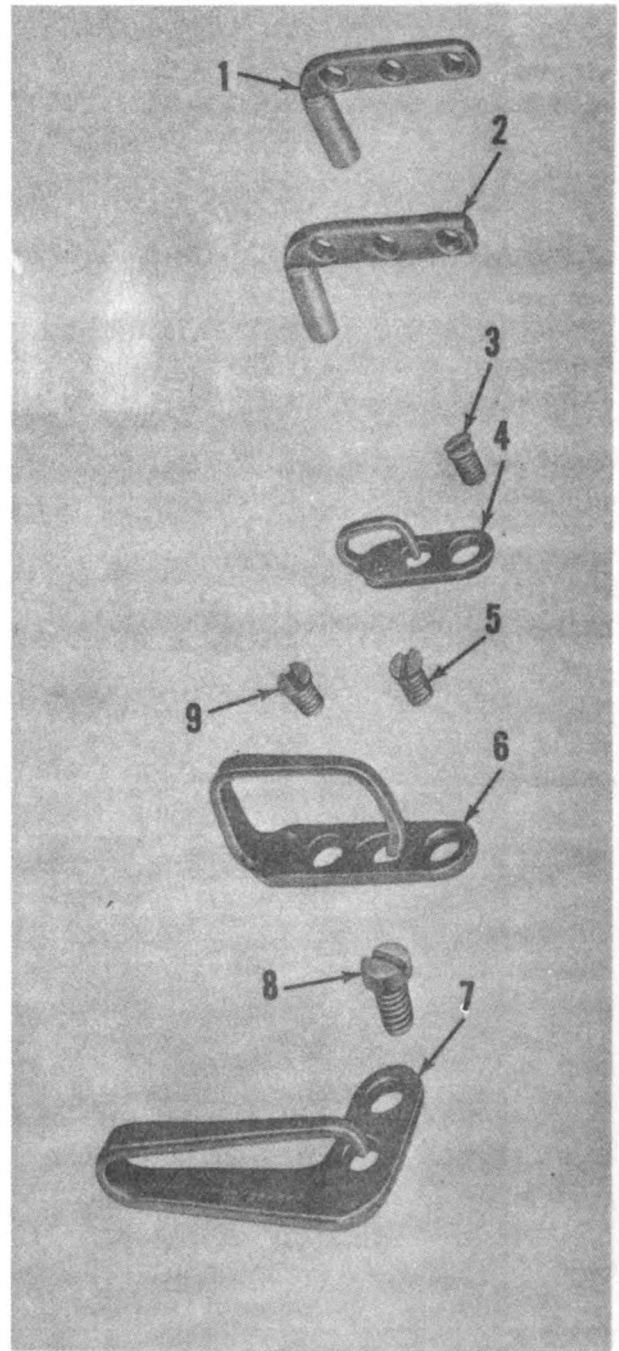
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for stripped threads, burs, cracks, bends, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above, omitting *a*(1).

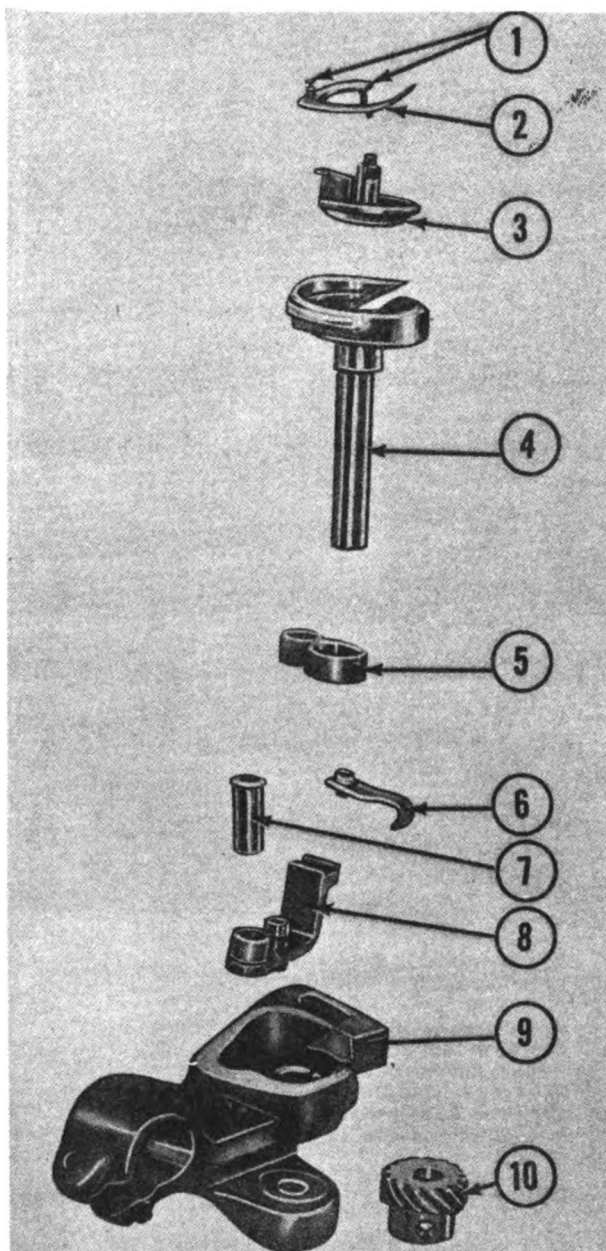
d. Timing Sewing Hooks. When the needle bar rises $\frac{3}{32}$ inch from its lowest point, the slack in the needle thread forms a loop beside the needle below the throat plate. The sewing hook should fall alongside the needle $\frac{1}{16}$ inch above the eye and catch the loop of the needle thread. Adjust timing of sewing hooks with the needles as follows:

- (1) Turn balance wheel until needle bar rises $\frac{3}{32}$ inch from its lowest position. On marked needle bars, the lower mark will be just visible below the bushing in the lower end of the needle bar rock frame.
- (2) Tilt machine back to expose bed assemblies.
- (3) Loosen setscrews (6 and 17, fig. 16) in hook driving pinions (7 and 16).



- 1 Retainer, thread, machine arm
- 2 Retainer, thread, machine arm
- 3 Screw, intermediate thread guide
- 4 Guide, thread, intermediate
- 5 Screw, upper thread guide
- 6 Guide, thread, upper
- 7 Guide, thread, lower
- 8 Screw, lower thread guide
- 9 Screw, upper thread guide

Figure 14. Thread guide assemblies, exploded view.



- 1 Screws, hook gib
- 2 Gib, hook
- 3 Case, bobbin
- 4 Hook, thread
- 5 Link, bobbin case opener lever
- 6 Opener, bobbin case
- 7 Stud, bobbin case opener lever hinge
- 8 Lever, bobbin case opener
- 9 Saddle, hook
- 10 Pinion, hook driving.

Figure 15. Sewing hook assembly, exploded view.

- (4) Turn thread hooks until point of each hook is at the needle center.
- (5) Tighten screws in driving pinion, leaving just enough play between the gears to permit proper lubrication.
- (6) Return the machine to the operating position.
- (7) Install throat plate and front and back bed slides.

37. Faceplate and Position Pin

a. Removal.

- (1) Remove thumbscrew that attaches faceplate to machine face, and remove faceplate.
- (2) Pull faceplate position pin from machine face.

b. Inspection and Repair.

- (1) Inspect parts for bends, cracks, burrs, nicks, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in a above.

38. Feed Dog

a. Removal.

- (1) Remove screws that attach throat plate to machine bed, and remove throat plate.
- (2) Remove screws (5, fig. 17) and lift feed dog (6) from feed bar (8).

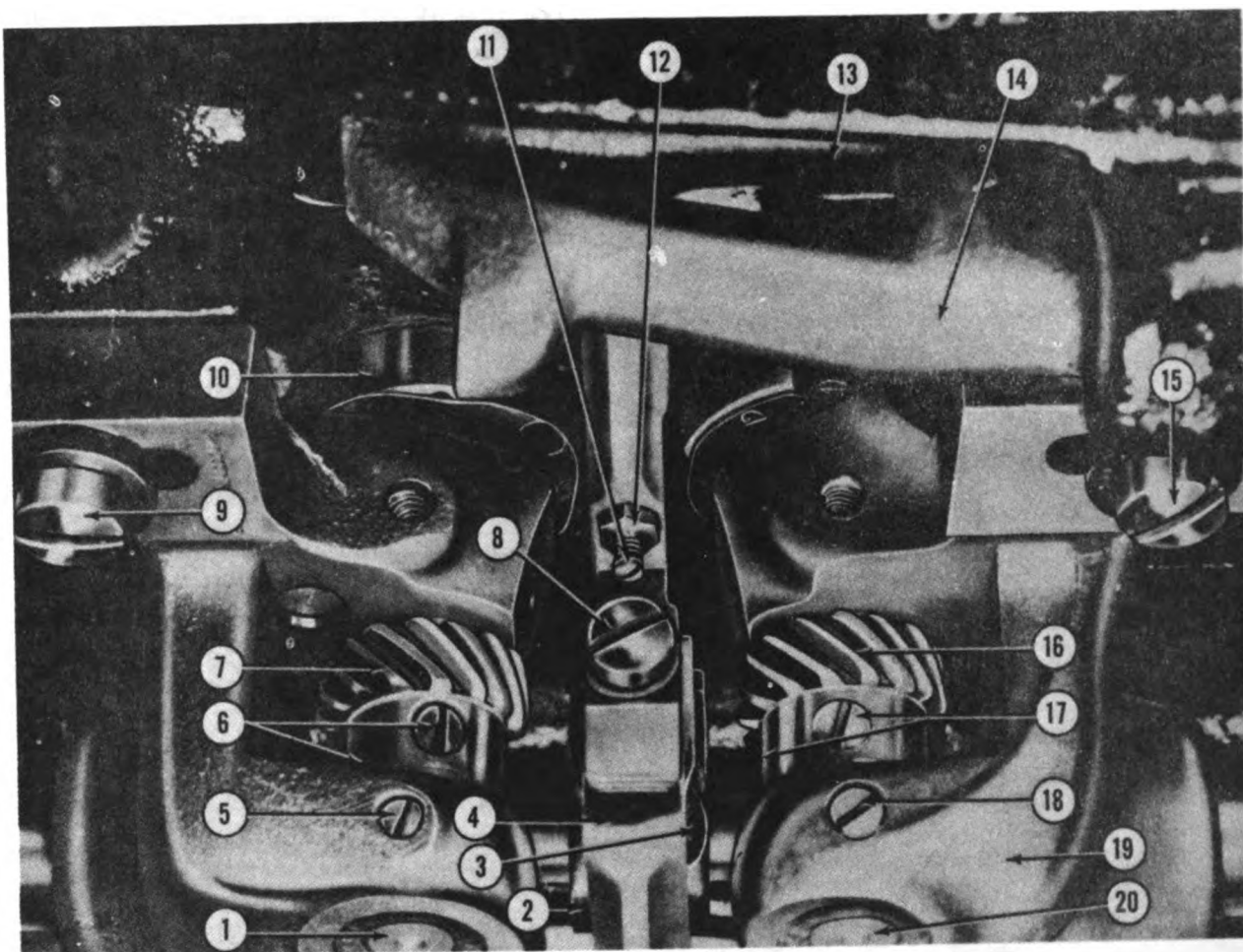
b. Cleaning, Inspection, and Repair.

- (1) Clean with SD.
- (2) Inspect feed dog for chipped or broken teeth.
- (3) Replace defective feed dog with serviceable one.

c. Assembly. Reverse the procedure in a above.

d. *Adjustments.* The feed dog rises from beneath the throat plate to help push material through the machine. Normal sewing conditions require that when the feed dog rises to full height it will show the full length of its teeth above the throat plate. The feed dog is raised or lowered as follows:

- (1) Remove the throat plate, clean out all lint and dust from between teeth of feed dog, and replace throat plate.
- (2) Turn balance wheel over until feed dog moves up to its highest position.



- 1 Shaft, thread hook
- 2 Cam, feed lifting
- 3 Pad, feed lifting cam oiling
- 4 Fork, feed lifting cam
- 5 Setscrew, hook, bushing, lower
- 6 Setscrews, hook driving pinion
- 7 Pinion, hook driving
- 8 Screw, feed lifting cam fork
- 9 Screw, saddle
- 10 Hook with gib, thread

- 11 Screw, adjusting, feed dog
- 12 Locknut, feed dog adjusting screw
- 13 Bar, feed
- 14 Shaft, feed driving rack
- 15 Screw, saddle
- 16 Pinion, hook driving
- 17 Setscrews, hook driving pinion
- 18 Setscrew, hook bushing, lower
- 19 Saddle, hook, right
- 20 Shaft, thread hook

Figure 16. Hook and feed dog assemblies under machine bed.

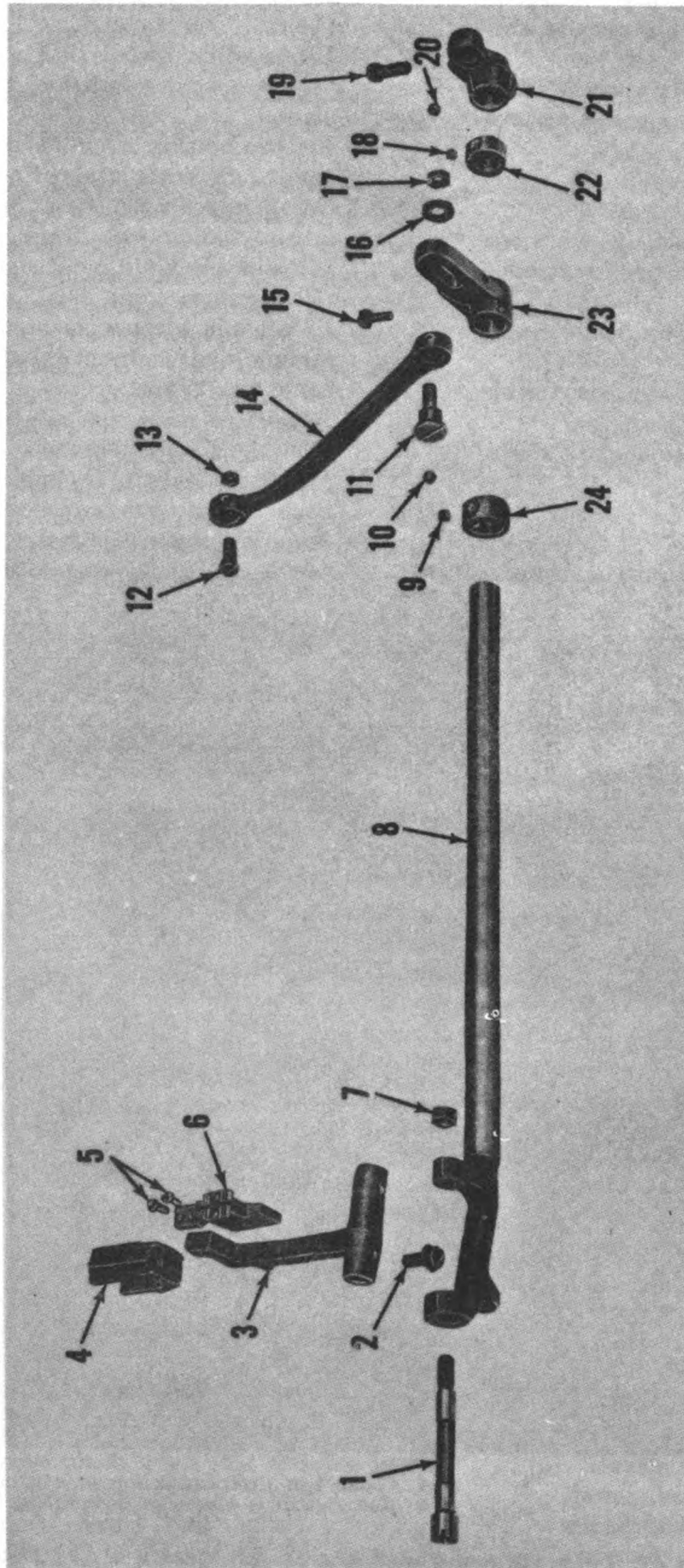
- (3) Tilt machine back to expose bed assemblies.
- (4) Loosen screw (8, fig. 16) in feed lifting cam fork (4) and raise or lower feed lifting cam fork as necessary.
- (5) Tighten feed lifting cam fork screw and return the machine to its operating position.
- (6) Various types of material may require that the feed dog be tilted as well as raised or lowered. To tilt feed dog, loosen locknut (12) and turn feed dog

adjusting screw (11) as required. After adjustment, tighten locknut securely.

39. Knee Lifter Connection Lever Assembly

a. Removal.

- (1) Remove cotter pin that attaches rod (5, fig. 18) to connection lever (1), and remove rod with collar (4) and spring (3).
- (2) Remove screw that attaches collar to rod and remove collar.
- (3) Remove hinge screw that attaches connection lever to machine arm, and remove connection lever.



- 1 Screw, feed bar hinge
- 2 Bar, feed
- 3 Fork, feed lifting cam
- 4 Screw, feed dog
- 5 Dog, feed
- 6 Nut, feed bar hinge screw
- 7 Shaft, rock feed driving

- 9 Setscrew, feed driving rock shaft stop collar
- 10 Setscrew, feed driving rock shaft stop collar
- 11 Screw, puller feed clutch driving
- 12 Nut, puller feed clutch driving screw
- 13 Connection, feed driving
- 14 Screw, puller feed clutch driving pinch
- 15 Washer, puller feed clutch driving screw nut

- 17 Nut, puller feed clutch driving screw
- 18 Setscrew, feed driving rock shaft stop collar
- 19 Screw, feed driving rock shaft pinch
- 20 Setscrew, feed driving rock shaft stop collar
- 21 Crank, feed driving rock shaft
- 22 Collar, stop feed driving rock shaft
- 23 Crank, puller feed driving
- 24 Collar, stop feed driving rock shaft

Figure 17. Feed driving assembly, exploded view.

- (4) Remove nut and washer that attach sewing lamp to screw stud, and remove sewing lamp.
- (5) Unscrew screw stud that attaches lifter lever (2) to machine arm, and remove lifter lever.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, nicks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

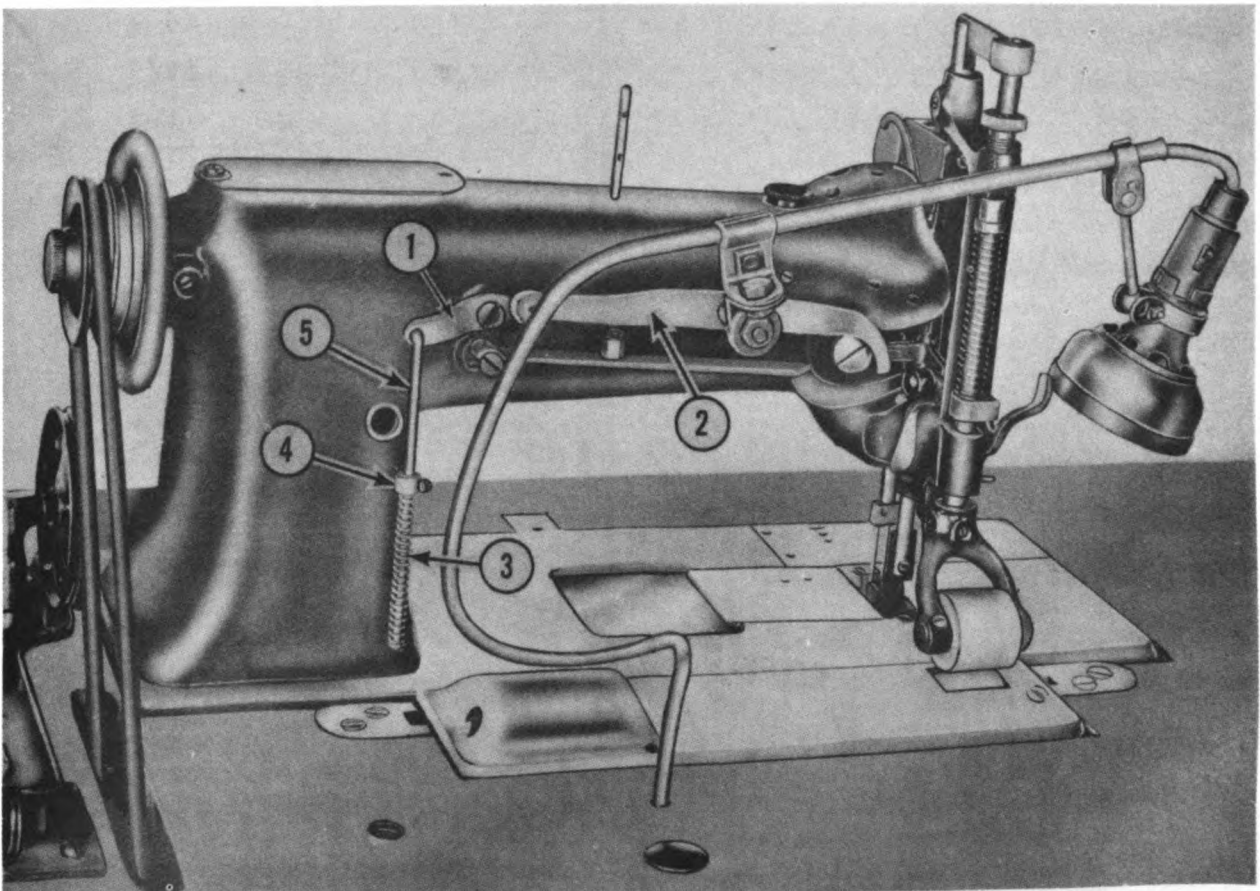
40. Needle Bar Assembly

a. Disassembly.

- (1) Remove needles (16, fig. 19) and needle

holder (15) from bottom of needle bar (14).

- (2) Remove thumbscrew that attaches face-plate to machine face, and remove face-plate.
- (3) Remove bracket screw (1) and position bracket (2) from inside of machine face.
- (4) Grasp rock frame (3) at top and pull gently, sliding rock frame, hinge stud (4), slide block (13), and connecting stud (12) from machine face.
- (5) Loosen pinch screw in needle bar connecting stud, and slide needle bar (14) from rock frame.
- (6) Remove setscrew that attaches stud (5) to machine face, and remove stud.
- (7) Pull stud (7), link (8), and lever (6), and remove them from machine face.
- (8) Remove screw that attaches oil guard to machine face, and remove oil guard.



- 1 Lever, knee lifter connection
- 2 Lever, knee lifter
- 3 Spring, knee lifter connection lever lifting rod

- 4 Collar, knee lifter connection lever lifting rod spring
- 5 Rod, knee lifter connection lever lifting

Figure 18. Two-needle sewing machine head, rear view.

b. Cleaning, Inspection and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly. Reverse procedure in *a* above.

d. Adjustment. The needle bar must be properly set so that a small loop of thread will form beneath the throat plate as the hook passes the needle. If the needle bar is too high, it will rise too soon and will pull the thread loop out of the path of the thread hook. If the needle bar is too low, it will not rise soon enough and will fail to form a loop before the sewing hook passes. Adjust the needle bar as follows:

- (1) See that the needles are inserted in the needle holder as far as they will go.
- (2) Turn the balance wheel until the needle bar reaches its lowest point.
- (3) Remove the face plate.
- (4) Loosen the needle bar connecting stud pinch screw.
- (5) If the needle bar is marked, set it so that the upper mark is just visible at the bottom of the needle bar bushing at the lower end of the needle bar rock frame. Marked needle bars are etched with two lines across the bar about 2 inches above the lower end.
- (6) If the needle bar is not marked, turn the balance wheel until the point of the sewing hooks is directly in line with the needle. Then raise or lower the needle bar until the needle eye is $\frac{1}{16}$ inch below the thread hook.
- (7) Tighten needle bar connecting stud pinch screw and install faceplate.

41. Presser Bar Assembly

a. Removal and Disassembly.

- (1) Remove screw that attaches presser foot (11, fig. 20) to presser bar (7), and remove presser foot.
- (2) Remove support screw (1) and flat spring (2) from back of machine head.
- (3) Remove upper puller feed roll assembly (par. 43).
- (4) Remove pinch screw that attaches position guide lever (10) to presser bar.
- (5) Remove screw that attaches spring bracket (4) to presser bar.

- (6) Push presser bar up through bushing (8), and remove spring bracket, lever bracket (5), spring (6), and guide lever (10).
- (7) Remove setscrew that attaches upper bushing (8) to machine head, and remove bushing.
- (8) Remove setscrew that attaches lower bushing to machine head, and remove bushing.
- (9) Remove setscrew that attaches position guide (9) to machine head, and remove guide.
- (10) Remove regulating screw (3) from machine head.
- (11) Remove screw that attaches presser bar lifter to machine head and remove lifter.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

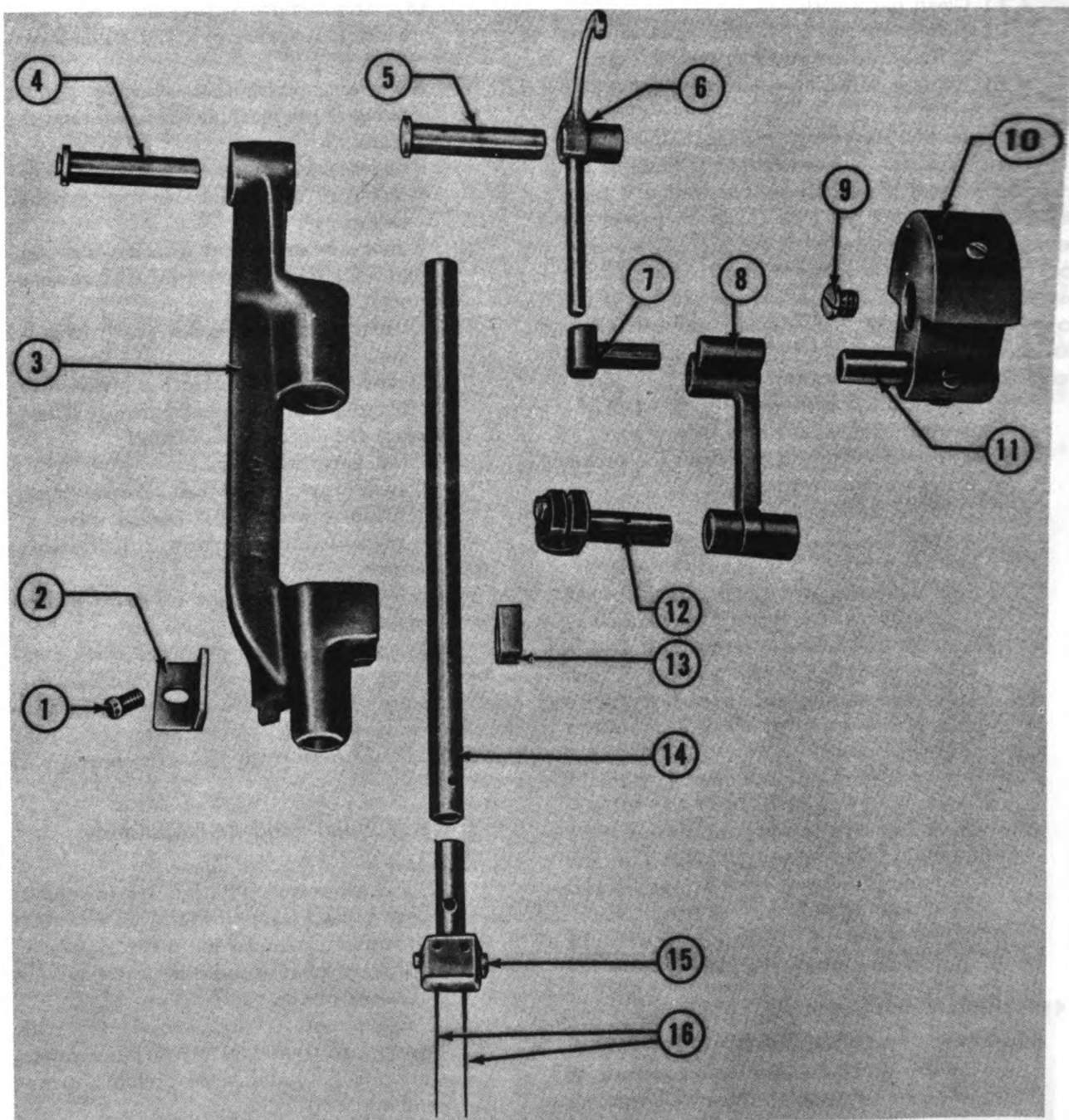
c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust presser foot to feed dog so that the material feeds past the needle without buckling the material. Turn presser bar thumbscrew downward to increase pressure on presser foot, upward to decrease pressure on presser foot.

42. Lower Puller Feed Roll Assembly

a. Removal and Disassembly.

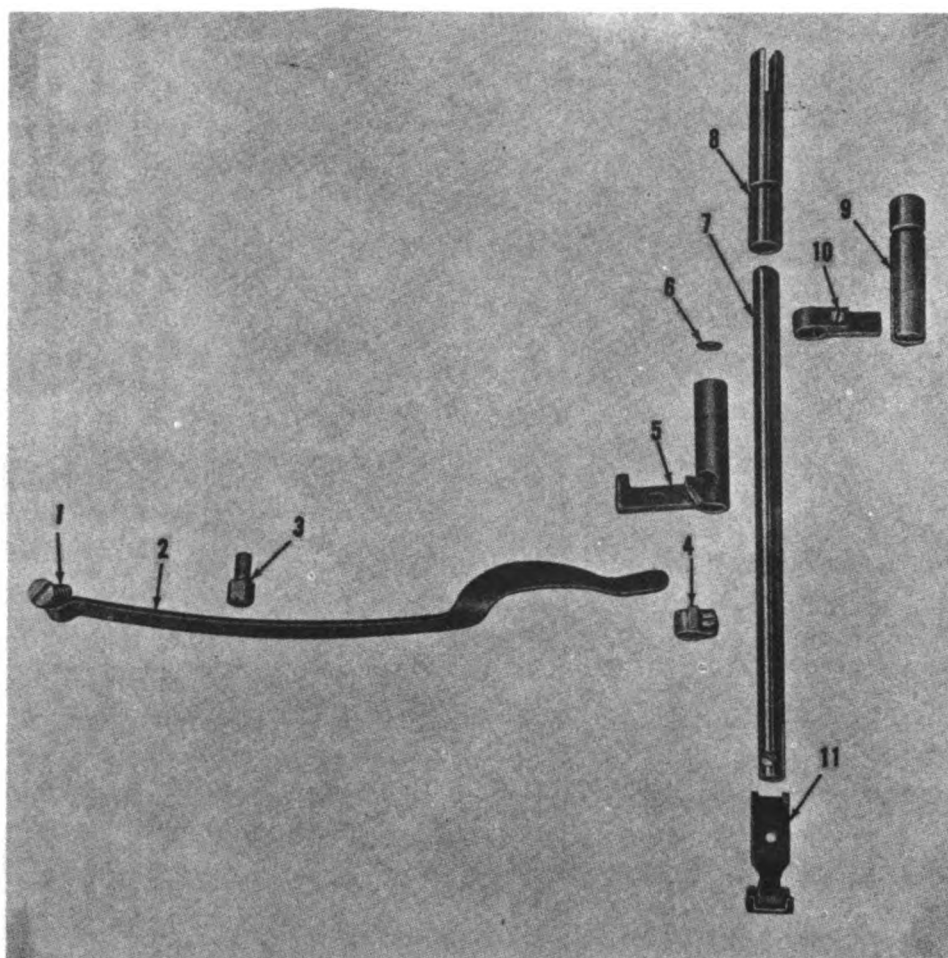
- (1) Remove screws (10, fig. 21) that attach cover plate (11) to lower shaft brackets (14 and 23), and remove cover plate.
- (2) Tilt the machine head back to expose the bed assemblies.
- (3) Remove nut (18), washer (19), and screw (20) that attach driving connection (7) to puller feed clutch driving crank.
- (4) Remove nut (8) that attaches driving connection to clutch assembly (4), pull end of puller feed clutch driving connection from puller feed clutch assembly, and remove screw (5) and bushing (6).
- (5) Remove screws (1 and 13) that attach lower shaft brackets (14 and 23) to machine bed. Lift lower puller feed roll assembly from machine bed.



- 1 Screw, needle bar rock frame position bracket
- 2 Bracket, needle bar rock frame position
- 3 Frame, needle bar rock
- 4 Stud, needle bar rock frame hinge
- 5 Stud, takeup lever hinge
- 6 Lever, takeup
- 7 Stud, takeup lever driving
- 8 Link, connecting, needle bar

- 9 Screw, needle bar crank position
- 10 Crank, needle bar
- 11 Stud, needle bar connecting link
- 12 Stud, needle bar connecting
- 13 Block, needle bar frame slide
- 14 Bar, needle
- 15 Holder, needle
- 16 Needles

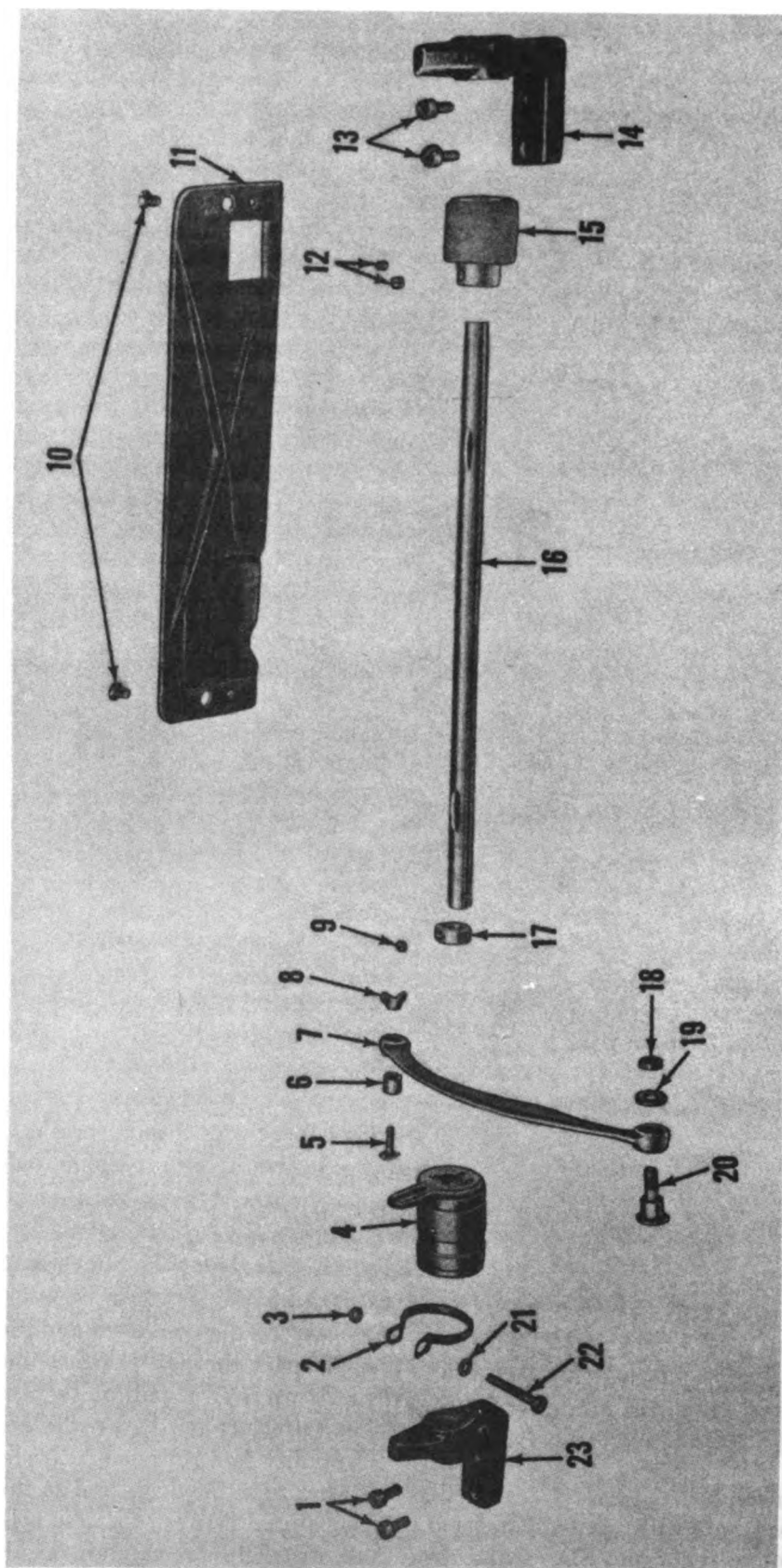
Figure 19. Needle bar and rock frame assembly, exploded view.



- | | |
|---|--------------------------------------|
| 1 Screw, presser bar spring support | 7 Bar, presser |
| 2 Spring, flat, presser bar | 8 Bushing, presser bar, upper |
| 3 Screw, presser bar spring regulating | 9 Guide, presser bar position |
| 4 Bracket, presser bar spring | 10 Lever, presser bar position guide |
| 5 Bracket, presser bar lifting releasing lever | 11 Presser foot |
| 6 Spring, presser bar lifting releasing lever bracket | |

Figure 20. Presser bar assembly, exploded view.

- (6) Slide lower shaft brackets from ends of shaft (16).
 - (7) Remove nut (3), screw (22), and washer (21) from friction spring (2) on the clutch; and remove spring from clutch.
 - (8) Remove setscrew in clutch assembly (4), and remove clutch from shaft.
 - (9) Remove setscrews (9) from collar (17), and pull collar off shaft.
 - (10) Remove screw and setscrews (12) from puller feed roll (15), and slide roll off shaft.
- b. Cleaning, Inspection, and Repair.**
- (1) Clean the puller feed roll with warm soapy water. Clean other parts with SD.
 - (2) Inspect parts for bends, breaks, burrs, stripped threads, and excessive wear.
 - (3) Replace defective parts with serviceable parts.
- c. Assembly and Installation.** Reverse procedure in *a* above.
- d. Adjustments.** As the needle bar and the feed dog pull the material through the machine, the puller feed rolls turn over to pull on the material and thus relieve pressure on the needles and the feed dog. The puller feed rolls should feed material slightly faster than the drop feed so that the tension on the material between the feed rolls and the drop feed will help to maintain a straight



- 1 Screws, puller feed roll lower shaft bracket
- 2 Spring, friction, puller feed clutch
- 3 Nut, puller feed clutch friction spring screw
- 4 Clutch assembly, puller feed
- 5 Screw, puller feed clutch driving connection hinge
- 6 Bushing, puller feed clutch driving connection
- 7 Connection, puller feed clutch driving
- 8 Nut, puller feed clutch driving connection hinge screw

- 9 Setscrew, puller feed roll lower shaft collar
- 10 Screws, puller feed cover plate
- 11 Plate, puller feed cover
- 12 Screw and setscrew, puller feed roll lower position
- 13 Screws, puller feed roll lower shaft bracket
- 14 Bracket, puller feed roll lower shaft
- 15 Roll, puller feed, lower
- 16 Shaft, puller feed roll lower

- 17 Collar, puller feed roll lower shaft
- 18 Nut, puller feed clutch driving crank hinge screw
- 19 Washer, puller feed clutch driving crank hinge screw nut
- 20 Screw, puller feed clutch driving crank hinge
- 21 Washer, puller feed clutch friction spring screw
- 22 Screw, puller feed clutch friction spring
- 23 Bracket, puller feed roll lower shaft

Figure 21. Lower puller feed roll assembly, exploded view.

seam. Change the speed of the puller feed rolls as follows:

- (1) Tilt the machine back to expose bed assemblies.
- (2) Loosen the puller feed clutch driving crank hinge screw nut (8) that holds the connection (7) to the clutch driving crank on the shaft (16).
- (3) To increase the speed of the puller feed rolls, slide the driving connection away from the shaft. To decrease the speed of the puller feed roll, slide the driving connection toward the shaft.
- (4) When the desired speed is reached, tighten the hinge screw securely, and return the machine to the operating position.

43. Upper Puller Feed Roll Assembly

a. Removal and Disassembly.

- (1) Remove setscrew that attaches bracket (3, fig. 22) to upper bar (7), and remove bracket with roll (1).
- (2) Remove setscrew that attaches stud (2) to bracket, and remove stud and roll.
- (3) Remove screws (14 and 15) from bracket support (16).
- (4) Remove screw that attaches presser foot to presser bar, and remove presser foot.
- (5) Slide bracket support down and off presser bar.
- (6) Remove setscrew that attaches bar (10) to bracket (11), and remove upper feed roll assembly from machine head.
- (7) Remove bar position lever pinch screw, and slide lever (8) off upper bar.
- (8) Remove thumbscrew (9) from machine face.
- (9) Remove setscrew from bracket (13), and remove bar (7), spring (6), washer (12), and bracket.
- (10) Remove screw (5) that attaches lifter (4) to bar bracket, and remove lifter.
- (11) Remove setscrew that attaches position guide bar to machine arm, and remove bar.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust pressure on the feed roll (1) so that both rolls will pull evenly on the material. Turn thumbscrew (9) down to increase pressure, up to decrease pressure.

44. Thread Takeup Assembly

a. Removal.

- (1) Remove needle bar assembly (para. 40).
- (2) Remove setscrew that attaches hinge stud (5, fig. 19) to takeup lever (6), and remove hinge stud.
- (3) Pull driving stud (7) from connecting link (8).
- (4) Remove takeup lever and connecting link from machine face and separate them.
- (5) Pull oil packing from takeup lever.
- (6) Remove screw that attaches takeup lever oiling felt to machine face, and remove oiling felt.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

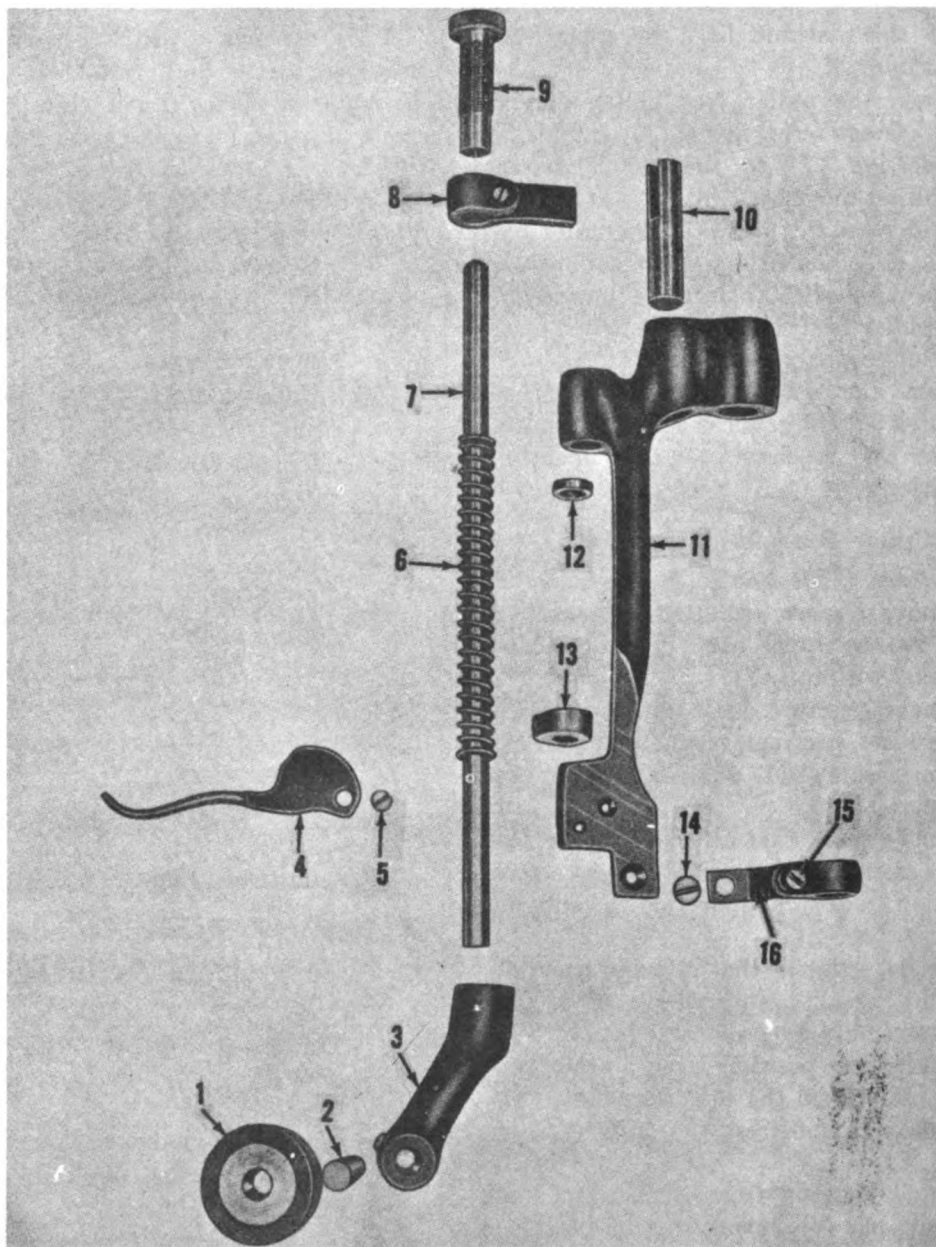
c. Installation. Reverse procedure in *a* above.

45. Universal Bobbin Winder for Singer Models 112W116, 131W113, 17W15, 111W155

a. Removal. Remove wood screws that attach base (11, fig. 23) to tabletop.

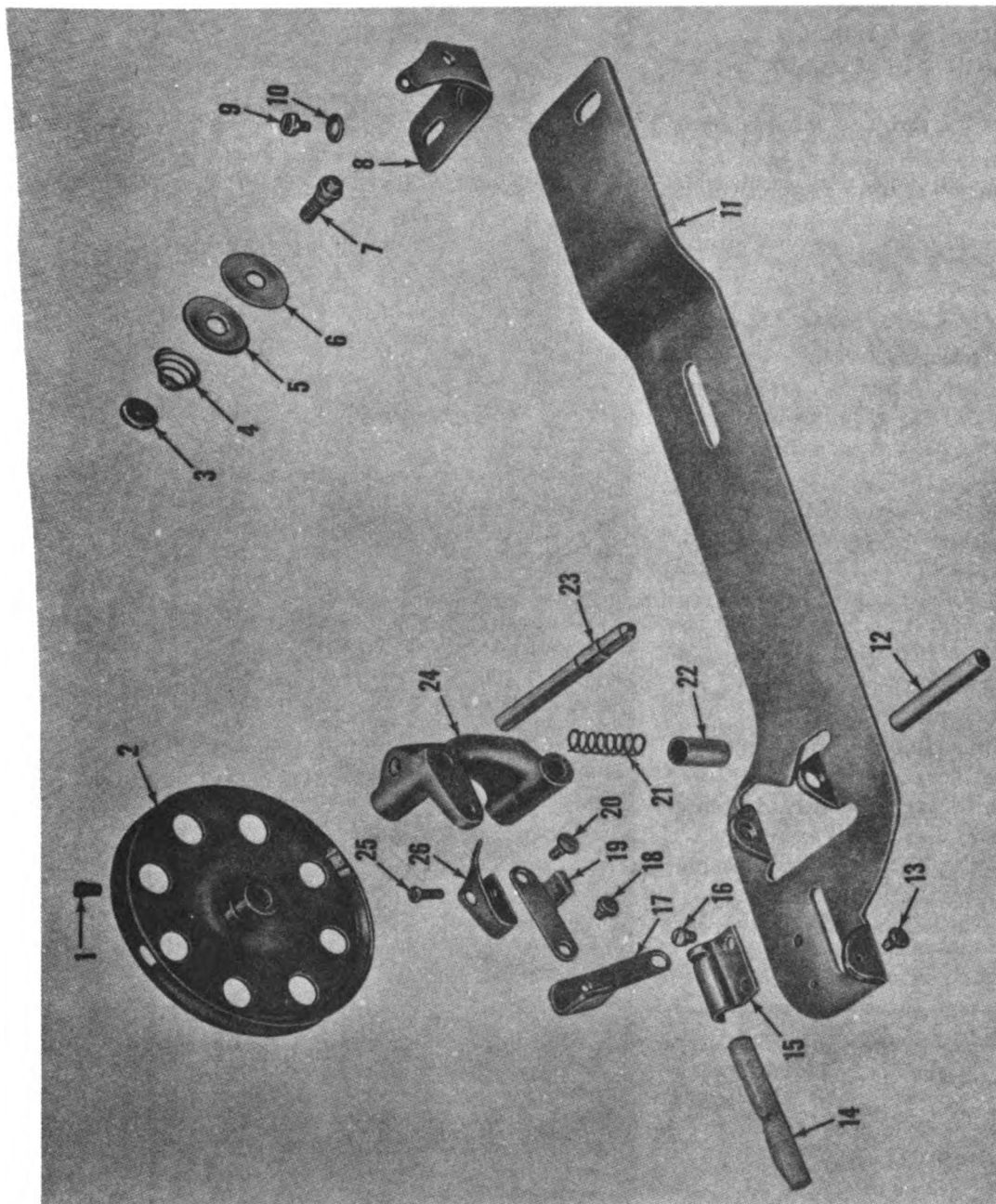
b. Disassembly.

- (1) Remove thumbnut (3) from stud (7) and remove spring (4) and thread tension disks (5 and 6).
- (2) Remove screw (9) and washer (10) and bracket (8) with stud from base (11).
- (3) Remove setscrew (1) from pulley (2) and slide pulley from spindle (23) and slide spindle from frame (24).
- (4) Remove screw (20) from frame.
- (5) Remove pin (12) from base and remove frame from base.
- (6) Remove plunger (22) and spring (21) from frame (24).
- (7) Remove screw (25) from lever (19) and remove latch (26).



- | | |
|--|--|
| 1 Roll, puller feed, upper, corkfaced | 9 Thumbcrew, puller feed roll, upper |
| 2 Stud, puller feed roll upper hinge | 10 Bar, position guide |
| 3 Bracket, puller feed roll, upper | 11 Bracket, puller feed roll upper bar |
| 4 Lifter, puller feed roll, upper bar | 12 Washer, puller feed roll bar upper bar spring |
| 5 Screw, puller feed roll bar lifter hinge | 13 Bracket, puller feed roll upper bar lifting |
| 6 Spring, puller feed roll upper bar | 14 Screw, puller feed roll upper bar bracket |
| 7 Bar, puller feed roll, upper | 15 Screw, puller feed roll upper bar bracket support pinch |
| 8 Lever, puller feed roll upper bar position | 16 Support, puller feed roll upper bar bracket |

Figure 22. Upper puller feed roll assembly, exploded view.



- 1 Setscrew, pulley
- 2 Pulley
- 3 Thumbnut, thread tension stud
- 4 Spring, helical, thread tension
- 5 Disk, thread tension
- 6 Stud, thread tension
- 7

- 8 Bracket, thread tension
- 9 Screw, thread tension bracket
- 10 Washer, thread tension bracket screw
- 11 Base
- 12 Pin, hinge, frame
- 13 Stud, bobbins winder

- 14 Brake, leather
- 15 Clamp, brake
- 16 Screw, brake clamp
- 17 Lever, thumb, stop latch
- 18 Stud, bobbins winder
- 19 Lever, trip stop latch
- 20 Screw, hinge, stop latch, trip lever

- 21 Spring, bobbins winder frame
- 22 Plunger, frame spring
- 23 Spindle, bobbins winder
- 24 Frame, bobbins winder
- 25 Screw, stop latch
- 26 Latch, stop

Figure 23. Universal bobbins winder, exploded view.

(8) Remove screw (16) from base and lift clamp (15) and leather brake (14) from base.

(9) Remove stud (18) from base and lift stop latch thumb lever (17) from base.

(10) Remove stud (18) and separate levers (17 and 19).

(11) Remove stud from bracket.

c. Cleaning, Inspection, and Repair.

(1) Clean parts with SD, except the leather brake (14).

(2) Inspect parts for stripped threads, burs, cracks, bends, and excessive wear.

(3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

46. Three Cone Thread Unwinder

a. Removal and Disassembly.

(1) Remove setscrew (9, fig. 24) from stand (10) and lift rod (8) from stand.

(2) Remove screws (11) from tabletop and remove stand.

(3) Remove screw (5) from rod (8) and pull thread guide rod (4) from spool rest rod.

(4) Remove setscrews (7 and 13) from spool rest (12) and slide the spool rests off rod (8).

(5) Remove locknut (3) from rod (4) and slide position cap (2) from rod.

(6) Remove thread guides (1).

b. Cleaning, Inspection, Repair.

(1) Clean parts with SD.

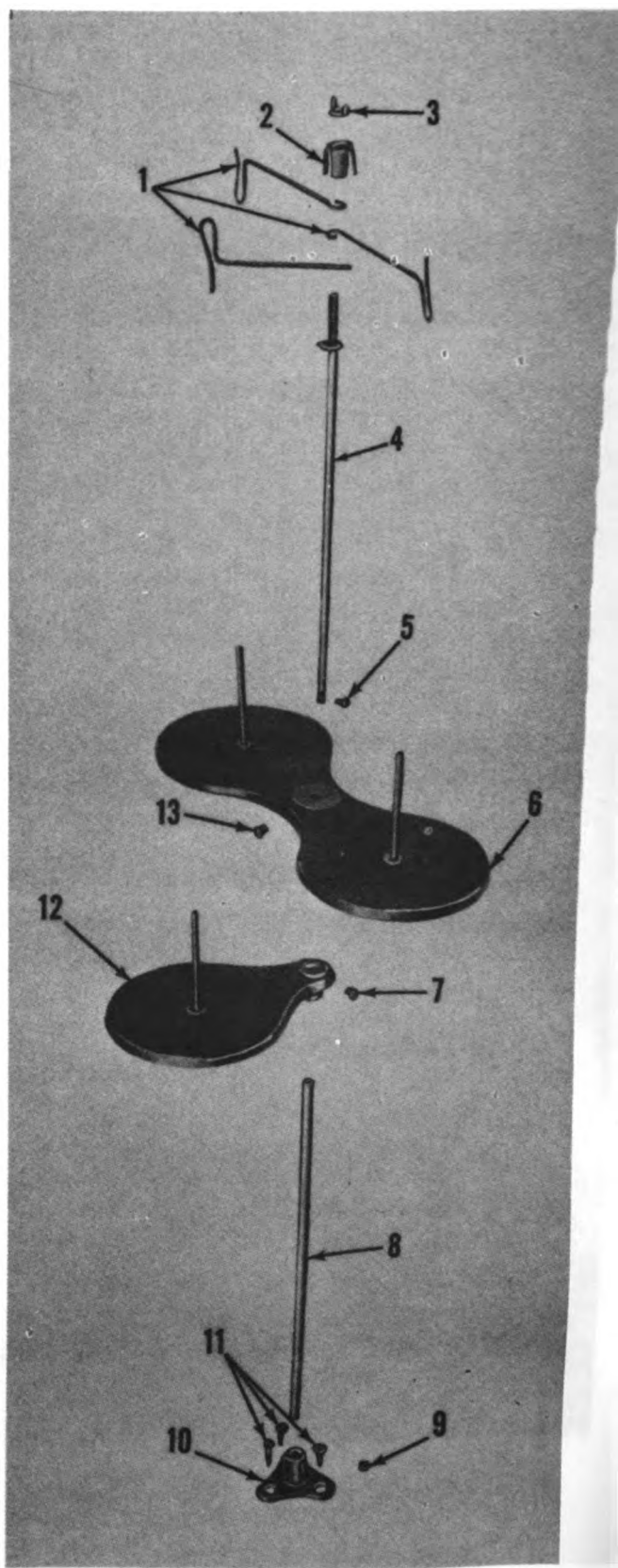
(2) Inspect parts for stripped threads, burs, cracks, bends, and excessive wear.

(3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedures in *a* and *b* above.

-
- 1 Guide, thread
 - 2 Cap, position, thread guide
 - 3 Locknut, guide
 - 4 Rod, thread guide
 - 5 Screw, rod thread guide
 - 6 Rest, spool, thread unwinder, 2 spool
 - 7 Setscrew, spool rest
 - 8 Rod, rest, spool
 - 9 Setscrew, stand, thread unwinder
 - 10 Stand, spool rest, thread unwinder
 - 11 Screws, wood
 - 12 Rest, spool, thread unwinder, 1 spool
 - 13 Setscrew, spool rest

Figure 24. Three cone thread unwinder, exploded view.



47. Knee Lifter Assembly for Singer Models 112W116, 131W113, 17W15, 55-5, 111W155

a. Removal. Remove screws (6, fig. 25) that attach knee lifter assembly to bottom of tabletop.

b. Disassembly.

- (1) Remove setscrew (5) that attaches plate (4) to arm (3) and remove plate.
- (2) Remove setscrew (7) that attaches arm (3) to bracket (1) and remove arm.
- (3) Remove setscrew (8) that attaches extension (9) to bracket and remove extension.
- (4) Remove setscrew (10) that attaches rod (11) to extension (9) and remove rod.
- (5) Remove setscrew (12) that attaches stud (2) to bracket (1) and remove stud.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for stripped threads, burs, cracks, bends, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

48. Rigid Stand and Wood Table for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Removal and Disassembly.

- (1) Slide round belt off balance wheel.
- (2) Remove machine head from table, and invert table.
- (3) Remove wood screws that attach rigid stand to wood table, and remove stand.
- (4) Remove electric motor (para. 19).
- (5) Remove switch box (para. 26).
- (6) Remove knee lifter assembly (para. 47).
- (7) Remove bolts and washers from treadle support brackets that attach support (6, fig. 26) to crossmembers (5), and remove support.

(8) Remove setscrews in slide position collars that position treadle on support, and slide treadle (7) and collars from support.

(9) Remove bolts, nuts, and washers that attach braces (4) to legs (3), and remove braces.

(10) Remove nuts, bolts, and washers that attach rail (8) to legs, and remove rail.

(11) Remove nuts, bolts, and washers that attach halves of legs together, and separate them.

(12) Remove nut, bolt, and washer that attach holder (9) to brace, and remove holder.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

49. Machine Stand Pitman Rod Assembly for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, 111W155

a. Removal and Disassembly.

(1) Remove nut on ball joint at each end of pitman rod, and remove pitman rod assembly from starting treadle and from motor clutch actuating lever.

(2) Remove setscrew that attaches upper and lower pitman rods to clamp, and slide rods from clamp.

(3) Unscrew ball joints from pitman rods.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

- 9 Extension, rock lever
10 Setscrew, rock lever rod
11 Rod, rock lever
12 Setscrew, rock lever stop stud

Figure 25. Knee after, exploded view.



- 1 Table, wood
- 2 Lifter assembly, knee
- 3 Leg, machine stand
- 4 Brace, leg, stand
- 5 Crossmember, stand

- 6 Support, treadle
- 7 Treadle
- 8 Rail, top, stand
- 9 Holder, oil can

Figure 28. Wooden table and rigid stand, assembled.

Section VIII. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), FOUR-NEEDLE SEWING MACHINE (SINGER MODEL 131W113)

50. Arm Cap

a. Removal and Disassembly.

- (1) Remove screw (4, fig. 27) and washer that attach arm cap (3) to machine arm (6), and remove arm cap.
- (2) Pull oil wicks from arm cap.

b. Cleaning; Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in a above, using new oil wicks.

51. Balance Wheel

a. Removal.

- (1) Slide round belt off balance wheel.
- (2) Unscrew spindle (1, fig. 27) from arm shaft.

- (3) Remove position screw and setscrew that attach balance wheel to arm shaft, and remove balance wheel (2).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect balance wheel for cracks, chipped places, and excessive wear.
- (3) Inspect screws for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above. Adjust feed regulating spindle (TM 10-3530-202-10).

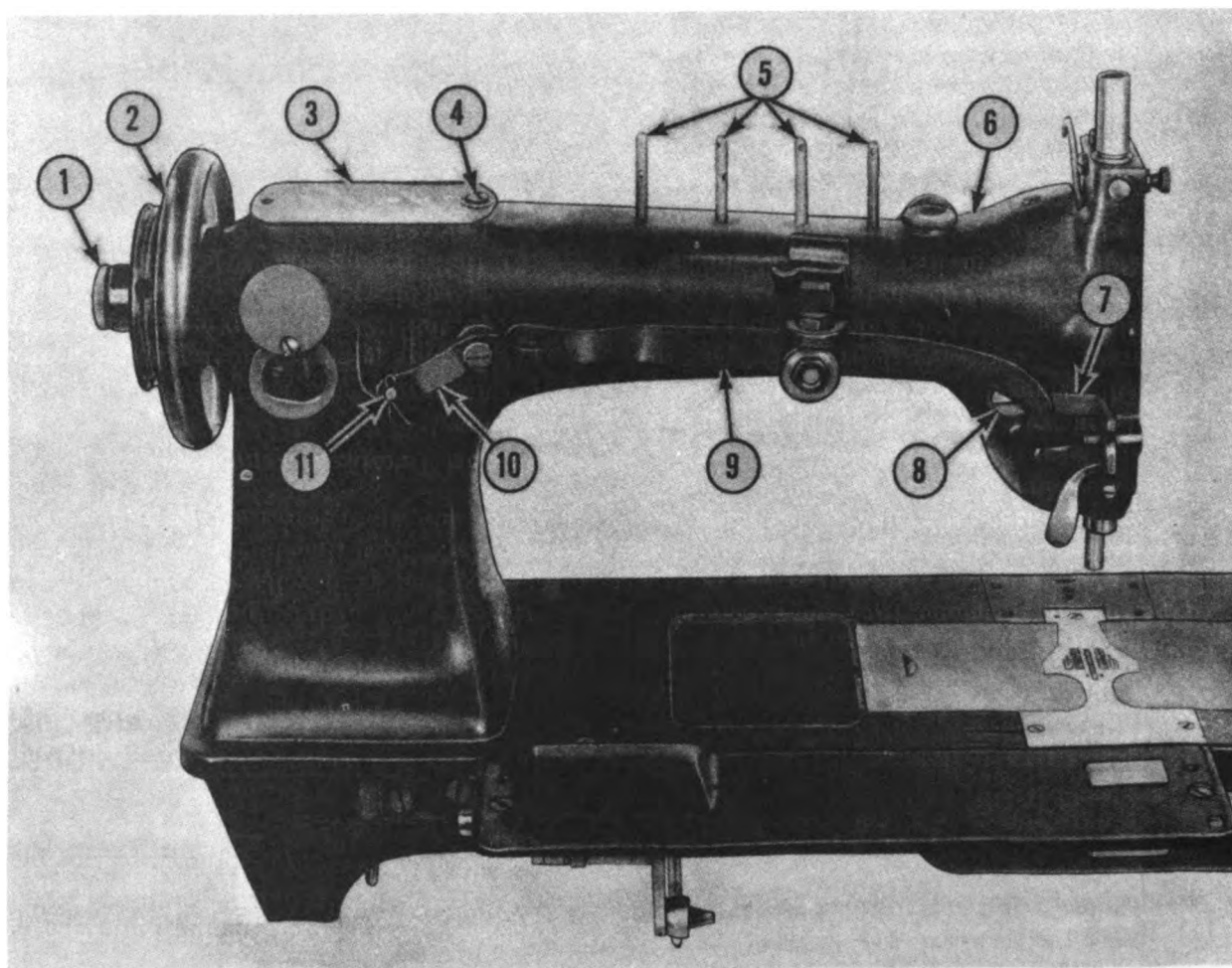
52. Presser Bar Lifter

a. Removal.

- (1) Remove thumbscrew (18, fig. 28) that attaches faceplate (19) to machine face, and remove faceplate.
- (2) Remove hinge screw that attaches lifter (9) to machine face, and remove lifter.

b. Cleaning, Inspection, and Repair.

- (1) Clean lifter with SD.
- (2) Inspect lifter for cracks, burs, and excessive wear.
- (3) Inspect screw for stripped threads.



- 1 Spindle, feed regulating
- 2 Wheel, balance
- 3 Cap, arm
- 4 Screw, machine, arm cap
- 5 Guide, thread, machine arm
- 6 Arm, machine

- 7 Bracket, presser bar lifting releasing lever
- 8 Screw, presser bar lifting releasing lever bracket
- 9 Lever, knee lifter lifting
- 10 Lever, knee lifter connection
- 11 Rod, knee lifter connection lever lifting

Figure 27. Four-needle sewing machine head, rear view, partially disassembled.

- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

53. Presser Bar Lifting Releasing Lever Bracket

a. Removal.

- (1) Remove presser bar (para. 62).
- (2) Remove lamp bracket screw stud that attaches lever (9, fig. 27) to arm (6), and remove lever.
- (3) Remove screw (8) that attaches bracket (7) to machine arm, and remove bracket from rear of machine face.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

54. Knee Lifter Lifting Lever, Knee Lifter Connection Lever, and Knee Lifter Connection Lever Lifting Rod

a. Removal.

- (1) Remove lamp bracket screw stud that attaches lever (9, fig. 27) to arm (6) and remove lever.
- (2) Remove hinge screw that attaches lever (10) to arm.
- (3) Remove cotter pin that attaches lever (10) to rod (11), and remove lever.
- (4) Lift rod out top of machine head.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

55. Thread Tension Assembly

a. Removal.

- (1) Remove thumbnut (13, fig. 29) from stud (19).
- (2) Remove screw (3) that attaches bracket (4) to machine arm, and remove thread tension assembly.
- (3) Remove spring (18) from stud, and remove rod (20) from machine arm.
- (4) Remove plungers (21) from bracket.

b. Disassembly.

- (1) Remove screw (17) that attaches stop (16) to machine arm, and remove stop.
- (2) Remove screw (14) that attaches disk to bracket (4) and remove disk. Remove remaining thread tension disk assembly.
- (3) Remove thumbnut (10) from stud, and remove spring (9), washer (8), and disks (11 and 12).
- (4) Remove setscrew that attaches stud (7) to bracket, and remove stud, sleeve (6), and spring (5). Remove remaining thread retainer assemblies.
- (5) Remove screws that attach tension bracket thread guides to bracket, and remove guides.
- (6) Remove screws (1) that attach lever (2) to bracket, and remove lever.
- (7) Remove setscrew that attaches stud (19) to machine arm, and remove stud and washer.
- (8) Remove setscrew that attaches tension bracket screw socket to machine arm, and remove socket.
- (9) Unscrew machine arm thread guides from machine arm.
- (10) Remove setscrew that attaches upper thread guide to machine arm, and remove guide.
- (11) Remove screws that attach lower thread guide to machine arm, and remove guide.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect parts for bends, burs, distortion, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedure in *a* and *b* above.

56. Feed Dog

a. Removal.

- (1) Raise needle holder to its highest position, loosen screws that attach sewing needles (23, fig. 28) to needle holder (22), and remove needles.
- (2) Remove front and back bed slides (27) from machine bed.
- (3) Remove screw that attaches presser foot (24) to presser bar, and remove presser foot.

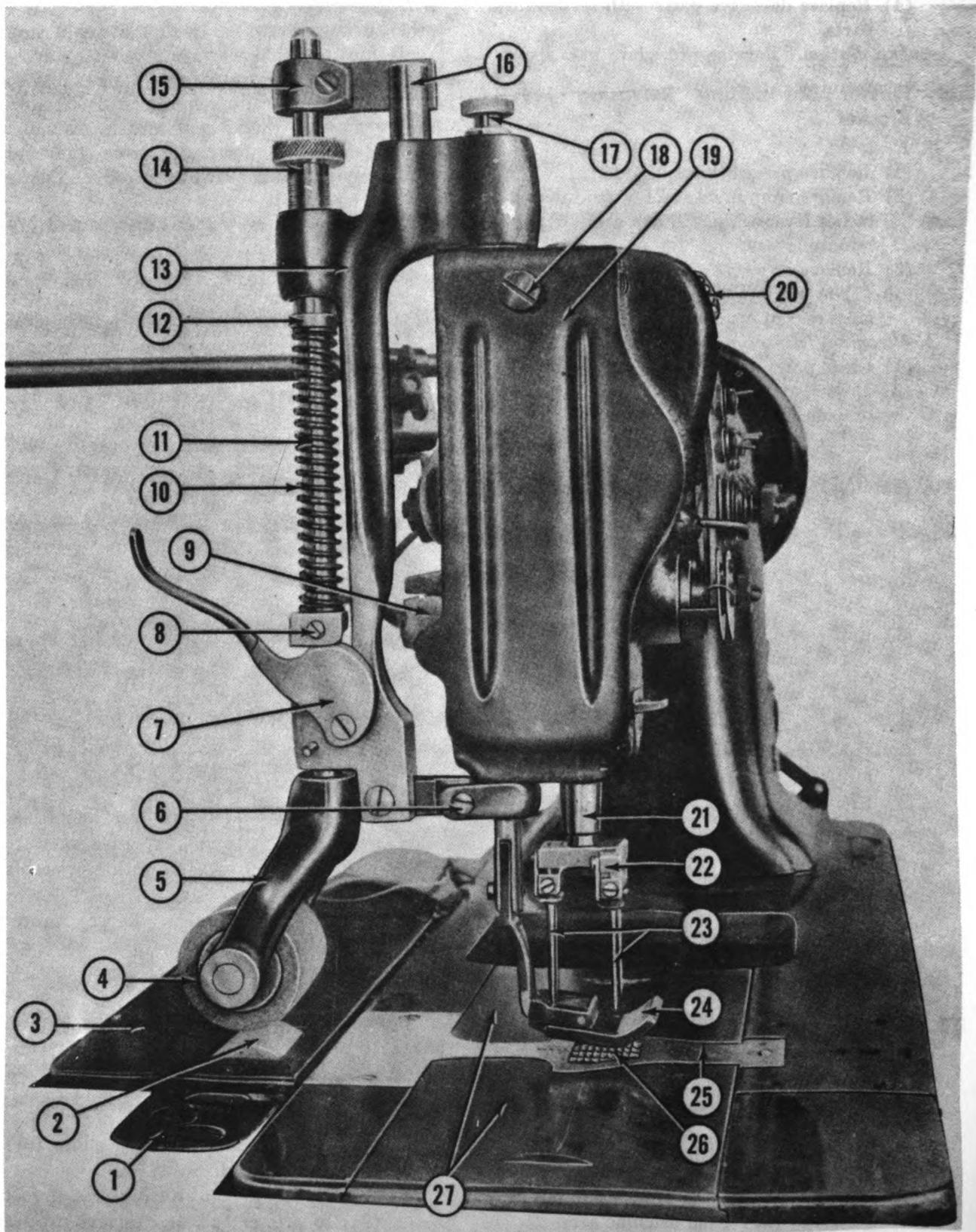
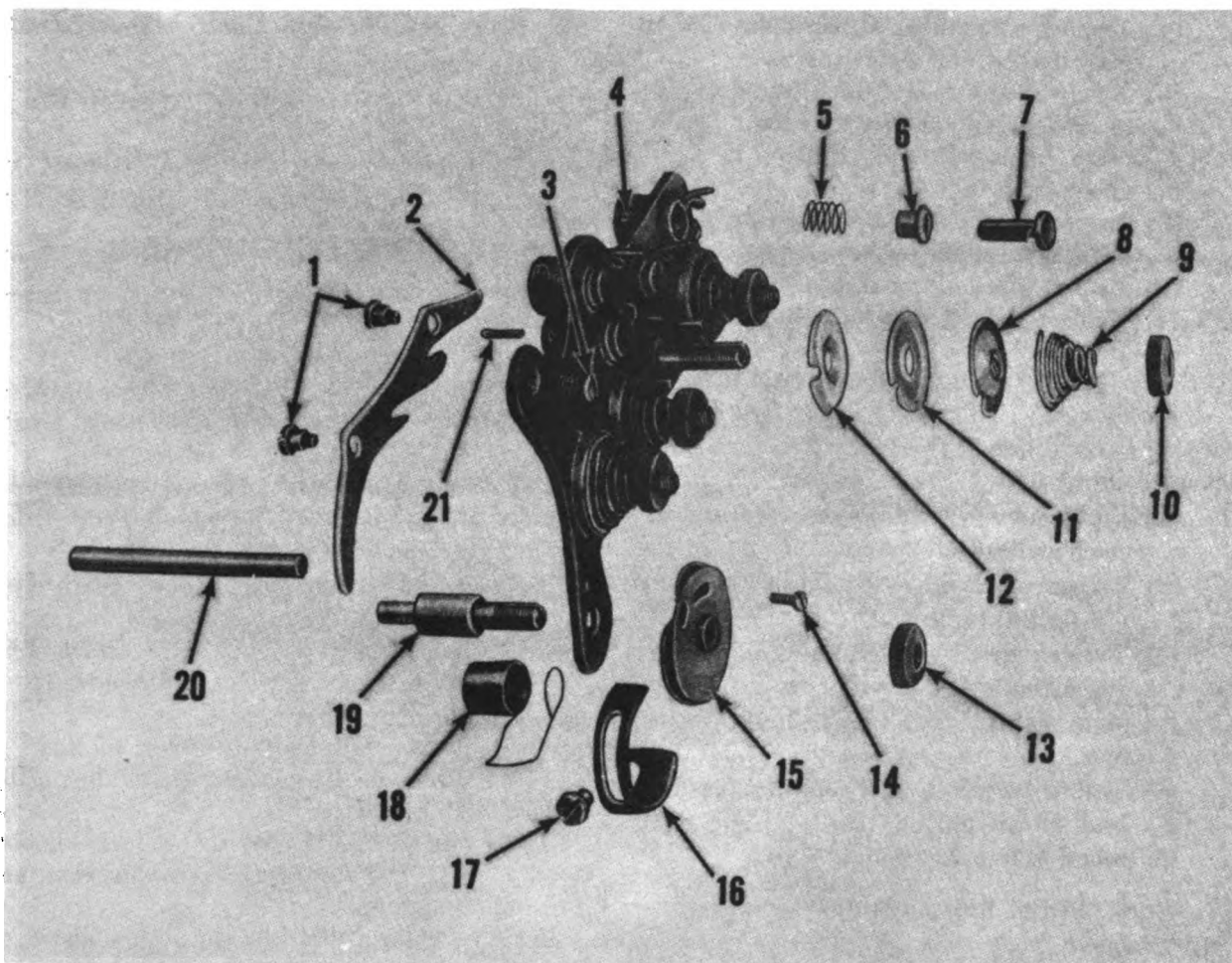


Figure 33. Model 131w113 sewing machine, face view.



- | | |
|---|--|
| 1 Screws, tension release level | 12 Disk, tension |
| 2 Lever, tension release | 13 Thumbnut, adjusting, tension thread |
| 3 Screw, tension bracket | 14 Screw, thread controller disk |
| 4 Bracket, tension | 15 Disk, thread controller |
| 5 Spring, thread retainer | 16 Stop, thread controller spring |
| 6 Sleeve, thread retainer | 17 Screw, thread controller spring stop |
| 7 Stud, thread retainer | 18 Spring, helical, torsion, thread controller |
| 8 Washer, tension release | 19 Stud, thread controller |
| 9 Spring, helical, compression, tension | 20 Rod, tension release lever |
| 10 Thumbnut, adjusting, tension thread | 21 Plunger, thread tension release |
| 11 Disk, tension | |

Figure 29. Thread tension assembly, exploded view.

- | | |
|---|--|
| 1 Bracket, puller feed roll, lower shaft, right | 15 Lever, puller feed roll upper bar position |
| 2 Roll, cork, puller feed, lower | 16 Guide, position, puller feed roll upper bar |
| 3 Plate, puller feed cover | 17 Thumbscrew, presser bar pressure regulating |
| 4 Roll, cork faced, puller feed, upper | 18 Thumbscrew, faceplate |
| 5 Bracket, puller feed roll, upper | 19 Faceplate |
| 6 Support, puller feed roll upper bar bracket | 20 Lever, takeup |
| 7 Lifter, puller feed roll, upper bar | 21 Bushing, needle bar, lower |
| 8 Bracket, puller feed roll upper bar lifting | 22 Holder, needle gage |
| 9 Lifter, presser bar | 23 Needles |
| 10 Spring, puller feed roll upper bar | 24 Presser foot, hinged |
| 11 Bar, puller feed roll, upper | 25 Plate, throat |
| 12 Washer, puller feed bar upper bar spring | 26 Dog, feed |
| 13 Bracket, puller feed roll upper bar | 27 Slides, bed, back and front |
| 14 Thumbscrew, puller feed roll upper bar | |

Figure 28. Four-needle sewing machine head end view.

- (4) Remove screws that attach plate (25) to machine bed, and remove plate.
- (5) Remove screws that attach feed dog (26) to feed bar, and remove feed dog.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect feed dog for chipped or broken teeth, cracks, and excessive wear.
- (3) Inspect screws for stripped threads.
- (4) Replace defective parts with serviceable ones.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. To raise or lower feed dog according to the different thickness of material, follow procedure below.

- (1) Slide round belt off balance wheel and tilt machine head backward.
- (2) Loosen pinch screw that attaches crank (13, fig. 30) to shaft (2).
- (3) Turn balance wheel to raise or lower feed dog so that material will move over throat plate without applying strain on presser foot.
- (4) Tighten screw securely, return machine head to an upright position, and slide round belt over balance wheel.

57. Hook Socket Spiral Gears

a. Removal.

- (1) Tilt machine head to the rear.
- (2) Remove screws that attach hook driving gear guard to underside of machine bed, and remove guard.
- (3) Remove setscrews that attach gears (19, fig. 30) to hook driving shaft (14), and remove gears.
- (4) Remove setscrews that attach gears (16) to hook driving shafts, and remove gears.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect gears for chipped or broken teeth, burs, stripped threads, and excessive wear.
- (3) Inspect setscrews for stripped threads and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Timing. Time sewing hooks with needles (TM 10-3530-202-10).

58. Hook and Bobbin Case Assemblies

a. Removal and Disassembly.

- (1) Pull bed slides (27, fig. 28) from machine bed.
- (2) Remove screws that attach throat plate (25) to machine bed, and remove throat plate.
- (3) Remove screws (7, fig. 31) that attach hook gib (8) to hook (5), and remove gib.
- (4) Lift out bobbin case (3, fig. 32).
- (5) Remove screw (7) that attaches hook (8) to hook shaft and remove hook, washer (9) and lever (10).
- (6) Remove screw (11, fig. 31) that attaches bobbin case lever fulcrum to hook saddle, and remove fulcrum.
- (7) Remove hook socket spiral gears (par. 57).
- (8) Remove screws (12) that attach hook saddle to machine bed, and remove saddle and hook shaft.
- (9) Remove screws that attach retainer (5, fig. 32) to case, and remove retainer oiling felt, and latch (4).
- (10) Remove screw (6) that attaches bobbin case tension spring to bobbin case, and remove spring.
- (11) Perform (1) through (10) above, to remove remaining hook and bobbin case assemblies.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect parts for bends, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable ones.

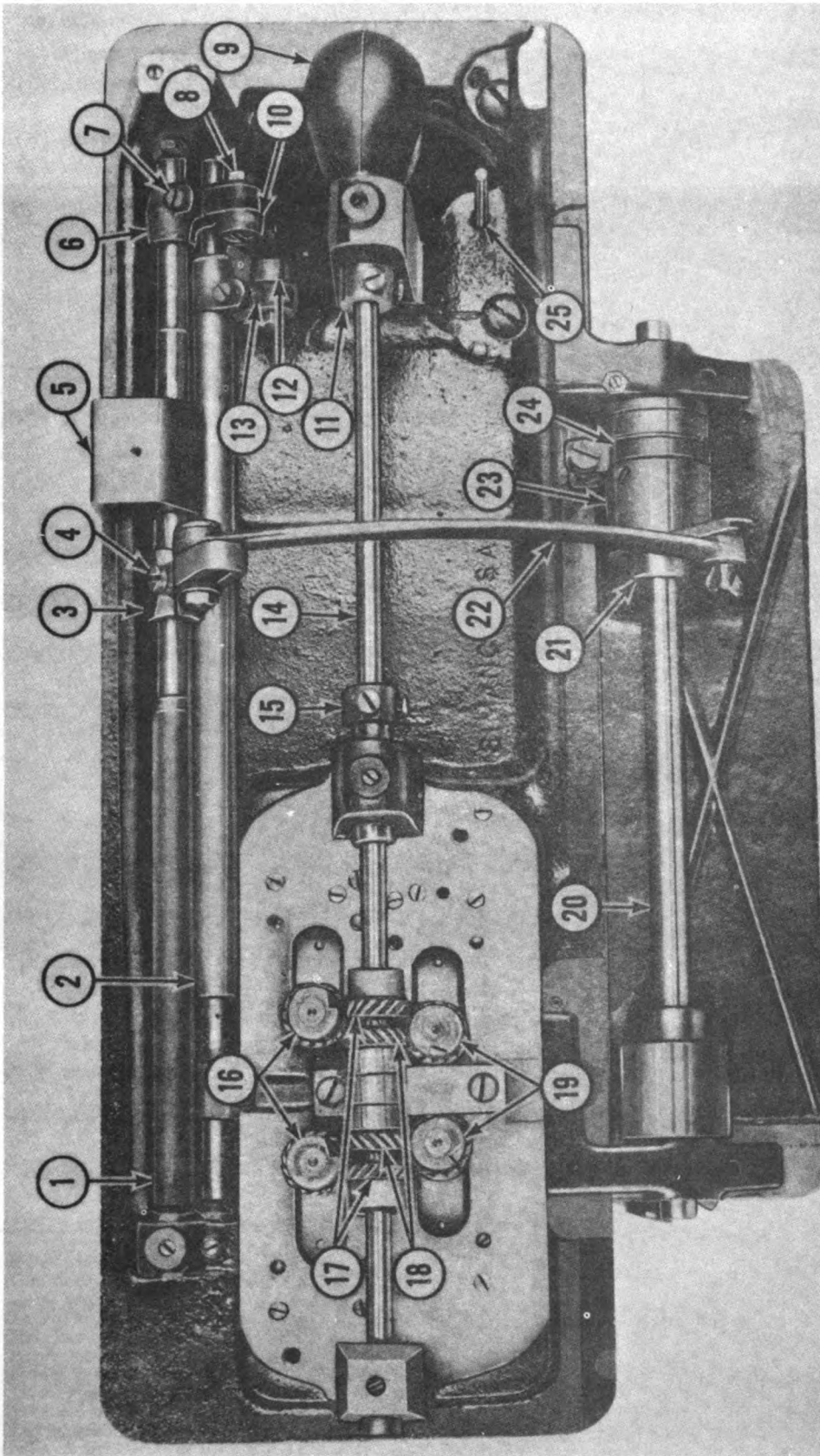
c. Installation. Reverse procedure in *a* above.

d. Adjustment. Time hook to needle and adjust sewing hooks (TM 10-3530-202-10).

59. Needle Holder Thread Guides

a. Removal.

- (1) Raise needle holder to its highest position by turning balance wheel.
- (2) Loosen screws that attach needles (23, fig. 28) to needle holder (22), and remove needles.
- (3) Remove screws that attach thread guides to needle holder, and remove guides.

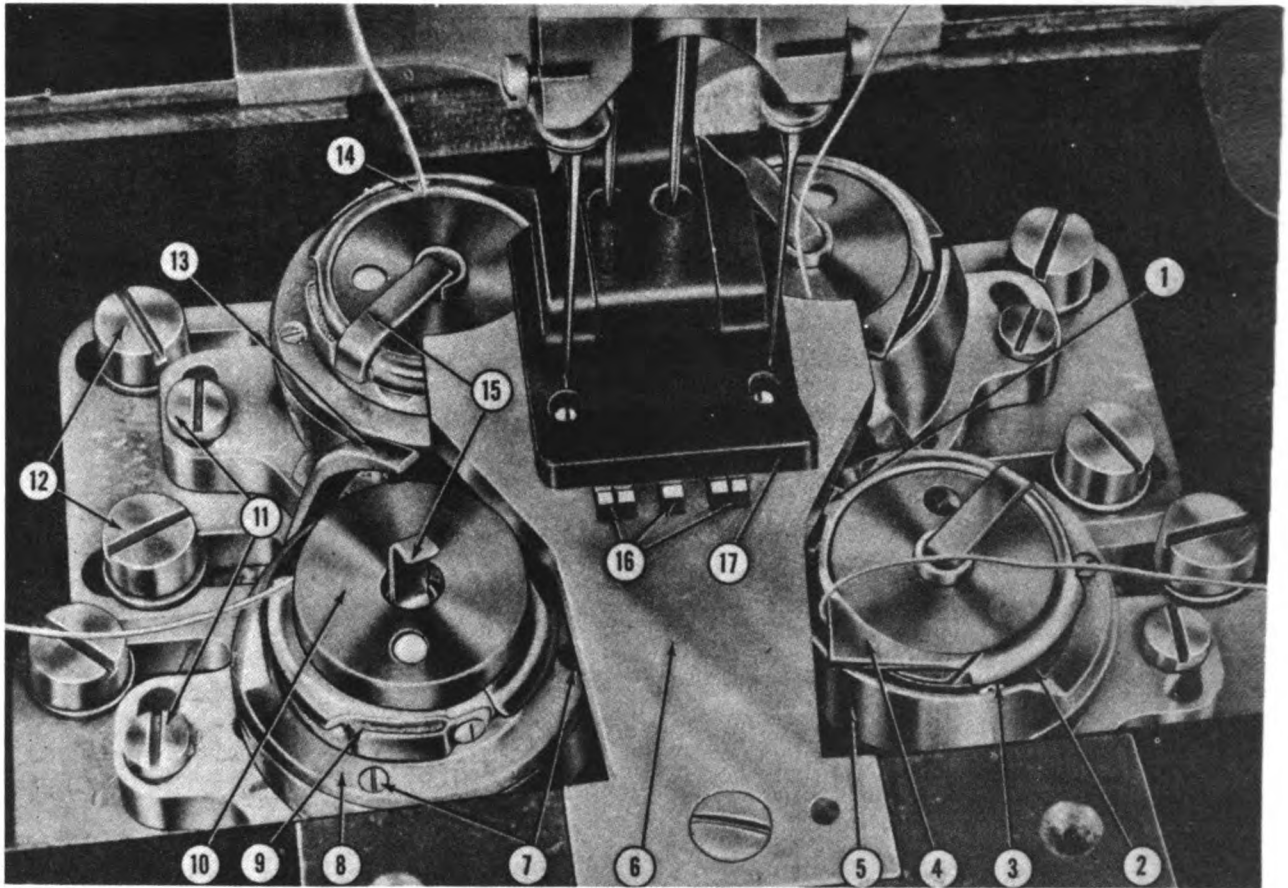


- 1 Shaft, rock, feed driving
- 2 Shaft, rock, feed lifting
- 3 Crank, puller feed clutch driving
- 4 Screw, puller feed clutch driving rock shaft
- 5 Bearing, feed driving rock shaft
- 6 Crank, feed driving rock shaft
- 7 Screw, feed driving rock shaft crank pinch
- 8 Nut, feed driving connection hinge screw
- 9 Guard assembly, hook driving shaft bevel gear

- 10 Connection, feed driving
- 11 Collar, hook driving shaft
- 12 Connection, feed lifting
- 13 Crank, feed lifting rock shaft
- 14 Shaft, hook driving
- 15 Collar, hook driving shaft
- 16 Gears, hook socket spiral, left and right, front
- 17 Gears, hook driving, left and right, front

- 18 Gears, hook driving, left and right, rear
- 19 Gears, hook socket spiral, left and right, rear
- 20 Shaft, puller feed roll, lower
- 21 Collar, puller feed roll, lower shaft
- 22 Connection, puller feed clutch driving
- 23 Case, clutch, puller feed
- 24 Spring, friction, puller feed clutch
- 25 Rod, knee lifter connection lever lifting

Figure 30. Four-needle sewing machine, bed assemblies.



- | | |
|--|-------------------------------------|
| 1 Lug, bobbin case throat plate | 10 Bobbin |
| 2 Spring, bobbin case tension | 11 Screw, bobbin case lever fulcrum |
| 3 Screw, bobbin case tension spring regulating | 12 Screws, hook saddle |
| 4 Projection, bobbin case | 13 Lever, bobbin case |
| 5 Hook | 14 Slot, thread |
| 6 Plate, throat | 15 Latch, bobbin case |
| 7 Screws, hook gib | 16 Dog, feed |
| 8 Gib, hook | 17 Presser foot, hinged |
| 9 Retainer, bobbin case oiling felt | |

Figure 31. Bobbin cases installed and threaded.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect guides for cracks, nicks, burs, and excessive wear.
- (3) Inspect screws for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

60. Takeup Lever, Driving Stud, and Needle Bar Connecting Link

a. Removal.

- (1) Remove thumbscrew (18, fig. 28) that attaches faceplate (19) to machine face, and remove faceplate.
- (2) Remove presser bar (para. 62).
- (3) Remove needle bar and upper needle bar bushing (para. 62).
- (4) Loosen setscrew that attaches stud (1, fig. 33) to machine arm, and remove stud.
- (5) Turn balance wheel until link (3, fig. 34) is in its lowest position and remove lever (1) and stud from machine face.
- (6) Remove link (3) from machine face.

b. Installation. Reverse procedure in *a* above.

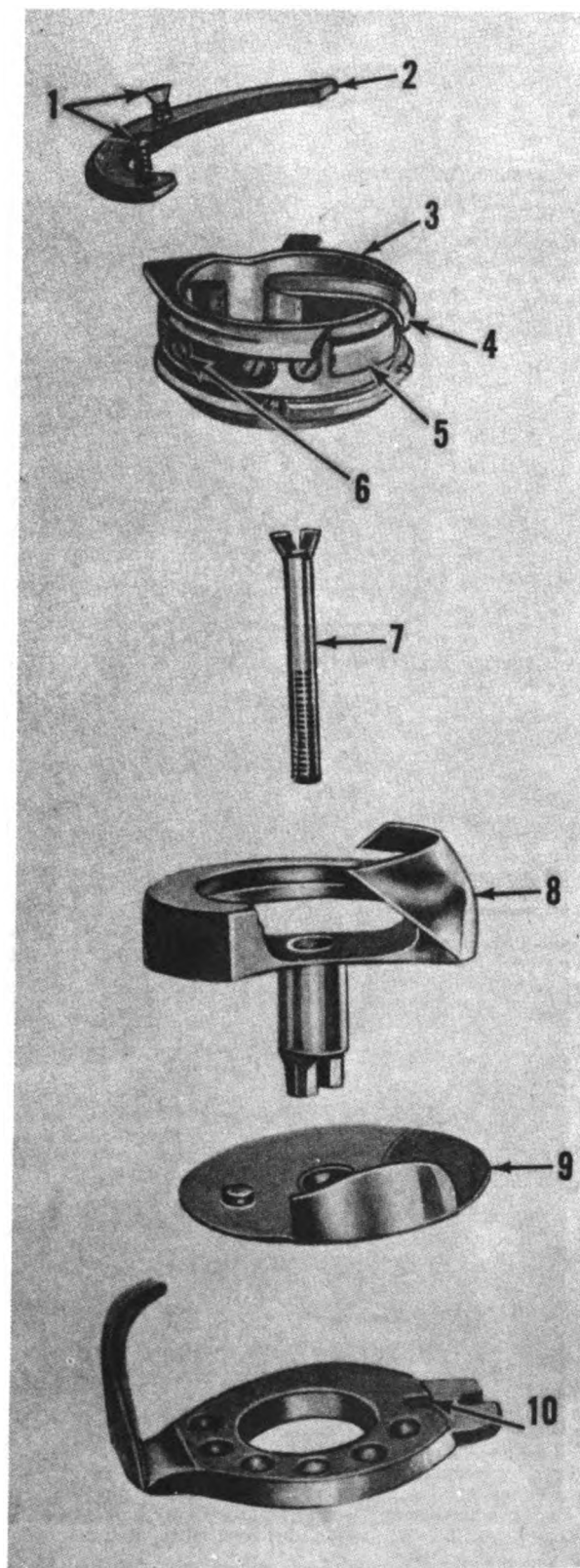
61. Needle Bar, Bushings, and Connecting Stud

a. Removal.

- (1) Remove thumbscrew (18, fig. 28) that attaches faceplate (19) to machine face, and remove faceplate.
- (2) Remove screw that attaches needle holder (22) to needle bar, raise needle holder to its highest position by turning balance wheel and remove needle holder from needle bar.
- (3) Loosen setscrew that attaches stud (9, fig. 33) to bar (10) and slide needle bar out top of machine. Remove stud and oil packing.

-
- 1 Screw, hook gib
 - 2 Gib, hook
 - 3 Case, bobbin
 - 4 Latch, bobbin case
 - 5 Retainer, bobbin case oiling felt
 - 6 Screw, bobbin case tension spring
 - 7 Screw, hook socket
 - 8 Hook, sewing balanced
 - 9 Washer, hook
 - 10 Lever, bobbin case opener

Figure 32. Hook assembly, exploded view.



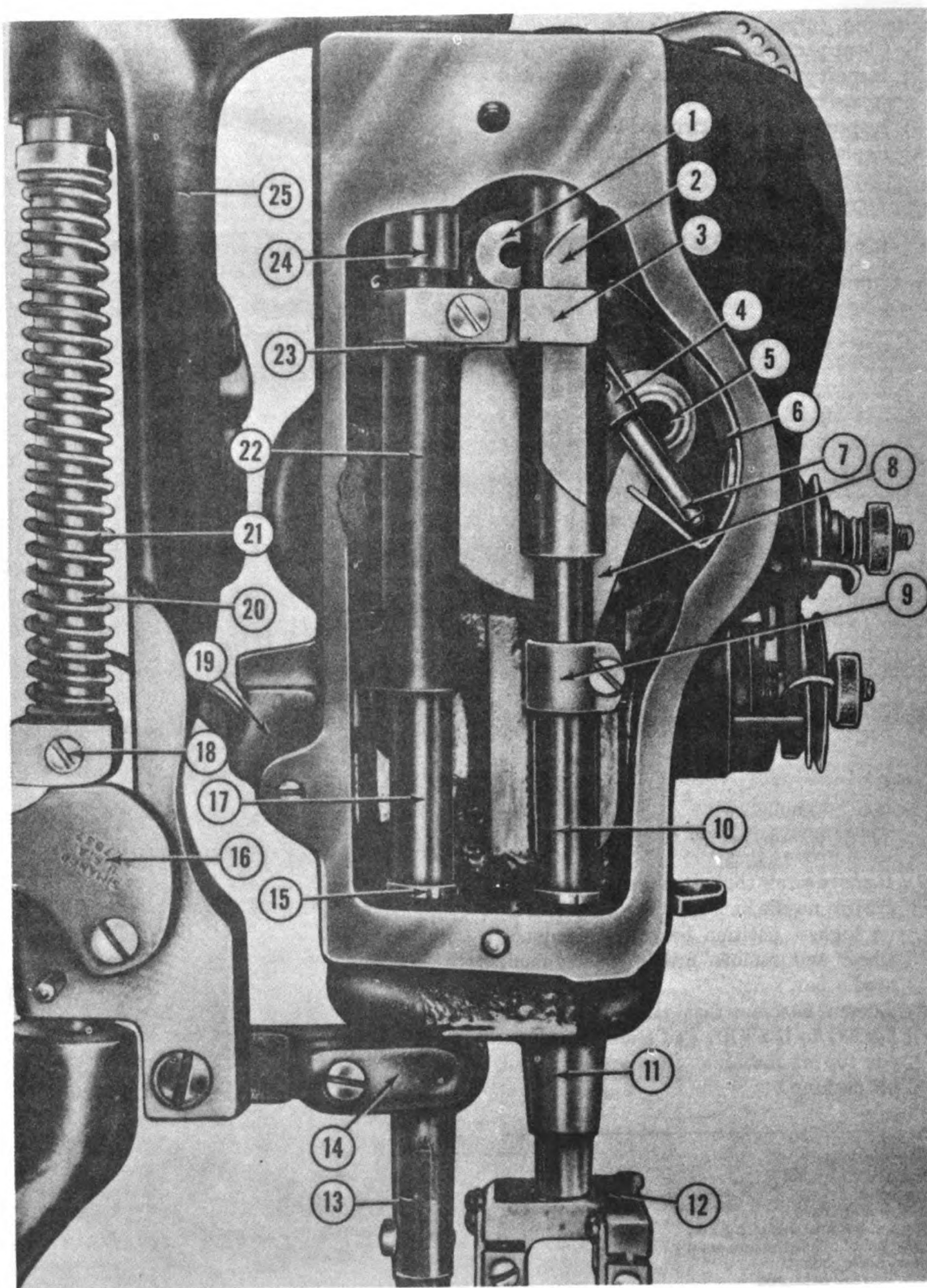
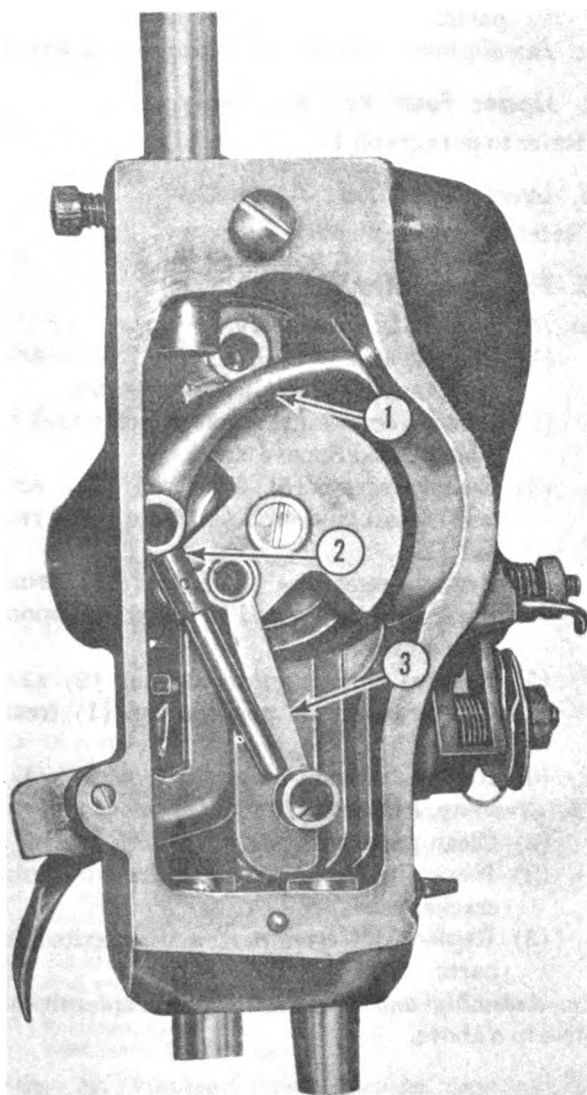


Figure 46. Face assemblies.



- 1 Lever, takeup
- 2 Stud, takeup lever driving
- 3 Link, needle bar connecting

Figure 34. Four-needle sewing machine, face view partially disassembled.

- (4) Loosen setscrew that attaches bushing (2) to machine face and slide bushing out top of machine.
- (5) Loosen setscrew that attaches bushing (11) to machine face and slide bushing out bottom of machine.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, chipped places, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

62. Presser Bar and Bushings

a. Removal.

- (1) Remove thumbscrew (18, fig. 28) that attaches faceplate (19) to machine face, and remove faceplate.
- (2) Remove thumbscrew (17), rod (3, fig. 35), and spring (2) from bushing (4).
- (3) Remove screw that attaches presser foot (24, fig. 28) to presser bar (6, fig. 35), and remove presser foot.
- (4) Remove setscrew that attaches guide (16, fig. 28) to presser bar.
- (5) Slide presser bar out top of machine.
- (6) Loosen setscrew that attaches lower bushing (15, fig. 33) to machine, and remove bushing.
- (7) Loosen thumbscrew that attaches upper bushing (24) to machine, and unscrew bushing. Remove fibre packing from bushing.
- (8) Remove position guide (7, fig. 35) from machine face.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for chipped places, burs, stripped threads, and excessive wear.

- 1 Stud, hinge, takeup lever
- 2 Bushing, needle bar, upper
- 3 Guide presser bar position
- 4 Stud, takeup lever driving
- 5 Stud, needle bar connecting link
- 6 Guard, oil, needle bar connecting link
- 7 Lever, takeup
- 8 Link, needle bar connecting
- 9 Stud, needle bar connecting link
- 10 Bar, needle
- 11 Bushing, needle bar, lower
- 12 Holder, needle gage
- 13 Presser foot, hinged

- 14 Support, puller feed roll upper bar bracket
- 15 Bushing, presser bar, lower
- 16 Lifter, puller feed roll, upper bar
- 17 Bar, presser
- 18 Bracket, puller feed roll upper bar lifting
- 19 Lifter, presser bar
- 20 Bar, puller feed roll, upper
- 21 Spring, puller feed roll upper bar
- 22 Bracket, presser bar lifting releasing lever
- 23 Spring, presser bar lifting releasing lever bracket
- 24 Bushing, presser bar, upper
- 25 Bracket, puller feed roll, upper

Figure 33. Face assemblies, installed.

(8) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

63. Upper Feed Roll Assembly

Refer to paragraph 43.

64. Lower Feed Roll Assembly

Refer to paragraph 42.

65. Five-Spool Thread Unwinder

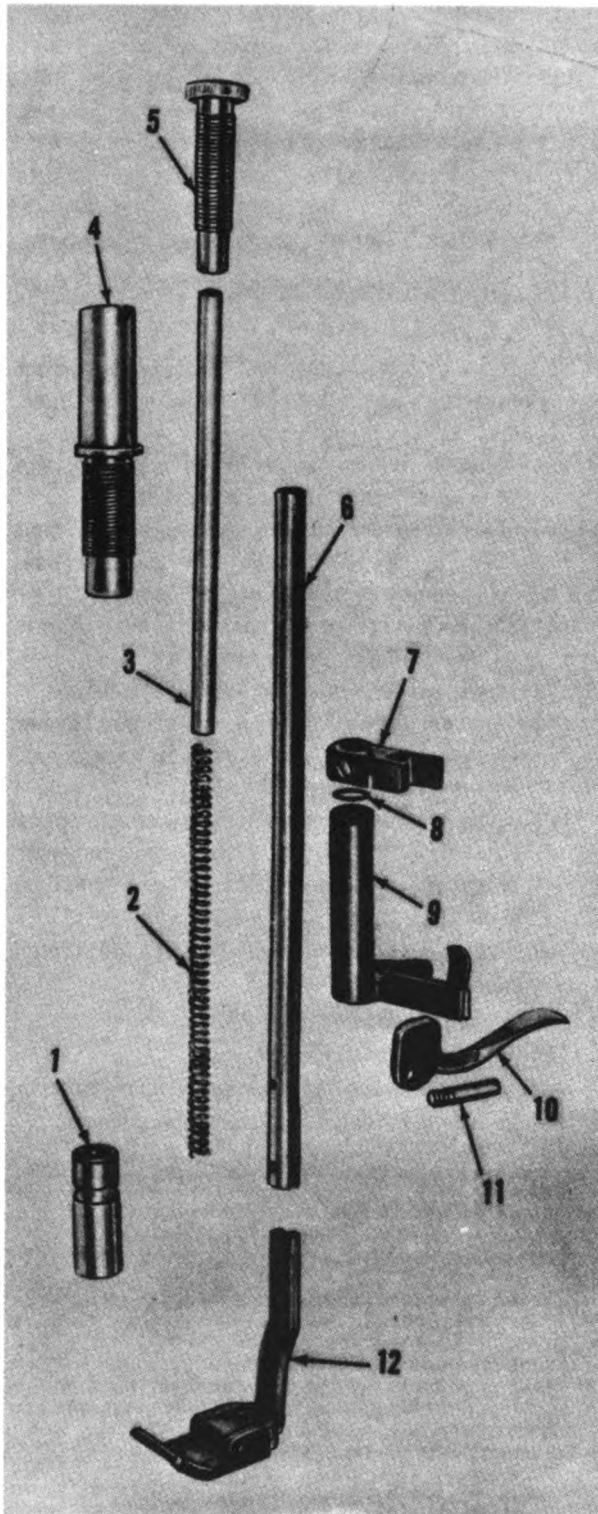
a. Removal and Disassembly.

- (1) Remove setscrew (9, fig. 36) from stand (10) and lift rod (12) from stand.
- (2) Remove screws (11) that attach stand to tabletop and remove stand.
- (3) Remove screw (5) from rod (12) and pull thread guide rod (4) from spool rest rod (12).
- (4) Remove setscrews (6, 8, and 14) from spool rests (7, 13, and 15), and pull spool rests off rod.
- (5) Remove thread guide locknut (2) and slip thread guide position cap (1) from rod (4).
- (6) Remove thread guides (3) from rod (4).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for stripped threads, burrs, cracks, bends, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedures in *a* above.

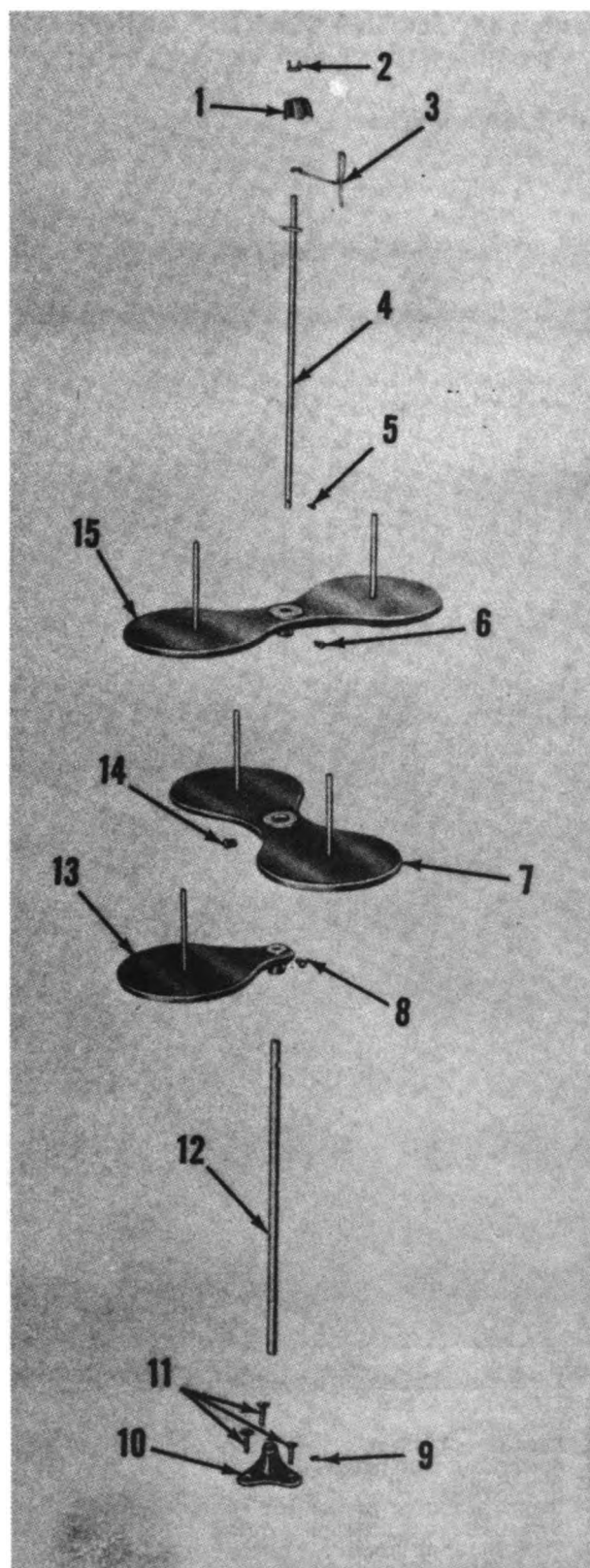


- 1 Bushing, presser bar, lower
- 2 Spring, presser bar
- 3 Rod, presser bar spring stop
- 4 Bushing, presser bar, upper
- 5 Thumbcrew, presser bar pressure regulating
- 6 Bar, presser
- 7 Guide, presser bar position
- 8 Spring, presser bar lifting releasing lever bracket
- 9 Bracket, presser bar lifting releasing lever
- 10 Lifter, presser bar
- 11 Screw, presser bar lifter hinge
- 12 Presser foot, hinged

Figure 35. Presser bar assembly, exploded view.

- 1 Cup, thread guide position
- 2 Locknut, thread guide
- 3 Guide, thread
- 4 Rod, thread guide
- 5 Screw, thread guide rod
- 6 Setscrew, spool rest
- 7 Rest, spool, for two spools
- 8 Setscrew, spool rest
- 9 Setscrew, spool rest rod stand
- 10 Stand, spool rest rod
- 11 Screws, wood, spool rest rod stand
- 12 Rod, spool rest
- 13 Rest, spool, for one spool
- 14 Setscrew, spool rest
- 15 Rest, spool, for two spools

Figure 36. Five-spool thread unwinder, exploded view.



Section IX. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), HEAVY-DUTY SEWING MACHINE (SINGER MODEL 7-33)

66. Balance Wheel

a. Removal.

- (1) Slide V-belt (13, fig. 37) off balance wheel (12) and off clutch pulley, and remove V-belt from machine.
- (2) Remove setscrews that attach balance wheel to arm shaft, and remove balance wheel.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect balance wheel for cracks,

stripped threads, and excessive wear.

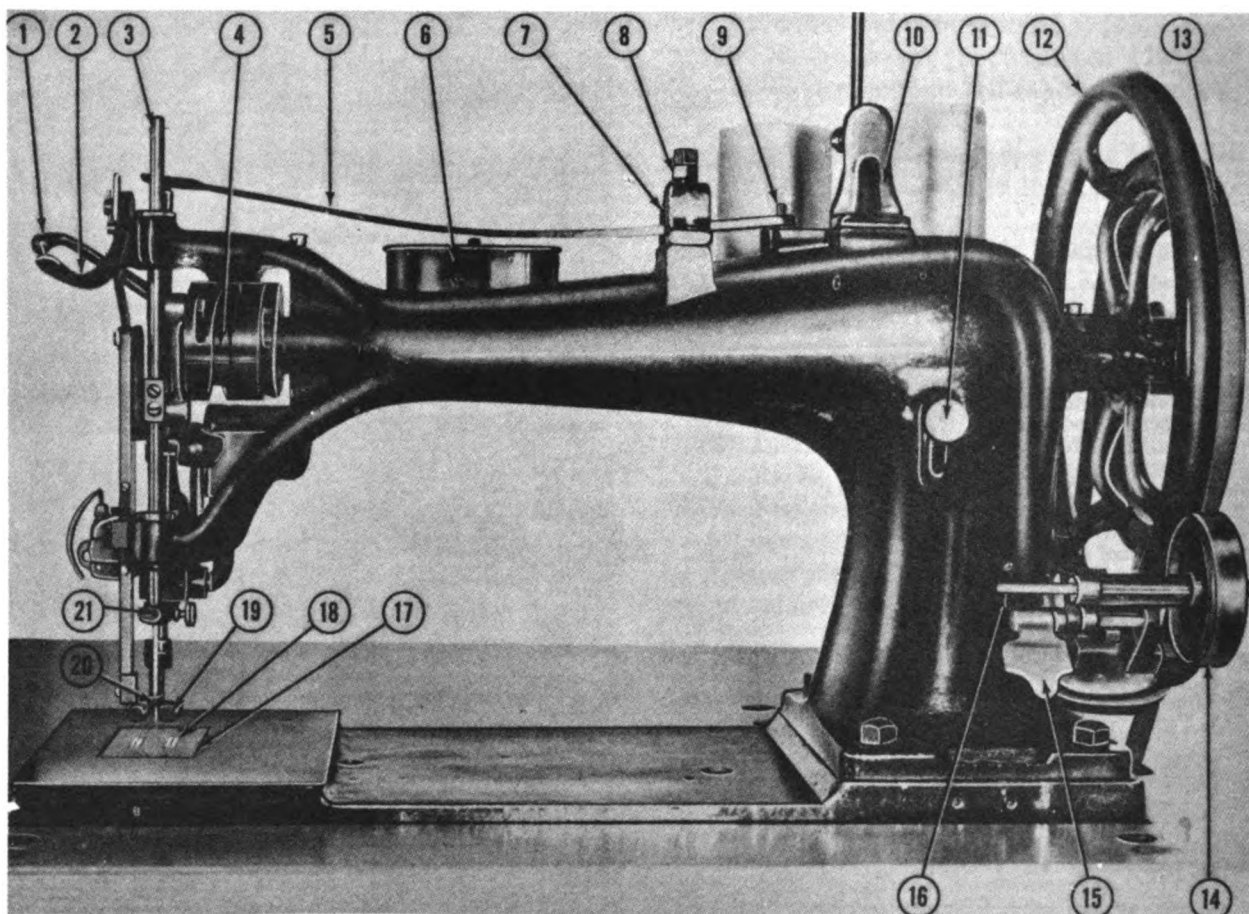
- (3) Inspect setscrews for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in a above.

67. Spool Holder Assembly

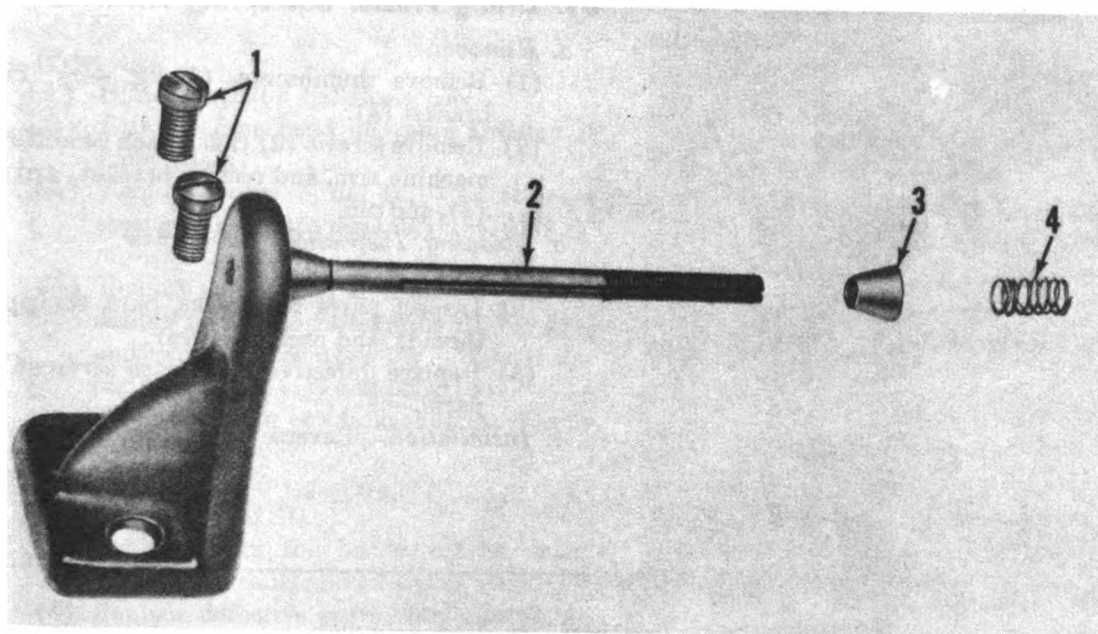
a. Removal.

- (1) Remove nut (5, fig. 38) from bracket assembly (2), and remove spring (4) and cone (3).



- | | |
|--|---------------------------------------|
| 1 Lever assembly, thread takeup | 12 Wheel, balance |
| 2 Lifter, presser bar | 13 V-belt, pulley |
| 3 Bar, needle | 14 Pulley assembly, friction |
| 4 Cam, thread takeup | 15 Latch, stop |
| 5 Spring, bar, vibrating presser bar | 16 Spindle |
| 6 Cup assembly, oil | 17 Body, throat plate |
| 7 Staple, vibrating presser bar spring adjusting | 18 Dog, feed, double |
| 8 Screw, vibrating presser bar spring | 19 Presser foot, vibrating |
| 9 Stud, vibrating presser bar spring | 20 Presser foot, lifting, double feed |
| 10 Bracket assembly, spool holder | 21 Clamp, needle |
| 11 Thumbscrew, feed regulator | |

Figure 37. Heavy-duty sewing machine, front view.



- 1 Screws, spool holder bracket
- 2 Bracket assembly, spool holder
- 3 Cone, spool holder tension spool pin

- 4 Spring, spool holder tension spool pin
- 5 Nut, spool holder tension spool pin

Figure 38. Spool holder assembly, exploded view.

- (2) Remove screws (1) that attach bracket assembly to machine arm, and remove bracket assembly.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect parts for bends, splits, burrs, tripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

68. Oil Cup Assembly

a. Removal and Disassembly.

- (1) Remove screw (10, fig. 39) and washer (6) that attach oil cup assembly to machine arm, and remove oil cup assembly. Remove oil in cup.

- (2) Drive out pin (2) that attaches cover (1) to cup (7), and remove cover.

- (3) Remove screw (4) that attaches washer (18) and felt (3) to cover, and remove washer and felt.

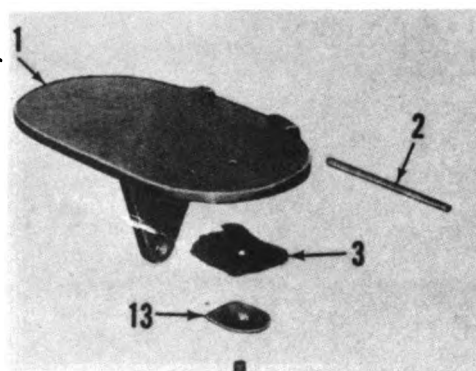
- (4) Remove screw (11) that attaches washer (12) and felt (5) to cup, and remove washer and felt.

- (5) Remove screw (8) that attaches spring (9) to cup, and remove spring.

b. Cleaning, Inspection, and Repair.

- (1) Clean metal parts with SD.
- (2) Inspect parts for cracks, bends, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



69. Lifting Presser Bar Spring Assembly

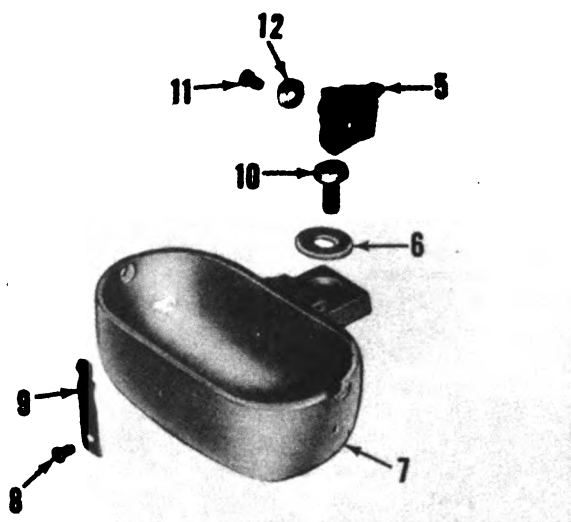
a. Removal.

- (1) Remove thumbscrew (1, fig. 40) from bracket (3).
- (2) Remove screws (2) that attach bracket to machine arm, and remove bracket, spring (4), and pin.

b. Cleaning, Inspection, and Repair.

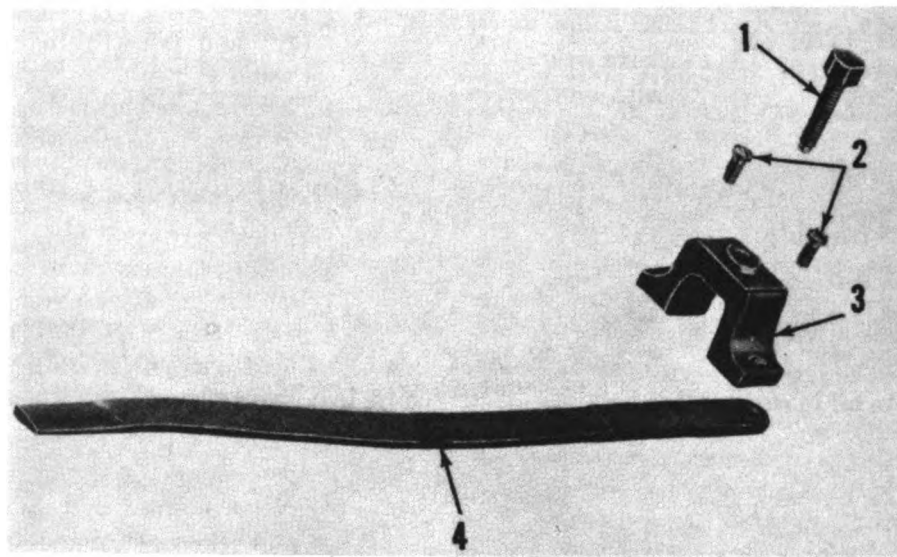
- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burrs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedures in a above.



- 1 Cover, oil cup
- 2 Pin, oil cup cover hinge
- 3 Felt, oil cup
- 4 Screw, oil cup felt
- 5 Felt, oil cup
- 6 Washer, oil cup screw
- 7 Cup, oil
- 8 Screw, oil cup cover latch spring
- 9 Spring, oil cup cover latch
- 10 Screw, oil cup
- 11 Screw, oil cup felt
- 12 Washer, oil cup felt
- 13 Washer, oil cup felt

Figure 39. Oil cup assembly, exploded view.



- 1 Thumbscrew, lifting presser bar spring regulating
- 2 Screws, lifting presser bar spring bracket
- 3 Bracket, lifting presser bar spring
- 4 Spring, lifting presser bar, flat

Figure 40. Lifting presser bar spring assembly, exploded view.

70. Shuttle Cylinder Assembly and Related Parts

a. Removal.

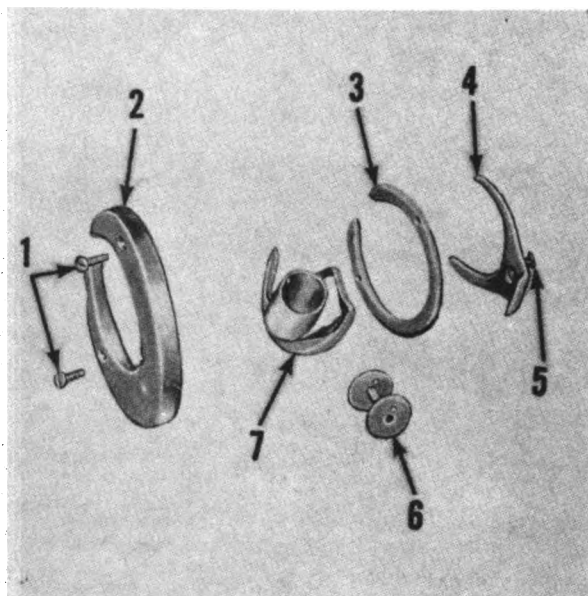
- (1) Slide V-belt off balance wheel.
- (2) Lift machine head off table and lay it front up.
- (3) Remove screw (5, fig. 41), that attaches spring (4) to race assembly (2), and remove spring.
- (4) Remove screws (1) that attach race assembly to shuttle race frame (2, fig. 42), and remove race assembly, cylinder assembly (7, fig. 41), and back (3).
- (5) Remove bobbin (6) from shuttle cylinder assembly.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation.

- (1) Turn shuttle driver in the same position as illustrated in figure 42.
- (2) Reverse procedure in *a* above.



- 1 Screws, shuttle race
- 2 Race assembly, shuttle
- 3 Back, shuttle race
- 4 Spring, shuttle race back
- 5 Screw, shuttle race back screw
- 6 Bobbin
- 7 Cylinder assembly, shuttle

Figure 41. Shuttle cylinder assembly and related parts, exploded view.

71. Bridle Irons

a. Removal.

- (1) Slide V-belt off balance wheel.
- (2) Lift machine head from opening in table top, and place head on tabletop.
- (3) Remove nuts, washers, and bolts that attach bridle irons (14, fig. 43) to tabletop (1), and remove irons.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect irons for cracks and excessive wear.
- (3) Inspect bolts and nuts for stripped threads and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

72. Thread Tension Assembly and Eyelets

a. Removal.

- (1) Remove thumbnut (8, fig. 44) from stud (4), and remove washer (7), spring (6), and disks (5) from stud.
- (2) Unscrew stud from machine arm.
- (3) Remove screw (2) that attaches eyelet (1) to machine arm and remove eyelet.
- (4) Unscrew eyelet (8) from machine arm.

b. Cleaning, Inspection, and Repair.

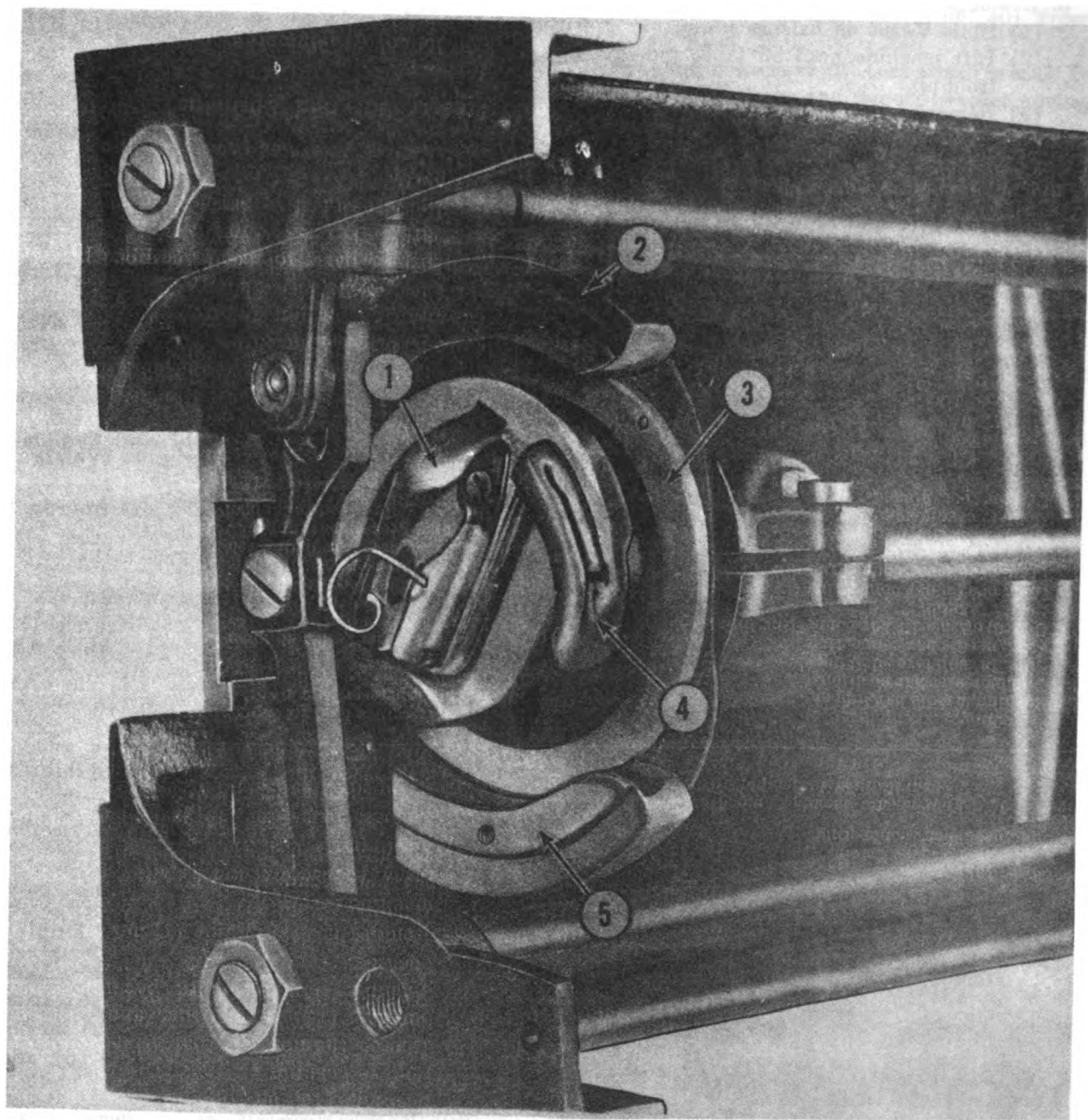
- (1) Clean parts with SD.
- (2) Inspect parts for bends, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

73. Thread Tension Assembly and Staple

a. Removal.

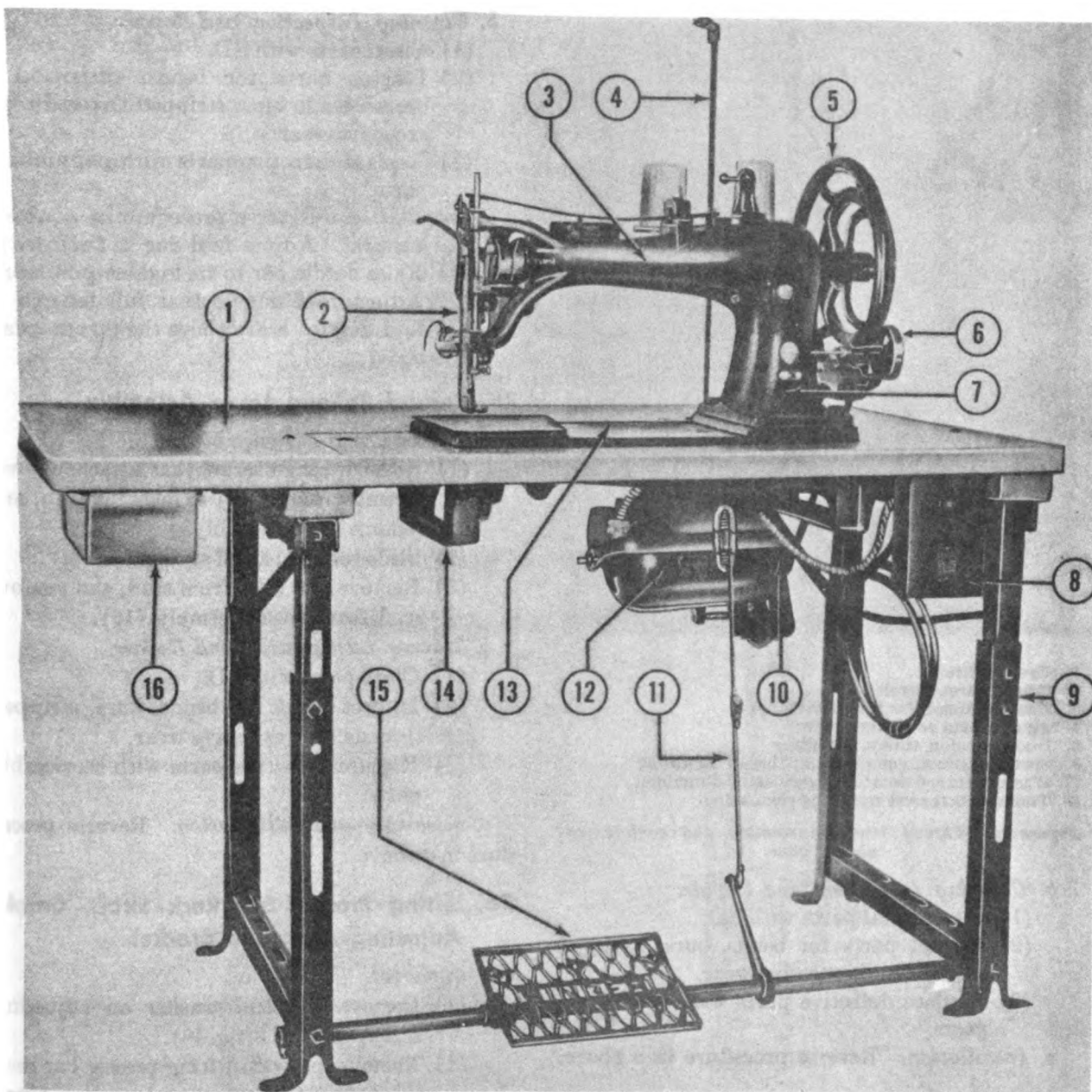
- (1) Unscrew thumbnut (1, fig. 45) from stud (8), and remove washer (2), spring (3), washers (4 and 5), wheel (6), and washer (7) from stud.
- (2) Remove screw (15) and washer (14) that attach staple (13) to cap (12), and remove staple.
- (3) Remove screw that attaches stud to cap, and remove stud and spring (9). Slide spring from stud.
- (4) Remove screw (10) that attaches plate (11) to cap, and remove plate.



- 1 Cylinder assembly, shuttle
- 2 Frame, shuttle race
- 3 Back, shuttle race

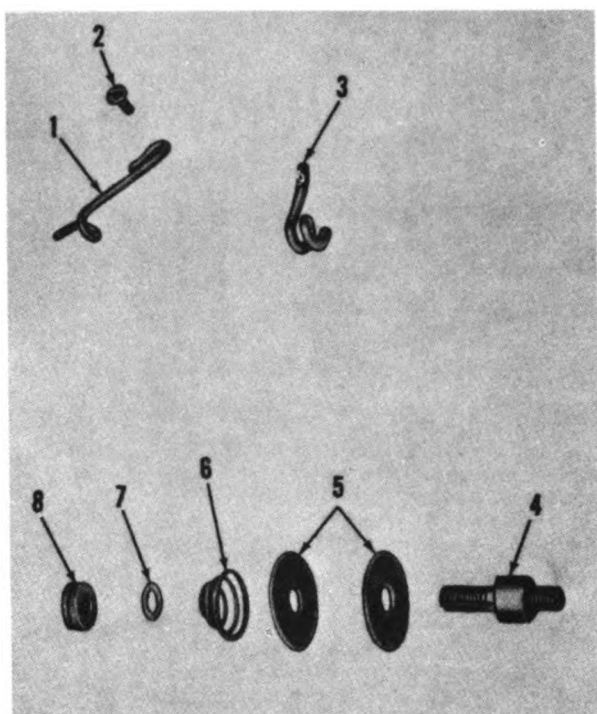
- 4 Driver, shuttle
- 5 Race assembly, shuttle

Figure 42. Shutter cylinder assembly, installed.



- | | | | |
|---|-------------------------|----|-----------------|
| 1 | Tabletop | 9 | Leg, stand |
| 2 | Face assemblies | 10 | Clutch, motor |
| 3 | Arm, machine | 11 | Rod, pitman |
| 4 | Rod, thread guard | 12 | Motor, electric |
| 5 | Wheel, balance | 13 | Bed, machine |
| 6 | Winder assembly, bobbin | 14 | Iron, bridle |
| 7 | Plate, model number | 15 | Treadle, foot |
| 8 | Box, switch | 16 | Drawer, tool |

Figure 43. Heavy-duty sewing machine, front view.



- 1 Eyelet, thread
- 2 Screw, thread eyelet
- 3 Eyelet, thread, for thread retainer
- 4 Stud, thread retaining screw
- 5 Disk, tension, thread retaining
- 6 Spring, helical, compression, thread retaining
- 7 Washer, thread retaining regulating thumbnut
- 8 Thumbnut, thread retaining regulating

Figure 44. Thread tension assembly and eyelets, exploded view.

b. Cleaning, Inspection, and Repair.

- (1) Clean metal parts with SD.
- (2) Inspect parts for bends, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

74. Cloth Plate, Throat Body Assembly, and Feed Dog

a. Removal and Disassembly.

- (1) Remove screws (4, fig. 46) that attach plate (5) to machine bed, and remove plate.
- (2) Remove screws (7) that attach body (3) to machine bed, and remove body with strip (2).
- (3) Remove screws (1) that attach strip to body, and remove strip.
- (4) Remove screw that attaches feed dog (6) to feed bar, and remove feed dog.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, chipped or broken teeth, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed dog as follows :

- (1) Raise needle bar to its highest position.
- (2) Adjust feed dog so that full length of feed dog teeth are above the throat plate body.

75. Thread Takeup Lever Assembly

a. Removal and Disassembly.

- (1) Remove hinge screw that attaches lever assembly (7, fig. 47) to machine arm, and remove lever assembly.
- (2) Slide roller (14) off stud (15).
- (3) Remove nut (17) from stud, and remove stud from lever assembly (16).

b. Cleaning, Inspection, and Repair.

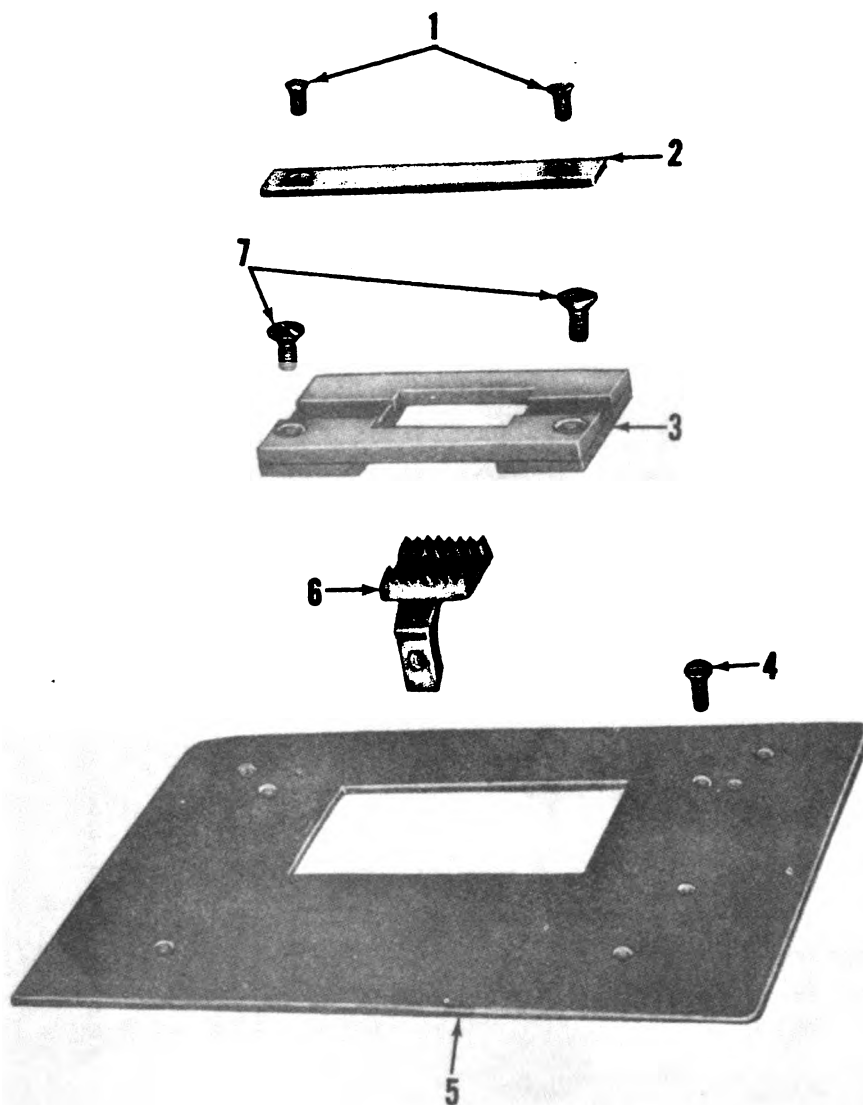
- (1) Clean parts with SD.
- (2) Inspect parts for bends, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

76. Lifting Presser Bar Rock Shaft, Crank, Adjusting Arm, and Bracket

a. Removal.

- (1) Remove nut and washer on adjusting screw (part of 4, fig. 48).
- (2) Remove screw on lifting presser bar rock shaft eccentric strap, and remove hinge screw and slide block.
- (3) Remove setscrew on arm (3), drive pin from arm, and remove arm from rock shaft.
- (4) Remove setscrew on crank (6), drive pin from crank, and remove crank from rock shaft.
- (5) Remove rock shaft from bracket (part of 5).
- (6) Remove screws that attach bracket to machine arm, and remove bracket. Remove dowel pin from bracket.



- 1 Screws, throat plate, needle hole strip
- 2 Strip, throat plate, needle hole
- 3 Body, throat plate
- 4 Screw, cloth plate

- 5 Plate, cloth
- 6 Dog, feed, double
- 7 Screws, throat plate

Figure 46. Cloth plate, feed dog, and related parts, exploded view.

b. Cleaning, Inspection, and Repair.

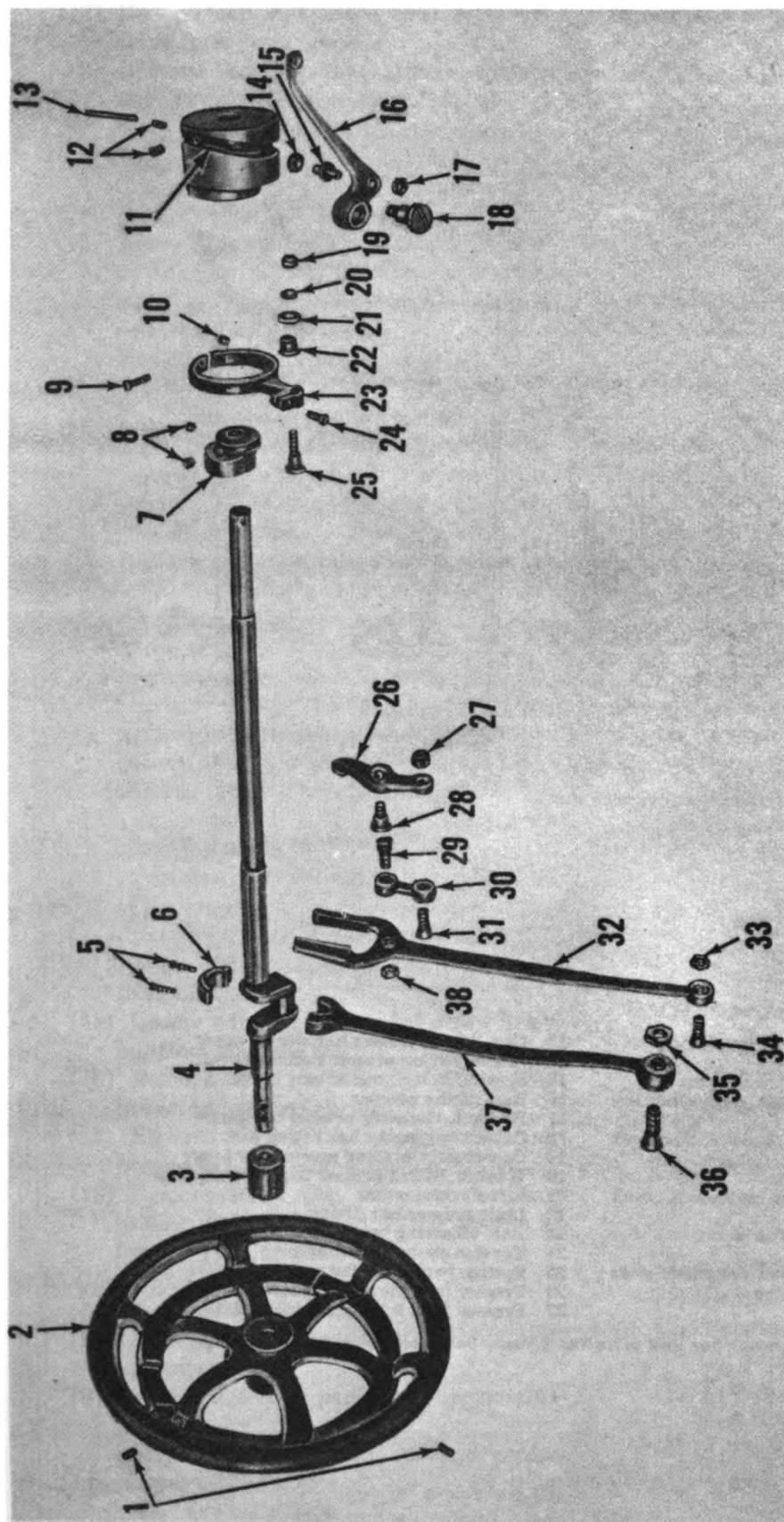
- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

77. Lifting Presser Bar and Vibrating Presser Bar Assemblies

a. Removal and Disassembly.

- (1) Loosen screw that applies tension to vibrating presser bar spring (25, fig. 48), and slide spring off cap (13).

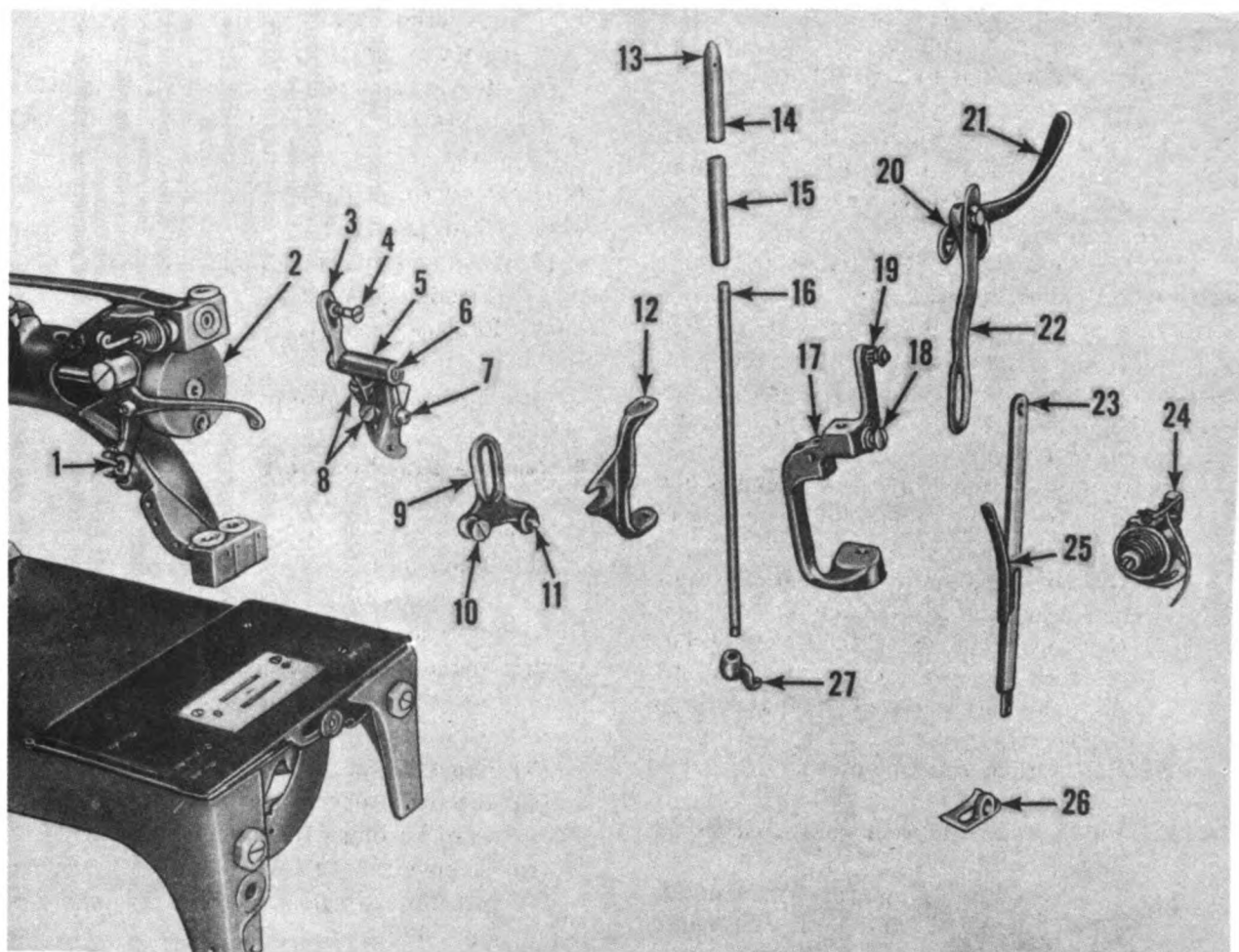


- 1 Setscrews, balance wheel
- 2 Wheel, balance
- 3 Bushing, arm shaft
- 4 Shaft, arm
- 5 Screws, crank connecting rod
- 6 Cap, crank connecting rod
- 7 Cam, feed
- 8 Setscrews, feed cam
- 9 Screw, lifting presser bar rock shaft eccentric strap adjusting
- 10 Nut, lifting presser bar rock shaft eccentric strap adjusting screw
- 11 Cam, thread takeup
- 12 Screws, thread takeup cam
- 13 Pin, thread takeup cam

- 14 Roller, thread takeup lever
- 15 Stud, thread takeup lever roller and screw
- 16 Lever assembly, thread takeup
- 17 Nut, thread takeup lever roller and screw stud
- 18 Screw, thread takeup lever hinge
- 19 Nut, lifting presser bar rock shaft eccentric strap hinge screw
- 20 Lockwasher, lifting presser bar rock shaft eccentric strap hinge screw
- 21 Washer, lifting presser bar rock shaft eccentric strap hinge screw slide
- 22 Slide, lifting presser bar rock shaft eccentric strap hinge screw
- 23 Strap, lifting presser bar rock shaft eccentric strap hinge screw
- 24 Screw, adjusting, lifting presser bar rock shaft eccentric strap hinge

- 25 Screw, lifting presser bar rock shaft eccentric strap hinge
- 26 Regulator, feed
- 27 Nut, feed connecting link hinge screw
- 28 Screw, feed regulator hinge
- 29 Screw, feed connecting link hinge
- 30 Link, feed connecting
- 31 Screw, feed connecting link hinge
- 32 Connection, feed forked
- 33 Nut, feed forked connection hinge screw
- 34 Screw, feed forked connection hinge
- 35 Nut, crank connecting rod hinge screw
- 36 Screw, crank connecting rod hinge
- 37 Rod, crank connecting
- 38 Nut, feed connecting link hinge screw

Figure 47. Arm shaft assembly and related parts, exploded view.



- | | |
|---|--|
| 1 Strap, lifting presser bar rock shaft eccentric | 13 Cap, lifting presser bar sleeve, upper |
| 2 Cam, thread takeup | 14 Sleeve, lifting presser bar, upper |
| 3 Arm, lifting presser bar rock shaft adjusting | 15 Sleeve, lifting presser bar, lower |
| 4 Screw and slide, lifting presser bar rock shaft eccentric strap adjusting | 16 Bar, lifting presser |
| 5 Bracket with rock shaft, lifting presser bar rock shaft | 17 Bracket, vibrating presser bar hinge |
| 6 Crank, lifting presser bar rock shaft | 18 Capcrew, presser bar lifting link |
| 7 Roller with stud, lifting presser bar rock shaft crank pin | 19 Capcrew, vibrating presser bar hinge |
| 8 Screws, lifting presser bar rock shaft bracket | 20 Washer, lifting presser bar lifter friction |
| 9 Crank, lifting presser bar | 21 Lifter, presser bar |
| 10 Block and screw, lifting presser bar bellcrank slide | 22 Link, presser bar lifting |
| 11 Stud, lifting presser bar bellcrank hinge | 23 Bar, vibrating presser |
| 12 Bracket, lifting presser bar | 24 Tension assembly, thread |
| | 25 Spring, bar, vibrating presser bar |
| | 26 Presser foot, vibrating, double feed |
| | 27 Presser foot, lifting, double feed |

Figure 48. Lifting presser bar and vibrating presser bar assemblies, exploded view.

- (2) Remove cap and sleeve (14) from machine face.
 - (3) Remove setscrew that attaches presser foot (27), to presser bar (16) and remove presser foot.
 - (4) Remove nut and screw that attach presser foot (26) to bar (23), and remove presser foot.
 - (5) Remove clamping screws that attach bar to bracket (12) and slide bar out top of machine head. Remove sleeve (15) from machine face.
 - (6) Remove capscrew (18) that attaches link (22) to bracket (17).
 - (7) Drive out pin that attaches link to lifter (21), and remove link and washer.
 - (8) Remove screws that attach tension assembly (24) to machine face, and remove tension assembly.
 - (9) Remove capscrew (19) that attaches bar (23) to bracket (17), and remove bar with spring (25).
 - (10) Loosen pinch screw in strap (1), and remove nut and screw from arm (3).
 - (11) Remove screws (8) that attach bracket with rock shaft (5) to machine face, and remove bracket with rock shaft and hinge bracket (17).
 - (12) Pull forked end of bracket (12) from block and screw (10).
 - (13) Pull crank (9) from roller with stud (7).
 - (14) Remove pins holding arm (3) and crank (6) to rock shaft, and push rock shaft from bracket (5).
 - (15) Unscrew lifting presser bar screw bushing from machine face.
 - (16) Remove screw that attaches spring (25) to bar, and remove spring.
 - (17) Remove screws that attach vibrating presser bar, and remove spring.
 - (18) Remove screw that attaches vibrating presser bar spring adjusting staple to bracket (17), and remove staple.
- b. Cleaning, Inspection, and Repair.**
- (1) Clean metal parts with SD.
 - (2) Inspect parts for bends, cracks, burs, and excessive wear.
 - (3) Replace defective parts with serviceable parts.
- c. Assembly and Installation.** Reverse procedure in *a* above.

78. Lifting Presser Bar Crank

a. Removal.

- (1) Remove nut and washer that attach block and screw (10, fig. 48) to crank (9), and remove block and screw.
- (2) Remove setscrew that attaches stud (11) to bracket (12), and remove stud and crank.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts in SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

79. Needle Bar Assembly

a. Removal.

- (1) Remove thumbscrew (7, fig. 49) that attaches needle (8) to clamp (6), and remove needle and clamp.
- (2) Remove setscrews that attach stud (4) to bar (5), and slide bar out top of machine head.
- (3) Remove stud from link (3).
- (4) Remove upper and lower needle bar screw bushings from machine face.
- (5) Remove nut (2) and screw (1) that attach link to thread takeup cam, and remove link.

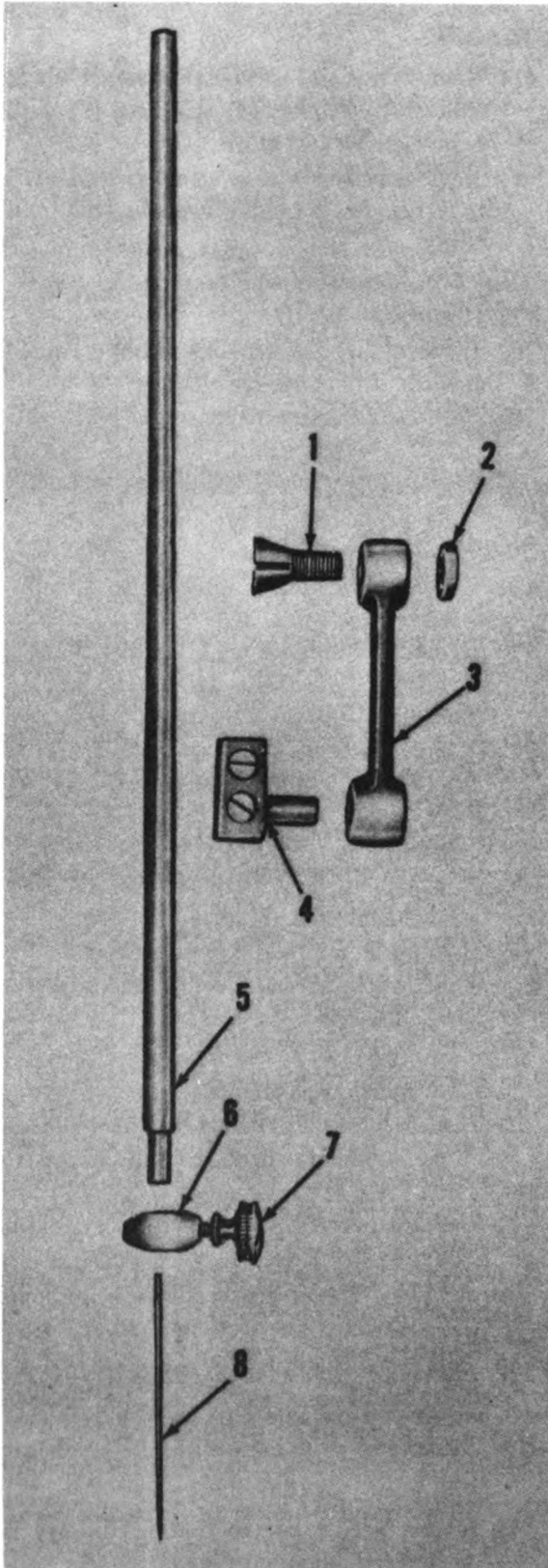
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment.

- (1) Remove throat plate body (para. 74).
- (2) Turn balance wheel until point of sewing hook is in line with needle.
- (3) Loosen setscrews in needle bar connecting stud.
- (4) Adjust needle bar so that needle eye is $\frac{1}{32}$ inch below point of hook.



80. Bobbin Winder Assembly

a. Removal. Remove screw (9, fig. 50) and washer (8) that attach bobbin winder assembly to machine arm, and remove bobbin winder assembly.

b. Disassembly.

(1) Remove setscrew (1) that attaches spindle (2) to shaft (17), and remove spindle.

(2) Remove setscrews (13) that attach pulley assembly (14) to shaft, and remove pulley assembly and shaft from frame (15).

(3) Remove setscrew (5) that attaches pin (4) to base (10), and remove pin, frame, and spring (16).

(4) Remove screw (11) that attaches arm (12) to latch (3), and remove arm and latch from base.

(5) Remove screws (7) that attach base to bracket (6), and remove base.

c. Cleaning, Inspection, and Repair.

(1) Clean parts with SD.

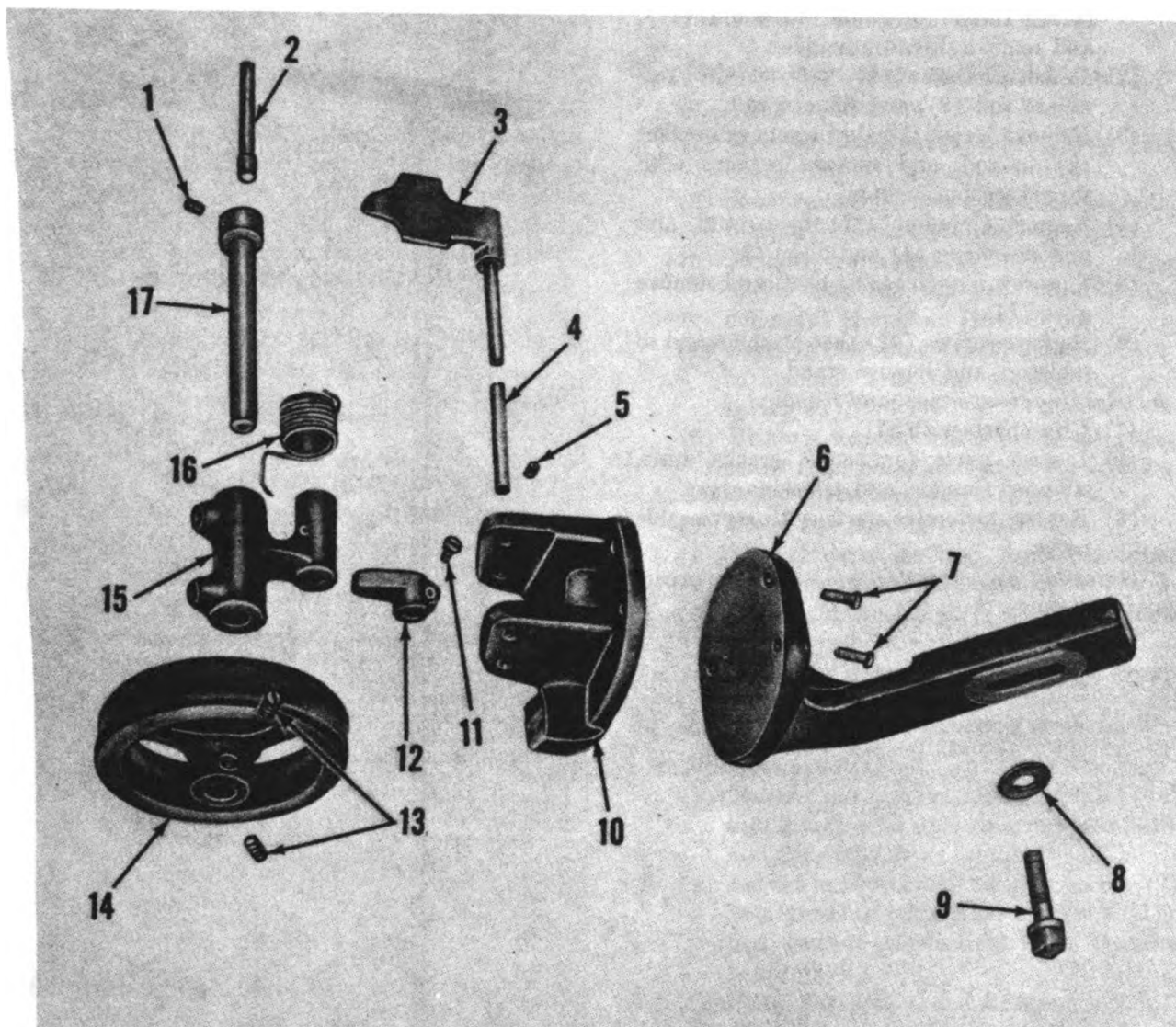
(2) Inspect parts for bends, cracks, stripped threads, burrs, and excessive wear.

(3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

-
- 1 Screw, needle bar connecting link hinge
 - 2 Nut, needle bar connecting link hinge screw
 - 3 Link, needle bar connecting
 - 4 Stud, connecting, needle bar
 - 5 Bar, needle
 - 6 Clamp, needle
 - 7 Thumbcrew, needle clamp
 - 8 Needle

Figure 49. Needle bar assembly, exploded view.



- | | | | |
|---|---------------------------|----|------------------------------|
| 1 | Setscrew, spindle shaft | 10 | Base, bobbin winder |
| 2 | Spindle | 11 | Screw, tripping arm clamping |
| 3 | Latch with pins, stop | 12 | Arm, tripping |
| 4 | Pin, frame hinge | 13 | Setscrews, friction pulley |
| 5 | Setscrew, frame hinge pin | 14 | Pulley assembly, friction |
| 6 | Bracket | 15 | Frame, bobbin winder |
| 7 | Screws, base | 16 | Spring, frame |
| 8 | Washer, bracket screw | 17 | Shaft, spindle |
| 9 | Screw, bracket | | |

Figure 50. Bobbin winder assembly, exploded view.

81. Thread Unwinder Assembly

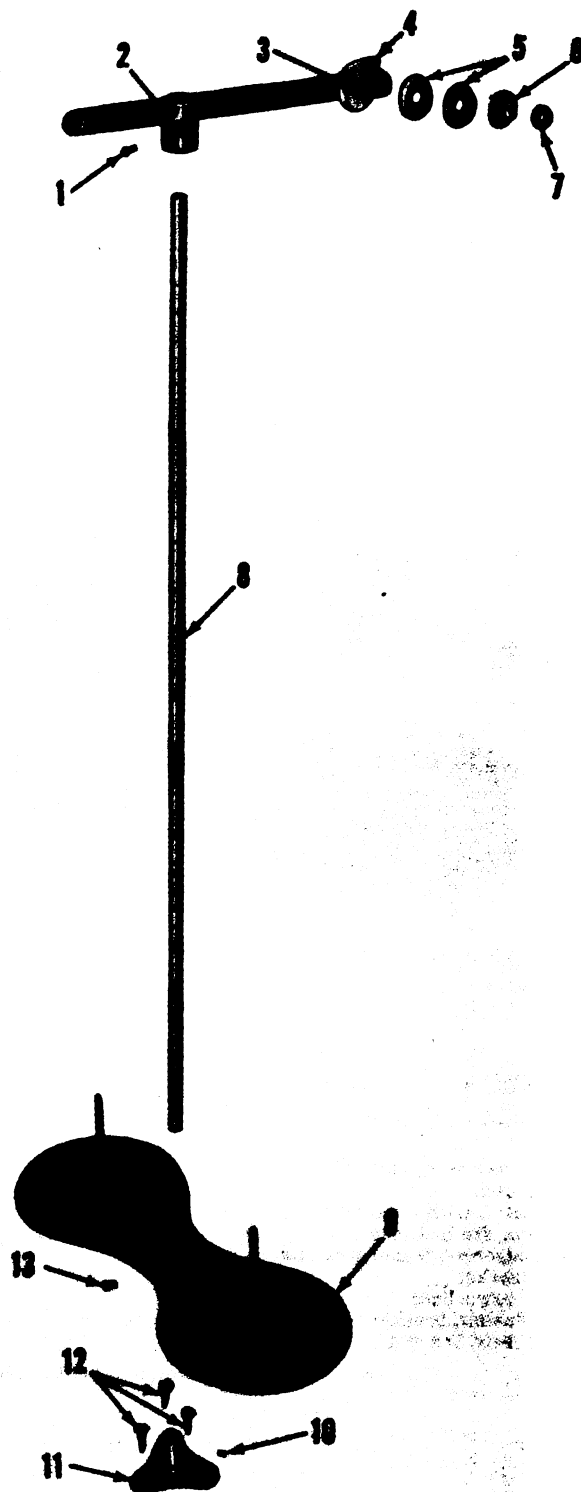
a. Removal and Disassembly.

- (1) Remove setscrew (10, fig. 51) that attaches thread unwinder to stand (11), and remove thread unwinder.
- (2) Remove setscrew (13) that attaches rest (9) to rod (8), and remove rest.
- (3) Remove screw (1) that attaches bracket (2) to rod, and remove bracket with thread tension assembly.
- (4) Remove thumbnut (7) from stud, and remove spring (6) and disks (5).
- (5) Unscrew stud from bracket, and remove guard (4).
- (6) Remove screws (12) that attach stand to tabletop, and remove stand.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in a above.



- 1 Screw, spool holder bracket
- 2 Bracket, spool holder
- 3 Stud, tension screw
- 4 Guard, tension thread
- 5 Disks, tension
- 6 Spring, helical, compression, tension
- 7 Thumbnut, tension regulating
- 8 Rod, thread guard
- 9 Rest, spool
- 10 Setscrew, spool stand
- 11 Stand, spool
- 12 Screws, wood, spool stand
- 13 Setscrew, spool rest

Figure 51. Thread unwinder assembly, exploded view.

Section X. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46) VERY-HEAVY-DUTY SEWING MACHINE (SINGER MODEL 97-10)

82. Arm Front Cover

a. Removal.

- (1) Remove screw (1, fig. 52) that attaches spring (2) to cover (3) and remove spring.
- (2) Remove screw and washer that attaches cover to machine face and remove cover.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

83. Balance Wheel Pulley Drive

a. Removal.

- (1) Slide belt (21, fig. 53) off pulley drive (20).
- (2) Remove screw from end of arm shaft.
- (3) Remove setscrews that attach pulley drive to arm shaft, and slide pulley drive off arm shaft.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, chipped places, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

84. Presser Bar Springs

a. Removal.

- (1) Remove adjusting screw (4, fig. 54) that adjust pressure on springs (5 and 6), and remove guide (8).
- (2) Remove springs from machine arm.

b. Inspection and Repair.

- (1) Inspect parts for cracks, burs, and excessive wear.
- (2) Replace defective parts with serviceable ones.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust presser bar springs (TM 10-3530-202-10).

85. Tension Assembly and Brake

a. Removal.

- (1) Remove thumbscrew and spring from connection (10, fig. 55).
- (2) Remove hinge screw that attaches brake to machine arm, and remove brake.
- (3) Remove thumbnut (9, fig. 56), spring (7), washer (6), washers (5 and 3), and roller (4) from stud (2).
- (4) Remove setscrew that attaches stud to machine arm, and remove stud and spring (1).
- (5) Remove tension wheel brake adjusting screw from brake and press out bushing.

b. Cleaning, Inspection, and Repair.

- (1) Clean metal parts with SD.
- (2) Inspect parts for burs, cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

86. Feed Regulator Connection and Stud

a. Removal.

- (1) Remove nut (14, fig. 57) and washer (15) that attach stud (17) to connection (16), and slide stud from regulator (18).
- (2) Loosen screw (18), remove screw (7) that attaches connection to crank (11), and remove connection from machine head.

b. Cleaning, Inspection, and Repair.

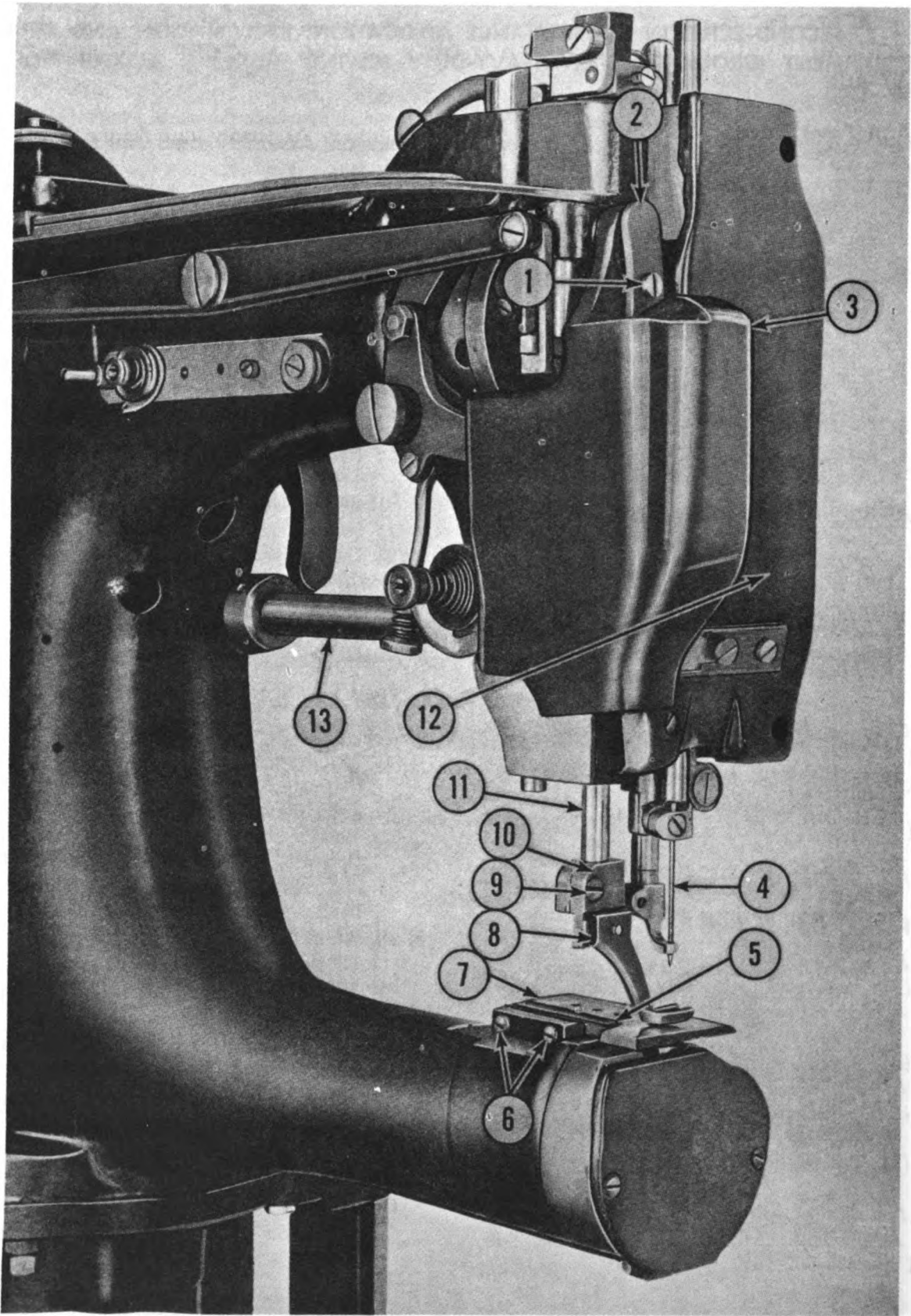
- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

87. Feed Regulator and Shaft

a. Removal.

- (1) Remove thumbscrew that attaches arm side cover to machine arm, and remove cover.

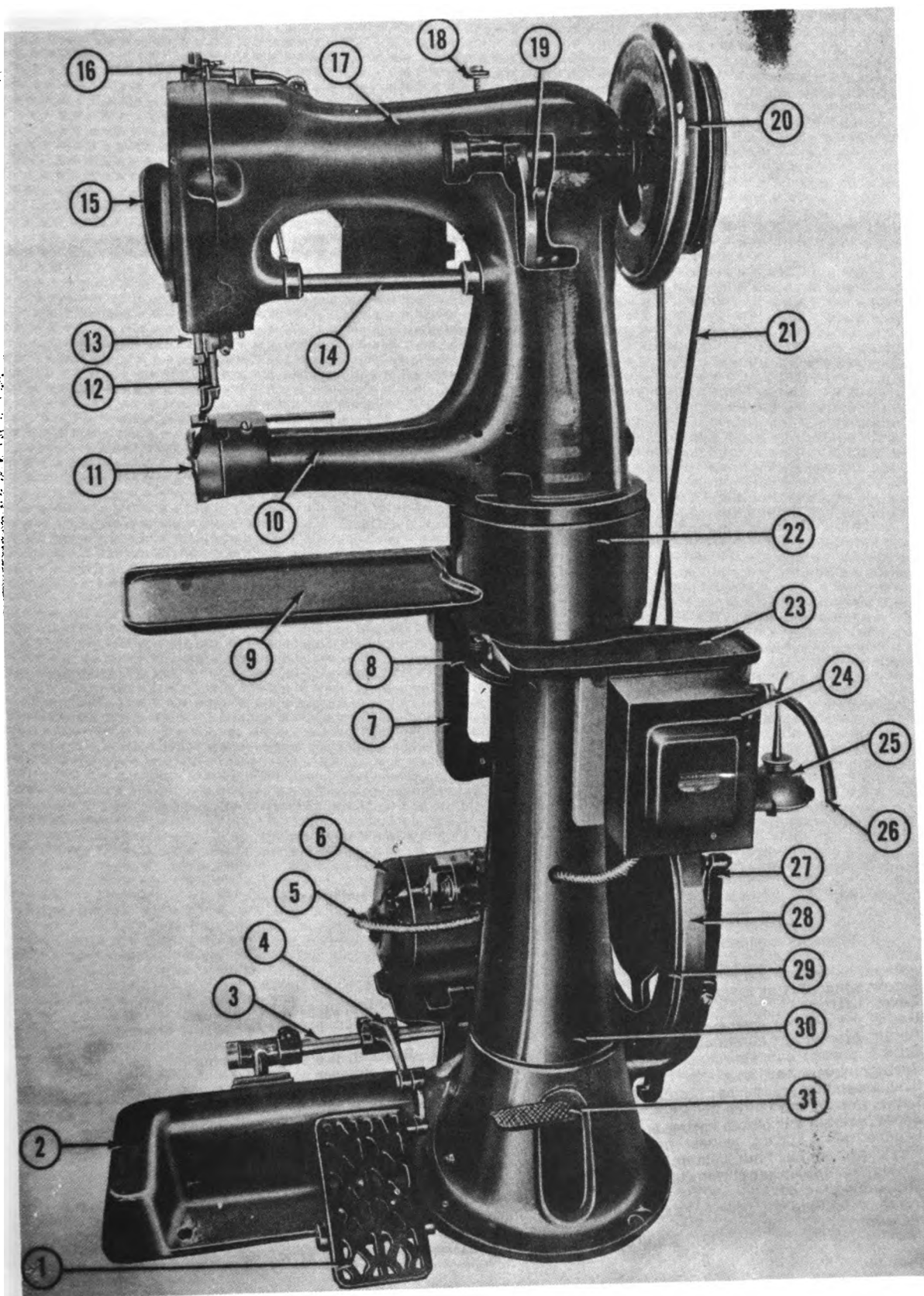


- | | | | |
|---|--------------------------------|----|-------------------------------------|
| 1 | Screw, arm front cover spring | 8 | Presser foot, double toe |
| 2 | Spring, arm front cover | 9 | Screw, presser foot holder clamping |
| 3 | Cover, arm front | 10 | Holder, presser foot |
| 4 | Needle | 11 | Bar, presser |
| 5 | Holder, needle plate | 12 | Faceplate |
| 6 | Setscrews, needle plate holder | 13 | Shaft, feed |
| 7 | Plate, needle | | |

Figure 52. Very-heavy-duty sewing machine, rear view of head.

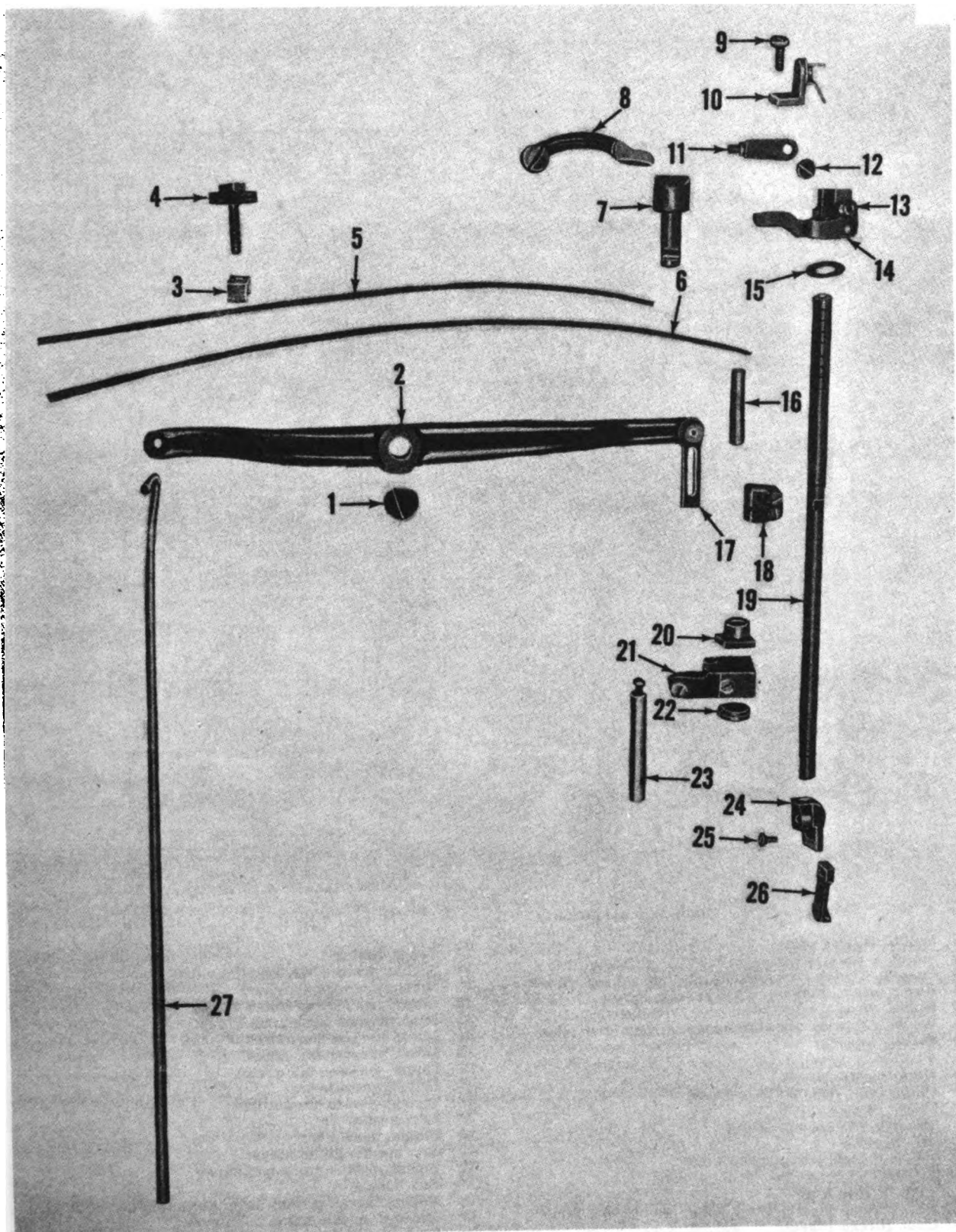
- | | | |
|--------------------------------------|------------------------------------|----------------------------|
| 1 Treadle, starting | 11 Cover, shuttle race | 22 Extension, column |
| 2 Base, column stand | 12 Bar, needle guide | 23 Tray, table |
| 3 Shaft, starting | 13 Bar, needle | 24 Box, switch |
| 4 Link, starting treadle connecting | 14 Shaft, feed | 25 Oiler, hand push bottom |
| 5 Cable, BX, machine motor-in-switch | 15 Cover, arm front | 26 Cord, lead |
| 6 Motor, electric | 16 Clutch, presser bar | 27 Arm, driving |
| 7 Bracket, table | 17 Arm, upper machine | 28 Belt, flat, leather |
| 8 Latch, table | 18 Thumbscrew, pressure regulating | 29 Wheel, balance |
| 9 Table, column | 19 Regulator, feed | 30 Column, stand |
| 10 Arm, lower machine | 20 Pulley drive, balance wheel | 31 Treadle, foot lifter |
| | 21 Belt, round leather | |

Figure 53. Very-heavy-duty sewing machine, front view.



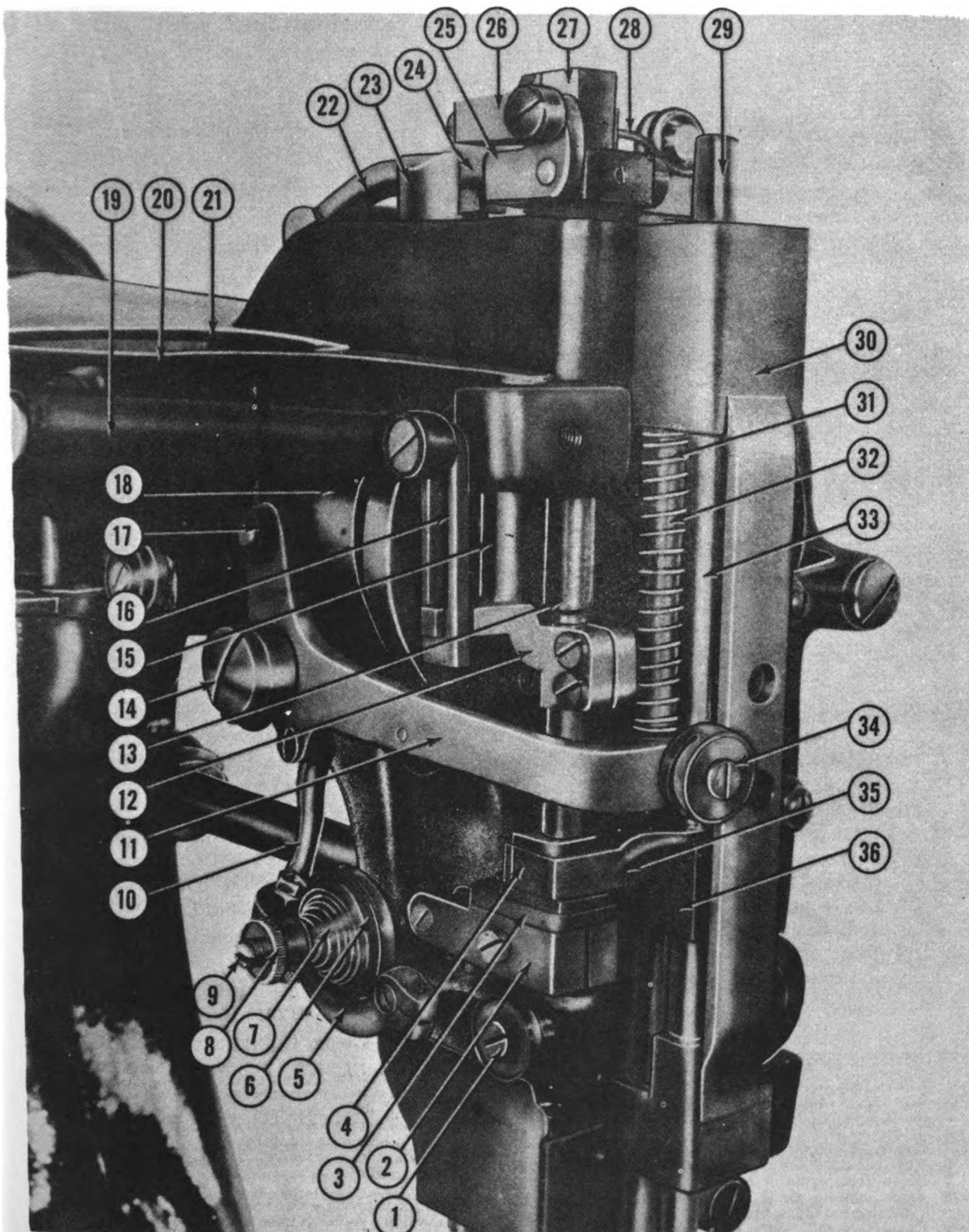
- | | | | |
|----|--|----|---|
| 1 | Screw, hinge, lifting lever | 15 | Cushion, presser bar clutch |
| 2 | Lever, lifting | 16 | Extension, presser bar spring bracket |
| 3 | Guide, presser bar spring | 17 | Link, lifting lever |
| 4 | Screw, presser bar clutch clamp adjusting | 18 | Bracket, presser bar spring |
| 5 | Spring, presser bar, short | 19 | Bar, presser |
| 6 | Spring, presser bar, long | 20 | Block, needle guide upper bar bracket slide |
| 7 | Stud assembly, presser bar clutch lifting | 21 | Bracket, presser bar guide |
| 8 | Lever, presser bar clutch lifting | 22 | Washer, presser bar guide bracket spacing |
| 9 | Screw, presser bar clutch spring bracket | 23 | Stud, presser bar guide bracket |
| 10 | Bracket with spring, presser bar clutch spring | 24 | Holder, presser foot |
| 11 | Screw, presser bar clutch clamp adjusting | 25 | Screw, presser foot holder clamping |
| 12 | Capscrew, presser bar clutch clamp | 26 | Presser foot |
| 13 | Clutch, presser bar | 27 | Rod, foot lifter treadle pitman, upper |
| 14 | Lever with hinge pin, presser bar clutch | | |

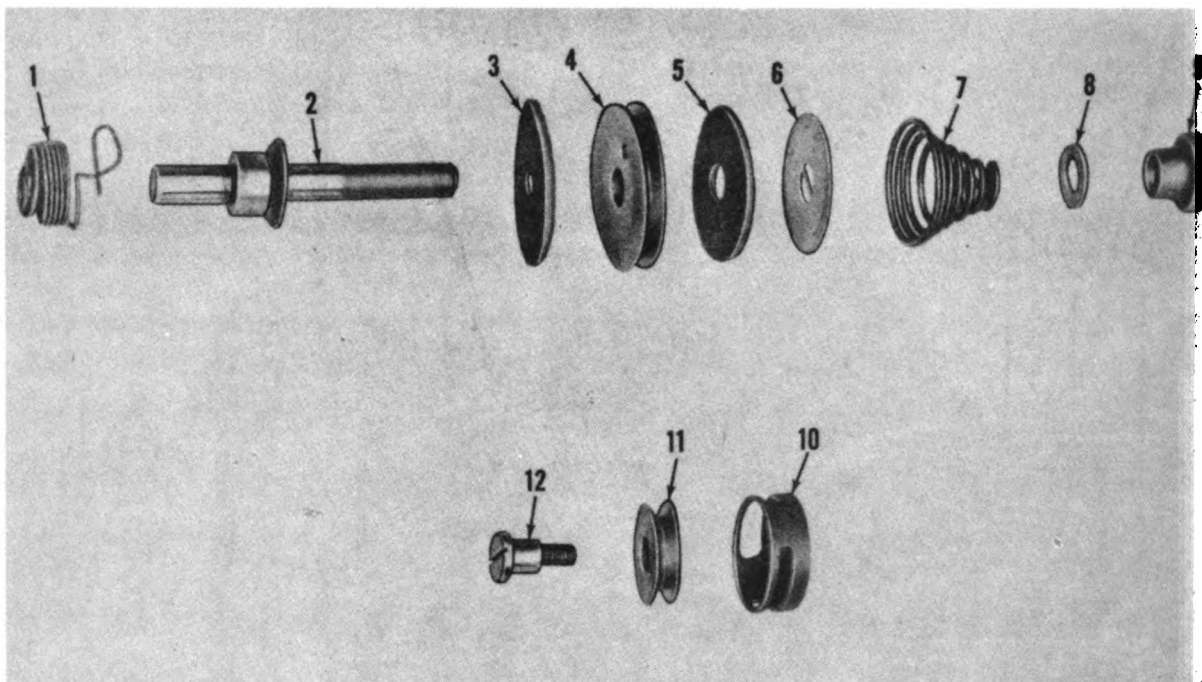
Figure 54. Presser bar assembly, exploded view.



- | | | | |
|----|--|----|--|
| 1 | Roller, thread guide | 19 | Lever, lifting |
| 2 | Bracket, presser bar guide | 20 | Spring, presser bar, long |
| 3 | Cushion, leather, needle guide upper bar bracket | 21 | Spring, presser bar, short |
| 4 | Block, needle guide upper bar bracket slide | 22 | Lever, presser bar clutch lifting |
| 5 | Brake, tension wheel | 23 | Stud, presser bar clutch lifting |
| 6 | Washer, tension friction, felt | 24 | Lever, presser bar clutch |
| 7 | Spring, tension | 25 | Lever, presser bar clutch |
| 8 | Thumbnut, tension regulating | 26 | Clamp, presser bar clutch |
| 9 | Stud, tension screw | 27 | Clutch, presser bar |
| 10 | Connection, tension wheel brake | 28 | Spring, clutch, presser bar |
| 11 | Lever, thread takeup | 29 | Bar, needle |
| 12 | Bracket, presser bar spring | 30 | Frame, needle bar |
| 13 | Bar, presser | 31 | Bar, needle guide, upper |
| 14 | Screw, thread takeup lever hinge | 32 | Spring, needle guide bar, upper |
| 15 | Extension, presser bar spring bracket | 33 | Bar, needle |
| 16 | Link, lifting lever | 34 | Roller, thread takeup lever thread guide front |
| 17 | Nut, thread takeup lever roller and screw stud | 35 | Bracket, needle guide bar, upper |
| 18 | Cam, thread takeup | 36 | Stud, needle bar connecting |

Figure 55. Face assemblies, rear view.





- 1 Spring, thread takeup
- 2 Stud, tension screw
- 3 Washer, tension friction, felt
- 4 Wheel, tension
- 5 Washer, tension friction, felt
- 6 Washer, tension friction, steel

- 7 Spring, tension
- 8 Washer, tension regulating thumbnut
- 9 Thumbnut, tension regulating
- 10 Cover, thread guide roller
- 11 Roller, thread guide
- 12 Screw, thread guide roller

Figure 56. Tension assembly, exploded view.

- (2) Loosen nut (5, fig. 58) on screw (6), and remove nut and screw from regulator (3).
- (3) Remove balance wheel pulley drive (par. 88).
- (4) Remove screw (1, fig. 57) that attaches regulator to shaft (3).
- (5) Remove setscrews (4) that attach collar (5) to shaft.
- (6) Loosen nut (14) on stud (17) and slide stud out of slot in regulator.
- (7) Drive out shaft, and remove regulator and collar from machine arm.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, chips, bends, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

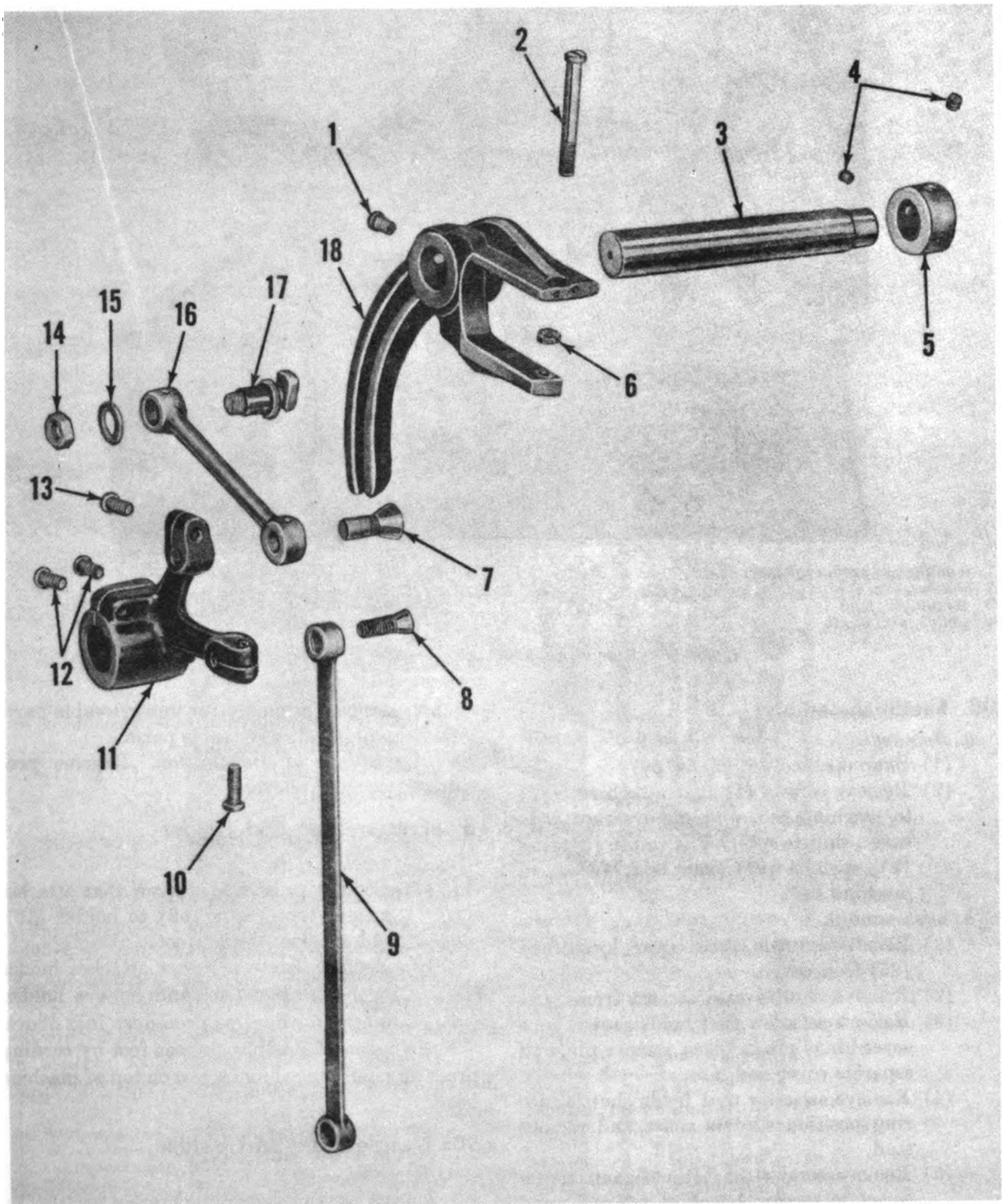
c. Installation. Reverse procedure in *a* above.

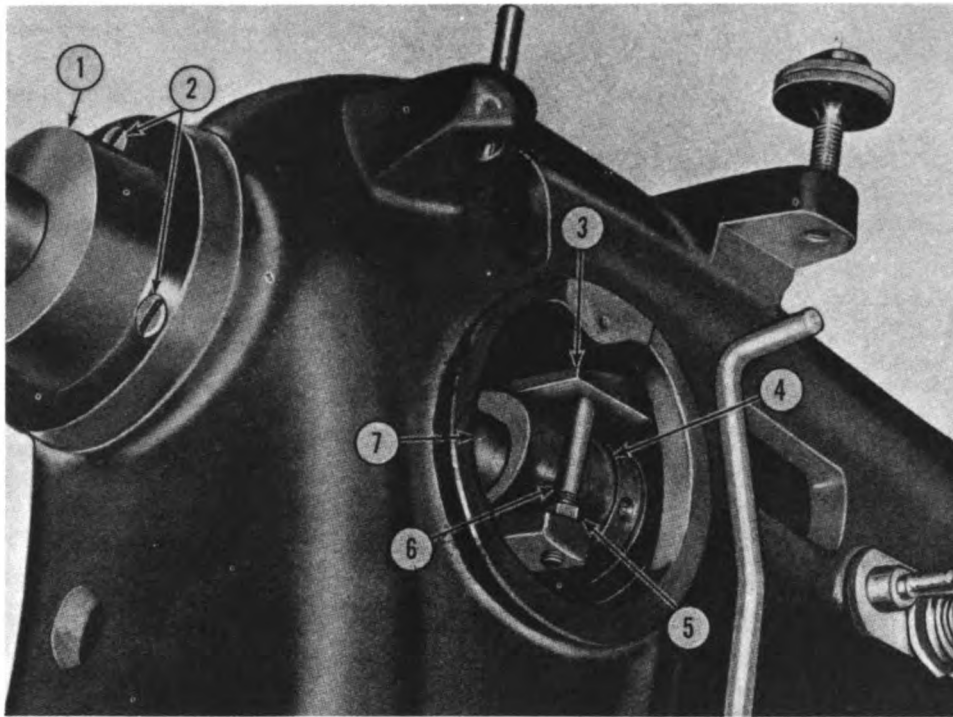
d. Adjustment. Adjust feed regulator (TM 10-3530-202-10).

- 1 Screw, feed regulator position
- 2 Screw, feed regulator, adjusting
- 3 Shaft, feed regulator
- 4 Setscrews, feed shaft collar
- 5 Collar, feed regulator shaft
- 6 Nut, feed regulator adjusting screw
- 7 Screw, feed regulator connection hinge
- 8 Screw, needle guide lower rock shaft crank connecting rod hinge, upper
- 9 Connecting rod, needle guide rock shaft crank, lower

- 10 Screw, feed shaft crank clamping, back
- 11 Crank, feed shaft, back
- 12 Screws, feed shaft crank clamping, back
- 13 Screw, feed shaft crank clamping, back
- 14 Nut, feed regulator adjusting stud
- 15 Washer, feed regulator adjusting stud nut
- 16 Connection, feed regulator
- 17 Stud, feed regulator adjusting
- 18 Regulator, feed

Figure 57. Feed regulator, shaft, and related parts, exploded view.





- 1 Bushing, flanged, back, arm shaft
- 2 Screws, arm shaft flanged bushing, back
- 3 Regulator, feed
- 4 Collar, arm shaft

- 5 Nut, feed regulator adjusting screw
- 6 Screw, feed regulator, adjusting
- 7 Shaft, arm

Figure 58. Rear of machine head, partially disassembled.

88. Shuttle Assembly

a. Removal.

- (1) Snap open cover (26, fig. 59).
- (2) Remove screws (1) that attach race (2) to machine bed, and remove race with cover, shuttle cylinder assembly (3), ring (5), springs (21), and back (6) from machine bed.

b. Disassembly.

- (1) Remove shuttle race cover lock screws (25) from cover.
- (2) Remove shuttle race screws from race.
- (3) Remove setscrew that holds shuttle race cover hinge pin in place, remove pin, and separate cover and race.
- (4) Remove setscrew that holds shuttle race ring position stud in place and remove stud.
- (5) Remove screws that attach shuttle race cover lock screw bushings to race, and remove bushings.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect assembly for unserviceable parts and install serviceable parts.

d. *Assembly and Installation.* Reverse procedures in a and b above.

89. Presser Foot and Holder

a. Removal.

- (1) Remove presser foot screw that attaches presser foot (8, fig. 52) to holder (10), and remove presser foot.
- (2) Remove screw (9) that attaches holder to presser bar (11) and remove holder.

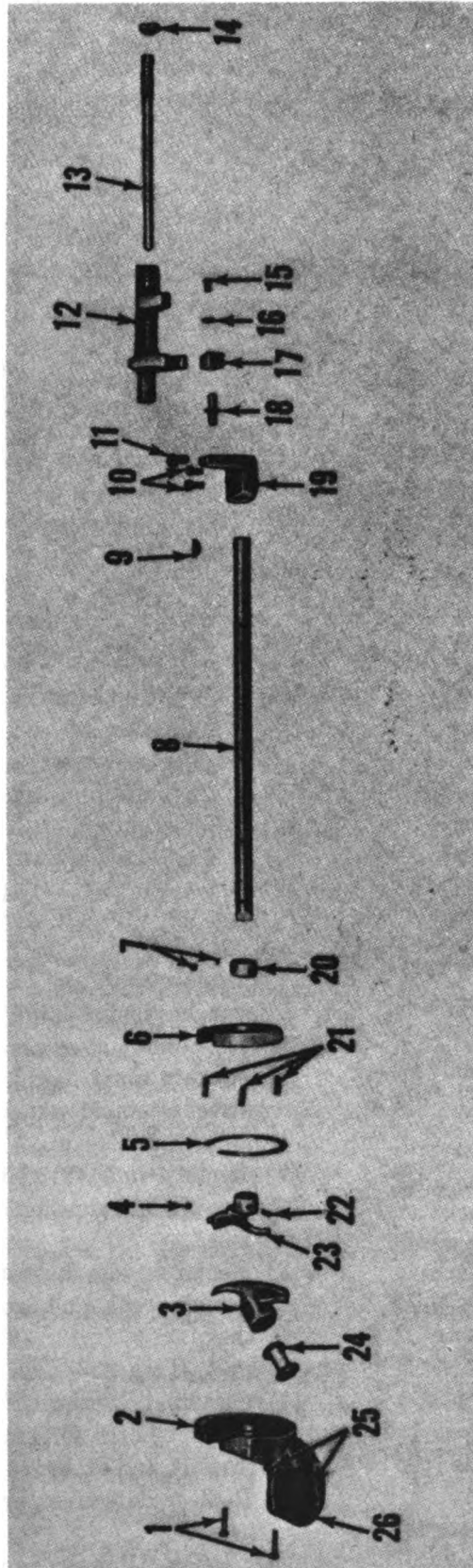
b. *Installation.* Reverse procedure in a above.

c. *Adjustment.* Adjust presser foot by turning pressure regulating thumbscrew on top of machine head.

90. Needle Plate and Holder

a. Removal.

- (1) Raise the needle to its highest position by turning balance wheel.
- (2) Remove screw that attaches plate (7, fig. 52) to holder (5), and slide out plate.



- | | | | |
|----|--|----|---------------------------------|
| 1 | Screws, shuttle race | 19 | Crank, oscillating shaft |
| 2 | Race, shuttle | 20 | Collar, oscillating shaft |
| 3 | Cylinder assembly, shuttle | 21 | Springs, shuttle race |
| 4 | Setscrew, shuttle driver | 22 | Pin, driver shuttle |
| 5 | Ring, shuttle race | 23 | Driver, shuttle |
| 6 | Back, shuttle race | 24 | Bobbin, shuttle |
| 7 | Setscrews, oscillating shaft collar | 25 | Screws, shuttle race cover lock |
| 8 | Shaft, oscillating | 26 | Cover, shuttle race |
| 9 | Key, oscillating shaft crank | | |
| 10 | Screws, oscillating shaft crank clamping | | |
| 11 | Screw, oscillating shaft crank slide block stud clamping | | |
| 12 | Hinge, oscillating rock shaft | | |
| 13 | Pin, oscillating rock shaft hinge | | |
| 14 | Nut, oscillating rock shaft hinge pin | | |
| 15 | Capscrew, oscillating shaft crank slide block | | |
| 16 | Washer, oscillating shaft crank slide block cap screw | | |
| 17 | Block, oscillating shaft crank slide | | |
| 18 | Stud, oscillating shaft crank slide block | | |

Figure 59. Oscillating shaft, shuttle drive, and bobbin, exploded view.

- (3) Remove setscrews (6) that attach holder to machine bed, and remove holder.

b. Installation. Reverse procedure in *a* above.

91. Lifting Lever

a. Removal.

- (1) Remove screw that attaches link (17, fig. 54) to lever (2).
- (2) Remove screw (1) that attaches lever to machine arm, spring top part of rod (27) out of hole in lever, and remove lever.

b. Inspection and Repair.

- (1) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

92. Thread Takeup Lever, Connection, and Roller

a. Removal.

- (1) Remove needle bar connecting link and crank (para. 94).
- (2) Remove thumbscrew and spring from connection (10, fig. 55).
- (3) Remove screw (14) that attaches lever (11) to machine arm, and remove lever with connection (10) and roller assembly.

b. Disassembly.

- (1) Remove nut (17) that attaches screw stud and roller to lever, and remove screw stud and roller.
- (2) Remove screws that attach rollers (34) and covers to lever, and remove covers and rollers.
- (3) Remove screw that attaches connection to lever, and remove connection.

c. Cleaning, Inspection and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, stripped threads, burs, and excessive wear.
- (3) Replace unserviceable parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

93. Needle Bar and Frame

a. Removal.

- (1) Loosen screw that attaches needle (2, fig. 60) to clamp, and remove needle.
- (2) Remove screws that attach faceplate to machine face, and remove faceplate.

- (3) Remove screw (25, fig. 51) that attaches presser foot (26) to holder (24), and remove presser foot.

- (4) Remove screws that attach bracket (18) to presser bar (19), and slide presser bar out top of machine head.

- (5) Remove screw that attaches needle bar frame hinge screw to machine head, and remove hinge screw.

- (6) Remove capscrew that attaches stud (7, fig. 60) to link (8), and remove frame (23).

- (7) Align screws in stud (7) with holes in frame, and remove screws.

- (8) Slide bar from frame.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for bends, cracks, burs, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

94. Needle Bar Connecting Link and Cranks

a. Removal.

- (1) Remove screws that attach arm front cover to machine face, and remove cover.

- (2) Remove screws that attach faceplate to machine face, and remove faceplate.

- (3) Remove presser bar (para. 98).

- (4) Remove needle bar frame assembly (para. 93).

- (5) Remove nut from hinge screw (11) that attaches inside crank (10, fig. 60) to cam (14), and remove screw.

- (6) Remove nut from hinge screw (12) that attaches outside crank (9) to cam (14), and remove screw.

- (7) Remove link (8), inside crank, outside crank, and extension (17) from machine face.

- (8) Remove screw that attaches inside crank, outside crank, and extension and separate them.

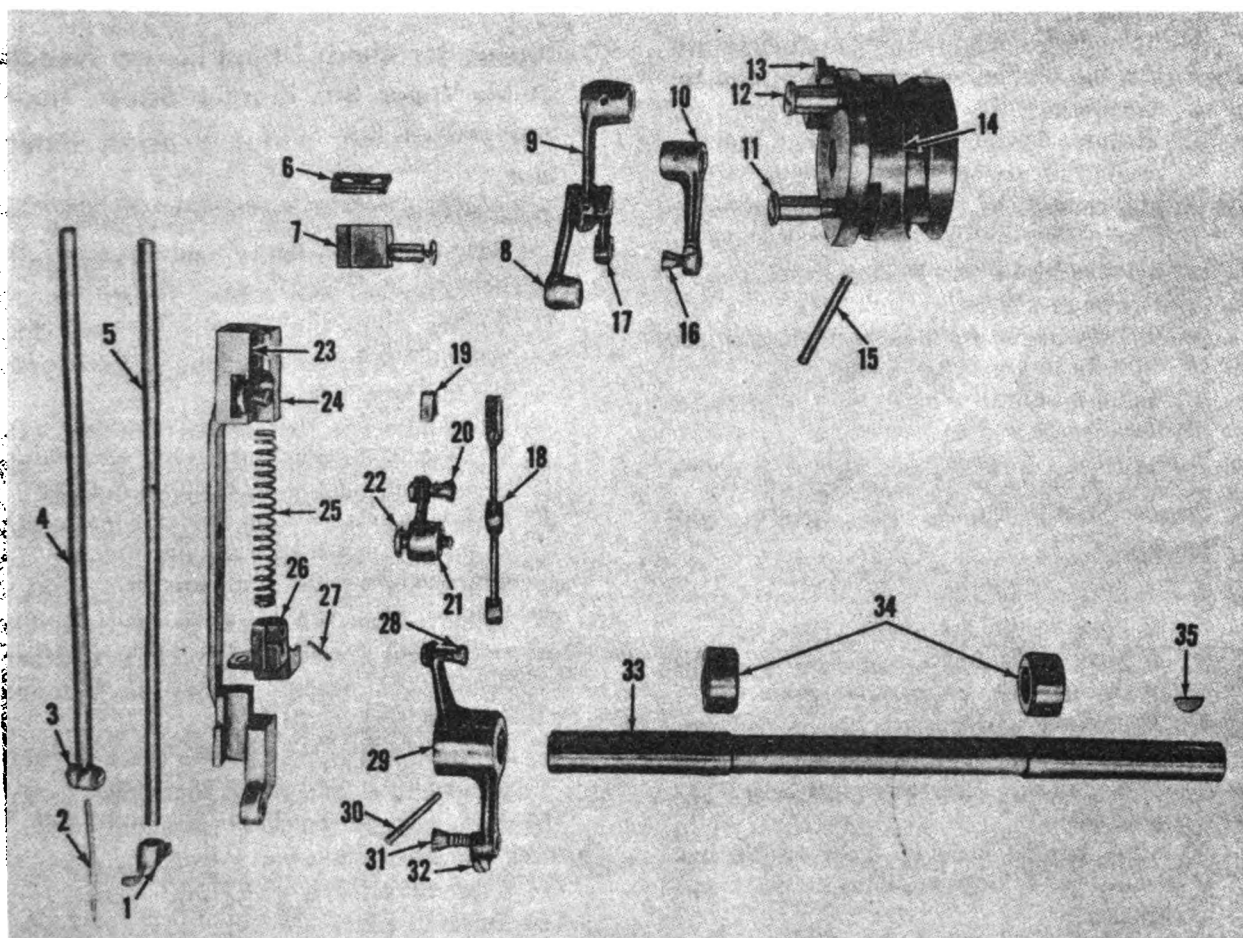
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.



- | | | | |
|----|--|----|---|
| 1 | Guide, needle, upper | 18 | Connection, needle bar frame |
| 2 | Needle | 19 | Block, needle bar frame connection alide |
| 3 | Clamp with screw, needle | 20 | Screw, needle bar frame connection hinge |
| 4 | Bar, needle | 21 | Arm, needle bar frame connection |
| 5 | Bar, needle guide, upper | 22 | Screw, needle bar frame connection arm hinge |
| 6 | Cushion, needle guide upper bar bracket | 23 | Frame, needle bar |
| 7 | Stud with capscrew, needle bar connecting | 24 | Screw with nut, needle bar frame connection alide block hinge |
| 8 | Link, needle bar connecting | 25 | Spring, needle guide bar, upper |
| 9 | Crank with clamping screw, inside, needle bar connecting link | 26 | Bracket with screws, needle guide bar, upper |
| 10 | Crank with clamping screw, outside, needle bar connecting link | 27 | Pin, needle guide upper bar bracket |
| 11 | Screw, needle bar connecting link crank, inside, hinge | 28 | Screw and nut, needle bar frame connection hinge |
| 12 | Screw, needle bar connecting link crank, outside, hinge | 29 | Crank, feed shaft, front |
| 13 | Support with capscrews, thread takeup cam | 30 | Pin, feed shaft crank, front |
| 14 | Cam, thread takeup | 31 | Screw, needle bar frame hinge |
| 15 | Pin, thread takeup cam | 32 | Screw, feed shaft crank, front, clamping |
| 16 | Screw, needle bar connecting link extension hinge | 33 | Shaft, feed |
| 17 | Extension, needle bar connecting link | 34 | Collars with setscrews, feed shaft, back and front |
| | | 35 | Key, feed shaft crank, back |

Figure 60. Needle bar frame assembly and related parts, exploded view.

95. Needle Bar Frame Connection Arm and Connection

a. Removal.

- (1) Remove locknut on stud that attaches arm (22, fig. 61) to connection (23), and remove stud.
- (2) Remove locknut on stud that attaches crank (26) to connection, and remove stud and connection.
- (3) Remove screw (21) that attaches arm to machine head, and remove arm.

b. Inspection and Repair.

- (1) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable ones.

c. Installation. Reverse procedure in *a* above.

96. Upper Needle Guide, Bar, Spring, and Bracket

a. Removal.

- (1) Remove needle bar frame (para. 98).
- (2) Remove screw that attaches guide (1, fig. 60) to bar (5), and remove guide.
- (3) Align screws in bracket (26) with holes in frame (23), and remove screws.
- (4) Drive out pin (27) that attaches bar (5) to bracket.
- (5) Slide needle bar (4) from needle bar frame and remove spring (25) and bracket.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for breaks, cracks, burs, and excessive wear.

- (8) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

97. Presser Bar Clutch Lifting Lever, Needle Guide Upper Bar Bracket Slide Block, and Presser Bar Spring Bracket Extension

a. Removal.

- (1) Remove screws that attach faceplate to machine face, and remove faceplate.
- (2) Loosen screw that attaches presser foot assembly to presser bar, and remove presser foot assembly.
- (3) Loosen screws that attach bracket (18, fig. 54) to presser bar (19), and slide presser bar out top of machine head.
- (4) Remove screw (1) that attaches lever (2) to machine head, and remove lever.
- (5) Lift out block (20) and extension (16).
- (6) Remove screw that attaches needle guide upper bar bracket slide block leather cushion to bracket (21), and remove cushion.
- (7) Remove screw that attaches bracket (21) to stud (23), and remove bracket.
- (8) Push stud out bottom of machine head.

b. Cleaning, Inspection, and Repair.

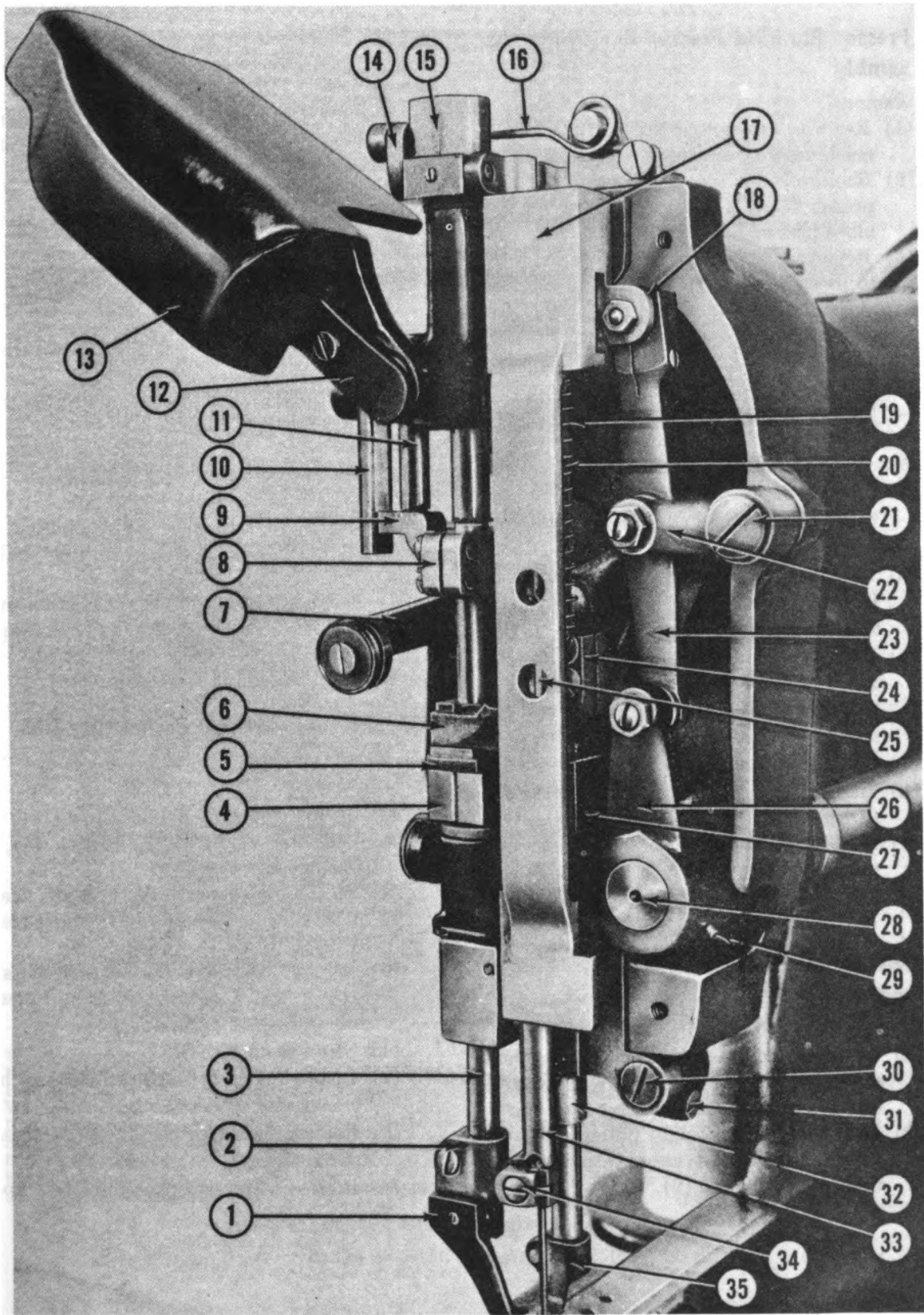
- (1) Clean metal parts with SD.
- (2) Inspect parts for stripped threads, cracks, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

- 1 Foot, presser
- 2 Holder, presser foot
- 3 Bar, presser
- 4 Bracket, presser bar guide
- 5 Block, needle guide upper bar bracket slide
- 6 Bracket, needle guide bar, upper
- 7 Lever, takeup
- 8 Bracket assembly, presser bar spring
- 9 Bracket assembly, presser bar spring
- 10 Link, lifting lever
- 11 Extension, presser bar spring bracket
- 12 Spring, arm front cover
- 13 Cover, arm front
- 14 Lever, presser bar clutch
- 15 Clutch, presser bar
- 16 Spring, clutch, presser bar
- 17 Frame, needle bar
- 18 Block, needle bar frame connection slide

- 19 Spring, needle guide bar, upper
- 20 Bar, needle guide, upper
- 21 Screw, needle bar frame connection arm hinge
- 22 Arm, needle bar frame connection
- 23 Connection, needle bar frame
- 24 Bracket, needle guide bar, upper
- 25 Bar, needle
- 26 Crank, feed shaft, front
- 27 Stud, needle bar connecting
- 28 Shaft, feed
- 29 Pin, feed shaft crank, front
- 30 Screw, needle bar frame hinge
- 31 Screw, needle bar frame hinge clamping screw
- 32 Frame, needle
- 33 Bar, needle
- 34 Clamp, needle
- 35 Guide, needle, upper

Figure 61. Very-heavy-duty sewing machine, face assemblies.



98. Presser Bar and Presser Bar Clutch Assembly

a. Removal.

- (1) Remove screws that attach faceplate to machine face, and remove faceplate.
- (2) Remove screw (25, fig. 54) that attaches presser foot (26) to holder (24), and remove presser foot.
- (3) Remove screws that attach bracket (18) to presser bar (19), and slide presser bar out top of machine head. Remove bracket and extension (16).
- (4) Lift out presser bar clutch (13).
- (5) Remove screw that attaches lever (8) to machine arm, and remove lever.
- (6) Lift off stud with roller (7).

b. Disassembly.

- (1) Remove setscrew that attaches lever (14) to clutch (13), and remove hinge pin and lever.
- (2) Remove capscrew (12) that attaches presser bar clutch clamp to lever (14), and remove clamp.
- (3) Remove nut on adjusting screw, and remove adjusting screw from presser bar clutch clamp.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

99. Driving Arm, Bracket, Friction Pulley, and Balance Wheel

a. Removal and Disassembly.

- (1) Remove nuts (5 and 12, fig. 62) from screws (6 and 13) and remove screws and arm (14) from bracket (11).
- (2) Remove belt (2), slide pulley (17) off driving shaft, and remove spring (15, fig. 63), and washer (2).

- (3) Slide belt (3, fig. 62) off wheel (1).
- (4) Loosen setscrew (3, fig. 63) that attaches wheel (14) to shaft (13).
- (5) Remove screw (10, fig. 62) that attaches bracket to machine base and remove bracket.
- (6) Slide wheel off shaft.
- (7) Remove nut (16) and screw (15) from arm (14).

b. Inspection and Repair.

- (1) Inspect parts for cracks, breaks, and excessive wear.
- (2) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment.

- (1) Loosen nut (16) on screw (15).
- (2) Press down on starting treadle.
- (3) Back off screw (15) until pulley (17) turns freely without turning balance wheel (1).
- (4) Tighten screw (15) until friction pulley (17) will drive machine without slipping, when balance wheel (1) is turned.
- (5) Tighten nut (16) on screw (15).

100. Starting Treadle, Connecting Link, and Shaft

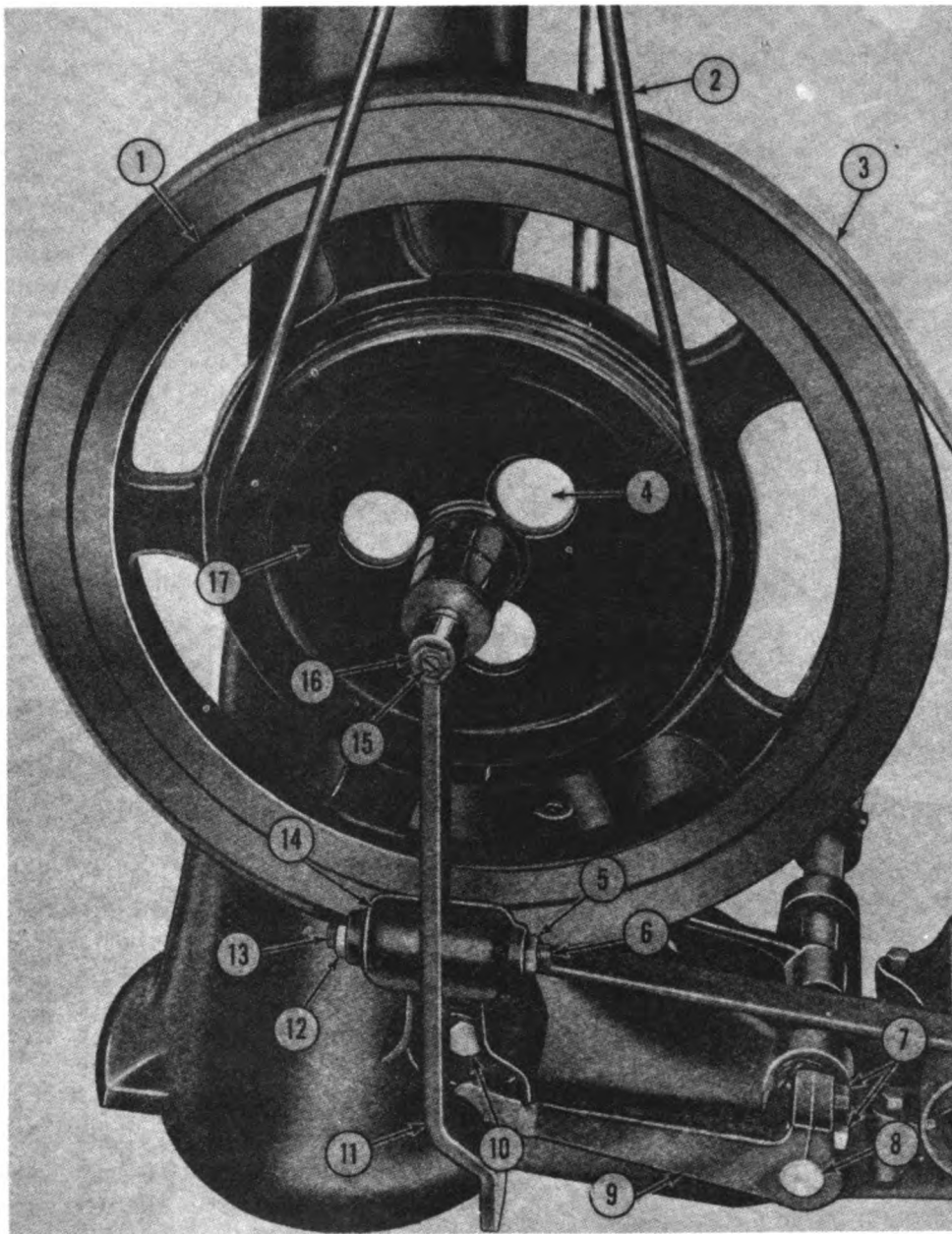
a. Removal.

- (1) Remove setscrews (8 and 9, fig. 64) that attach studs (5 and 7) to link (6), and remove studs and link.
- (2) Remove screws (1) that attach treadle (10) to machine base, and remove treadle with stand (3).
- (3) Remove setscrews (2) that attach shaft (4) to stand, remove shaft and treadle.

b. Cleaning, Inspection, and Repair.

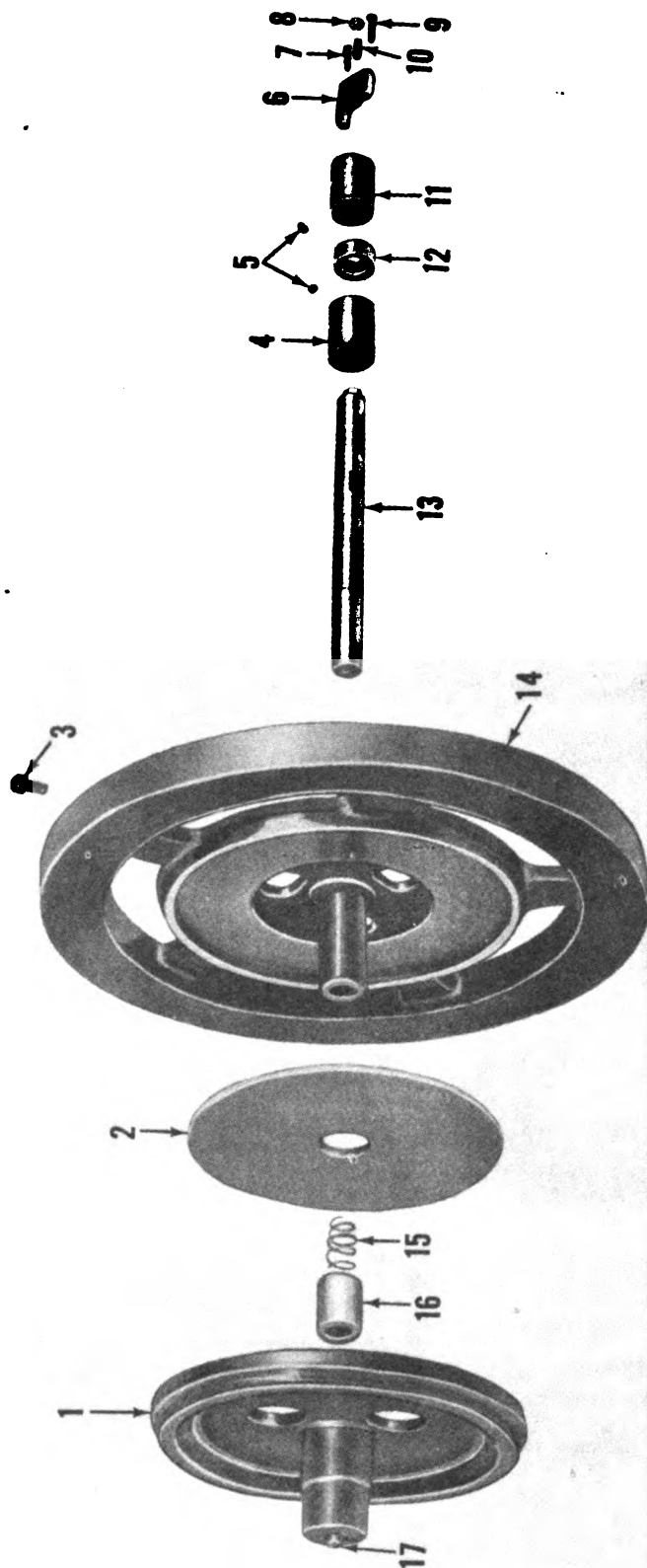
- (1) Clean parts with SD.
- (2) Inspect parts for stripped threads, burs, cracks, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.



- | | |
|---------------------------------------|-------------------------------------|
| 1 Wheel, balance | 10 Screw, driving arm bracket |
| 2 Belt, round | 11 Bracket, driving arm |
| 3 Belt, flat | 12 Nut, driving arm center screw |
| 4 Washer, friction, paper | 13 Screw, driving arm center |
| 5 Nut, driving arm center screw | 14 Arm, driving |
| 6 Screw, driving arm center | 15 Screw, driving arm adjusting |
| 7 Screws, starting shaft arm clamping | 16 Nut, driving arm adjusting screw |
| 8 Shaft, starting | 17 Pulley, friction |
| 9 Arm, driving, starting shaft | |

Figure 62. Balance wheel and clutch assembly, installed.

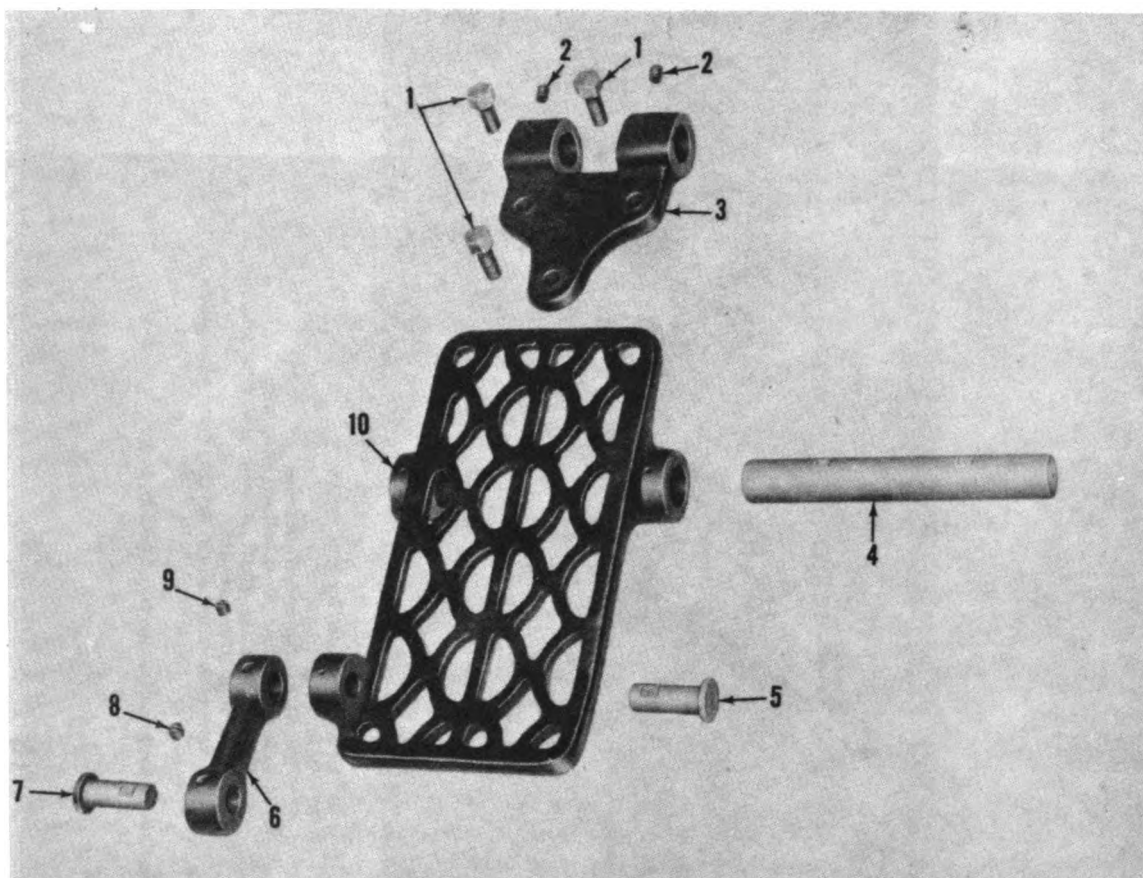


Pulley, friction

- 1 Washer, friction, paper
- 2 Setscrew, balance wheel
- 3 Bushing, balance wheel shaft
- 4 Setscrews, balance wheel shaft collar
- 5 Bracket, stop, balance wheel shaft
- 6 Screw, balance wheel shaft stop screw bracket
- 7 Nut, balance wheel shaft stop screw bracket
- 8 Screw, balance wheel shaft stop screw bracket

- 10 Screw, balance wheel shaft, stop
- 11 Bushing, balance wheel shaft
- 12 Collar, balance wheel shaft
- 13 Shaft, balance wheel
- 14 Wheel, balance
- 15 Spring, friction pulley
- 16 Bushing, friction pulley
- 17 Plug, center, wood, friction pulley

Figure 63. Balance wheel and clutch assembly, exploded view.



- 1 Screws, starting treadle stand
- 2 Setscrews, starting treadle shaft
- 3 Stand, starting treadle
- 4 Shaft, starting treadle
- 5 Stud, starting treadle connecting link hinge

- 6 Link, starting treadle connecting
- 7 Stud, starting treadle connecting link hinge
- 8 Setscrew, starting treadle connecting link hinge stud
- 9 Setscrew, starting treadle connecting link hinge stud
- 10 Treadle, starting

Figure 64. Starting treadle, shaft, and related parts, exploded view.

101. Foot Lifter Treadle, Starting Shaft, and Related Parts

a. Removal.

- (1) Remove setscrews (9, fig. 65) that attach collar (10) to shaft (3) and remove collar.
- (2) Remove screw (12) that attaches collar (7) to shaft.
- (3) Remove screws (13) that attach arm (6) to shaft.
- (4) Remove screws (15) that attach arm (1) to shaft, and remove arm and spring (2).
- (5) Drive out shaft.

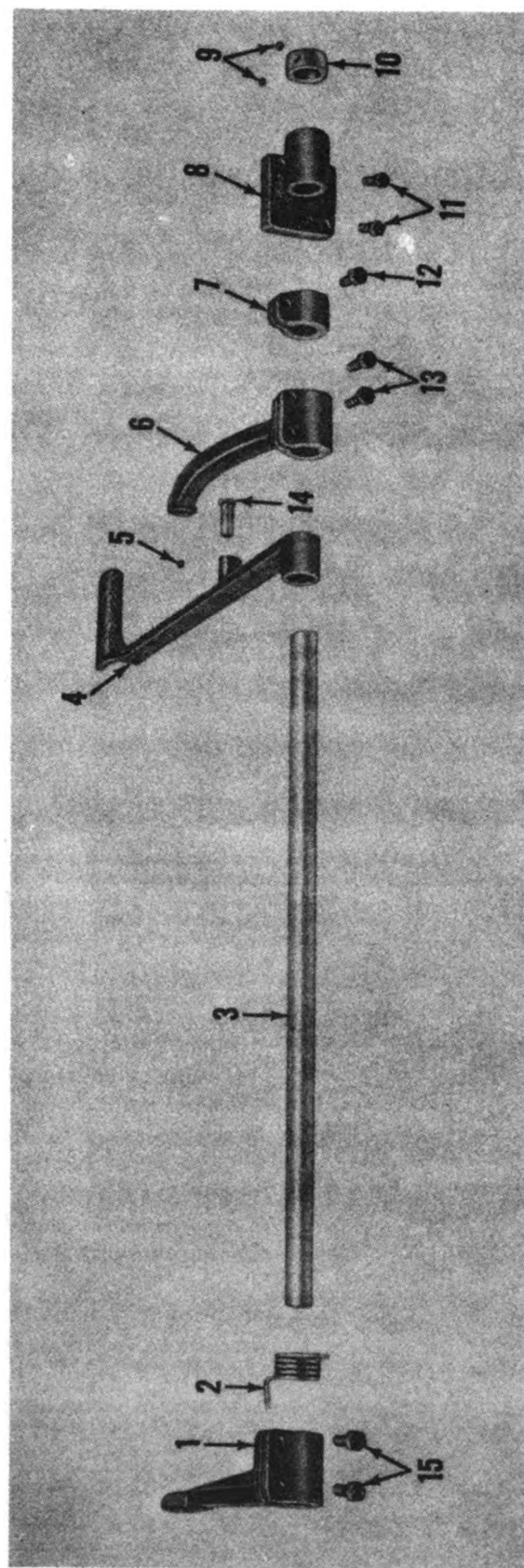
- (6) Remove screws (11) that attach bracket (8) to machine base (19, fig. 66), and remove bracket.

- (7) Remove setscrew (5, fig. 65) that attaches stud (14) to treadle (4), and remove treadle from front of machine base.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, breaks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

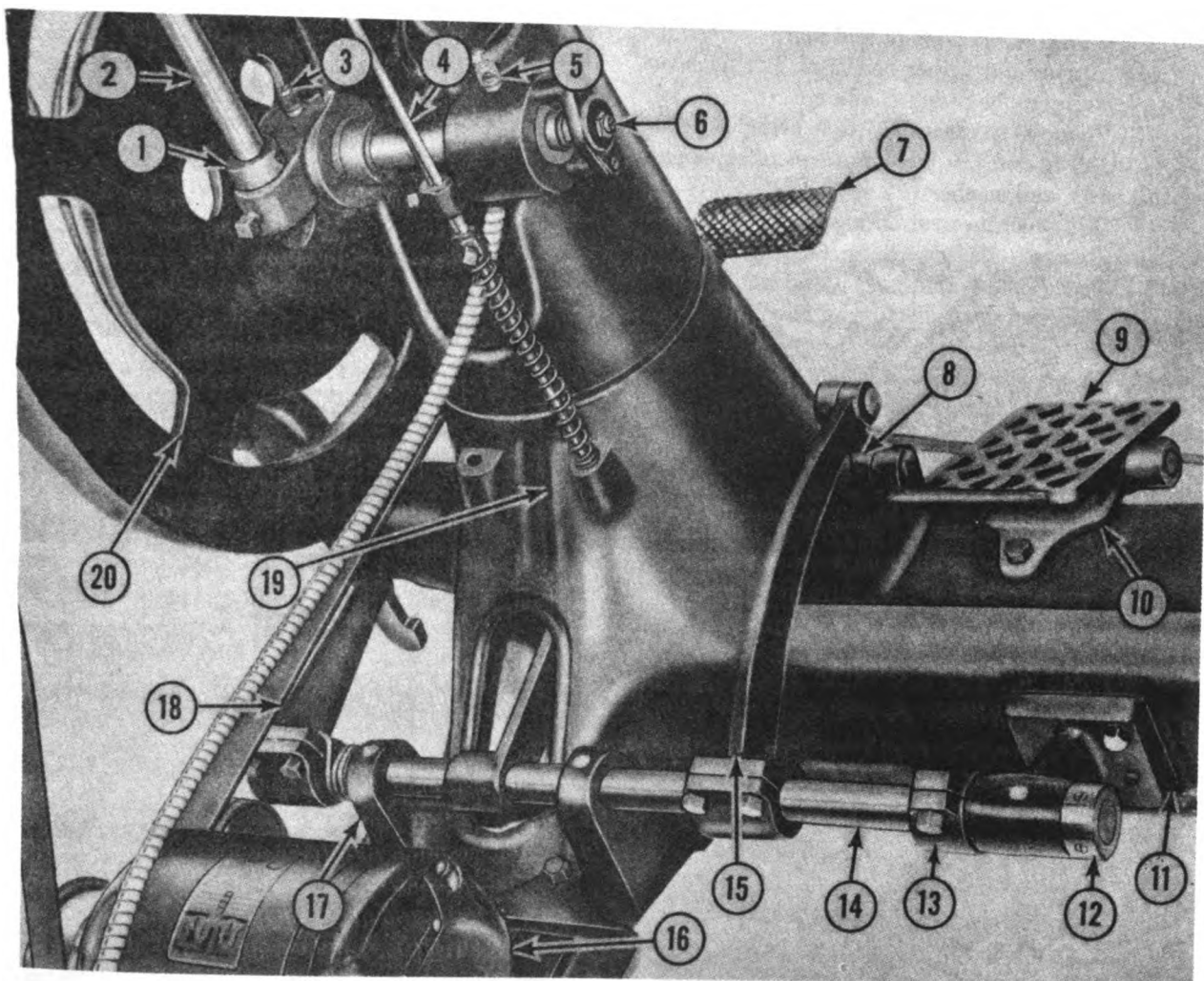
c. Installation. Reverse procedure in a above.



- 1 Arm, driving, starting shaft
- 2 Spring, treadle
- 3 Shaft, starting
- 4 Treadle, foot lifter
- 5 Setscrew, foot lifter treadle stud
- 6 Arm, treadle, starting shaft
- 7 Collar, starting shaft
- 8 Bracket, starting shaft

- 9 Setscrews, starting shaft collar
- 10 Collar, starting shaft
- 11 Screws, starting shaft bracket
- 12 Screw, starting shaft collar clamping
- 13 Screws, starting shaft treadle arm clamping
- 14 Stud, foot lifter treadle
- 15 Screws, starting shaft driving arm clamping

Figure 65. Foot lifter treadle, starting shaft, and related parts, exploded view.



- | | |
|--------------------------------------|---------------------------------|
| 1 Collar, table shaft | 11 Bracket, starting shaft |
| 2 Shaft, table | 12 Collar, starting shaft |
| 3 Fitting, lubrication | 13 Collar, starting shaft |
| 4 Rod, foot lifter treadle pin upper | 14 Shaft, starting |
| 5 Fitting, lubrication | 15 Arm, treadle, starting shaft |
| 6 Bracket, stop, balance wheel shaft | 16 Motor, electric |
| 7 Treadle, foot lifter | 17 Spring, treadle |
| 8 Link, starting treadle connecting | 18 Arm, driving, starting shaft |
| 9 Treadle, starting | 19 Base, column stand |
| 10 Stand, starting treadle | 20 Wheel, balance |

Figure 66. Balance wheel, clutch assembly, and starting treadle assembly, mounted.

102. Upper and Lower Foot Lifter Treadle Pitman Rod and Related Parts

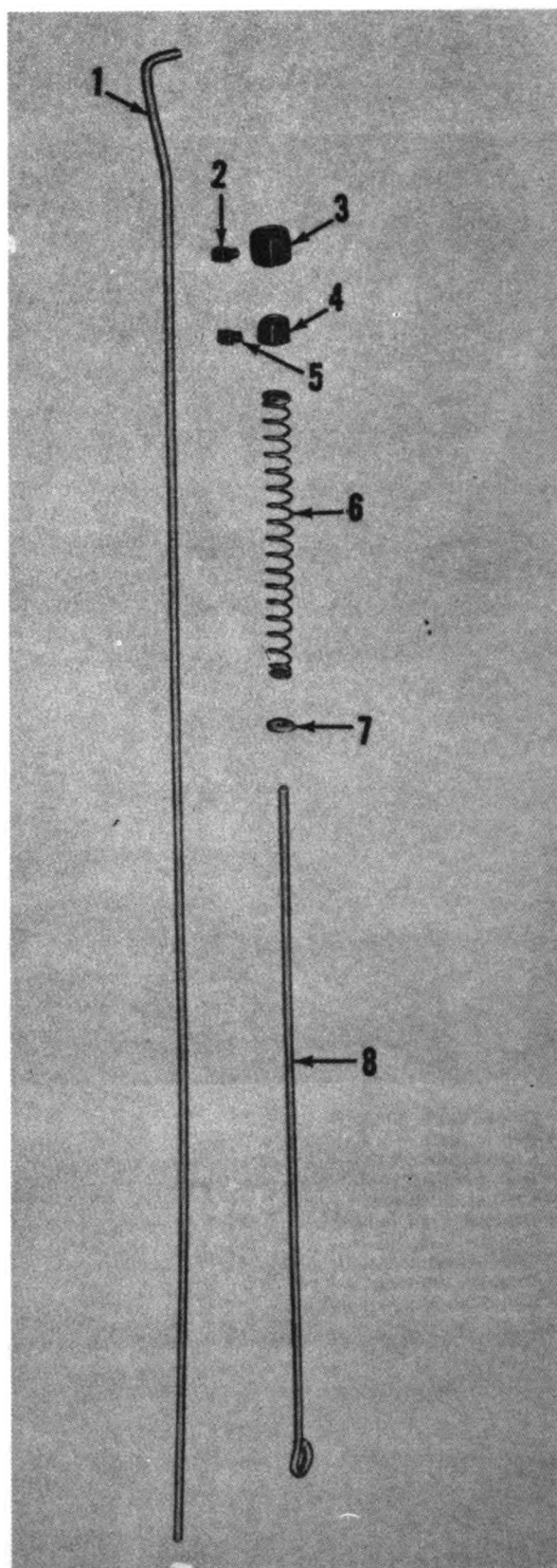
a. Removal.

- (1) Remove setscrew (2, fig. 67) that attaches clamp (3) to rods (1 and 8).
- (2) Spring out upper rod from lifting lever, and remove rod and collar.
- (3) Remove setscrew (5) that attaches collar (4) to rod (8), and remove collar, spring (6), and washer (7).
- (4) Tilt machine over on its side.
- (5) Remove setscrew (5, fig. 65) that attaches stud (14) to treadle (4), and remove stud.
- (6) Pull rod from bottom of machine.

b. Inspection and Repair.

- (1) Inspect rods for bends and excessive wear.
- (2) Inspect spring for proper tension and breaks.
- (3) Inspect setscrews for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in a above.



- 1 Rod, foot lifter treadle pitman, upper
- 2 Setscrew, foot lifter treadle pitman rod clamp
- 3 Clamp, foot lifter treadle pitman rod
- 4 Collar, foot lifter treadle pitman rod upper spring
- 5 Setscrew, foot lifter treadle pitman rod upper stop collar
- 6 Spring, foot lifter treadle pitman rod, lower
- 7 Washer, foot lifter treadle pitman rod lower spring
- 8 Rod, foot lifter treadle pitman, lower

Figure 67. Upper and lower foot lifter treadle pitman rod and related parts, exploded view.

103. Table, Table Shaft, Latch, and Spring

a. Removal.

- (1) Remove setscrew (3, fig. 68) that attaches thread unwinder rod to shaft (2), and remove thread unwinder.
- (2) Remove setscrew (5) in collar (4), loosen setscrew (13) that attaches shaft (2) to machine base, and remove shaft, table (6), and collar.
- (3) Remove screw (7) that attaches latch (9) to column (15), and remove spring (8) and latch.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, breaks, bends, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in a above.

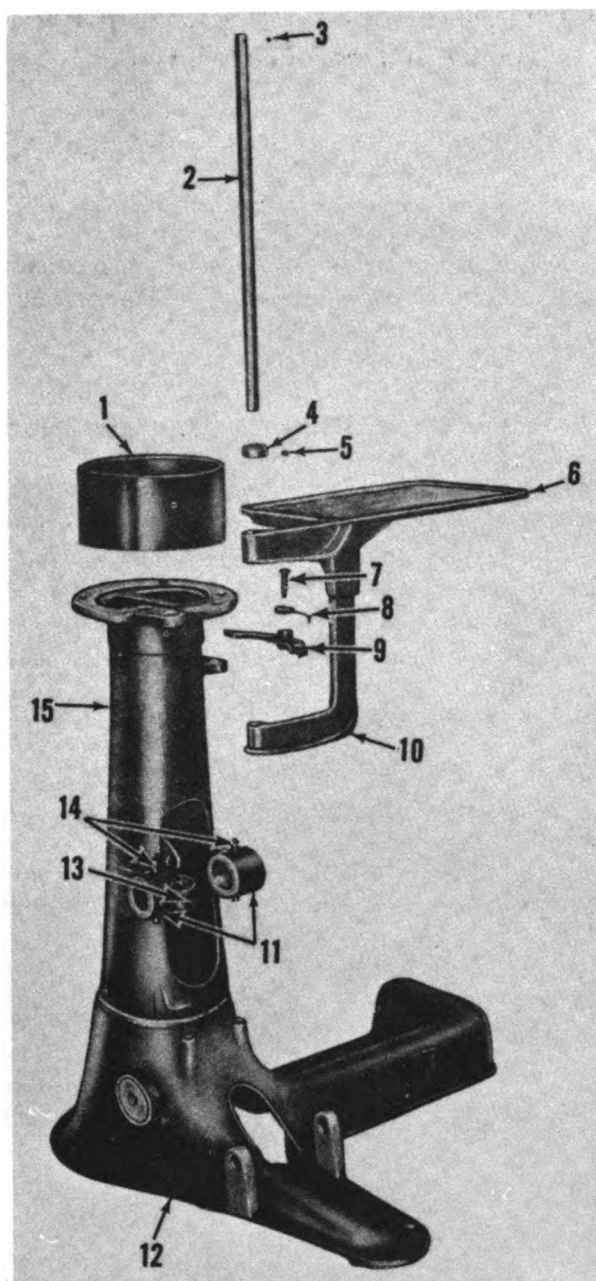
104. Wax Box Assembly

a. Removal.

- (1) Disconnect heating element from electrical source.
- (2) Remove screws that attach wax box (12, fig. 69) to machine arm, and remove wax box.

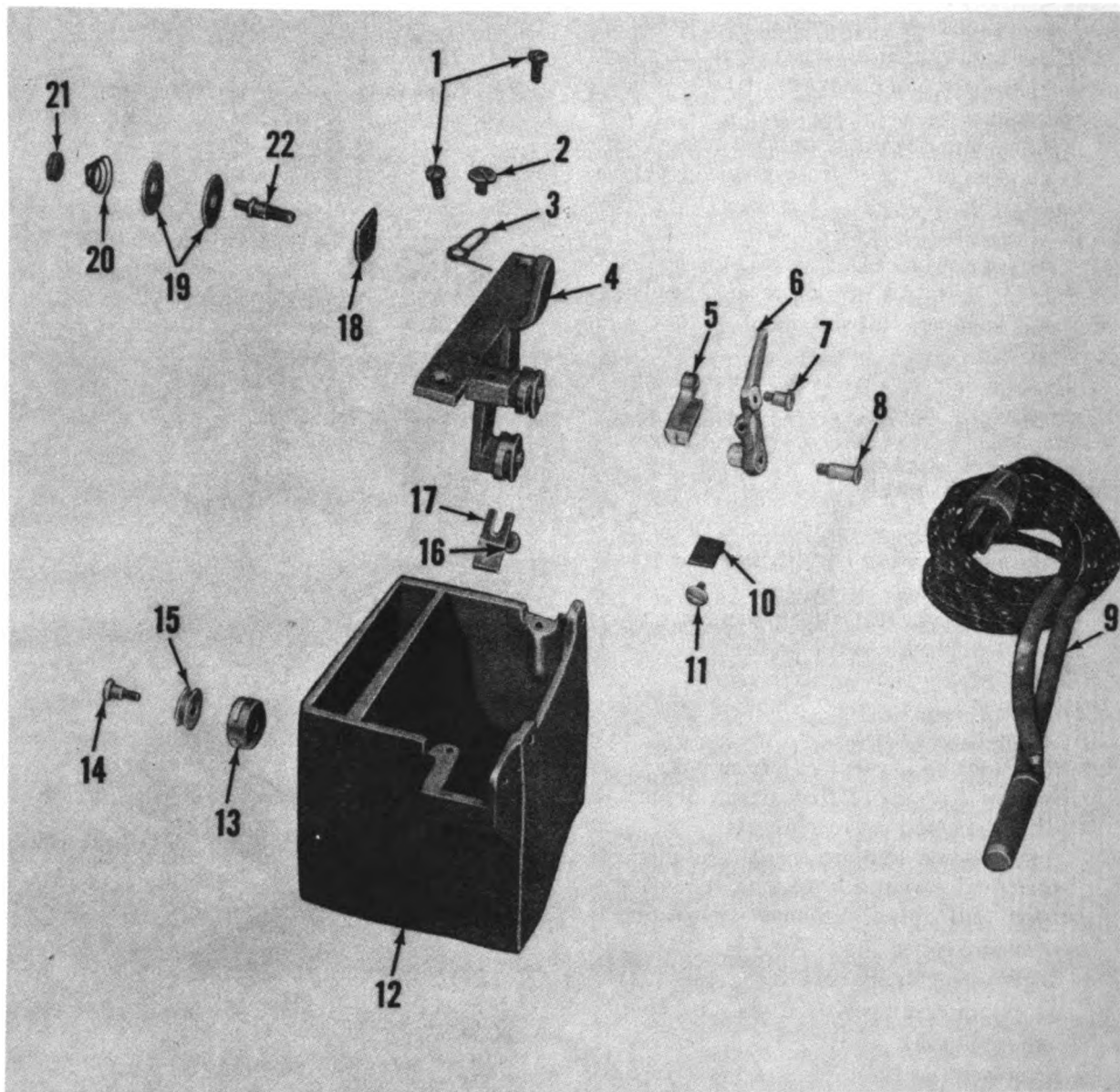
b. Disassembly.

- (1) Remove wax from box.
- (2) Slide heating element (9) from box.
- (3) Remove screws (1) that attach bracket (4) to box, and remove bracket.
- (4) Remove screw that attaches thread guide roller and cover to bracket, and remove cover and roller. Remove remaining cover and roller.
- (5) Remove thumbnut (21) from stud (22) and remove spring (20), disks (19), stud, and guide (18).
- (6) Remove screw (16) that attaches stripper (17) to bracket, and remove stripper.
- (7) Remove screw (2) that attaches spring (3) to bracket, and remove spring.
- (8) Remove screw (11) that attaches spring (10) to arm (6), and remove spring.
- (9) Remove screw (7) that attaches stripper (5) to arm, and remove stripper.
- (10) Remove screw (8) that attaches arm to bracket, and remove arm.



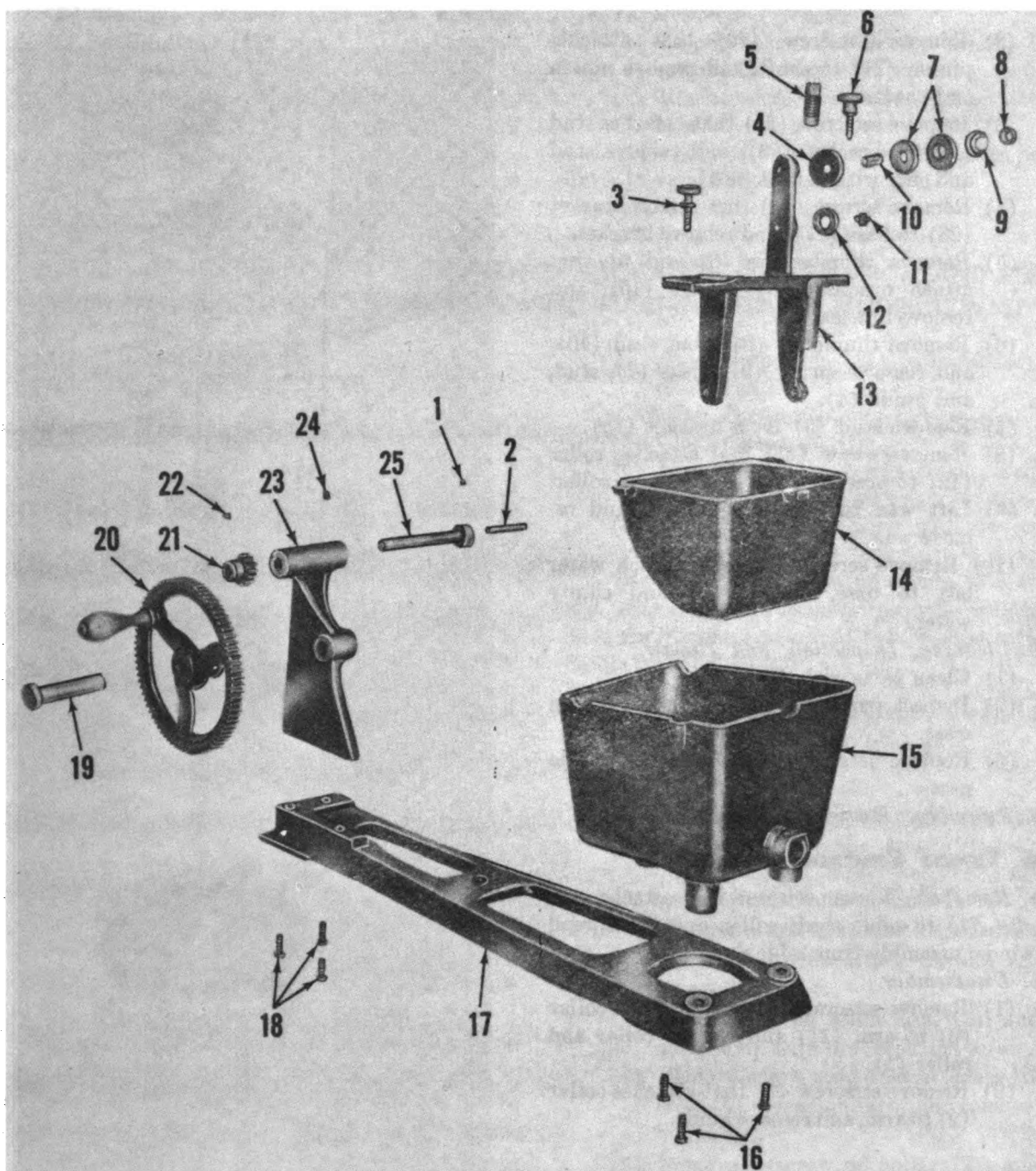
- 1 Extension, column
- 2 Shaft, table
- 3 Setscrew, table shaft
- 4 Collar, table shaft
- 5 Setscrew, table shaft collar
- 6 Table, column
- 7 Screw, table latch hinge
- 8 Spring, table latch
- 9 Latch, table
- 10 Bracket, table
- 11 Setscrews, balance wheel shaft
- 12 Base, column stand
- 13 Setscrew, table shaft
- 14 Fittings, lubrication, balance wheel shaft
- 15 Column, stand

Figure 68. Base, column, and related parts, exploded view.



- | | | | |
|----|--|----|---|
| 1 | Screws, wax box tension bracket | 12 | Box, wax |
| 2 | Screw, wax box thread stripper, lower arm spring | 13 | Cover, thread guide roller, wax box |
| 3 | Spring, wax box thread stripper, lower arm | 14 | Roller, thread guide, wax box |
| 4 | Bracket, wax box tension | 15 | Screw, thread guide roller, wax box |
| 5 | Stripper, wax box thread, lower | 16 | Screw, wax box thread stripper, upper |
| 6 | Arm, wax box thread stripper, lower | 17 | Stripper, wax box thread, upper |
| 7 | Screw, wax box thread stripper, lower hinge | 18 | Guide, wax box tension thread |
| 8 | Screw, wax box thread stripper, lower arm hinge | 19 | Disks, wax box tension |
| 9 | Element, heating, wax box | 20 | Spring, helical, compression, wax box tension |
| 10 | Spring, wax box thread stripper, lower | 21 | Thumbnut, wax box tension regulating |
| 11 | Screw, wax box thread stripper, lower spring | 22 | Stud, wax box tension guide |

Figure 69. Wax box assembly, exploded view.



- | | | | |
|----|--|----|---------------------------------|
| 1 | Setscrew, spindle | 14 | Box, wax, bobbin winder |
| 2 | Spindle | 15 | Box, water |
| 3 | Thumbscrew, wax box tension bracket | 16 | Screw, water box |
| 4 | Guide, wax box tension thread guide | 17 | Base, bobbin winder |
| 5 | Stud, wax box tension thread stripper regulating | 18 | Screws, gear bracket |
| 6 | Thumbscrew, wax box tension bracket | 19 | Stud, gear hinge |
| 7 | Disks, wax box tension | 20 | Gear with handle, bobbin winder |
| 8 | Thumbnut, wax box tension regulating | 21 | Pinion, gear |
| 9 | Spring, helical, compression, wax box tension | 22 | Setscrew, pinion |
| 10 | Stud, wax box tension screw | 23 | Bracket, gear |
| 11 | Screw, wax box tension thread guide roller | 24 | Setscrew, gear hinge stud |
| 12 | Roller, wax box tension thread guide | 25 | Shaft, spindle |
| 13 | Bracket, wax box tension | | |

Figure 70. Bobbin winder assembly, exploded view.

- (2) Remove setscrew (22) that attaches pinion (21) to shaft, and remove pinion and shaft.
- (3) Remove setscrew (24) that attaches stud (19) to bracket (23), and remove stud and gear with handle (20).
- (4) Remove screws (18) that attach bracket (28) to base (17), and remove bracket.
- (5) Remove thumbscrews (8 and 6) that attach bracket (13) to box (15), and remove bracket.
- (6) Remove thumbnut (8) from stud (10), and remove spring (9), disks (7), stud, and guide (4).
- (7) Remove stud (5) from bracket (13).
- (8) Remove screw (11) that attaches roller (12) to bracket (13), and remove roller.
- (9) Lift wax box from water box and remove wax.
- (10) Remove screws (16) that attach water box to base, remove box and empty water.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for defects and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly. Reverse procedure in *a* above.

106. Thread Unwinder Assembly

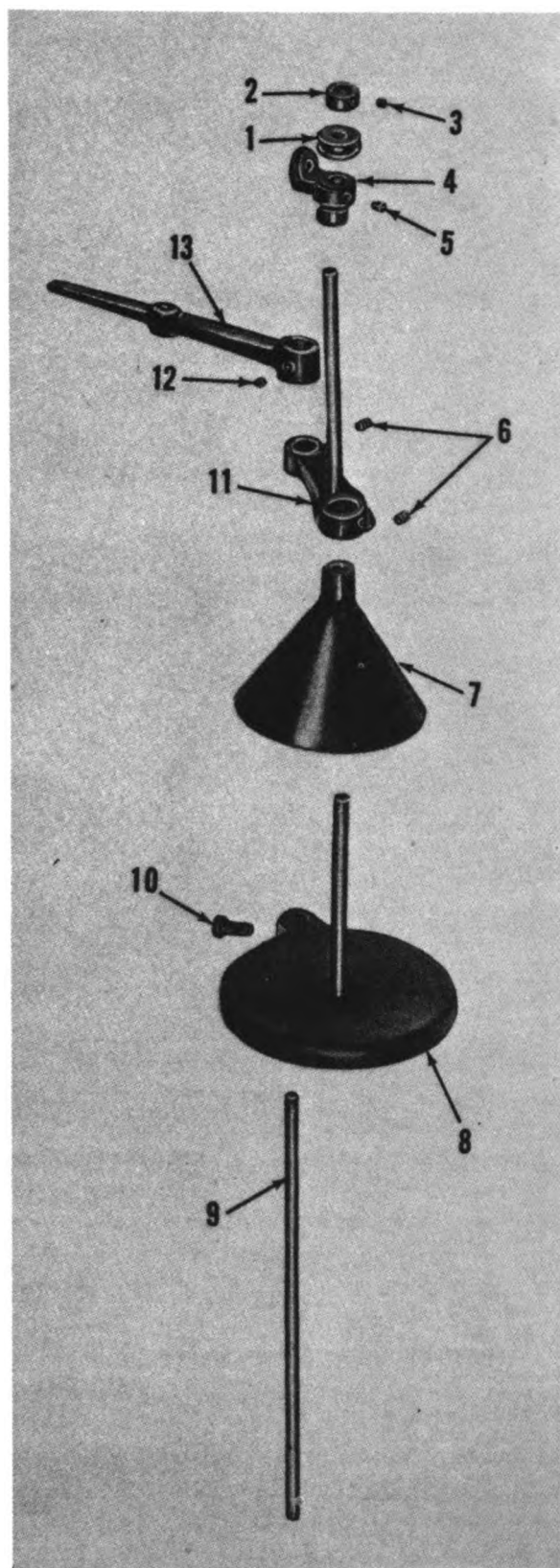
a. Removal. Loosen setscrew that attaches rod (9, fig. 71) to table shaft collar and lift thread unwinder assembly from table shaft.

b. Disassembly.

- (1) Remove setscrew (3) that attaches collar (2) to arm (11) and remove collar and roller (1).
- (2) Remove setscrew (5) that attaches collar (2) to arm, and remove guide.

-
- 1 Roller, thread unwinder
 - 2 Collar, roller, thread guide
 - 3 Setscrew, collar, thread guide, roller
 - 4 Guide, thread roller
 - 5 Setscrew, thread roller guide
 - 6 Setscrew, arm, thread guide
 - 7 Cone, thread guide
 - 8 Rest, spool
 - 9 Rod, thread unwinder
 - 10 Setscrew, spool rest
 - 11 Arm, thread guide
 - 12 Setscrew, thread straightener
 - 13 Straightener, thread

Figure 71. Thread unwinder, exploded view.



- (3) Remove setscrew (12) that attaches straightener (18) to rod (9), and remove straightener.
- (4) Remove setscrews (6) that attach arm to cone (7) and to rod, and remove cone and arm.
- (5) Remove setscrew (10) that attaches rest (8) to rod, and remove rest.

c. Inspection and Repair.

- (1) Inspect parts for bends, breaks, burs, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable ones.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

Section XI. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), ZIGZAG SEWING MACHINE (SINGER MODEL 17W15)

107. Pulley With Balance Wheel

a. Removal.

- (1) Slide round belt from pulley (28, fig. 72).
- (2) Remove adjusting screw from end of arm shaft.
- (3) Remove setscrews that attach pulley to arm shaft, and slide pulley with balance wheel off arm shaft.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

108. Needle Bar Frame Pitman Assembly

a. Removal.

- (1) Remove wingnut (16, fig. 73) and washer (15), and slide connection (7) off screw (14).
- (2) Remove screws that attach cap (5) to pitman (6) and remove cap.
- (3) Remove pitman from ball screw (4) on needle bar frame.
- (4) Loosen locknut that attaches ball screw to needle bar frame, and remove ball screw.
- (5) Remove screws that attach pitman connection (7) to pitman, and remove connection.
- (6) Remove setscrew on shaft collar (8) and remove collar from shaft that is attached to regulator (10).
- (7) Remove regulator from machine arm, and remove regulator roller (9) from regulator.
- (8) Remove screw (13) and washer (12) that

attach stop slide (11) to regulator, and remove slide.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust pitman connection slide for proper amount of side motion right of needle bar (TM 10-3530-202-10).

109. Knee Lifter Connection Lever, Foot Lifter Lifting Lever, and Rod

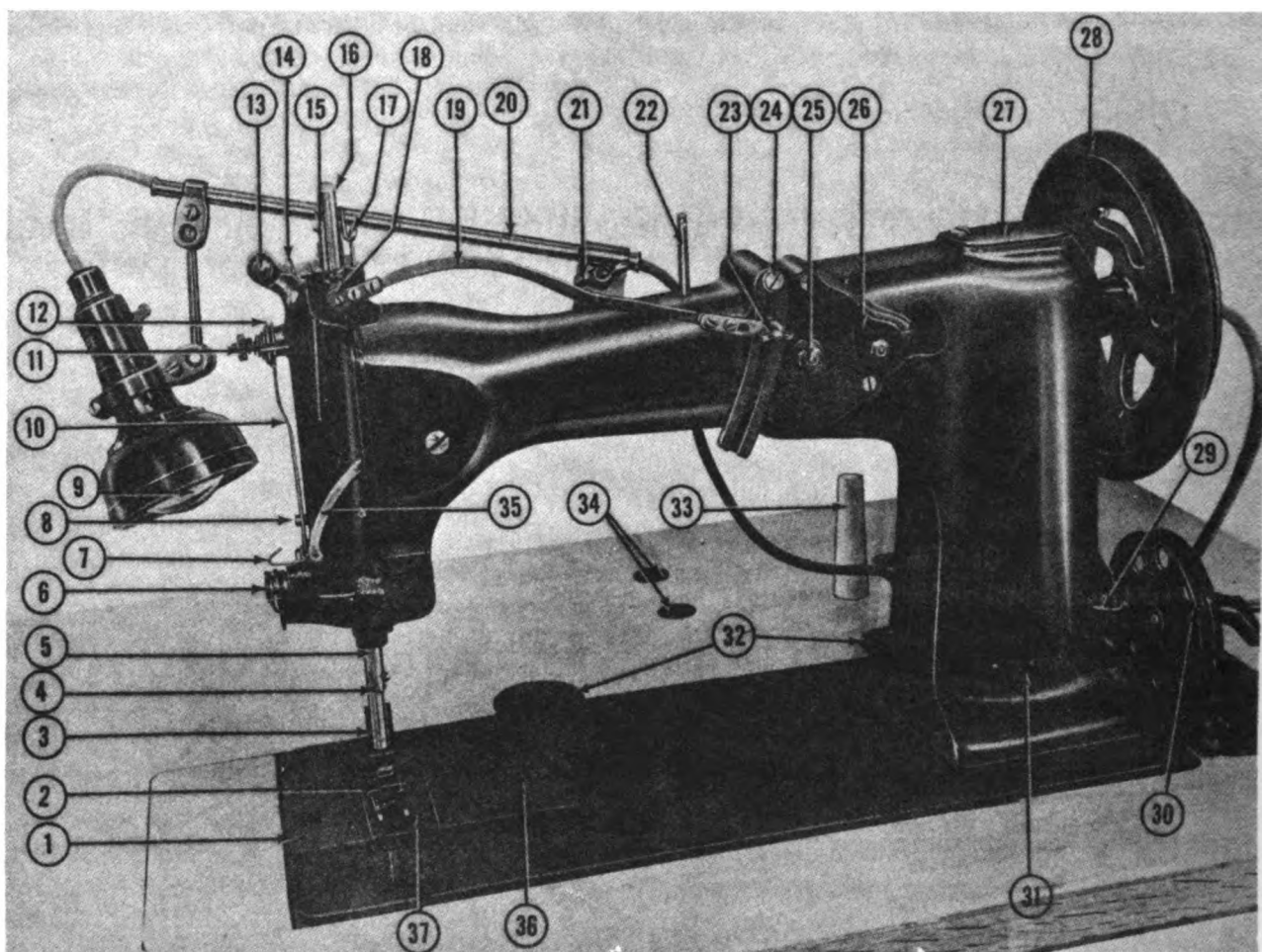
a. Removal and Disassembly.

- (1) Remove cotter pin that attaches rod (1, fig. 74) to connection lever (2), pull rod out of hole in lever, and lift rod and spring (6) from machine bed.
- (2) Remove hinge screw that attaches connection lever to machine arm, and remove connection lever.
- (3) Remove nut on screw stud (3), and remove lamp with bracket from screw stud.
- (4) Remove screw stud that attaches lifting lever (4) to machine arm, and remove lifting lever.
- (5) Remove setscrew on collar (7), and remove collar from rod.

b. Cleaning, Inspection, and Repair.

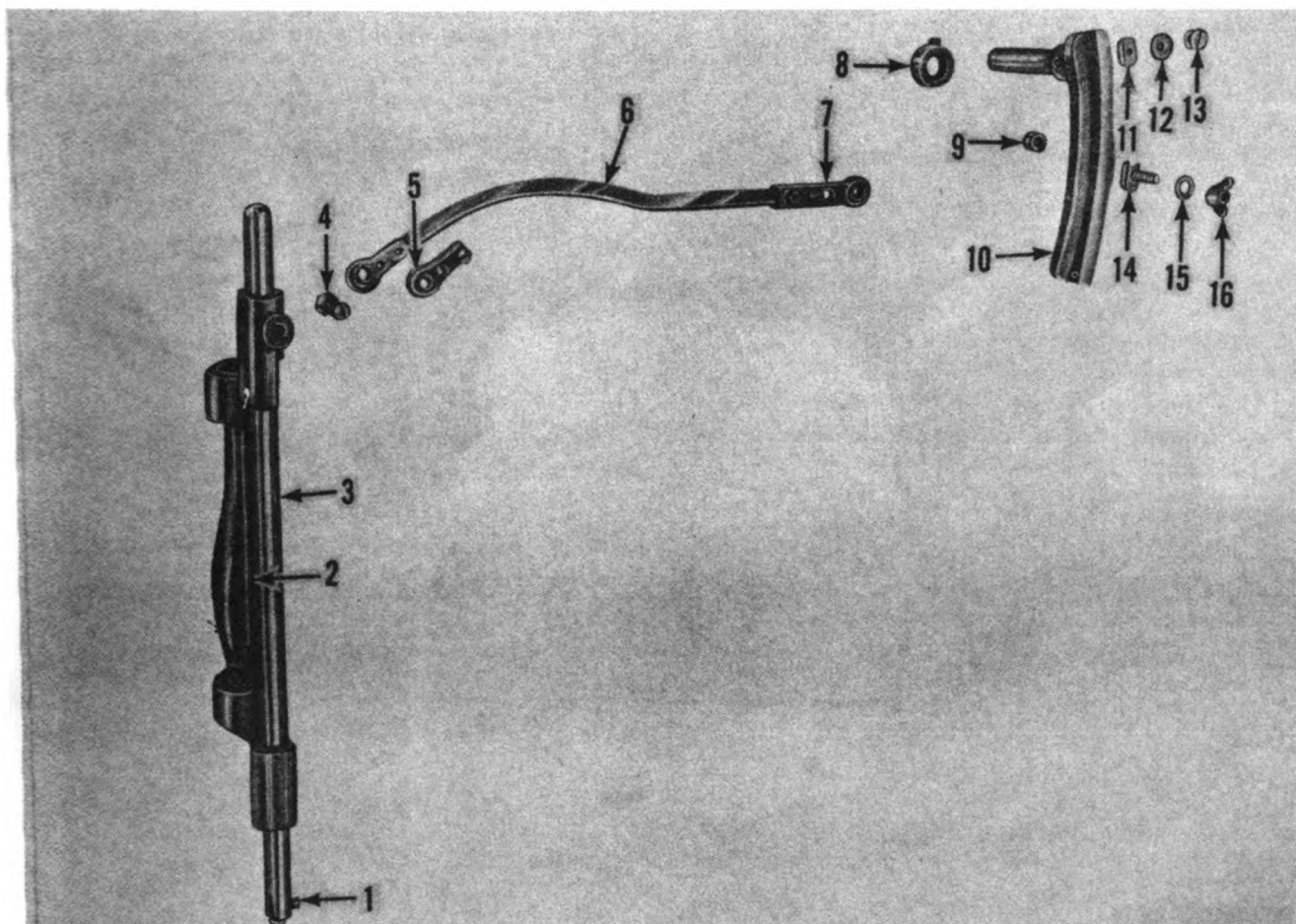
- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



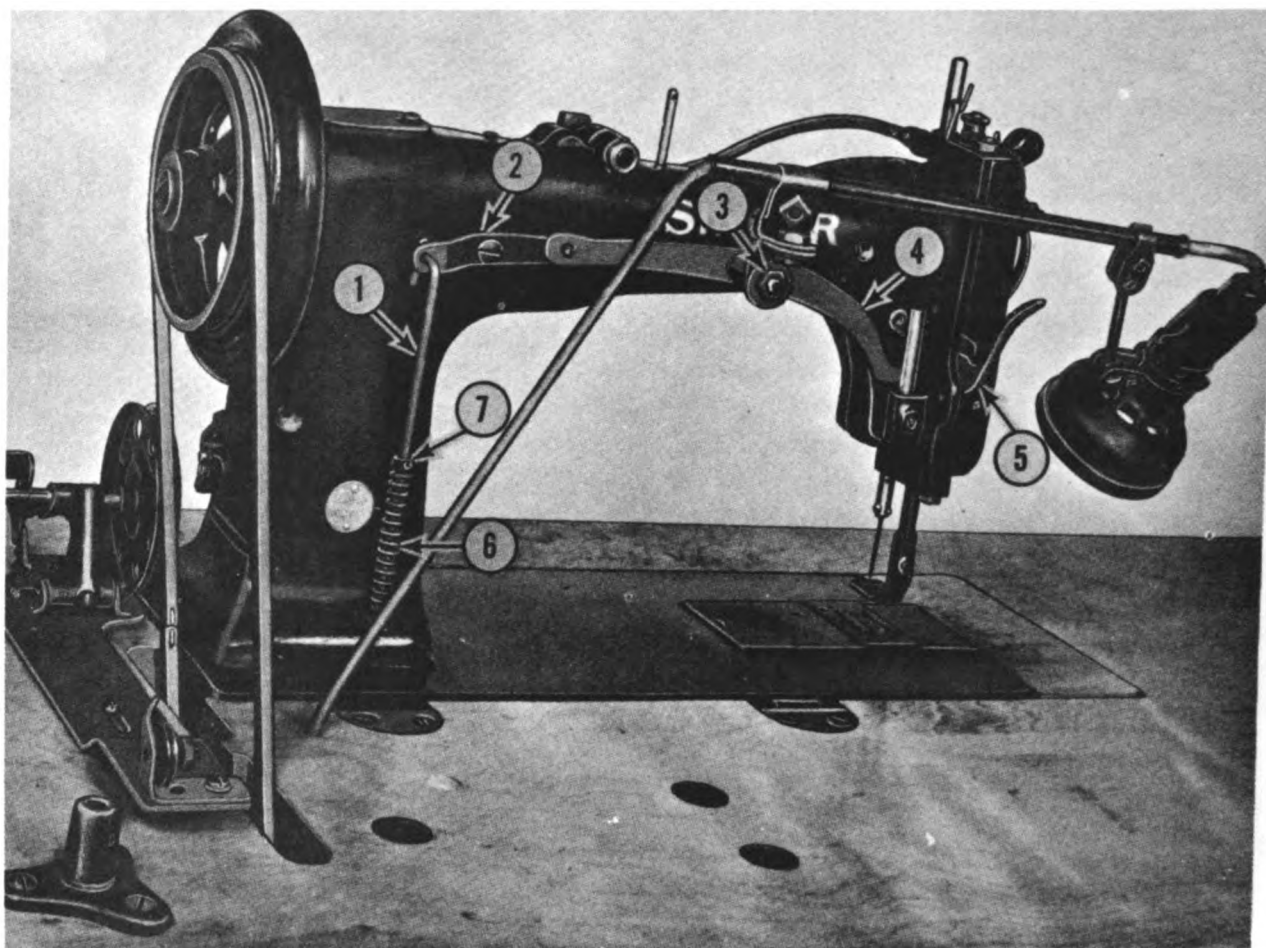
- | | |
|---|--|
| 1 Slide, bed, front | 20 Fixture, light |
| 2 Foot, presser | 21 Wingnut, lamp bracket |
| 3 Bar, presser | 22 Guide, thread |
| 4 Guide, needle bar thread | 23 Wingnut, needle bar frame pitman connection slide |
| 5 Bar, needle, hollow | 24 Screw, needle bar frame pitman connection stop slide |
| 6 Controller assembly, thread | 25 Stud and nut, needle bar frame cam gear eccentric screw |
| 7 Guide, thread | 26 Cover, needle bar frame cam gear |
| 8 Stud, tension release lever switch back screw | 27 Cap, arm |
| 9 Lens, sewing machine lamp | 28 Pulley with balance wheel |
| 10 Lever, tension release | 29 Handle, feed regulating |
| 11 Thumbnut, tension | 30 Pulley, bobbin winder |
| 12 Disk, tension | 31 Plate, model number |
| 13 Retainer, thread | 32 Connections, bed hinge |
| 14 Guide, wire, thread retainer | 33 Pin, machine rest |
| 15 Thumbscrew, presser bar, pressure regulating | 34 Bolts, carriage, motor mount |
| 16 Bar, needle, hollow | 35 Lever, thread takeup |
| 17 Guide, thread | 36 Slide, bed, back |
| 18 Screw, ball, needle bar frame | 37 Plate, throat |
| 19 Pitman, needle bar frame | |

Figure 72. Zigzag sewing machine, front view.



- | | | | |
|---|--|----|--|
| 1 | Setscrew, needle | 9 | Roller, needle bar frame regulator |
| 2 | Frame, needle bar | 10 | Regulator, needle bar frame |
| 3 | Bar, needle, hollow | 11 | Slide, needle bar frame regulator stop |
| 4 | Screw and nut, ball | 12 | Washer, frame regulator stop |
| 5 | Cap with screws, needle bar frame | 13 | Screw, frame regulator stop |
| 6 | Pitman, needle bar frame | 14 | Screw, connection slide |
| 7 | Connection, needle bar frame pitman | 15 | Washer, connection slide |
| 8 | Collar, needle bar frame regulator shaft | 16 | Wingnut, connection slide |

Figure 73. Needle bar frame pitman assembly, exploded view.



- 1 Rod, foot lifter lifting lever
- 2 Lever, knee lifter connection
- 3 Stud, screw, sewing lamp bracket
- 4 Lever, foot lifter lifting

- 5 Lifter, presser bar
- 6 Spring, foot lifter lifting lever rod
- 7 Collar, foot lifter lifting lever rod spring

Figure 74. Zigzag sewing machine, rear view.

110. Bed Hinge Connection

a. Removal.

- (1) Slide round belt off pulley (28, fig. 72).
- (2) Lift machine head from tabletop.
- (3) Remove screws that attach bed hinge connections (32) to tabletop, and remove connections.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

111. Feed Dog

a. Removal.

- (1) Pull slides (1 and 36, fig. 72) from machine bed.
- (2) Remove screw that attaches presser foot (2) to presser bar (3), and remove presser foot.
- (3) Remove screw that attaches throat plate (37) to machine bed, and remove throat plate.
- (4) Remove screws that attach feed dog to feed bar, and remove feed dog.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect feed dog for chipped or broken teeth, cracks, burs, and excessive wear.
- (3) Inspect screw for stripped thread and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Raise or lower feed dog as follows:

- (1) Slide round belt off pulley, and tilt machine head back.
- (2) Turn balance wheel until feed dog raises to its highest position.
- (3) Loosen rock shaft pinch screw and move rock shaft up or down until depth of feed dog teeth are above throat plate.
- (4) Tighten pinch screw securely.

112. Shuttle Assembly and Hook Driver Bevel Gear

a. Removal and Disassembly.

- (1) Slide round belt off balance wheel and tilt machine head back.
- (2) Swing stop (18, fig. 75) away from case (2).
- (3) Remove case and bobbin (3) from hook (7).
- (4) Remove screws with springs (4), and lift off cap (5), race (6), and hook (7).
- (5) Remove setscrew (12) in gear (11) and lift out driver (8).
- (6) Pull gear off hook driving bevel gear shaft.
- (7) Remove screws (13) that attach bracket (9) to machine bed, and remove bracket.
- (8) Drive pin (15) out of bracket, and remove stop (18).
- (9) Drive pin (14) out of bracket, and remove latch (16) and spring (17).
- (10) Remove setscrews (10) in bracket.
- (11) Remove screw that attaches finger (1) to case, and remove finger.

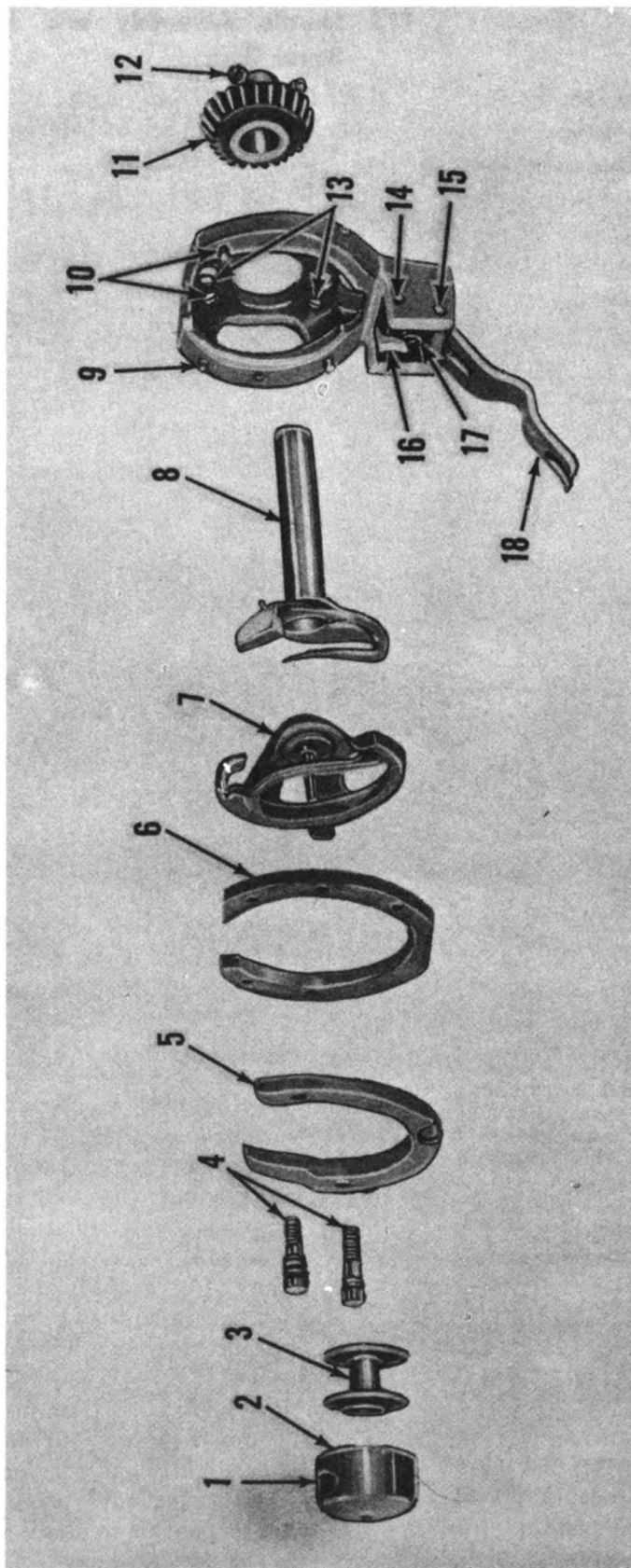
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped or broken teeth, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above, setting sewing hook to needle (*d* below).

d. Adjustment. Set sewing hook to needle by following procedure below.

- (1) Turn balance wheel so that hook bracket adjusting screws and screws (13) aline with opening in hook.
- (2) Move hook closer to needle by loosening screws (13) slightly and tightening upper screws (10) carefully and evenly. Keep hook square so that it will have proper clearance for both left and right bight stitches.
- (3) Move hook away from needle by loosening upper screws (10) and large lower screw slightly and turning larger upper screw inward until point of hook is as close as possible to needle without touching the needle.

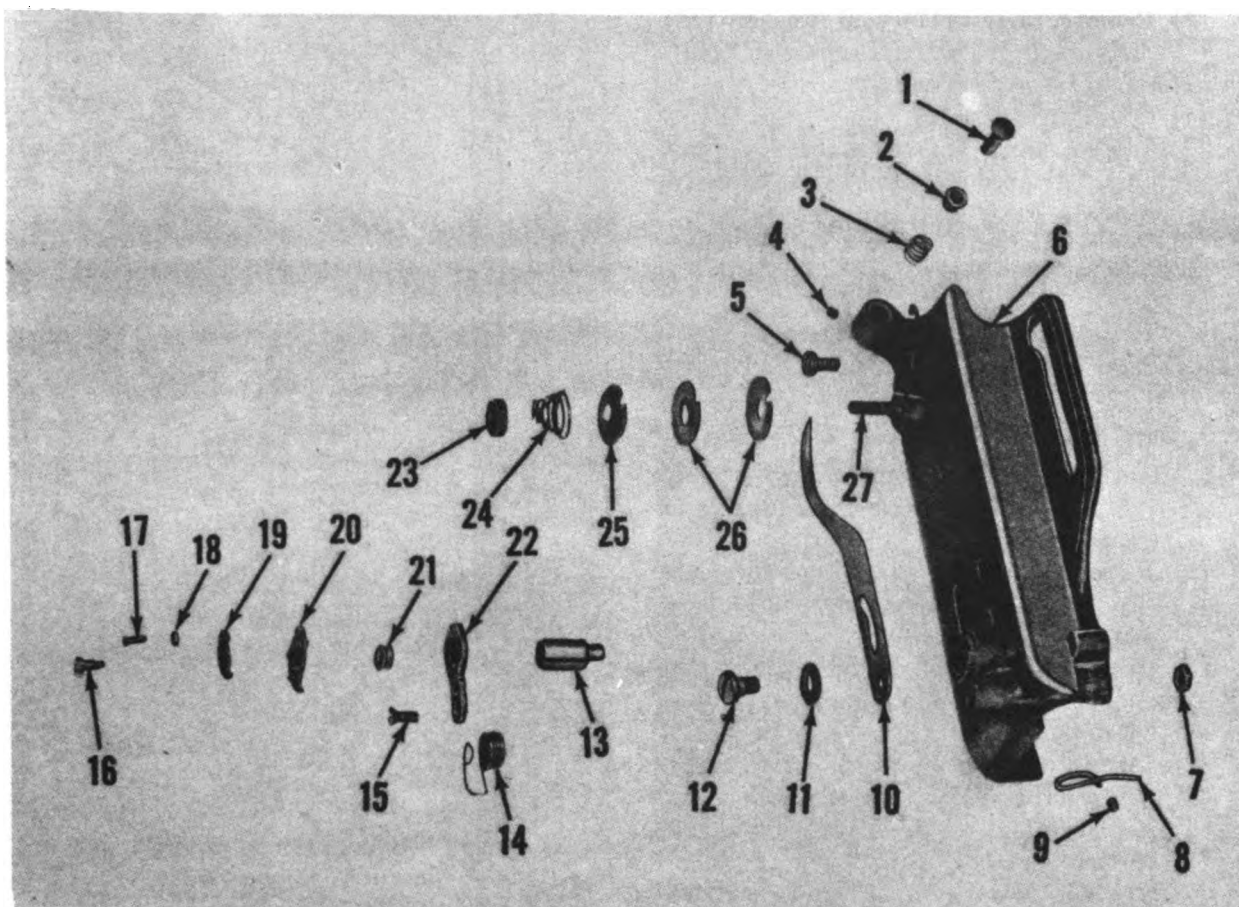


- 1 Finger, bobbin case position
- 2 Case, bobbin
- 3 Bobbin
- 4 Screws with springs, hook race cap
- 5 Cap, hook race
- 6 Race, hook
- 7 Hook, sewing

- 8 Driver, hook
- 9 Bracket, hook
- 10 Setscrews, hook bracket adjusting, upper
- 11 Gear, bevel, hook driver
- 12 Setscrew, hook driver bevel gear
- 13 Screws, hook bracket

- 14 Pin, hinge, hook bracket bobbin case stop latch
- 15 Pin, hinge bracket bobbin case stop hinge
- 16 Latch, hook bracket bobbin case stop
- 17 Spring, hook bracket bobbin case stop latch
- 18 Stop, hook bracket bobbin case, hinged

Figure 75. Shuttle assembly, exploded view.



- | | |
|--|---|
| 1 Stud, thread retainer | 15 Screw, thread controller plate |
| 2 Sleeve, thread retainer | 16 Screw, thread controller roller |
| 3 Spring, thread retainer | 17 Screw, thread controller spring guard |
| 4 Setscrew, thread retainer | 18 Washer, thread controller roller guard |
| 5 Screw, faceplate | 19 Guard, thread controller spring |
| 6 Faceplate | 20 Guard, thread controller roller |
| 7 Nut, tension release lever hinge screw | 21 Roller, thread controller |
| 8 Guide, faceplate thread | 22 Plate, thread controller |
| 9 Setscrew, faceplate thread guide | 23 Thumbnut, tension |
| 10 Lever, tension release | 24 Spring, tension |
| 11 Washer, tension release lever hinge screw | 25 Washer, tension |
| 12 Screw, tension release lever hinge | 26 Disks, tension |
| 13 Stud, thread controller spring | 27 Stud, tension |
| 14 Spring, thread controller | |

Figure 76. Faceplate, thread controller, and thread tension assemblies, exploded view.

113. Thread Controller Assembly and Tension Release Assembly

a. Removal.

- (1) Remove screw (16, fig. 76) that attaches guards (19 and 20), roller (21), and plate (22) to stud, and remove guards and roller.
- (2) Remove screw (15) that attaches thread controller plate to faceplate (6), and remove thread controller plate spring (14), and spring stud.
- (3) Remove screw (5) that attaches faceplate to machine face, and remove faceplate.
- (4) Remove nut (7), screw (12), and washer (11) that attach lever (10) to faceplate, and remove lever.
- (5) Remove setscrew (4) that attaches stud (1) to faceplate, and remove stud, sleeve (2), and spring (3).
- (6) Remove setscrew (9) that attaches guide (8) to faceplate, and remove guide.

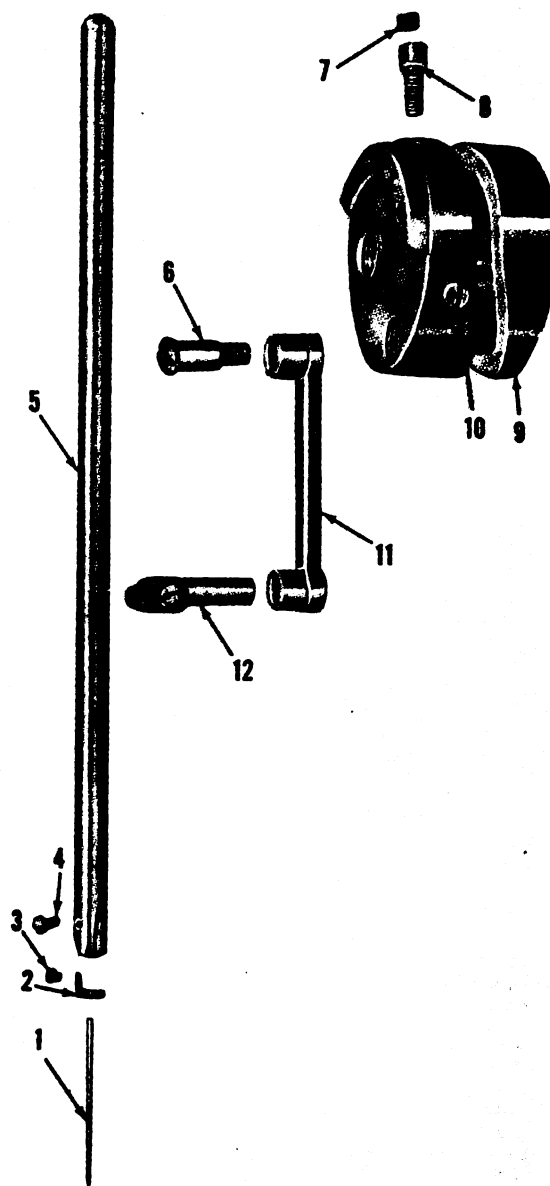
- (7) Remove screw (17) and washer (18) that attach guards, and separate them.
- b. Cleaning, Inspection, and Repair.*
 - (1) Clean parts with SD.
 - (2) Inspect parts for bends, cracks, nicks, burs, stripped threads, and excessive wear.
 - (3) Replace defective parts with serviceable parts.
- c. Installation.* Reverse procedure in *a* above.

114. Thread Tension Assembly

- a. Removal.*
 - (1) Unscrew thumbnut (23, fig. 76) from tension stud (27), and remove spring (24), washer (25), and disks (26) from tension stud.
 - (2) Remove screws (5) that attach faceplate (6) to machine face, and remove faceplate.
 - (3) Press tension stud from faceplate.
- b. Cleaning, Inspection, and Repair.*
 - (1) Clean parts with SD.
 - (2) Inspect parts for bends, burs, nicks, stripped threads, and excessive wear.
 - (3) Replace defective parts with serviceable parts.
- c. Installation.* Reverse procedure in *a* above.

115. Needle Bar, Frame, and Stud

- a. Removal and Disassembly.*
 - (1) Remove setscrew (4, fig. 77) and needle (1) from needle bar (5).
 - (2) Remove screw (3) and thread guide (2) from needle bar.
 - (3) Loosen setscrews in the needle bar connecting stud (12).
 - (4) Pull the needle bar out top of needle bar frame.
 - (5) Pull connecting stud (12) out of connecting link (11).
 - (6) Remove screw and nut (4, fig. 78) from frame pitman (6).
 - (7) Loosen nuts on lower and upper center screw and remove center screws from machine face.
 - (8) Tilt needle bar frame, and remove it from machine face.
- b. Cleaning, Inspection, and Repair.*
 - (1) Clean parts with SD.
 - (2) Inspect parts for bends, breaks, cracks, stripped threads, and excessive wear.



- 1 Needle
- 2 Guide, needle bar thread
- 3 Screw, guide, needle bar thread
- 4 Setscrew, needle
- 5 Bar, needle, hollow
- 6 Stud, needle bar connecting link hinge screw
- 7 Setscrew, takeup cam position screw check
- 8 Screw, takeup cam position
- 9 Cam, takeup
- 10 Setscrew, takeup cam
- 11 Link, needle bar connecting
- 12 Stud with setscrews, needle bar connecting

Figure 77. Needle bar assembly, exploded view.

- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

116. Presser Bar Assembly

a. Removal and Disassembly.

- (1) Remove screw that attaches presser foot (1, fig. 78) to presser bar (5), and remove presser foot.
- (2) Remove pressure regulating thumbscrew (7) from machine head.
- (3) Remove nut (3) and stud (2) that attach stud bracket (4) to presser bar.
- (4) Remove setscrew that attaches lifting bracket (8) to presser bar.
- (5) Remove presser bar and spring (6) out top of machine face, and remove stud bracket and lifting bracket.
- (6) Remove screw (10) that attaches plate (9) to lifting bracket, and remove plate.
- (7) Remove screw (11) that attaches lifter (12) to machine face, and remove lifter.
- (8) Remove setscrew that attaches presser bar lifting bracket position guide to machine face, and remove guide.
- (9) Remove screw that attaches lifting bracket roller to bracket, and remove roller.

b. Cleaning, Inspection, and Repair.

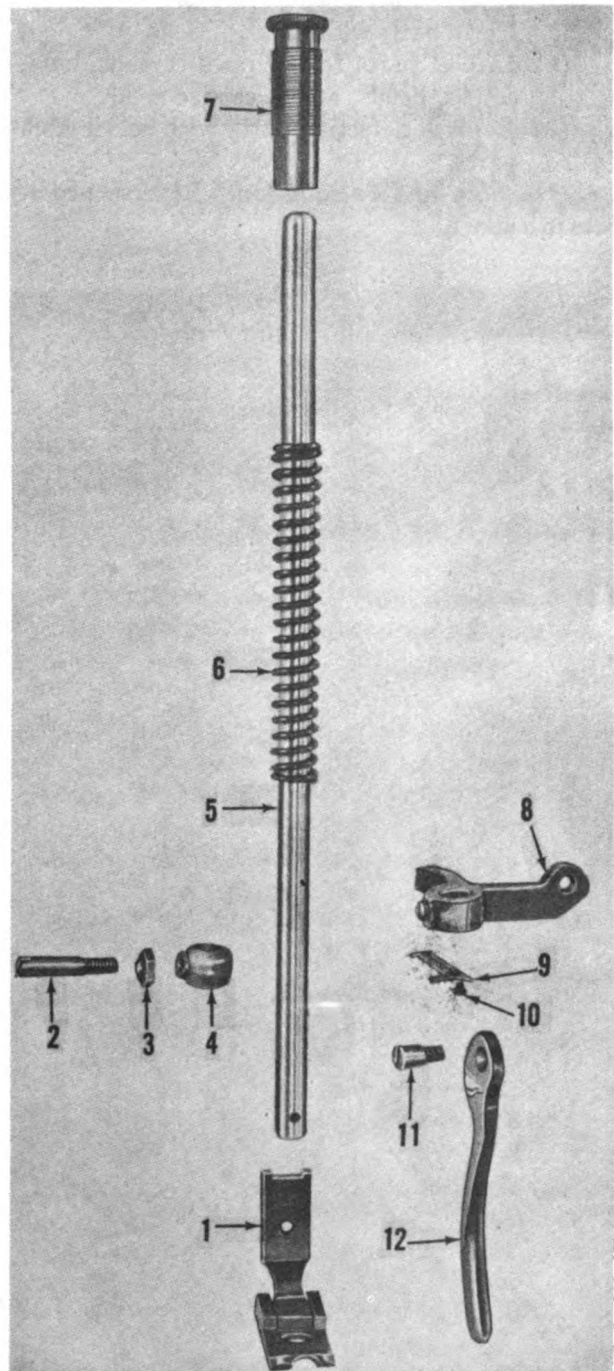
- (1) Clean all parts with SD.
- (2) Inspect parts for bends, breaks, cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

117. Two Cone Thread Unwinder

a. Removal and Disassembly.

- (1) Remove setscrew (8, fig. 79) and pull rod (7) from stand (9).
- (2) Remove screws (10) from tabletop and lift stand (9) from tabletop.
- (3) Remove screw (5) from rod (7) and pull thread guide rod (4) from spool rest rod.
- (4) Remove setscrew (11) from rest (6) and slide spool rest off rod.
- (5) Remove nut (2) and slip cap (1) from rod (4).
- (6) Remove thread guides (3).



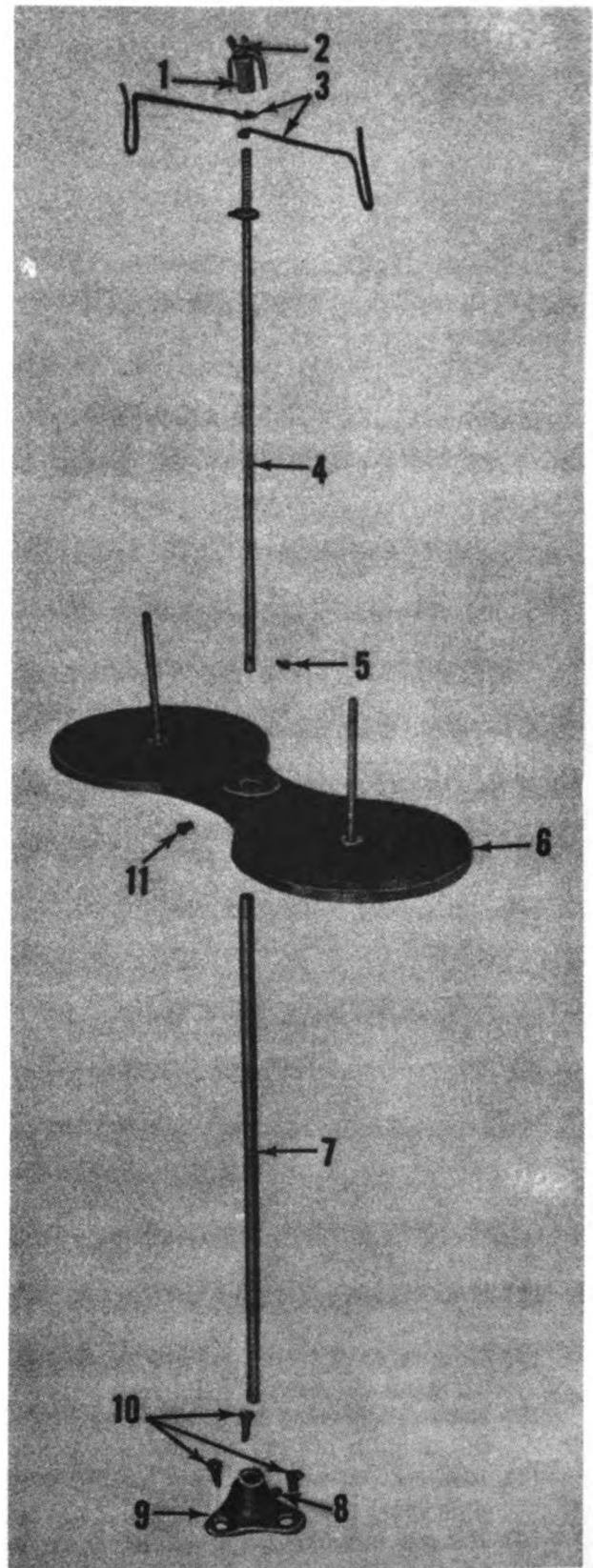
- 1 Presser foot
- 2 Stud, tension release lever switch back screw
- 3 Nut, tension release lever switch back screw stud
- 4 Bracket, tension release lever switch back screw stud
- 5 Bar, presser, hollow
- 6 Spring, presser bar
- 7 Thumbscrew, presser bar, pressure regulating
- 8 Bracket, presser bar lifting
- 9 Plate, presser bar lifting bracket
- 10 Screw, presser bar lifting bracket plate
- 11 Screw, presser bar lifter hinge
- 12 Lifter, presser bar

Figure 78. Presser bar assembly, exploded view.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for stripped threads, burs, cracks, bends, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



-
- 1 Cup, thread guide position
 - 2 Nut, thread guide lock
 - 3 Guide, thread
 - 4 Rod, thread guide
 - 5 Screw, thread guide rod
 - 6 Rest, spool
 - 7 Rod, spool rest
 - 8 Setscrew, spool rest rod
 - 9 Stand, spool
 - 10 Screw, wood, spool rest rod
 - 11 Setscrew, thread guide

Figure 79. Two-cone thread unwinder, exploded view.

Section XII. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46) SINGLE-THREAD CHAIN-STITCH BASTING MACHINE (SINGER MODEL 55-5)

118. Arm Side Cap

a. Removal.

- (1) Remove stud that attaches lever (4, fig. 80) to arm (3).
- (2) Remove screw that attaches arm side cap to machine arm.
- (3) Remove screw and thumbscrew that attach faceplate to face (5) and remove faceplate.
- (4) Remove screw (8, fig. 81) that attach both bracket (6) and link (9) to face, and slide link from face.
- (5) Slide arm side cap out front of face.

b. Inspection and Repair.

1. Inspect parts for bends, cracks, burs, and stripped threads.

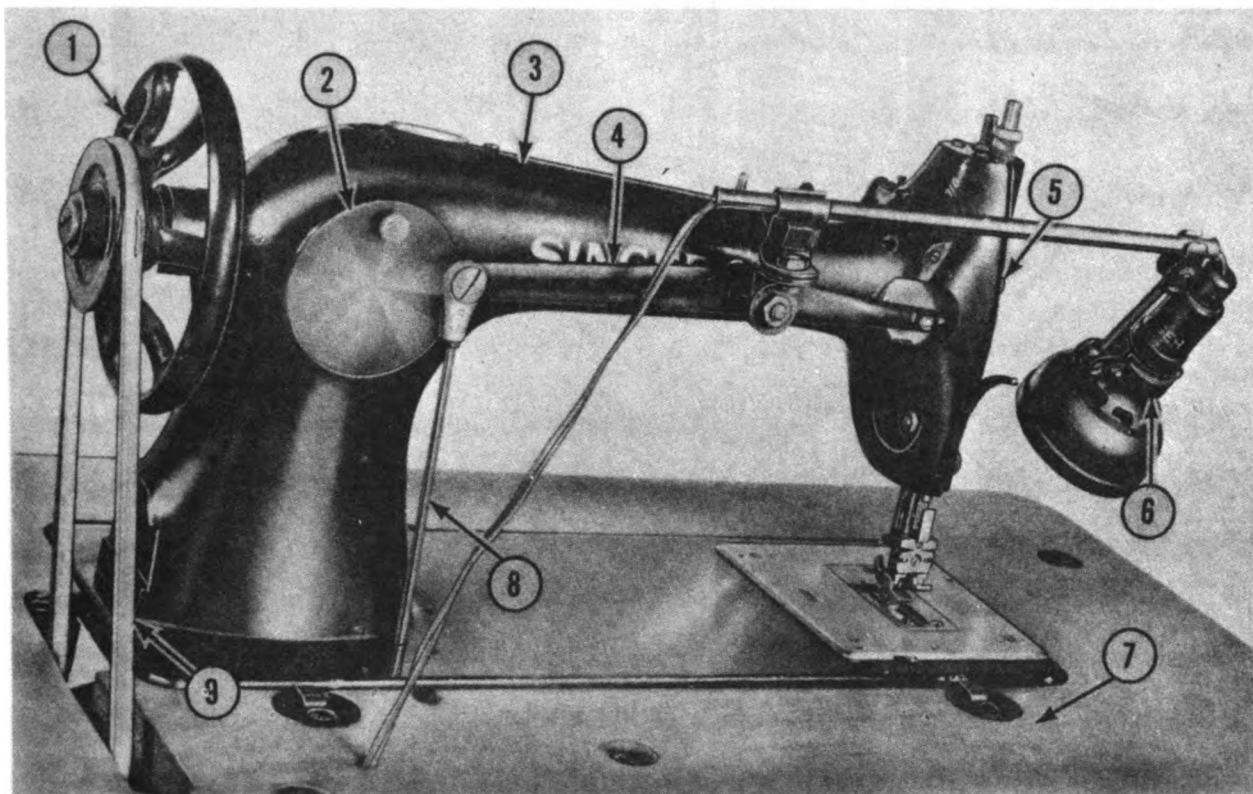
- (2) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

119. Lifting Lever Assembly

a. Removal and Disassembly.

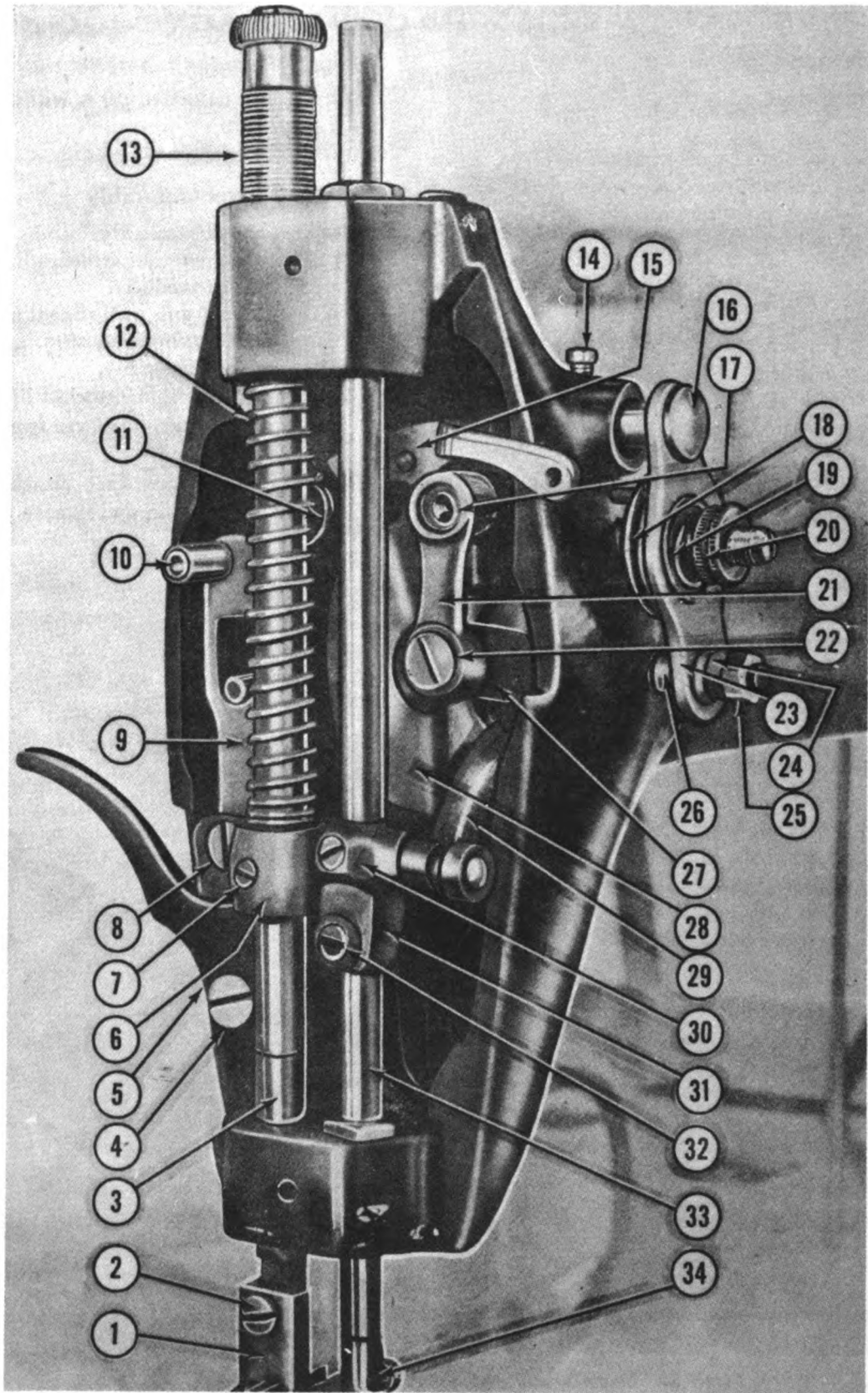
- (1) Remove screw that attaches lifting lever (4, fig. 80) to rod (8).
- (2) Remove nut and washer that attach sewing lamp assembly to stud, and remove sewing lamp assembly.
- (3) Remove stud that attaches lifting lever to arm (3), and slide lever from machine face.
- (4) Remove setscrew that attaches lifting lever pin to lever, and remove pin.



- | | |
|---|----------------------------------|
| 1 | Pulley with balance wheel, drive |
| 2 | Cover, arm side |
| 3 | Arm, machine |
| 4 | Lever, lifting |
| 5 | Face, machine |

- | | |
|---|-------------------------------|
| 6 | Lamp assembly, sewing |
| 7 | Tabletop |
| 8 | Rod, lifting lever connecting |
| 9 | Belt, round, leather |

Figure 80. Single-thread, chain-stitching basting machine, rear view.



b. Inspection and Repair.

- (1) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable ones.

c. Assembly and Installation. Reverse procedure in *a* above.

120. Lifting Lever Connecting Rod and Bellcrank Assembly

a. Removal.

- (1) Remove screw that attaches rod (8, fig. 80) to lever (4).
- (2) Loosen nut on rod just below lifting lever connecting rod joint, and unscrew joint.
- (3) Remove nut from rod.
- (4) Slide belt (9) off drive pulley (1), and tilt machine head to the rear.
- (5) Pull rod from bellcrank (2, fig. 82), and slide rod out bottom of machine bed.
- (6) Pull spring (3) from bellcrank and from bellcrank bracket.
- (7) Remove screws that attach bellcrank bracket to machine bed, and remove bracket with bellcrank.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

121. Finger Guard Assembly

a. Removal.

- (1) Remove screw and washer that attach finger guard to finger guard holder, and remove guard.

- (2) Remove screw that attaches presser foot to presser bar, and remove presser foot.
- (3) Remove screw that attaches finger guard holder to presser bar, and remove holder.

b. Inspection and Repair.

- (1) Inspect parts for bends, burs, cracks, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

122. Guide Assembly

a. Removal and Disassembly.

- (1) Remove screw and washer that attach guide assembly to machine base, and remove guide assembly.
- (2) Remove guide thumbscrew that attaches guide to guide holder and separate them.
- (3) Remove screw that attaches guide holder to guide shank, and separate them.

b. Inspection and Repair.

- (1) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (2) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

123. Drive Pulley With Balance Wheel

a. Removal.

- (1) Slide round belt off drive pulley.
- (2) Remove screw that attaches balance wheel (28, fig. 72) to arm shaft.
- (3) Remove setscrews that attach balance wheel to shaft, and remove balance wheel.

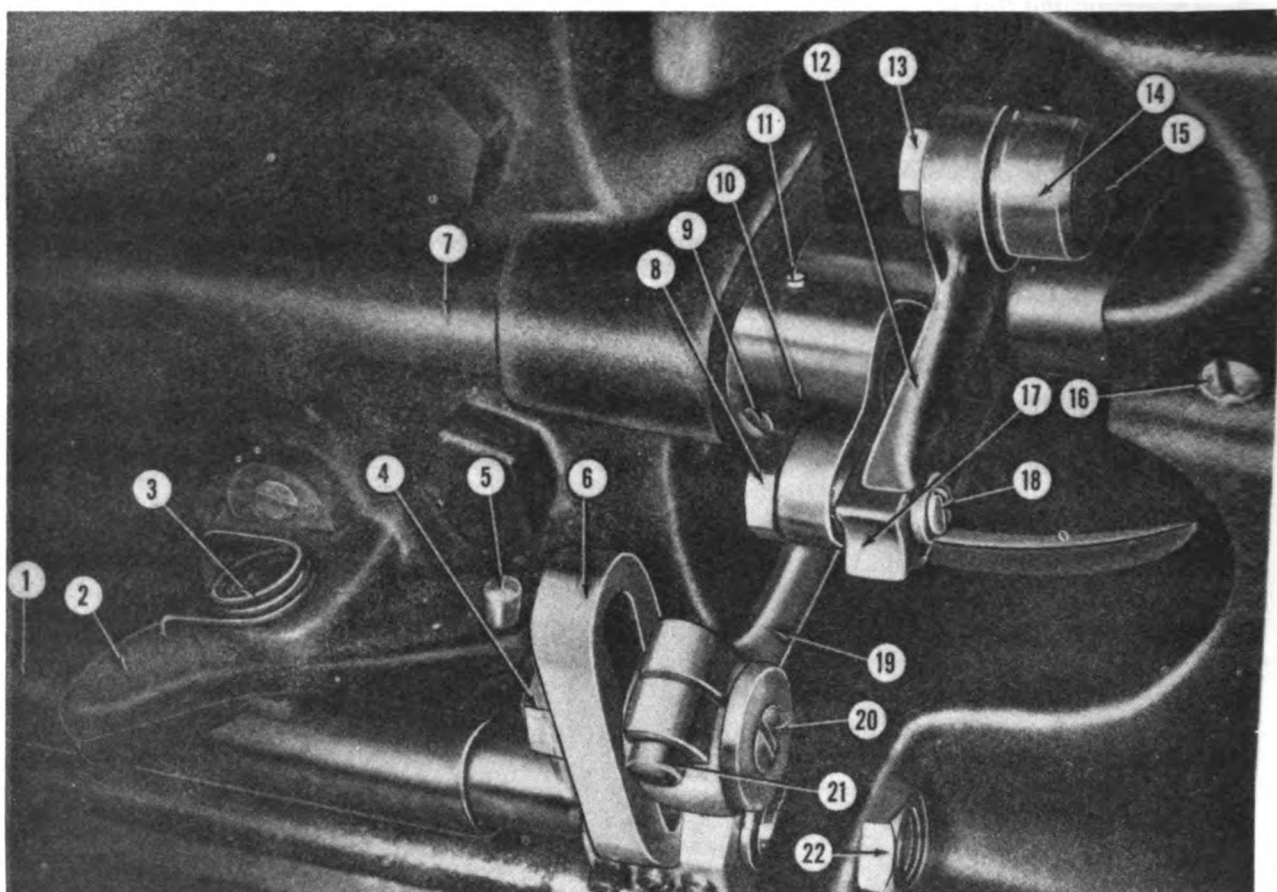
b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- 1 Presser foot
- 2 Screw, presser foot
- 3 Bar, presser
- 4 Screw, presser bar lifter
- 5 Lifter, presser bar
- 6 Bracket, presser bar spring
- 7 Setscrew, presser bar spring bracket
- 8 Screw, slack thread regulator link hinge
- 9 Link, slack thread regulator
- 10 Roller and stud, slack thread regulator
- 11 Pin, hinge, thread takeup lever
- 12 Spring, presser bar
- 13 Thumbscrew, pressure regulating
- 14 Setscrew, thread nipper plate stud and thread eyelet
- 15 Lever, thread takeup
- 16 Eyelet, thread nipper plate stud and thread
- 17 Arm, thread takeup lever

- 18 Disk, tension
- 19 Spring, tension
- 20 Thumbnut, tension regulating
- 21 Link, thread takeup lever
- 22 Capscrew, thread takeup lever link
- 23 Plate, thread nipper
- 24 Nut, thread nipper regulating
- 25 Nut, thread nipper regulating nut lock
- 26 Connection assembly, thread nipper
- 27 Crank, thread takeup
- 28 Eccentric, needle bar crank and thread nipper
- 29 Link, needle bar connecting
- 30 Bracket, needle bar thread retainer
- 31 Stud, connecting, needle bar
- 32 Setscrew, needle bar connecting stud
- 33 Bar, needle
- 34 Clamp, needle

Figure 81. Face assemblies, installed.



- | | |
|--|---|
| 1 Shaft, feed rock | 12 Shaft, oscillating rock |
| 2 Bellcrank | 13 Nut, crank connecting rod hinge screw |
| 3 Spring, bellcrank | 14 Rod, crank connecting |
| 4 Nut, feed eccentric connecting rod stud | 15 Screw, hinge, crank connecting rod |
| 5 Rod, lifting lever connecting | 16 Setscrew, oscillating rock shaft hinge pin |
| 6 Crank, feed rock shaft regulator | 17 Block, looper shaft crank slide |
| 7 Shaft, looper | 18 Stud, looper shaft crank slide block |
| 8 Nut, looper shaft crank slide block stud | 19 Rod, feed eccentric connecting |
| 9 Setscrew, looper shaft crank | 20 Capscrew, feed eccentric connecting rod stud |
| 10 Crank, looper shaft | 21 Screw, feed eccentric connecting rod adjusting |
| 11 Pin, looper shaft crank pin | 22 Nut, feed rock shaft screw center |

Figure 82. Bed assemblies, right side.

- (2) Inspect parts for cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

124. Throat Plate, Feed Dog, and Cloth Plate

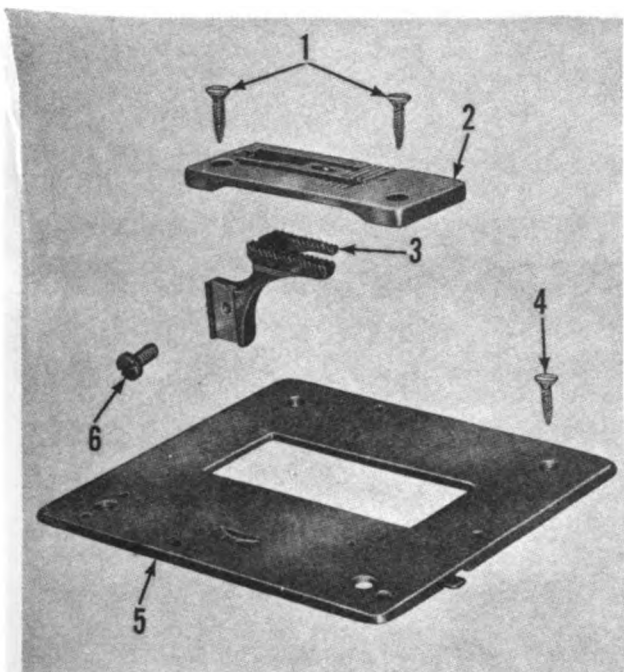
a. Removal and Disassembly.

- (1) Turn balance wheel until needle has reached its highest point.
- (2) Remove screws (1, fig. 83) that attach plate (2) to machine bed, and remove plate.

- (3) Remove screws (4) that attach plate (5) to machine bed, and remove plate.
- (4) Slide round belt off drive pulley.
- (5) Tilt machine head to the rear.
- (6) Remove screw (6) that attaches feed dog (3) to feed bar, and remove feed dog.
- (7) Remove screw that attaches loop retainer to feed dog and remove retainer.
- (8) Remove screw that attaches bed oilhole cover to underside of cloth plate, and remove plate.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped



- 1 Screw, throat plate
- 2 Plate, throat, single thread
- 3 Dog, feed
- 4 Screw, cloth plate
- 5 Plate, cloth
- 6 Screw, feed dog

Figure 83. Throat plate, feed dog, and cloth plate, exploded view.

or broken teeth, burs, stripped threads, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

125. Looper Assembly

a. Removal.

- (1) Slide round belt off drive pulley.
- (2) Tilt machine head to the rear.
- (3) Remove screw (15, fig. 84) and setscrew that attach looper (8) to shaft (9), and remove looper.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect looper for cracks, chipped places, burs, and excessive wear.
- (3) Inspect screws for stripped threads.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment.

- (1) Remove screws that attach throat plate to machine bed, and remove plate.
- (2) Turn balance wheel until needle has reached its lowest position and raises about $\frac{3}{32}$ of an inch.
- (3) Loosen setscrew and position screw on looper.
- (4) Adjust looper to needle as close as possible without touching needle.
- (5) Tighten position screw and setscrew on looper.
- (6) Install throat plate.

126. Needle Bar, Bushings, Clamp, Bracket, and Connecting Stud

a. Removal.

- (1) Remove presser bar assembly (par. 127).
- (2) Remove setscrew (23, fig. 85) that attaches needle (1) to clamp (2), and remove needle.
- (3) Drive out pin (3) that attaches clamp to bar (6), and remove clamp.
- (4) Remove setscrew (22) that attaches bar to stud (21).
- (5) Remove setscrew (4) that attaches bar to bracket (5).
- (6) Pull needle bar out top of machine head and remove thread retainer bracket from machine face.
- (7) Slide stud from link (20), and remove roller from slot in machine face.
- (8) Unscrew needle bar screw bushings from machine face.

b. Cleaning Inspection, and Repair.

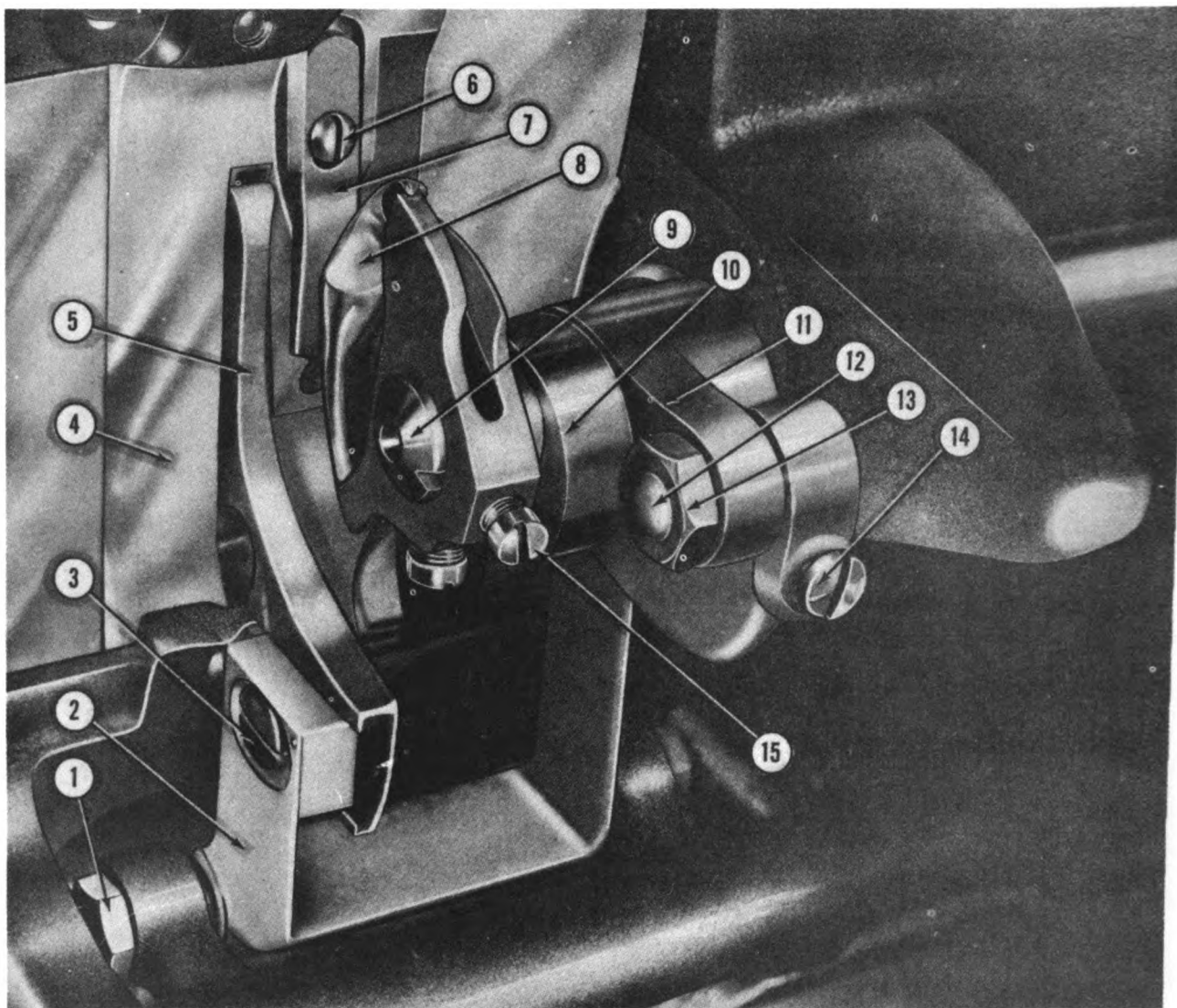
- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

127. Presser Bar Assembly

a. Removal and Disassembly.

- (1) Remove screw (2, fig. 86) that attaches presser foot (1) to bar (3) and remove presser foot.
- (2) Unscrew thumbscrew (6) from machine face and remove it from presser bar.
- (3) Remove screw and thumbscrew that at-



- | | |
|---|---------------------------------------|
| 1 Nut, feed bar rock shaft screw center | 9 Shaft, looper |
| 2 Bar, feed | 10 Eccentric, feed lifting |
| 3 Screw, feed dog | 11 Connection, feed lifting eccentric |
| 4 Plate, throat | 12 Screw, feed bar hinge |
| 5 Dog, feed | 13 Nut, feed bar hinge |
| 6 Screw, looper retainer | 14 Screw, feed bar adjusting screw |
| 7 Retainer, looper | 15 Screw, looper position |
| 8 Looper | |

Figure 84. Bed assemblies, left side.

- | | |
|--|---|
| 1 Needle | 13 Screw, wedge, thread takeup crank |
| 2 Clamp, needle | 14 Wedge, thread takeup crank |
| 3 Pin, needle clamp | 15 Capscrew, thread nipper connection |
| 4 Setscrew, needle bar thread retainer bracket | 16 Cap, thread nipper connection |
| 5 Bracket, needle bar thread retainer | 17 Eccentric, needle bar crank and thread nipper |
| 6 Bar, needle, hollow | 18 Screw, machine, needle bar crank and thread nipper |
| 7 Capscrew, thread takeup lever link | eccentric position |
| 8 Link, thread takeup lever | 19 Roller, needle bar connecting stud |
| 9 Pin, hinge, thread takeup lever | 20 Link, needle bar connecting |
| 10 Lever, thread takeup | 21 Stud, connecting, needle bar |
| 11 Arm, thread takeup lever | 22 Setscrew, needle bar connecting stud |
| 12 Crank, thread takeup | 23 Setscrew, needle |

Figure 85.—Continued

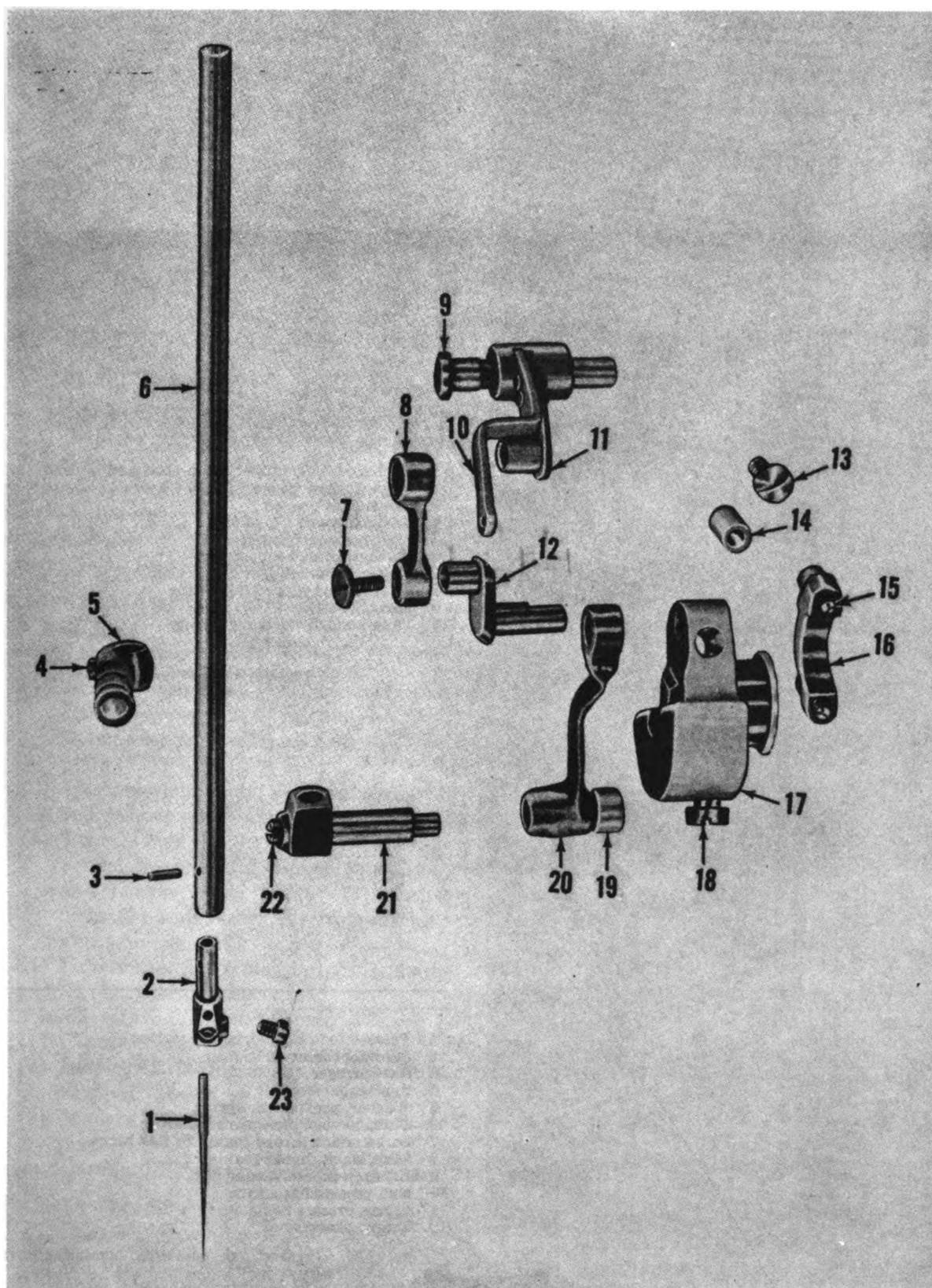
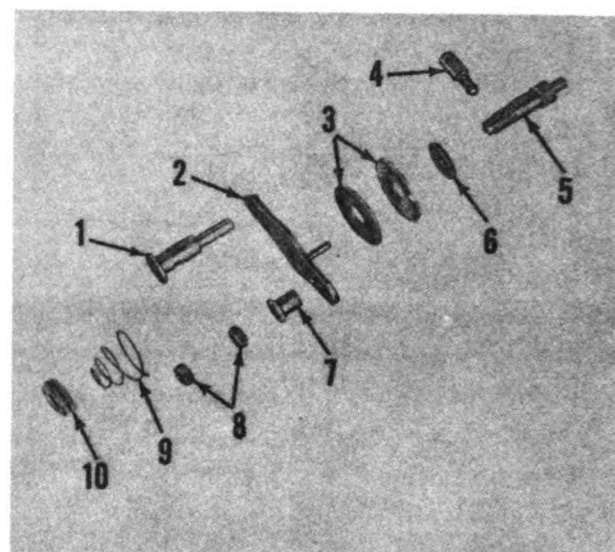
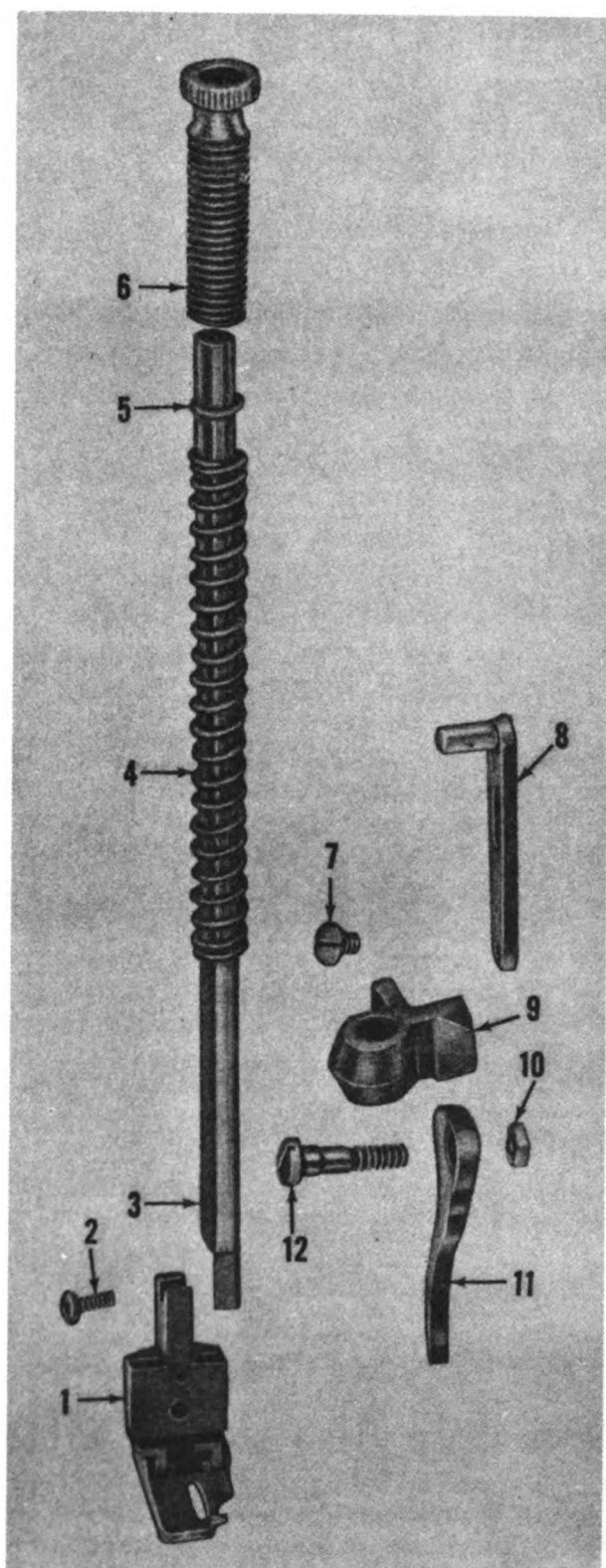


Figure 85. Needle bar assembly, exploded view.



- 1 Eyelet, thread nipper plate stud and thread
- 2 Plate, thread nipper
- 3 Disks, tension
- 4 Eyelet, thread, top of arm
- 5 Stud, tension screw
- 6 Washer, thread nipper plate
- 7 Sleeve, thread nipper connection
- 8 Nuts, thread nipper regulating
- 9 Spring, tension
- 10 Thumbnut, tension regulating

Figure 87. Tension assembly and thread nipper assembly, exploded view.

- 1 Presser foot, hinged, compensating
- 2 Screw, presser foot
- 3 Bar, presser
- 4 Spring, presser bar
- 5 Washer, presser bar spring
- 6 Thumbscrew, pressure regulating
- 7 Screw, slack thread regulator link hinge
- 8 Link, slack thread regulator
- 9 Bracket, presser bar spring
- 10 Nut, presser bar spring
- 11 Lifter, presser bar
- 12 Screw, presser bar

Figure 88. Presser bar assembly, exploded view.

tach plate to machine face, and remove plate.

- (4) Remove screw that attaches bracket (9) to presser bar, and slide bar with washer (5) and spring (4) out top of machine face. Remove washer and spring from presser bar.
- (5) Lift out bracket with link (8).
- (6) Remove screw (7) that attaches link to bracket and separate them.
- (7) Remove nut (10) and screw (12) that attach lifter to back of machine face, and remove lifter.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust presser foot pressure as necessary (TM 10-3530-202-10).

128. Tension Assembly and Thread Nipper Assembly

a. Removal.

- (1) Remove setscrew (14, fig. 81) that attaches eyelet (16) to machine arm, and slide eyelet from machine arm and from plate (2, fig. 87).
- (2) Unscrew thumbnut (10) from stud (5), and remove tension spring (9).
- (3) Remove nuts (8) that attach thread nipper plate to thread nipper connection, and remove plate, sleeve (7), tension disks (3) and washer (6) from machine arm.
- (4) Unscrew tension screw stud (5) and eyelet (4) from machine arm.

b. Cleaning, Inspection, and Repair.

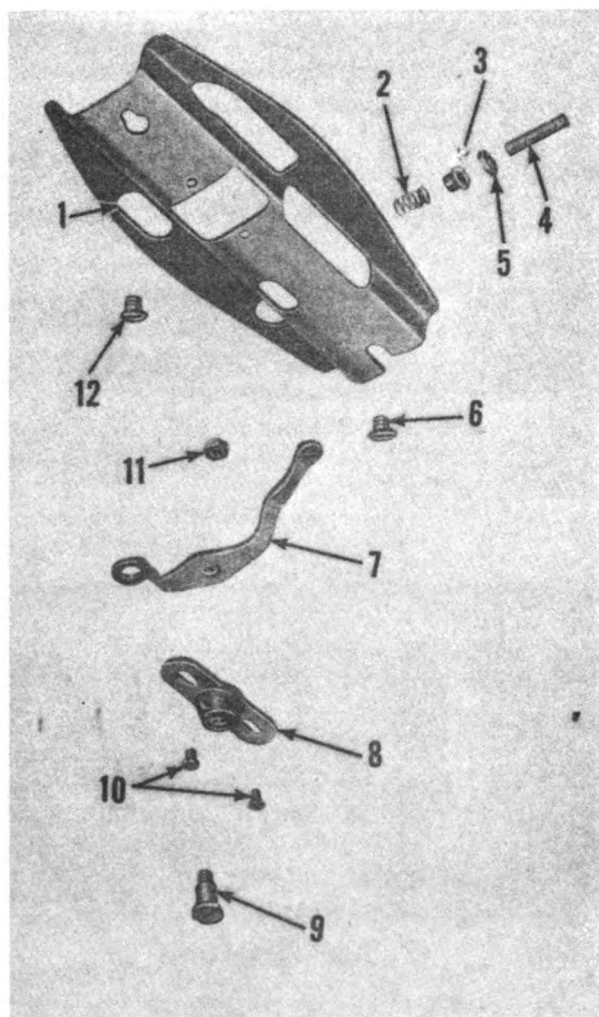
- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

129. Slack Thread Assembly

a. Removal.

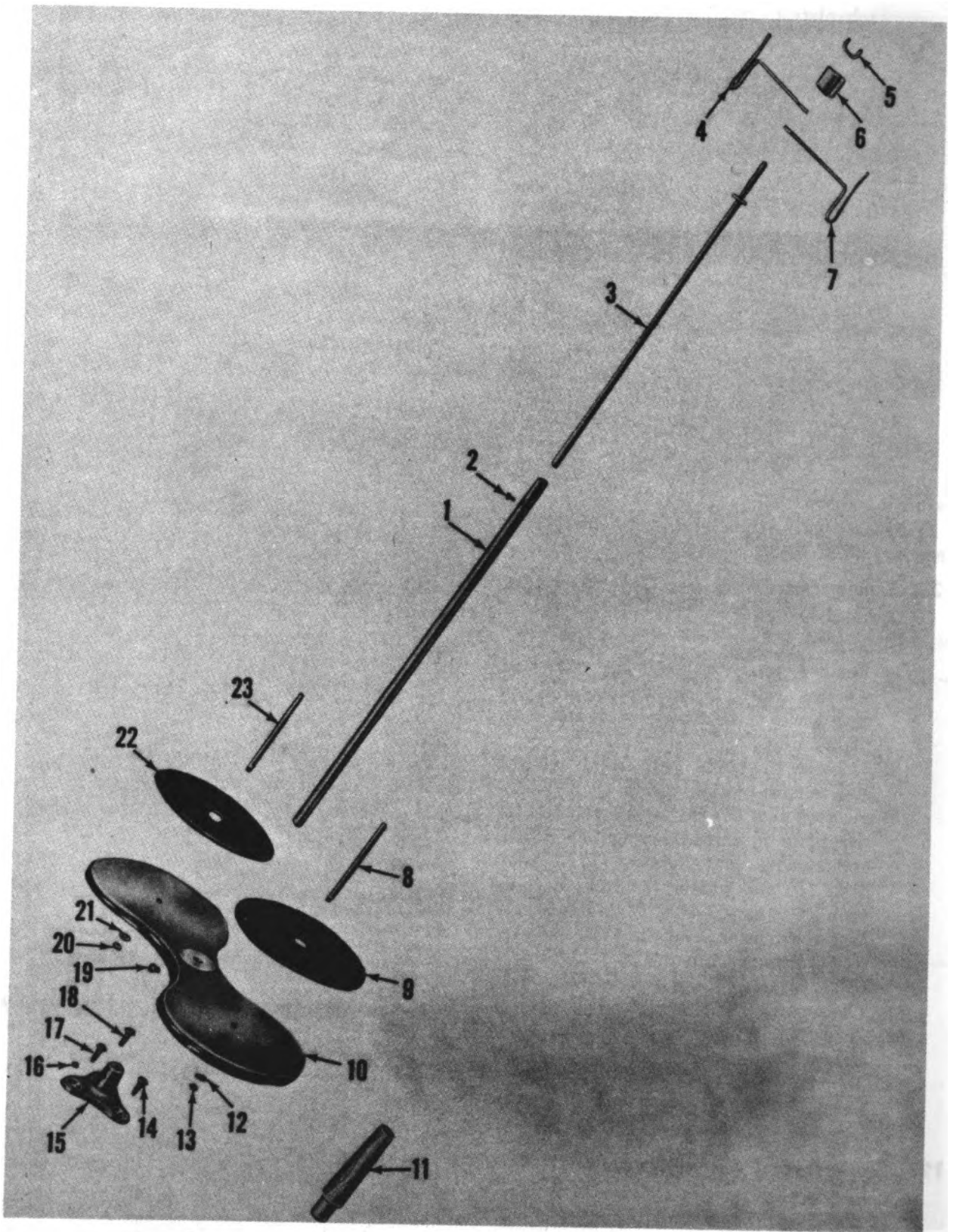
- (1) Remove thumbscrews (6, fig. 88) and screw (12) that attach faceplate (1) to machine face, and remove faceplate.



- 1 Faceplate
- 2 Spring, needle bar thread retainer
- 3 Sleeve, needle bar thread retainer
- 4 Stud, needle bar thread retaining
- 5 Collar, needle bar thread retaining
- 6 Thumbscrew, faceplate
- 7 Regulator, slack thread
- 8 Bracket, slack thread regulator adjusting
- 9 Screw, slack thread regulator hinge
- 10 Screws, slack thread regulator adjusting bracket
- 11 Nut, slack thread regulator hinge screw
- 12 Screw, faceplate

Figure 88. Faceplate, thread regulator assembly, slack thread assembly, and needle bar thread retainer assembly, exploded view.

- (2) Remove nut (11) and hinge screw (9) that attach slack thread regulator (7) to faceplate, and remove regulator.
- (3) Remove bracket screws (10) that attach bracket (8) to faceplate, and remove bracket.



b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

130. Needle Bar Thread Retainer Assembly

a. Removal.

- (1) Remove thumbscrews that attach faceplate to machine face, and remove faceplate.
- (2) Remove setscrew that attaches stud (4, fig. 88) to retainer bracket (30, fig. 81) and remove stud, collar (5, fig. 88), sleeve (3), and spring (2) from retainer bracket.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

131. Two Cone Thread Unwinder

a. Removal and Disassembly.

- (1) Remove setscrew (16, fig. 89) from stand (15), and lift thread unwinder from stand.
- (2) Remove screws (14, 17, and 18) that attach stand to tabletop, and remove stand.
- (3) Remove nut (5) on rod (3), and remove cup (6) and guides (4 and 7).
- (4) Remove setscrew (2) from rod (1), and slide rod (3) from rod (1).
- (5) Remove setscrew (19) from rest (10), and slide rest off rod (1).
- (6) Lift cushions (9 and 22) from rest.
- (7) Remove nuts (13 and 20) and washers (12 and 21) from rods (8 and 23) and remove rods.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

Section XIII. SECOND-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), TEXTILE SEWING MACHINE (SINGER MODEL 111W155)

132. Tension Assembly

a. Removal and Disassembly.

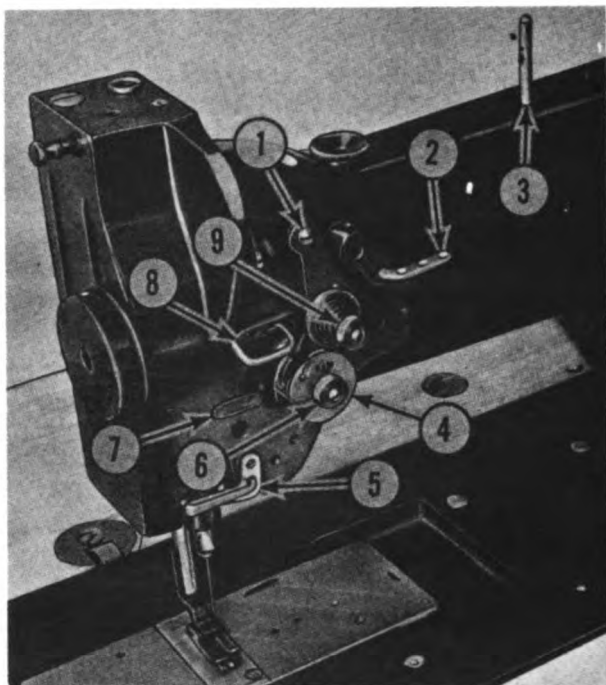
- (1) Remove bracket screw (1, fig. 90) and adjusting thumbnut (4), and remove tension bracket assembly (9) from machine arm.
- (2) Remove lever screws (3, fig. 91) from tension bracket (6). Remove release lever (4) and tension release plunger (25) from tension bracket.
- (3) Remove screw (16) that attaches thread control disks (17 and 20) to tension bracket, and remove thread control disks and control spring (26).
- (4) Unscrew adjusting thumbnut (12) from thread tension adjusting stud. Remove thread control spring (11), tension release washer (10), and thread tension disks (8 and 9) from adjusting stud.
- (5) Remove thread controller stud setscrew (30) and remove thread controller stud (31). Remove stud washer (1) from stud.
- (6) Remove stop screw (23) and spring stop (24) from machine arm.

1 Rod, thread rest
2 Setscrew, thread rest rod
3 Rod, thread guide
4 Guide, thread
5 Nut, lock, thread guide
6 Cup, positioning, thread guide
7 Guide, thread
8 Rod, spool guide

9 Cushion, felt, spool rest
10 Rest
11 Pin, rest, machine
12 Washer, spool guide rod nut
13 Nut, spool guide rod
14 Screw, wood
15 Stand, spool rest
16 Setscrew, spool rest stand

17 Screw, wood
18 Screw, wood
19 Setscrew, rest
20 Nut, spool guide rod
21 Washer, spool guide rod nut
22 Cushion, felt, spool rest
23 Rod, spool guide

Figure 89. Two cone thread unwinder, exploded view.



- 1 Screw, tension bracket
- 2 Retainer, thread
- 3 Guide, thread, arm, top
- 4 Thumbnut, adjusting, control disk
- 5 Guide, thread, side, lower
- 6 Stud, thread control disk
- 7 Guide, thread, side, intermediate
- 8 Guide, thread, side, upper
- 9 Bracket assembly, tension

Figure 90. Thread guide and thread tension assemblies, installed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, breaks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

133. Drive Pulley With Balance Wheel

a. Removal.

- (1) Slide round belt off drive pulley with balance wheel (1, fig. 92).
- (2) Remove adjusting screw from end of arm shaft.
- (3) Remove setscrews that attach drive pulley with balance wheel to arm shaft, and remove drive pulley with balance wheel.

b. Installation. Reverse procedure in *a* above.

134. Knee Lifter Connection Lever, Knee Lifter Lifting Lever, and Lifting Rod

a. Removal and Disassembly.

- (1) Remove cotter pin that attaches rod (2, fig. 92) to lifting lever (3), and remove rod from lever and from machine bed.
- (2) Remove setscrew that attaches collar to rod, and remove collar and spring from rod.
- (3) Remove hinge screw that attaches connection lever (4) to machine arm, and remove lever.
- (4) Remove hinge screw that attaches lifting lever (8) to machine arm, and remove lifting lever.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burrs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

135. Feed Dog

a. Removal.

- (1) Remove left and right slide plates (1 and 4, fig. 93) from machine bed.
- (2) Remove screws (2) that attach throat plate (15) to machine bed, and remove throat plate.
- (3) Remove screws (3) that attach feed dog (14) to feed bar (13), and remove feed dog.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect feed dog teeth for excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly. Reverse procedure in *a* above.

d. Adjustment. With needle bar at its highest position, adjust feed dog so that the teeth show their full length above the throat plate.

136. Thread Hook Assembly

a. Removal and Disassembly.

- (1) Remove feed dog (para. 135).
- (2) Remove bobbin (3, fig. 94).
- (3) Remove screws (1) that attach thread hook gib (2) to thread hook (39), and remove thread hook gib.

- (4) Remove bobbin case (7).
- (5) Remove bobbin case latch (4), plunger (5), and latch spring (6) from the bobbin case.
- (6) Unscrew tension spring screw (40) and tension spring regulating screw (41) that attach flat tension spring (42) to bobbin case, and remove flat tension spring.
- (7) Unscrew retainer screws (43) that attach oiling retainer (44) to bobbin case, and remove felt retainer.
- (8) Remove screw stud (8) that attaches bobbin case opener (34) to bobbin case opener lever (33), and remove bobbin case opener.
- (9) Tilt the machine head back.
- (10) Loosen positioning screw (28) and setscrew (29) that attach hook driving pinion to thread hook shaft, and remove thread hook (39) from hook saddle (11).
- (11) Remove bobbin case opener lever link (36).
- (12) Remove setscrew that attaches bobbin case opener lever hinge stud (9) to hook saddle (11), and remove the opener lever (33) and lever hinge stud from hook saddle. Remove the lever hinge stud from the lever.
- (13) Remove nut (10) that attaches opener lever driving screw stud to opener lever, and remove opener lever driving screw stud.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for breaks, bends, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse the procedure in *a* above.

d. Adjustment. Timing the hook with the needle.

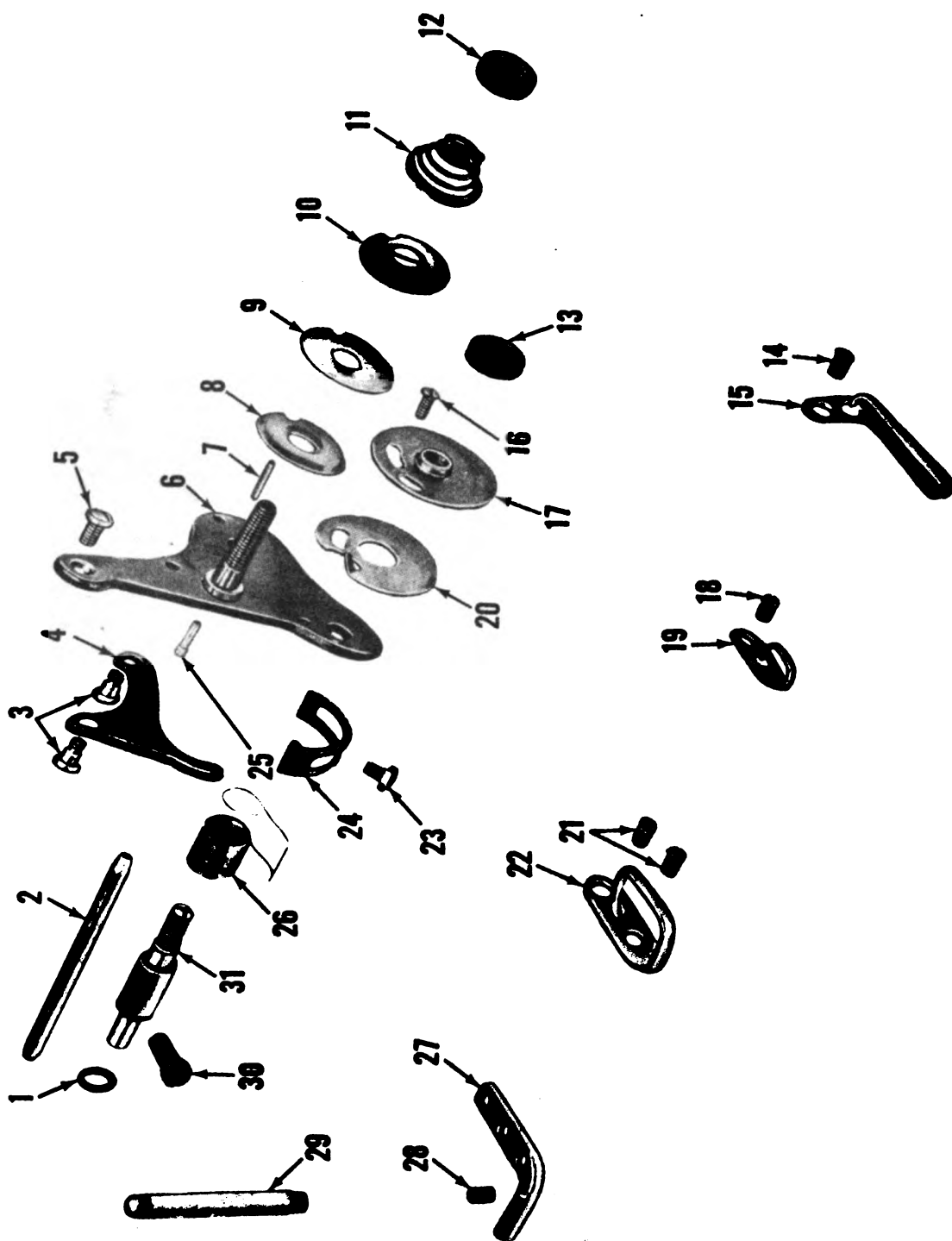
- (1) Remove the slide plates and throat plate.
- (2) Check the needle for correct size and for proper installation. See that it is up in the needle bar as far as it will go.
- (3) Turn the balance wheel toward the operator until the needle reaches its lowest position. Turn it in the same direction until the needle is raised $\frac{3}{32}$ inch. At this point, the hook should be directly in line with the needle.

- (4) If the hook point does not line up with the needle, loosen the setscrew (5, fig. 95) and positioning screw (4) in the hook drive pinion (1). Move the gear slightly to the right or left, to align the hook point with the needle. Tighten the setscrew and positioning screws.
- (5) If the hook is too far out of time the following steps will have to be performed. The drive gear (14) must be disengaged from the hook drive pinion and the pinion must be moved either forward or backward until there are enough teeth to get the proper timing. This adjustment is made in the following manner:
 - (a) Loosen setscrew (7) and positioning screw (8) that hold drive gear to hook driving shaft.
 - (b) Loosen hook saddle screw (10) and hook saddle pinch screw (13) that attach hook saddle to machine bed.
 - (c) Slide drive gear to the left and hook saddle (11) to the right until the drive gear and hook drive pinion (1) become disengaged.
 - (d) Move the hook backward or forward to obtain proper timing. Slide the hook driving gear and saddle back in position, check the timing, and make final adjustments.

137. Needle Bar and Rock Frame

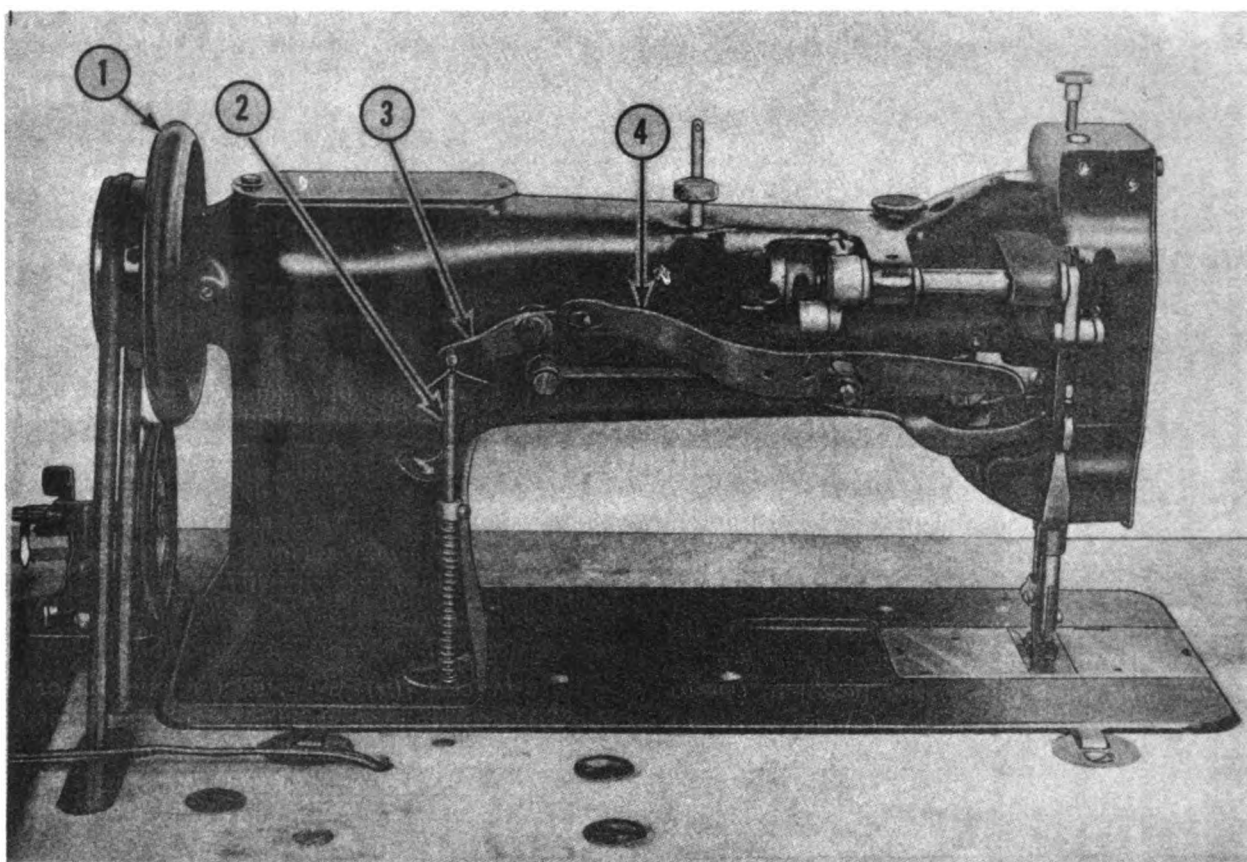
a. Removal and Disassembly.

- (1) Remove faceplate thumbscrew (55, fig. 96) and remove faceplate (53) from machine face.
- (2) Remove screw (42) that attaches lifting presser foot (41) to lifting presser bar (43), and remove presser foot.
- (3) Remove needle setscrew (37) and pull needle from the needle bar (34).
- (4) Remove vibrating presser foot screw (40) that attaches vibrating presser foot (38) to vibrating presser bar (11).
- (5) Unscrew needle bar thread guide screw (36) and remove needle bar thread guide (35) from needle bar.
- (6) Remove positioning bracket screw (45) that attaches positioning bracket (44) to machine face, and remove positioning bracket.



1	Washer, thread controller stud		
2	Rod, tension release lever		
3	Screws, tension release lever		
4	Lever, tension release		
5	Screw, tension bracket		
6	Bracket, tension		
7	Pin, position, tension disk		
8	Disk, tension, thread		
9	Disk, tension, thread		
10	Washer, release, thread tension		
11	Spring, helical, torsion, thread control		
12	Thumbnut, adjusting, thread tension		
13	Thumbnut, adjusting, control disk		
14	Screw, thread guide		
15	Guide, thread, side, lower		
16	Screw, thread control disk		
17	Disk, thread control		
18	Screw, thread guide		
19	Guide, thread, side, intermediate		
20	Disk, thread control		
21	Screw, thread guide		
22	Guide, thread, side, upper		
23	Screw, thread controller spring stop		
24	Stop, thread controller spring		
25	Plunger, tension release		
26	Spring, helical, torsion, thread control		
27	Retainer, thread		
28	Setscrew, thread retainer		
29	Guide, thread, arm, top		
30	Setscrew, thread controller stud		
31	Stud, thread control disk		

Figure 91. Thread guide and thread tension assemblies, exploded view.



1 Pulley with balance wheel, drive, arm shaft
2 Rod, lifting

3 Lever, lifting
4 Lever, connection

Figure 92. Textile sewing machine head, rear view.

- (7) Remove stud setscrew (48) and pull hinge stud (47) from machine head.
- (8) Remove lifting bellcrank screw (62) from presser bar lifting bracket (67) and slide bellcrank (63) off vibrating presser bar connecting links (64 and 68).
- (9) Pull vibrating presser bar connecting links off vibrating presser bar and from stud on end of vibrating presser bar shaft.
- (10) Remove regulating thumbscrew (5) from machine head.
- (11) Slide vibrating presser bar down to its lowest position.
- (12) Remove needle bar rock frame (46) and needle bar rock frame slide block (33) from machine face.
- (13) Remove vibrating presser bar extension (7), compression spring (8), and vibrating presser bar (11) from needle bar rock frame (46).

- (14) Remove pinch screw (17) in needle bar connecting stud (18) and slide needle bar from needle bar rock frame.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, breaks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Raise or lower needle bar by following procedure below:

- (1) Check the needle for proper size.
- (2) Loosen the needle setscrew (37) and push the needle up into the needle bar as far as it will go.
- (3) Turn the balance wheel toward the operator until the sewing hook is directly in line

with the needle. If properly adjusted, the needle eye is 1/16 inch below the hook.

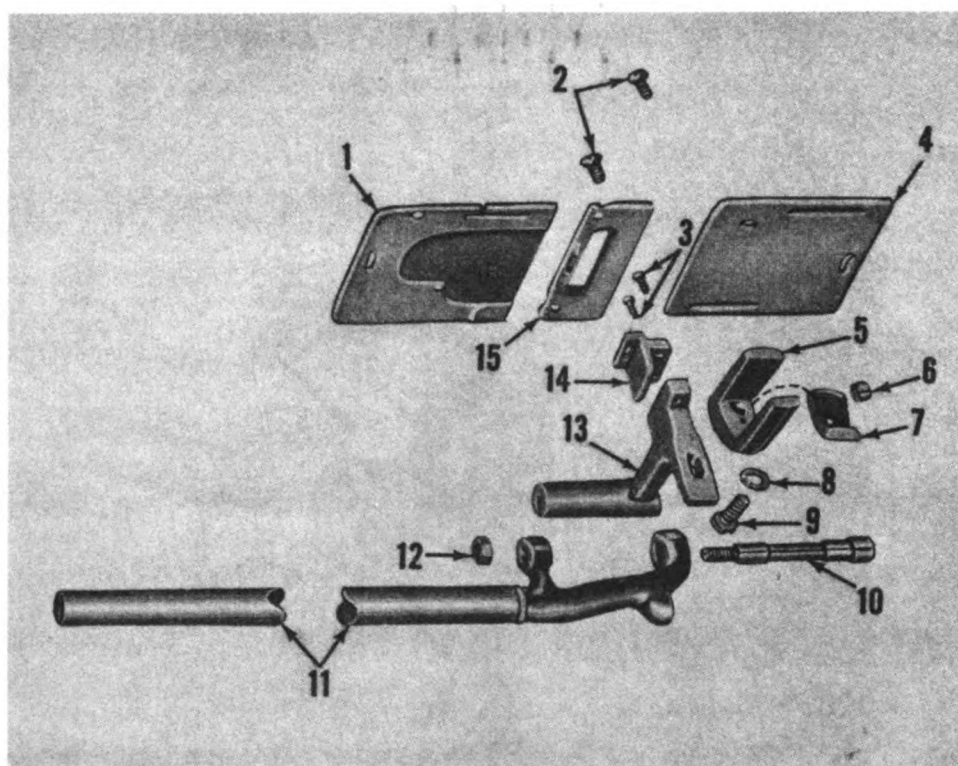
- (4) If adjustment is needed, remove the faceplate (53) and loosen the pinch screw (17) in the needle bar connecting stud (18). Raise or lower the needle bar (34) as required. Tighten the pinch screw.

138. Lifting Presser Bar

a. Removal and Disassembly.

- (1) Release the presser bar lifter (57, fig. 96).
- (2) Remove faceplate thumbscrew (55) and slide faceplate (53) from machine face.
- (3) Remove screw (42) that attaches lifting presser foot (41) to lifting presser bar (48) and remove lifting presser foot.
- (4) Remove lifting bellcrank screw (62) from presser bar lifting bracket (67) and slide bellcrank (63) off vibrating presser bar connecting links (64 and 68).

- (5) Using the access hole in the back of machine face, loosen the presser spring bracket screw (50) in the presser bar spring bracket (49). Loosen presser bar lifting bracket pinch screw (61) in the presser bar lifting bracket (67). Loosen pinch screw (66) in the lifting presser bar guide lever (65).
- (6) Remove lifting presser bar (48) out through top of machine face.
- (7) Remove vibrating presser bar guide lever (65), presser bar lifting bracket (67), thread tension release slide (58), thread tension release spring (59), and presser bar spring bracket (49).
- (8) Remove setscrews (4 and 51) that attach upper and lower presser bar bushings (8 and 52) to machine face and remove bushings.



- | | |
|---------------------------------------|---|
| 1 Plate, slide, right | 9 Screw, feed lifting cam fork |
| 2 Screws, throat plate | 10 Screw, feed driving connection hinge |
| 3 Screws, feed dog | 11 Shaft, feed driving rock |
| 4 Plate, slide, right | 12 Nut, feed driving connection hinge screw |
| 5 Dog, feed | 13 Bar, feed |
| 6 Screw, feed lifting cam oiling felt | 14 Dog, feed |
| 7 Pad, oiling, feed lifting cam | 15 Plate, throat |
| 8 Washer, feed lifting cam fork screw | |

Figure 93. Feed assembly, exploded view.

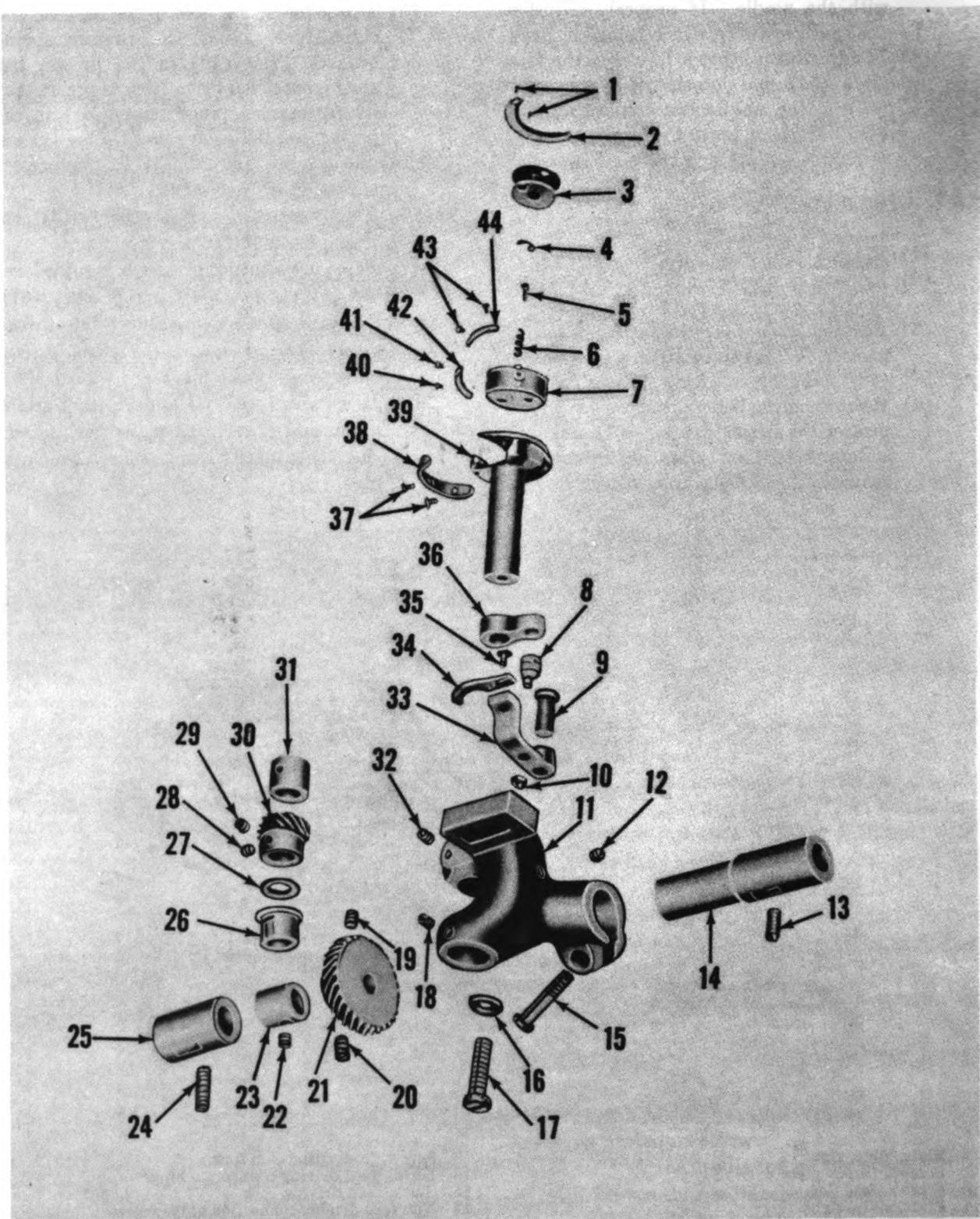
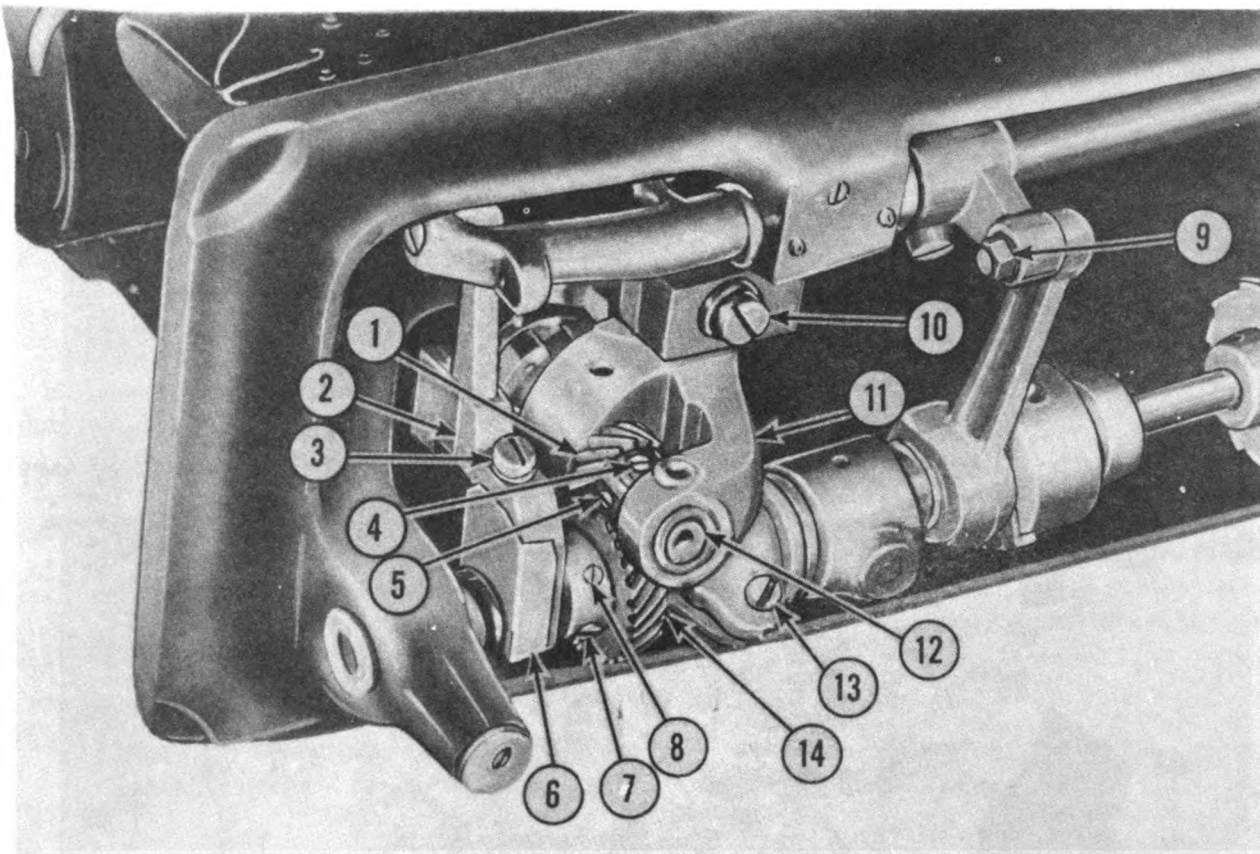


Figure 94. Thread hook assemblies, exploded view.

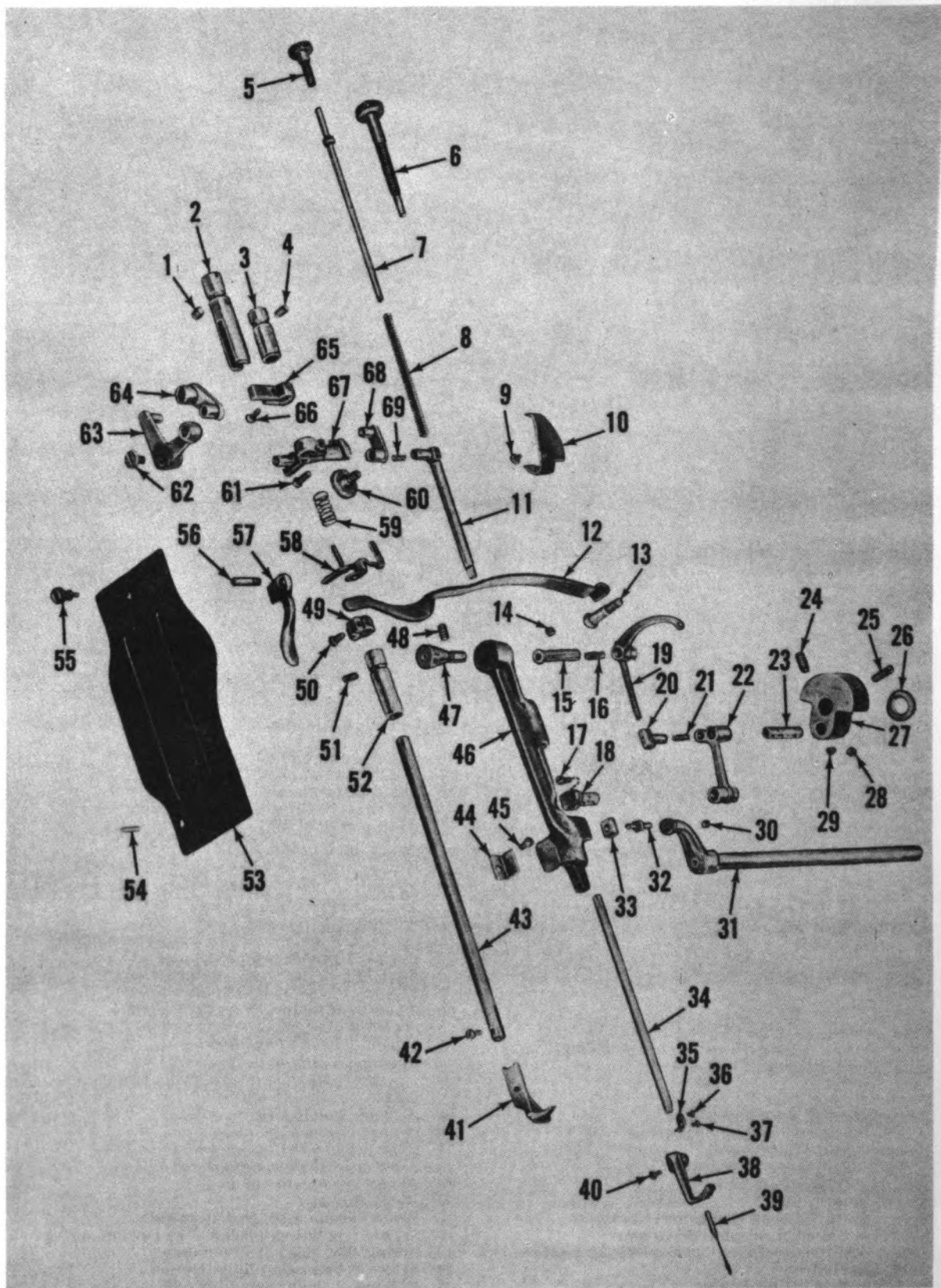


- | | |
|---|---|
| 1 Pinion, spiral, drive, thread hook | 8 Screw, positioning, thread hook spiral drive gear |
| 2 Bar, feed | 9 Nut |
| 3 Screw, feed lifting cam fork | 10 Screw, hook saddle |
| 4 Screw, positioning, hook driving pinion | 11 Saddle, thread hook |
| 5 Setscrew, thread hook drive pinion | 12 Shaft, thread hook |
| 6 Fork, feed lifting cam | 13 Screw, pinch thread hook saddle |
| 7 Setscrew, thread hook spiral drive gear | 14 Gear, spiral, drive |

Figure 95. Hook driving assembly, installed.

- | | |
|--|--|
| 1 Screws, thread hook gib | 23 Cam, feed lifting arm |
| 2 Gib, thread hook | 24 Setscrew, thread hook drive shaft bushing |
| 3 Bobbin | 25 Bushing, thread hook drive shaft |
| 4 Latch, bobbin case | 26 Bushing, bronze, hook saddle, lower |
| 5 Plunger, bobbin case latch | 27 Washer, thrust, hook driving pinion |
| 6 Spring, bobbin case latch | 28 Screw, positioning, hook driving pinion |
| 7 Case, bobbin | 29 Setscrew, thread hook drive pinion |
| 8 Stud, screw, bobbin case opener lever driving | 30 Pinion, spiral, drive, thread hook |
| 9 Stud, hinge, bobbin case opener lever | 31 Bushing, hook saddle, upper |
| 10 Nut, screw stud | 32 Screw, positioning, thread hook saddle, upper bushing |
| 11 Saddle, thread hook | 33 Lever, bobbin case opener |
| 12 Screw, position, hook bushing | 34 Opener, bobbin case |
| 13 Setscrew, thread hook saddle bearing | 35 Screw, bobbin case opener |
| 14 Bearing, thread hook saddle | 36 Link, bobbin case opener lever |
| 15 Screw, pinch, thread hook saddle | 37 Screw, thread hook needle guard |
| 16 Washer, hook saddle screw | 38 Guard, needle, thread hook |
| 17 Screw, hook saddle | 39 Hook, thread |
| 18 Setscrew, thread hook saddle lower bushing | 40 Screw, bobbin case tension spring |
| 19 Setscrew, thread hook spiral drive gear | 41 Screw, regulating, bobbin case tension spring |
| 20 Screw, positioning, thread hook spiral drive gear | 42 Spring, flat, tension, bobbin case |
| 21 Gear, spiral, drive | 43 Screw, bobbin case oiling retainer |
| 22 Setscrew, feed lifting cam | 44 Retainer, bobbin case oiling felt |

Figure 94.—Continued



- (9) Remove setscrew (1) that attaches presser bar positioning guide to machine face and remove guide.

- (10) Remove spring screw (6), bracket guide screw (60), and support screw (13) from machine arm, and remove flat spring (12).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, breaks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

139. Thread Takeup Lever

a. Removal.

- (1) Remove faceplate thumbscrew (55, fig. 96) that attaches faceplate to machine face and remove faceplate.
- (2) Remove needle bar rock frame assembly (para. 187).
- (3) Unscrew the connecting link oil guard screw (9) that attaches oil guard (10) to machine arm, and remove oil guard.

- (4) Turn needle bar drive crank (27) to its lowest position.

- (5) Remove setscrew (14) that attaches thread takeup lever hinge stud (15) to hinge, and remove hinge stud (47).

- (6) Grasp thread takeup lever (19) and needle bar connecting link (22) and slide needle bar connecting link off needle bar connecting link stud (23).

- (7) Remove thread takeup lever from thread takeup lever drive stud (20) and remove drive stud from connecting link.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, breaks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

140. Presser Bar Lifter

a. Removal.

- (1) Remove faceplate thumbscrew (55, fig. 96) that attaches faceplate to machine

1 Setscrew, presser bar position guide
 2 Guide, positioning, presser bar
 3 Bushing, presser bar, upper
 4 Setscrew, presser bar bushing
 5 Thumbscrew, regulating, vibrating presser bar pressure
 6 Screw, regulating, presser bar flat spring
 7 Extension, w/collar and pin, vibrating presser bar
 8 Spring, helical, compression, vibrating presser bar
 9 Screw, needle bar connecting link oil guard
 10 Guard, oil, needle bar, connection link
 11 Presser bar, vibrating
 12 Spring, flat, lifting presser bar
 13 Screw, support, presser bar flat spring
 14 Setscrew, thread takeup lever hinge stud
 15 Stud, hinge, thread takeup lever
 16 Wick, oil, thread takeup lever hinge stud
 17 Screw, pinch, needle bar connecting stud
 18 Stud, connecting, needle bar
 19 Lever, thread takeup
 20 Stud, drive, thread takeup lever
 21 Wick, oil, thread takeup lever drive stud
 22 Link, connecting, needle bar
 23 Stud, needle bar connecting link
 24 Setscrew, needle bar drive crank
 25 Setscrew, needle bar drive crank
 26 Washer, friction, needle bar drive crank
 27 Crank, drive, needle bar
 28 Setscrew, needle bar connecting link stud, side
 29 Setscrew, needle bar connecting link stud, bottom
 30 Setscrew, needle bar rock frame slide block stud
 31 Shaft, rock, needle bar rock frame
 32 Stud, needle bar rock frame slide block
 33 Block, slide needle bar rock frame
 34 Bar, needle

35 Guide, thread, needle bar
 36 Screw, needle bar thread guide
 37 Setscrew, needle
 38 Foot, presser, vibrating
 39 Needle
 40 Screw, vibrating presser foot
 41 Foot, presser, lifting
 42 Screw, lifting presser foot
 43 Bar, presser, lifting
 44 Bracket, positioning, needle bar rock frame
 45 Screw, needle bar rock frame positioning bracket
 46 Frame, rock, needle bar
 47 Stud, hinge, needle bar rock frame
 48 Setscrew, needle bar rock frame hinge stud
 49 Bracket, presser bar spring
 50 Screw, presser bar spring bracket
 51 Setscrew, lower presser bar
 52 Bushing, presser bar, lower
 53 Faceplate
 54 Pin, positioning, faceplate
 55 Thumbscrew, faceplate
 56 Screw, hinge, presser bar lifter
 57 Lifter, presser bar
 58 Slide, thread tension release
 59 Spring, helical, compression, thread tension release
 60 Screw, guide, presser bar lifting bracket
 61 Screw, pinch, presser bar lifting bracket
 62 Screw, lifting bellcrank
 63 Bellcrank, lifting, vibrating presser bar
 64 Link, connecting, vibrating presser bar
 65 Lever, guide, vibrating presser bar
 66 Screw, pinch, vibrating presser bar
 67 Bracket, lifting, presser bar
 68 Link, connecting, vibrating presser bar
 69 Wick, oil, vibrating presser bar connecting link

Figure 96. Face assemblies, exploded view.

face, and remove faceplate off faceplate positioning pin (54).

- (2) Remove presser bar lifter hinge screw (56), that attaches lifter (57) to machine head, and remove lifter.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, breaks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

141. Vibrating Presser Bar Lifting Rock Shaft

a. Removal and Disassembly.

- (1) Remove faceplate thumbscrew (55, fig. 96) and remove faceplate (53) from machine face.
- (2) Remove lifting bellcrank screw (62) from presser bar lifting bracket (67) and slide bellcrank (63) off vibrating presser bar links (64 and 68). Pull vibrating presser bar links from vibrating presser

bar and from the stud on end of vibrating presser bar shaft.

- (3) Remove rock shaft crank pinch screw (2, fig. 97) that attaches rock shaft crank (1) to lifting rock shaft (4).

- (4) Grasp left end of lifting rock shaft and pull it out of rock shaft crank.

- (5) Remove lifting rock shaft crank from lifting rock shaft eccentric connector.

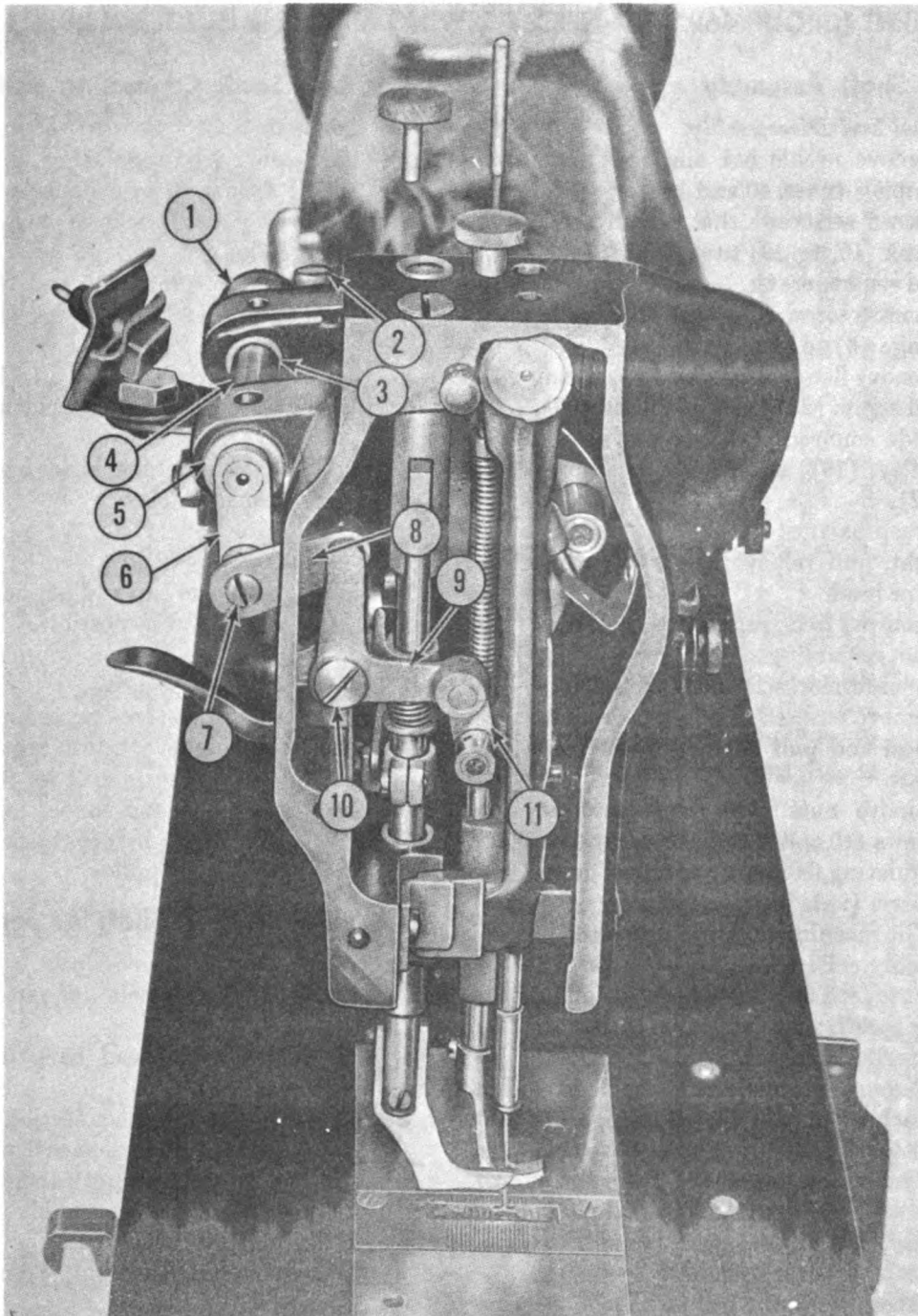
- (6) Push lifting rock shaft bushings (3 and 5) out mounting brackets on back of machine arm.

- (7) Unscrew bellcrank stud nut (6) that attaches the bellcrank stud (7) to lifting rock shaft crank, and remove bellcrank stud.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



- | | |
|---|--|
| 1 Crank, needle bar rock frame rock shaft | 7 Stud, vibrating presser bar lifting bellcrank link |
| 2 Screw, pinch, needle bar rock frame rock shaft crank | 8 Link, vibrating presser bar lifting bellcrank |
| 3 Bushing, vibrating presser bar lifting rock shaft crank | 9 Bellcrank, vibrating presser bar lifting |
| 4 Shaft, vibrating presser bar lifting rock | 10 Screw, lifting bellcrank |
| 5 Bushing, vibrating presser bar lifting rock shaft crank | 11 Link, vibrating presser bar lifting bellcrank |
| 6 Nut, vibrating presser bar lifting bellcrank stud. | |

Figure 97. Vibrating presser bar lifting rock shaft assembly, installed.

Section XIV. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), TWO-NEEDLE SEWING MACHINE (SINGER MODEL 112W116)

142. Arm Shaft Assembly

a. Removal and Disassembly.

- (1) Remove needle bar and rock frame assemblies (pars. 40 and 146).
- (2) Loosen setscrews that attach needle bar crank (10, fig. 19) to arm shaft (4, fig. 98) and remove crank.
- (3) Remove screw (25) that attaches bracket flange (6) to arm shaft.
- (4) Remove flange setscrews (7), spring (8), and screw (25) from eccentric (23).
- (5) Slide connection belt to one side of belt pulley (19) and loosen position screw (12).
- (6) Grasp balance wheel (18), pull it to the right, and remove arm shaft from machine head.
- (7) Remove feed regulating spindle (17) from remaining assembly by turning it in a counterclockwise direction.
- (8) Remove screws (15 and 16) from balance wheel and pull balance wheel from arm shaft.
- (9) Remove nuts (26) from bracket stop screws (10 and 22), and separate eccentric regulating flange (6) and feed driving eccentric (23).
- (10) Tilt machine back to expose the bed assembly. Remove hinge screw that attaches feed driving connection and needle bar rock frame connection to feed driving rock shaft crank.
- (11) Remove setscrews in machine arm that attach front and rear bushings (2) and 14) to machine arm and remove bushings.
- (12) Remove the screw (3) from the end of the arm shaft, and remove oil packing.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, breaks, wear on bearing surfaces, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

143. Arm Shaft Connecting Belt

a. Removal.

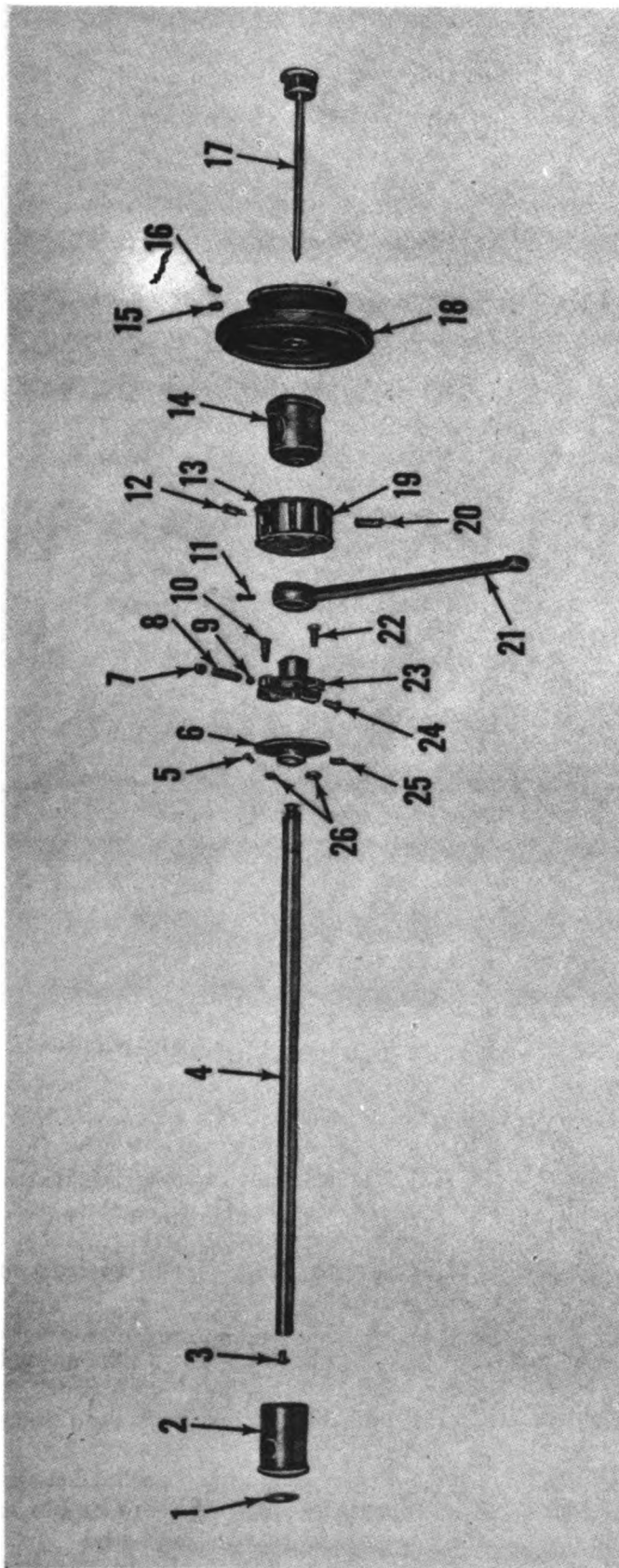
- (1) Remove feed regulating spindle (17, fig. 98) from end of balance wheel (18) by turning spindle in a counter-clockwise direction.
- (2) Loosen setscrews (15 and 16) in the balance wheel and slide the wheel off shaft (4).
- (3) Loosen setscrew that attaches rear arm shaft bushing (14) to machine arm, and remove bushing.
- (4) Tilt the machine head back to expose the bed assemblies.
- (5) Slip the belt (1, fig. 99) off hook driving shaft pulley (2).
- (6) Remove arm cap and lift belt up through the hole as far as possible. Draw the belt out through the hole normally filled by the bushing.

b. Installation. Reverse procedure in *a* above. The thread takeup lever must be at its highest position and the timing marks on the connection belt timing plate (4) and connection belt timing collar (3) must line up before the belt is installed on the hook shaft drive pulley.

144. Hook Driving Shaft Assembly

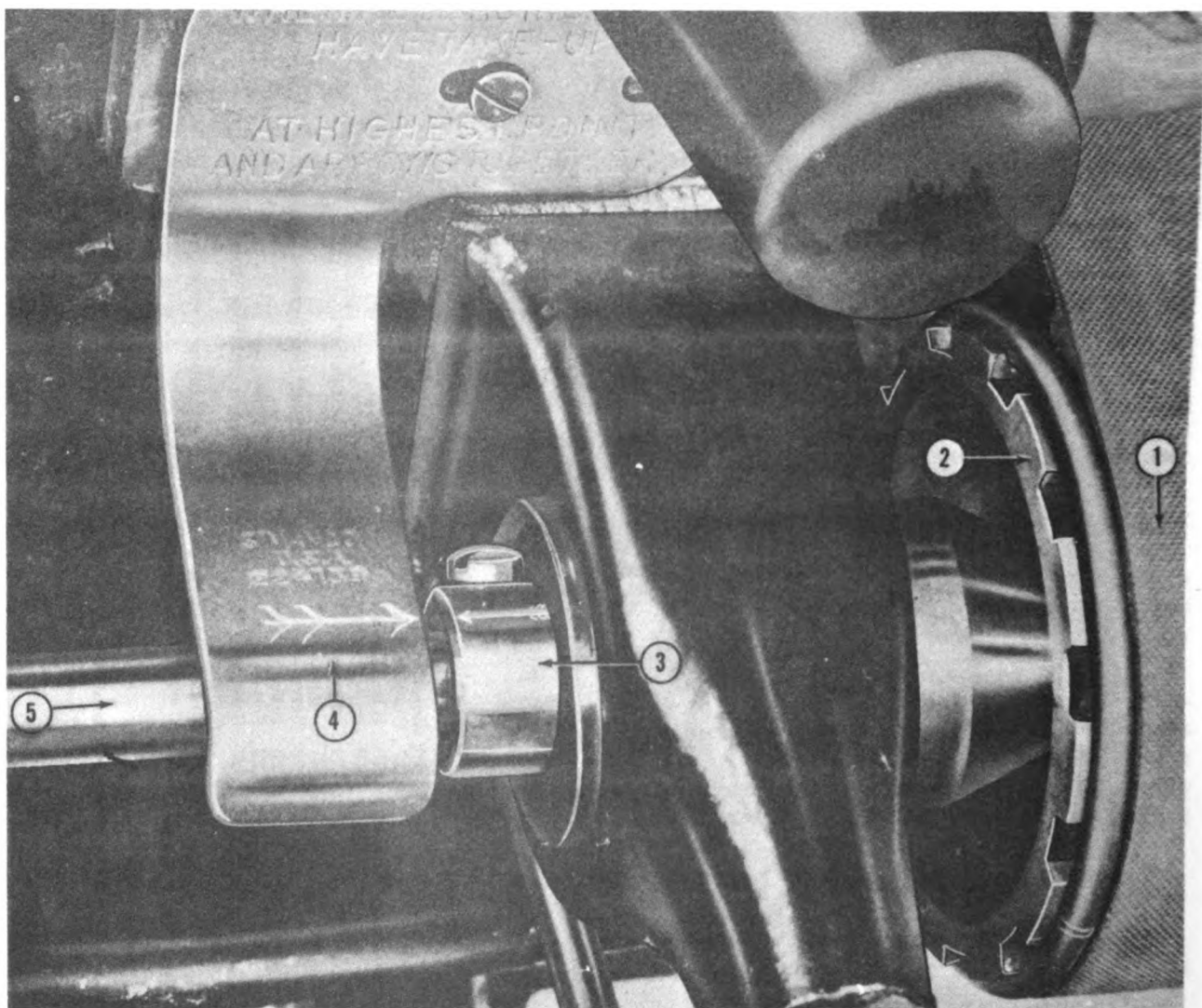
a. Removal and Disassembly.

- (1) Slide round belt off arm shaft belt pulley.
- (2) Tilt machine head back to expose bed assemblies.
- (3) Slide arm shaft connection belt (11, fig. 100) from connection belt pulley (14).
- (4) Remove setscrews (12 and 13) from connection belt pulley and slide pulley from hook driving shaft (8).
- (5) Remove setscrew (15) from timing collar (9).
- (6) Remove setscrews (2, 5, 16, and 18) from hook driving gears (3 and 6).
- (7) Remove setscrew (17) that attaches feed lifting cam (4) to shaft and slide shaft from machine bed.



- | | | |
|--|---|---|
| 1 Washer, thrust | 14 Bushing, arm shaft rear | 20 Setscrew, arm shaft connection belt pulley |
| 2 Bushing, arm shaft, front | 15 Screw, balance wheel position | 21 Connection, feed driving |
| 3 Screw, arm shaft oil packing stop | 16 Setscrew, balance wheel | 22 Eccentric, feed driving |
| 4 Shaft, arm | 17 Spindle, feed regulating | 23 Screw, feed driving eccentric regulating bracket |
| 5 Setscrew, feed driving eccentric regulating bracket flange | 18 Wheel, balance | 24 Eccentric, feed driving |
| 6 Flange, bracket, feed driving eccentric regulating | 19 Pulley, belt, arm shaft | 25 Screw, feed driving eccentric regulating bracket flange position |
| 7 Setscrew, feed driving eccentric regulating bracket flange | 20 Setscrew, arm shaft connection belt pulley | 26 Nuts, feed driving eccentric regulating bracket stop screw. |
| 8 Spring, bracket plunger, feed driving eccentric regulating | 21 Connection, feed driving | |
| 9 Plunger, feed driving eccentric regulating bracket | 22 Eccentric, feed driving | |
| 10 Screw, feed driving eccentric bracket stop | 23 Screw, feed driving eccentric regulating bracket | |
| 11 Screw, feed driving eccentric bracket pinch | 24 Eccentric, feed driving | |
| 12 Screw, arm shaft connection belt pulley position | 25 Screw, feed driving eccentric regulating bracket flange position | |
| 13 Spring, flange, hook driving shaft connection belt pulley | 26 Nuts, feed driving eccentric regulating bracket stop screw. | |

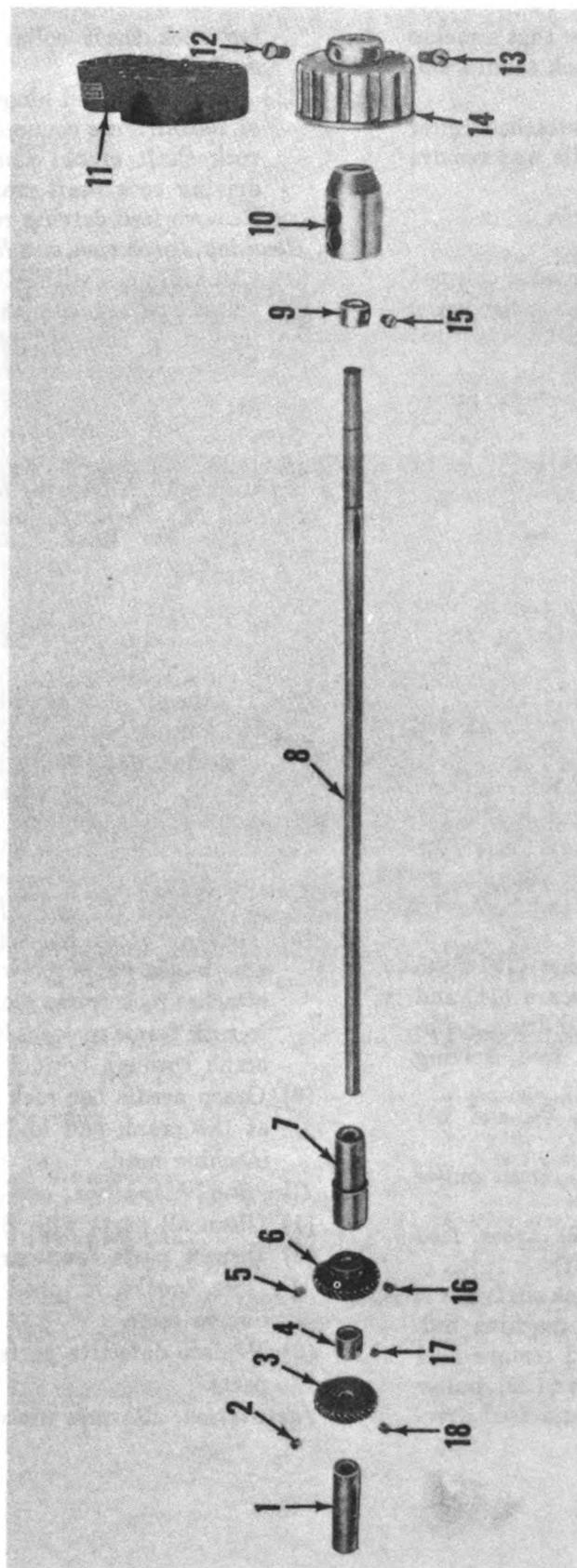
Figure 98. Arm shaft assembly, exploded view.



- | | |
|--|---|
| 1 Belt, arm shaft connection | 4 Plate, arm shaft connection belt timing |
| 2 Pulley, hook driving shaft | 5 Shaft, hook driving |
| 3 Collar, arm shaft connection belt timing | |

Figure 99. Bed assembly showing timing plate.

- | | |
|---|---|
| (8) Remove hook driving gear (3), feed lifting cam (4), hook driving gear (6), and timing collar (9), from machine bed. | (12) Remove screw and washer that attach right hook saddle to machine bed, and remove right hook saddle. |
| (9) Remove pinch screw that attaches left hook saddle bearing (1) to machine bed and remove bearing. | (13) Lift lever link (5, fig. 15) from opener lever (8). |
| (10) Remove setscrew that attaches left hook driving shaft bushing (10) to machine bed, and remove bushing. | (14) Remove stud setscrew that attaches stud (7) to hook saddle and lift out stud and lever. |
| (11) Remove screw and washer that attach left hook saddle to machine bed, and remove left hook saddle. | (15) Pull oil packings from stud and from lever. |
| | (16) Remove nut that attaches bobbin case opener lever driving screw stud to opener lever, and remove screw stud. |



- 1 Bearing, hook saddle, left
- 2 Setscrew, hook driving gear
- 3 Gear, hook driving
- 4 Cam, feed lifting
- 5 Setscrew, hook driving gear
- 6 Gear, hook driving

- 7 Bearing, hook saddle, right
- 8 Shaft, hook driving
- 9 Collar, connection belt timing
- 10 Bushing, hook driving shaft
- 11 Belt, arm shaft connecting
- 12 Setscrew, hook driving shaft connection belt

- 13 Setscrew, hook driving shaft connection belt
- 14 Pulley, hook driving shaft connection belt
- 15 Setscrew, connection belt timing collar
- 16 Setscrew, hook driving gear
- 17 Setscrew, feed lifting cam
- 18 Setscrew, hook driving gear

Figure 100. Hook driving shaft assembly, exploded view.

(17) Remove positioning screw that attaches upper hook bushing to hook saddle, and remove bushing.

(18) Remove setscrew that attaches lower hook bushing to hook saddle, and remove bushing.

b. Cleaning, Inspection and Repair.

(1) Clean parts with SD.

(2) Inspect parts for bends, breaks, chipped or broken gear teeth, and excessive wear.

(8) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust timing of thread hooks as necessary (par. 36).

145. Feed Driving Assembly

a. Removal and Disassembly.

(1) Remove screws that attach throat plate to machine bed and remove throat plate.

(2) Remove feed dog screws and feed dog from feed bar.

(8) Tilt machine head back to expose bed assemblies.

(4) Remove fork screw (4, fig. 101) and cam fork (3) from connector crank (10).

(5) Remove feed bar hinge screw nut (7, fig. 102) and pull the feed bar hinge screw (1) from the feed bar (3) and feed driving rock shaft (8).

(6) Remove nut (17) and washer (16) from puller feed clutch driving screw (11) and pull the screw from the feed driving connection (14) and puller feed driving crank (23).

(7) Remove setscrews (9, 10, 18, and 20) from collars (22 and 24).

(8) Remove pinch screw (15) from puller feed driving crank.

(9) Remove pinch screw (19) from feed driving rock shaft crank (21).

(10) Grasp the feed driving rock shaft at the left and pull it from the machine bed. As the rock shaft is pulled remove feed driving rock shaft stop collar (22), puller feed driving crank (23), and feed driv-

ing rock shaft collar (24) from rock shaft.

(11) Remove nut and hinge screw from ends of feed driving connection (11, fig. 101), rock shaft crank connection, and feed driving rock shaft crank (12) together. Remove feed driving rock shaft crank.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with SD.

(2) Inspect parts for breaks, cracks, stripped threads, and excessive wear.

(8) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust the feed dog (par. 38).

146. Needle Bar Rock Frame Rock Shaft Assembly

a. Removal.

(1) Remove the needle bar assembly (par. 40).

(2) Tilt the machine head back to expose the bed assemblies.

(8) Remove hinge screw (4, fig. 103) and locknut (2) from crank (8), using the access hole in machine bed.

(4) Remove hinge screw (7) and locknut (6) that attach connector crank (5) to rock shaft crank (12, fig. 101).

(5) Through access hole in rear of machine arm loosen pinch screw (8, fig. 103) that attaches rock frame rock shaft crank (3) to rock frame rock shaft (1), and remove crank through bottom of machine arm.

(6) Grasp needle bar rock frame rock shaft at the crank end and pull shaft from machine head.

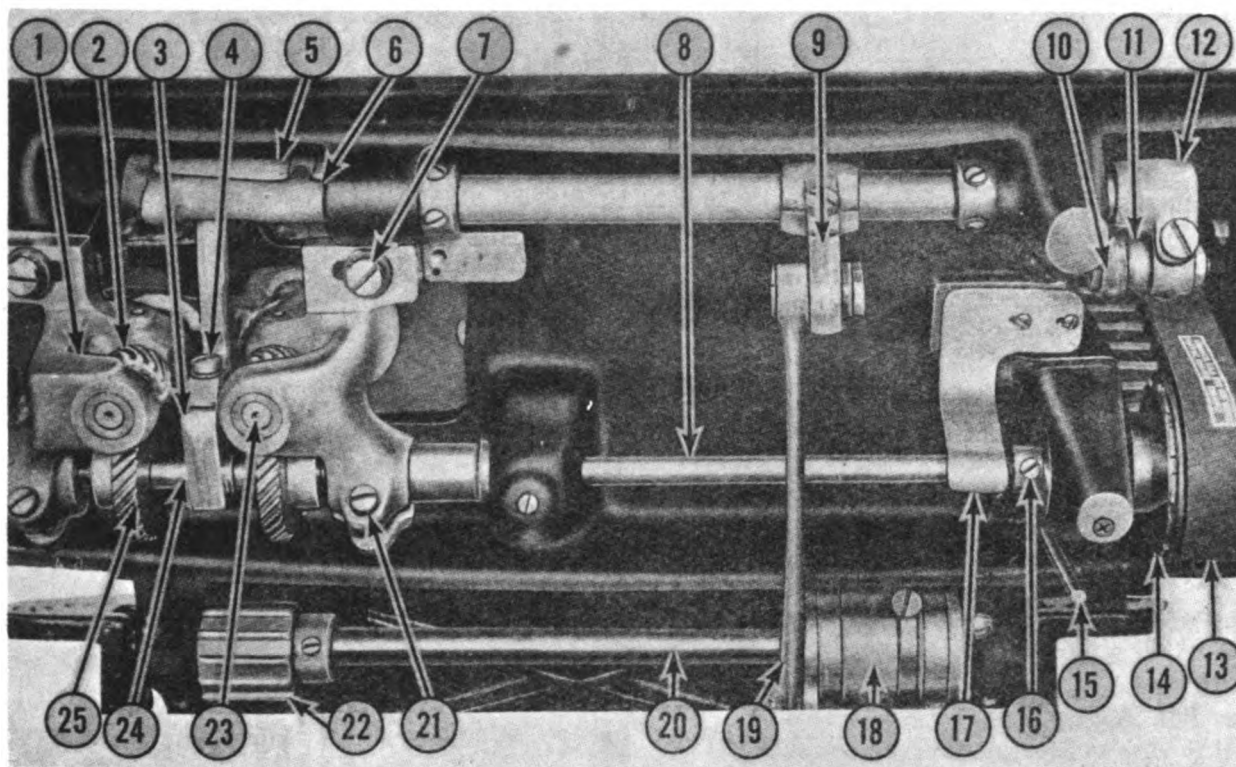
b. Cleaning, Inspection, and Repair.

(1) Clean all parts with SD.

(2) Inspect parts for wear on bearing surfaces, breaks, stripped threads, and excessive wear.

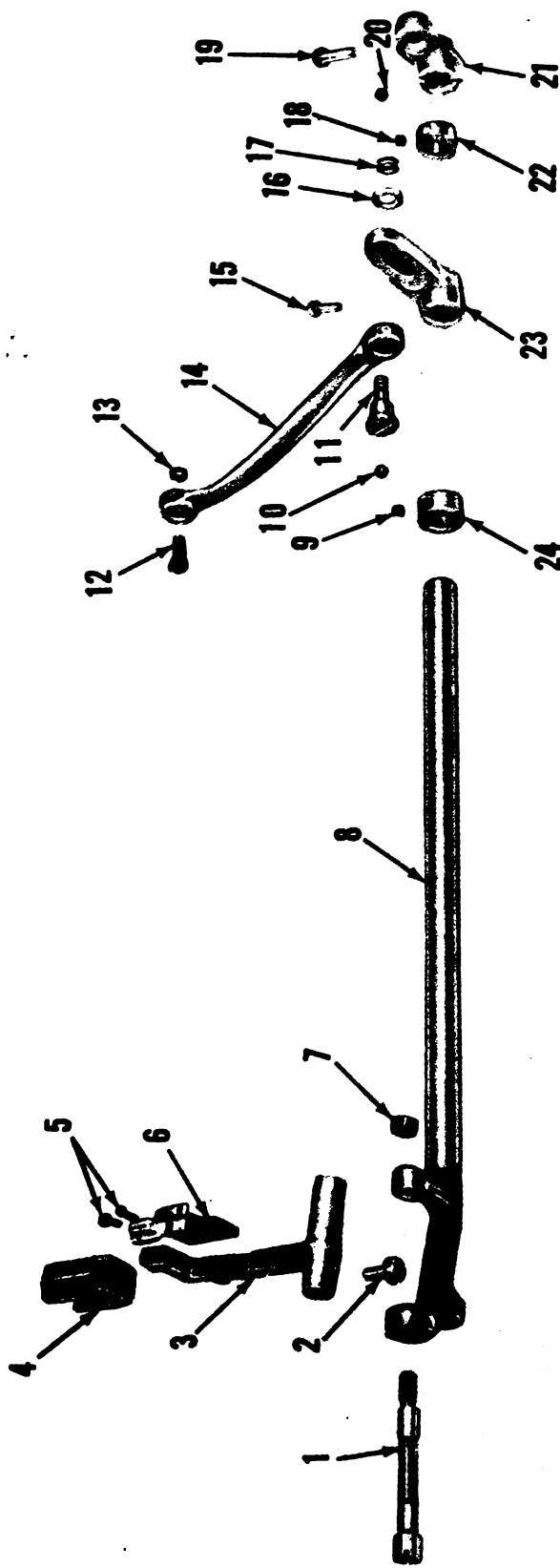
(8) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.



- | | |
|---|---|
| 1 Saddle, hook | 14 Pulley, hook driving shaft connection belt |
| 2 Pinion, hook driving | 15 Rod, knee lifter connection lever lifting |
| 3 Fork, feed lifting cam | 16 Collar, arm shaft connection belt timing |
| 4 Screw, feed lifting cam fork | 17 Plate, arm shaft connection belt timing |
| 5 Bar, feed | 18 Clutch assembly, puller feed |
| 6 Shaft, rock, feed driving | 19 Connection, puller feed clutch driving |
| 7 Screw, hook saddle | 20 Shaft, puller feed roll, lower |
| 8 Shaft, hook driving | 21 Screw, pinch, hook saddle |
| 9 Crank, puller feed clutch driving | 22 Roll, puller feed, lower |
| 10 Crank, connector, needle bar rock frame rock shaft | 23 Hook, thread (shaft end) |
| 11 Connection, feed driving | 24 Cam, feed lifting |
| 12 Crank, feed driving rock shaft | 25 Gear, hook driving |
| 13 Belt, arm shaft connecting | |

Figure 101. Bed assemblies, installed.

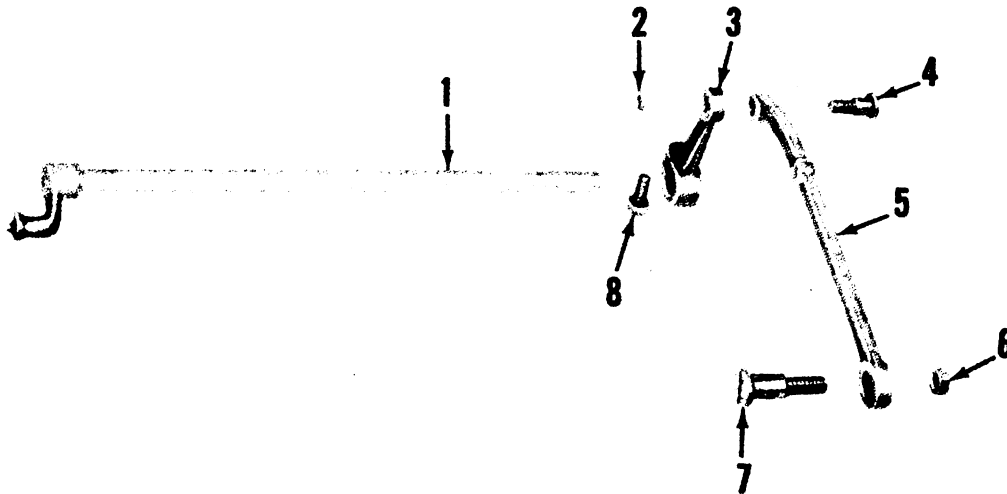


- 1 Screw, feed bar hinge
- 2 Screw and washer, feed bar
- 3 Bar, feed
- 4 Fork, feed lifting cam
- 5 Screws, feed dog
- 6 Dog, feed
- 7 Nut, feed bar hinge screw
- 8 Shaft, rock, feed driving

- 9 Setscrew, feed driving rock shaft collar
- 10 Setscrew, feed driving rock shaft collar
- 11 Screw, puller feed clutch driving
- 12 Nut, hinge screw
- 13 Connection, puller feed clutch driving
- 14 Screw, pin
- 15 Washer, puller feed clutch driving

- 17 Nut, puller feed clutch driving screw
- 18 Setscrew, feed driving rock shaft collar
- 19 Screw, pin, feed driving rock shaft collar
- 20 Setscrew, feed driving rock shaft collar
- 21 Crank, feed driving rock shaft
- 22 Crank, feed driving rock shaft
- 23 Crank, puller feed clutch driving
- 24 Collar, feed driving rock shaft

Figure 102. Feed driving assembly, exploded view.



- 1 Shaft, needle bar rock frame rock
- 2 Locknut, hinge screw
- 3 Crank, needle bar rock frame shaft
- 4 Screw, hinge

- 5 Crank, connector, needle bar rock frame rock shaft
- 6 Locknut, hinge screw
- 7 Screw, hinge
- 8 Screw, pinch

Figure 103. Needle bar rock frame rock shaft assembly, exploded view.

Section XV. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), FOUR-NEEDLE SEWING MACHINE (SINGER MODEL 131W113)

147. Arm Shaft, Bushings, and Needle Bar Crank Assembly

a. Removal and Disassembly.

- (1) Remove needle bar (par. 61a (1) through (3)).
- (2) Remove presser bar (par. 62a (1) through (5)).
- (3) Insert screwdriver through access hole in top of machine head and remove setscrews and position screw that attaches needle bar crank to arm shaft (16, fig. 104), and remove crank assembly and washer.
- (4) Remove screws that attach stud to crank, and remove stud.
- (5) Remove screw that attaches cap to machine arm and remove cap.
- (6) Insert screwdriver through arm cap opening and remove setscrew (14) and screw (15) that attach eccentric (18) to shaft (16).
- (7) Remove setscrew (23), screws (22 and 5), spring (6), and plunger (7) from bracket (24).

- (8) Remove setscrews (4 and 26) that attach gear (25) to shaft.
 - (9) Slide round belt off balance wheel (2), pull balance wheel to the right, and remove arm shaft from machine arm. Lift out bracket (24) with gear (25), and eccentric (18).
 - (10) Unscrew spindle (1) from shaft.
 - (11) Remove setscrews that attach balance wheel to arm shaft, and remove wheel.
 - (12) Remove setscrews (28) that attach bushing (3) to machine arm, and remove bushing.
 - (13) Remove setscrew that attaches bushing (17) to machine arm and remove bushing.
 - (14) Remove screw (5) from bracket, and lift out spring (6) and plunger (7).
 - (15) Remove screws (23 and 22) from bracket.
 - (16) Remove screws (20) and separate gear and bracket.
- #### b. Cleaning, Inspection, and Repair.
- (1) Clean parts with SD.
 - (2) Inspect parts for bends, chipped places, stripped threads, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment of Feed Regulator. If number shown in balance wheel notch does not correspond to actual number of stitches per inch that machine sews, adjust feed regulator (para. 51).

148. Feed Lifting Connection

a. Removal.

- (1) Remove arm shaft (par. 147a (1) through (9)).
- (2) Tilt machine head back.
- (3) Remove nut (11, fig. 104) and screw (18) that attach connection (12) to crank, and remove connection out bottom of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect connection for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Inspect screws and nut for stripped threads and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

149. Hook Saddles

a. Removal.

- (1) Remove hook and bobbin case assemblies (par. 58).
- (2) Remove screws (12, fig. 31) and washers that attach hook saddles to machine bed, and remove hook saddles.

b. Cleaning, Inspection, and Repair.

- (1) Clean saddles with SD.
- (2) Inspect saddles for cracks, burs, and excessive wear, and screws for stripped threads.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

150. Hook Driving Shaft, Gears, and Bushings

a. Removal.

- (1) Remove hook socket spiral gears (par. 57).
- (2) Remove setscrew and position screw (1, fig. 105) that attach gear (35) to shaft (26).

- (3) Remove screws (4) that attach gear (32) to shaft.

- (4) Remove setscrew and position screw (6) that attach gear (30) to shaft.

- (5) Remove setscrew and position screw (9) that attach gear (27) to shaft.

- (6) Remove setscrews (12) that attach collar (11) to shaft.

- (7) Remove setscrews (18) that attach collar (25) to shaft.

- (8) Remove screw (22) that attaches two halves of guard assembly (14 and 21), and remove guard halves from machine bed.

- (9) Remove setscrew and position screw (20) that attach gear (23) to shaft.

- (10) Push shaft out left end of machine bed, and remove gears and collars.

- (11) Remove screws (31) that attach bearing (5) to machine bed, and remove bearing.

- (12) Remove setscrews that attach bushings (10, 24, and 36) to machine bed, and drive out bushings.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Time sewing hooks with needles (TM 10-3530-202-10).

151. Vertical Shaft, Gears, and Bushings

a. Removal.

- (1) Remove balance wheel (para. 51).
- (2) Remove setscrews that attach rear arm shaft bushing to machine arm, and remove bushing.

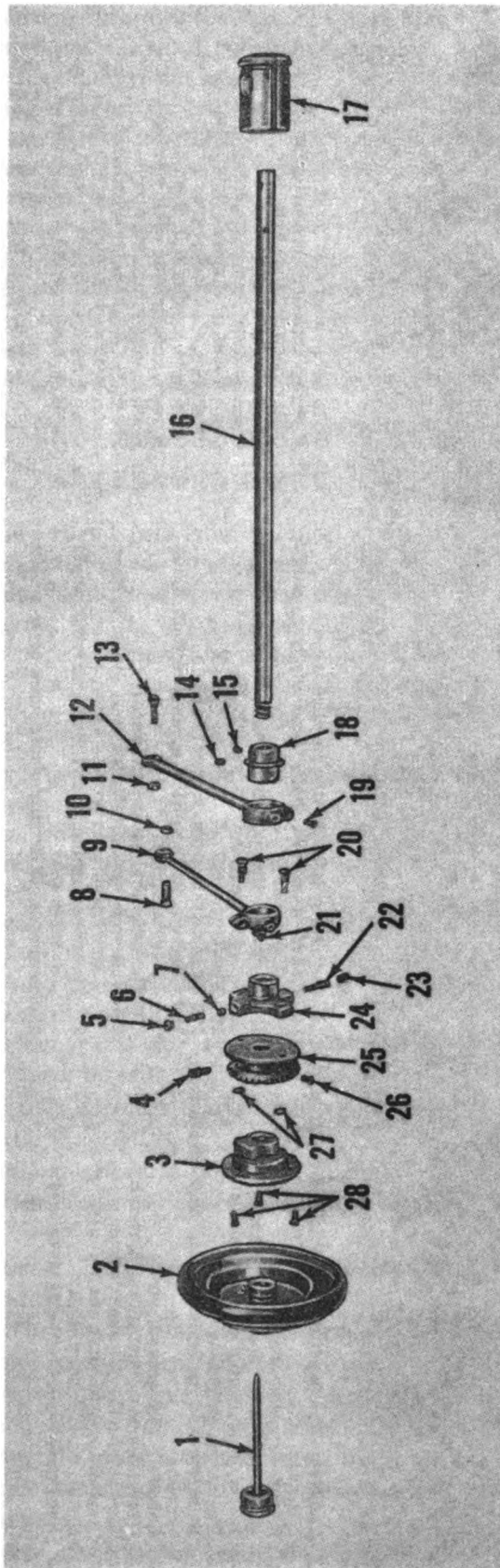
- (3) Remove setscrew and position screw (18, fig. 105) that attach gear (17) to shaft (16).

- (4) Tilt machine head to the rear.

- (5) Remove screw (22) that attaches halves of guard assembly (14 and 21), and remove halves.

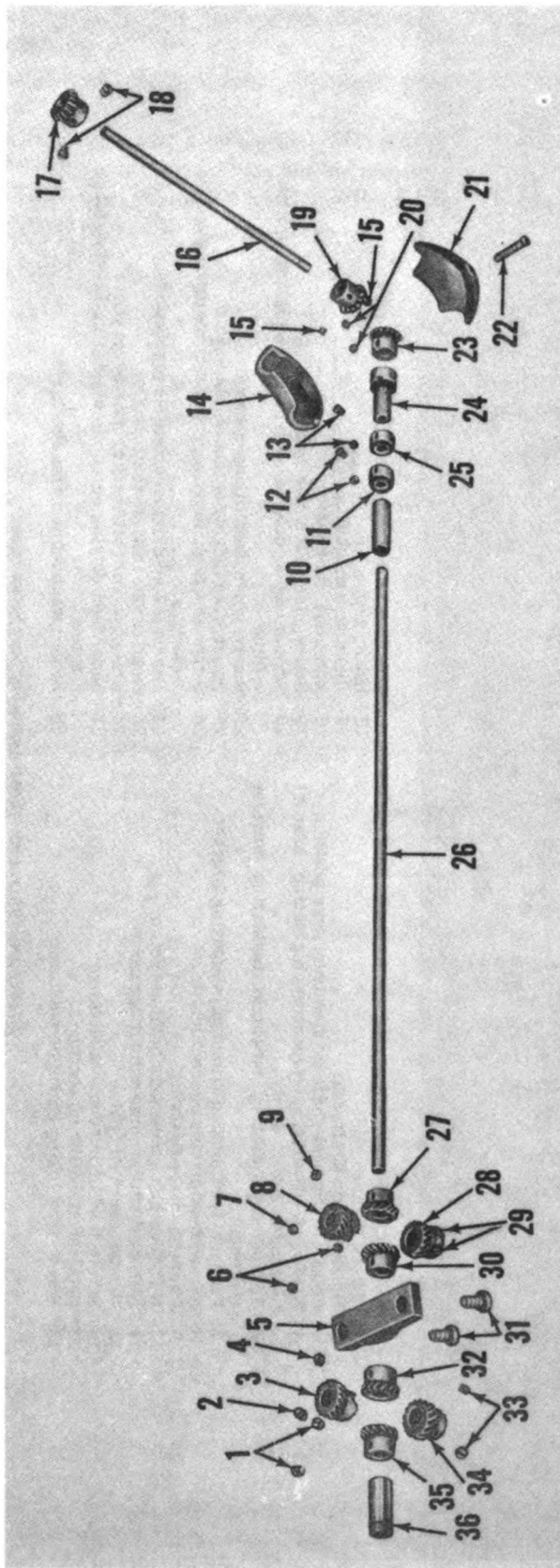
- (6) Remove setscrew and position screw (15) that attach gear (19) to shaft.

- (7) Push shaft out machine bed, and remove gears.



- | | |
|--|--|
| 1 Spindle, feed regulating | 16 Shaft, arm |
| 2 Wheel, balance | 17 Bushing, arm shaft front |
| 3 Bushing, arm shaft, rear | 18 Eccentric, feed lifting |
| 4 Setscrew, vertical shaft driving level gear position | 19 Screw, pinch, feed driving connection |
| 5 Screw, feed driving, eccentric regulating bracket | 20 Screws, feed driving eccentric regulating bracket hinge |
| 6 Spring, feed driving eccentric regulating bracket | 21 Screw, pinch, feed lifting connection |
| 7 Plunger, feed driving eccentric regulating bracket | 22 Screw, feed driving eccentric regulating |
| 8 Screw, feed driving connection hinge | 23 Setscrew, feed driving eccentric regulating screw check |
| 9 Connection, feed driving | 24 Bracket, feed driving, eccentric regulating |
| 10 Nut, feed driving connection hinge screw | 25 Gear, bevel, vertical shaft driving |
| 11 Nut, feed lifting connection hinge screw | 26 Setscrew, vertical shaft driving bevel gear |
| 12 Connection, feed lifting | 27 Nuts, feed driving eccentric regulating bracket hinge screw |
| 13 Screw, feed lifting connection hinge | 28 Setscrews, bushing, arm shaft, rear |
| 14 Setscrew, feed lifting eccentric | |
| 15 Screw, feed lifting eccentric position | |

Figure 104. Arm shaft assembly, exploded view.



- | | | | | | |
|----|---|----|---|----|--|
| 1 | Set screw and position screw, hook driving gear | 13 | Set screws, hook driving shaft collar | 23 | Gear, bevel, hook driving shaft |
| 2 | Set screw, hook socket gear | 14 | Guard assembly, half, hook driving shaft bevel gear | 24 | Bushing, hook driving shaft, rear |
| 3 | Gear, hook socket spiral, left, rear | 15 | Set screw and position screw, vertical shaft bevel gear | 25 | Collar, hook driving shaft |
| 4 | Screw, hook driving gear position | 16 | Shaft, vertical | 26 | Shaft, hook driving |
| 5 | Bearing, hook driving shaft | 17 | Gear, bevel, upper, vertical shaft | 27 | Gear, hook driving, right, front |
| 6 | Set screw and position screw, hook driving gear | 18 | Set screw and position screw, vertical shaft bevel gear | 28 | Gear, hook socket spiral, right, front |
| 7 | Set screw, hook socket gear | 19 | Gear, bevel, lower, vertical shaft | 29 | Set screws, hook socket gear |
| 8 | Gear, hook socket spiral, right, rear | 20 | Set screw and position screw, hook driving shaft bevel gear | 30 | Gear, hook driving, left, front |
| 9 | Screw, hook driving gear position | 21 | Guard assembly, half, hook driving shaft bevel gear | 31 | Screws, hook driving shaft bearing |
| 10 | Bushing, hook driving shaft, center | 22 | Screw, hook driving shaft bevel gear guard | 32 | Gear, hook driving, left rear |
| 11 | Collar, hook driving shaft | | | 33 | Set screws, hook socket spiral gear |
| 12 | Set screws, hook driving shaft collar | | | 34 | Gear, hook socket spiral, left, front |
| | | | | 35 | Gear, hook driving, left, front |
| | | | | 36 | Bushing, hook driving shaft, front |

Figure 105. Hook driving shafts, hook driving gears, hook spiral socket gears, and related parts, exploded view.

- (8) Remove setscrews that attach upper and lower vertical shaft bushings to machine head, and drive out bushings.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect shaft for bends, cracks, burs, and excessive wear.
- (3) Inspect gears for chipped or broken teeth, burs, and excessive wear.
- (4) Inspect screws for stripped threads.
- (5) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

152. Feed Lifting Rock Shaft Assembly and Cranks

a. Removal.

- (1) Slide round belt from balance wheel.
- (2) Tilt machine head to the rear.
- (3) Remove nut and screw that attach connection (12, fig. 30) to crank (13).
- (4) Remove setscrew and extension pin in machine bed at each end of shaft (2) and push centers (1 and 8) out of machine bed.
- (5) Remove shaft and crank out bottom of machine bed.
- (6) Remove screw (2, fig. 106) that attaches crank (3) to shaft, and slide crank off shaft.
- (7) Remove setscrews (7) that attach crank (5) to shaft, and slide crank off shaft.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above. Make sure that crank (5) properly engages block (6).

d. Adjustment. To time feed dog with needle follow procedure below:

- (1) Remove screw that attaches arm cap to top of machine arm, and remove cap.
- (2) Insert screwdriver through opening in machine arm and loosen setscrew and screw (15) that attach eccentric to shaft.
- (3) Turn balance wheel slightly forward or rearward and tighten setscrew and screw; check movement of feed dog.

- (4) Feed dog should start to move forward when needle is at its highest position and feed dog should complete its forward travel just before needle enters material.
- (5) Continue this procedure until feed dog is properly timed with needle.

153. Feed Driving Rock Shaft Assembly and Feed Bar

a. Removal and Disassembly.

- (1) Remove feed dog (para. 56).
- (2) Remove feed lifting rock shaft (para. 152).
- (3) Removing nut (8, fig. 30) and hinge screw that attach connection (10) to crank (6).
- (4) Remove nut, washer, and stud that attach connection (22) to crank (3).
- (5) Remove setscrew and extension pin in machine base at each end of shaft (1) and push centers (12 and 20, fig. 106) out machine bed.
- (6) Remove screw (17) that attaches bearing (5, fig. 30) to machine bed.
- (7) Lift shaft with cranks and bearing from machine bed.
- (8) Remove screws (4 and 7), that attach cranks (3 and 6) to shaft, and slide cranks and bearing off shaft.
- (9) Remove nut (10, fig. 106) and screw (11) that attach feed bar (9) to shaft, and remove bar. Slide block (6) out of bar.
- (10) Remove feed driving rock shaft bearing adjusting screws from bearing.

b. Cleaning, Inspection, and Repair.

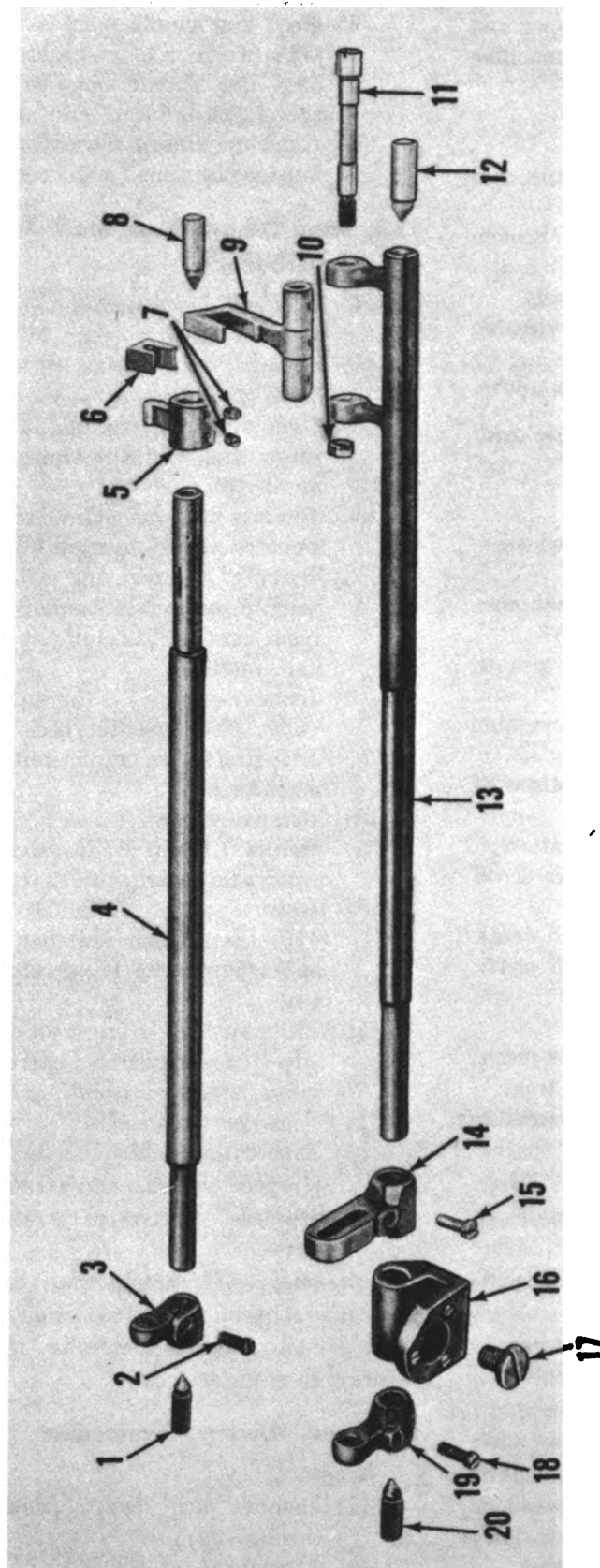
- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above. Aline feed dog with slots in throat plate by moving centers to left or to right before tightening setscrews.

154. Feed Driving Connection

a. Removal.

- (1) Remove arm shaft (para. 147a (1) through (9)).
- (2) Tilt machine head back.



- | | | | | | |
|---|--|----|-----------------------------------|----|---|
| 1 | Center, feed lifting rock shaft | 8 | Center, feed lifting rock shaft | 15 | Screw, puller feed clutch driving crank pinch |
| 2 | Screw, pinch, feed lifting rock shaft crank | 9 | Bar, feed | 16 | Bearing, feed driving rock shaft |
| 3 | Crank, feed lifting rock shaft | 10 | Nut, feed bar hinge screw | 17 | Screw, feed driving rock shaft bearing |
| 4 | Shaft, rock, feed lifting | 11 | Screw, feed bar hinge | 18 | Screw, feed driving rock shaft crank pinch |
| 5 | Crank, feed lifting rock shaft slide block | 12 | Center, feed driving rock shaft | 19 | Crank, feed driving rock shaft |
| 6 | Block, feed lifting rock shaft slide | 13 | Shaft, rock, feed driving | 20 | Center, feed driving rock shaft |
| 7 | Setscrews, feed lifting rock shaft slide block crank | 14 | Crank, puller feed clutch driving | | |

Figure 106. Feed lifting shaft and feed driving rock assemblies, exploded view.

- (3) Remove nut (10, fig. 104) and screw (8) that attach connection (9) to crank (6, fig. 30), and remove connection out bottom of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect connection for bends, cracks,

burs, stripped threads, and excessive wear.

- (3) Inspect screws and nut for stripped threads and excessive wear.
- (4) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

Section XVI. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), HEAVY-DUTY SEWING MACHINE (SINGER MODEL 7-33)

155. Arm Shaft, Bushing, and Feed Cam

a. Removal.

- (1) Remove thumbscrew that attaches arm side cover to machine arm, and remove cover.
- (2) Remove thread takeup cam (para. 158).
- (3) Turn balance wheel so that connecting rod cap screws aline with opening in top of machine arm.
- (4) Remove balance wheel (para. 66).
- (5) Remove screws (5, fig. 47) that attach cap (6) to rod (37), and remove cap.
- (6) Through opening in arm side, remove setscrews (8) that attach cam (7) to shaft (4).
- (7) Loosen setscrew that attaches bushing (3) to machine head, and remove bushing.
- (8) Turn arm shaft so that it alines with opening in back of machine arm, and slide out shaft with cam.
- (9) Slide feed cam from arm shaft.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

156. Feed Regulator

a. Removal.

- (1) Remove feed forked connection (para. 159).
- (2) Through opening in rear of machine arm, remove feed regulator hinge screw that attaches regulator (3, fig. 107) to machine arm, and remove regulator through opening.

b. Cleaning, Inspection, and Repair.

- (1) Clean part with SD.
- (2) Inspect parts for cracks, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed regulator (TM 10-3530-202-10).

157. Crank Connecting Rod

a. Removal.

- (1) Through opening in top of machine arm, remove screws (5, fig. 47) that attach cap (6) to rod (37), and remove cap.
- (2) Slide V-belt off balance wheel.
- (3) Lift machine head off table and place it on its back.
- (4) Remove nut (35) and screw (36) that attach rod to shaft (19, fig. 108), and remove rod out machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, burs, chipped places, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

158. Thread Takeup Cam and Lifting Presser Bar Rock Shaft Eccentric Strap

a. Removal and Disassembly.

- (1) Remove vibrating presser bar (para. 77).
- (2) Remove vibrating presser bar hinge bracket (para. 77).
- (3) Remove lifting presser bar and bracket (para. 76 and 77).
- (4) Remove needle bar assembly (para. 79).

- (5) Remove lifting presser bar crank (para. 78).
- (6) Remove presser bar lifting link and lifter (para. 77).
- (7) Remove thread takeup lever (para. 75).
- (8) Remove screws (12, fig. 47) that attach cam (11) to shaft (4).
- (9) Drive pin (13) out cam, and remove cam from arm shaft.
- (10) Remove screw (24) from strap.
- (11) Remove nut (19), lockwasher (20), and washer (21) from screw (25).
- (12) Remove screw and slide (22) from strap (23). Remove strap from machine face.
- (13) Remove nut (10) and screw (9) from strap.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for cracks, chipped places, burs, stripped threads, and excessive wear.

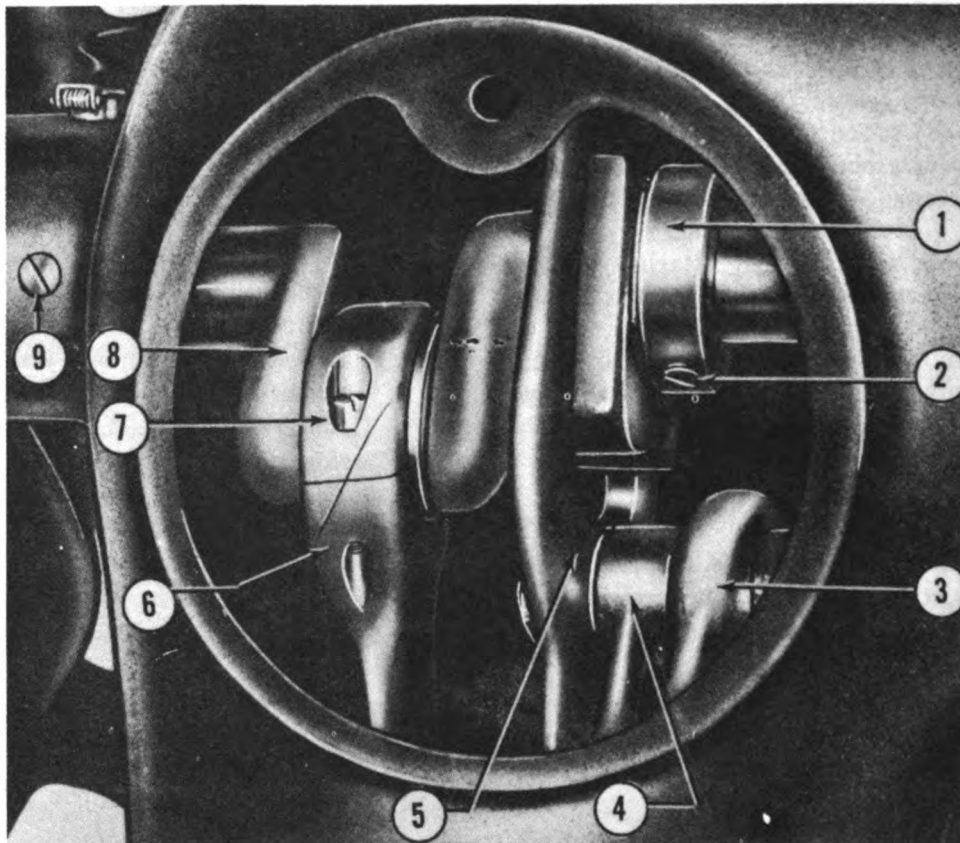
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

159. Feed Forked Connection and Link

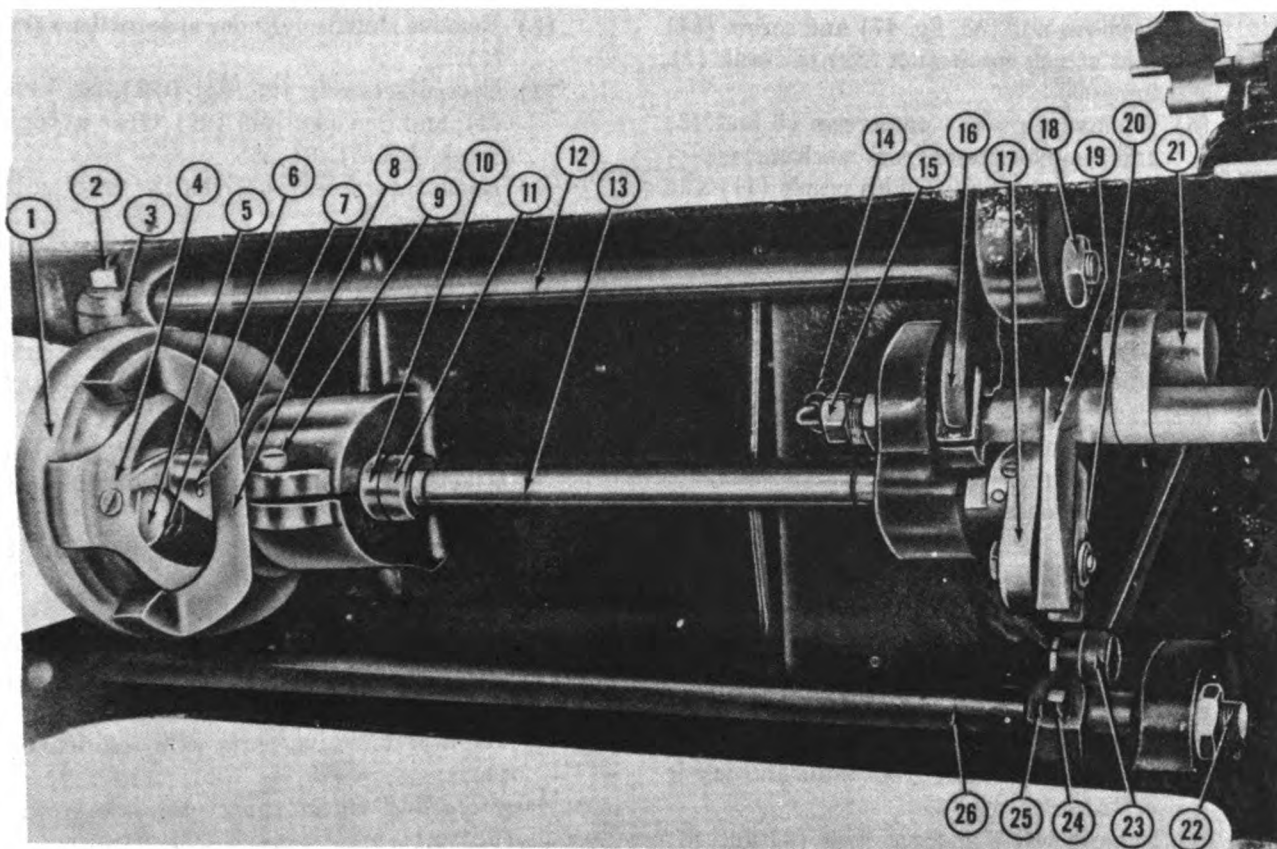
a. Removal.

- (1) Remove screw that attaches arm side cover to machine arm, and remove cover.
- (2) Remove feed regulating thumbscrew (11, fig. 37) from feed regulator.
- (3) Raise regulator (3, fig. 107) and link (4) so that feed connecting link hinge screw can be removed through arm side opening.



- | | |
|---------------------------|-------------------------------|
| 1 Cam, feed | 6 Rod, crank connecting |
| 2 Setscrew, feed cam | 7 Screw, crank connecting rod |
| 3 Regulator, feed | 8 Shaft, arm |
| 4 Link, feed connecting | 9 Setscrew, arm shaft bushing |
| 5 Connection, feed forked | |

Figure 107. Arm shaft assemblies through arm side cover opening.



- | | |
|--|---|
| 1 Race assembly, shuttle | 14 Tube, oil, oscillating rock shaft |
| 2 Screw, feed, rock shaft clamp clamping | 15 Joint assembly, oil, oscillating rock shaft |
| 3 Crank with roller, feed lifting rock shaft | 16 Shaft, feed lifting rock (wearing block end) |
| 4 Spring, shuttle race back | 17 Crank, oscillating shaft |
| 5 Bobbin | 18 Nut, feed lifting rock shaft screw center, right |
| 6 Cylinder assembly, shuttle | 19 Shaft, oscillating rock |
| 7 Driver, shuttle | 20 Block, oscillating shaft crank slide |
| 8 Frame, shuttle race | 21 Rod, crank connecting |
| 9 Screw, shuttle race frame clamping | 22 Screw, feed lifting rock shaft screw center, right |
| 10 Frame, shuttle race | 23 Connection, feed forked |
| 11 Collar, oscillating shaft | 24 Screw, feed rock shaft clamp clamping |
| 12 Shaft, feed, lifting rock | 25 Crank, feed rock shaft |
| 13 Shaft, oscillating | 26 Shaft, feed rock |

Figure 108. Heavy-duty sewing machine, bed assemblies.

- (4) Remove nut (27, fig. 47) and screw (31) that attach link (30) to regulator (26).
- (5) Slip V-belt off balance wheel.
- (6) Lift machine head from table and lay it on its side.
- (7) Remove nut (33) and screw (34) that attach connection to feed rock shaft crank, and remove connection with link.
- (8) Remove nut (38) and screw (29) that attach link to connection, and remove link.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for bends, cracks, chipped places, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

160. Feed Rock Shaft and Feed Bar

a. Removal.

- (1) Slip V-belt off balance wheel.
- (2) Lift machine head from table and lay it on its back.
- (3) Remove feed dog (para. 74).

- (4) Remove nut (33, fig. 47) and screw (34) that attach connection (32) to crank (11, fig. 109).
- (5) Remove nuts (8) on screws (9 and 15) and remove screws from machine bed.
- (6) Remove shaft (12) with crank (11) and bar (17) from machine bed.
- (7) Remove screw (10) that attaches crank to shaft, and remove crank.
- (8) Remove nuts (13) and screws (14) that attach bar to shaft, and remove bar.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

161. Feed Lifting Rock Shaft and Crank With Roller

a. Removal.

- (1) Slide V-belt off balance wheel.
- (2) Lift machine head from table and lay it on its back.
- (3) Remove left and right nuts (31 and 37, fig. 109) from screws (32 and 36), and remove screws from machine bed.
- (4) Remove shaft (33) and crank with roller (34) from machine bed.
- (5) Remove screw (35) that attaches crank to shaft, and remove crank with roller.
- (6) Remove screw that attaches feed lifting rock shaft wearing block to shaft, and remove block and pin.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped places, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

162. Oscillating Shaft, Shuttle Driver, and Crank Assembly

a. Removal and Disassembly.

- (1) Slide V-belt off balance wheel and off motor clutch pulley.
- (2) Lift machine head off of table and place it on its back.

- (3) Remove shuttle cylinder assembly (para. 70).

- (4) Loosen setscrew (25, fig. 109) on crank (5), and drive out pin (27) that attaches crank to shaft (21).

- (5) Remove setscrews (7) that attach collar (22) to shaft.

- (6) Drive shaft with driver out shuttle cylinder end of machine bed, and remove collar.

- (7) Remove setscrew (20) on driver, drive out pin (19) that attaches driver to shaft, and remove driver.

- (8) Remove screw (1) and washer (2) that attach block (3) to stud (4), and remove block.

- (9) Remove nut (6) that attaches stud to crank, and remove stud.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

163. Oscillating Rock Shaft, Bearing, and Oil Tube and Joint Assembly

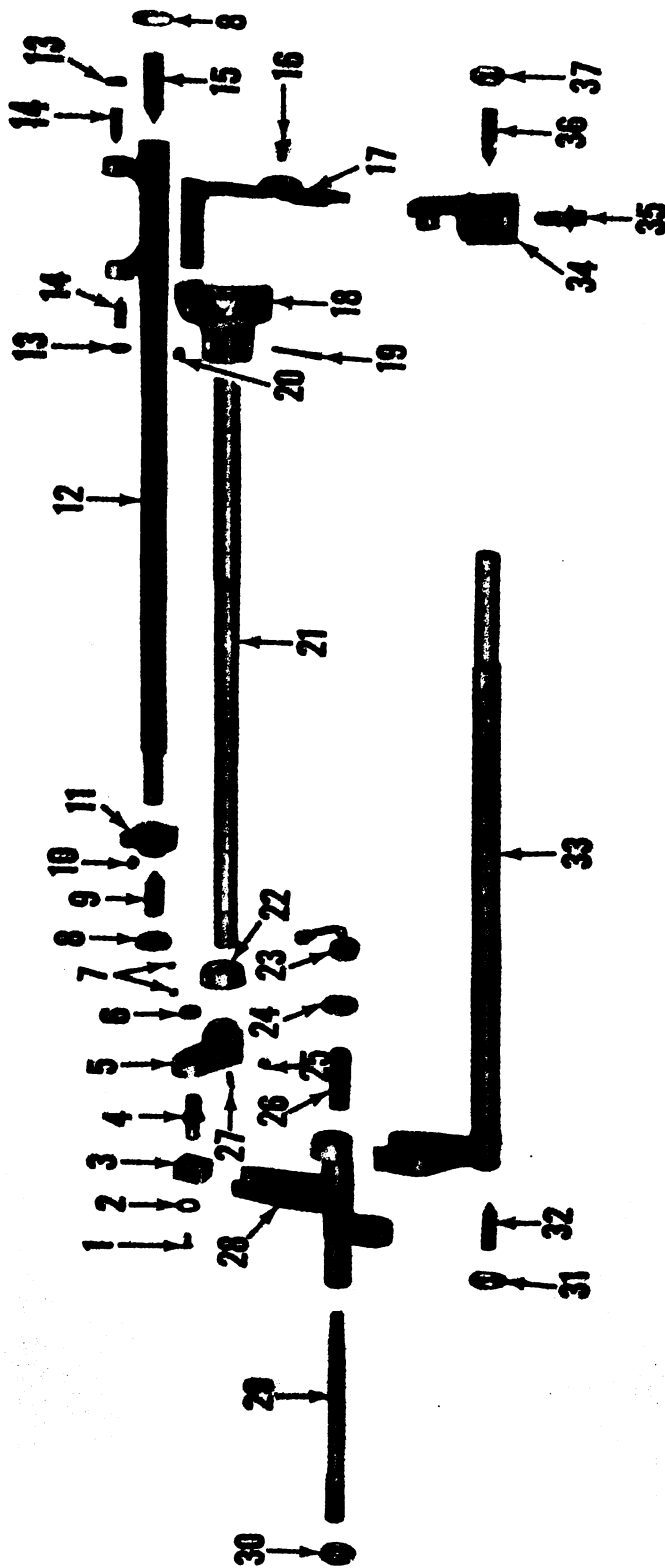
a. Removal.

- (1) Remove feed lifting rock shaft (par. 161).
- (2) Remove hinge screw and nut that attach crank connecting rod to shaft (28, fig. 109).
- (3) Remove nut (30) on pin (29) and remove pin from machine bed.
- (4) Unscrew tube and joint assembly (23) from bearing (26), and remove tube and joint assembly from machine bed.
- (5) Remove nut (24) from bearing, and remove bearing from machine bed.
- (6) Slide shaft from block (3) and from machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.



- 1 Screw, oscillating shaft crank slide block
- 2 Washer, oscillating shaft crank slide block cap screw
- 3 Block, oscillating shaft crank slide
- 4 Stud, oscillating shaft crank slide block, cap screw
- 5 Crank, oscillating shaft
- 6 Nut, oscillating shaft crank slide block cap screw stud
- 7 Setscrews, oscillating shaft collar
- 8 Nut, feed rock shaft screw, right and left
- 9 Screw, center, feed rock shaft, left
- 10 Screw, feed rock shaft clamp clamping
- 11 Crank, feed rock shaft

- 12 Shaft, feed rock
- 13 Nuts, feed bar center screw
- 14 Screws, center, feed bar
- 15 Screw, center, feed rock shaft, right
- 16 Screw, feed dog
- 17 Bar, feed
- 18 Driver, shuttle
- 19 Pin, shuttle driver
- 20 Setscrew, shuttle driver
- 21 Shaft, oscillating
- 22 Collar, oscillating shaft
- 23 Tube and joint assembly, oil, oscillating rock shaft
- 24 Nut, oscillating rock shaft hinge pin, bearing

- 25 Setscrew, oscillating shaft crank
- 26 Bearing, oscillating rock shaft hinge pin screw
- 27 Pin, oscillating shaft crank
- 28 Shaft, oscillating rock
- 29 Pin, oscillating rock shaft hinge
- 30 Nut, oscillating rock shaft hinge pin
- 31 Nut, feed lifting rock shaft screw center, left
- 32 Screw, center, feed lifting rock shaft, left
- 33 Shaft, feed lifting rock
- 34 Crank with roller, feed lifting rock shaft
- 35 Screw, feed lifting rock shaft crank clamping
- 36 Screw, feed lifting rock shaft screw center, right
- 37 Nut, feed lifting rock shaft screw center, right

Figure 109. Bed assemblies, exploded view.

Section XVII. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), VERY-HEAVY-DUTY SEWING MACHINE (SINGER MODEL 97-10)

164. Arm Shaft, Cam, and Bushings

a. Removal.

- (1) Remove needle bar connecting links and cranks (para. 94).
- (2) Remove drive pulley with balance wheel (para. 99).
- (3) Remove thumbscrew that attaches cover to machine head, and remove cover.
- (4) Remove presser bar springs (para. 84).
- (5) Remove presser bar lifting lever (para. 97).
- (6) Remove screws (1, fig. 32) that attach cap (2) to rod on arm shaft, and remove cap.
- (7) Loosen nut (5, fig. 58) on screw (6), back screw out of bottom part of regulator (3), and remove nut from screw.
- (8) Remove screw from regulator.
- (9) Remove setscrews (4, fig. 57) that attach collar (5) to shaft (3).
- (10) Remove screw (1) that attaches regulator to shaft (3).
- (11) Loosen nut (14) on stud (17), and slide stud from regulator.
- (12) Drive out shaft (3), and remove regulator and collar (5) from machine head.
- (13) Remove screws (2, fig. 58) that attach bushing (1) to machine head, and remove bushing.
- (14) Aline crank in arm shaft (6, fig. 110) with opening in machine head, and slide out shaft with cam (10).
- (15) Remove setscrews (7) and slide cam off shaft.
- (16) Loosen setscrew that attaches bushing (12) to machine head, and remove bushing.
- (17) Loosen setscrew that attaches bushing (8) to machine head, and remove bushing.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, cracks, burrs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

165. Lower Needle Guide Rock Shaft Crank Connecting Rod

a. Removal.

- (1) Slide round belt off pulley drive and off friction pulley.
- (2) Loosen setscrew on collar that attaches upper and lower pitman rod, spring top of upper pitman rod out of hole in lifting lever, and remove rod from machine.
- (3) Remove nuts and bolts that attach machine head to column extension, and remove machine head. Lay head on its side.
- (4) Through opening in bottom of machine head, loosen screw (1, fig. 111) on crank (7) and remove screw that attaches connecting rod (2) to crank.
- (5) Loosen screw (10, fig. 57) on crank (11), remove screw (8) that attaches connecting rod to crank, and remove connecting rod out bottom of machine head.

b. Cleaning, Inspection, and Repair.

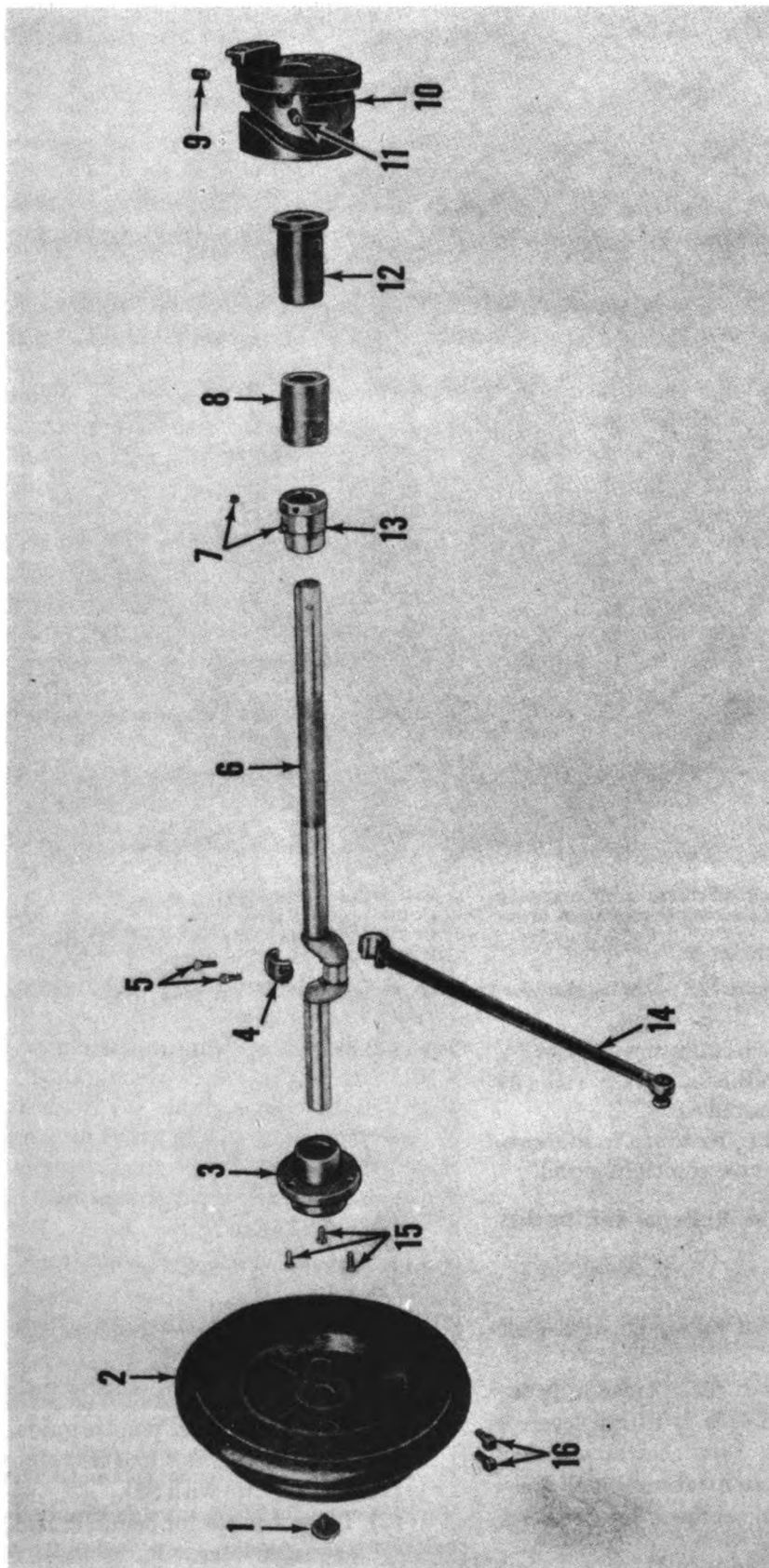
- (1) Clean parts with SD.
- (2) Inspect parts for cracks, bends, burrs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

166. Crank Connecting Rod

a. Removal.

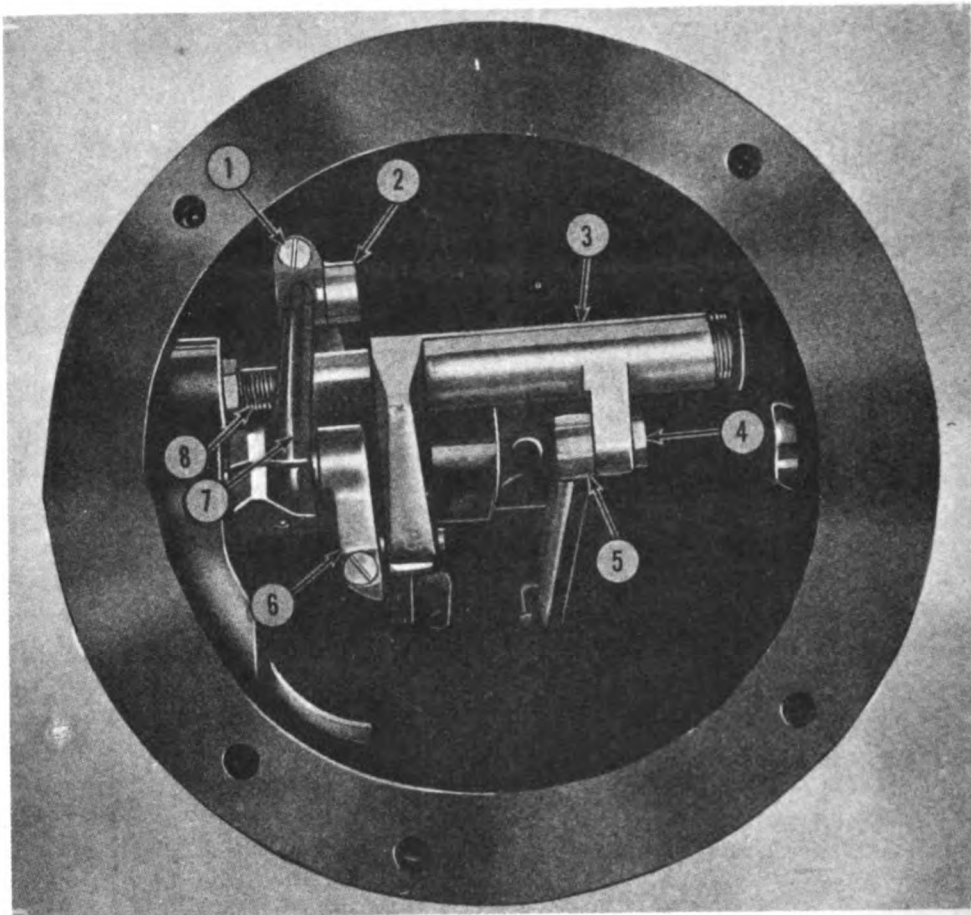
- (1) Remove thumbscrew that attaches arm side cover to machine head, and remove arm side cover.
- (2) Slip round belt off pulley drive.
- (3) Loosen setscrew (2, fig. 67) that attaches clamp (1) to rods (7 and 8), slide clamp until rod is free, and remove rod from lifting lever.
- (4) Remove nuts from studs that attach machine head to column extension, and remove machine head.
- (5) Remove screws (1, fig. 112) that attach cap (2) to rod on arm shaft, and remove cap.



- 1 Screw, arm shaft
- 2 Pulley, drive, balance wheel
- 3 Bushing, flanged, back, arm shaft
- 4 Cap, crank connecting rod
- 5 Screws, crank connecting rod cap

- 6 Shaft, arm
- 7 Setscrews, arm shaft collar
- 8 Bushing, intermediate, arm shaft
- 9 Rod, crank connecting
- 10 Cam, thread takeup
- 11 Pin, thread takeup cam
- 12 Bushing, flanged, arm shaft, front
- 13 Collar, arm shaft
- 14 Rod, crank connecting
- 15 Screws, arm shaft flanged bushing, back
- 16 Setscrews, balance wheel

Figure 110. Arm shaft, pulley, and related parts, exploded view.



- 1 Screw, needle guide lower rock shaft, crank clamping
- 2 Connecting rod, needle guide rock shaft crank, lower
- 3 Shaft, oscillating rock
- 4 Nut, crank connecting rod hinge screw

- 5 Rod, crank connecting
- 6 Crank, oscillating shaft
- 7 Crank, lower needle guide rock shaft
- 8 Bushing, screw, oscillating rock shaft hinge pin

Figure 111. Sewing machine head, Singer model 97-10, inverted.

- (6) From bed end of machine, remove nut (4, fig. 111) and screw that attach rod (5) to shaft (3), and remove rod.

b. Installation. Reverse procedure in *a* above, using serviceable crank connecting rod.

167. Lower Needle Guide Rock Shaft and Crank

a. Removal.

- (1) Slide round belt off pulley drive and off friction pulley.
- (2) Spring top of foot lifter treadle upper pitman rod out of hole in lifting lever.
- (3) Remove nuts and bolts that attach machine head to column extension, and remove head. Lay machine head on its side.

- (4) Through opening in bottom of machine head, (fig. 111) drive out pin (2, fig. 118) that attaches crank (3) to shaft (6).

- (5) Remove screws (4) that attach crank to shaft.

- (6) Remove screw (5) that attaches crank to connecting rod (2).

- (7) Remove crank out bottom of machine head.

- (8) Remove shuttle assembly (para. 88).

- (9) Slide out rock shaft.

- (10) Remove screw (1) that attaches guide (7) to shaft, and remove guide.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for bends, cracks, burrs, and excessive wear.

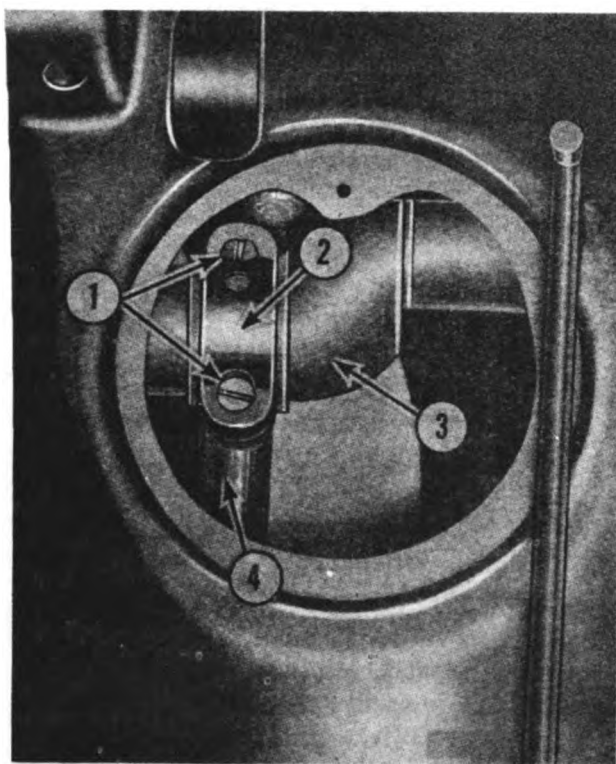
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

168. Oscillating Rock Shaft and Bushing

a. Removal.

- (1) Slide round belt from pulley drive.
- (2) Loosen setscrew on collar that attaches upper pitman rod to lower pitman rod, spring top of upper rod out of hole in lifting lever, and remove upper rod.
- (3) Remove nut and bolts that attach machine head to column extension, and lift off machine head.
- (4) Tilt machine head on its side.
- (5) From bed end of head, remove nut (4, fig. 111) on screw that attach rod (5) to shaft (3), and remove screw.
- (6) Loosen locknut on oscillating rock shaft hinge pin, and remove hinge pin.



- 1 Screws, crank connecting rod
- 2 Cap, crank connecting rod
- 3 Shaft, arm
- 4 Rod, crank connecting

Figure 118. Machine arm, showing parts through opening.

- (7) Remove shaft out bottom of machine head.
- (8) Remove nut on bushing (8), and remove bushing.

b. Inspection and Repair.

- (1) Inspect shaft for cracks, burs, and excessive wear.
- (2) Inspect screws and nuts for stripped threads.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

169. Oscillating Shaft, Shuttle Driver, and Collar

a. Removal.

- (1) Remove oscillating rock shaft (para. 168).
- (2) Remove clamping screw on oscillating shaft crank slide block stud and remove stud and slide block.
- (3) Remove clamping screws that attach crank (6, fig. 111) to oscillating shaft, and remove crank and key.
- (4) Remove shuttle assembly (para. 88).
- (5) Remove shaft, collar, and shuttle driver.

b. Disassembly.

- (1) Remove setscrew that attaches pin to shuttle driver, drive out pin, and remove driver from shaft.
- (2) Remove setscrews in collar, and remove collar.

c. Cleaning, Inspection, and Repair.

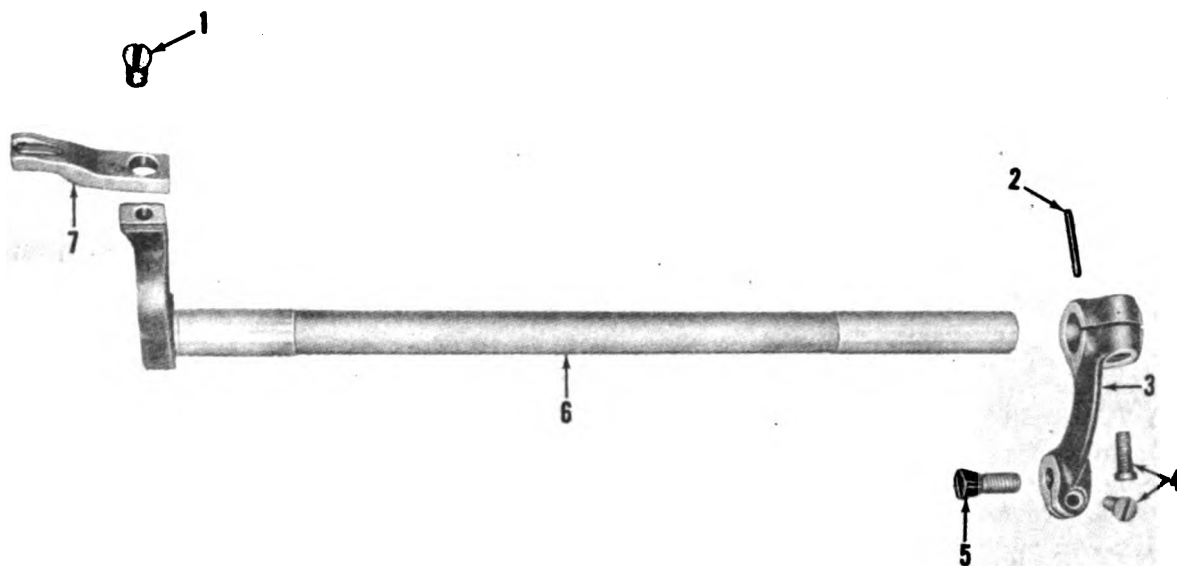
- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

170. Feed Shaft Assembly

a. Removal.

- (1) Remove screws that attach plate (12, fig. 52) to machine face, and remove plate.
- (2) Remove presser bar (para. 98).
- (3) Remove needle bar frame (para. 93).
- (4) Loosen screws that attach crank (28, fig. 114) to shaft (27).
- (5) Remove setscrews that attach collars (34, fig. 60) to shaft (33).



- | | |
|---|-----------------------------------|
| 1 Screw, lower needle guide | 5 Screw, crank connecting |
| 2 Pin, needle guide rock shaft crank, lower | 6 Shaft, rock, lower needle guide |
| 3 Crank, lower needle guide rock shaft | 7 Guide, needle, lower |
| 4 Screws, lower needle guide rock shaft, crank clamping | |

Figure 113. Lower needle guide assembly, exploded view.

- (6) Loosen screw in crank (29) and drive out pin (30).
- (7) Drive shaft away from machine head until front crank is freed. Remove front crank.
- (8) Remove key (35) from shaft.
- (9) Slide shaft from machine arm, and remove collars and back crank.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for cracks, burs, and stripped threads.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

171. Thread Takeup Cam Assembly

a. Removal.

- (1) Remove needle bar connecting link and cranks (para. 94).
- (2) Remove thread takeup lever, connection, and rollers (para. 92).
- (3) Drive out pin (15, fig. 60) that attaches cam (14) to arm shaft.

- (4) Remove setscrew that attaches cam to arm shaft, and remove cam.

b. Disassembly. Remove capscrews that attach support (13) to cam, and remove support.

c. Cleaning, Inspection, and Repair.

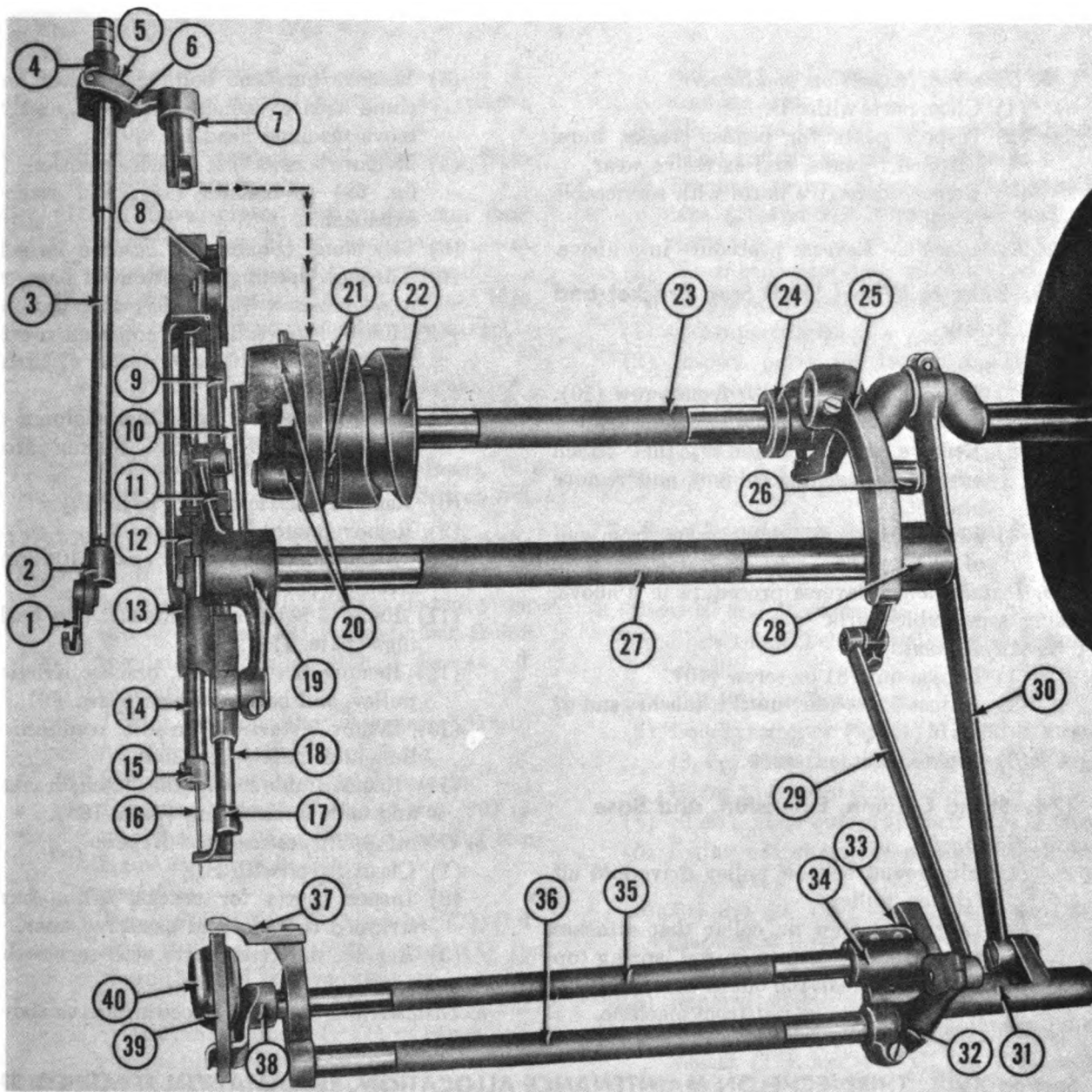
- (1) Clean parts with SD.
- (2) Inspect parts for burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

172. Balance Wheel Shaft and Bushings

a. Removal.

- (1) Remove driving arm, bracket, friction pulley, and balance wheel (para. 99).
- (2) Remove setscrews (5, fig. 63) that attach collar (12) to shaft (13), and remove shaft and collar.
- (3) Remove setscrews that attach bearings (4 and 11) to machine column, and remove oilcups.
- (4) Remove bushings.



- 1 Foot, presser, double toe
- 2 Holder, presser foot
- 3 Bar, presser
- 4 Clutch, presser bar
- 5 Clamp, presser bar clutch
- 6 Lever, presser bar clutch
- 7 Stud assembly with roller, presser bar clutch lifting
- 8 Block, needle bar frame connection slide
- 9 Connection, needle bar frame
- 10 Link, needle bar connecting
- 11 Bracket, needle guide bar, upper
- 12 Stud, needle bar connecting
- 13 Frame, needle bar
- 14 Bar, needle
- 15 Clamp, needle
- 16 Needle
- 17 Guide, needle, upper
- 18 Bar, needle guide, upper
- 19 Crank, feed shaft, front
- 20 Cranks, inside and outside, needle bar connecting link

- 21 Screws, needle bar connecting link crank, inside and outside hinge
- 22 Cam, thread takeup
- 23 Shaft, arm
- 24 Cam, feed, double
- 25 Regulator, feed
- 26 Connection, feed regulator
- 27 Shaft, feed
- 28 Crank, feed shaft, back
- 29 Connecting rod, needle guide rock shaft crank, lower
- 30 Rod, crank connecting
- 31 Shaft, oscillating rock
- 32 Crank, lower needle guide rock shaft
- 33 Block, oscillating shaft crank slide
- 34 Crank, oscillating shaft
- 35 Shaft, oscillating
- 36 Shaft, rock, needle guide, lower
- 37 Guide, needle, lower
- 38 Driver, shuttle
- 39 Frame, shuttle
- 40 Shuttle cylinder

Figure 114. Line of power, Singer model 97-10.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

173. Balance Wheel Shaft Stop Bracket and Screw

a. Removal.

- (1) Remove nut (8, fig. 63) from screw (10), and remove screw from bracket (6).
- (2) Remove screws (7 and 9) that attach bracket to machine column, and remove bracket.
- (3) Remove cap screw and washer from end of shaft (13).

b. Installation. Reverse procedure in *a* above, using serviceable parts.

c. Adjustment.

- (1) Loosen nut (8) on screw (10).
- (2) Adjust screw (10) until it touches end of shaft (13).
- (3) Tighten nut on screw.

174. Stand Column, Extension, and Base

a. Removal.

- (1) Slip round belt off pulley drive and off friction pulley.
- (2) Loosen setscrew on collar that attaches upper and lower pitman rod, spring top of upper pitman rod out of hole in lifting lever, and remove rod from machine.

- (3) Remove nuts and bolts that attach machine head to column extension, and remove machine head.

- (4) Remove screws that attach extension, (1, fig. 68) to column (15), and remove extension.

- (5) Lay stand column and base on its side.

- (6) Through opening in bottom of base, remove setscrew (5, fig. 65) that attaches stud (14) to treadle (4), and remove stud rod (8), spring (6), and washer (7) from base.

- (7) Remove screws that attach column to base (12), and separate column from base.

- (8) Remove electric motor (para. 20).

- (9) Remove motor base (para. 25).

- (10) Remove starting shaft (para. 101) and treadle (para. 100).

- (11) Remove balance wheel shaft and bushings (para. 172).

- (12) Remove driving arm, bracket, friction pulley, and balance wheel (para. 99).

- (13) Remove starting treadle, connecting link, and shaft (para. 100).

- (14) Remove table shaft, table, latch, bracket, and table latch spring (para. 108).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for cracks, splits, burs, stripped threads, and excessive wear.

- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

Section XVIII. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION REPAIR EQUIPMENT (GROUP 46), ZIGZAG SEWING MACHINE (SINGER MODEL 17W15)

175. Arm Shaft, Bushing, and Bevel Gear Pinion

a. Removal.

- (1) Remove presser bar assembly (para. 116).
- (2) Remove needle bar and frame (para. 115).
- (3) Remove screw (17, fig. 27) that attaches takeup lever bearing (18) to machine face, and remove lever, bearing, and roller.

- (4) Remove check screw (7, fig. 77), positioning screw (8), and setscrew (10) that attach cam (9) to arm shaft.

- (5) Remove arm shaft positioning screw that attaches front arm shaft bushing (1, fig. 115) to machine arm.

- (6) Remove screws (6) and cap (7) from connection (23).

- (7) Remove screws (8) and cap (9) from connection (14).

- (8) Remove pulley with balance wheel (para. 107).

- (9) Remove setscrew that attaches collar (8, fig. 78) to regulator (10), and remove collar.
- (10) Remove regulator and roller (9) from machine head.
- (11) Remove screws that attach cam gear cover (26, fig. 72) to machine arm, and remove cover with cam gear assembly.
- (12) Insert a light, flexible punch into cam gear cover opening, and drive bushing (1, fig. 115) out machine face.
- (13) Pull arm shaft (5) with bevel gear pinion (4) out machine face.
- (14) Remove setscrews (2 and 3) that attach pinion to shaft, and remove pinion.

b. Installation. Reverse procedure in *a* above.

176. Needle Bar Frame Cam Gear Assembly

a. Removal.

- (1) Loosen wingnut (23, fig. 72) that attaches end of pitman (19) to needle bar frame regulator, and slide end of pitman off regulator.
- (2) Loosen setscrew that attaches collar to regulator, and remove collar.
- (3) Slide regulator from machine arm.
- (4) Remove screws that attach cover (26) to machine arm, and remove needle bar frame cam gear assembly.

b. Disassembly.

- (1) Remove nut (6, fig. 116), washer (7), and stud (9) that attach cam gear (2) to cover (3), and remove cam gear.
- (2) Remove nut (5) and washer (4) that attach pinion assembly (1) to cover, and remove pinion assembly.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, chipped or broken teeth, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

177. Arm Shaft Connections

a. Removal.

- (1) Remove screw that attaches arm cover to machine arm, and remove arm cover.
- (2) Remove screws (6 and 8, fig. 115) that attach caps (7 and 9) to connections (14

and 23), and remove caps out top of machine arm.

- (3) Slip round-belt off pulley with balance wheel and tilt machine head back.
- (4) Remove screws (19 and 20) that attach caps (17 and 21) to connectors, and remove caps.
- (5) Work connectors out machine bed.

b. Cleaning, Inspection, and Repair.

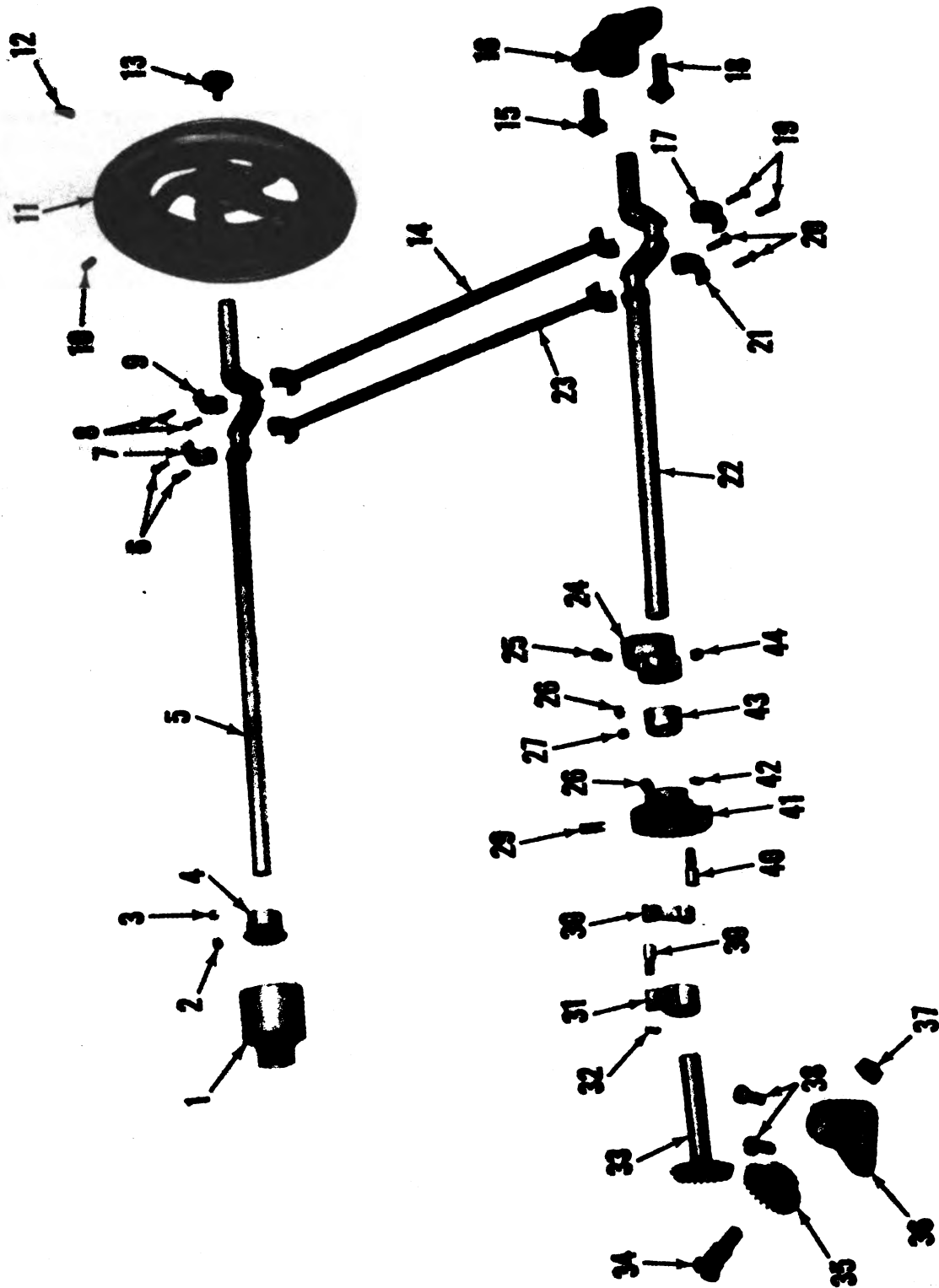
- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

178. Feed Regulating Assembly and Related Parts

a. Removal and Disassembly.

- (1) Slide round belt off pulley with balance wheel.
- (2) Tilt machine head back.
- (3) Loosen setscrew (7, fig. 117) and setscrew (8, fig. 118) that attach centers (29 and 40, fig. 119) to machine bed.
- (4) Slide centers out until shaft (32) is free.
- (5) Swing out shaft far enough to remove hinge screw (30).
- (6) Remove nut (28) and hinge screw (30) that attach lever to shaft (32).
- (7) Remove screw (15) from crank (14).
- (8) Remove setscrew that attaches sleeve (18) to machine arm, and remove shaft (16), washer (17), sleeve (18), pin (19), stop (20), washer (21), screw (22), and handle (23) as an assembly from machine arm.
- (9) Remove screw and washer that attaches stop to handle, and remove stop.
- (10) Drive out pin (19) that attaches handle to shaft, and remove handle, sleeve, and washer from shaft.
- (11) Slide clamp (11), connection (27), link (25), and crank (14) as an assembly from lever (10).
- (12) Slide clamp from stud (12).
- (13) Remove pinch screw (31) from clamp.
- (14) Remove nut (24) that attaches stud to connection, and remove stud.

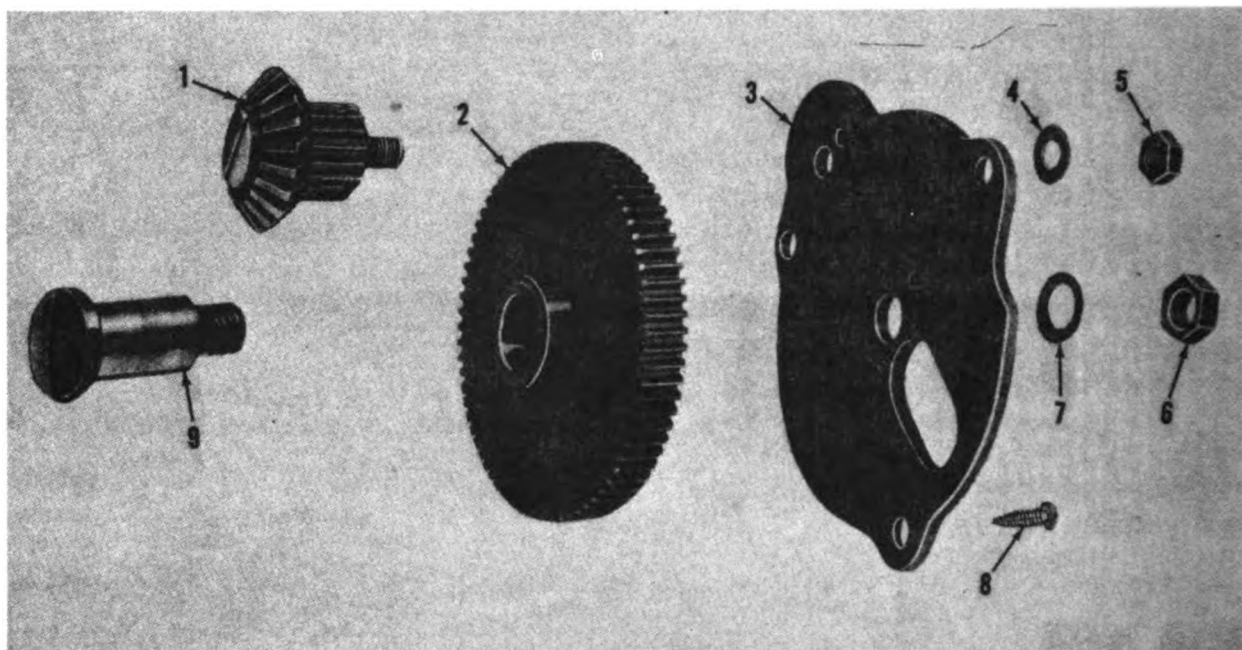


1 Bushing, arm shaft, front
 2 Setscrew, needle bar frame driving pinion
 3 Setscrew, needle bar frame driving pinion
 4 Pinion, bevel, needle bar frame driving
 5 Shaft, arm
 6 Screw, arm shaft connection
 7 Cap, arm shaft connection
 8 Screw, arm shaft connection
 9 Cap, arm shaft connection
 10 Setscrew, balance wheel position
 11 Pulley with balance wheel
 12 Setscrew, balance wheel position
 13 Screw, balance wheel adjusting
 14 Connection, arm shaft
 15 Screw, hook driving shaft bearing

16 Bearing, hook driving shaft
 17 Cap, arm shaft connection
 18 Screw, hook driving shaft bearing
 19 Screw, arm shaft connection
 20 Screw, arm shaft connection
 21 Cap, arm shaft connection
 22 Shaft, hook driving
 23 Connection, arm shaft
 24 Cam, feed driving
 25 Setscrew, feed driving cam
 26 Setscrew, hook driving shaft collar
 27 Setscrew, hook driving shaft collar
 28 Setscrew, hook driver crank, short
 29 Setscrew, hook driver crank, long

30 Link, hook driver crank
 31 Crank, hook driver
 32 Nut, hook driver crank stud
 33 Shaft, hook driving bevel gear
 34 Stud, hook driving intermediate bevel gear
 35 Gear, bevel, hook driving, intermediate
 36 Bracket, hook driving intermediate bevel gear
 37 Nut, hook driving intermediate bevel gear stud
 38 Screws, hook driving gear bracket
 39 Stud, hook driver crank
 40 Stud, hook driver crank link
 41 Cam, crank, feed lifting
 42 Nut, hook driver crank link stud
 43 Collar, hook driving shaft
 44 Setscrew, feed driving cam

Figure 115. Arm shaft and hook driving shaft assemblies, exploded view.



- 1 Pinion assembly, needle bar frame cam gear
- 2 Gear, cam, needle bar frame
- 3 Cover, needle bar cam gear frame
- 4 Washer, needle bar frame cam gear intermediate pinion screw stud
- 5 Nut, needle bar frame cam gear intermediate pinion screw stud

- 6 Nut, needle bar frame cam gear eccentric screw stud
- 7 Washer, needle bar frame cam gear eccentric screw stud
- 8 Screw, needle bar frame cam gear cover
- 9 Stud, needle bar cam frame gear eccentric screw

Figure 116. Needle bar frame cam gear assembly, exploded view.

(15) Remove hinge screw (26) that attaches link (25) to connection.

(16) Remove hinge screw (18) that attaches link to crank.

b. Cleaning, Inspection, and Repair.

(1) Clean parts with SD.

(2) Inspect parts for cracks, bends, burs, stripped threads, and excessive wear.

(3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed regulator (TM 10-3530-202-10).

179. Feed Driving Rock Shaft and Feed Bar Assemblies

a. Removal and Disassembly.

(1) Remove front and rear bed slides from machine bed.

(2) Remove screw that attaches throat plate to machine bed, and remove throat plate.

(3) Remove screws (36, fig. 119) that attach feed dog (37) to feed bar (38), and remove feed dog.

(4) Slide round belt off pulley with balance wheel, and tilt machine head back.

(5) Remove setscrews that attach centers (29 and 40) to machine bed, and remove centers. Swing out shaft (32) to gain access to hinge screws (30).

(6) Remove nut (28) and hinge screw that attach connection (27) to shaft.

(7) Disconnect spring (35) from feed bar and from crank (41).

(8) Remove shaft, crank, and feed bar as an assembly from machine bed.

(9) Remove nut (39) and hinge screw (34) that attach feed bar to crank, and remove feed bar.

(10) Remove setscrews (42) that attach crank (41) to shaft, and remove crank.

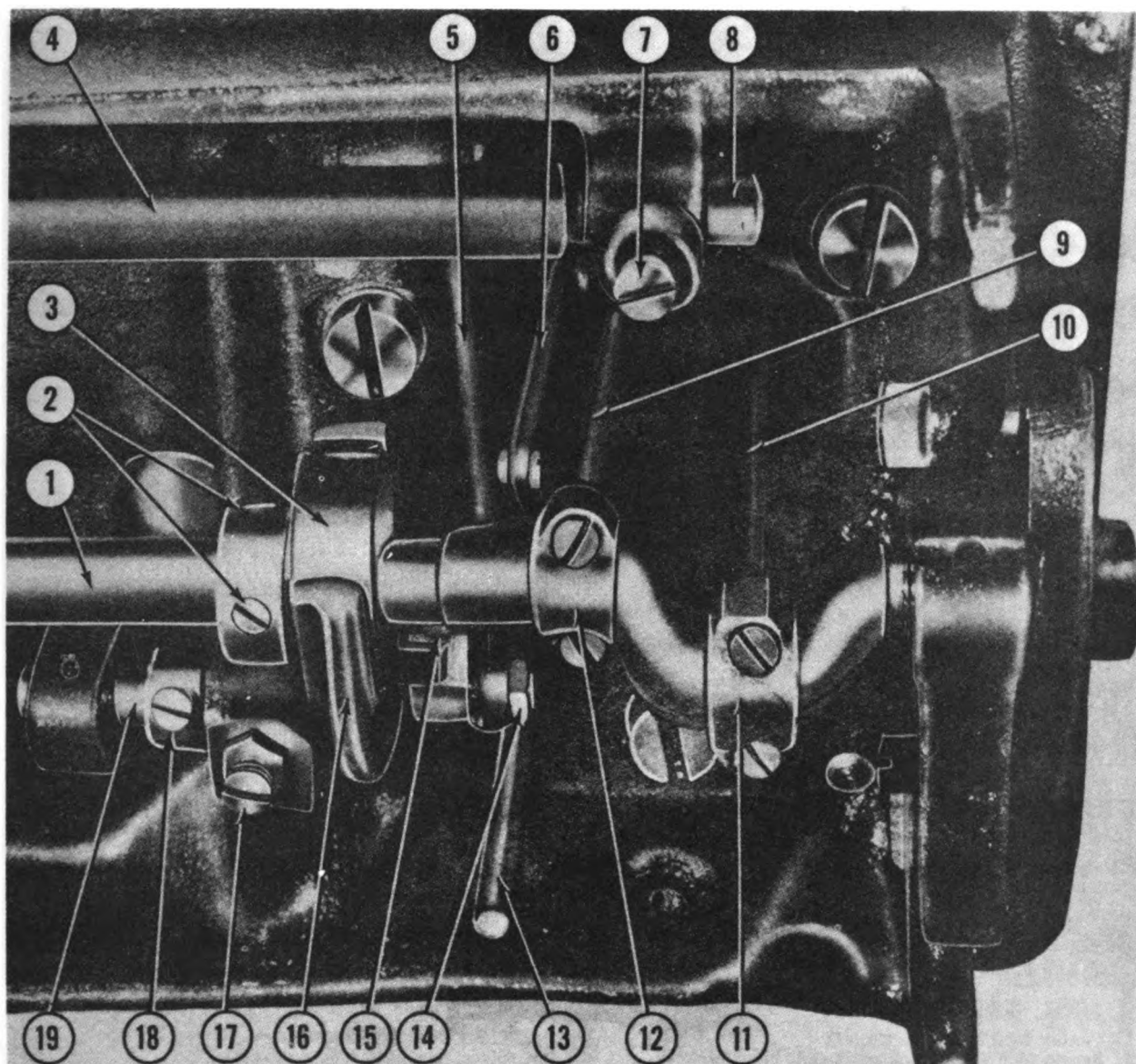
b. Cleaning, Inspection, and Repair.

(1) Clean parts with SD.

(2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.

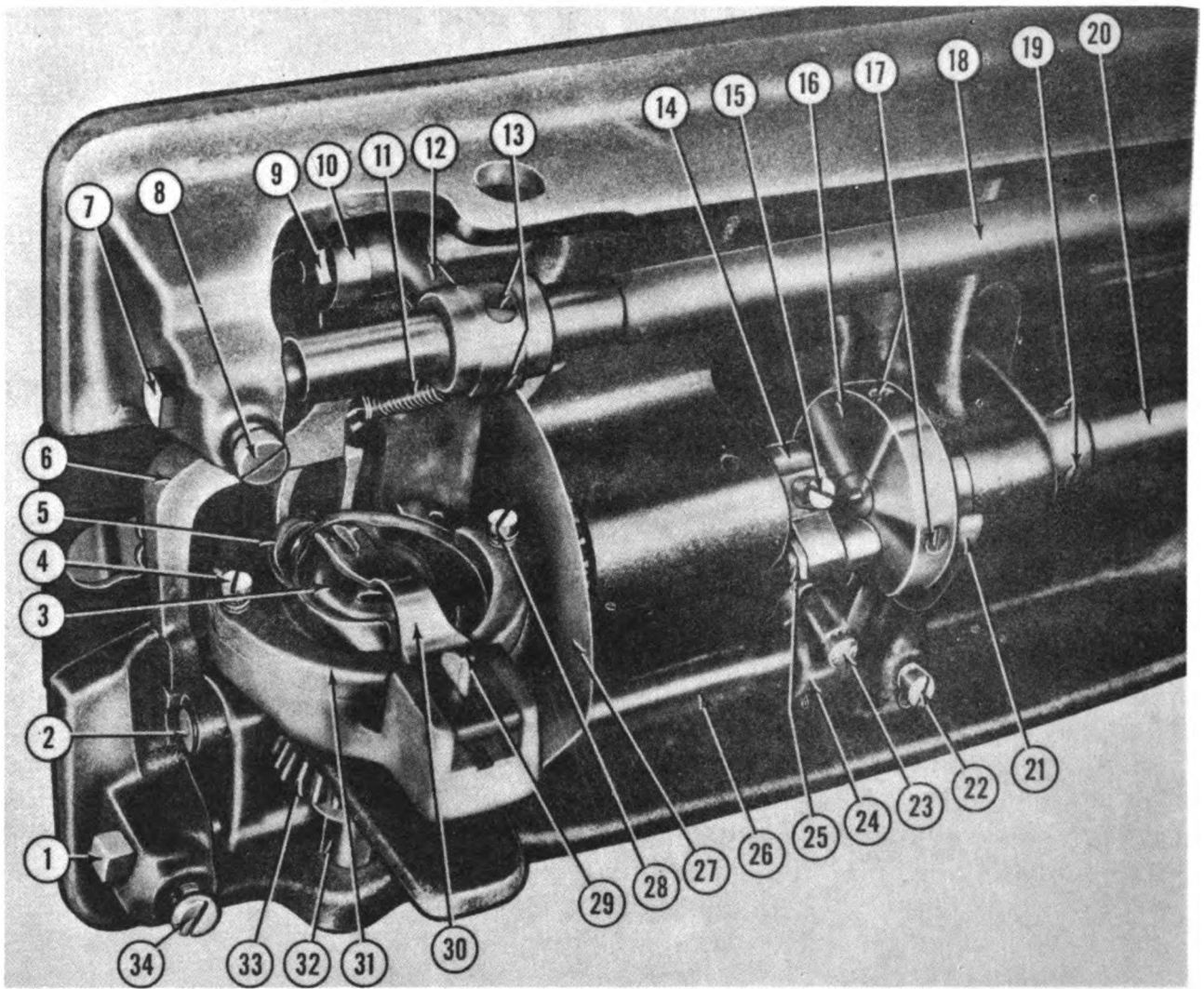
(3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



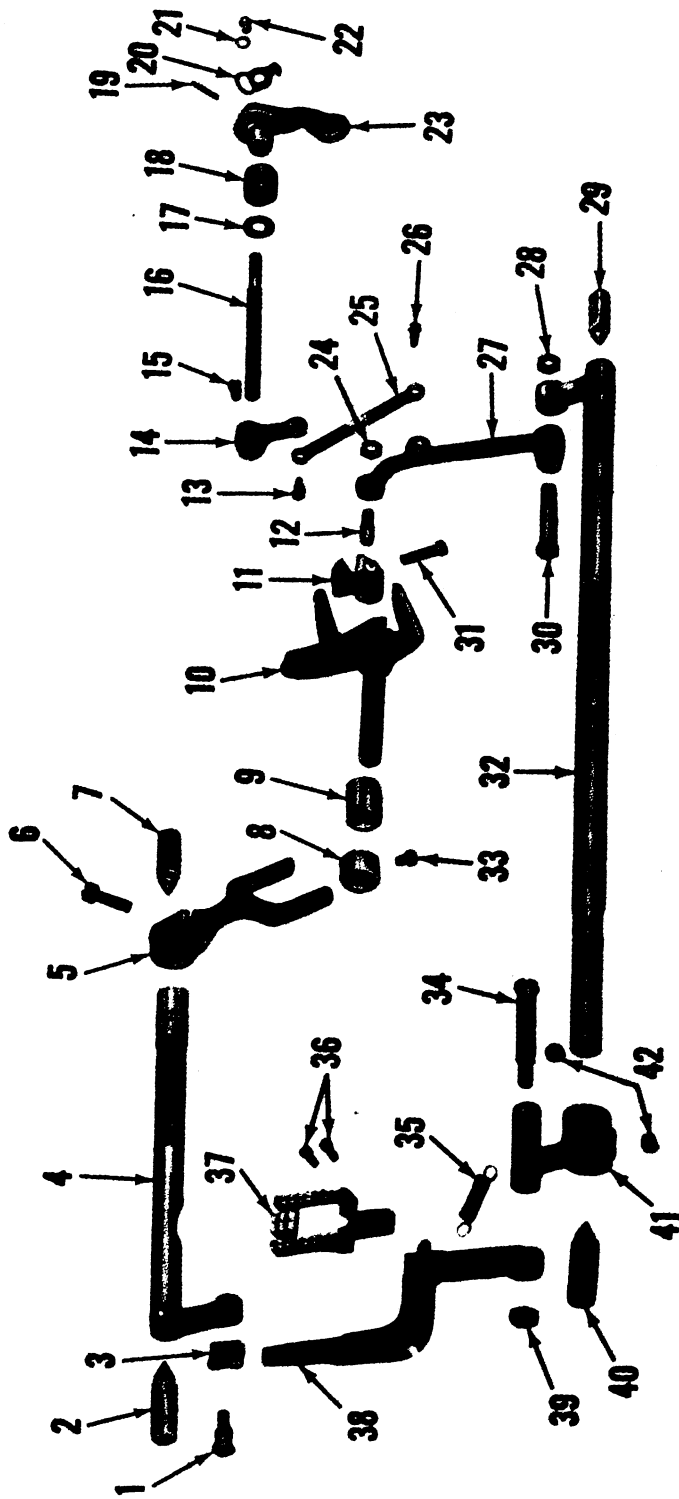
- | | |
|--|---|
| 1 Shaft, hook driving | 11 Cap, arm shaft connection |
| 2 Setscrews, feed driving cam | 12 Cap, arm shaft connection |
| 3 Cam, feed driving | 13 Rod, foot lifter lifting lever |
| 4 Shaft, feed driving rock | 14 Nut, feed driving cam fork lever connection clamp screw stud |
| 5 Connection, feed driving cam fork lever | 15 Clamp, feed driving cam fork lever connection |
| 6 Link, feed regulating handle shaft crank | 16 Lever, feed driving cam fork |
| 7 Setscrew, feed driving rock shaft center | 17 Setscrew, feed driving cam fork lever shaft sleeve |
| 8 Center, feed driving rock shaft | 18 Screw, feed driving cam fork lever shaft collar |
| 9 Connection, arm shaft | 19 Lever, feed driving cam fork |
| 10 Connection, arm shaft | |

Figure 117. Bed assemblies, right side installed.



- | | |
|--|---|
| 1 Center, feed lifting rock shaft | 18 Shaft, feed driving rock |
| 2 Screw, feed lifting rock shaft slide block hinge | 19 Setscrews, hook driving shaft collar |
| 3 Bobbin | 20 Shaft, hook driving |
| 4 Screw, hook race cap spring | 21 Fork, feed lifting cam |
| 5 Hook, sewing | 22 Setscrew, feed lifting rock shaft center |
| 6 Bar, feed | 23 Screw, pinch, feed lifting cam fork |
| 7 Center, feed driving rock shaft | 24 Fork, feed lifting cam |
| 8 Setscrew, feed driving rock shaft center | 25 Stud and nut, hook driver crank |
| 9 Nut, feed bar hinge screw | 26 Shaft, feed lifting rock |
| 10 Bar, feed | 27 Guard, oil, hook driving intermediate bevel gear |
| 11 Spring, feed bar | 28 Screw, hook race cap spring |
| 12 Crank, feed driving rock shaft | 29 Latch, hook bracket bobbin case stop |
| 13 Setscrews, feed driving rock shaft crank | 30 Stop, hook bracket bobbin case, hinged |
| 14 Crank, hook driver | 31 Cap, hook race |
| 15 Setscrew, hook driver crank, long | 32 Driver, hook |
| 16 Crank, feed lifting cam | 33 Gear, bevel, hook driver, 25 teeth |
| 17 Screw and setscrew, feed lifting cam crank position | 34 Setscrew, feed lifting rock shaft center |

Figure 118. Bed assemblies, left side, installed.



- 1 Screw, feed lifting rock shaft slide block
- 2 Center, feed lifting rock shaft
- 3 Block, feed lifting rock shaft
- 4 Shaft, feed lifting rock
- 5 Fork, feed lifting cam
- 6 Screw, pinch, feed lifting cam fork
- 7 Center, feed lifting rock shaft
- 8 Collar, feed driving cam fork lever shaft
- 9 Sleeve, feed driving cam fork lever shaft
- 10 Lever, feed driving cam fork
- 11 Clamp, feed driving cam fork lever connection
- 12 Stud, feed driving cam fork lever connection clamp screw
- 13 Screw, hinge, upper
- 14 Crank, feed regulating handle shaft

- 15 Screw, feed regulating handle shaft crank
- 16 Shaft, feed regulating handle
- 17 Washer, shaft sleeve (F)
- 18 Sleeve, handle shaft, split
- 19 Pin, feed regulating handle position
- 20 Stop, feed regulating handle adjustable
- 21 Washer, feed regulating handle adjustable stop screw
- 22 Screw, stop, feed regulating handle adjustable
- 23 Handle, feed regulating
- 24 Nut, feed driving cam fork lever connection clamp screw stud
- 25 Link, feed regulating handle shaft crank
- 26 Screw, hinge, lower
- 27 Connection, feed driving cam fork lever

- 28 Nut, feed driving cam fork lever hinge screw
- 29 Center, feed driving rock shaft
- 30 Screw, hinge, feed driving cam fork lever
- 31 Screw, pinch, feed lifting connection clamp
- 32 Shaft, feed driving rock
- 33 Screw, feed driving cam fork lever shaft collar
- 34 Screw, feed bar hinge
- 35 Spring, feed bar
- 36 Screws, feed dog
- 37 Dog, feed
- 38 Bar, feed
- 39 Nut, feed bar hinge screw
- 40 Center, feed driving rock shaft
- 41 Crank, feed driving rock shaft
- 42 Setscrew, feed driving rock shaft crank

Figure 119. Feed lifting rock shaft and feed driving rock shaft assemblies, exploded view.

180 Feed Driving Cam Fork Lever and Related Parts

a. Removal and Disassembly.

- (1) Remove screw (18, fig. 117) that attaches collar to shaft end of lever (19).
- (2) Loosen locknut on setscrew (17) that attaches sleeve (9, fig. 119) to machine bed and remove setscrew with locknut.
- (3) Remove nut (24) from stud (12) that attaches connection (27) to clamp (11).
- (4) Remove pinch screw (31) that attaches stud to clamp, and remove stud.
- (5) Slide clamp from lever (10).
- (6) Slide lever and collar (8) from machine bed.
- (7) Remove sleeve from machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

181. Feed Lifting Rock Shaft Assembly

a. Removal and Disassembly.

- (1) Slide round belt off balance wheel.
- (2) Tilt machine head back.
- (3) Remove sewing hook assembly (para. 112).
- (4) Remove setscrews (22 and 34, fig. 118) that attach centers (2 and 7, fig. 119) to machine bed, and remove centers.
- (5) Lift out shaft (4), fork (5), and block (3) as an assembly from machine bed.
- (6) Remove screw (1) that attaches block to shaft, and remove block.
- (7) Remove pinch screw (6) from fork, and remove fork from shaft.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

182. Hook Driving Shaft Assembly

a. Removal and Disassembly.

- (1) Remove round belt from balance wheel.
- (2) Tilt machine head back.
- (3) Remove screws (19 and 20, fig. 115) that attach caps (17 and 21) to connections (14 and 23) and remove caps.
- (4) Remove setscrews (25 and 44) that attach cam (24) to shaft (22).
- (5) Remove setscrews (28 and 29) that attach cam (41) to shaft.
- (6) Remove screws (15 and 18) that attach bearing (16) to machine bed, and remove bearing.
- (7) Work hook driving shaft with collar and cam out right end of machine bed.
- (8) Remove setscrews (26 and 27) that attach collar (43) to shaft, and remove collar and cam from shaft.
- (9) Swing out cam (41) and slide cam and link (30) from hook driver crank stud (39).
- (10) Remove nut (42) from stud (40), and remove stud from cam (41).
- (11) Remove setscrews that attach crank (31) to shaft (33), and remove crank.
- (12) Remove nut (32) from stud (39), and remove stud from crank (31).
- (13) Remove screws that attach oil guard (27, fig. 118), and remove oil guard.
- (14) Remove sewing hook (para. 112).
- (15) Remove screws (38, fig. 115) that attach bracket (36) to machine bed, and remove bracket with bevel gear (35).
- (16) Slide out shaft (33).
- (17) Drive bushing out machine bed.
- (18) Remove nut (37) from stud (39) and remove stud and intermediate bevel gear (35) from bracket.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

183. Needle Bar Connecting Link and Guard

a. Removal.

- (1) Remove needle bar (para. 115).
- (2) Remove setscrew and brass packing from cam (9, fig. 77).
- (3) Remove stud that attaches link (11) to cam, and remove link.
- (4) Remove screws that attach needle bar

connecting link guard to cam, and remove guard.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

Section XIX. THIRD-ECHOLON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), SINGLE-THREAD CHAIN-STITCH BASTING MACHINE (SINGER MODEL 55-5)

184. Arm Shaft Assembly and Bushing

a. Removal.

- (1) Remove position screw (18, fig. 85) and setscrew that attach eccentric (17) to shaft (3, fig. 120).
- (2) Through access hole in top of machine head, remove screws (6) that attach rod (15) and cap (7) to shaft, and remove cap.
- (3) Through access hole in top of machine head, remove screws (5) that attach cap (4) and rod (18) to eccentric (1), and remove cap.
- (4) Through access hole in back of machine head, remove setscrews (2) that attach eccentric (1) to shaft.
- (5) Remove setscrews that attach bushing (8) to machine arm at wheel (9).
- (6) Pull balance wheel to the right, working shaft out eccentric (17, fig. 85), feed eccentric (1, fig. 120), and machine head.
- (7) Loosen screw (11) and setscrews (10) that attach balance wheel to shaft, and remove wheel and bushing (8) from shaft.
- (8) Lift feed eccentric from rod (18).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

185. Feed Eccentric Connecting Rod Assembly

a. Removal.

- (1) Through access hole in top of machine head, remove screws (5, fig. 120) that attach cap (4) and rod (18) to eccentric (1), and remove cap.
- (2) Slide round belt off drive pulley.
- (3) Tilt machine head back.
- (4) Loosen screw (32) on crank.
- (5) Remove capscrew (34) and washer (33) that attach stud (31) to rod, and remove rod out bottom of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed eccentric connecting rod (TM 10-3530-202-10).

186. Crank Connecting Rod Assembly

a. Removal.

- (1) Through access hole in top of machine head, remove screws (6, fig. 120) that attach cap (7) to rod (15), and remove cap.
- (2) Slide round belt off drive pulley.
- (3) Tilt machine head to the rear.

- (4) Remove nut (16) and screw (18) that attach rod to shaft (14), and remove crank out of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, chipped places, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

187. Feed Rock Shaft Assembly, Crank, and Feed Bar

a. Removal and Disassembly.

- (1) Slide round belt off drive pulley.
- (2) Tilt machine head back.
- (3) Loosen nut (28, fig. 120) on stud (31), and remove capscREW (34) and washer (33) that attach rod (18) to stud.
- (4) Remove nuts (17 and 22) on centers (25) that attach shaft (27) to machine bed, and remove centers.
- (5) Remove screw (6, fig. 83) that attaches feed dog (3) to bar (26, fig. 120) and remove feed dog.
- (6) Swing shaft out machine bed.
- (7) Remove nuts (20 and 23, fig. 120) from centers (21 and 24) that attach bar (26) to shaft, and remove centers.
- (8) Remove shaft from machine.
- (9) Remove screw and setscrews (19) that attach crank (30) to shaft, and remove crank with stud.
- (10) Remove nut (28) and washer (29) that attach stud to shaft, and remove stud.
- (11) Pull connection (45) around until screw (46) can be removed.
- (12) Remove screw (49) that attaches screw (46) to bar.
- (13) Remove nut (44) that attaches screw to connection, and remove screw.
- (14) Lift feed bar out machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

188. Oscillating Rock Shaft Assembly

a. Removal.

- (1) Slide round belt off drive pulley.
- (2) Tilt machine head to the rear.
- (3) Remove nut (13, fig. 82) on screw (15) that attach rod (14) to shaft (12), and remove screw.
- (4) Remove setscrew (16) that attaches pin to machine bed, and slide out pin.
- (5) Remove shaft from block (17).

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

189. Looper Shaft Assembly and Related Parts

a. Removal and Disassembly.

- (1) Slide round belt off drive pulley.
- (2) Tilt machine head to the rear.
- (3) Remove setscrew (41, fig. 120) and drive out pin (39) that attach crank (40) to shaft (43).
- (4) Remove screw (50) and setscrew (51) that attach looper (52) to shaft, and remove looper.
- (5) Remove setscrew (48) that attaches eccentric (47) to shaft, and remove eccentric and connection (45).
- (6) Drive shaft out machine bed, and remove crank (40) with slide block assembly.
- (7) Slide eccentric from connection.
- (8) Remove nut (44) and screw (46) from connection.
- (9) Remove capscREW (36) and washer (37) that attach block (38) to stud (35), and remove block.
- (10) Remove nut (42) and stud from crank.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped places, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust looper to needle (para. 125).

190. Needle Bar Assembly and Thread Takeup Assembly

a. Removal and Disassembly.

- (1) Remove needle bar assembly (para. 115).
- (2) Remove capcrew (7, fig. 85) that attaches link (8) to crank (12) and remove link from crank and from arm (11).
- (3) Remove setscrew in back of machine arm that attaches pin (9) to machine arm, and remove pin and arm (11) with lever (10).
- (4) Pull stud (21) from link (20) and remove roller (19) from groove in machine arm behind link.
- (5) Through access hole in back of machine arm, remove capcrews (15) and cap (16) from thread nipper connection.
- (6) Remove arm side cover (para. 118).

(7) Remove setscrew and position screw (18) that attach eccentric (17) to arm shaft, and remove eccentric.

(8) Remove locknut (25, fig. 81) and regulating nut that attach connection to plate (23), and remove connection from machine arms.

(9) Remove screw (13, fig. 85) that attaches wedge (14) to eccentric, and push wedge out large hole in small curved side of eccentric.

(10) Pull crank out eccentric and pull link off crank (12).

(11) Drive out rivets that attach lever to arm, and separate them.

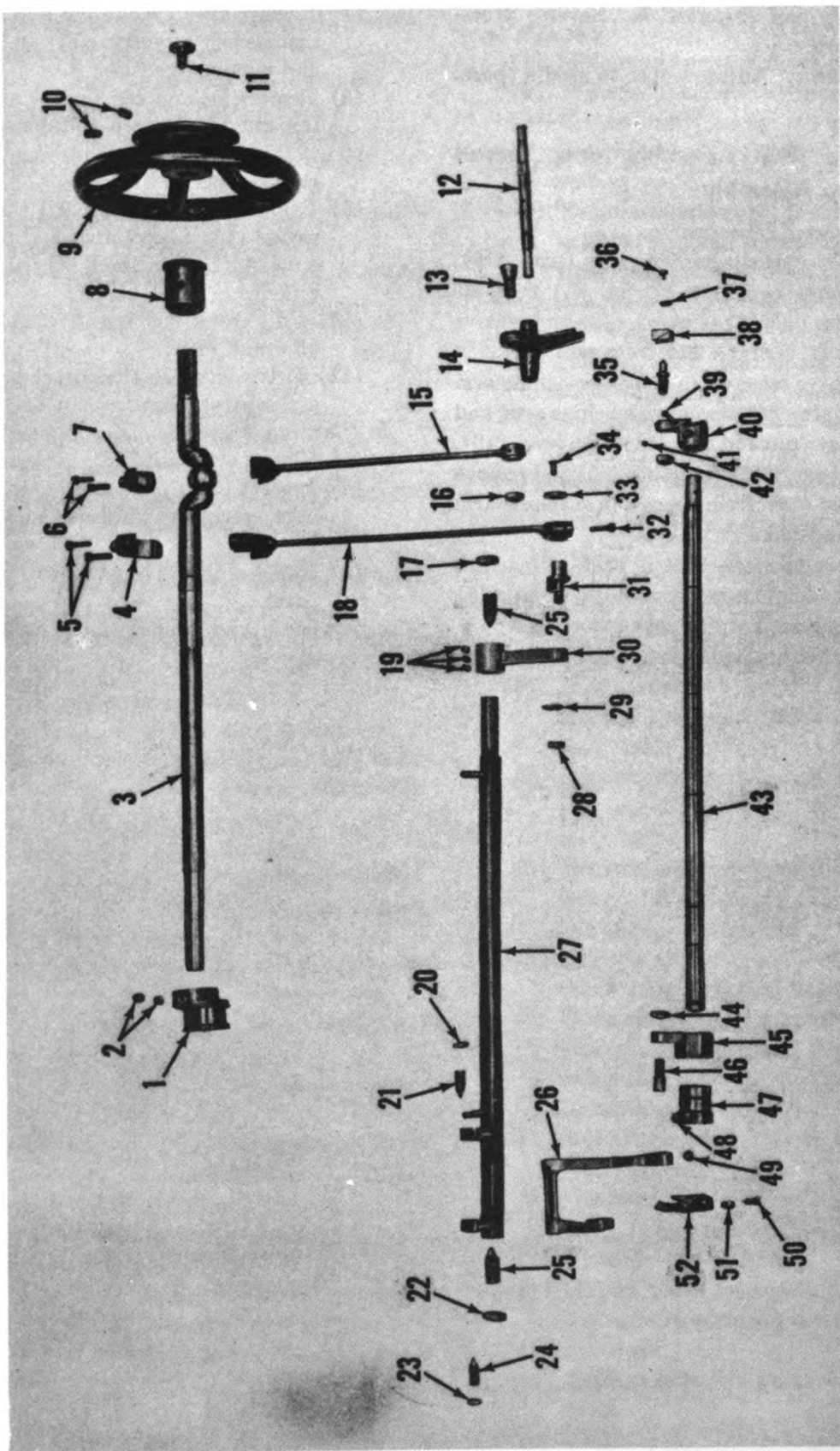
b. Cleaning, Inspection, and Repair.

(1) Clean parts with SD.

(2) Inspect parts for cracks, chipped places, burrs, stripped threads, and excessive wear.

(3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.



- | | | |
|---|---|---|
| 1 Eccentric, feed | 19 Screw and setscrews, feed rock shaft regulator | 26 Capscrew, looper shaft crank slide block |
| 2 Setscrews, feed eccentric | 20 Nut, feed bar screw center | 27 Washer, looper shaft crank slide block cap-screw |
| 3 Shaft, arm | 21 Center, screw, feed bar | 28 Block, looper shaft crank slide |
| 4 Cap, feed eccentric connecting rod cap | 22 Nut, feed rock shaft screw center | 29 Pin, looper shaft crank |
| 5 Screws, feed eccentric connecting rod cap | 23 Nut, feed bar screw center | 30 Crank, looper shaft |
| 6 Screws, crank connecting rod cap | 24 Center, screw, feed bar | 31 Setscrew, looper shaft crank |
| 7 Cap, crank connecting rod | 25 Center, screw, shaft, feed rock | 32 Nut, looper shaft crank slide block stud |
| 8 Bushing, flanged, back, arm shaft | 26 Bar, feed | 33 Shaft, looper |
| 9 Pulley with balance wheel, drive | 27 Shaft, feed rock | 34 Nut, feed bar hinge screw |
| 10 Setscrews, balance wheel | 28 Nut, feed eccentric connecting rod stud | 35 Connection, feed lifting eccentric |
| 11 Screw, shaft, arm shaft | 29 Washer, feed eccentric connecting rod stud nut | 36 Screw, feed bar hinge |
| 12 Pin, oscillating rock shaft hinge | 30 Crank, feed rock shaft regulator | 37 Eccentric, feed lifting |
| 13 Screw, hinge, crank connecting rod | 31 Stud, feed eccentric connecting rod | 38 Setscrew, feed lifting eccentric |
| 14 Shaft, oscillating rock | 32 Screw, feed eccentric connecting rod adjusting | 39 Screw, feed bar adjusting |
| 15 Rod, crank connecting | 33 Washer, feed eccentric connecting rod stud | 40 Screw, looper position |
| 16 Nut, crank connecting rod hinge screw | 34 Capscrew | 41 Setscrew, looper |
| 17 Nut, feed rock shaft screw center | 35 Stud, looper shaft crank slide block | 42 Looper, single thread |
| 18 Rod, feed eccentric connecting | | |

Figure 180. Arm shaft assembly and machine bed assemblies, exploded view.

Section XX. THIRD-ECHELON MAINTENANCE ALLOCATION, RECLAMATION AND REPAIR EQUIPMENT (GROUP 46), TEXTILE SEWING MACHINE (SINGER MODEL 111W155)

191. Arm Shaft, Bushing, Bearing, and Related Parts

a. Removal and Disassembly.

- (1) Remove needle bar rock frame (para. 187).
- (2) Through opening in top of machine arm, remove crank setscrews (24 and 25, fig. 96) that attach needle bar crank (27) to arm shaft (40), and remove needle bar crank.
- (3) Remove bed thread hook shaft drive belt (para. 192).
- (4) Tilt machine head forward.
- (5) Remove setscrews (5, fig. 121) and positioning screw (6) that attach arm shaft belt pulley to arm shaft.
- (6) Remove setscrew (2) that attaches feed indicating disk to arm shaft.
- (7) Through slot in rear of machine arm, remove setscrews (23 and 44) that attach lifting eccentric to arm shaft (40).
- (8) Grasp the arm shaft on the right end and pull it from the machine head.
- (9) Remove eccentric connector (41), lifting eccentric (24), feed indicating disk (1), arm shaft belt pulley (4), and rear arm shaft bushing (11) with collar (13), bearing (14), and washer (15).
- (10) Remove setscrew (37) that attaches front arm shaft bushing (36) to machine arm, and remove bushing.

b. Cleaning, Inspection, and Repair.

- (1) Clean all parts with SD.
- (2) Inspect parts for bends, breaks, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly. Reverse procedure in *a* above.

d. Adjustment and Timing.

- (1) Turn the balance wheel toward the operator until the thread takeup lever is at its highest position.
- (2) Tilt machine head back.
- (3) Check arrows on collar (2, fig. 122) and plate (3) to see if they are alined. If the arrows are not alined, remove connection belt from pulley on hook driving shaft.

- (4) With the thread takeup lever at its highest position, turn the hook driving shaft until the arrows are alined. Install drive belt on pulley.
- (5) Time thread hook with needle (para. 186).
- (6) If the stitch indicator disk does not indicate accurately, adjust it as follows:
 - (a) With a pencil or tailor's crayon, make two parallel lines 1-inch apart on a scrap of fabric.
 - (b) Sew a line of stitches across both ruled lines and at right angles to them. Count the number of stitches between the lines.
 - (c) Adjust the machine until it sews five stitches to the inch.
 - (d) Open the cover plate on top of the machine arm, and turn the balance wheel until the setscrew hole in the edge of the indicator disk comes into view. Insert a screwdriver into this hole, and loosen the screw so that the indicator disk does not turn with the balance wheel (fig. 123).
 - (e) Hold down the right hand plunger (fig. 124) in the machine bed, and turn the balance wheel until it drops into the notch in the feed driving adjusting disk.
 - (f) Without moving the balance wheel and with the plunger still in the notch, turn the indicator dial until the figure 5 appears through the indicator hole.

192. Bed Thread Hook Shaft Drive Belt

a. Removal.

- (1) Remove drive pulley with balance wheel (para. 22).
- (2) Remove screw (8, fig. 121) that attaches arm cap (7) to machine arm, and remove arm cap.
- (3) Remove setscrew that attaches rear arm shaft bushing (11) to machine arm.
- (4) Remove setscrew (12) that attaches arm shaft ball bearing collar (13) to arm shaft.
- (5) Remove rear arm shaft bushing.
- (6) Tilt the machine head back.

- (7) Slide hook shaft drive belt (1, fig. 122) off safety clutch (4).
- (8) Grasp the belt at the top and pull it up as far as it will go. Remove the belt through the hole normally occupied by the arm shaft bushing.

b. Installation. Reverse procedure in *a* above.

c. Timing. Time arm shaft to thread hook drive shaft (para. 136).

193. Hook Driving Shaft Assembly

a. Removal.

- (1) Slide round belt off drive pulley with balance wheel, and tilt machine head back fig. 125).
- (2) Slide drive belt (1, fig. 122) off safety clutch (4).
- (3) Remove setscrews (87, fig. 126) that attach safety clutch to hook drive shaft (89), and remove spring flange (79), safety clutch (81), link (82), lever (83), stud (84), spring (85), latch (86), collar (88), stud (90), and lever (91) as an assembly from shaft.
- (4) Insert screwdriver into machine bed opening, remove setscrew (94) that attaches bushing (72) to hook drive shaft.
- (5) Remove position screw (74) and setscrew (75) that attach collar (76) to hook drive shaft.
- (6) Remove bushing (72), screws (73), setscrew (75), collar (76), bearing (77), washer (78), screws (93), and setscrew (94) as an assembly from hook drive shaft.
- (7) Remove screws (47) that attach timing plate (46) to machine bed, and remove timing plate.
- (8) Remove setscrew (42) and positioning screw (49) that attach lock ratchet (48) to hook drive shaft.
- (9) Remove setscrews (40) that attach stop collar (41) to hook drive shaft.
- (10) Remove setscrews (50) and positioning screw (51) that attach flange (52) to hook drive shaft.
- (11) Remove setscrew (60) and positioning screw (61) that attach gear (62) to hook drive shaft.
- (12) Slide hook drive shaft to the right so that setscrew (63) can be removed. Remove setscrew from cam (64).

- (13) Slide hook drive shaft from machine bed and remove ratchet, collar, spring, disk, flange, gib (53), setscrew (33), screw (34), eccentric (32), gear, and cam from machine bed.

- (14) Remove nut (27) and hinge screw (29) that attach connector (28) to feed driving shaft crank, and remove crank.

- (15) Remove setscrew (54) that attaches bearing (55) to machine bed.

- (16) Loosen pinch screw (56) that attaches hook saddle to bearing, and remove bearing.

- (17) Insert screwdriver into opening in machine bed, remove setscrew (65) that attaches front bushing (66) to machine bed, and remove bushing.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, burrs, chipped or broken teeth, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

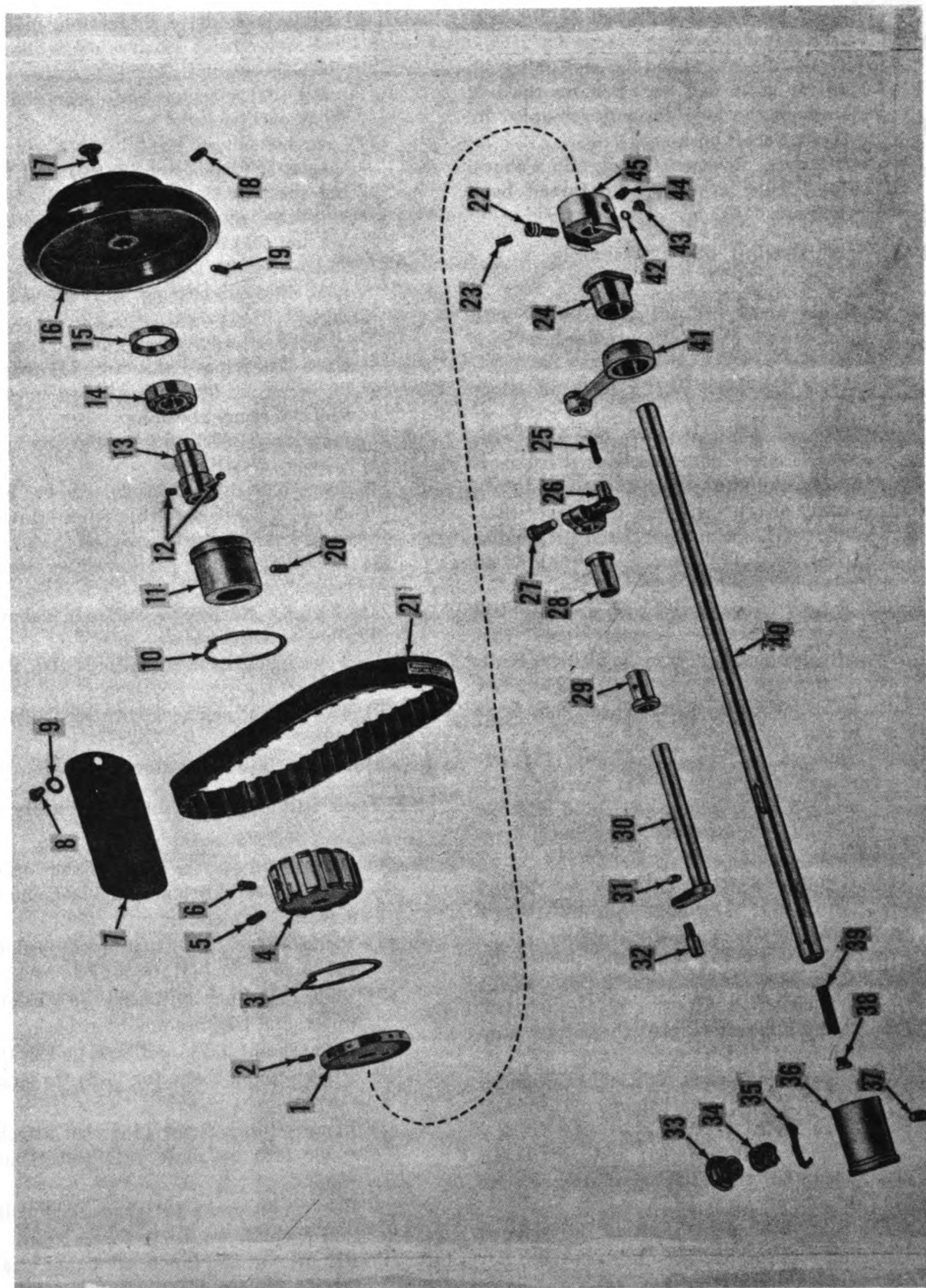
d. Timing and Adjustments.

- (1) Time hook drive shaft with arm shaft (para. 191).
- (2) Time and adjust hook with needle (para. 136).
- (3) Adjust thread indicator disk (para. 136).

194. Feed Driving Rock Shaft Assembly

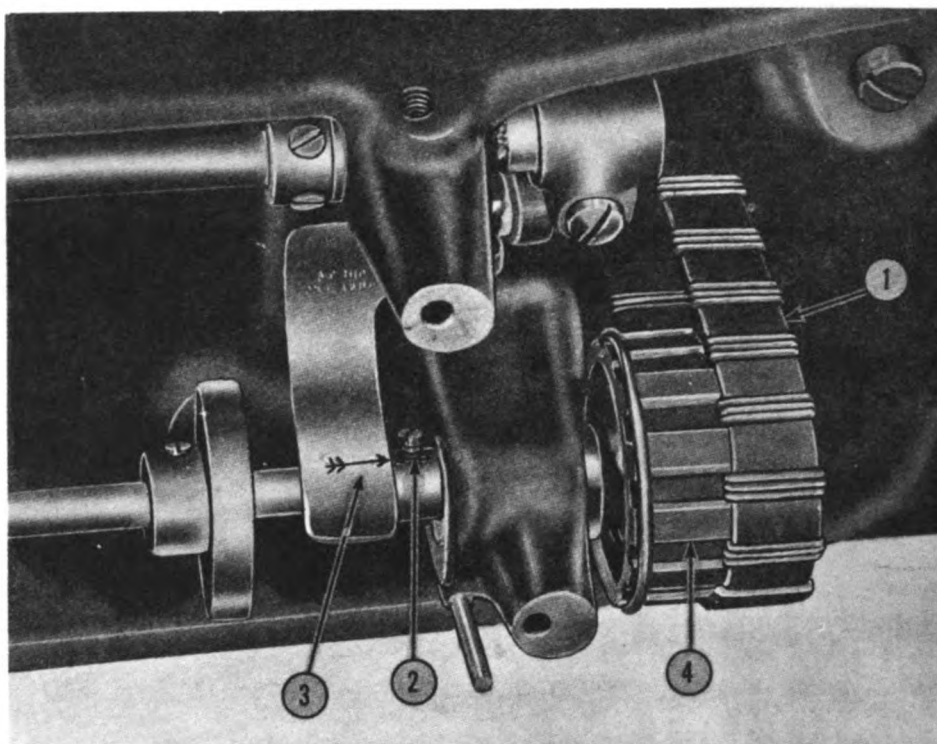
a. Removal and Disassembly.

- (1) Remove screws (8, fig. 127) that attach throat plate (6) to machine bed, and remove throat plate.
- (2) Remove screws (30) that attach feed dog (5) to feed bar (4), and remove feed bar.
- (3) Slide round belt off pulley with balance wheel, and tilt machine head back.
- (4) Remove nut (17) and screw (14) that attach crank connector (18) to crank (16).
- (5) Remove pinch screw (15) that attaches crank (16) to shaft (2), and remove crank.
- (6) Remove setscrews (9) that attach collar (10) to shaft.
- (7) Remove nut and hinge screw that attach drive connector to crank (23).



- | | | | | | |
|----|---|----|--|----|---|
| 1 | Diak, indicating, arm feed | 18 | Setcrew, drive pulley | 32 | Stud, vibrating presser bar lifting bellcrank link |
| 2 | Setcrew, feed indicating diak | 19 | Setcrew, drive pulley | 33 | Thumbcrew, shaft front bushing |
| 3 | Flange, spring, shaft pulley | 20 | Setcrew, shaft rear bushing | 34 | Wick, oil, arm shaft front bushing |
| 4 | Pulley, arm shaft belt | 21 | Belt, drive, bed thread book shaft | 35 | Wick, oil, arm shaft, front |
| 5 | Setcrew, shaft flanged pulley | 22 | Screw, regulating, lifting eccentric | 36 | Bushing, arm shaft, front |
| 6 | Screw, positioning, shaft flanged pulley | 23 | Setcrew, lifting eccentric body | 37 | Setcrew, shaft front bushing |
| 7 | Cap, arm | 24 | Eccentric, lifting | 38 | Wick, oil, drive shaft |
| 8 | Screw, arm cap | 25 | Packing, oil, lifting eccentric connecting crank | 39 | Screw, drive shaft oil wick |
| 9 | Washer, arm cap screw | 26 | Crank, needle bar rock frame rock shaft | 40 | Shaft, drive, arm |
| 10 | Flange, spring, shaft pulley | 27 | Screw, pinch, needle bar rock frame rock shaft crank | 41 | Eccentric connector, vibrating presser bar lifting rock shaft |
| 11 | Bushing, arm shaft, rear | 28 | Bushing, vibrating presser bar lifting rock shaft | 42 | Washer, lifting eccentric setscrew |
| 12 | Setcrew, shaft rear ball bearing collar | 29 | Bushing, vibrating presser bar lifting rock shaft | 43 | Screw, lifting eccentric |
| 13 | Collar, arm shaft ball bearing | 30 | Shaft, vibrating presser bar lifting rock | 44 | Setcrew, lifting eccentric body |
| 14 | Bearing, ball, annular, arm shaft | 31 | Nut, vibrating presser bar lifting bellcrank stud | 45 | Body, lifting eccentric |
| 15 | Washer, retaining, arm shaft ball bearing | | | | |
| 16 | Pulley with balance wheel, drive | | | | |
| 17 | Screw, adjusting, shaft drive pulley | | | | |

Figure 121. Arm shaft assembly and related parts, exploded view.



- 1 Belt, drive, bed thread hook shaft
- 2 Collar, timing

- 3 plate, timing, arm shaft flanged pulley
- 4 Clutch, safety, hook drive shaft

Figure 122. Machine bed, showing timing marks.

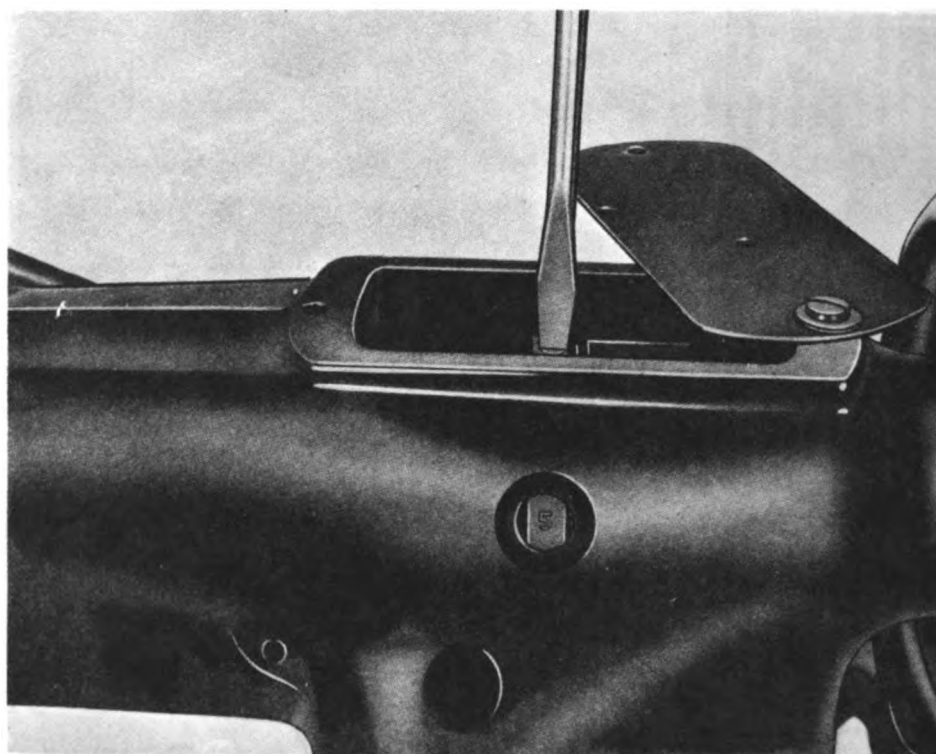
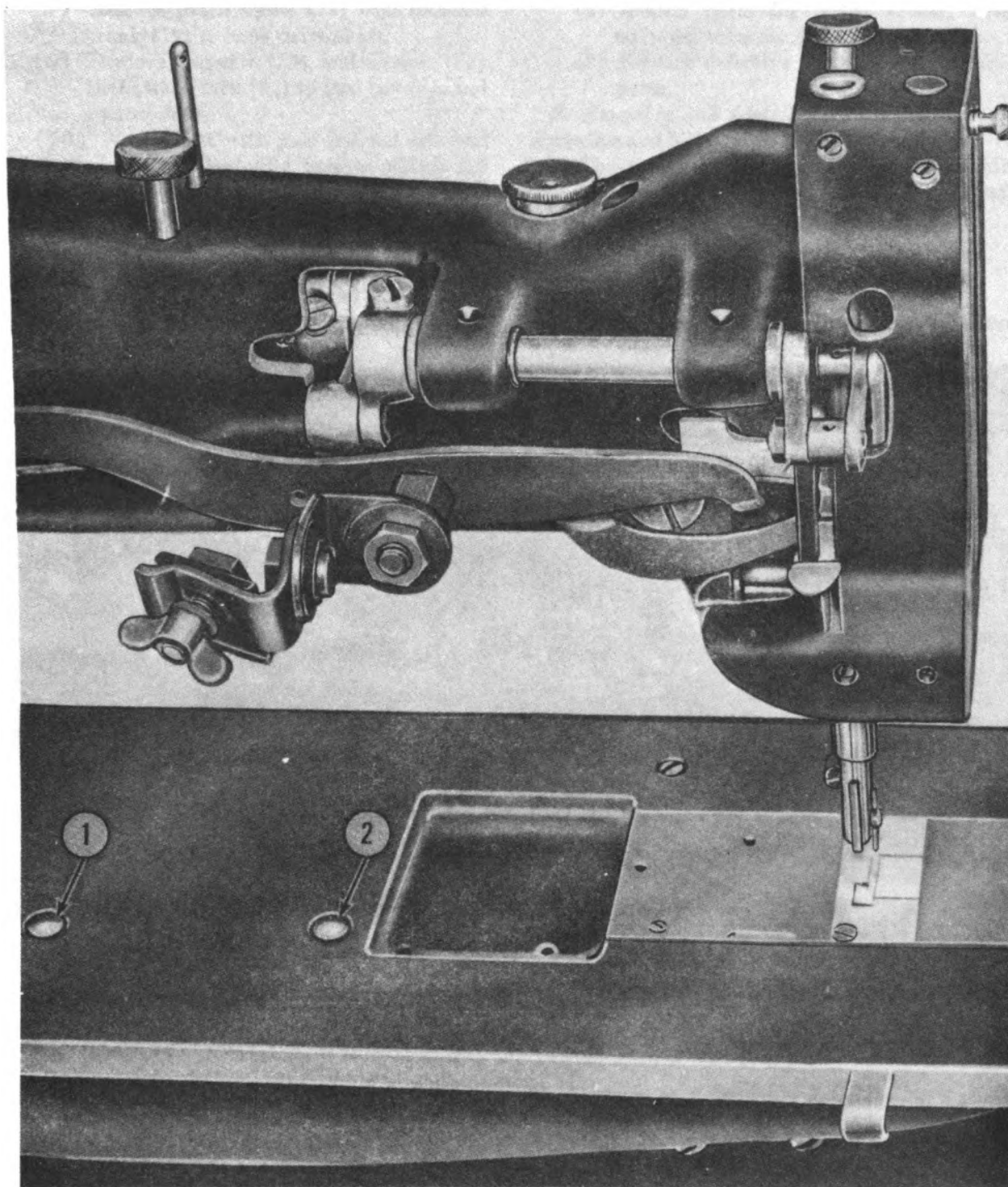


Figure 123. Adjusting the stitch indicator disk.



1 Stud, lock, thread hook drive shaft

2 Stud, regulating feed

Figure 124. Machine bed, showing plungers.

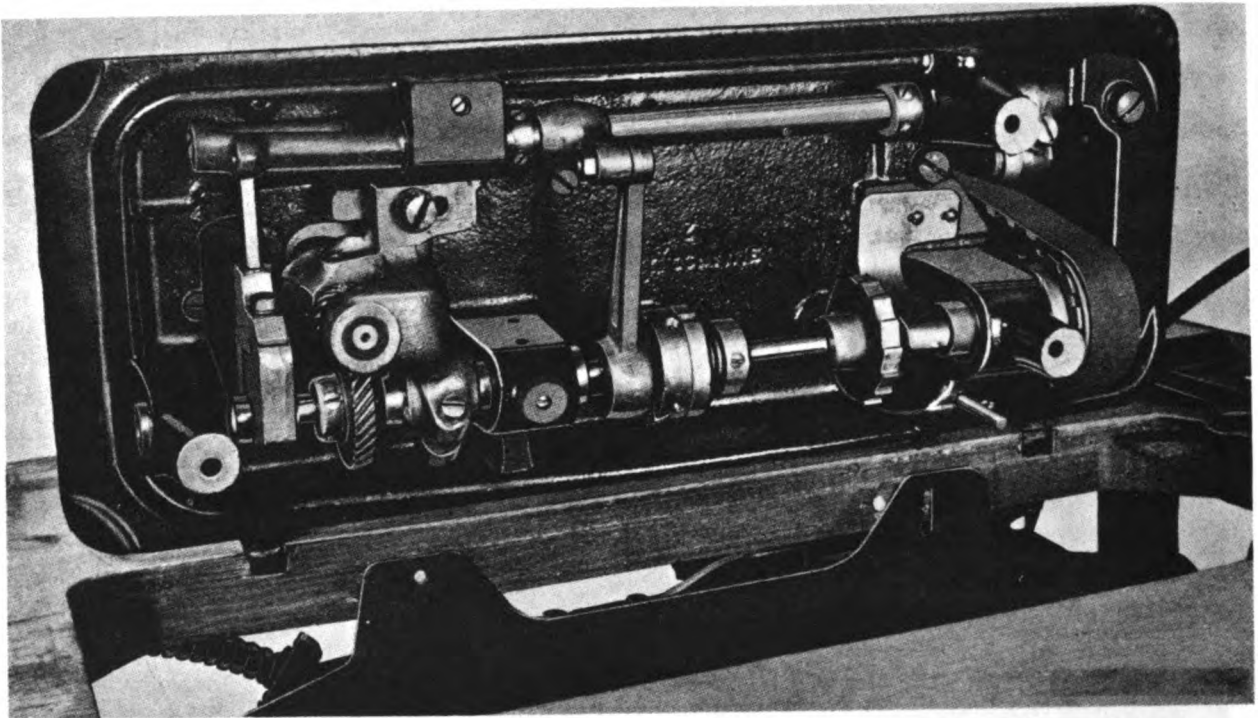


Figure 125. Machine head tilted back.

- (8) Remove pinch screw (15) that attaches crank (16) to hook drive shaft.
- (9) Remove setscrew (36) and washer (35) that attach fork (32) to feed bar (4), and remove fork.
- (10) Work shaft with feed bar out left end of machine bed, and remove collars (10 and 25) and feed driving crank.
- (11) Remove nut (8) and hinge screw (1) that attach feed bar to shaft, and remove feed bar.
- (12) Remove setscrews (11 and 12) that attach bushing (13) to machine bed, and remove bushing.
- (13) Remove setscrews (27 and 28) that attach bushing (26) to machine bed, and remove bushing.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for bends, cracks, chipped or broken teeth, burs, and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Assembly and Installation. Reverse procedure in *a* above.

d. Adjustment. Adjust feed dog (para. 135).

195. Hook Saddle Assembly

a. Removal.

- (1) Remove hook driving shaft (para. 193).
- (2) Remove screw (58, fig. 126) and washer (57) that attach hook saddle (25) to machine bed, and remove saddle.

b. Disassembly.

- (1) Remove thread hook (para. 136).
- (2) Remove setscrew (2) that attaches upper bushing (1) to hook saddle, and remove bushing.
- (3) Remove setscrew (59) that attaches lower bushing to hook saddle, and remove bushing.

c. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.

- (2) Inspect parts for bends, cracks, burs, stripped threads, and excessive wear.
- (3) Replace defective parts with serviceable parts.

d. Assembly and Installation. Reverse procedures in *a* and *b* above.

e. Timing. Time sewing hook with needle (para. 136) and time hook drive shaft with arm shaft (para. 191).

196. Feed Regulating Stud Assembly

a. Removal.

- (1) Slide round belt off pulley with balance wheel, and tilt machine head back.
- (2) Remove retainer (36, fig. 126) that attaches stud (38) and spring (37) to machine bed, and remove stud and spring out top of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for burs and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.

197. Thread Hook Drive Shaft Lock Stud Assembly

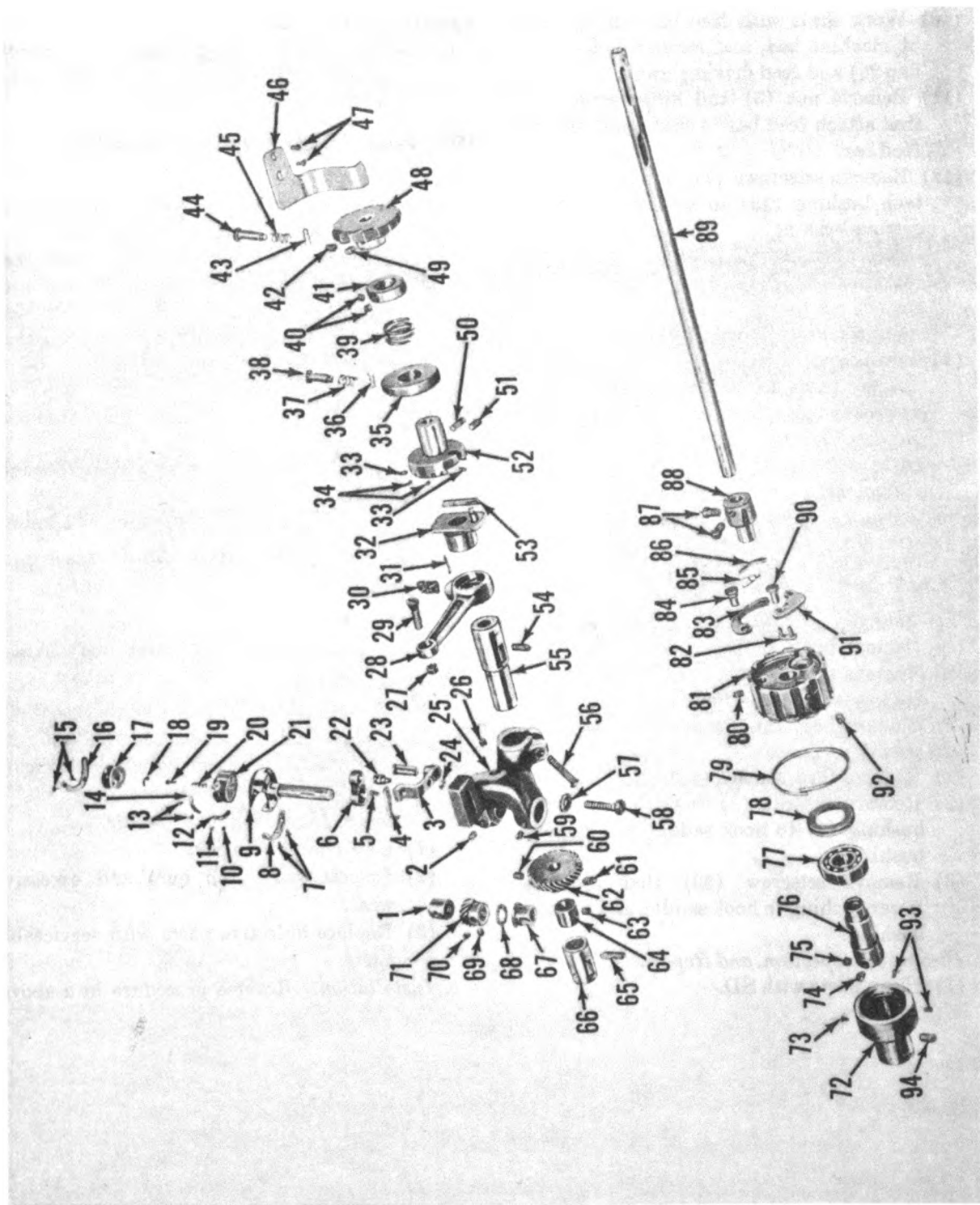
a. Removal.

- (1) Slide round belt off pulley with balance wheel, and tilt machine head back.
- (2) Remove retainer (43, fig. 126) that attaches stud (44) and spring (45) to machine bed, and remove stud and spring out top of machine bed.

b. Cleaning, Inspection, and Repair.

- (1) Clean parts with SD.
- (2) Inspect parts for burs and excessive wear.
- (3) Replace defective parts with serviceable parts.

c. Installation. Reverse procedure in *a* above.



1 Bushing, hook, saddle, upper
 2 Screw, positioning, thread hook saddle upper bushing
 3 Lever, bobbin case opener
 4 Opener, bobbin case
 5 Screw, bobbin case opener
 6 Link, bobbin case opener lever
 7 Screw, thread hook needle guard
 8 Guard, needle, thread hook
 9 Hook, thread
 10 Screw, bobbin case tension spring
 11 Screw, regulating, bobbin case tension spring
 12 Spring, flat, tension, bobbin case
 13 Screw, bobbin case oiling retainer
 14 Retainer, bobbin case oiling felt
 15 Screw, thread hook gib
 16 Gib, thread hook
 17 Bobbin
 18 Latch, bobbin case
 19 Plunger, bobbin case latch
 20 Spring, bobbin case latch
 21 Case, bobbin
 22 Stud, screw, bobbin case opener lever driving
 23 Stud, hinge, bobbin case opener lever
 24 Nut, screw stud
 25 Saddle, thread hook
 26 Screw, position, hook bushing
 27 Nut, feed drive connector hinge screw
 28 Drive connector, feed
 29 Screw, hinge, feed drive connector
 30 Felt, oiling, feed drive connector
 31 Wire, retaining, feed drive connector oiling felt
 32 Eccentric, drive, feed
 33 Setscrew, feed drive eccentric friction gib adjusting screw
 34 Screw, adjusting, feed drive eccentric friction gib

35 Disk, adjusting, feed drive eccentric
 36 Retainer, spring, hairpin, feed regulating and thread hook drive shaft lock stud
 37 Spring, feed regulating stud
 38 Stud, regulating, feed
 39 Spring, feed drive eccentric adjusting
 40 Setscrew, feed driving rock shaft stop collar
 41 Collar, stop, feed drive eccentric adjusting disk spring
 42 Setscrew, thread hook drive lock ratchet
 43 Retainer, spring, hairpin, thread hook drive lock ratchet stud
 44 Stud, lock, thread hook drive shaft
 45 Spring, thread hook drive shaft lock stud
 46 Plate, timing, arm shaft flanged pulley
 47 Screws, shaft flanged pulley timing plate
 48 Ratchet, lock, thread hook drive shaft
 49 Screw, positioning, thread hook drive shaft lock ratchet
 50 Setscrew, feed drive flange
 51 Screw, position, feed drive flange
 52 Flange, feed drive
 53 Gib, friction, feed drive eccentric
 54 Setscrew, thread hook saddle bearing
 55 Bearing, thread hook saddle
 56 Screw, pinch, thread hook saddle
 57 Washer, hook saddle screw
 58 Screw, hook saddle
 59 Setscrew, thread hook saddle lower bushing
 60 Setscrew, thread hook spiral drive gear
 61 Screw, positioning, thread hook spiral drive gear
 62 Gear, spiral, drive
 63 Setscrew, feed lifting cam
 64 Cam, feed lifting
 65 Setscrew, thread hook drive shaft bushing

66 Bushing, thread hook drive shaft, front
 67 Bushing, bronze, hook saddle, lower
 68 Washer, thrust, hook driving pinion
 69 Screw, positioning, hook driving pinion
 70 Setscrew, thread hook drive pinion
 71 Pinion, spiral, drive thread hook
 72 Bushing, hook driving shaft
 73 Screw, hook driving ball bearing retaining washer
 74 Screw, position, hook driving shaft ball bearing collar
 75 Setscrew, hook driving shaft ball bearing collar
 76 Collar, hook driving shaft, ball bearing
 77 Bearing, ball, hook driving shaft
 78 Washer, retaining, hook driving shaft driving ball bearing
 79 Flange, spring, safety pulley
 80 Setscrew, safety clutch locking lever spring stud
 81 Clutch, safety, hook drive shaft
 82 Link, connecting, safety clutch locking lever
 83 Lever, safety clutch
 84 Stud, safety clutch locking lever spring
 85 Spring, safety clutch throwin latch
 86 Latch, safety clutch throwin latch
 87 Setscrew, safety clutch hook driving shaft
 88 Collar, position, safety clutch hook driving shaft
 89 Shaft, drive, hook
 90 Stud, safety clutch locking lever hinge
 91 Lever, safety clutch locking
 92 Setscrew, safety clutch locking lever spring stud
 93 Screw, hook driving ball bearing retaining washer
 94 Setscrew, hook driving bushing

Figure 126. Thread hook and hook driving assemblies, exploded view.

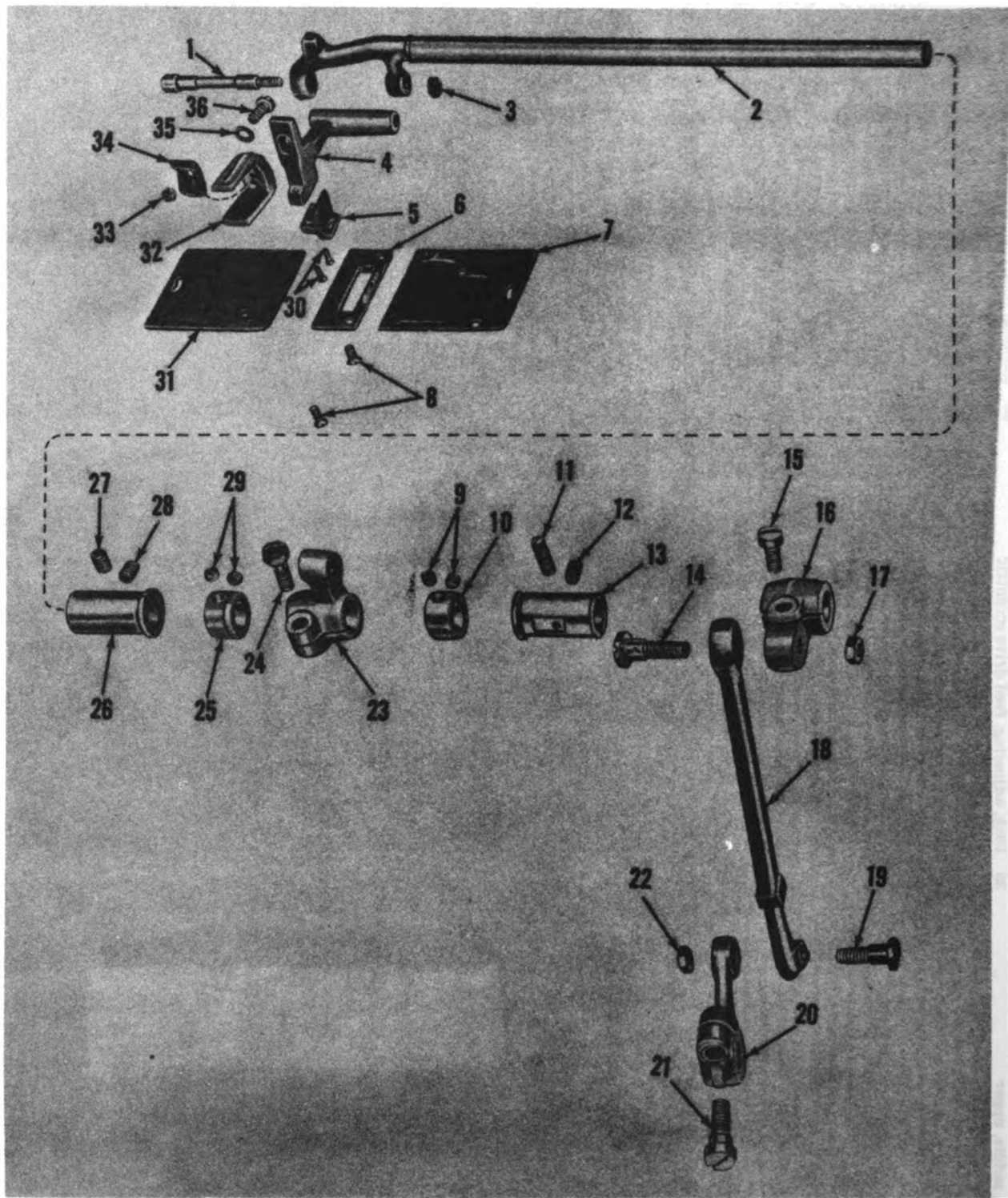


Figure 187. Feed assemblies, exploded view.

Section XXI. FOURTH-ECHELON MAINTENANCE ALLOCATION, ELECTRIC MOTOR (GROUP 30)

198. Motor Shaft Ball Bearing (Drive End) for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Inspection. If unusual noises are detected while electric motor is operating, the bearing is defective.

b. Removal.

- (1) Remove electric motor (para. 19).
- (2) Remove belt guard bracket (para. 24).
- (3) Remove screws (17, fig. 6) and lockwashers (18) that attach end cover (9) to motor housing (4), and remove end cover.
- (4) Remove screws (81) and lockwashers (80) that attach end cover (1) to motor housing, and remove end cover.
- (5) Remove nut (7) from clutch shaft, and remove flywheel (6) and key (29) from clutch shaft.
- (6) Slide rotor (8) out motor housing.
- (7) Remove screws (27) that attach retaining plate (5) to motor housing, and remove plate.
- (8) Slide ball bearing (28) out motor housing.

c. Installation. Reverse procedure in *b* above, using serviceable ball bearing.

199. Motor Shaft Ball Bearing (Opposite Drive End) for Singer Models 112W116, 131W113, 7-33, 17W15, 55-5, and 111W155

a. Inspection. If unusual noises are detected while electric motor is operating, the bearing is defective.

- 1 Screw, feed driving connection hinge
- 2 Shaft, feed driving rock
- 3 Nut, feed driving connection hinge screw
- 4 Bar, feed
- 5 Dog, feed
- 6 Plate, throat
- 7 Plate, slide, right
- 8 Screws, throat plate
- 9 Setscrews, feed driving rock shaft stop collar
- 10 Collar, feed driving rock shaft stop
- 11 Setscrew, feed driving rock shaft right bushing
- 12 Setscrew, feed driving rock shaft right bushing
- 13 Bushing, feed driving rock shaft, right, split
- 14 Screw, hinge
- 15 Screw, pinch, feed driving rock shaft crank
- 16 Crank, feed driving rock shaft
- 17 Nut, hinge screw
- 18 Crank connector, needle bar rock frame rock shaft

b. Removal.

- (1) Remove electric motor (para. 19).
- (2) Remove screws (81, fig. 6) and lockwashers (80) that attach end cover (1) to motor housing (4), and remove end cover.
- (3) Pull ball bearing (2) from rotor shaft.

c. Installation. Reverse procedure in *b* above, using serviceable ball bearing.

200. Electric Motor for Singer Model 97-10

a. Removal and Disassembly.

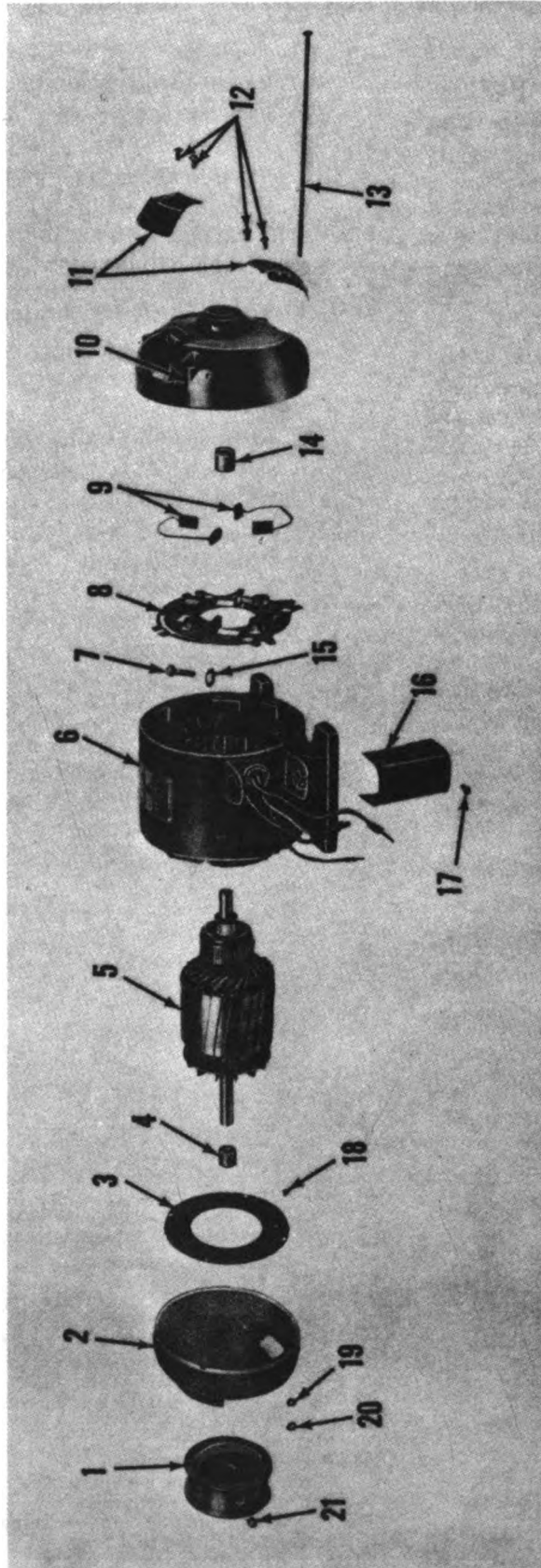
- (1) Remove motor from motor base (para. 20).
- (2) Remove nuts (20, fig. 128), washers (19), and bolts (13) that secure bells (2 and 10) to frame (6).
- (3) Remove end bells from motor frame.
- (4) Slide armature (5) from motor frame.
- (5) Note position of holder (8) and remove holder from motor frame.
- (6) Raise springs and remove brushes with leads (9) from holder (8).
- (7) Pry out end bell dust shields, and press out bearings (4 and 14) from end bells.

b. Repair. After installing new bearings in bells, ream bearings to fit armature shaft. Install felt oil wicks.

c. Assembly and Installation. Reverse procedure in *a* above.

- 19 Screw, hinge
- 20 Crank, needle bar rock frame rock shaft
- 21 Screw, pinch, needle bar rock frame rock shaft crank
- 22 Nut, hinge screw
- 23 Crank, feed driving
- 24 Screw, pinch, feed driving crank
- 25 Collar, feed driving rock shaft
- 26 Bushing, feed driving rock shaft, left, split
- 27 Setscrew, feed driving rock shaft bushing, left, pinch
- 28 Setscrew, feed driving rock shaft bushing, left, pinch
- 29 Setscrews, feed driving rock shaft stop
- 30 Screws, feed dog
- 31 Plate, slide, right
- 32 Fork, feed lifting cam
- 33 Screw, feed lifting cam oiling felt
- 34 Pad, oiling, feed lifting cam
- 35 Washer, feed lifting cam fork screw
- 36 Screw, feed lifting cam fork

Figure 187.—Continued



- 1 Pulley, drive
- 2 Bell, end
- 3 Plate, fan
- 4 Bearing, shaft, drive end
- 5 Armature
- 6 Frame, motor
- 7 Screw, motor mounting

- 8 Holder, brush
- 9 Brushes with leads, electrical contact
- 10 Bell, end
- 11 Covers, end bell
- 12 Screws, end bell cover
- 13 Bolt, through
- 14 Bearing, shaft, opposite drive end

- 15 Washer, flat, motor mounting screw
- 16 Cover, junction box
- 17 Screw, junction box cover
- 18 Screw, fan plate
- 19 Washer, through bolt
- 20 Nut, through bolt
- 21 Setscrew, pulley drive

Figure 128. *Electric motor and drive pulley, exploded view.*

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION

201. Domestic Shipment and Limited Storage

a. General. The following instructions apply to sewing machines that are to be shipped within the zone of interior or that are to be placed in limited storage.

b. Inspection. Perform the services that are described on applicable figures 1 and 2. Correct all deficiencies and shortcomings, if facilities are available for such service. If repairs cannot be made at this time, make appropriate notations on a tag that will be attached to the sewing machine.

c. Preparation.

- (1) Remove machine head from stand, coil it, wrap it with a greaseproof covering, and place it in the tool drawer.
- (2) Remove the needle and bobbin from the machine head, oil them, and place them in the tool drawer.
- (3) Cover all tools and parts with rust preventive material, wrap them with greaseproof, noncorrosive material, and place them in the tool drawer or in a box attached to the machine stand.
- (4) Cover all unpainted parts with oil, grease, or other rust preventive material.
- (5) Place a moisture resistant bag over the machine head and bobbin winder and under the needle bar and presser foot. Tie the bag around the bottom of the machine arm so that it protects the bobbin winder.
- (6) Tie a greaseproof bag over the motor and grease the unpainted metal parts of the machine stand.

202. Demolition

a. Authority. The sewing machines are destroyed only upon an order by the proper authority to prevent their use by the enemy. Destroy the same parts on all like items to prevent enemy use through cannibalization.

b. Methods.

Warning: Exercise extreme care when destroying sewing machine, to prevent personal injury or loss of life.

- (1) Smash the following with a sledge hammer, a hand ax, a pickax, or a crowbar:
 - (a) Head castings.
 - (b) Assemblies.
 - (c) Motor housings.
 - (d) Armatures.
- (2) Cut the electric cords with an ax, cutting pliers, a bayonet, or a machete.
- (3) Bend the following:
 - (a) Stands.
 - (b) Driving shafts.
 - (c) Presser bars.
 - (d) Needle bars.
- (4) Drench the smashed machines with gasoline and burn them.
- (5) Burst the machines, if necessary, with the use of firearms, grenades, or TNT.

APPENDIX I

REFERENCES

AR 310-1	General Policies
AR 320-50	Authorized Abbreviations and Brevity Codes
AR 700-58	Report of Damaged or Improper Shipment
AR 746-2300-1	Color and Marking of Vehicles and Equipment
AR 750-5	Organization, Policies, and Responsibilities for Maintenance Operation
DA Pam 310-1	Index of Administrative Publications
DA Pam 310-2	Index of Blank Forms
DA Pam 310-3	Index of Doctrinal Training and Organizational Publications
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 4, 6, 7, 8 and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders
FM 21-5	Military Training
FM 21-6	Techniques of Military Instruction
FM 21-80	Military Symbols
TM 10-8580-202-10	Operator's Manual: Machines, Sewing, Industrial, for Repair of Parachutes and Allied Equipment
TM 10-8580-202-24P	Organizational and Field Maintenance Repair Parts and Special Tool Lists: Machines, Sewing, Industrial, for Repair of Parachutes and Allied Equipment
TM 11-661	Electrical Fundamentals
TM 38-230	Preservation, Packaging, and Packing of Military Supplies and Equipment
TM 38-750	Army Equipment Records Procedures
FSC C9100-series	Fuels, Lubricants, Oils, and Waxes

APPENDIX II

MAINTENANCE ALLOCATION

1. This appendix lists all maintenance operations to be performed by the applicable echelons. These allocations are based on skills, tools, test equipment, and time required and/or available in the average TOE organization.

2. The sequence of entries coincide with the sequence followed in TM 10-3530-202-24P.

3. This appendix is a guide in performing maintenance operation; for authorization for specific repair parts, refer to TM 10-3530-202-24P.

4. The explanations listed below define the terms used in this maintenance allocation chart.

a. Clean. To perform major cleaning internally or with disassembly.

b. Adjust. To regulate periodically to prevent malfunctioning.

c. Inspect. To verify serviceability and to detect electrical or mechanical failure by scrutiny.

d. Test. To verify serviceability and to detect electrical or mechanical failure by use of special equipment such as gages, meters, etc.

e. Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

f. Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

g. Align. To adjust two or more parts and/or assemblies of an electrical, precision, mechanical or steering system so that their functions are properly synchronized.

h. Overhaul. To restore an item to a completely serviceable condition as prescribed by serviceability standards. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul operation.

5. The following is the list of all maintenance operations.

Maintenance Allocation Chart

Group No.	Component and related operations	Echelon of maintenance					Tools required	Remarks
		1	2	3	4	5		
30	ELECTRIC MOTOR							
	MOTOR, Electric							
	Replace		X					
	Inspect, Repair				X			
36	ELECTRICAL FITTINGS							
	SWITCH, sewing machine motor							
	Replace		X					
	CABLE, B.X., Machine							
	Motor-to-switch							
	Inspect, Replace			X				
46	RECLAMATION AND REPAIR EQUIPMENT							
	SEWING MACHINE, Industrial, Singer Model 112W116							
	Inspect, Replace		X					
	Repair			X				

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Schedule of maintenance					Tools required	Remarks
		1	2	3	4	5		
	MACHINE ARM							
	THUMBNUT, adjusting, thread tension and control disk							
	Adjust	X						
	Replace		X					
	SPRING, Tension, thread							
	Clean, Replace		X					
	BUSHING, armshaft, front and rear							
	Inspect, Replace			X				
	THUMBNUT, adjusting, thread tension							
	Adjust	X						
	Replace		X					
	MACHINE BED							
	BEARING, hook saddle, right and left							
	Inspect, Replace			X				
	PULLEY, hook driving shaft connection belt							
	Inspect, Replace			X				
	HOOK, thread, w/gib							
	Adjust, Clean, Replace		X					
	MACHINE HEAD							
	SPRING, flat, presser bar							
	Adjust	X						
	Replace		X					
	ROLL, puller feed, lower and upper							
	Inspect, Replace		X					
	SEWING MACHINE, INDUSTRIAL, Singer Model 7-33							
	Inspect, Replace		X					
	Repair			X				
	MACHINE ARM BUSHING, arm shaft							
	Inspect, Replace			X				
	REGULATOR, feed							
	Adjust	X						
	Replace			X				
	THUMBSCREW, feed regulator							
	Adjust	X						
	Replace		X					
	MACHINE BED CYLINDER, shuttle							
	Clean, Replace		X					
	CONNECTION, feed forked							
	Inspect, Replace			X				
	MACHINE HEAD							
	SLEEVE, lifting, presser bar, lower and upper							
	Inspect, Replace		X					
	SPRING, lifting presser bar, flat							
	Adjust	X						
	Replace		X					
	THUMBSCREW, lifting regulating presser bar spring							
	Adjust	X						
	Replace		X					
	MACHINE HEAD CAM, thread takeup							
	Inspect, Replace			X				
	THUMBNUT, tension regulating							
	Adjust	X						
	Replace		X					

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Schedule of maintenance					Tools required	Remarks
		1	2	3	4	5		
	SEWING MACHINE, INDUSTRIAL, Singer Model 17W15							
	Inspect, Replace.....		X					
	MACHINE ARM							
	BUSHING, arm shaft, front							
	Inspect, Replace.....			X				
	CONNECTION ASSEMBLY, Needle bar frame pitman							
	Adjust, Replace.....		X					
	REGULATOR, needle bar frame							
	Adjust.....	X						
	Replace.....		X					
	MACHINE BED CASE, bobbin							
	Clean.....	X						
	Replace.....		X					
	GEAR, bevel, hook driver, 25 teeth							
	Inspect, Replace.....		X					
	GEAR, bevel, hook driving, intermediate 24 teeth							
	Inspect, Replace.....			X				
	BEARING, hook driving shaft							
	Inspect, Replace.....			X				
	HOOK, sewing							
	Clean, Replace.....		X					
	MACHINE HEAD FRAME, needle bar							
	Adjust, Replace.....		X					
	BAR, presser, hollow							
	Adjust, Replace.....		X					
	THUMBSCREW, presser bar, pressure regulating							
	Adjust.....	X						
	Replace.....		X					
	THUMBNUT, Adjusting, tension and control disk							
	Adjust.....	X						
	Replace.....		X					
	SEWING MACHINE, INDUSTRIAL, Singer Model 97-10							
	Inspect, Replace.....		X					
	Repair.....			X				
	MACHINE ARM BUSHING, arm shaft, front, intermediate, and back							
	Inspect, Replace.....			X				
	DISK, control, thread tension							
	Adjust.....	X						
	Replace.....		X					
	THUMBNUT, adjusting, thread tension and control disk							
	Adjust.....	X						
	Replace.....		X					
	REGULATOR, feed							
	Adjust, Replace.....		X					
	THUMBNUT, wax box tension, regulating							
	Adjust.....	X						
	Replace.....		X					
	MACHINE BED AND COLUMN							
	BUSHING, screw, oscillating rock shaft hinge pin							
	Inspect, Replace.....			X				
	WASHER, friction, paper							
	Inspect, Replace.....		X					

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Echelon of maintenance					Tools required	Remarks
		1	2	3	4	5		
	GUIDE, needle							
	Adjust.....	X						
	Replace.....		X					
	BRACKET ASSEMBLY, presser bar spring							
	Inspect, Replace.....		X					
	SEWING MACHINE, INDUSTRIAL, Singer Model 131W113							
	Inspect, Replace.....		X					
	Repair.....			X				
	MACHINE ARM BUSHING, arm shaft, front and rear							
	Inspect, Replace.....			X				
	DISKS, thread controller and tension							
	Adjust.....	X						
	Replace.....		X					
	SHAFT, drive							
	Inspect, Replace.....			X				
	SPRING, thread tension							
	Clean, Replace.....		X					
	THUMBNUTS, adjusting, thread tension and control disk							
	Adjust.....	X						
	Replace.....		X					
	MACHINE BED Eccentric, feed lifting							
	Inspect, Replace.....			X				
	CRANK, feed driving							
	Inspect, Replace.....			X				
	SADDLE, hook							
	Inspect, Replace.....			X				
	HOOK, w/gib							
	Adjust, Replace.....		X					
	MACHINE HEAD BUSHING, needle bar, lower and upper							
	Inspect, Replace.....		X					
	CLUTCH ASSEMBLY, puller feed							
	Inspect, Replace.....		X					
	ROLL, puller feed, lower and upper							
	Inspect, Replace.....		X					
	SPRING, thread tension							
	Adjust.....	X						
	Replace.....		X					
	THUMBNUT, thread tension							
	Adjust.....	X						
	Replace.....		X					
	SEWING MACHINE, INDUSTRIAL, Singer Model 55-5							
	Inspect, Replace.....		X					
	Repair.....			X				
	MACHINE ARM BUSHING, flanged, back arm shaft							
	Inspect, Replace.....			X				
	ECCENTRIC, feed							
	Inspect, Replace.....			X				
	ROD, feed eccentric connecting							
	Inspect, Replace.....			X				
	MACHINE BED DOG, feed							
	Adjust.....	X						
	Replace.....		X					

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Selection of maintenance					Tools required	Remarks
		1	2	3	4	5		
	ECCENTRIC, feed lifting			X				
	Inspect, Replace.....			X				
	CONNECTION, feed lifting eccentric							
	Inspect, Replace.....	X						
	GUIDE ASSEMBLY, adjustable, hinged							
	Adjust.....	X						
	Replace.....		X					
	MACHINE HEAD REGULATOR, slack thread							
	Adjust.....	X						
	Replace.....		X					
	TENSION ASSEMBLY							
	Adjust.....	X						
	Replace.....		X					
	CONNECTION ASSEMBLY, thread nipper							
	Adjust.....	X						
	Replace.....			X				
	GUARD, finger							
	Adjust.....	X						
	Replace.....		X					
	SEWING MACHINE, INDUSTRIAL, Singer Model 111W155							
	Inspect, Replace.....		X					
	Repair.....			X				
	THUMBNUT, adjusting, thread tension and control disk							
	Adjust.....	X						
	Replace.....		X					
	MACHINE BED BEARING, ball, w/bushing and collar, thread hook driving shaft, rear							
	Clean, Inspect, Replace.....			X				
	COLLAR, w/setcrews, feed drive eccentric adjusting disk spring							
	Adjust.....		X					
	Replace.....			X				
	DISK AND SPRING, adjusting, feed drive eccentric							
	Adjust.....		X					
	Inspect, Replace.....			X				
	GIB, friction, feed drive eccentric							
	Adjust.....		X					
	Inspect, Replace.....			X				
	HOOK, thread, w/gib and guard							
	Adjust, Clean, Replace.....		X					
	SPRING AND STUD, thread hook drive shaft lock							
	Adjust.....		X					
	Inspect, Replace.....			X				
	MACHINE HEAD SPRING, flat, lifting, presser bar							
	Adjust.....	X						
	Replace.....		X					
	THUMBSCREW, regulating, vibrating presser bar pressure							
	Adjust.....	X						
	Replace.....		X					

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TWO-NEEDLE SEWING MACHINE (SINGER MODEL 112W116)

	Para- graph	Page		Para- graph	Page
Adjustments:			Assemblies—Continued		
Feed dog	38	23	Thread takeup	44	31
Sewing hook	36, 144	22, 126	Thread tension	32	20
Lower puller feed roll	42	27	Upper puller feed roll	43	31
Needle bar	40	26	Balance wheel, drive pulley	31	19
Presser foot	41	27	Belt guard bracket with guard	24	14
Thread hooks	36	22	Bobbin winder, universal	45	31
Thread tension assembly	32	20	Bushings, arm shaft	142	126
Upper puller feed roll	43	31	Capacitor, switch	26	14
Arm cap	30	19	Drive pulley	22	14
Arm shaft assembly	142	126	Drive pulley with balance wheel	31	19
Arm shaft connection belt	143	126	Electric motor	19	10
Assemblies:			Faceplate and position pin	37	23
Arm shaft	142	126	Feed dog	38	23
Feed driving	145	130	Feed driving assembly	145	130
Hook driving shaft	144	126	Front and back bed slides	35	20
Knee lifter	47	35	Hook driving shaft assembly	144	126
Knee lifter connection lever	54	39	Knee lifter assembly	47	35
Lower puller feed roll	42	27	Knee lifter connection lever assembly	39	24
Machine stand pitman rod	49	35	Lamp with bracket	28	17
Needle bar	40	26	Lead cord	26	14
Needle bar rock frame rock shaft	146	130	Lower puller feed roll assembly	42	27
Presser bar	41	27			
Sewing hook	36	22			
Thread guide	33	20			

	Para- graph	Page		Para- graph	Page
Machine stand pitman rod assembly.....	49	35	Switch box.....	26	14
Motor, electric.....	19	10	Switch capacitor.....	26	14
Motor clutch actuating lever.....	21	12	Thread guide assemblies.....	33	20
Motor shaft ball bearing (drive end).....	198	175	Thread takeup assembly.....	44	31
Motor shaft ball bearing (opposite end drive).....	199	175	Thread tension assembly.....	32	20
Motor switch.....	26	14	Three cone thread unwinder.....	46	34
Needle bar assembly.....	40	26	Throat plate.....	34	20
Needle bar rock frame rock shaft assembly.....	146	130	Timing sewing hooks.....	36	22
Presser bar assembly.....	41	27	Upper puller feed roll assembly.....	43	31
Rigid stand.....	48	35	Universal bobbin winder.....	45	31
Sewing hook assembly.....	36	22	Wood table.....	48	35

FOUR-NEEDLE SEWING MACHINE (SINGER MODEL 131W113)

	Para- graph	Page		Para- graph	Page
Adjustments:			Hook driving gears.....	150	134
Feed dog.....	56, 152	39, 137	Hook driving shaft.....	150	134
Feed regulator.....	51	37	Hook saddles.....	149	134
Lower puller feed roll.....	42	27	Hook socket spiral gears.....	57	42
Sewing hooks.....	57	42	Knee lifter assembly.....	47	35
Upper puller feed roll.....	43	31	Knee lifter connection lever.....	54	39
Arm cap.....	50	37	Knee lifter connection lever lifting rod.....	54	39
Arm shaft.....	147	133	Knee lifter lifting lever.....	54	39
Arm shaft bushings.....	147	133	Lamp with bracket.....	28	17
Assemblies:			Lead cord.....	26	14
Feed driving rock shaft.....	153	137	Lower puller feed roll assembly.....	42	27
Feed lifting rock shaft.....	152	137	Machine stand pitman rod assembly.....	49	35
Hook and bobbin case.....	58	42	Motor clutch actuating lever.....	21	12
Knee lifter.....	47	35	Motor, electric.....	19	10
Lower feed roll.....	42	35	Motor shaft ball bearing (drive end).....	198	175
Machine stand pitman rod.....	49	35	Motor shaft ball bearing (opposite drive end).....	199	175
Needle bar crank.....	147	133	Needle bar.....	61	45
Thread tension.....	55	39	Needle bar bushings.....	61	45
Upper feed roll.....	43	31	Needle bar connecting link.....	60	45
Balance wheel.....	51	37	Needle bar crank assembly.....	147	133
Belt guard bracket with guard.....	24	14	Needle holder thread guide.....	59	42
Bobbin case assembly.....	58	42	Presser bar.....	62	47
Bushings:			Presser bar bushings.....	62	47
Hook driving shaft.....	150	134	Presser bar lifter.....	52	38
Needle bar.....	61	45	Presser bar lifting releasing lever bracket.....	53	39
Presser bar.....	62	47	Rigid stand.....	48	35
Vertical shaft.....	151	134	Switch box.....	26	14
Capacitor, switch.....	26	14	Switch capacitor.....	26	14
Connecting stud.....	61	45	Takeup lever.....	60	45
Drive pulley.....	22	14	Thread tension assembly.....	55	39
Driving stud.....	60	45	Timing sewing hooks.....	57	42
Electric motor.....	19	10	Upper feed roll assembly.....	43	31
Feed bar.....	153	137	Universal bobbin winder.....	45	31
Feed dog.....	56	39	Vertical shaft.....	151	134
Feed driving connection.....	154	137	Vertical shaft bushings.....	151	134
Feed driving rock shaft assembly.....	153	137	Vertical shaft gears.....	151	134
Feed lifting connection.....	148	134	Wood table.....	48	35
Feed lifting rock shaft assembly.....	152	137			
Feed lifting rock shaft cranks.....	152	137			
Five spool thread unwinder.....	65	48			
Hook assembly.....	58	42			
Hook driving bushings.....	150	134			

HEAVY-DUTY SEWING MACHINE (SINGER MODEL 7-23)

	Para- graph	Page		Para- graph	Page
Adjustments:					
Feed dog.....	74	56	Lamp with bracket.....	28	17
Feed regulator.....	156	139	Lead cord.....	26	14
Needle bar.....	79	61	Lifting presser bar assembly.....	77	58
Arm shaft.....	155	139	Lifting presser bar bracket.....	76	56
Arm shaft bushing.....	155	139	Lifting presser bar crank.....	78	61
Assemblies:			Lifting presser bar rock shaft.....	76	56
Bobbin winder.....	80	62	Lifting presser bar rock shaft adjusting arm.....	76	56
Lifting presser bar.....	77	58	Lifting presser bar rock shaft crank.....	76	56
Machine stand pitman rod.....	49	35	Lifting presser bar rock shaft eccentric strap.....	158	139
Needle bar.....	79	61	Machine stand pitman rod assembly.....	49	35
Oilcup.....	68	51	Motor clutch actuating lever.....	21	12
Oscillating rock shaft oil tube and joint.....	163	142	Motor, electric.....	19	10
Shuttle cylinder.....	70	53	Motor shaft ball bearing (driver end).....	198	175
Spool holder.....	67	50	Motor shaft ball bearing (opposite drive end).....	199	175
Stand.....	29	18	Motor switch.....	26	14
Thread takeup lever.....	75	56	Needle bar assembly.....	79	61
Thread tension.....	72, 73	53	Oilcup assembly.....	68	51
Thread unwinder.....	81	64	Oscillating rock shaft.....	163	142
Throat body.....	74	56	Oscillating rock shaft bearing.....	163	142
Vibrating presser bar.....	77	58	Oscillating rock shaft oil tube and joint assembly.....	163	142
Balance wheel.....	66	50	Oscillating shaft.....	162	142
Belt guard bracket with guard.....	24	14	Oscillating shaft crank.....	162	142
Bobbin winder assembly.....	80	62	Rigid stand.....	48	35
Bushing, arm shaft.....	155	139	Shuttle cylinder assembly.....	70	53
Capacitor, switch.....	26	14	Shuttle driver.....	162	142
Cloth plate.....	74	56	Spool holder assembly.....	67	50
Crank connecting rod.....	157	139	Staple.....	73	53
Drive pulley.....	22	14	Stand assembly.....	29	18
Electric motor.....	19	10	Switch box.....	26	14
Eyelets, thread.....	72	53	Thread takeup cam.....	158	139
Feed bar.....	160	141	Thread takeup lever assembly.....	75	56
Feed cam.....	155	139	Thread tension assembly.....	72, 73	53
Feed dog.....	74	56	Thread unwinder assembly.....	81	64
Feed forked connection.....	159	140	Throat body assembly.....	74	56
Feed forked connection link.....	159	140	Vibrating presser bar assemblies.....	77	58
Feed lifting rock shaft.....	161	142	Wood table.....	48	35
Feed lifting rock shaft crank with roller.....	161	142			
Feed regulator.....	156	139			
Feed rock shaft.....	160	141			

VERY-HEAVY-DUTY SEWING MACHINE (SINGER MODEL 97-10)

	Para- graph	Page		Para- graph	Page
Adjustments:			Assemblies—Continued		
Balance wheel shaft stop bracket screw.....	173	150	Thread unwinder.....	106	92
Feed regulator.....	87	65	Wax box.....	104	89
Friction pulley.....	99	82	Balance wheel.....	99	82
Presser bar springs.....	84	65	Balance wheel pulley drive.....	83	65
Arm front cover.....	82	65	Balance wheel shaft.....	172	148
Arm shaft.....	164	144	Balance wheel shaft bushings.....	172	148
Arm shaft bushings.....	164	144	Balance wheel shaft stop bracket and screw.....	173	150
Assemblies:			Base.....	174	150
Belt tightener.....	25	14	Belt tightener assembly.....	25	14
Bobbin winder.....	105	90	Board.....	27	15
Feed shaft.....	170	147	Bushings, balance wheel shaft.....	172	148
Motor base.....	25	14	Column extension.....	174	150
Pressure bar clutch.....	98	82	Crank connecting rod.....	166	144
Shuttle.....	88	76	Driving arm.....	99	82
Thread takeup cam.....	171	148	Driving arm bracket.....	99	82
Thread tension.....	85	65			

VERY-HEAVY-DUTY SEWING MACHINE (SINGER MODEL 97-10)—Continued

	Para- graph	Page		Para- graph	Page
Electric motor.....	20, 200	12, 175	Presser bar spring.....	84	65
Feed regulator.....	87	65	Presser bar spring bracket extension.....	97	80
Feed regulator adjusting stud.....	86	65	Presser foot.....	89	76
Feed regulator connection.....	86	65	Presser foot holder.....	89	76
Feed regulator shaft.....	87	65	Rigid stand.....	48	35
Feed shaft assembly.....	170	147	Shuttle assembly.....	88	76
Foot lifter treadle.....	101	85	Shuttle driver.....	169	147
Friction pulley.....	99	82	Starting shaft.....	101	85
Lifting lever.....	91	78	Starting treadle.....	100	82
Lower needle guide rock shaft.....	167	146	Starting treadle connecting link.....	100	82
Lower needle guide rock shaft crank.....	167	146	Starting treadle shift.....	100	82
Lower needle guide rock shaft crank con- necting rod.....	165	144	Switch box.....	27	15
Motor base assembly.....	25	14	Table.....	103	89
Motor drive pulley.....	23	14	Table latch.....	103	89
Motor, electric.....	20, 200	12, 175	Table latch spring.....	103	89
Motor starting switch.....	27	15	Table shaft.....	103	89
Needle bar.....	93	78	Table tray.....	27	15
Needle bar connecting link.....	94	78	Tension assembly.....	85	65
Needle bar connecting link cranks.....	94	78	Tension wheel brake.....	85	65
Needle bar frame.....	93	78	Tension wheel brake connection.....	92	78
Needle bar frame connection.....	95	80	Thread takeup cam.....	164	144
Needle bar frame connection arm.....	95	80	Thread takeup cam assembly.....	171	148
Needle guide upper bracket slide block.....	97	80	Thread takeup lever.....	92	78
Needle plate.....	90	76	Thread takeup lever thread guide roller.....	92	78
Needle plate holder.....	90	76	Thread unwinder assembly.....	106	92
Oscillating rock shaft.....	168	147	Upper and lower foot lifter treadle pitman rod.....	102	88
Oscillating rock shaft bushing.....	168	147	Upper needle guide.....	96	80
Oscillating shaft.....	169	147	Upper needle guide bar.....	96	80
Oscillating shaft collar.....	169	147	Upper needle guide bar bracket.....	96	80
Presser bar.....	98	82	Upper needle guide bar spring.....	96	80
Presser bar clutch.....	98	82	Wax box assembly.....	104	89
Presser bar clutch lifting lever.....	97	80	Wood table.....	48	35

ZIGZAG SEWING MACHINE (SINGER MODEL 17W15)

	Para- graph	Page		Para- graph	Page
Adjustments:			Bed hinge connection.....	110	97
Feed dog.....	111	97	Belt guard bracket with guard.....	24	14
Feed regulator.....	178	151	Bevel gear pinion.....	175	150
Needle bar frame pitman connection slide.....	108	93	Capacitor, switch.....	26	14
Sewing hooks.....	112	97	Drive pulley.....	22	14
Arm shaft.....	175	150	Electric motor.....	19	10
Arm shaft bushings.....	175	150	Feed bar assembly.....	179	154
Arm shaft connections.....	177	151	Feed dog.....	111	97
Assemblies:			Feed driving cam fork lever.....	180	158
Feed bar.....	179	154	Feed driving rock shaft assembly.....	179	154
Feed driving rock shaft.....	179	154	Feed lifting rock shaft assembly.....	181	158
Feed lifting rock shaft.....	181	158	Feed regulating assembly.....	178	151
Feed regulating.....	178	151	Foot lifter lifting lever.....	109	93
Hook driving shaft.....	182	158	Foot lifter lifting lever rod.....	109	93
Knee lifter.....	47	35	Hook driver bevel gear.....	112	97
Machine stand pitman rod.....	49	35	Hook driving shaft assembly.....	182	158
Needle bar frame cam gear.....	176	151	Knee lifter assembly.....	47	35
Needle bar frame pitman.....	108	93	Knee lifter connection lever.....	109	93
Presser bar.....	116	101	Lamp with bracket.....	28	17
Shuttle.....	112	97	Lead cord.....	26	14
Tension release.....	113	99			
Thread controller.....	113	99			
Thread tension.....	114	100			

ZIGZAG SEWING MACHINE (SINGER MODEL 17W15)—Continued

	Para- graph	Page		Para- graph	Page
Machine stand pitman rod assembly.....	49	35	Presser bar assembly.....	116	101
Motor clutch actuating lever.....	21	12	Pulley with balance wheel.....	107	93
Motor, electric.....	19	10	Rigid stand.....	48	35
Motor shaft ball bearing (drive end).....	198	175	Shuttle assembly.....	112	97
Motor shaft ball bearing (opposite drive end).....	199	175	Switch box.....	26	14
Motor switch.....	26	14	Tension release assembly.....	113	99
Needle bar.....	115	100	Thread controller assembly.....	113	99
Needle bar connecting link and guard.....	183	159	Thread tension assembly.....	114	100
Needle bar connecting stud.....	115	100	Two cone thread unwinder.....	117	101
Needle bar frame.....	115	100	Universal bobbin winder.....	45	31
Needle bar frame cam gear assembly.....	176	151	Wood stand.....	48	35
Needle bar frame pitman assembly.....	108	93			

SINGLE-THREAD CHAIN-STITCH BASTING MACHINE (SINGER MODEL 55-5)

	Para- graph	Page		Para- graph	Page
Adjustments:			Feed rock shaft assembly.....	187	160
Feed eccentric connecting rod.....	185	159	Feed rock shaft crank.....	187	160
Looper.....	125	107	Finger guard assembly.....	121	105
Presser foot.....	127	107	Guide assembly.....	122	105
Arm shaft assembly.....	184	158	Knee lifter assembly.....	47	35
Arm shaft bushing.....	184	158	Lamp with bracket.....	28	17
Arm side cap.....	118	103	Lead cord.....	26	14
Assemblies:			Lifting lever assembly.....	119	103
Arm shaft.....	184	159	Lifting level connecting rod.....	120	105
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Feed eccentric connecting rod.....	185	159	Machine stand pitman rod assembly.....	49	35
Feed rock shaft.....	187	110	Motor clutch actuating lever.....	21	12
Finger guard.....	121	105	Motor shaft ball bearing (drive end).....	198	175
Guide.....	122	105	Motor shaft ball bearing (opposite drive end).....	199	175
Knee lifter.....	47	35	Motor switch.....	26	14
Lifting lever.....	119	103	Needle bar.....	126	107
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Needle bar thread retainer.....	130	113	Needle bar thread retainer bracket.....	126	107
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Bellcrank assembly.....	120	105	Tension assembly.....	128	111
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Feed eccentric connecting rod assembly..	185	159			

TEXTILE SEWING MACHINE (SINGER MODEL 111W155)

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Hook driving shaft.....	193	165	Motor shaft ball bearing (drive end).....	198	175
Hook saddle.....	195	171	Motor shaft ball bearing (opposite drive end).....	199	175
Knee lifter.....	47	35	Motor switch.....	26	14
Machine stand pitman rod.....	49	35	Needle bar.....	137	115
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