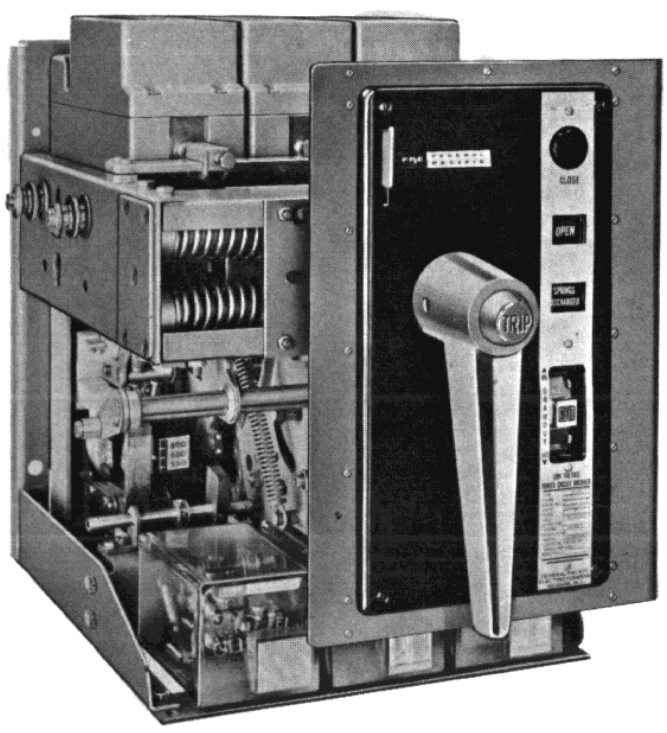
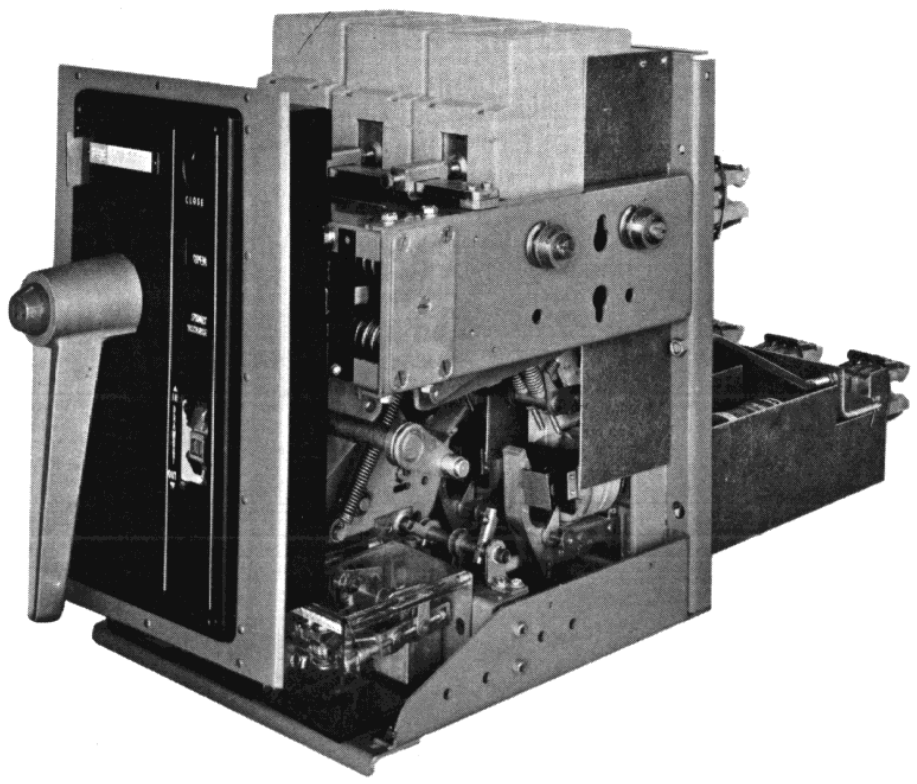
IN-810.4

INSTRUCTION & RENEWAL PARTS MANUAL
for
TYPE FP LOW VOLTAGE POWER CIRCUIT BREAKERS
and
FM FUSEMATIC BREAKER

FEBRUARY, 1963



FP-50-800
CIRCUIT BREAKER



FM-50-800
FUSEMATIC

INSTRUCTION & RENEWAL PARTS MANUAL

for

TYPE FP LOW VOLTAGE POWER CIRCUIT BREAKERS

and

FM FUSEMATIC BREAKERS

Manually and Electrically Operated

BREAKER	FUSEMATIC
Type FP-50-400	
Type FP-50-800	FM-50-800
Type FP-50-2000	FM-50-2000

INDEX

FEDERAL PACIFIC ELECTRIC COMPANY

50 PARIS STREET, NEWARK 1, NEW JERSEY

PART 1
GENERAL DESCRIPTION

This Instruction Manual covers the FP50-400, FP50-800, FP50-2000, FM50-800 and FM50-2000 Fusematic breakers only. For instructions on the FP100 series breakers refer in Instruction Booklet #IN810.6.

The FP line of Low Voltage Power Circuit Breakers and Fusematic Breakers, which ranges from 15A through 2000A continuous current at 600 Volt ratings, are designed for simplicity of operation, reliability and easy maintenance. The FP Breaker and FM Fusematic are equipped with a stored energy mechanism mechanically trip free in any position of the closing cycle, three unit pole assemblies, fully field adjustable timing devices, multi-range series trip coils, and telescoping roll-out rails. The three position drawout mechanism is operable with the door closed.

STANDARD ACCESSORIES

Maintenance closing handle 1151-9252
Cell racking in handle 1101-9251

PART 2
SHIPMENT, RECEIVING, HANDLING AND STORAGE

Each FP Breaker and FM Fusematic is thoroughly inspected and tested before leaving the factory. Breakers are shipped in individual crates or in the cell compartment. If breakers are crated, no hooks should be used in handling. Examine all equipment carefully for indication of damage sustained in transit. If damage in transit is indicated, call for an immediate inspection by the delivering carrier. Upon assessment of the damage a claim should be filed with the carrier or, depending on the nature of the damage, an intent to file for concealed damage should be registered. For assistance in filing the claim, advise the area sales office of Federal Pacific Electric Company, giving a full description of the damage, serial number of the breaker, delivering carrier's name, and, if shipped by rail, the car number, waybill reference, and any other information that might be of help to the Company in aiding in the filing of the damage claim.

When unpacking, make sure that all items are removed from the box including packing list, instruction book, maintenance parts and hardware. Report any shortage immediately. See that identification tags are left on the breaker. Lifting eyelets are furnished for handling. Do not lift or handle breaker by the front box or the operating handle.

Clean breaker thoroughly. To remove dust an industrial vacuum cleaner is recommended. If the breaker can be installed in its permanent location, it is advisable to do so, even if it is not expected to be energized for some time. When breakers must be stored in buildings under construction, be sure they are kept in a space free of dust, moisture, dirt and in an upright position. It is recommended that the breaker not be operated prior to final inspection.

PART 3
INSPECTION AND INSTALLATION

SECTION I Inspection - Manually Operated Breakers

The FP and FM breakers consist of a coordinated set of assemblies mounted on a steel frame, all carefully adjusted and locked in place for long and trouble-free operation.

To assist in properly checking and inspecting breakers prior to placing into service, the following 15 points should be followed in the order listed:

1. Remove arc chutes and interphase barriers.
2. Charge stored energy mechanism by rotating operating handle to a positive stop. Handle should return to normal vertical position.

NOTE: Charging Operation:

FP & FM50-400 and 50-800 — Rotate handle 90° counterclockwise to engage mechanism and then 180° clockwise to positive stop. (Figure 1).

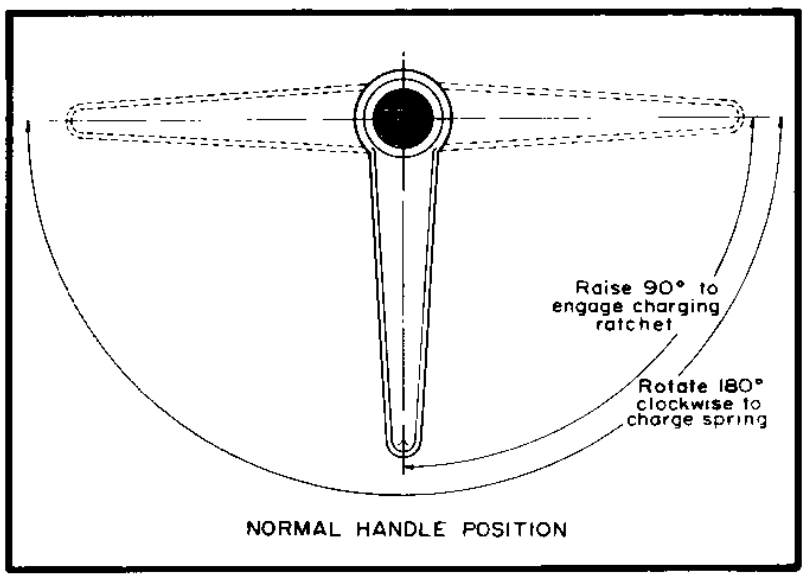


Figure 1

FP & FM50-2000 — Unfold collapsible handle from vertical down position to vertical up position. Rotate 180° clockwise to positive stop. Release handle slowly. (Figure 2).

Figure 2

3. Lock safety discharge interlock to prevent accidental discharge of stored energy mechanism. (Figure 3).

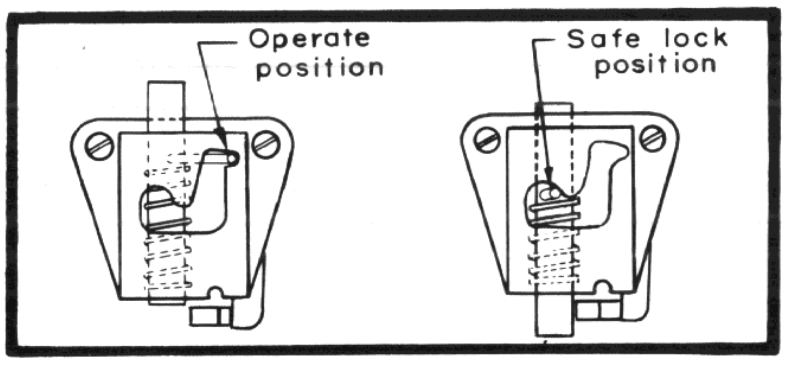


Figure 3

4. Remove right and left hand accelerating springs (Figure 4).

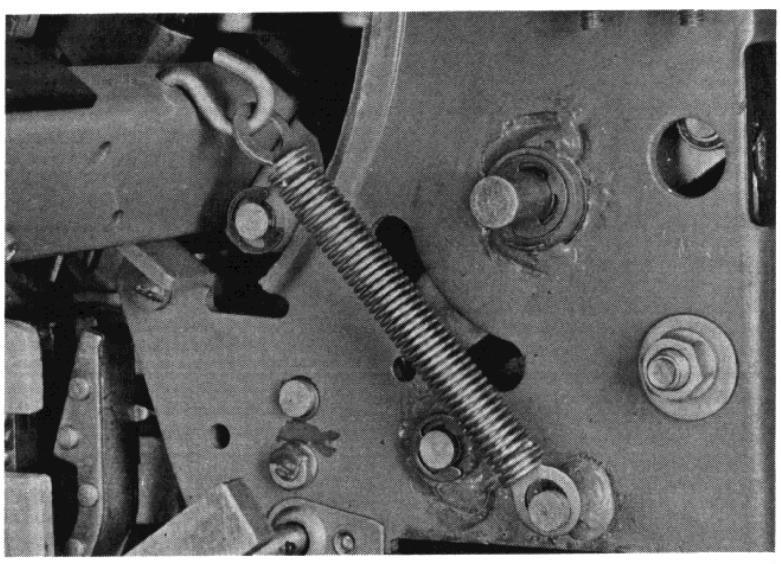


Figure 4

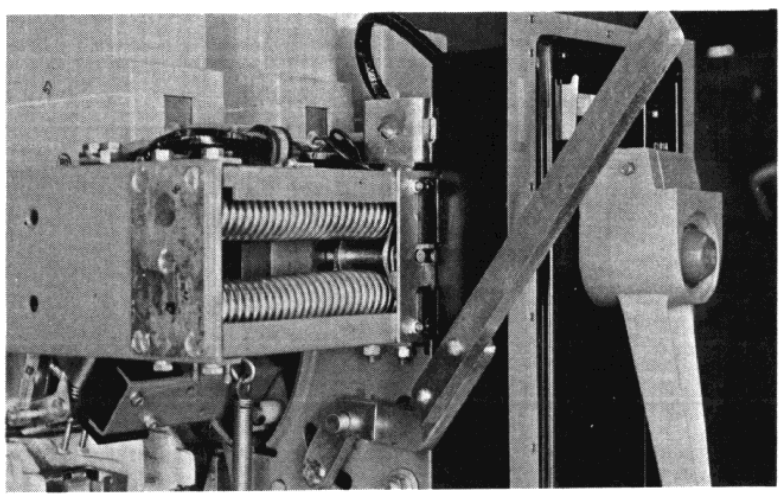


Figure 5

5. Insert maintenance closing handle #1151-9252 as in Figure 5 and slowly operate until arcing contacts touch. All arcing contacts should make simultaneously with a permissible variation of 1/32 max. Moveable arcing contact fingers should align with stationary arcing contacts.

   If misalignment or misadjustments are observed, refer to Part 4 — MAINTENANCE FOR ADJUSTING INSTRUCTIONS. Moveable arcing contacts are designed with side clearances for better guidance inside the arc chutes. A side to side movement of 1/8 is allowable. Close breaker and check overtravel on main contacts.

6. With maintenance closing handle in position and trip bar in tripped position, proceed to close breaker. Operating mechanism will now be trip free and contacts should not make.
7. Remove maintenance closing handle and trip breaker by moving trip bar.
8. Replace one pull-off spring right side only.
9. Inspect each arc chute to be sure no plates are damaged. Replace chutes and interphase barriers on breaker. Move contacts in by hand and tighten arc chutes only after contacts move in and out freely.
10. Release discharge safety interlock. (Figure 3). NOTE: To avoid possible injury *NEVER* handle or touch any moveable part of the breaker when the stored energy mechanism is charged, without first applying safety interlock. Press close button on front cover. Breaker will close. Depress red trip button (located in charging handle) slowly. Breaker will open before trip button reaches its extreme stop.
11. Recharge stored energy mechanism and close breaker. Slowly move series trip coil's magnet (armature) to fully closed position. Breaker should trip before armature touches pole face assembly. Repeat this procedure on all poles.
12. On a draw-out breaker, charge stored energy mechanism, close breaker and move draw-out interlock plate sideways. Breaker will trip. (Figure 6).

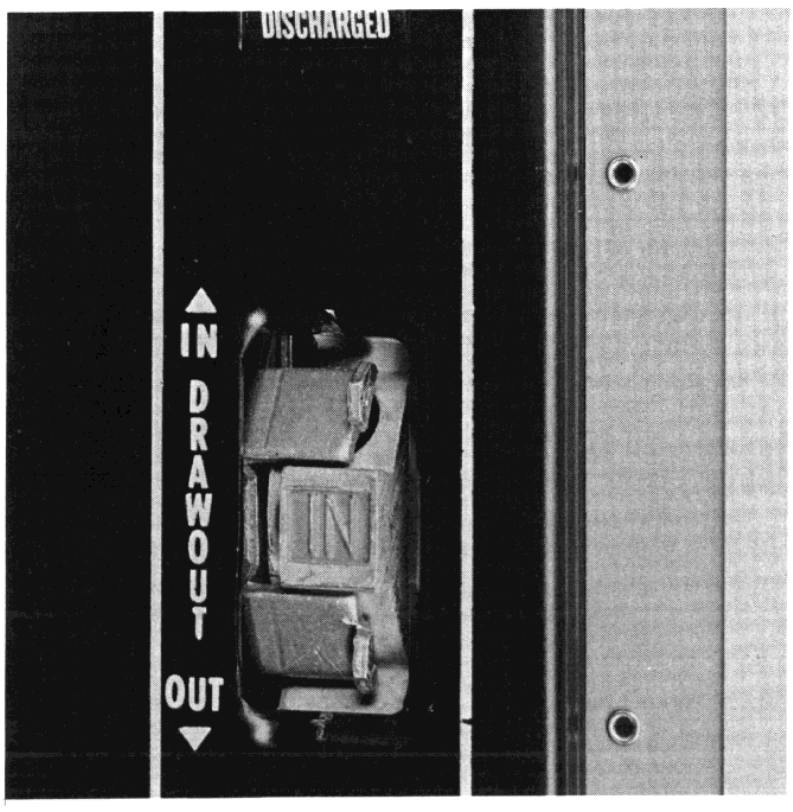


Figure 6

13. Charge stored energy mechanism and close breaker. Pull padlock lever out. Breaker should trip before padlock slot is fully exposed.
14. Check retaining rings and hardware for tightness.
15. Basket and finger assembly should be secured and retaining bolts tight. Contact finger must be free of dirt and foreign particles. Secondary female contacts mounted on breaker must operate freely.

SECTION II Inspection - Electrically Operated Breakers

Electrically the stored energy mechanism is charged by a fractional horsepower ratchet type AC/DC universal motor. Identification, voltage ranges and currents requirements are specified below. The stored energy mechanism is charged electrically in approximately one second.

CHARGING MOTORS FOR FP BREAKERS STORED ENERGY MECHANISM

Voltage Rating	FPE Part #	Motor	FLA.	LRA.	Fuse*
48V A.C./48V D.C.	162-007	15058	20	50	12.0
115V A.C./125V D.C.	162-004	14976	6.5	25	5.0
230V A.C./250V D.C.	162-006	14978	6.1	12	3.5

Maximum 240V, use control power transformer for higher voltage
*Class 1330 Econ Dual element fuses

From wiring diagram supplied with equipment, or standard diagram Part 7 of this book, locate motor terminals on secondary contacts and connect required power source.

Motor will charge when power is applied and shutoff automatically when charging cycle is completed.

Breaker cannot be closed with the maintenance closing handle unless stored energy mechanism is charged. On all electrically operated FP breakers the stored energy mechanism will recharge immediately following a closing operation ready for instant reclosure if needed.

Follow inspection procedure Steps 1 through 15 exactly as outlined in "Inspection - Manually Operated Breakers."

In addition the following steps are recommended:

16. From wiring diagram locate terminals on secondary contacts and connect proper control power supply and controls for shunt close and shunt trip attachments. Close and open breaker five times electrically and check for proper operation.
17. Disconnect control power supply. Close and trip trip-breaker manually. Do not leave breaker in the charged and/or closed position while in storage.

SECTION III - Installation

Before installing breaker in cell, check following points inside cell:

1. Secondary contact support — make sure all connections are tight and adjusted to proper dimensions.
2. Ground connections should be tight.
3. Extension rails should be free to move in and out; check rail stops for tightness.
4. Rail rollers should be free and well lubricated.
5. Main contact stabs should be tight and free of dust and dirt.
6. Check condition of insulating transite plate in roof of case. Screws should be tight.
7. Remove control power fuses.
8. Place breaker on fully extended moveable rails. Make sure all four rollers engage on inside grooves (Outside grooves fit into stationary rails inside cell). (Figure 7).

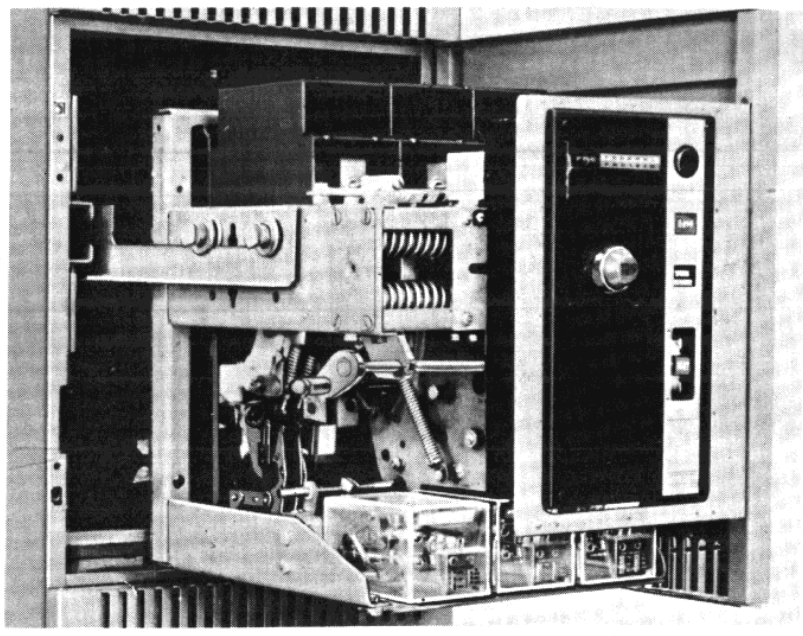


Figure 7

9. Draw-out mechanism on breaker should be in OUT position.
10. Push breaker inside the cell until racking-in cranks engage a positive stop. This is the OUT position.
11. Close door slowly and latch and make sure that the metal mask provided on outside of front box moves freely back as it comes in contact with the door. The door should close all the way with the breaker in the OUT position.
12. Push drawout interlock to left, insert drawout lever 1101-9251, (Figure 8) into the bottom hole of the drawout mechanism and, with an up-stroke, rack breaker into the TEST position. Remove drawout lever, drawout interlock plate should snap into position completely covering the holes.
13. Install control power fuses, circuit is now energized, the motor will charge the stored energy mechanism and closing and tripping control circuits become energized in the TEST position.
14. Open door and make sure that grounding contact in cell is now in contact with the breaker. Close door and check breaker electrically for proper closing and opening operation.

If breaker operates properly, rack breaker back to OUT position and leave there until ready to be put into service.

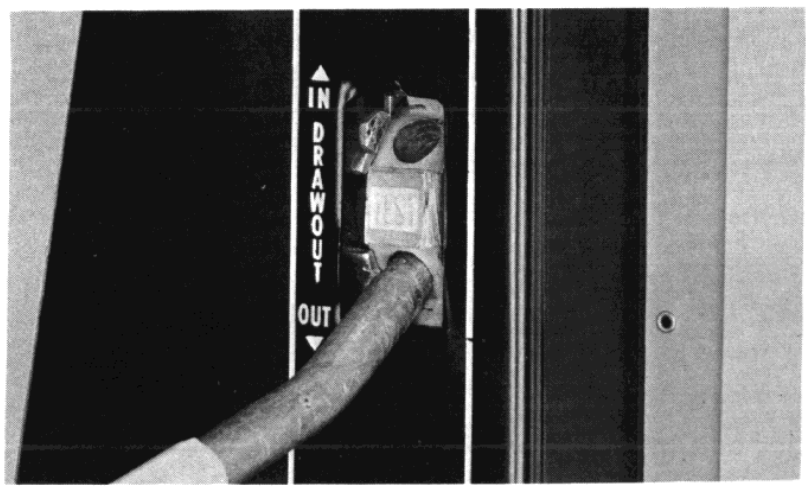


Figure 8

15. When putting into service push drawout interlock to left, insert drawout lever in the bottom hole of the drawout mechanism (Figure 8) and with an upward stroke rack breaker into operating position. Remove drawout lever, interlock plate should snap in position and red IN appears.

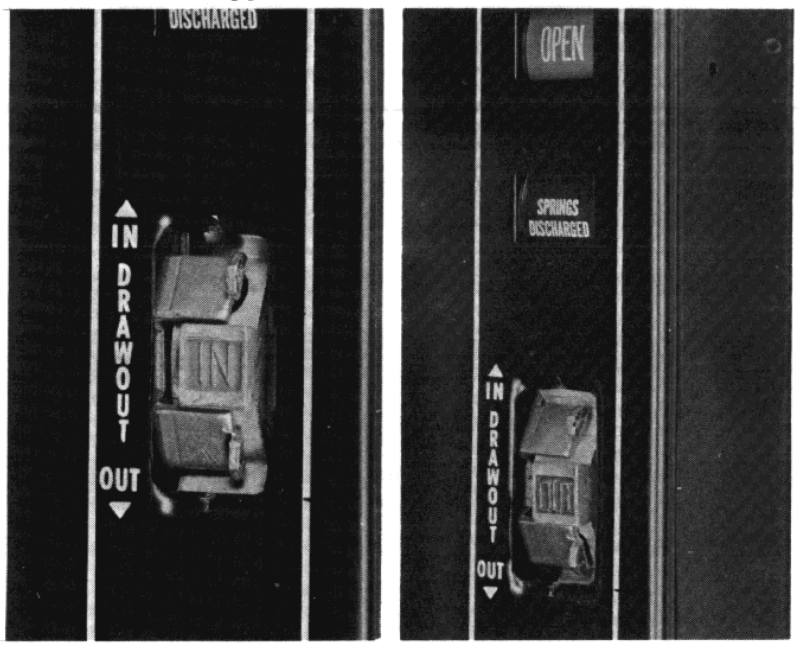


Figure 9 & Figure 9A

PART 4 MAINTENANCE

The breakers with all component parts have been extensively tested for performance as per NEMA Standards SG. 3-3-17 and SG. 3-3-18 and proved to be satisfactory with a wide margin of safety.

In accordance with NEMA Standards SG3 - Part 6, a periodic maintenance schedule should be established. For the convenience of the user a simple log sheet is provided with every breaker to ensure proper maintenance and years of trouble-free operation. It should be kept and followed conscientiously, especially in cases where breakers are required to operate under more adverse conditions.

The following instructions and adjustments should be followed carefully:

CONTACT ADJUSTMENT — Figure 10 and 11

MAIN AND ARCING CONTACTS ADJUSTMENT FOR FP400/800 AND FP 2000 BREAKERS

"A" -	Main Contact Press 400/800A	42-50 lbs., measured at point of contact
	— 2000A	25-35 lbs., measured at point of contact
"B" -	Over Travel Mains	⅛ ±1/32
"C" -	Arcing Contact Press	22-25 lbs., measured at a point 1¼ below tip of contact
"D" -	Gap (distance) between mains when arcing contacts touch	⅛ ±1/32

CHECK POINTS — Figure 10 and 11

1. Stationary arcing contacts — make sure that retaining screws and contacts are tight.
2. Main contacts should be clean and free.
3. Make sure all retaining rings are in place.
4. Make sure nylon spacer is in place.
5. Roller 1101-9231 must roll free on its pivot pin.
6. Surfaces marked "F" should be lubricated by a thin film of "Conducto-Lube #240-200" before assembly.

Contacts must be inspected after every known short circuit interruption and should also be inspected at regular inspection periods. If contacts are found to be worn or excessively pitted they should be dressed or replaced.

CAUTION: When reinstalling the arc chutes, adjust the retaining screw holder on the arc chute retaining bar so that the arcing contacts do not come in contact with the arc chute baffles.

CONTACT ASSEMBLY

To repair or replace moveable arcing contacts, proceed as follows (Figure 11):

1. Charge stored energy mechanism and lock discharge safety interlock (Figure 3).
2. Remove arc chutes and interphase barrier.
3. Remove arc chute retaining bar.
4. Remove insulating block and push fork assembly.
5. Tighten moveable arcing contact's adjusting screw until springs are solid and remove retaining pins.
6. Remove arcing contact pivot pin and replace moveable arcing contacts. Both contacts should be replaced at one time.
7. Make sure nylon bushings are in place and in a good condition, while replacing moveable arcing contact.

Reassemble following the same sequence of operations and adjust per Figs. 10 & 11. In most cases it is not necessary to replace contacts, but occasional redressing and readjustments are recommended.

To replace stationary arcing contacts (Figure 11), remove unit pole assembly, replace main stud and arcing contact assembly, part 1151-9339, for 400/800A breaker and 1151-9432 for 2000A breaker.

Adjust contacts as per Figures 10, 11 & 12.

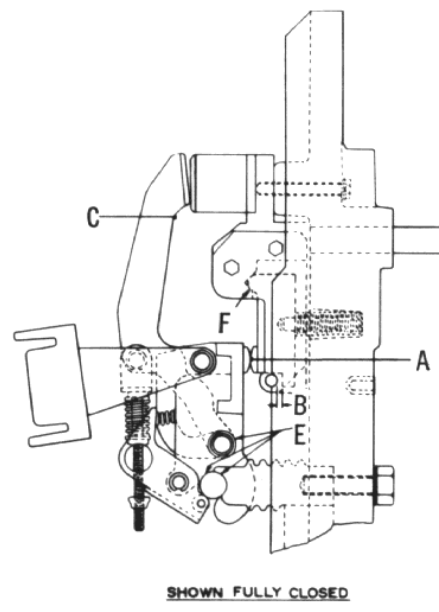


Figure 10

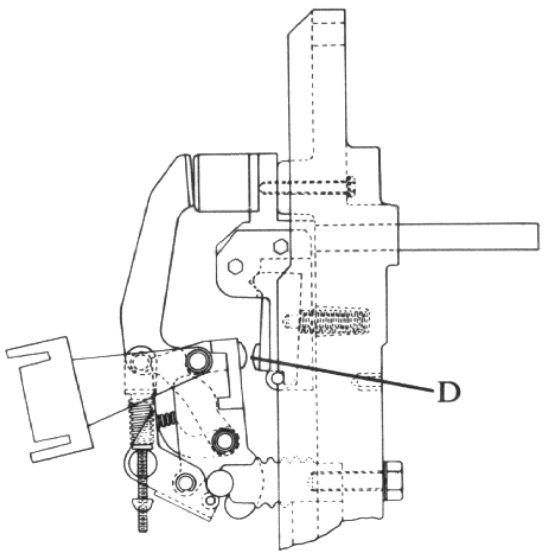


Figure 11

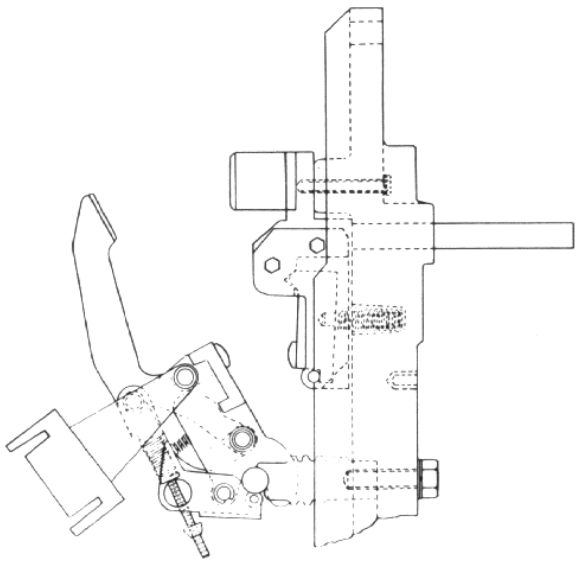


Figure 12

STORED ENERGY MECHANISM

Check latch engagement and adjust if necessary by moving safety discharge interlock (Figure 3) to proper position. Make sure springs are in place and in good condition. On electrically operated breakers, remove motor to make sure roller is free and well lubricated. Reinstall motor. Make sure that all retaining rings are in place. Check mechanism to insure that all moving parts are free and well lubricated.

OPERATING MECHANISM

Make sure that all retaining rings and springs are in place and that the mechanism is free. Replace nylon bumper rollers if excessive wear is evident. Make sure that the operating mechanism resets when stored energy mechanism is charged slowly and that the trip shaft is free. It should take no more than 20-22 ounce inches of torque to trip the breaker.

GENERAL

Make sure that all current carrying parts are secured and associated hardware is tight. Basket and finger assembly should be secured but free enough to compensate for misalignment in cell. The free up and down movement should be approximately $\frac{3}{16}$.

PART 5

ACCESSORIES

SHUNT TRIP

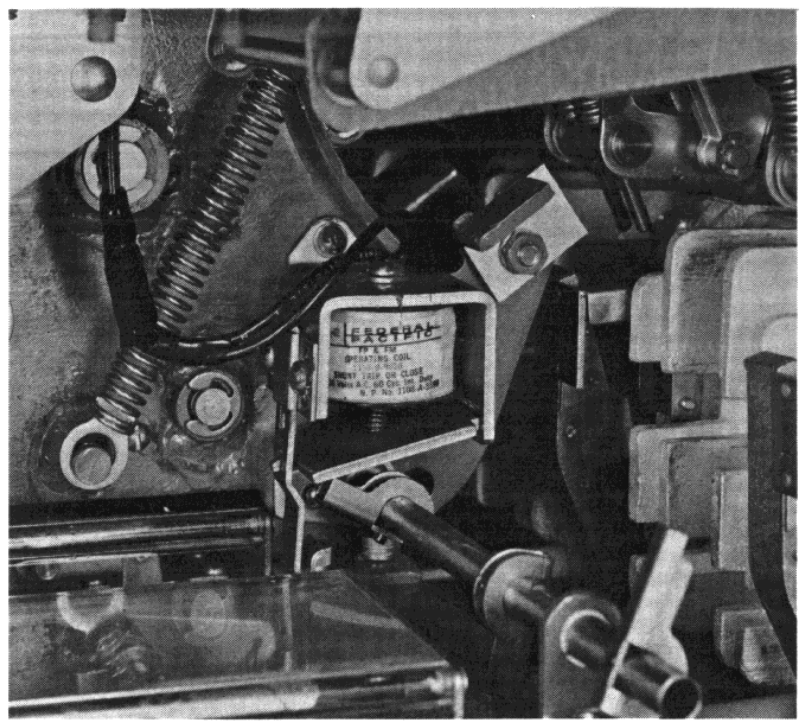


Figure 13

The shunt trip attachment is mounted directly above the trip shaft. It is a non-adjustable electro-magnet intended for intermittent duty only, and its circuit should be interrupted only by an auxiliary contact.

SHUNT CLOSE

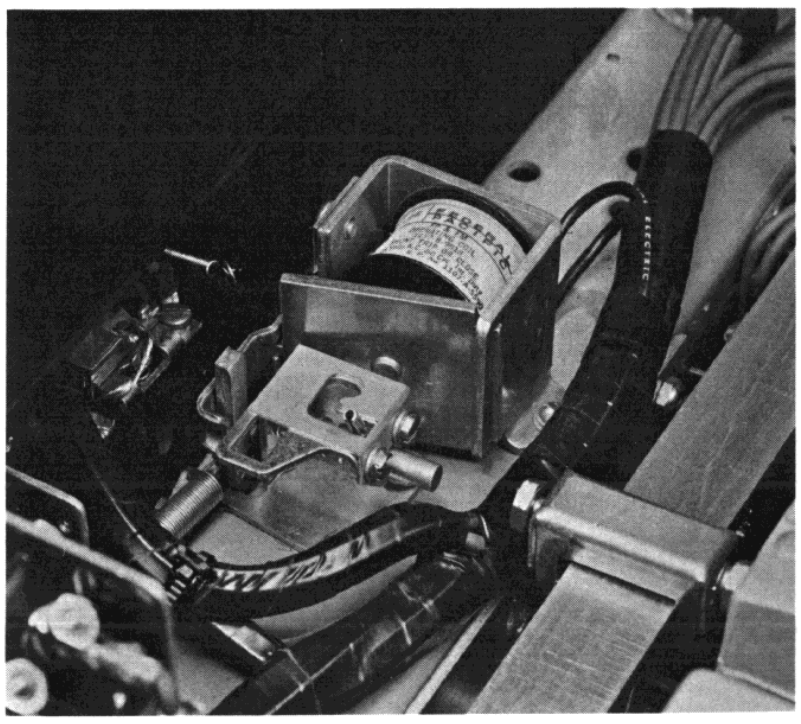


Figure 14

The shunt close attachment is mounted on top of the stored energy mechanism and is used to electrically discharge the stored energy mechanism and thus to close the breaker. It is a non-adjustable intermittent duty device and its circuit should be interrupted by an auxiliary contact.

UNDERVOLTAGE ATTACHMENT (Figure 15 & 15A)

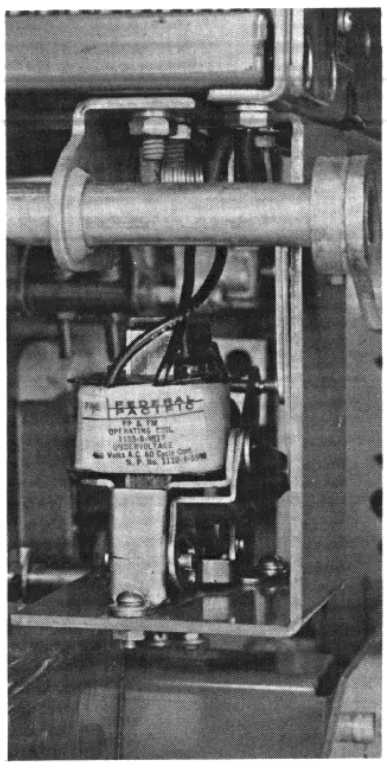


Figure 15

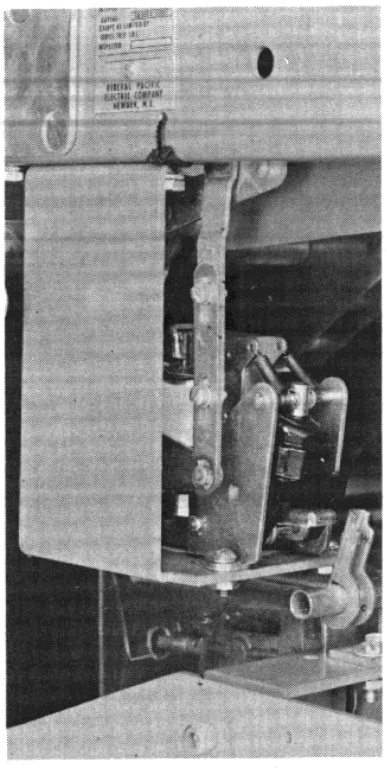


Figure 15A

The undervoltage attachment is a continuous duty device, which can be provided with or without a time delay, and which mechanically trips the breaker if the voltage drops to 30% to 60% of normal voltage. It is mechanically resettable with no auxiliary contact in its circuit.

The undervoltage time delay mechanism is of the surface tension delay type. The time delay is controlled by the viscosity of a fluid and is factory adjusted.

To inspect the undervoltage attachment, hold the moveable armature by hand, close breaker and slowly release armature. Before the armature is fully opened, the spring loaded plunger will be released and strike the trip lever and trip the breaker. Check for missing retaining rings and loose or missing screws and bolts. Check condition of coil. If undervoltage attachment is noisy while being energized, clean faces of both armatures.

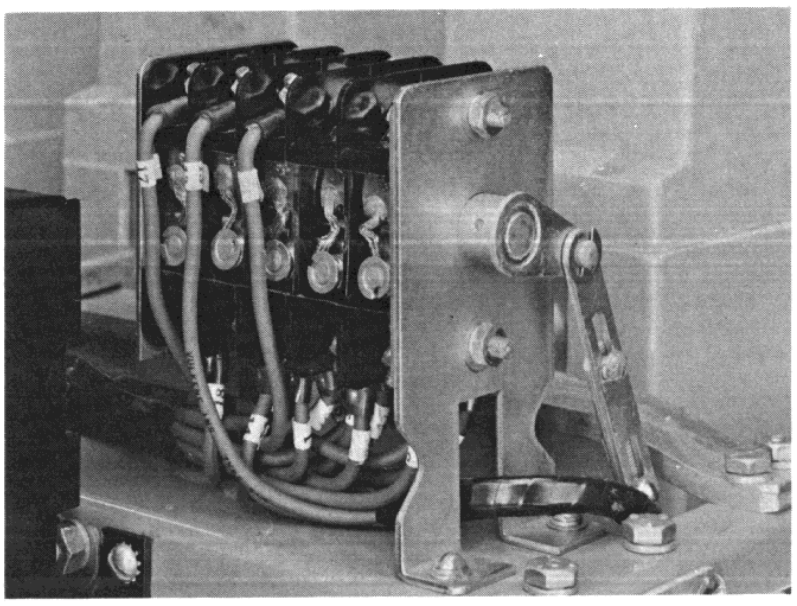


Figure 16

AUXILIARY SWITCH (Figure 16)

A 4 pole or a 10 pole auxiliary switch is normally provided.

It is mounted on top of the stored energy mechanism on the right hand side of the breaker and is operated by the main moveable contacts. All contacts are operated by nylon cams and are factory adjusted to any of the following combinations:

Normally Open	Normally Closed
Early Open	Early Closed
Late Open	Late Closed

The position and the conditoin of all contacts can be seen and inspected through a transparent dust cover.

LOAD AND INTERRUPTING CAPACITY

TYPE R-4 AUXILIARY SWITCH INTERRUPTING RATING IN AMPS

Volts	D.C. Non-Inductive	D.C. Inductive	A.C. Non-Inductive	A.C. Inductive
SINGLE BREAK				
24	20	15	—	—
48	10	7.5	—	—
115	—	—	50	30
125	2.5	2.0	—	—
230	—	—	25	15
250	0.5	.45	—	—
DOUBLE BREAK				
24	50	40	—	—
48	25	20	—	—
115	—	—	80	60
125	12	7	—	—
230	—	—	50	30
250	2.25	2	—	—

BELL ALARM SWITCH (Figure 17)

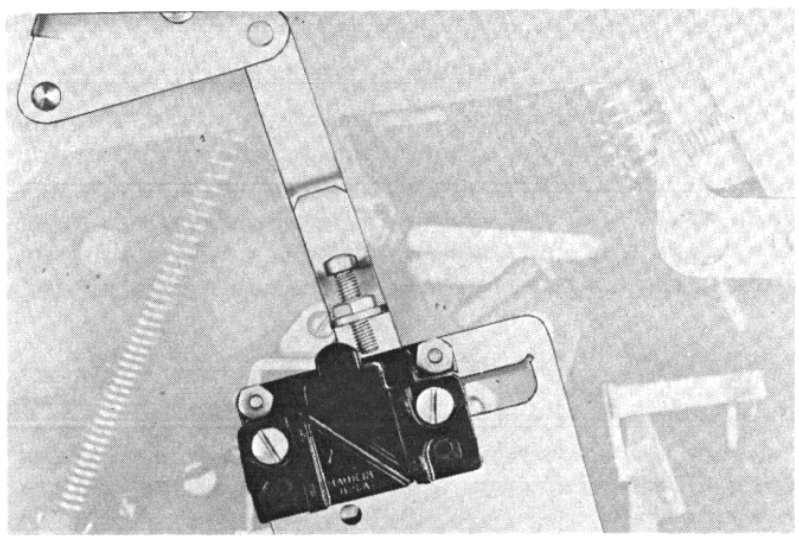


Figure 17

A bell alarm switch attachment is mounted on the right hand side of the breaker and will function only when breaker is tripped by the overcurrent trip units. It can be manually and/or electrically reset. Closing of breaker also resets the alarm switch.

To check the alarm switch attachment, trip breaker with trip button, then with shunt trip. In both cases the switch should not be actuated. Trip breaker by moving the series trip coil magnet and the switch should operate.

PART 6
OVERCURRENT TRIP DEVICES

GENERAL DESCRIPTION

The direct acting series coils and magnet assemblies provide the energy to operate the over-current time delay device and to trip the circuit breaker, interrupting sustained overcurrents and faults. There are seven (7) different coils covering the range from 15 to 2,000 amperes. Each magnet is field adjustable and calibrated for the values listed in Table A. Any one of the seven series coils may be used in any one of the three ratings of FP50 circuit breakers and FM Fusematic provided the maximum coil rating does not exceed the maximum continuous current rating of the circuit breaker frame size.

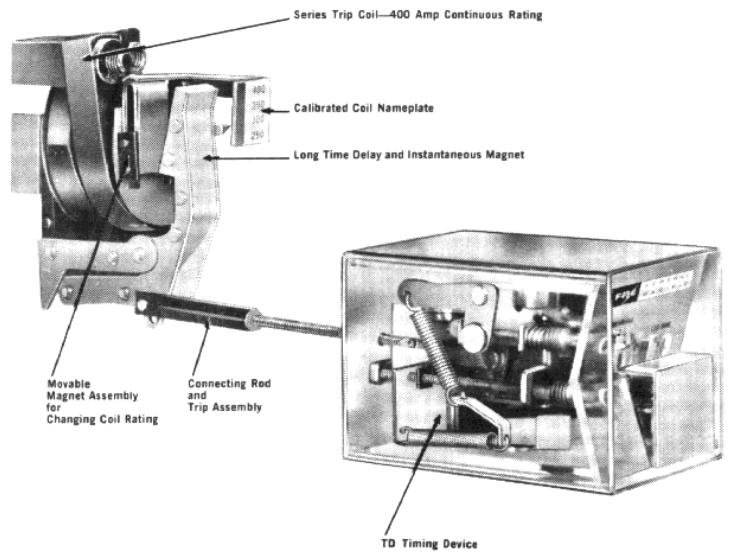


Figure 18

Dual Magnetic Overcurrent Trip Device (TD-1) (Figure 18)

The dual magnetic overcurrent trip device, in combination with the series coil and magnet, provides inverse long delayed tripping for all overcurrents below the instantaneous pickup setting, and adjustable instantaneous tripping. All devices are factory calibrated and can be field adjusted.

Selective Overcurrent Trip Device (TD-2) (Fig. 18)

The selective overcurrent trip device, in combination with the series coil and dual armature magnet, provides inverse long delayed tripping for all overcurrents below the short delay pickup setting, and short delayed tripping for all overcurrents and faults above the short delay pickup setting. All devices are factory calibrated and can be field adjusted.

Single Phasing Protection (Fig. 19)

When fuses are used to protect circuits feeding three phase motors or similar reactive apparatus there is always the possibility, upon the blowing of one fuse only, that the apparatus, single phased, will burn out. To eliminate this danger, Fusematic Air Circuit Breakers incorporate three single phase trip coils, one in parallel with each of the three main fuses. Each trip coil is approximately a one thousand-turn coil wound to operate down to $\frac{1}{10}$ of line voltage.

Each of the single phase trip coils can be looked upon as a shunt trip continuously energized by the voltage drop across its fuse. Under normal conditions the "fuse drop" voltage is zero, but it immediately rises to a value of "full phase voltage — back E.M.R. (reactive load)" when the load fuse blows. This energizes the single phase trip coil, causing the common trip bar to unlatch and trip the Fusematic Air Circuit Breaker. The coil is specifically rated at $\frac{1}{10}$ line voltage to assure instantaneous operation even when the Fusematic Air Circuit Braeker is used as a motor starter. In this case, although the back E.M.F. induced in the motor winding is equal to phase voltage, because of phase angle displacement the resultant voltage drop across the fuse is sufficient to trip Fusematic Air Circuit Breakers.

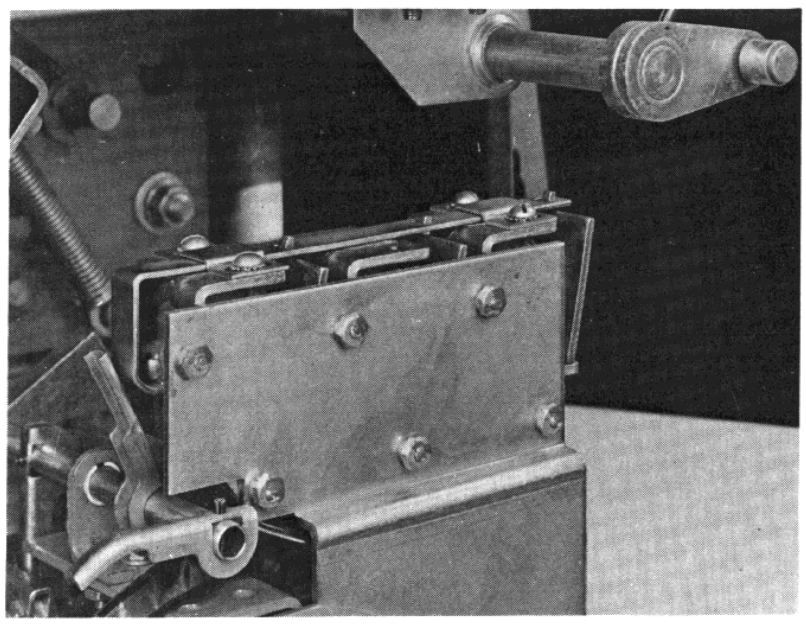


Figure 19

METHOD OF OPERATION

A. Series Coil and Magnet

The current through the series coil provides the magnetomotive force to energize the magnet assembly. The clapper type armature exerts the force on the push rod which operates the trip unit and trips the circuit breaker. The current rating of the coil and magnet may be changed by moving the pole face assembly up or down. The calibrated indicator plate lines up with the pointer on the armature to indicate the proper position of the poleface for each rating.

B. Dual Magnetic Overcurrent Trip Device (TD-1) (Long Time Delay and Instantaneous Trip)

The long delay overcurrent trip device consists of a dash pot which operates by the positive displacement of a liquid through a fixed orifice and an adjustable tension coupling spring which permits the push rod to move rapidly when the force from the magnet exceeds a predetermined value. The lever ratio between the push rod and the dash pot is adjustable permitting the time delay to be varied. There are three calibrated positions or adjustment bands. The three bands are identified as minimum, intermediate and maximum. In addition to the long delay band adjustment there is an adjustable tension spring which prevents motion of the push rod for currents below the maximum desired continuous current. This is the long delay pickup. It is adjustable from 80 percent to 160 percent with calibrated points at 80%, 100%, 120%, 140% and 160%.

The tension in the coupling spring determines the current at which the dash pot will be mechanically by-passed. This is the instantaneous pickup adjustment. The high range instantaneous element has calibrated settings at 7.5, 10 and 15 times the coil and magnet setting. The low range has calibrated settings at .8, 1.5 and 2.5 times. High range units cannot be field modified to low range units or vice versa.

C. Selective Service Trip Device (TD-2) (Long Delay and Short Delay)

The selective service trip device is similar to the dual magnetic trip device except that it has a rigid coupling link in place of an instantaneous pickup coupling spring and it has a mechanical escapement timing device which provides a short delay for high values of overcurrents and for faults. The long delay dash pot is identical to that used on the dual magnetic trip device. The short delay device is operated by a separate armature in the series coil and magnet assembly. It has an adjustable pickup spring with calibrated settings at 5, 7.5 and 10 times the coil and magnet setting. In addition, the short delay has a band adjustment with calibrated points for the minimum, intermediate and the maximum bands.

MAINTENANCE & ADJUSTMENTS

Remove breaker completely from cells before servicing.

A. Series Coil and Magnet Assembly

The series coil and magnet requires no maintenance other than cleaning periodically to remove dust and dirt which may accumulate on bearings and pivots of the magnet armatures. All pivots and bearings are made of nylon and no lubrication is required.

The current rating of the coil and magnet may be adjusted by loosening the two pole face retaining screws a few turns and sliding the pole face of the flux shunting device up or down to the desired position. The two retaining screws must be tightened securely after making the adjustment.

Certain care should be exercised when adjusting the pole face assembly to avoid bending or deforming it.

(1) Do not raise or lower the pole face assembly by exerting force on the indicator plate. This plate is calibrated at the factory and bending it will alter the calibration.

(2) Move the two pole faces so that they remain parallel, thus preventing binding on the magnet core.

The entire series coil and magnet assembly may be removed and replaced in the field by removing the $\frac{3}{8}$" coil retaining screws and the $\frac{1}{2}$" magnet retaining screws at the rear of the pole insulator. When replacing coils, always tighten the coil retaining screws securely. This is important to prevent overheating and possible failure. Care should be taken not to damage the coil insulation.

B. Dual Magnetic Overcurrent Trip Device (TD-1) (Long Delay and Instantaneous Trip)

The circuit breakers are shipped with the trip devices installed and properly adjusted. It is only necessary to keep the devices reasonably clean. They are lubricated for the life of the circuit breaker and *must not* be lubricated again.

It is possible to remove and replace a trip device in the field.

To Remove a Trip Device

The trip units which are contained in transparent plastic cases should be removed as units. Remove the two screws which hold the plastic case to the breaker frame. These screws are located in the back side of the trip unit (looking into the front of breaker) and can be removed by reaching in from behind. The connecting rod which connects to the magnet assembly must be slipped off the pin connection at the magnet. Then unscrew the plastic part of connecting rod and remove the two nuts holding the tripping pieces in place.

To Install a Trip Device

Insert the push rod in the proper hole in the front channel and screw the trip unit to the channel using the two $\frac{5}{16}$" hex. head cap screws provided. IMPORTANT: Use the washer and lock washer provided. Run a 10-32 nut down the push rod. Follow it with a trip finger on top of the push rod with a spacer between the wings and another 10-32 nut. (Do not tighten it yet.) Install the nylon turnbuckle and adjust its length so that it is $\frac{1}{32}$" longer than is just necessary to permit the trip device to reset the magnetic armature against its stop. Install the turn buckle on the armature pin and retain it with E-ring provided. Adjust the position of the trip finger so that the breaker does not trip when the magnet is closed with a $\frac{1}{32}$" thick shim in the air gap, and does trip with a $\frac{1}{64}$" thick shim in the air gap. Tighten the finger and check this adjustment again. The trip unit must reset the magnet armature all the way until the armature is against the stop.

C. Selective Service Trip Device (TD-2) (Long Delay and Short Delay)

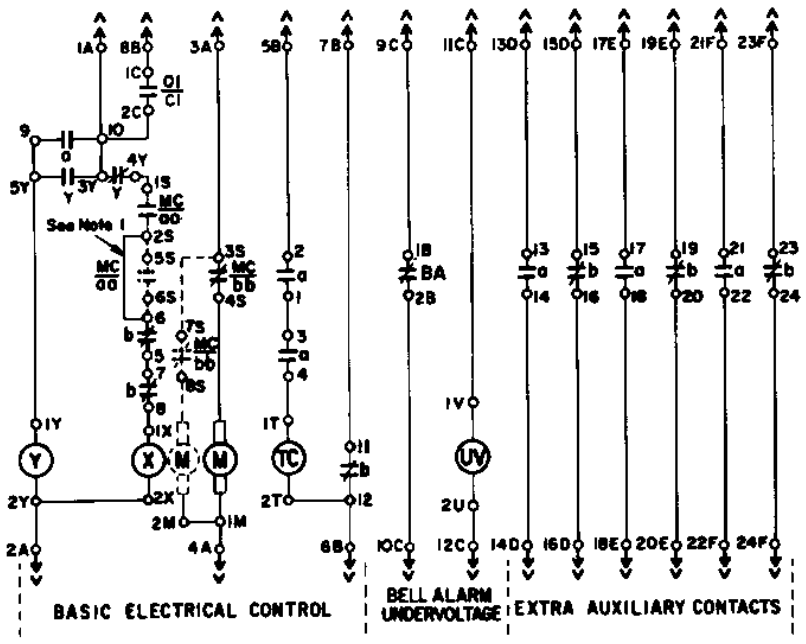
The maintenance and adjustment of the selective service trip device is the same as the dual magnetic trip device, except that the trip finger on the short delay push rod is installed under the push rod. Care should be taken to ensure that the long delay trip finger on top of its push rod does not interfere with the short delay trip finger which is installed under its push rod.

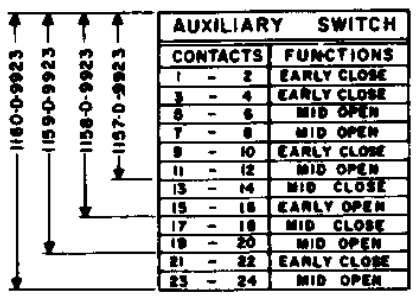
PART 7

DEFINITION OF SYMBOLS

TC	—	Trip coil
TC1	—	A phase fuse trip coil
TC2	—	B phase fuse trip coil
TC3	—	C phase fuse trip coil
X	—	Closing release coil
Y	—	Anti pump relay
M	—	Spring charging motor
MC/aa	—	NO } Motor cut off switch (Shown with
MC/bb	—	NC } closing mechanism spring discharged)
a	—	Auxiliary switch contact (open when breaker is open)
b	—	Auxiliary switch contact (closed when breaker is open)

01	—	Control switch 01 local, C1 close
BA	—	Bell alarm switch
PF	—	Power fuse
UV	—	Undervoltage device
A	—	Main power circuit - A phase
B	—	Main power circuit - B phase
C	—	Main power circuit - C phase





AUXILIARY SWITCH	
CONTACTS	FUNCTIONS
1 - 2	EARLY CLOSE
3 - 4	EARLY CLOSE
5 - 6	MID OPEN
7 - 8	MID OPEN
9 - 10	EARLY CLOSE
11 - 12	MID OPEN
13 - 14	MID CLOSE
15 - 16	EARLY OPEN
17 - 18	MID CLOSE
19 - 20	MID OPEN
21 - 22	EARLY CLOSE
23 - 24	MID OPEN

——— = FP50 & FM50
------ = ADD FOR FP100 & FM100

Note 1 Wire 2S to 6 on FP50 and FM50 only.

TYPE FP & FM ELECTRICALLY OPERATED A.C.B. SCHEMATIC DIAGRAM

FP BREAKER OPERATING SEQUENCE

1. Control switch 01-C closed.
2. "X" coil is energized thru "b" contact of the "Y" relay, "b" contact of the breaker auxiliary switch, and "aa" contact of the motor cut-off switch.
3. Stored energy closing spring released via "X" coil, closing breaker.
4. Closing breaker operates auxiliary switch opening "b" contacts and closing "a" contact thus energizing anti pump "Y" relay and de-energizing "X" coil.
5. "Y" relay remains energized via seal-in contact thus providing anti-pumping lockout of "X" coil if $\frac{01}{C1}$ is held closed.
6. "Y" relay is de-energized when $\frac{01}{C1}$ contact is opened.
7. Closing breaker, closes auxiliary switch "a" contacts permitting the breaker to be tripped electrically when control power is switched to auxiliary stabs 5B and 6B.
8. Motor cut-off switch contact "bb" closes when spring discharges and re-opens when spring is fully charged.
9. Auxiliary switch "b" contact closes when the breaker is tripped.
10. Motor cut-off switch contact "aa" closes when the closing mechanism spring is fully charged.
11. The breaker will close when control switch $\frac{01}{C1}$ is closed.

PART 8

MINIMUM RECOMMENDED SPARE PARTS FOR FP BREAKERS

Req.	FP 400/800	Req.	FP 2000	
6	1151-9986	6	1151-9986	Moving Arcing Contacts
3	1151-9939	3	1151-9937	Upper Stud Assembly
6	1151-9088	12	1151-9354	Main Stationary Contact Assembly
--	------	3	1152-9354	Leading Contacts
6	1151-9380	6	1151-9381	Cluster Assembly
3	1151-9566	3	1151-9566	Arc Chutes

One each of the following:

SHUNT CLOSE ATTACHMENTS (Common for All FP Breakers)

			Sealed	Inrush
48V A.C. 60 cycles	1156-9517	Amp A.C.	5.7A	7.5A
115V A.C. 60 cycles	1157-9517	Amp A.C.	3.15A	4.0A
230V A.C. 60 cycles	1158-9517	Amp A.C.	1.6A	1.95A
48V D.C.	1152-9517	Amp D.C.	4.8A	
125V D.C.	1153-9517	Amp D.C.	3.0A	
250V D.C.	1154-9517	Amp D.C.	2.3A	

SHUNT TRIP ATTACHMENTS (Common for All FP Breakers)

			Sealed	Inrush
48V A.C. 60 cycles	1156-9519	Amp A.C.	5.7A	7.5A
115V A.C. 60 cycles	1157-9519	Amp A.C.	3.15A	4.0A
230V A.C. 60 cycles	1158-9519	Amp A.C.	1.6A	1.95A
48V D.C.	1152-9519	Amp D.C.	4.8A	
125V D.C.	1153-9519	Amp D.C.	3.0A	
250V D.C. and Capacitor Trip Device*	1154-9519	Amp D.C.	2.3A	

*Capacitor Trip Device #2751-0137

UNDERVOLTAGE ATTACHMENT (Common for All FP Breakers)

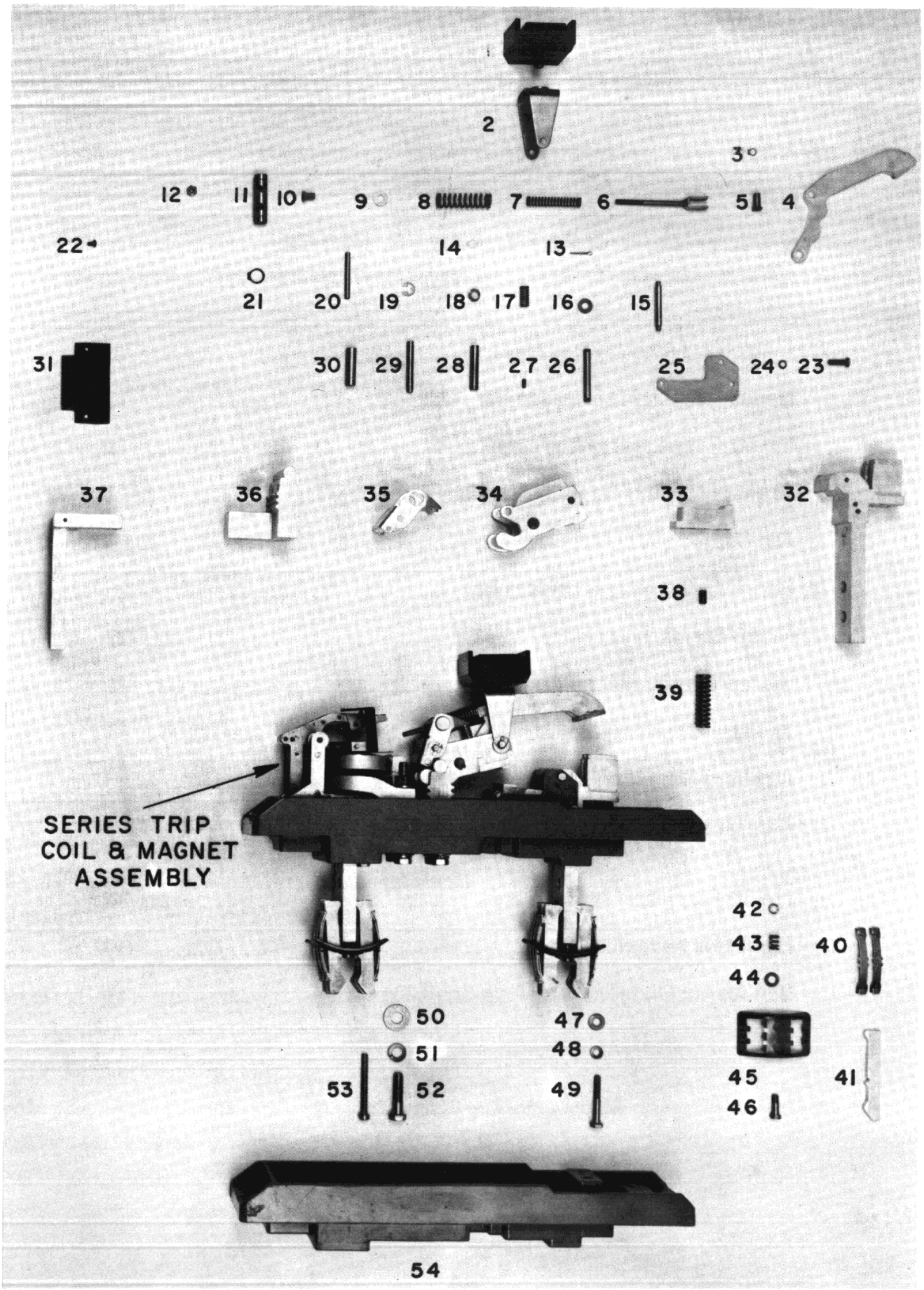
	Delayed	Instantaneous
115 Volts A.C.	1151-9458	1151-9456
230 Volts A.C.	1152-9458	1152-9456
460 Volts A.C.	1153-9458	1153-9456
575 Volts A.C.	1154-9458	1154-9456
125 Volts D.C.	1155-9458	1155-9456
250 Volts D.C.	1156-9458	1156-9456

***MOTORS TO CHARGE FP BREAKERS STORED ENERGY MECHANISM (Common for All FP Breakers)**

	Purchase Part #	Motor	FLA.	LRA.	Fuse**
48V A.C. / 48V D.C.	162-007	15058	20	50	12.0
115V A.C. / 125V D.C.	162-004	14976	6.5	25	5.0
230V A.C. / 250V D.C.	162-006	14978	6.1	12	3.5

*Maximum 240V, use control power transformer
**Class 1330 Econ Dual Element fuses

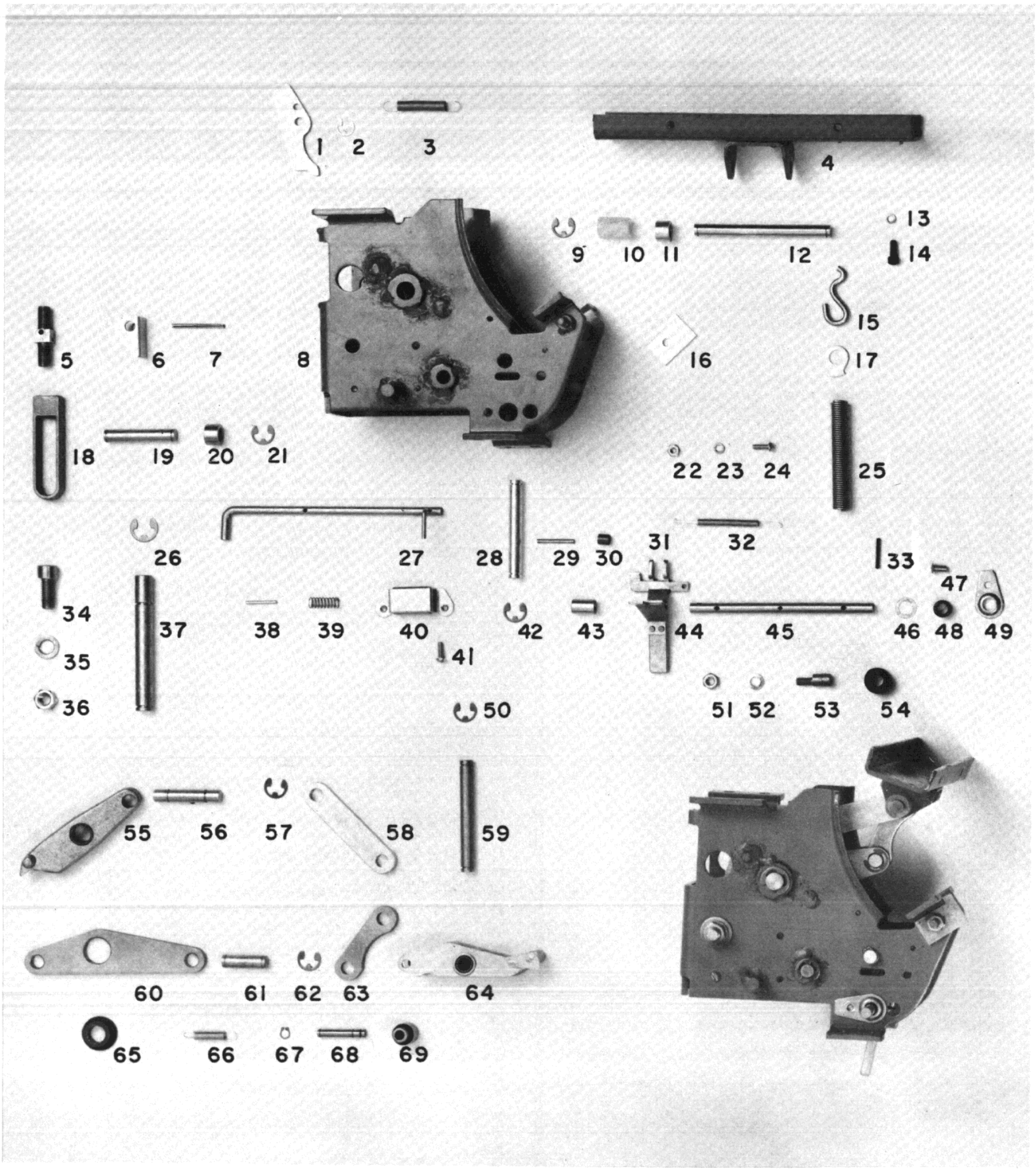
SPARE PARTS INDEX


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
SERIES TRIP
COIL & MAGNET
ASSEMBLY

INSULATOR ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER INSULATOR ASSEMBLY 400 Amp	800 Amp	2000 Amp
		INSULATOR			
54	1151-9137	Main Insulator	1	1	
54*	1151-9243	Main Insulator			1
		STATIONARY CONTACT ASSEMBLY (Upper Stud Assembly)			
32	1151-9339	Stationary Contact Assembly	1	1	
32*	1151-9937	Stationary Contact Assembly			1
25	1101-9146	Retaining Plate	2	2	2
23	19S-10-10	Retaining Plate Screw	4	4	4
24	1-W-10	Retaining Plate Lock Washer	4	4	4
15	1101-9233	Retaining Pin	1	1	
15*	1101-9430	Retaining Pin			1
33	1151-9088	Main Contact Finger	2	2	
33*	1151-9354	Main Contact Finger			4
33*	1152-9354	Main Leading Contact Finger			1
38	99-048-250-0500	Contact Compression Spring Guide	2	2	5
39	1122-9606	Contact Compression Spring	2	2	
39*	1103-9606	Contact Compression Spring			5
47	W-250	Mounting Washer	2	2	
48	1W-250	Mounting Lock Washer	2	2	2
49	19S-250-28	Mounting Bolt	2	2	
49*	10S-250-34	Mounting Screw			2
Not Shown	N-250	Mounting Nut			2
		MOVEABLE MAIN CONTACT ASSEMBLY			
1	1151-9244	Cross Bar Insulator	1	1	1
2	1151-9648	Driving Clevice	1	1	1
26	1101-9350	Driving Clevice Pin (Left & Center Pole)	1	1	
26*	1102-9350	Driving Clevice Pin (Right Pole)	1	1	
26*	1101-9674	Driving Clevice Pin (Left & Center Pole)			2
26*	1101-9687	Driving Clevice Pin (Right Pole)			1
26*	1101-9674	Driving Clevice Pin (Right Pole)			1
16	W-250	Driving Clevice Washer	2	2	6
13	1503-2639	Driving Clevice Cotter Pin	2	2	2
34	1151-9676	Moveable Main Contact	1	1	
34*	1151-9675	Moveable Main Contact			1
28	1101-9581	Moveable Arcing Contact Pivot Pin	1	1	1
18	5L4-F	Moveable Arcing Contact Pivot Pin Insulator	2	2	2
14	5100-31	Moveable Arcing Contact Pivot Pin Retaining Ring	2	2	2
35	1101-9148	Hinge Bracket	1	1	1
29	1101-9969	Hinge Bracket Pivot Pin	1	1	
29*	1101-9689	Hinge Bracket Pivot Pin			1
19	5133-25	Hinge Bracket Pivot Pin Retaining Ring	2	2	2
20	1101-9351	Hinge Pressure Roller Pin	1	1	
20*	1101-9670	Hinge Pressure Roller Pin			1
30	1101-9231	Hinge Pressure Roller	1	1	1
30*	1101-9669	Hinge Pressure Roller			2
Not Shown	5100-18	Hinge Pressure Roller Pin Retaining Ring			2
17	1102-9606	Hinge Pressure Compression Spring	2	2	2
27	1101-5582	Hinge Pressure Compression Spring Guide	2	2	2
		MOVEABLE ARCING CONTACT ASSEMBLY			
4	1151-9986	Moveable Arcing Contact	2	2	2
5	1101-9232	Moveable Arcing Contact Adjusting Stud Pin	2	2	2
3	5100-25	Moveable Arcing Contact Adjusting Stud Pin Retaining Ring	2	2	2
6	1151-9353	Moveable Arcing Contact Adjusting Stud	2	2	2
7	1101-9606	Moveable Arcing Contact Inner Compression Spring	2	2	2
8	1119-9606	Moveable Arcing Contact Outer Compression Spring	2	2	2
9	W-250	Moveable Arcing Contact Compression Spring Washer	2	2	2
10	1101-9409	Moveable Arcing Contact Adjusting Stud Insulator	1	1	1
11	1101-9230	Moveable Arcing Contact Adjusting Stud Guide	2	2	2
21	5100-50	Guide Retaining Ring	2	2	2
12	22-TM-02	Moveable Arcing Contact Adjusting Nut			
		MOVEABLE MAIN CONTACT PIVOT			
36*	1151-9325	Moveable Main Contact Pivot	1		
36	1151-9319	Moveable Main Contact Pivot		1	
36*	1151-9424	Moveable Main Contact Pivot			1
52	1-S-375-24	Mounting Screw	1	2	2
51	1W-375	Mounting Lock Washer	1	2	2
50	W-375	Mounting Washer	1	2	2
		LOWER TERMINAL ASSEMBLY			
37	1151-9646	Lower Terminal	1	1	
37*	1151-9425	Lower Terminal			1
31	1101-9418	Terminal Insulation	1	1	
31*	1101-9383	Terminal Insulation			1
22	PK #6 - Typ Ux5/16	(Screw) Terminal Insulation Screw	2	2	2
53	19S-250-32	Terminal Mounting Screw	2	2	
Not Shown	1-W-250	Terminal Mounting Lock Washer	2	2	
Not Shown	W-250	Terminal Mounting Washer	2	2	
		TERMINAL STAB ASSEMBLY			
45	1101-0895	Contact Finger Retaining Bracket	2	2	
45*	1101-9679	Contact Finger Retaining Bracket			2
41	1101-0446	Contact Finger	12	12	40
40	1101-0117	Contact Finger Spring	24	24	40
46	1101-1280	Shouldered Mounting Screw	4	4	
46*	1101-0193	Shouldered Mounting Screw			4
44	1101-0173	Mounting Washer	4	4	4
43	1101-0192	Mounting Spring	4	4	4
42	2705-0339	Mounting Spacer	4	4	
		MOUNTING HARDWARE			
Not Shown	1S 375-20	Mounting Bolt	6	6	12
Not Shown	W-375	Mounting Washer	6	6	12
Not Shown	1W-375	Mounting Lock Washer	6	6	12
Not Shown	N-375	Mounting Nut	6	6	12

***SIMILAR TO PART SHOWN**

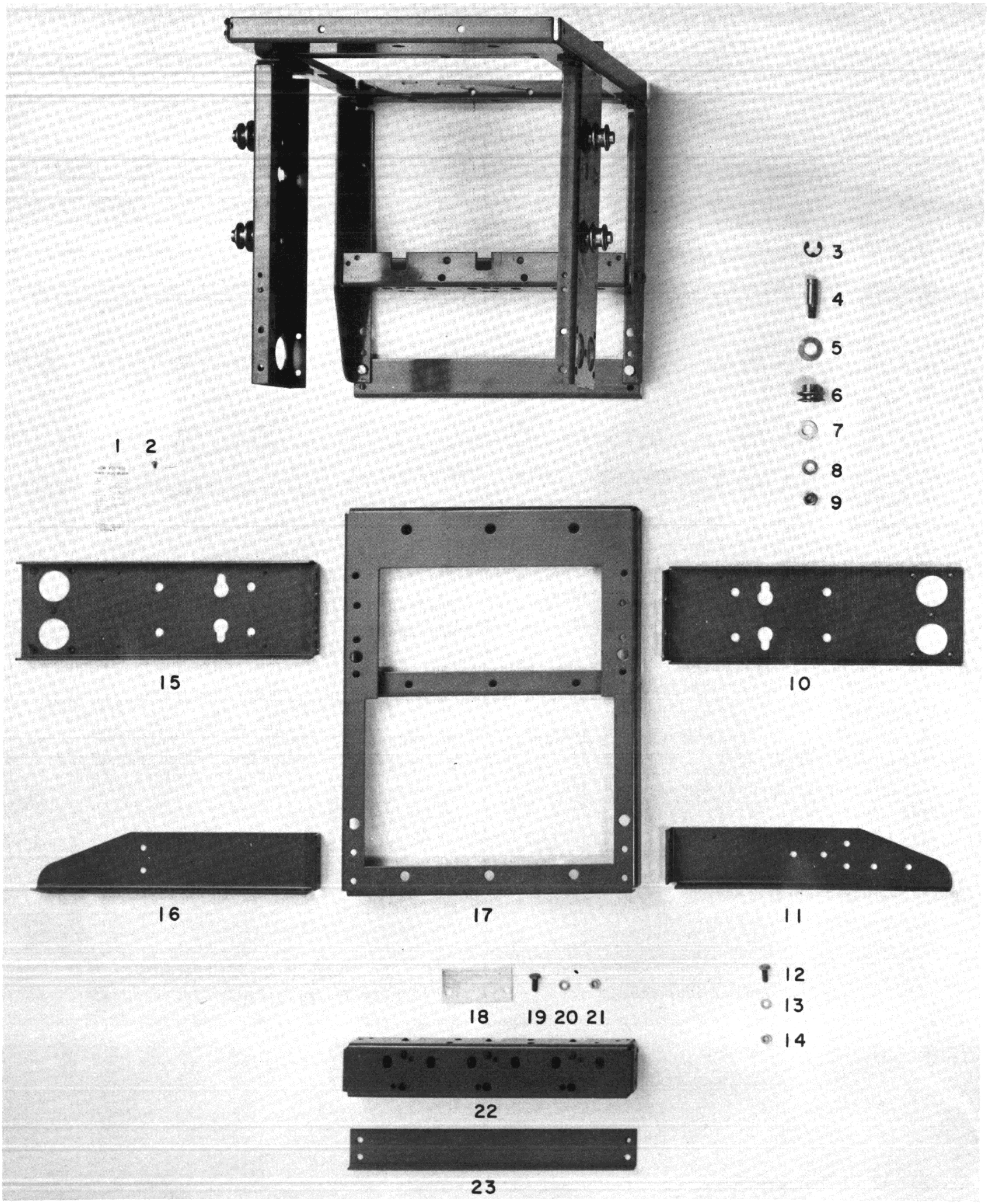

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69

HOUSING MECHANISM ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER CIRCUIT BREAKER 400 Amp	800 Amp	2000 Amp
8	1151-C-9305	Housing Frame	1	1	1
		TRIP LEVER ASSEMBLY			
64	1151-A-9758	Trip Lever	1	1	1
59	1101-A-9218	Trip Lever Shaft	1	1	1
50	5133-37	Trip Lever Shaft Retaining Ring	1	1	1
Not Shown	1104-9796	Trip Lever Shim Washer	As Required		
69	1151-A-9853	Trip Lever Roller	1	1	1
68	1101-A-9927	Trip Lever Roller Shaft	1	1	1
67	5133-25	Trip Lever Roller Shaft Retaining Ring	2	2	2
66	1101-A-9052	Trip Lever Reset Spring	1	1	1
		MAIN SHAFT ASSEMBLY			
60	1101-A-9147	Lever Arm	2	2	2
65	1101-A-9213	Lever Arm Bearing	2	2	2
55	1151-A-9539	Main Latch Link	1	1	1
37	1101-A-9216	Main Latch Shaft	1	1	1
26	5133--50	Main Latch Shaft Retaining Ring	2	2	2
34	1101-A-9116	Lever Arm Stop	2	2	2
35	1W-375	Lever Arm Stop Lock Washer	2	2	2
36	N-375	Lever Arm Stop Nut	2	2	2
		OPERATING LINKAGE			
58	1101-9145	Compression Link	2	2	2
63	1101-A-9152	Lift Link	2	2	2
18	1101-A-9172	Drive Yoke	1	1	1
5	1101-A-9191	Drive Yoke Turnbuckle	1	1	1
6	1101-A-9108	Drive Yoke Turnbuckle Lock	1	1	1
7	52-028-125	Drive Yoke Turnbuckle Lock Pin	1	1	1
28	1101-9215	Trip Lever Stop Pin	1	1	1
42	5133-37	Trip Lever Stop Pin Retaining Ring	2	2	2
61	1101-A-9192	Lift Link Pin	1	1	1
62	5133-37	Lift Link Pin Retaining Ring	2	2	2
19	1101-A-9194	Drive Pin	1	1	1
20	1101-A-9196	Drive Pin Roller	2	2	2
21	5133-37	Drive Pin Roller Retaining Ring	2	2	2
56	1101-A-9195	Compression Link Pin	1	1	1
57	5133-37	Compression Link Pin Retaining Ring	2	2	2
		TRIP ROD ASSEMBLY			
40	1101-A-9593	Trip Rod Guide	1	1	1
27	1151-A-9942	Trip Rod	1	1	1
39	1105-B-9606	Trip Rod Spring	1	1	1
38	52-022-049-0875	Trip Rod Guide Pin	1	1	1
41	WS8-6	Trip Rod Assembly Mounting Screw	2	2	2

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER CIRCUIT BREAKER 400 Amp	800 Amp	2000 Amp
		TRIP FINGER ASSEMBLY			
44	1151-A-9936	Trip Finger	1	1	1
30	1151-A-9262	Latch Bearing Assembly	1	1	1
29	1101-A-9804	Latch Bearing Pin	1	1	1
31	5100-12	Latch Bearing Pin Retaining Ring	2	2	2
45	1101-A-9925	Trip Shaft	1	1	1
43	1101-A-5531	Trip Shaft Spacer	2	2	2
48	D.C.-B55	Trip Shaft Bearing	2	2	2
49	1101-A-9883	Trip Shaft Bearing Holder	4	4	4
47	E598-3/8Lg.	Trip Shaft Bearing Holder Rivet	2	2	2
33	55-022-094-0562	Trip Finger Roll Pin	1	1	1
32	1101-A-5544	Trip Finger Spring	1	1	1
24	S8-10	Trip Finger Spring Screw	1	1	1
23	1W-8	Trip Finger Spring Lockwasher	1	1	1
22	N-8	Trip Finger Spring Nut	1	1	1
		TRIP FINGER STOP			
53	1101-A-09934	Trip Finger Stop Pin	1	1	1
54	1101-A-9543	Stop Pin Tubing	1	1	1
52	1W-250	Mounting Lockwasher	1	1	1
51	N-250	Mounting Nut	1	1	1
		TRIP GUIDE ASSEMBLY			
1	1101-A-9111	Trip Guide Latch	1	1	1
2	5133-25	Trip Guide Latch Retaining Ring	1	1	1
3	1117-B-9606	Trip Guide Latch Spring	1	1	1
		CROSS BAR ASSEMBLY			
4	1151-9407	Cross Bar	1	1	
4*	1151-9408	Cross Bar			1
12	1101-9219	Cross Bar Pin	1	1	1
11	1101-9214	Cross Bar Spacer	2	2	2
10	1101-9190	Cross Bar Roller	2	2	2
9	5100-37	Cross Bar Roller Retaining Ring	2	2	2
15	1101-A-5543	Pull-Off Spring Hook	2	2	2
17	1101-A-9946	Pull-Off Spring End	4	4	4
25	1101-A-5540	Pull-Off Spring	2	2	2
16	1101-A-9142	Cross Bar Guide	1	1	1
14	1102-9116	Insulation Block Mounting Screw	4	4	4
14*	1104-9116	Insulation Block Mounting Screw	2	2	2
13	1W-10	Insulation Block Mounting Lockwasher	6	6	6
		MOUNTING HARDWARE			
Not Shown	1S-250-10	Mounting Screw	4	4	4
Not Shown	W-250	Mounting Washer	4	4	4
Not Shown	1W-250	Mounting Lock Washer	8	8	8
Not Shown	N-250	Mounting Nut	8	8	8

***SIMILAR TO PART SHOWN**


3
4
5
6
7
8
9
1 2
15
10
16
17
11
12
13
14
18
19 20 21
22
23

FP-50 FRAME ASSEMBLY

MAIN ASSEMBLY PARTS

ITEM	PART NUMBER	DESCRIPTION	400 & 800 FIXED MOUNTED	2000 FIXED MOUNTED	400 & 800 DRAW-OUT	2000 DRAW-OUT
17	1151-9392	Back Plate Assembly	1		1	
17*	1151-9395	Back Plate Assembly		1		1
16	1101-9162	Lower Left Side	1	1	1	1
11	1101-9163	Lower Right Side	1	1	1	1
10	1101-9266	Upper Right Side	1	1	1	1
15	1101-9266	Upper Left Side	1	1	1	1
23	1102-9272	Forward Cross Member	1		1	
23*	1101-9272	Forward Cross Member		1		1
22	1101-9160	Main Cross Member	1		1	
22*	1101-9273	Main Cross Member		1		1

GROUNDING STRIP ASSEMBLY

18	1101-9917	Grounding Strip	1	1	1	1
19	1S-250-10	Grounding Strip Mounting Screw	2	2	2	2
20	1W-250	Grounding Strip Lock Washer	2	2	2	2
21	N-250	Grounding Strip Nut	2	2	2	2

DRAW-OUT ROLLER ASSEMBLY

6	1101-9686	Draw-Out Roller			4	4
4	1101-9685	Draw-Out Roller Shaft			4	4
5	W-500	Draw-Out Roller Washer			4	4
3	5133-50	Draw-Out Roller Retaining Ring			4	4
7	W-375	Mounting Washer			4	4
8	1W-375	Mounting Lock Washer			4	4
9	N-375	Mounting Nut			4	4

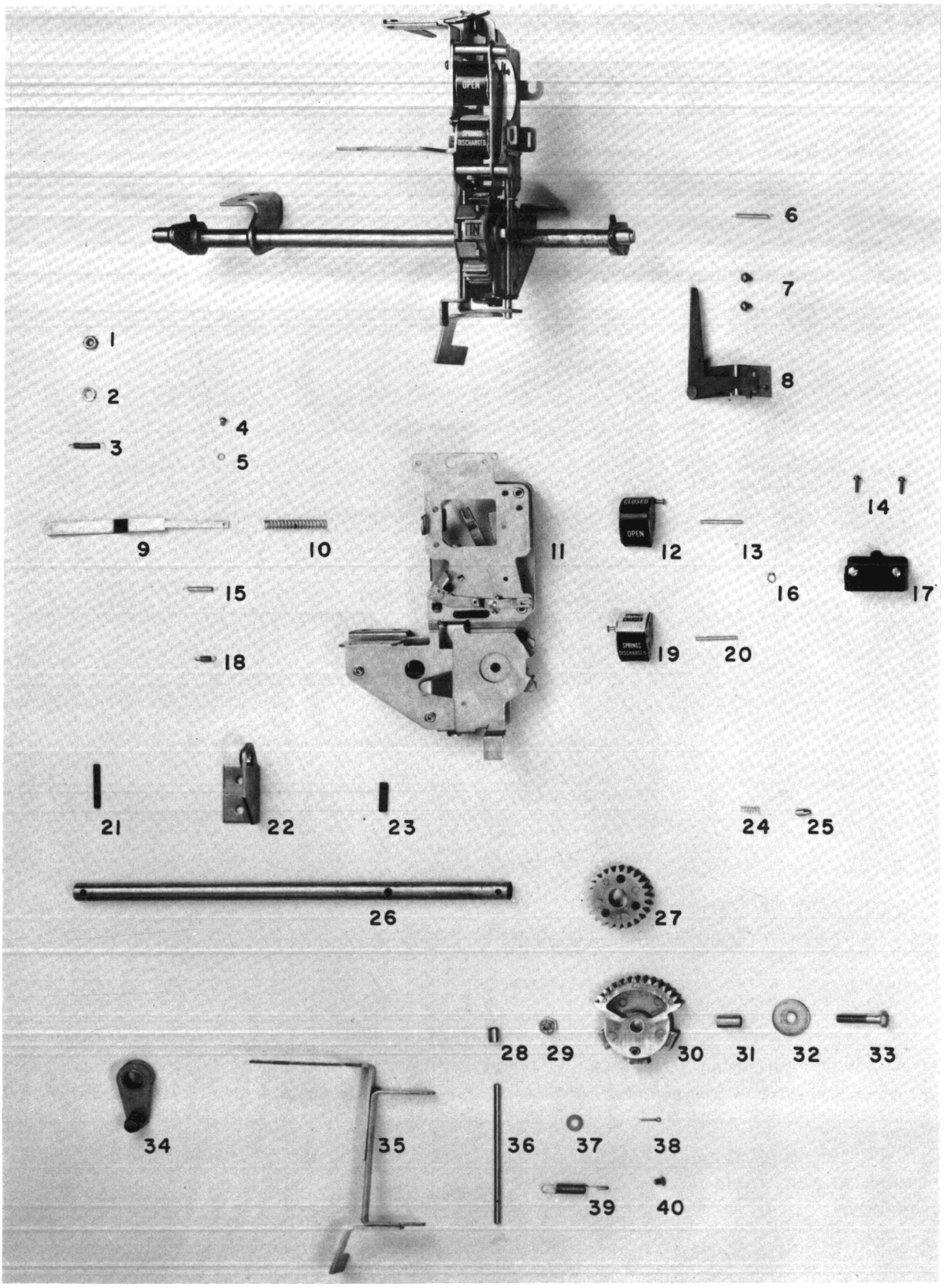
FRAME FASTENERS

12	1S-250-10	Frame Screw	16	16	16	16
13	1W-250	Frame Lock Washer	16	16	16	16
14	N-250	Frame Nut	16	16	16	16

NAME PLATE

1	1101-9295	Name Plate	1	1	1	1
2	1101-9277	Name Plate Screw	2	2	2	2

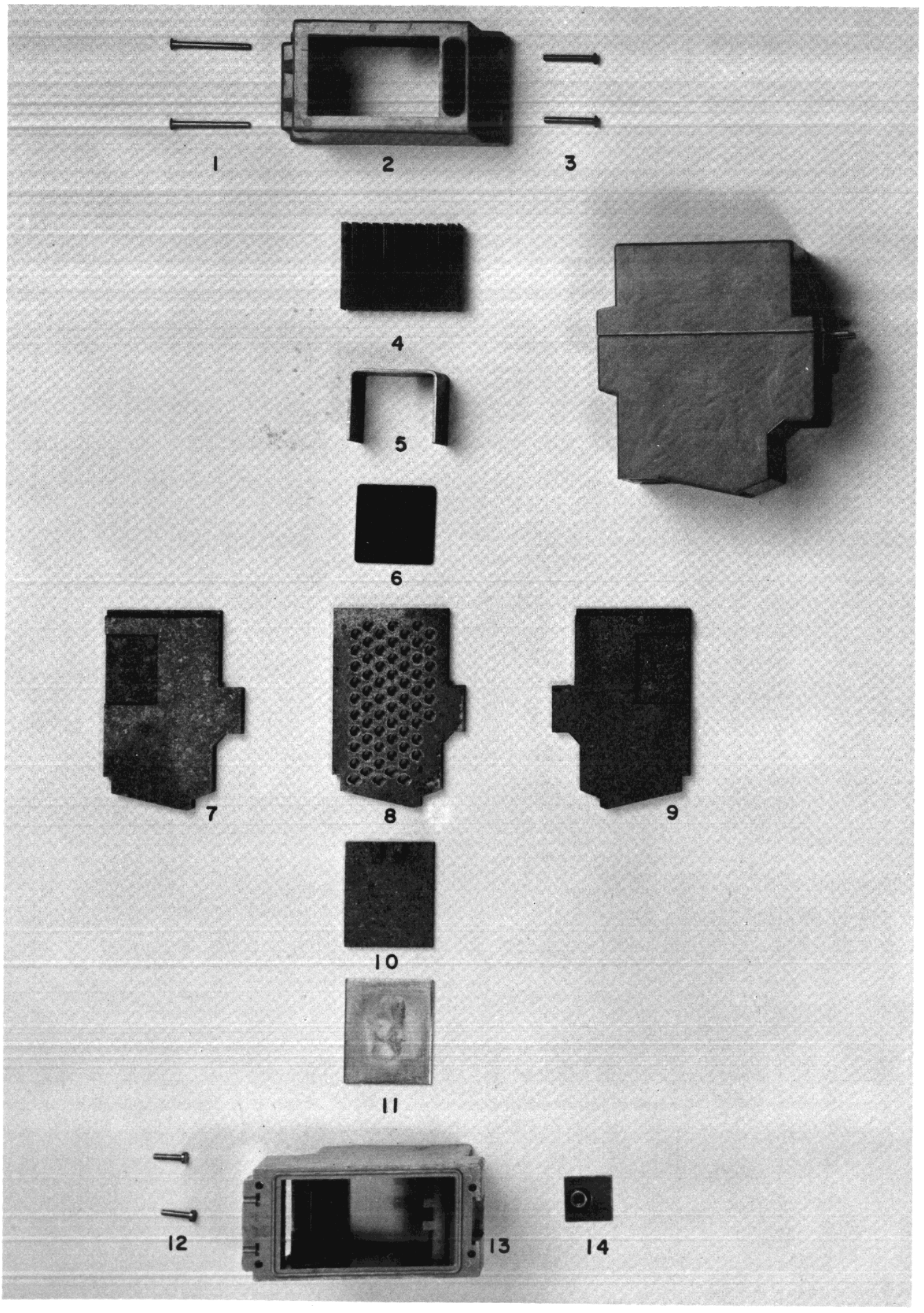
***SIMILAR TO PART SHOWN**


OPEN
SPRINGS DISCHARGED
IN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

DRAW-OUT AND INDICATOR MECHANISM ASSEMBLY

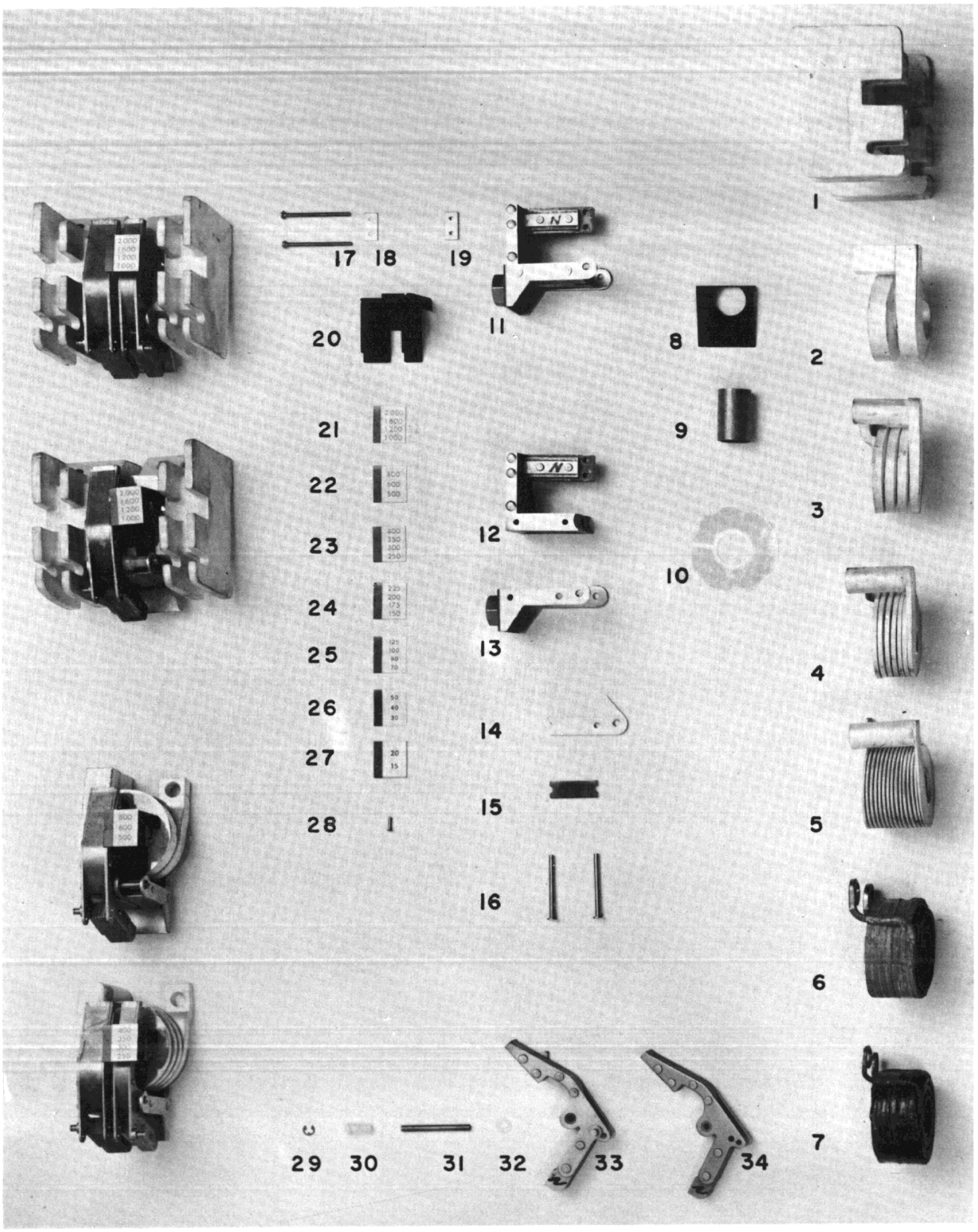
ITEM	PART NUMBER	DESCRIPTION	MANUALLY OPERATED FIXED 400 & 800	MANUALLY OPERATED FIXED 2000	MANUALLY OPERATED DRAW-OUT 400 & 800	MANUALLY OPERATED DRAW-OUT 2000	ELECTRICALLY OPERATED FIXED 400 & 800	ELECTRICALLY OPERATED FIXED 2000	ELECTRICALLY OPERATED DRAW-OUT 400 & 800	ELECTRICALLY OPERATED DRAW-OUT 2000
FRAME ASSEMBLY										
11	1151-9710	Frame Assembly							1	1
11*	1152-9710	Frame Assembly			1	1				
11*	1153-9710	Frame Assembly					1	1		
11*	1154-9710	Frame Assembly	1	1						
INDICATOR LINKS										
9	1101-9944	O.C. Indicator Conn. Link	1	1	1	1	1	1	1	1
10	1116-9606	O.C. Indicator Conn. Spring	1	1	1	1	1	1	1	1
4	SF6-40x5/32 Lg.	O.C. Indicator Conn. Screw	1	1	1	1	1	1	1	1
5	1W-6	O.C. Indicator Conn. Washer	1	1	1	1	1	1	1	1
3	1101-9732	O.C. Indicator Conn. Return Spring	1	1	1	1	1	1	1	1
12	1151-9735	O.C. Indicator	1	1	1	1	1	1	1	1
13	1101-9738	O.C. Indicator Pin	1	1	1	1	1	1	1	1
16	5133-15	Indicator Pin Retaining Ring	2	2	2	2	2	2	2	2
18	102-023	C.D. Link Spring	1	1	1	1	1	1	1	1
15	1101-9718	C.D. Link Return Spring	1	1	1	1	1	1	1	1
19	1151-9739	C.D. Indicator	1	1	1	1	1	1	1	1
20	1101-9738	C.D. Indicator Pin	1	1	1	1	1	1	1	1
16	5133-15	Indicator Pin Retaining Ring	2	2	2	2	2	2	2	2
LOCAL CLOSE LINKAGE										
8	1151-9720	Local Close Linkage	1	1	1	1				
8*	1152-9720	Local Close Linkage					1	1	1	1
6	1101-9732	Local Close Return Spring	1	1	1	1	1	1	1	1
7	WS10-4	Close Linkage Mounting Screw	2	2	2	2	2	2	2	2
17	120-001	Local Close Switch					1	1	1	1
14	WS6-7	Local Close Switch Mounting Screw					2	2	2	2
DRAW-OUT OPERATING MECHANISM										
30	1151-9800	Front Gear Assembly			1	1			1	1
33	19S-312-24	Front Gear Screw	1	1	1	1	1	1	1	1
32	1101-9743	Front Gear Washer	1	1	1	1	1	1	1	1
31	1101-A-9744	Fron Gear Spacer	1	1	1	1	1	1	1	1
29	N-312	Front Gear Lock Nut	1	1	1	1	1	1	1	1
27	1101-9652	Rear Gear			1	1			1	1
24	1108-B-9606	Rear Gear Index Pin Spring			3	3			3	3
25	1101-A-9734	Rear Gear Index Pin			3	3			3	3
23	52-048-219-1750	Rear Gear Roll Pin			1	1			1	1
26	1101-A-9663	Operating Shaft			1				1	
26*	1102-A-9663	Operating Shaft				1				1
22	1101-A-9742	Left Shaft Guide			1	1			1	1
22*	1102-A-9742	Right Shaft Guide				1				1
34	1151-9671	Drive Link Assembly			2	2			2	2
21	52-032-156-1250	Drive Link Pin			2	2			2	2
TRIP LINKAGE										
35	1151-B-9528	Trip Link Assembly	1	1	1	1	1	1	1	1
28	1101-A-5512	Trip Link Spacer	1	1	1	1	1	1	1	1
36	1101-A-9529	Trip Link Pivot Shaft	1	1	1	1	1	1	1	1
37	1101-A-5514	Trip Link Washer	1	1	1	1	1	1	1	1
38	52-012-062-0500	Trip Link Pin	1	1	1	1	1	1	1	1
39	1120-B-9606	Trip Link Return Spring	1	1	1	1	1	1	1	1
40	1101-A-5581	Trip Link Return Spring Pin	1	1	1	1	1	1	1	1
2	1W-250	Mounting Lock Washer	6	6	8	10	6	6	8	10
1	N-250	Mounting Nut	6	6	8	10	6	6	8	10

***SIMILAR TO PART SHOWN**


1
2
3
4
5
6
7
8
9
10
11
12
13
14

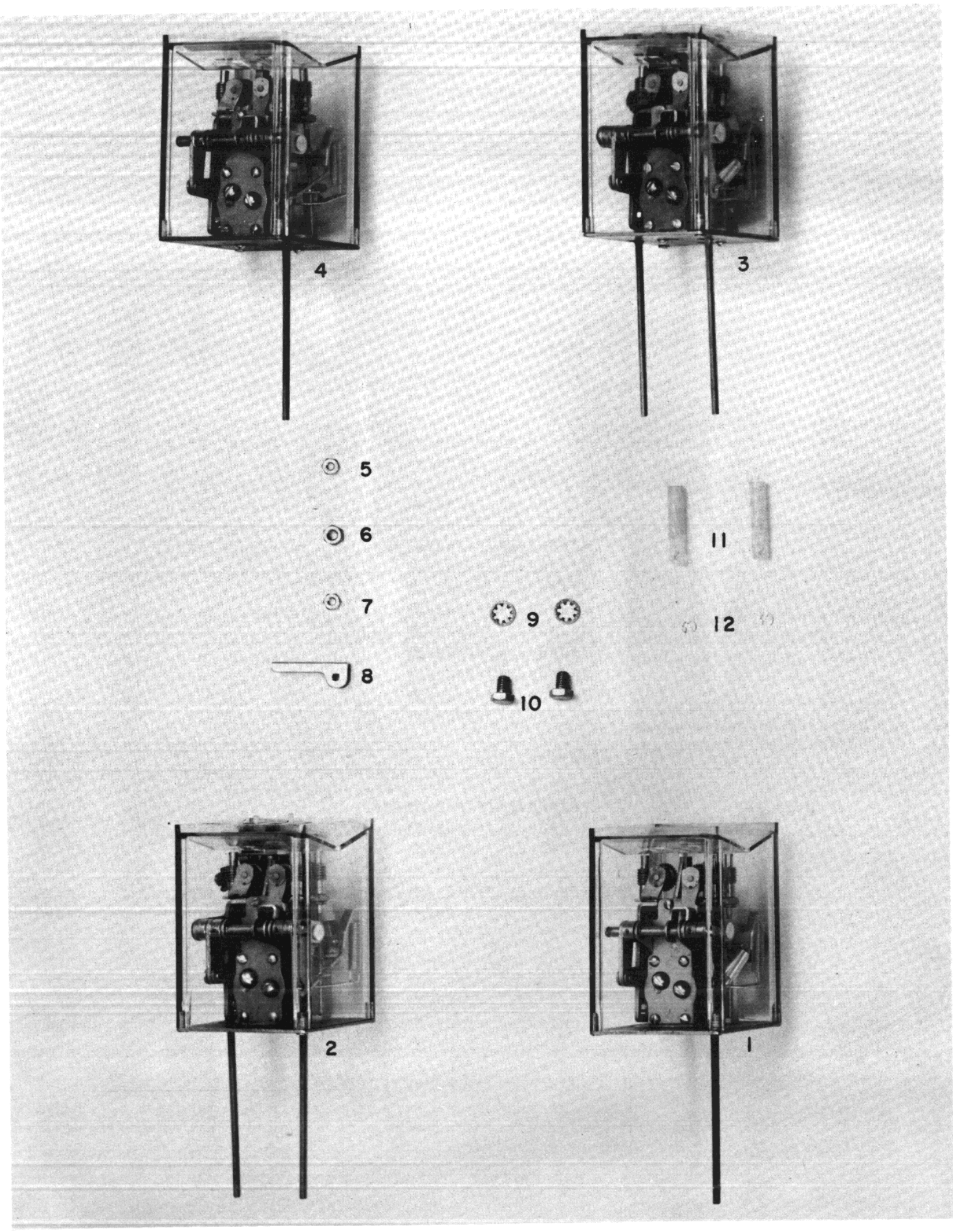
ARC CHUTE

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER POLE ALL FP-50
2	1101-9554	Upper Cover	1
4	1101-9410	De-Ionization Screen	1
5	1101-9411	Blow-Out Magnet	1
6	1101-9414	Blow-Out Magnet Insulation Plate	1
7	1101-9558	Left Side Plate	1
8	1101-9558	Center Plate	3
9	1101-9557	Right Side Plate	1
10	1101-9413	Pressure Plate Insulation	1
11	1101-9412	Pressure Plate	1
13	1101-9553	Lower Cover	1
12	1101-9811	Guide Pin	2
14	1101-9824	Thrust Plate	1
1	RT6-148	Front Rivet	2
3	RT6-100	Rear Rivet	2


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

SERIES COIL & MAGNET ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER POLE — DUAL MAGNETIC 20	50	125	225	400	800	2000	SELECTIVE SERVICE 20	50	125	225	400	800	2000
		SERIES COIL														
7	1101-9771	15-20 Amp Coil	1							1						
6	1101-9772	30-50 Amp Coil		1							1					
5	1151-9994	70-125 Amp Coil			1							1				
4	1151-9755	150-225 Amp Coil				1							1			
3	1151-9756	250-400 Amp Coil					1							1		
2	1151-9776	500-800 Amp Coil						1							1	
1	1101-9440	1000-2000 Amp Coil							1							1
8	1101-9967	Rear Insulation	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1101-9966	Insulation Tube	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1101-9986	Insulation Disc	1	1	16	8	5	3	1	1	1	16	8	5	3	1
		MAGNET CORE ASSEMBLY														
11	1151-9769	Stationary Magnet Assembly							1							1
12	1151-9763	Magnet Core Assembly	1	1	1	1	1	1		1	1	1	1	1	1	
13	1151-9106	Magnet Core Bracket	1	1	1	1	1	1		1	1	1	1	1	1	
14	1101-9948	Center Spacer	1	1	1	1	1	1		1	1	1	1	1	1	
15	1101-9099	Outside Spacer	2	2	2	2	2	2		2	2	2	2	2	2	
16	12R5-118	Rivet	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		POLE FACE ASSEMBLY														
20	1151-9750	Pole Face	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	S6-30	Pole Face Screw	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	1101-9707	Pole Face Plate	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1101-9747	Pole Face Tapped Plate	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1101-9855	Pole Face Indicator Plate	1							1						
26	1101-9856	Pole Face Indicator Plate		1							1					
25	1101-9857	Pole Face Indicator Plate			1							1				
24	1101-9858	Pole Face Indicator Plate				1							1			
23	1101-9859	Pole Face Indicator Plate					1							1		
22	1101-9860	Pole Face Indicator Plate						1							1	
21	1101-9861	Pole Face Indicator Plate							1							1
28	RT2-8A	Pole Face Indicator Plate Rivet	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		ARMATURE ASSEMBLY														
33	1151-9753	Left Hand Armature	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	1151-9754	Right Hand Armature								1	1	1	1	1	1	1
31	1101-9109	Armature Shaft	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	5133-18	Armature Shaft Retaining Ring	2	2	2	2	2	2	2	2	2	2	2	2	2	2
32	1101-9784	Spacer Washer	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1101-9379	Spacer Tube							1							
		MOUNTING HARDWARE														
N	19S-375-40	3/8-16 Bolt 2-1/2" Lg.	2	2	1	1				2	2	1	1			
o	19S-375-48	3/8-16 Bolt 3" Lg.			1	1	1	2	4			1	1	1	2	4
t	19S-375-44	3/8-16 Bolt 2-3/4" Lg.					1							1		
S	19S-500-20	1/2-13 Bolt 1-1/8" Lg.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
h	1W-375	3/8" Lock Washer	4	4	3	2	2	2	2	4	4	3	2	2	2	2
o	W-375	3/8" Washer	4	4	3	2	2	2	2	4	4	3	2	2	2	2
w	1W-500	1/2" Lock Washer	1	1	1	1	1	1	1	1	1	1	1	1	1	1
n	W-500	1/2" Washer	1	1	1	1	1	1	1	1	1	1	1	1	1	1

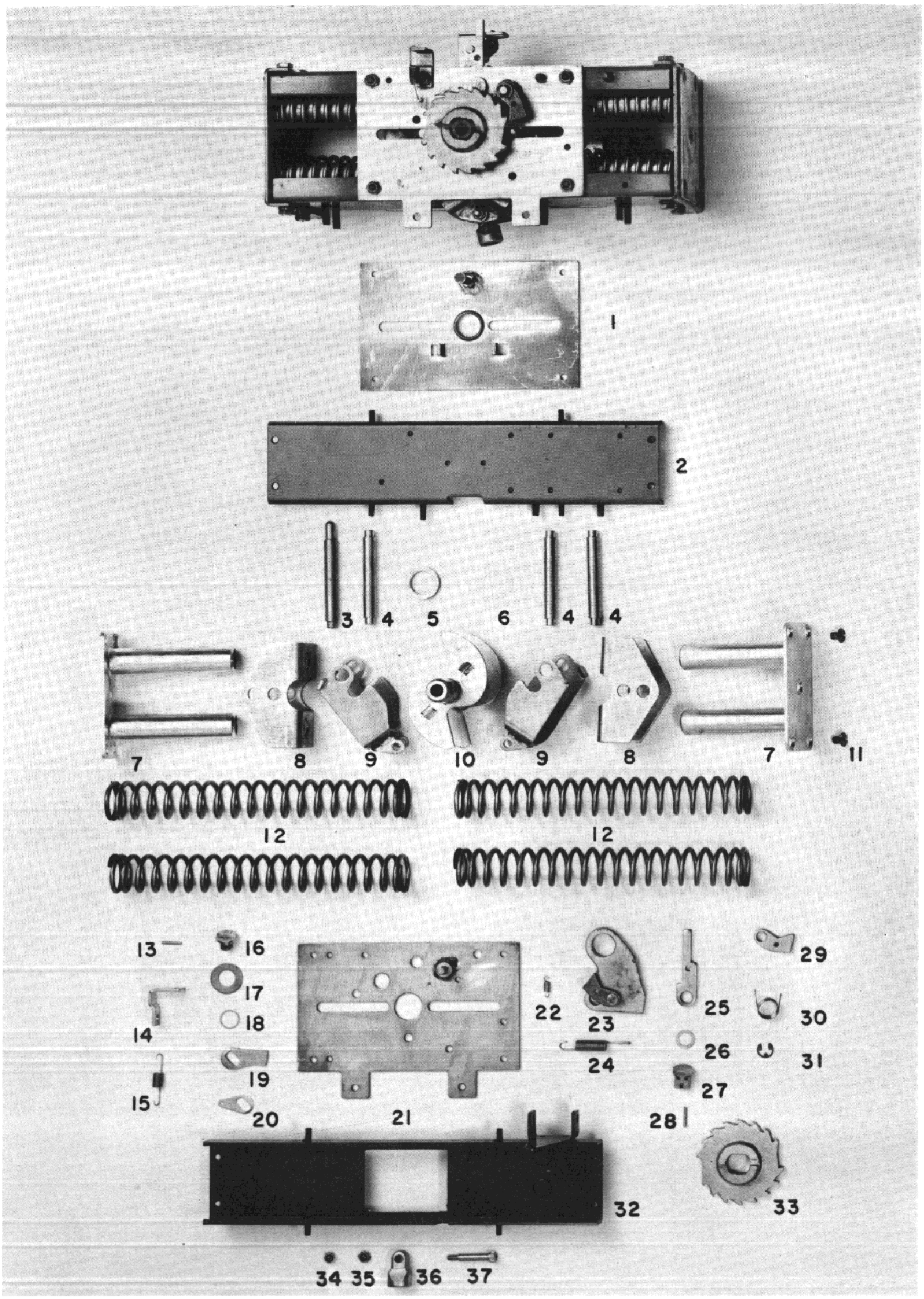

4
3
5
6
7
8
9
10
11
12
2
1

FP-50 SERIES TRIP UNIT

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER POLE
1	1151-9082	Dual Magnetic Series Trip Unit Type TD1 Long Delay & Instantaneous Trip	1
2	1151-9081	Selecting Series Trip Unit Type TD2 Long Delay & Short Delay Trip	1
3	1151-9879	Special Service Trip Unit Type TD3 Long Delay, Short Delay & Instantaneous Trip	1
4	1151-9083	Special Application Trip Unit Type TD4 Long Delay Trip	1

MOUNTING HARDWARE

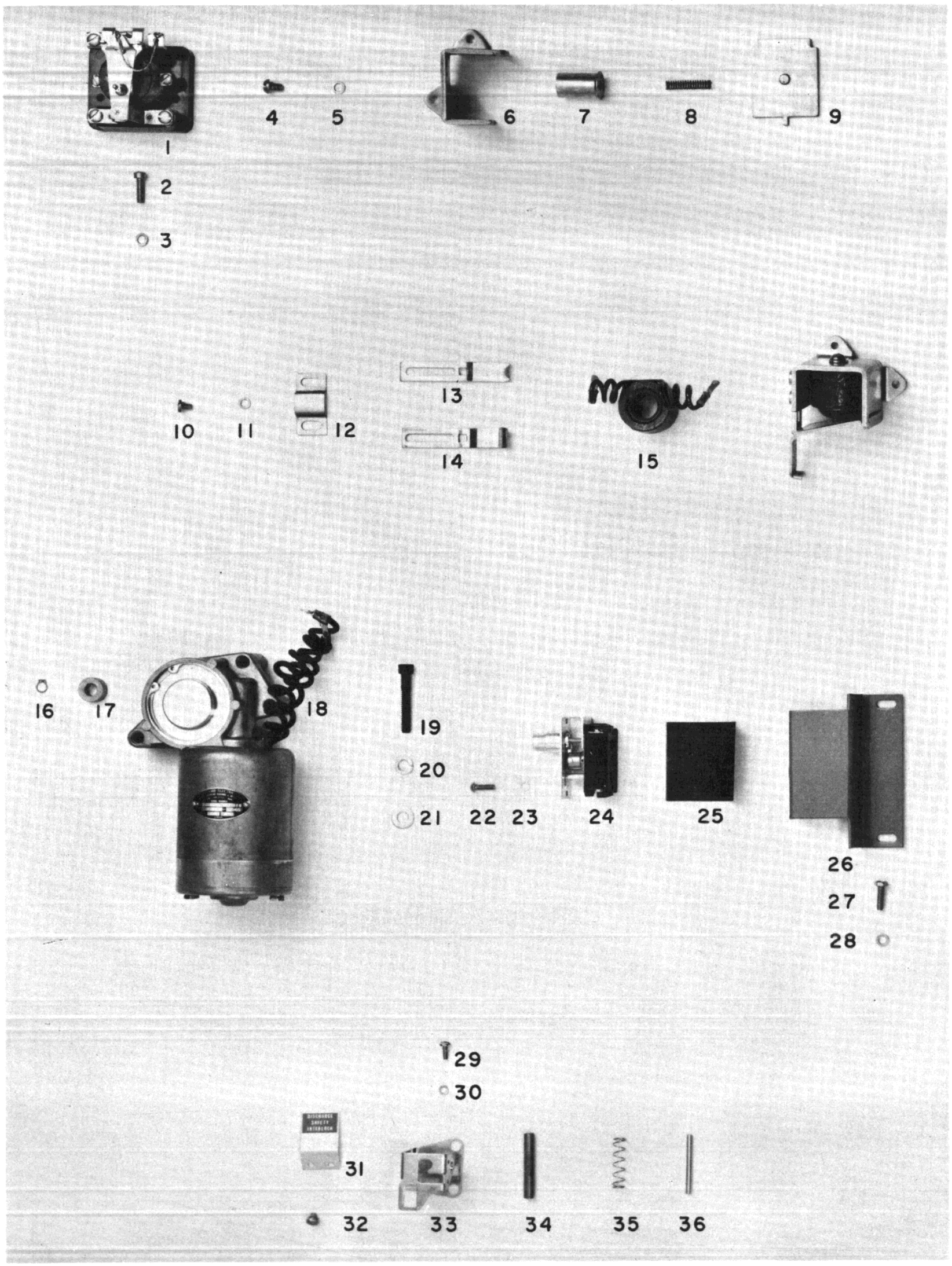
			TD 1 & 4	TD 2 & 3
10	1S-312-7	Mounting Screw	2	2
9	1W-312	Mounting Lock Washer	2	2
8	1101-9128	Trip Arm	1	2
7	N-10	Trip Arm Jam Nut	1	2
6	N-250	Spacer Nut	1	2
5	N-10	Trip Arm Nut	1	2
11	1101-9026	Nylon Turnbuckle	1	2
12	5133-18	Turnbuckle Retaining Ring	1	2


2
3
4
5
6
4
4
7
8
9
10
9
8
7
11
12
12
13
16
17
18
14
19
15
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37

STORED ENERGY MECHANISM

ITEM	PART NUMBER	DESCRIPTION	MANUALLY OPERATED 400	MANUALLY OPERATED 800	MANUALLY OPERATED 2000	ELECTRICALLY OPERATED 400	ELECTRICALLY OPERATED 800	ELECTRICALLY OPERATED 2000
		FRAME ASSEMBLY						
1	1151-B-9538	Rear Plate	1	1	1	1	1	1
1*	1101-9156	Rear Plate						
2	1151-B-9396	Upper Channel	1	1		1	1	
2*	1151-B-9365	Upper Channel			1			1
32	1151-B-9362	Lower Channel	1	1		1	1	
32*	1151-B-9364	Lower Channel			1			1
21	1151-B-9230	Front Plate	1	1	1	1	1	1
34	22TM-02	Assembly Nut	9	9	9	9	9	9
		FRONT PLATE ASSEMBLY						
33	1101-A-9164	Ratchet Gear	1	1	1	1	1	1
29	1101-A-9166	Ratchet Pawl	1	1	1	1	1	1
30	1101-A-9155	Ratchet Pawl Spring	1	1	1	1	1	1
31	5100-25	Ratchet Pawl Retaining Ring	1	1	1	1	1	1
19	1101-A-9450	Cam Stop Latch Plate	1	1	1	1	1	1
20	1101-A-9522	Latch Reset Plate	1	1	1	1	1	1
18	1105-A-9796	Shim Washer	As Required					
17	2701-A-0412	Washer	1	1	1	1	1	1
18	1103-A-9796	Rear Shim Washer	1	1	1	1	1	1
16	1101-A-9521	Cam Stop Pin	1	1	1	1	1	1
13	79-022-094-0375	Cam Stop Roll Pin	1	1	1	1	1	1
27	1101-9222	Close Latch Pin	1	1	1	1	1	1
26	1104-9764	Close Latch Shim	As Required					
25	1101-9151	Close Latch Lever	1	1	1	1	1	1
28	79-022-094-0625	Close Latch Level Roll Pin	1	1	1	1	1	1
14	1101-9248	Cam Stop Reset Spring Support	1	1	1	1	1	1
15	1101-9788	Cam Stop Reset Spring	1	1	1	1	1	1
23	1151-A-9490	Charging Lever Assembly				1	1	1
22	Z-7756-W	Charging Lever Pawl Spring				1	1	1
24	1101-A-9417	Charging Lever Return Spring				1	1	1
		INTERNAL MECHANISM						
10	1151-9374	Cam Assembly	1	1	1	1	1	1
9	1151-9373	Thrust Bracket Assembly	2	2	2	2	2	2
8	1101-A-9241	Spring Holder	2	2	2	2	2	2
3	1101-4684	Guide Pin	2	2	2	2	2	2
4	1101-9229	Guide Pin	2	2	2	2	2	2
5	1101-A-9796	Cam Spacer	1	1	1	1	1	1
6	1102-A-9796	Cam Shim	As Required					
7	1151-9806	Main Spring Guide	2	2		2	2	
7*	1152-9806	Main Spring Guide			2			2
11	1101-9267	Main Spring Guide Screw	10	10	10	10	10	10
12	1112-9606	Main Spring	4	4		4	4	
12*	1111-9606	Main Spring			4			4
36	1101-A-9165	Turnbuckle Head	1	1	1	1	1	1
37	1101-A-9748	Turnbuckle Screw	1	1	1	1	1	1
35	22M-04	Turnbuckle Screw Nut	1	1	1	1	1	1

***SIMILAR TO PART SHOWN**


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

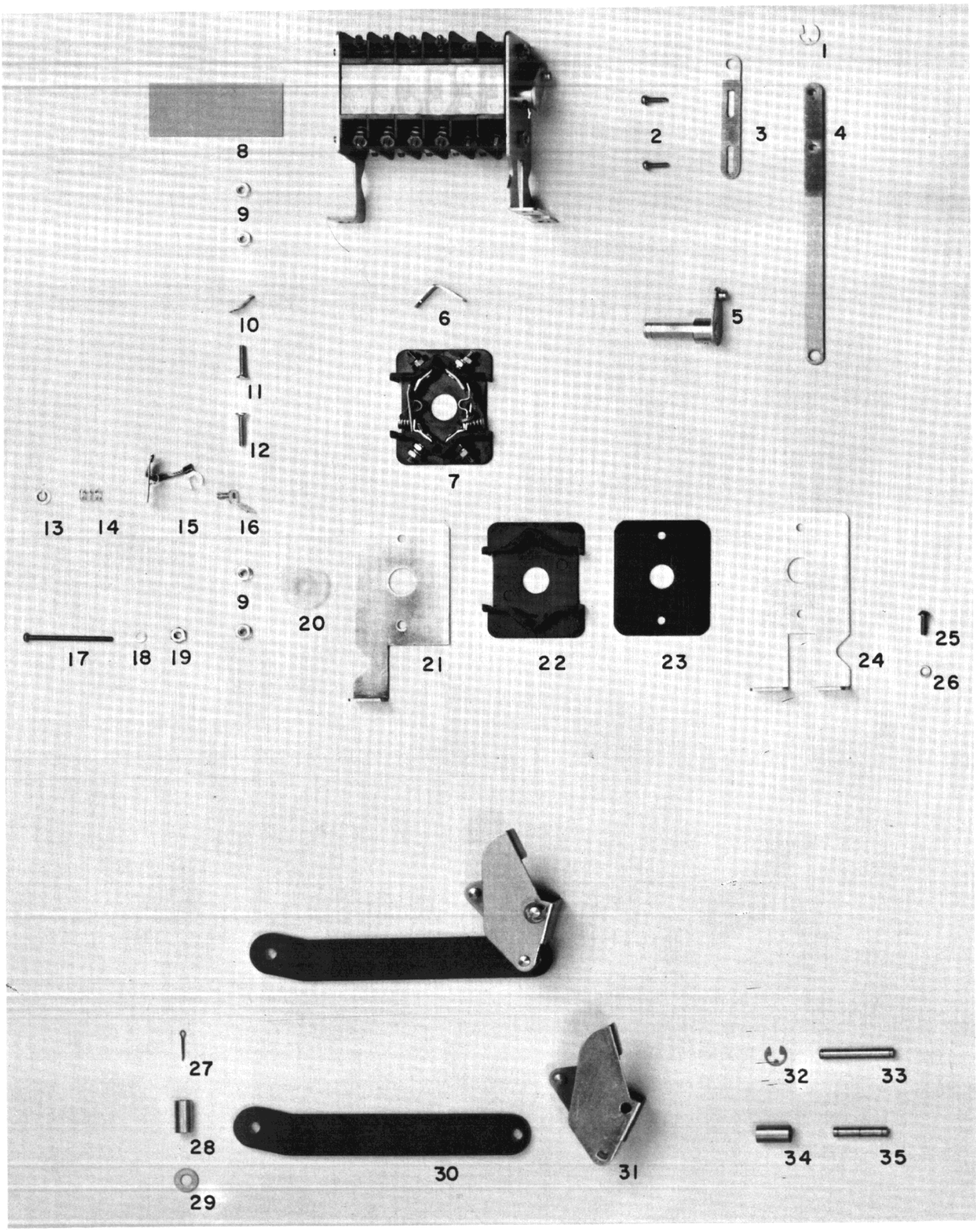
Y-RELAY; CHARGING MOTOR – SHUNT CLOSE; SHUNT TRIP; SAFETY LOCK

ITEM	PART NUMBER	DESCRIPTION	ALL BREAKERS
		Y (ANTI PUMP) RELAY	
1	1151-5569	Y Relay 48V AC	1
1*	1152-5569	Y Relay 115V AC	1
1*	1153-5569	Y Relay 230V AC	1
1*	1154-5569	Y Relay 125V DC	1
1*	1155-5569	Y Relay 250V DC	1
2	S-10-10	Y Relay Mounting Screw	2
3	1W-10	Y Relay Mounting Lock Washer	2
Not Shown	N-10	Y Relay Mounting Nut	2

			SHUNT TRIP	SHUNT CLOSE
		SHUNT TRIP & SHUNT CLOSE		
6	1101-9513	Magnet Frame	1	1
7	1101-9512	Magnet Core	1	1
8	1101-9524	Magnet Spring	1	1
9	1101-9516	Magnet Armature	1	1
15	1151-9818	Coil 24V DC	1	1
15*	1152-9818	Coil 48V DC	1	1
15*	1153-9818	Coil 125V DC	1	1
15*	1154-9818	Coil 250V DC	1	1
15*	1155-9818	Coil 230V AC	1	1
15*	1156-9818	Coil 48V AC	1	1
15*	1157-9818	Coil 115V AC	1	1
15*	1158-9818	Coil 230V AC	1	1
13	1101-9931	Shunt Close Arm		1
14	1101-9690	Shunt Trip Arm	1	
12	1101-A-5583	Guide Plate	1	1
10	S10-4	Guide Plate Screw	2	2
11	2W-10	Guide Plate Lock Washer	2	2
4	S8-8	Mounting Screw	2	2
5	1W8	Mounting Lock Washer	2	2

			400	800	2000
		SPRING CHARGING MOTOR			
18	15058	Spring Charging Motor 48V AC-DC	1	1	1
18*	14975	Spring Charging Motor 115V AC - 125V DC	1	1	
18*	14977	Spring Charging Motor 230V AC - 250V DC	1	1	
18*	14976	Spring Charging Motor 115V AC - 125V DC			1
18*	14978	Spring Charging Motor 230V AC - 250V DC			1
17	1101-9220	Motor Roller	1	1	1
16	5100-31	Motor Roller Retaining Ring	1	1	1
19	1/4-20 x 1-1/2 Lg.	Motor Mounting Screw	3	3	3
20	1W-250	Motor Mounting Lock Washer	3	3	3
21	W-250	Motor Mounting Washer	3	3	3
		MOTOR CUT-OFF SWITCH			
24	1101-A-5543	Motor Cut-Off Switch	1	1	1
25	1101-A-5605	Switch Insulation	1	1	1
22	SF6-32-4	Switch Mounting Screw	2	2	2
23	2W-6	Switch Mounting Lock Washer	2	2	2
26	1101-B-5604	Mounting Bracket	1	1	1
27	1S8-5	Mounting Screw	2	2	2
28	2W-8	Mounting Lock Washer	2	2	2
		STORED ENERGY SAFETY LOCK			
33	1151-9863	Lock Frame	1	1	1
34	1101-9864	Lock Pin	1	1	1
35	1113-9606	Lock Pin Spring	1	1	1
36	50-028-125-1250	Lock Pin Roll Pin	1	1	1
31	1101-9225	Name Plate	1	1	1
32	WS6-2	Name Plate Screw	2	2	2
29	S8-6	Mounting Screw	2	2	2
30	1W-8	Mounting Lock Washer	2	2	2

***SIMILAR TO PART SHOWN**


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
9
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

AUXILIARY SWITCH & SECTOR ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	ELECTRICALLY OPERATED FP-50 BREAKERS 1157-9923 3 UNITS NO EXTRA CONTACTS	ELECTRICALLY OPERATED FP-50 BREAKERS 1158-9923 4 UNITS 2 EXTRA CONTACTS	ELECTRICALLY OPERATED FP-50 BREAKERS 1159-9923 5 UNITS 4 EXTRA CONTACTS	ELECTRICALLY OPERATED FP-50 BREAKERS 1160-9923 6 UNITS 6 EXTRA CONTACTS	MANUALLY OPERATED FP-50 BREAKERS 1161-9923 3 UNITS 6 EXTRA CONTACTS
AUXILIARY SWITCH							
7	C-46422	Unit Assembly	3	4	5	6	3
24	1101-9914	Right End Mounting Bracket	1	1	1	1	1
23	A-356791	End Insulation	1	1	1	1	1
21	1102-9914	Left End Mounting Bracket	1	1	1	1	1
20	1101-9815	Switch Cam	6	8	10	12	6
6	C-45287	Terminal Jumper	2	2	2	2	
8*	1101-9961	Contact Insulation Panel					
8*	1102-9961	Contact Insulation Panel	2				2
8*	1103-9961	Contact Insulation Panel		2			
8	1104-9961	Contact Insulation Panel			2		
8*	1105-9961	Contact Insulation Panel				2	
17*	S8-38	Switch Assembly Screw	2				2
17*	S8-48	Switch Assembly Screw		2			
17*	S8-58	Switch Assembly Screw			2		
17	S8-68	Switch Assembly Screw				2	
5	1151-9911	Operating Shaft Assembly	1	1	1	1	1
4	1101-9890	Drive Link Long	1	1	1	1	1
1	5133-25	Drive Link Retaining Ring	2	2	2	2	2
3	1101-9501	Drive Link Short	1	1	1	1	1
2	WS6-4	Drive Link Lock Screw	2	2	2	2	2
25	S8-5	Mounting Screw	3	3	3	3	3
26	1W-8	Mounting Lock Washer	3	3	3	3	3
18	1W-8	Switch Assembly Lock Washer	2	2	2	2	2
19	N-8	Switch Assembly Nut	2	2	2	2	2

UNIT ASSEMBLY C-46422

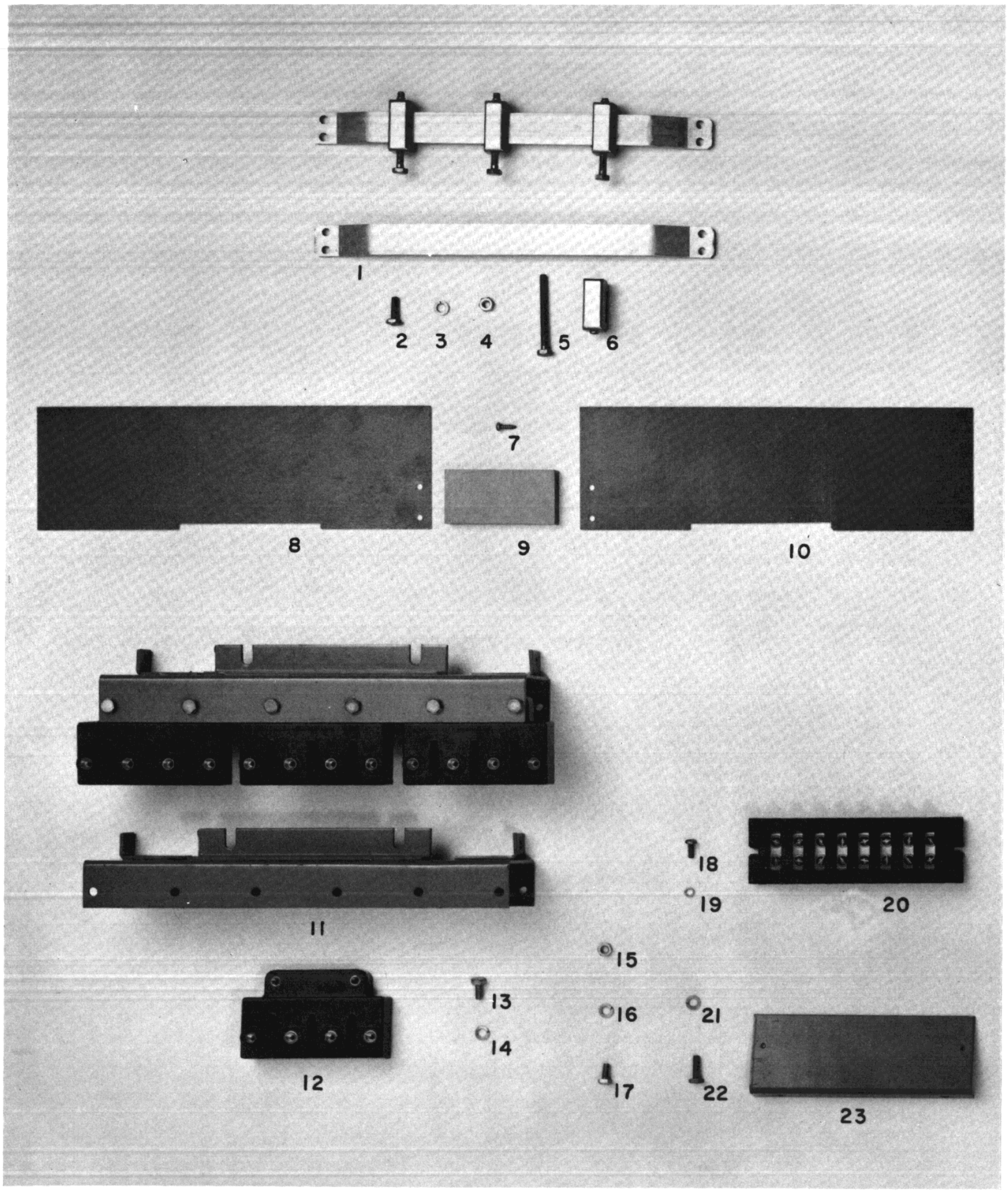
			NUMBER REQUIRED PER UNIT ASSEMBLY
22	D-45276	Unit Housing	1
15	C-45278	Moving Contact Assembly	2
16	C-45293	Moving Contact Support	2
14	C-45300	Moving Contact Spring	2
13	C-45299	Moving Contact Spring Retainer	2
12	C-45286-1	Lower Terminal Stud	2
11	C-45286-1	Upper Terminal Stud	2
9	A-125019-1	Terminal Nut	8
10	C-45298	Stationary Contact	2

COMMON LINKAGE ASSEMBLY

(Operates: C.O. Indicator Bell-Alarm, Under Voltage, Auxiliary Switch)

			400A	800A	2000A
31	1151-9508	Sector Assembly	1		
31	1151-9821	Sector Assembly		1	
33	1101-9509	Sector Pivot Pin	1		
33*	1101-9822	Sector Pivot Pin		1	
30	1101-9506	Sector Drive Link	1	1	
29	W-250	Spacer Washer	As Required		
28	1102-5586	Spacer			1
27	1503-2639	Cotter Pin	1	1	1
35	1101-9505	Drive Pin	1	1	
35*	1101-9823	Drive Pin			1
34	1101-5586	Drive Pin Spacer	1	1	
34*	1103-5586	Drive Pin Spacer			1
32	5133-25	Drive & Pivot Pin Retaining Ring	5	5	5

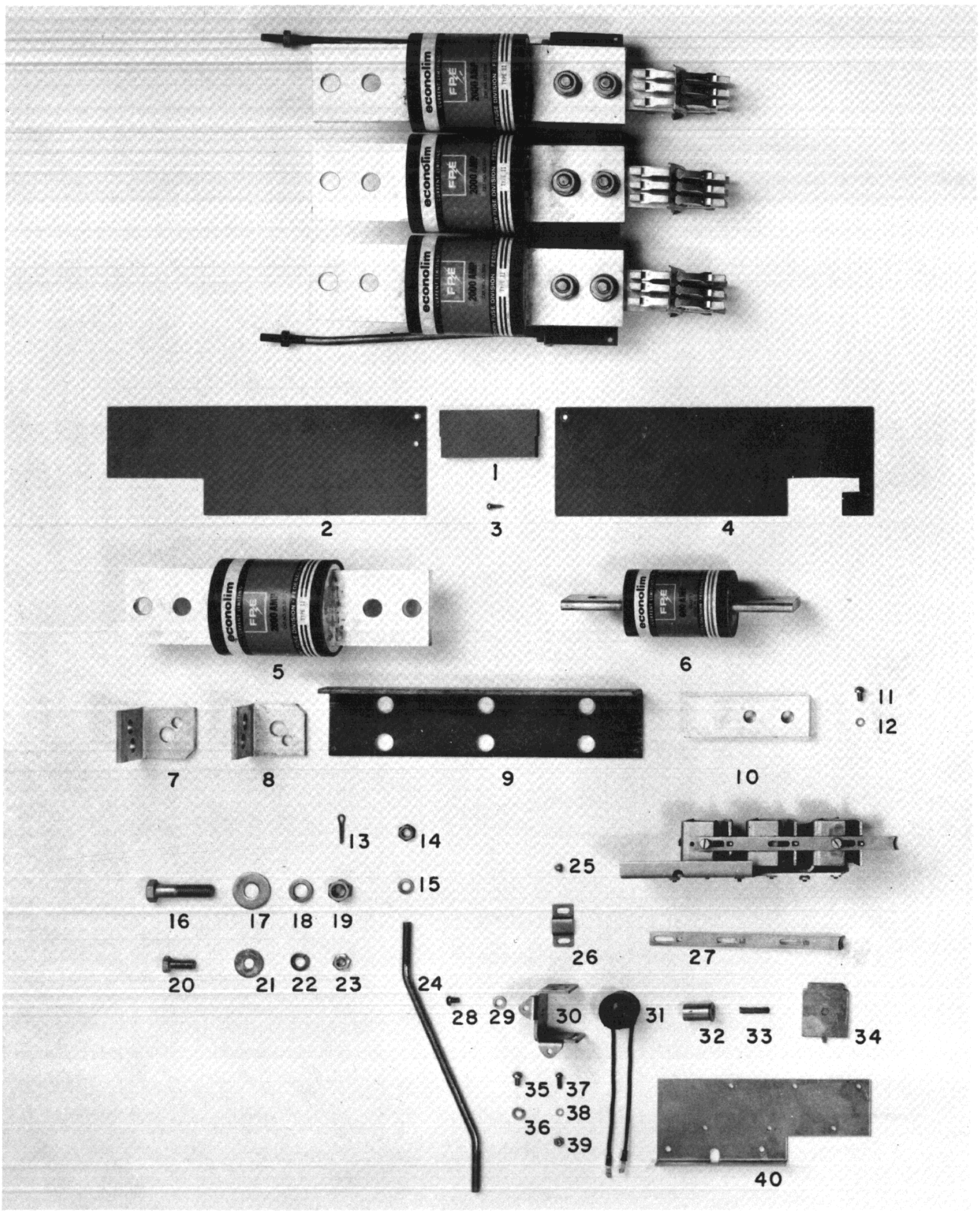
***SIMILAR TO PART SHOWN**


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

ARC-CHUTE RETAINING BAR – INTERPHASE BARRIER
AUXILIARY CONTACT ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	400A FRAME	800A FRAME	2000A FRAME
		ARC-CHUTE RETAINING BAR			
1	1101-9887	Arc-Chute Retaining Bar	1	1	
1*	1101-9888	Arc-Chute Retaining Bar			1
6	1101-9885	Retaining Screw Holder	3	3	3
5	1S-250-40	Retaining Screw	3	3	3
2	1S-250-12	Mounting Screw	4	4	4
3	1W-250	Mounting Lock Washer	4	4	4
4	N-250	Mounting Nut	4	4	4
		INTERPHASE BARRIER (2 Req. Per Breaker)			
9	1101-9289	Spacer Block	1	1	
9*	1102-9289	Spacer Block			1
8	1101-9288	Left Barrier	1	1	1
10	1101-9288	Right Barrier	1	1	1
7	SA8-8	Assembly Screw	4	4	4
		SECONDARY CONTACT ASSEMBLY DRAW-OUT BREAKERS (1 Req. Per Breaker)			
11	1151-9403	Secondary Contact Bracket	1	1	1
12	1151-0631	Secondary Contact Block		As Required (1 to 6)	
13	1S-250-7	Secondary Contact Mounting Screw		2 Per Block (Item 12)	
14	1W-250	Secondary Contact Mounting Lock Washer		2 Per Block	
Not	3S10-7	Wire Binding Screw		4 Per Block	
Shown	1W-10	Wire Binding Lock Washer		4 Per Block	
17	1S-250-12	Mounting Screw	4	4	4
16	1W-250	Mounting Lock Washer	4	4	4
15	N-250	Mounting Nut	4	4	4
		FIXED MOUNTED			
20	121-012	Terminal Block	1	1	1
23	1101-5518	Mounting Bracket	1	1	1
18	1S-8-14	Terminal Block Mounting Screw	2	2	2
19	1W-8	Terminal Block Mounting Lock Washer	2	2	2
22	1S-250-8	Mounting Screw	2	2	2
21	1W-250	Mounting Lock Washer	2	2	2

***SIMILAR TO PART SHOWN**


econolim
FRÉ
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

FM-50 FUSEMATIC ATTACHMENTS

ITEM	PART NUMBER	DESCRIPTION	NUMBER REQUIRED PER CIRCUIT BREAKER 800A FRAME J	800A FRAME J	800A & 2000A FRAME L	800A & 2000A FRAME L	800A & 2000A FRAME L	800A & 2000A FRAME L	2000A FRAME L
		FUSE							
6*	P1690	Econolim Fuse "J" 201 to 400 Amp	3						
6	P1690	Econolim Fuse "J" 401 to 600 Amp		3					
5*	P1700	Econolim Fuse "L" Type II 601 to 800 Amp			3				
5*	P1700	Econolim Fuse "L" Type II 801 to 1200 Amp				3			
5*	P1700	Econolim Fuse "L" Type II 1201 to 1600 Amp					3		
5	P1700	Econolim Fuse "L" Type II 1601 to 2000 Amp						3	
5*	P1700	Econolim Fuse "L" Type II 2100 to 3000 Amp							3
		FUSE MOUNTING ACCESSORIES							
7	1101-8108	Right Hand "J" Fuse Adaptor	3	3					
8	1101-8107	Left Hand "J" Fuse Adaptor	3	3					
9	1101-8102	Fuse Support Insulator, 800 only	1	1	1	1	1	1	
9*	1101-8202	Fuse Support Insulator, 2000 only			1	1	1	1	1
10	1101-8101	Stab Adaptor, 800 only	3	3	3	3	3	3	
10*	1101-8201	Stab Adaptor, 2000 only			3	3	3	3	3
24	1101-8103	Supporting Rod	2	2	2	2	2	2	2
14	N-312	Supporting Rod Nut	8	8	8	8	8	8	8
15	1W-312	Supporting Rod Lock Washer	8	8	8	8	8	8	8
16	19S-500-32	"L" Fuse Mounting Bolt			12	12	12	12	12
16*	19S-500-24	"J" Fuse Mounting Bolt	12	12					
16*	19S-250-20	"J" Fuse Mounting Bolt 401 to 600 Amp only		6					
17	W500	Fuse Mounting Washer	12	18	12	12	12	12	12
18	1W500	Fuse Mounting Lock Washer	12	18	12	12	12	12	12
19	N500	Fuse Mounting Nut	12	18	12	12	12	12	12
20	19S-375-15	Fuse Mounting Bolt	6						
21	W375	Fuse Mounting Washer	6						
22	1W375	Fuse Mounting Lock Washer	6						
23	N375	Fuse Mounting Nut	6						

INTERPHASE BARRIER

800A FM-50 FRAME 1601 - 2000 AMP FUSE

			800A FRAME
LINE (UPPER STUD) FUSE MOUNTING			
2	1101-8109	Inside Barrier	4
1*	1101-8113	Spacer	2
Not Shown	Stimpson A 1730	Assembly Eyelet	8
LOAD SIDE (LOWER STUD) FUSE MOUNTING			
LEFT HAND BARRIER			
2	1101-8109	Inside Barrier	1
4	1101-8104	Outside Barrier	1
1	1101-8110	Spacer	1
3	SA8-8	Assembly Screw	4
RIGHT HAND BARRIER			
2	1101-8109	Inside Barrier	1
4	1101-8114	Outside Barrier	1
1*	1101-8113	Spacer	1
Not Shown	Stimpson A 1730	Assembly Eyelet	4

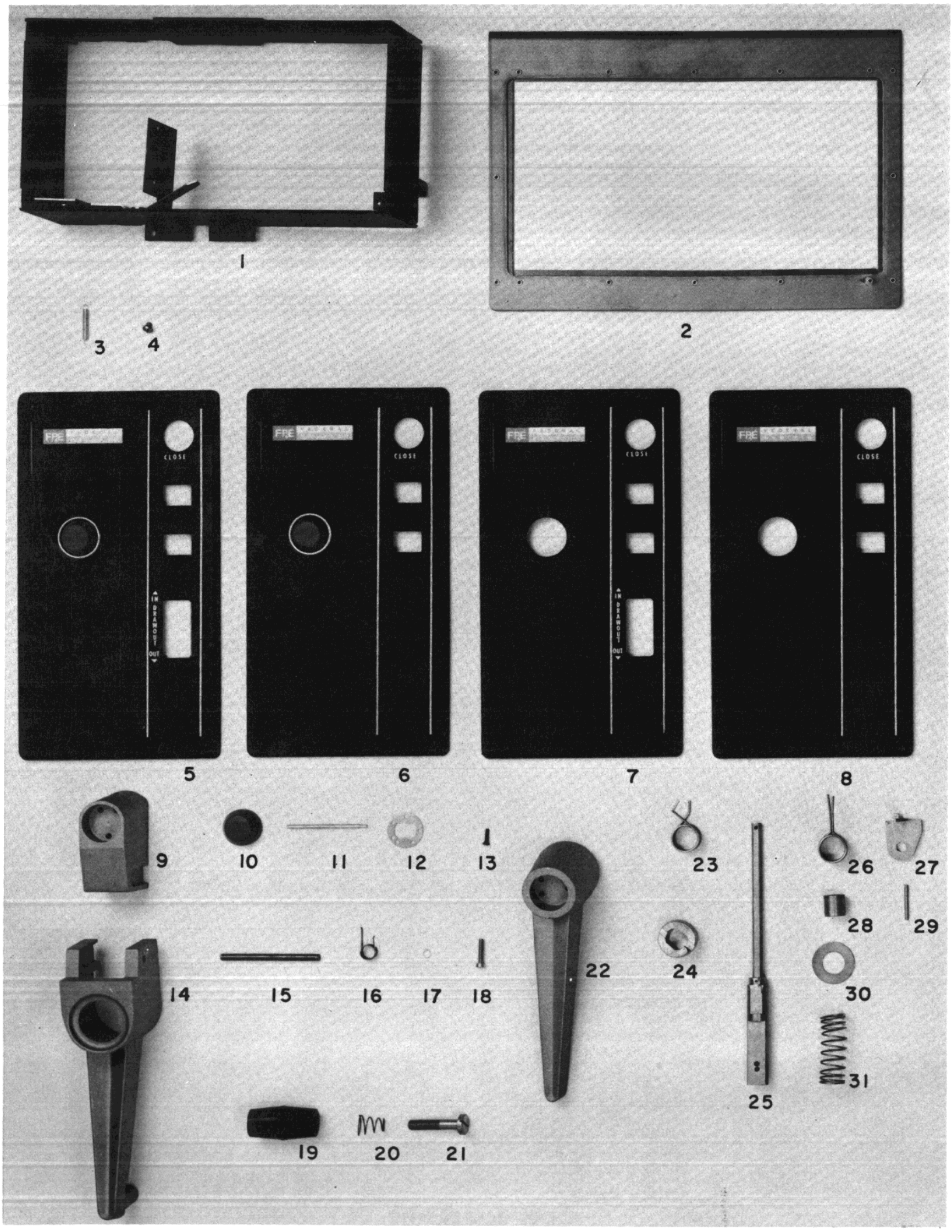
SINGLE PHASE PROTECTIVE DEVICE

			800A & 2000A FRAME
40	1101-B-8105	Mounting Plate	1
27	1101-A-8106	Tripping Arm	1
30	1101-9513	Magnet Frame	3
31	1151-B-9818	Magnet Coil	3
32	1101-9512	Magnet Core	3
28	S12-5B	Magnet Core Screw	3
29	1W-12	Magnet Core Lock Washer	3
33	1101-A-9524	Magnet Core Spring	3
34	1101-A-9516	Armature Plate	3
26	1101-A-5583	Guiding Plate	2
25	S10-4	Guide Plate Mounting Screw	2
Not Shown	2W10	Guide Plate Mounting Lock Washer	2
37	S8-5	Magnet Assembly Mounting Screw	6
38	1W-8	Magnet Assembly Mounting Lock Washer	6
39	N-8	Magnet Assembly Mounting Nut	6
35	S 250-10	Assembly Mounting Screw	3
36	1W-250	Assembly Mounting Lock Washer	3
Not Shown	N-250	Assembly Mounting Nut	3

WIRING ACCESSORIES

11	S10	Wire Mounting Screw	3
12	2W10	Wire Mounting Lock Washer	3
Not Shown	S-250	Wire Mounting Screw	3
Not Shown	2W-250	Wire Mounting Lock Washer	3

***SIMILAR TO PART SHOWN**


1
2
3
4
CLOSE
IN DRAWOUT OUT
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

FRONT BOX ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	ELECT. DRAWOUT	ELECT. FIXED	MAN. DRAWOUT	MAN. FIXED	MAN. & ELECT. DRAWOUT	MAN. & ELECT. FIXED
1	1151-9695	Front Box Assembly	1	1	1	1	1	1
2	M51-9810	Front Box Screen	1	1	1	1	1	1
5	1151-C-9844	Front Box Cover Assembly	1					
6	1151-9998	Front Box Cover Assembly		1				
7	1151-9845	Front Box Cover Assembly			1		1	
8	1151-9999	Front Box Cover Assembly				1		1
3	1101-9718	Lock Lever Spring	1	1	1	1	1	1
13	17S6-4	Front Box Cover Mounting Screw	4	4	4	4	4	4
4	WS-10-6	Front Box Mounting Screw	3	3	3	3	3	3

2000 AMP MANUAL CHARGING HANDLE ASSEMBLY

9	1101-9278	Charging Handle Hub			1	1	1	1
14	1101-9279	Charging Handle			1	1	1	1
15	1102-A-9215	Handle Pivot Pin			1	1	1	1
16	1101-9846	Handle Spring			1	1	1	1
17	5133-25	Handle Pivot Pin Retaining Ring			2	2	2	2
19	1101-9560	Handle Knob			1	1	1	1
20	1101-9846	Handle Knob Spring			1	1	1	1
21	1101-9561	Handle Knob Screw			1	1	1	1
10	1101-A-9562	Trip Button			1	1	1	1
11	1102-A-9563	Trip Button Pin			3	3	3	3
12	1101-9149	Trip Button Plate			1	1	1	1
18	6S10-32	Handle Mounting Screw			1	1	1	1
Not Shown	1W-10	Handle Mounting Lock Washer			1	1	1	1

FP 50-400 & -800 MANUAL CHARGING HANDLE

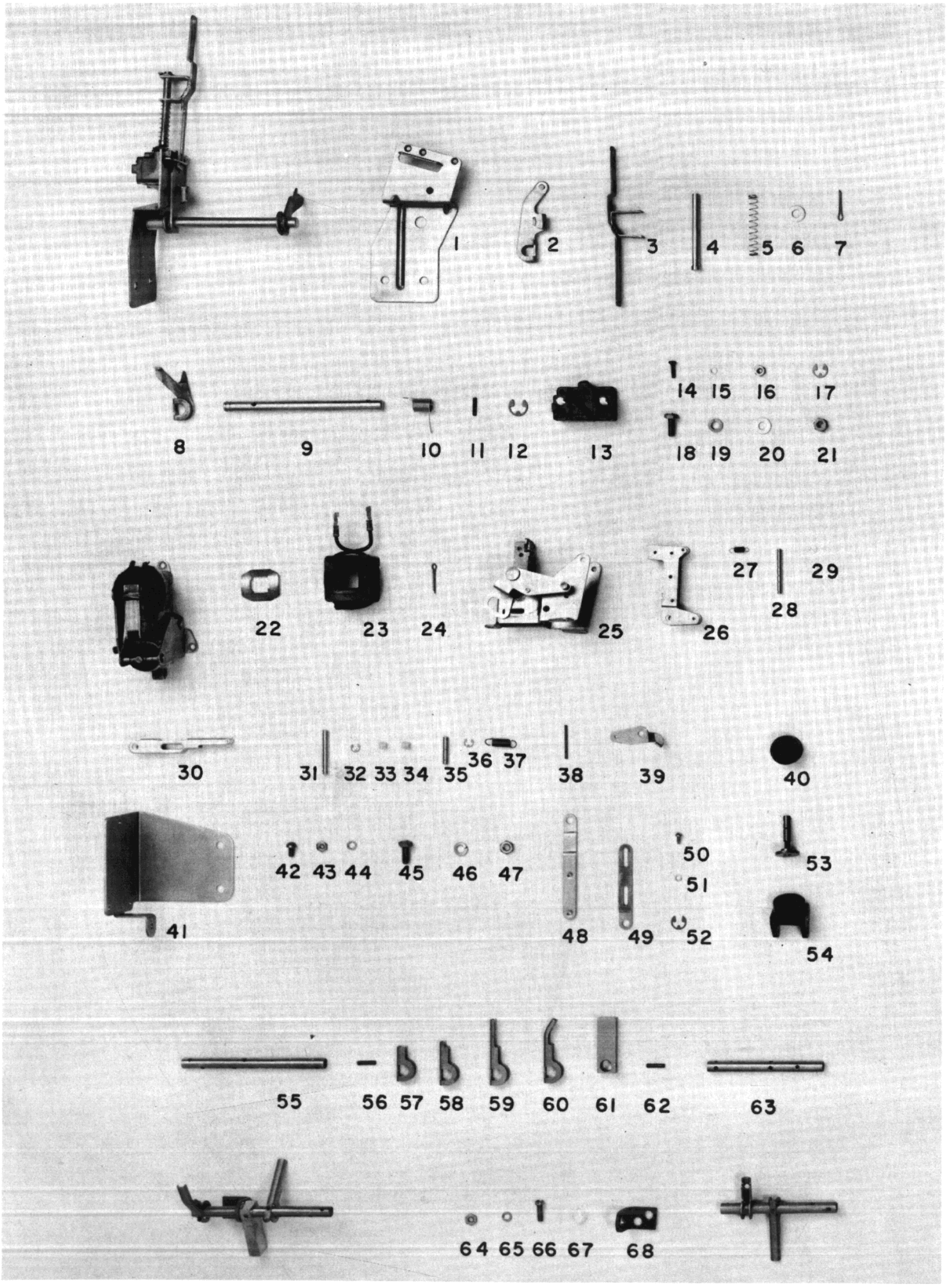
22	1151-9807	Charging Handle			1	1	1	1
10	1101-A-9562	Trip Button			1	1	1	1
11*	1101-A-9563	Trip Button Pin			3	3	3	3
12	1101-9149	Trip Button Plate			1	1	1	1
18	6S10-32	Handle Mounting Screw			1	1	1	1
Not Shown	1W-10	Handle Mounting Lock Washer			1	1	1	1

CHARGING SHAFT ASSEMBLY

(All Manual and Manual & Electrical FP-50 Breakers)

25	1151-9479	Charging Shaft Assembly			1	1	1	1
24	1101-9310	Manual Charging Dog			1	1	1	1
31	1115-9606	Dog Spring			1	1	1	1
30	2703-A-0412	Dog Washer			1	1	1	1
23	1101-9306	Handle Centering Spring						1
26	1101-9301	Handle Centering Spring			1	1		
28	1101-9549	Spring Guide			1	1	1	
27	1101-9548	Centering Spring Lever			1	1	1	1
29	99-028-125-1000	Centering Spring Lever Retaining Pin			1	1	1	1

***SIMILAR TO PART SHOWN**


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68

BELL-ALARM, UNDERVOLTAGE
TRIP SHAFT EXTENSIONS

BELL ALARM ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	400	800	2000
1	1101-9896	Mounting Plate	1	1	1
2	1101-9899	Deflector Arm	1	1	1
3	1151-9902	Operating Link	1	1	1
17	1533-25	Operating Link Retaining Ring	1	1	1
4	1101-5587	Operating Pin	1	1	1
5	1123-9606	Operating Pin Spring	1	1	1
6	W-250	Operating Pin Washer	1	1	1
7	1503-A-2639	Operating Pin Cotter Pin	1	1	1
8	1101-9898	Deflection Shaft Drive Arm	1	1	1
9	1101-9897	Deflection Shaft	1	1	
9*	1102-9897	Deflection Shaft			1
10	1101-9900	Deflection Shaft Return Spring	1	1	1
11	59-028-125-0500	Deflection Arm & Drive Arm Pin	2	2	2
12	5133-37	Deflection Shaft Retaining Ring	2	2	2
13	120-001	Bell-Alarm Switch	1	1	1
14	10S6-8	Bell-Alarm Switch Mounting Screw	2	2	2
15	1W6	Bell-Alarm Switch Mounting Lock Washer	2	2	2
16	N-6	Bell-Alarm Switch Mounting Nut	2	2	2
18	19S-250-8	Bell-Alarm Mounting Screw	2	2	2
19	1W-250	Bell-Alarm Mounting Lock Washer	2	2	2
20	W-250	Bell-Alarm Mounting Washer	2	2	2
21	N-250	Bell-Alarm Mounting Nut	2	2	2

UNDERVOLTAGE TRIP DEVICE

ITEM	PART NUMBER	DESCRIPTION	INST. TRIP	DELAYED TRIP
25	1151-9493	Stationary Magnet & Bracket Assembly	1	1
23	1151-9817	Undervoltage Coil 115V AC	1	1
23*	1152-9817	Undervoltage Coil 230V AC	1	1
23*	1153-9817	Undervoltage Coil 460V AC	1	1
23*	1154-9817	Undervoltage Coil 575V AC	1	1
23*	1155-9817	Undervoltage Coil 125V DC	1	1
23*	1156-9817	Undervoltage Coil 250V DC	1	1
22	1101-9461	Coil Retaining Spring	1	1
24	1508-2639	Coil Retaining Cotter Pin	1	1
26	1151-9494	Armature Assembly	1	1
27	1101-9478	Pull Off Spring	2	2
28	1101-9479	Pull Off Spring Pin	1	1
29	1533-15	Pull Off Spring Pin Retaining Ring	2	2
30	1151-5511	Tripping Ram Assembly	1	1
31	1101-9469	Armature Pivot Pin	1	1
32	5133-18	Armature Pivot Pin Retaining Ring	2	2
33	1101-9473	Armature Pivot Pin Spacer	1	1
34	1101-9472	Armature Pivot Pin Spacer	1	1
35	1101-9468	Drive Pin	1	1
36	1533-18	Drive Pin Retaining Ring	2	2
37	1101-9470	Main Spring	1	1
38	1101-9480	Latch Pin	1	1
39	1101-9471	Armature Latch Lever	1	1
40	1101-9485	Dash Pot Gasket		1
53	1151-9495	Piston Assembly		1
54	1101-9481	Dash Pot Housing		1
41	1101-9500	Mounting Bracket	1	1
42	S8-8	Undervoltage Unit Mounting Screw	4	4
44	1W-8	Undervoltage Unit Mounting Lock Washer	4	4
43	N8	Undervoltage Unit Mounting Nut	4	4
45	19S-250-8	Mounting Screw	2	2
46	1W-250	Mounting Lock Washer	2	2
47	N-250	Mounting Nut	2	2
48	1101-9502	Reset Link	1	1
49	1101-9501	Reset Link	1	1
50	S6-4	Reset Link Screw	2	2
51	1W-6	Reset Link Lock Washer	2	2
52	5133-25	Reset Link Retaining Ring	2	2

TRIP SHAFT EXTENSIONS

ITEM	PART NUMBER	DESCRIPTION	FP-50 400	FP-50 800	FP-50 2000
55	1101-9779	Left Hand Shaft Extension	1	1	
55*	1101-9781	Left Hand Shaft Extension			1
63	1101-9778	Right Hand Shaft Extension	1	1	
63*	1101-9782	Right Hand Shaft Extension			1
56	59-028-125-0500	Shaft Extension Coupling Pin	2	2	2
57	1101-9531	Trip Finger	1	1	1
58	1102-9531	Trip Finger	1	1	1
59	1103-9531	Trip Finger	2	2	2
60	1101-9385	Trip Finger	1	1	1
61	1101-9309	Counter Weight	1	1	1
62	59-028-125-0625	Trip Finger Roll Pin	6	6	6
68	1101-9402	Shaft Extension Support	2	2	2
67	6L1-FF	Shaft Extension Bearing Thomson Industries	2	2	2
66	S8-8	Shaft Extension Support Mounting Screw	4	4	4
65	1W-8	Shaft Extension Support Mounting Screw Lock Washer	4	4	4
64	N-8	Shaft Extension Support Mounting Nut	4	4	4

***SIMILAR TO PART SHOWN**