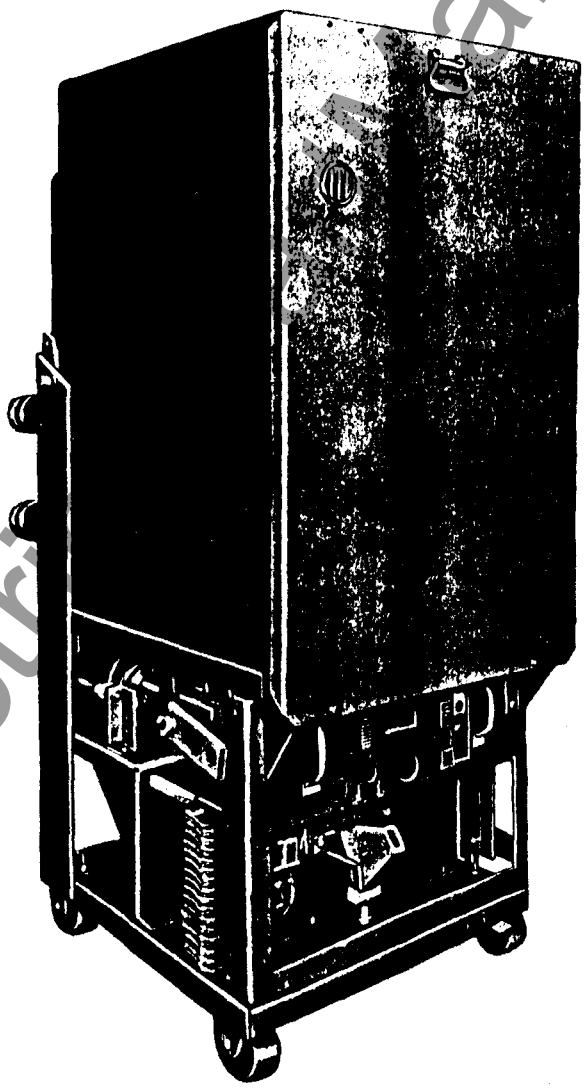
METAL-CLAD SWITCHGEAR

INSTRUCTIONS

TYPE HV CIRCUIT BREAKERS

7.5 AND 15 KV; 150, 250, AND 500 MVA

1200 AND 2000 AMPERES



Models

G4	K2	N2
H3	L4	P2
J2	M2	R2

I-T-E CIRCUIT BREAKER COMPANY • PHILADELPHIA 30, PENNSYLVANIA

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NEW

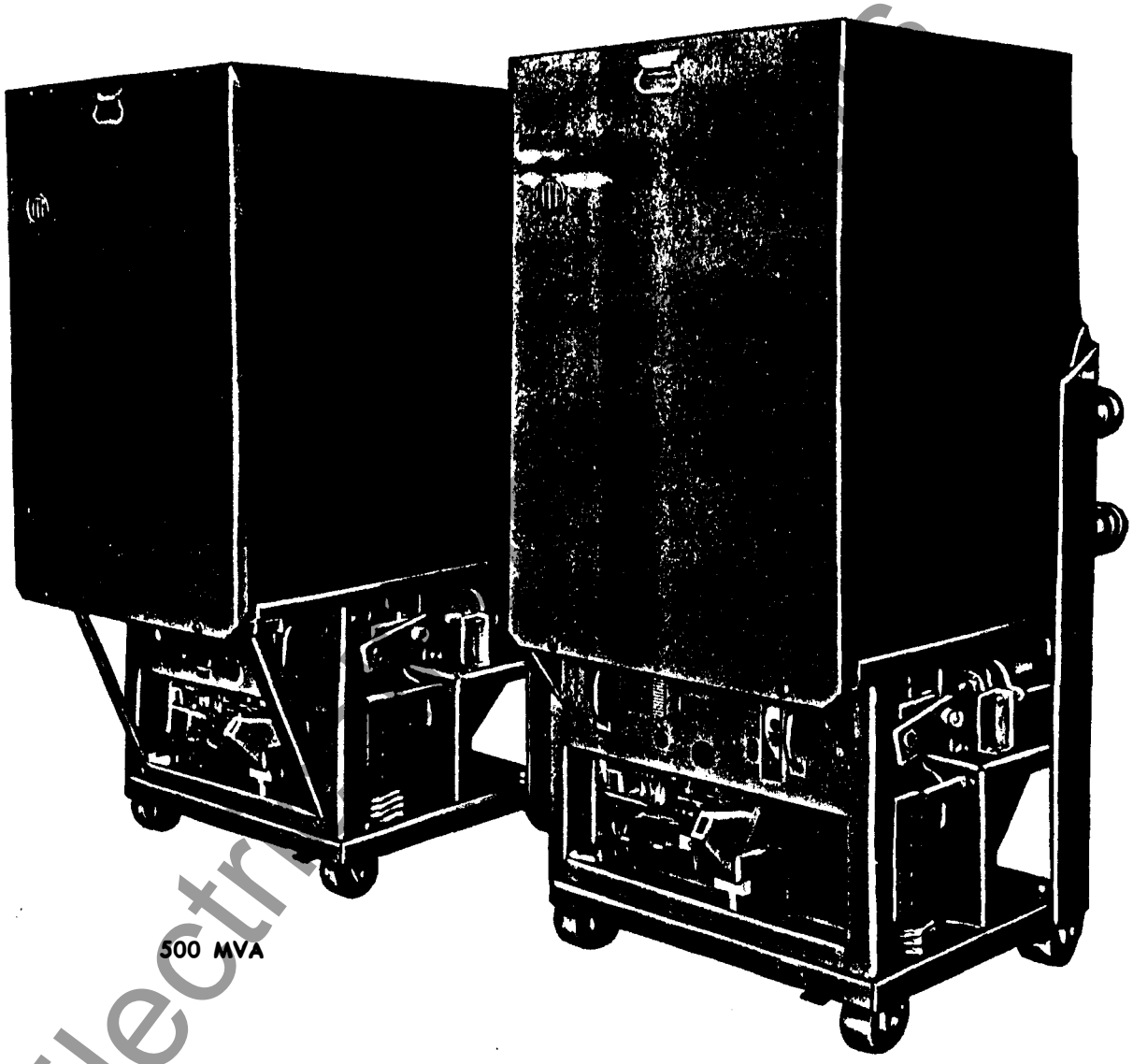


Photo 26736-R

Fig. 1—Typical of Type HV Circuit Breakers, 7.5 or 15KV, 1200 or 2000 Amperes

INSTRUCTIONS FOR TYPE HV CIRCUIT BREAKERS 7.5 AND 15 KV; 150, 250, AND 500 MVA 1200 AND 2000 AMPERES

INTRODUCTION

These instructions apply to the circuit breaker types and models listed in Table I. The circuit breaker model is designated by the serial number suffix as stamped on the nameplate.

TABLE I

Type	Current Rating Amperes	Model
7.5 HV-250	1200	G4
7.5 HV-250	2000	H3
7.5 HV-500	1200	J2
7.5 HV-500	2000	K2
15 HV-150	1200	L4
15 HV-250	1200	M2
15 HV-250	2000	N2
15 HV-500	1200	P2
15 HV-500	2000	R2

Read these instructions thoroughly and carefully before installing or attempting to operate the power circuit breakers described in this bulletin. The operator can prolong the life and usefulness of this equipment by following these instructions.

The circuit breakers, as shown in Fig. 1, are three-pole, electrically operated circuit breakers designed for use in drawout switchboard installations. The circuit breakers consist of a control panel, operating mechanism, solenoid, upper and lower current carrying parts, arc chute and blowout structure assemblies, racking and indicator assembly, and the necessary supporting structure.

RATINGS

The rating of each circuit breaker is stamped on a nameplate which is attached to the lower front panel.

The circuit breakers are designed for applications on a-c voltages, and are available in the ratings listed in Table II.

RECEIVING, HANDLING, AND STORAGE

Each power circuit breaker, before leaving the I-T-E Circuit Breaker Company is carefully inspected and tested for proper operation and then crated by workmen who are experienced in the proper handling and packing of electrical equipment. Each crate is plainly marked at convenient places with the crate number, weight and handling position.

TABLE II

Type	Current Rating Amperes	Interrupting Rating MVA	Voltage Rating	
			Minimum	Maximum
7.5 HV-250	1200	250	4600	8250
7.5 HV-250	2000	250	4600	8250
7.5 HV-500	1200	500	6600	8250
7.5 HV-500	2000	500	6600	8250
15 HV-150	1200	150	6600	15000
15 HV-250	1200	250	6600	15000
15 HV-250	2000	250	6600	15000
15 HV-500	1200	500	11500	15000
15 HV-500	2000	500	11500	15000

TRANSPORTATION DAMAGE

Immediately upon receipt of the circuit breakers, examine the crates to determine if any damage or loss was sustained during transit. If injury or rough handling is evident, file a damage claim once with the carrier and promptly notify the I-T-E Circuit Breaker Company. The I-T-E Circuit Breaker Company is not responsible for damage of goods after delivery to the carrier. However, the company will lend assistance in securing any adjustment if notified of such claims.

HANDLING

Unpack the circuit breakers as soon as possible after receipt. If unpacking is delayed, difficulty may be experienced in making a claim for damages not evident upon receipt.

Use care in unpacking in order to avoid damaging any of the circuit breaker parts. Check the contents of each package against the packing list before discarding any packing material. If any shortage of material is discovered, promptly notify the nearest representative of the I-T-E Circuit Breaker Company. Information specifying the purchase number, crate number, and part numbers of the damaged or missing parts should accompany the claim.

STORAGE

When a circuit breaker can be installed in its permanent location, it is advisable to do so even though it will not be placed in service for some time, unless conditions of high humidity prevail and it is not possible to energize space heaters equipment.

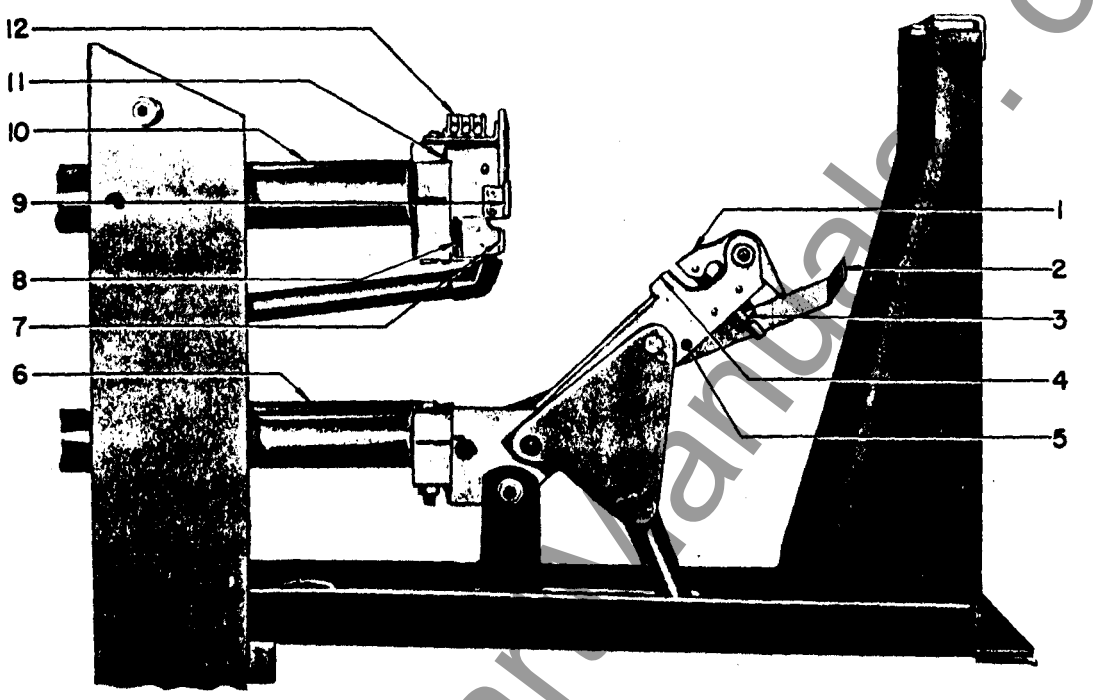


Photo 26905-R-A

1 Movable Arcing Contact
2 Return Connection
3 Arcing Contact Spring
4 Movable Main Contact
5 Movable Bridge Assembly
6 Lower Current Stud
7 Stationary Main Contact
8 Main Contact Spring (Lower)
9 Stationary Arcing Contact
10 Upper Current Stud
11 Main Contact Spring (Upper)
12 Arc Chute Disconnect Contact

Fig. 2—Partial View of Circuit Breaker Showing Contact Assembly

If the circuit breaker can not be installed in its permanent location, or the high humidity condition listed above prevails, the following precautions should be taken:

1. Uncrate the circuit breaker as describ under section HANDLING.

2. Cover with heavy wrapping paper to prevent dirt or foreign substances from settling on the movable parts and electrical contact surfaces.

3. Store in a clean, dry place with moderate temperatures.

DESCRIPTION

The circuit breaker is electrically operated against heavy compression springs located back of the main and arcing contacts and in the operating mechanism and linkage. During inspection and maintenance periods, with the circuit breaker in the "TEST" position, the circuit breaker may be closed manually by a removable maintenance closing handle. The circuit breaker contacts are opened by the opening springs when the trip latch is released either by pushing the manual trip button or automatically by any trip device with which the circuit breaker is equipped.

The circuit breaker is mechanically "trip free" at any point in the closing stroke, which assures that it can be tripped at any point in the closing stroke by means of either manual or electrical actuation of the trip latch.

The current path of the circuit breaker is through the upper terminals, stationary main and arcing contacts, movable bridge assemblies, and the lower terminals. When the arcing contacts open and the arc has moved above the jump gap, a magnetic field is produced by the blowout structure assembly which causes the arc to rise into the arc chute where it is extinguished by cooling and elongation.

CURRENT STUDS

The upper and lower current studs (10 and 6' Fig. 2) are constructed of heavy copper rods which are pressed into an insulating NEMA Grade XX paper base tube having a conductive inner surface liner and an imbedded ground shield to minimize corona and raise the insulation level.

1 Arc Chute
2 Rear Support
3 Blowout Structure
4 Main Separable Contacts
5 Movable Bridge Assembly
6 Return Connection
7 Operating Link
8 Puffer-Buffer Assembly
9 Racking Crank
10 Control Separable Contacts
11 Manual Closing Lever
12 Resistor
13 Control Relay
14 Manual Trip Button
15 Test Switch
16 Visual Indicator
17 Interphase Barrier
18 Front Support

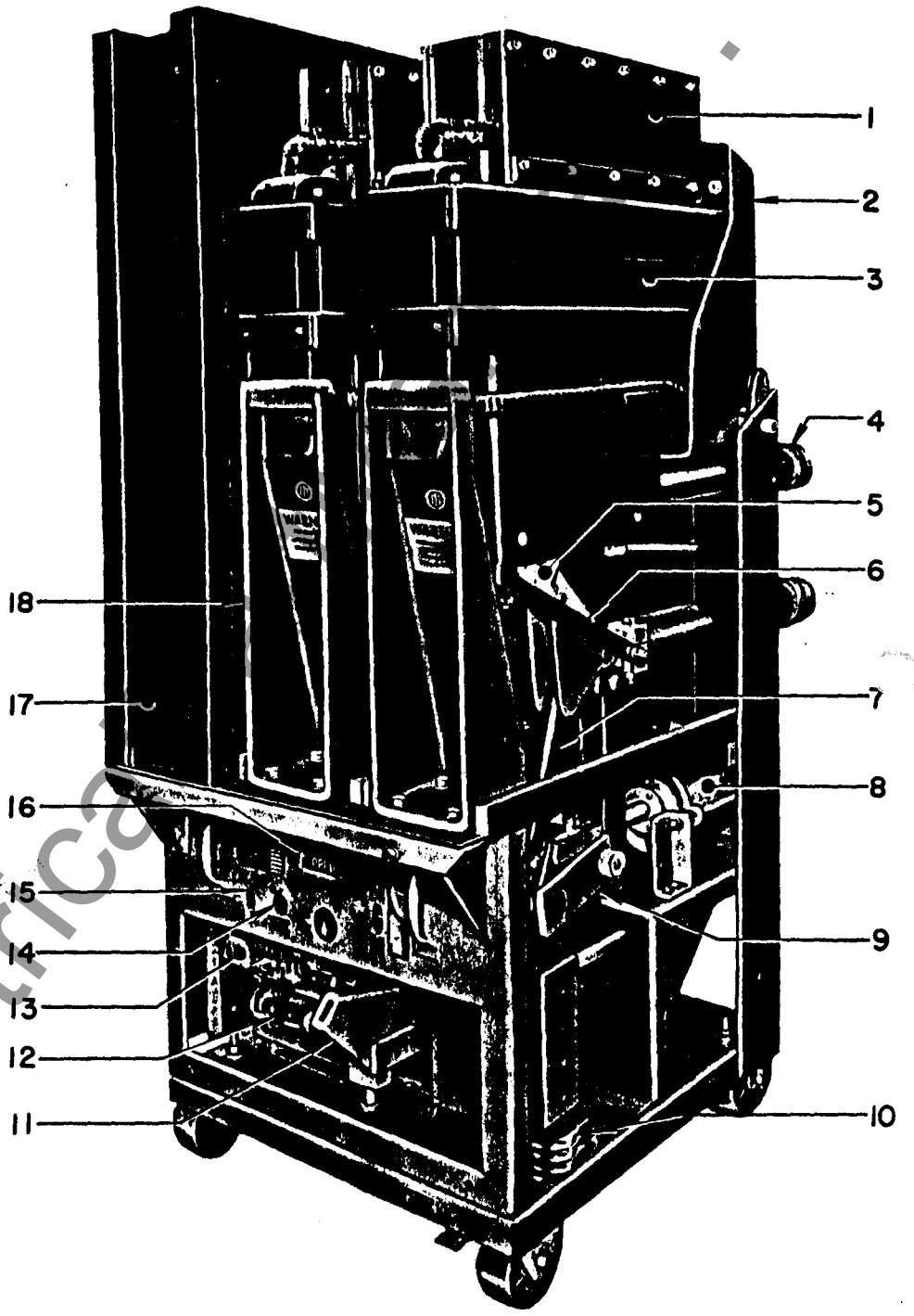


Photo 26726-R-A

Fig. 3—Circuit Breaker with Front Cover and One Interphase Barrier Removed

CONTACTS

The correct contact closing sequence is as follows: The arcing contacts close first, followed by closure of the main contacts. The contacts open in the reverse order; i.e., main contacts first, followed by the arcing contacts.

All the contact surfaces are silver-alloy blocks which are brazed to the stationary and movable copper contact parts. No flexible connectors are used to conduct the current between contact pivot points. These pivot points are silver to silver held under a fixed pressure maintained by a compression spring assembly.

Main Contacts

The movable bridge assembly (5, Fig. 2) is a brazed assembly of parallel copper bars and a silver-alloy contact block. The number of bars in the bridge varies with the current rating; two for 1200 ampere rated circuit breakers, and four for 2000 ampere rated circuit breakers. The movable contact bridge pivots about the lower terminal which is supported by the lower current stud.

The stationary main contacts (7, Fig. 2), for each pole, pivot on the main contact pivot which is a part of the upper terminal assembly. Circuit breakers rated 1200 amperes have four contacts per pole; while the 2000 ampere rated circuit breakers have eight contacts per pole. (The exception to this is the 7.5 HV-500 rating which has eight contacts for the 1200 ampere rating because of its high momentary current rating.) Each pair of contacts are "backed-up" by two lower and one upper compression spring. The lower springs furnish the necessary contact pressure and wipe, while the upper spring furnishes the necessary pressure at the main contact pivot points.

Arcing Contacts

The movable arcing contacts (1, Fig. 2) pivot on a pivot tube assembly which is supported by the movable bridge assembly. The pivot tube assembly consisting of a spring tube, spring, plug washer, and adjusting screw furnishes the necessary contact pressure between the arcing contacts and movable bridge assembly. Each pole of the circuit breaker has two movable arcing contacts, each of which is "backed-up" by a compression spring which furnishes the necessary contact pressure and wipe.

The stationary arcing contact (9, Fig. 2), for each pole, is rigidly fastened to the upper terminal assembly.

BLOWOUT STRUCTURE

The blowout structure (3, Fig. 3) is supported by a front and rear support. The front support (18, Fig. 3) is securely bolted to the top of the front panel. The rear support (2, Fig. 3) pivots on a pin supported by the main frame of the circuit breaker. The blowout structure consists of an assembly of laminated iron held in position by an upper and lower pan. The iron laminations pass through a front and rear blowout coil which are electrically connected together by coil connectors so as to produce a high intensity magnetic field. This closed loop magnetic circuit drives the arc upward into the arc chute, resulting in short arc interruption time.

ARC CHUTE

The arc chute (1, Fig. 3) is mounted inside the loop formed by the iron laminations of the blowout structure. The arc chute is supported by and fastened to the top edges of the upper pan of the blowout structure.

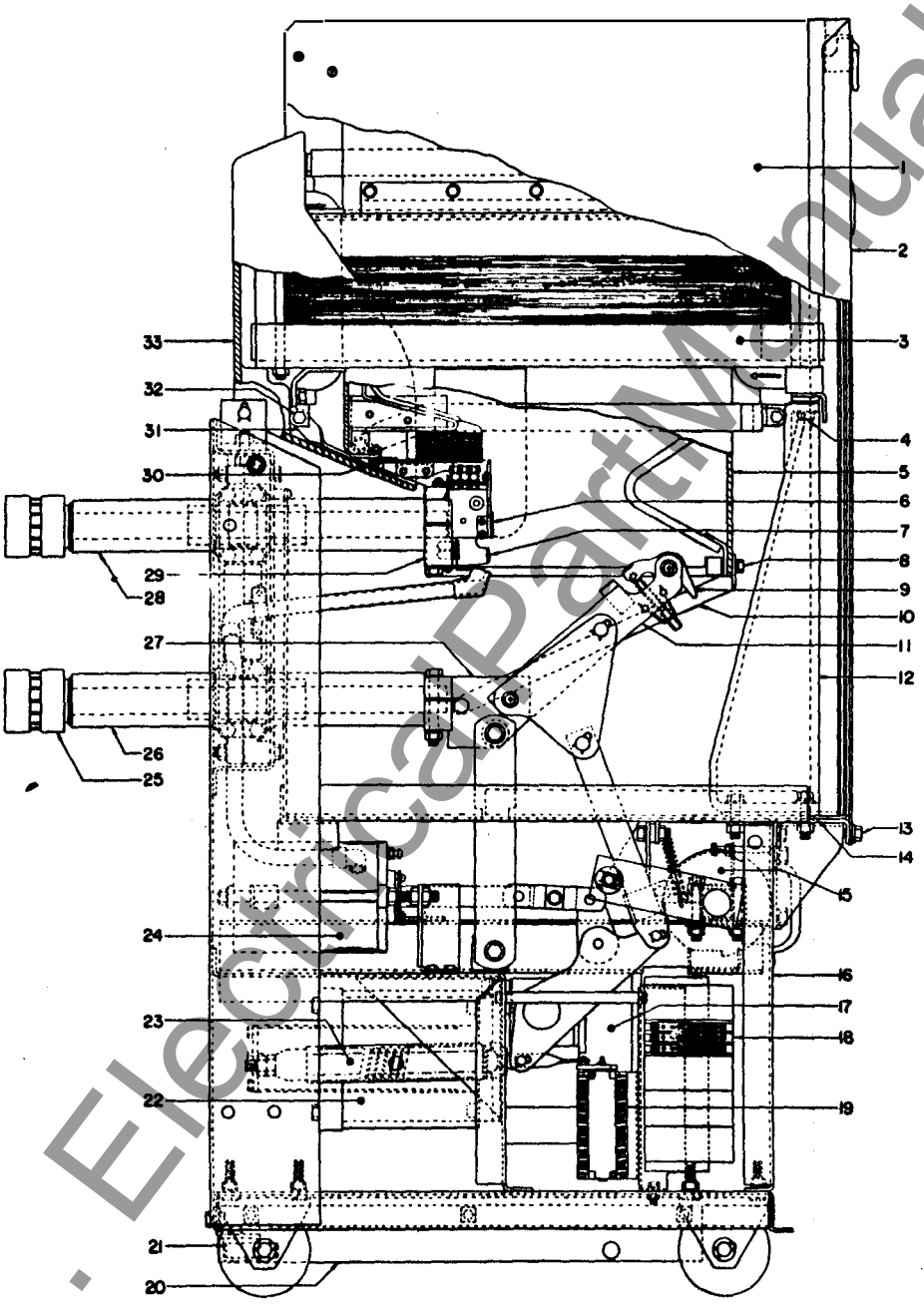
The arc chute consists of a one piece NEMA Grade X rolled laminated shell, liner plates and sheets, front and rear arc runners, and a series of arcing plates mounted in spaced relation transverse to the arc path, creating a long arcing path in a small space.

When the circuit breaker is tripped, the main contacts separate first followed by the arcing contacts which draw an arc. As the contact bridges move toward their open position, the arc, forced upward by its own magnetic field, thermal action, and air blast supplied by the puffer, travels across the jump gap to the rear arc runner, thereby inserting the magnetic blowout coils in the circuit. The arcing associated with the insertion of the blowout coils is extinguished at the jump gap with the aid of the magnetic field produced by the auxiliary blowout irons.

As the contact bridge approaches the open contact position, the arc transfers from the movable arcing contact to the front arc runner, which is return connected to the lower terminal. The high intensity magnetic field, produced by the two blowout coils and closed loop magnetic circuit, drives the arc upward into the arc chute. The arc, as it rises along the front and rear arc runners, increases in length and at the same time is brought into contact with the larger surfaces of the arcing plates. The arc is interrupted by the cooling, lengthening, and squeezing of the arc in many points along its path.

INTERPHASE BARRIER AND FRONT COVER ASSEMBLY

The interphase barrier (1, Fig. 4) and front cover (2, Fig. 4) form an insulated assembly that provides the necessary isolation between phases of the circuit breaker. The complete assembly consists of two barrier assemblies and a front cover assembly. The barrier assemblies completely isolate the sides and front of the two outside poles of



1 Interphase Barrier Assembly
2 Front Cover Assembly
3 Blowout Structure
4 Mounting Screw
5 Arc Chute
6 Stationary Arcing Contact
7 Stationary Main Contact
8 Mounting Screw
9 Movable Arcing Contact
10 Return Connection
11 Movable Bridge Assembly
12 Front Support
13 Mounting Screw
14 Front Insulation Barrier Sheet
15 Racking and Indicator Assembly
16 Lower Front Panel
17 Operating Mechanism
18 Control Separable Contacts
19 Auxiliary Switch
20 Guide Bar
21 Ground Contact
22 Solenoid Assembly
23 Accelerating Spring
24 Puffer-Buffer Assembly
25 Main Separable Contact
26 Lower Current Stud
27 Lower Terminal
28 Upper Current Stud
29 Upper Terminal
30 Mounting Bolt
31 Rear Coil Connector
32 Mounting Screw
33 Rear Support

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Fig. 4—Side Section View of Circuit Breaker

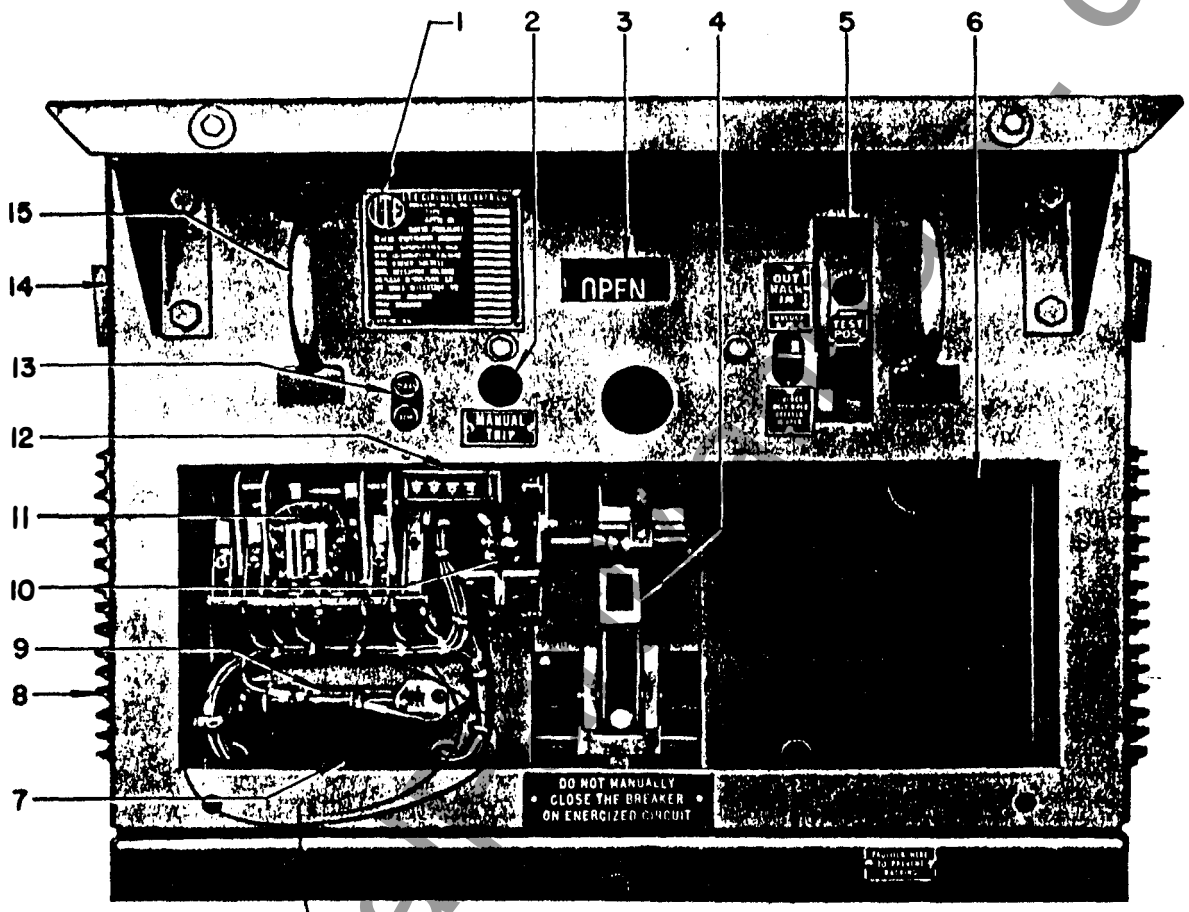


Photo 26907-R-A

1 Nameplate
2 Manual Trip Button
3 Visual Indicator
4 Manual Closing Lever
5 Racking Wheel
6 Control Panel—Right
7 Control Panel—Left
8 Control Separable Contacts
9 Resistor
10 Shunt Trip Device
11 Control Relay
12 Operation Counter
13 Test Switch
14 Lower Front Panel
15 Handle

Fig. 6—Partial View Showing Lower Front of Circuit Breaker

which in turn transmits the force to close the contacts. A "bb" switch opens the pick-up coil circuit of the control relay near the end of the solenoid closing stroke and de-energizes the closing coil. The plunger is returned to its normal de-energized position, against the plunger stop, by the return springs. "Pumping" or repetition of the closing stroke is prevented by a "non-repeat" feature on the control relay by means of the holding coil magnet.

CONTROL PANEL

The control panel is divided into two parts; the left-hand control panel (7, Fig. 6) and the right-hand control panel (6, Fig. 6).

The left-hand control panel is the supporting member on which the control relay, resistors (when required), shunt trip device, auxiliary switch, and up to 15 separable contacts are mounted.

The right-hand control panel is added to the circuit breaker when more than eight auxiliary switch contacts or more than 15 control separable contacts are required. A transformer trip assembly can be supplied and mounted on this panel.

The Type R14 control relay (11, Fig. 6) is mounted on the front of the left control panel. The purpose of the relay is to close and interrupt the current drawn by the solenoid closing coil during a closing operation of the circuit breaker. The control relay is energized by closing the circuit through a remote mounted control switch. A "non-repeat" feature of the control relay prevents cyc

reclosing of the circuit breaker and assures that the momentarily rated pick-up coil receives only intermittent service. For more specific information on the Type R14 control relay, refer to IB-5412.

The Type L2 auxiliary switch (19, Fig. 4) is mounted to a support plate fastened to the back of the left-hand control panel. An additional auxiliary switch can be furnished mounted to the right-hand control panel, if required. The number of auxiliary switch contacts furnished on either control panel will vary with the control voltage and circuit breaker application. For more specific information on the Type L2 auxiliary switch, refer to IB-5504.

The control separable contacts (18, Fig. 4) are mounted on the outside edge of the control panels. Each control panel can mount 15 contacts, or a total of 30 control separable contacts can be furnished on each circuit breaker.

Ninety percent of all the required wiring is done on the control panels. Any of the above mentioned devices can be added to the circuit breaker in the field without additional drilling since all the holes necessary for mounting these devices are drilled at the factory.

RACKING AND INDICATOR ASSEMBLY

The racking and indicator assembly (15, Fig. 4) is located at the front of the circuit breaker directly above the control panel. The front panel contains the openings for the visual indicator, manual trip button, test switch push buttons, and racking wheel. Whenever the circuit breaker is in the "CLOSE" position, the racking wheel is automatically locked to prevent racking the circuit breaker from one position to another without first tripping it. A racking rod (4, Fig. 7) is furnished as an accessory to fit into the racking wheel.

The nameplates indicating the circuit breaker position are attached to the racking wheel. When the racking wheel is turned to the "TEST" or "OPERATING" position, the corresponding nameplate is then visible.

A nameplate to the left of the racking wheel indicates the direction to turn the wheel in order to rack the circuit breaker "IN" or "OUT" of the switchboard compartment. The lower portion of the same nameplate indicates the direction to push the lever to unlock the racking wheel.

The circuit breaker nameplate is attached to the lower front plate and is stamped with the necessary information concerning voltage, current and interrupting ratings, serial number, etc.

The push button station (13, Fig. 6), located below the circuit breaker nameplate, is used to operate the circuit breaker electrically in the "TEST" position. These push buttons will not operate the circuit breaker when it is in the "OPERATING" position.

Racking the circuit breaker from the "OPERATING" to the "TEST" position moves it forward 12 inches. In the "TEST" position, the circuit breaker is disconnected from the primary bus. However, the ground and control separable contacts are still engaged, which permits electrical operation of the circuit breaker for test purposes. NOTE: If desired, the control separable contacts can be isolated in the "TEST" position when specified in the order.

PUFFER ASSEMBLY

The puffer assembly (24, Fig. 4) is furnished on the outside poles only. The assembly is mounted directly beneath the pole with which it is associated. The puffer consists of a cylinder containing a piston, piston ring, piston rod, rear end plate, and front end plate assembly with packing gland. As the circuit breaker opens, the motion of the closing arm assembly forces the piston rod and piston forward which compresses the air in the cylinder. An exhaust port near the front of the cylinder allows the air to escape as it is compressed. A tube and nozzle direct the air to a point directly below the main stationary contacts. This air, forced across the arc as the circuit breaker opens, shortens the total arcing time on interruptions of very low currents such as transformer or induction regulator magnetizing currents.

PUFFER-BUFFER ASSEMBLY

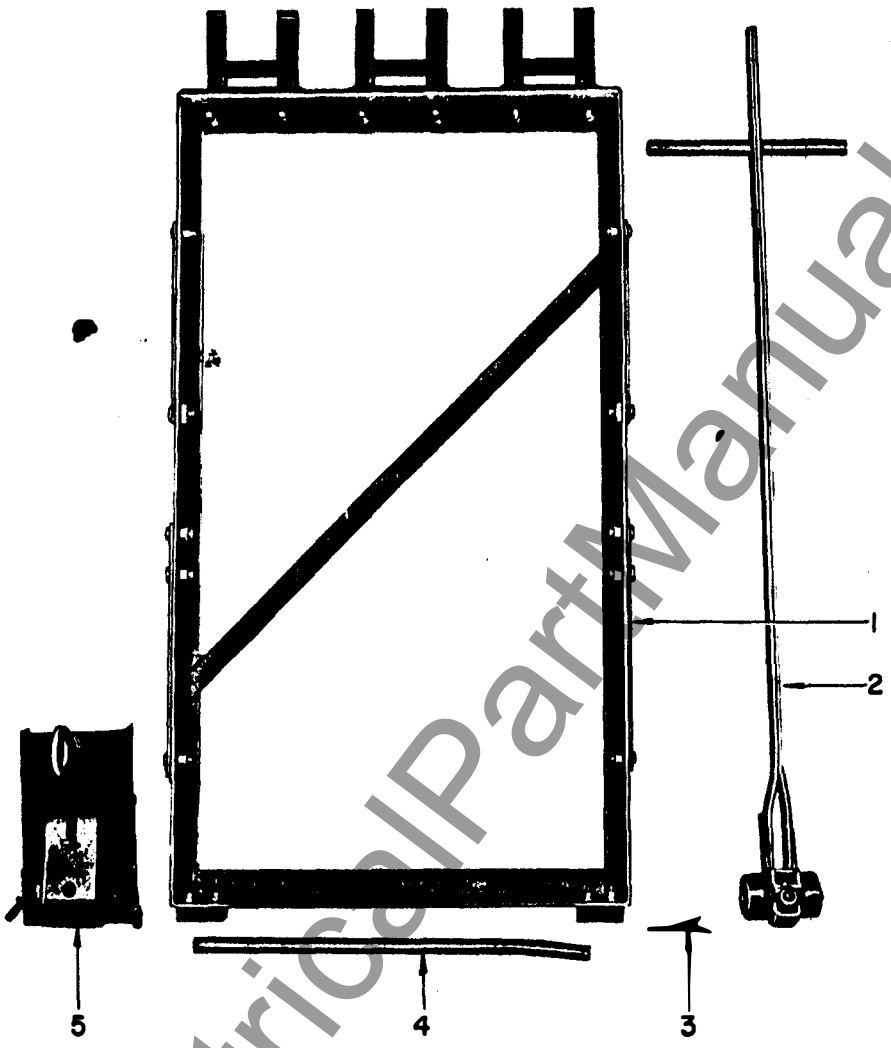
The puffer-buffer assembly (24, Fig. 4) is furnished on the center pole only. The device is similar to the puffer assembly described above and differs only in the physical location of the exhaust port. Therefore, as the piston travels from the rear of the cylinder toward the exhaust port, it acts the same as the puffer assembly described above. The final portion of the stroke of the piston compresses the air in the cylinder and acts as a buffer by absorbing the kinetic energy of the movable contact bridges and mechanism as they reach the open position.

INTERLOCKS

Interlocks are provided to prevent moving the circuit breaker between the "TEST" or "OPERATING" position while the contacts are closed.

These interlocks serve two functions. One prevents racking the circuit breaker from either of its two positions unless the circuit breaker is in the "OPEN" position. The second holds the trip latch disengaged at all positions of the circuit breaker between the connected "OPERATING" and disconnected "TEST" positions. This prevents "making" or "breaking" current on the main separable contacts.

Key interlocks can be furnished for customers' special requirements.



1 Arc Chute Support Assembly
2 Fifth Wheel and Closing Handle
3 Trip Latch Gauge
4 Racking Rod
5 Arc Chute Lifting Plate

Photo 26345-R-A

Fig. 7—Circuit Breaker Accessories

GROUND CONNECTION

The ground bus contact (21, Fig. 4) engages the ground bus before the circuit breaker reaches the "TEST" position. The ground contact remains engaged from the "TEST" to the "OPERATING" position.

ACCESSORIES

One each of the following accessories is furnished with each switchboard.

The fifth wheel and closing handle (2, Fig. 7) is a combination steering handle and manual closing handle. In use, the fifth wheel is placed under the center front of the circuit breaker. It is properly positioned when the pin enters the hole in the guide bar support. Downward pressure on the handle lifts the front wheels off the floor to facilitate steering and moving the circuit breaker in and out of the switchboard, as well as any other moving that may be required during installation and maintenance of the equipment. The handle end of the fifth wheel is used as the manual closing handle. This handle is used only during test and maintenance periods to manually close the circuit breaker.

A racking rod (4, Fig. 7) is furnished for racking the circuit breaker to either of its two positions within the switchboard.

The arc chute support assembly (1, Fig. 7) mounts to the circuit breaker frame and supports the arc chutes in the tilted position for inspection and maintenance.

The arc chute lifting plate (5, Fig. 7) bolts to the front of the blowout structure. The hook of a [illegible] or hoist can be placed in the eye of the [illegible]ing

plate should it become necessary to remove the arc chutes. The wheel end of the fifth wheel and closing handle (2, Fig. 7) can be bolted to the arc chute lifting plate. The long extending "T" shaped handle provides a grip big enough for two men in order to tilt the largest arc chutes back on the arc chute support assembly for inspection and maintenance (See Fig. 12).

A trip latch gauge (3, Fig. 7) is furnished to facilitate proper adjustment of the trip latch as described in section ADJUSTMENTS.

INSTALLATION

The switchboard and all associated equipment should be completely installed, inspected, and tested before installing the circuit breakers.

Circuit breakers that have been in storage during the installation of the switchboard and associated equipment should be unwrapped and thoroughly cleaned. Moving parts of the mechanism were lubricated with a dry powdered Molydenum product, such as "Molycote", at the factory. Re-use if needed.

Close and trip the circuit breaker manually before inserting it into the switchboard. If a test station is available, also check the electrical close and trip operations.

CAUTION: DE-ENERGIZE THE PRIMARY AND CONTROL CIRCUITS BEFORE INSERTING THE CIRCUIT BREAKER INTO THE SWITCHBOARD FOR THE FIRST TIME.

INSERTING CIRCUIT BREAKER

The procedure described below should be followed when inserting the circuit breaker into the switchboard.

CAUTION: CHECK TO ASCERTAIN THAT THE TWO INTERPHASE BARRIERS AND FRONT COVER ARE IN THEIR PROPER POSITION ON THE CIRCUIT BREAKER.

1. The circuit breaker should be in the "OPEN" position and the position indicator at the "TEST" position.
2. By use of the steering handle, align the sides of the circuit breaker with the sides of the circuit breaker compartment.
3. Back the circuit breaker into the compartment so that the guide bar at the bottom of the circuit breaker enters the guide slot on the compartment floor.
4. Push the circuit breaker approximately half way into the compartment and then remove the steering handle.
5. Using the two handles on the lower front panel, continue pushing the circuit breaker into the compartment until the rollers on the racking mechanism cranks snap up into the vertical guides in the compartment. The circuit breaker is now latched in the "TEST" position.

Photo 26725-R

Fig. 8—Operator Shown Racking Circuit Breaker from Operating Position

6. ENERGIZE the control circuit and electrically close and trip the circuit breaker.
7. With the circuit breaker in the "OPEN" position, insert the racking rod, push down on the racking release lever, and rack the circuit breaker to the "OPERATING" position as shown in Fig. 8.
8. Close all switchboard doors, ENERGIZE the primary circuit and the switchgear is ready to be put into service.

REMOVING CIRCUIT BREAKER

The procedure described below should be followed when removing the circuit breaker from the switchboard.

1. Trip the circuit breaker by means of the control switch.

2. Open the compartment door, insert racking rod, push down on the racking release lever, and rack the circuit breaker out to the "TEST" position as indicated by the position indicator. (See Fig. 8).

If it is desired to remove the circuit breaker from the switchboard, continue as follows:

3. Insert the racking rod into the hole in the racking wheel directly above the "TEST" position nameplate.

4. Push down on the racking release lever and move the racking rod slightly (15 degrees) in the "IN" direction.

5. Release the racking release lever, and move the racking rod in the direction of the "OUT" arrow (upward) approximately 30 degrees. This upward motion of the racking rod must be fast enough to move the circuit breaker forward past the self-latching "TEST" position.

6. Remove the racking rod and pull the circuit breaker forward, using the two handles on the lower front panel, until the circuit breaker is approximately half way out of the compartment.

7. Insert the steering handle and withdraw the circuit breaker from the compartment.

OPERATION

The circuit breakers can be electrically operated when in the "TEST" or "OPERATING" position. With the circuit breaker in the "TEST" position, it can be operated from the push button station mounted on the lower front panel or from the main control switch mounted remotely from the circuit breaker. However, when the circuit breaker is in the "OPERATING" position, it can be operated electrically only from a remote mounted main control switch.

The circuit breaker can be manually operated in the "TEST" position or when completely withdrawn from the switchboard as described under MANUAL CLOSING and MANUAL TRIPPING. The circuit breaker should not be operated manually while in the "OPERATING" position if the bus is energized.

Refer to the schematic diagram (See Fig. 9) when following the electrical closing and tripping procedures described below.

ELECTRICAL CLOSING

The circuit breaker is electrically closed by the operation of the remote mounted control switch as follows:

Turn the control switch to the "CLOSE" position. This energizes simultaneously the pick-up coil (PC) and the holding coil (HC) on the control relay. The stronger of the two coils, the pick-up coil, attracts the relay armature and closes contacts 52X-1, 52X-2, and 52X-3. (NOTE: Contact 52X-4 is closed when the relay is de-energized and remains closed when the armature is attracted to the pick-up coil magnet.) This energizes the solenoid closing coil (CC) and the solenoid plunger's forward movement actuates the breaker closing mechanism. Near the end of its travel, the plunger push rod causes the 52bb switch contacts to open, thus de-energizing the pick-up coil (PC). The relay armature is then attracted by the weaker or holding coil (HC) and opens all the 52X contacts. The opening of contacts 52X-2 and 52X-3 de-energizes the closing coil (CC).

If the control switch has a maintaining contact in the closing circuit or if a momentary contact is held closed, the circuit breaker will not attempt to reclose if it trips on the first attempt due to some fault. The reason for this failure to reclose, even though the control switch is in the "CLOSE" position, is that the relay armature remains attracted to the magnet of the holding coil, thus preventing the 52X contacts from closing. Therefore, a second attempt to close the circuit breaker cannot be made until the control switch is turned to the "OFF" position which de-energizes the holding coil and closes the 52X-4 contact.

The control relay is now in its normal de-energized position and will function to close the circuit breaker when the control switch is again turned to the "CLOSE" position. This non-repeat feature of the control relay prevents cyclic reclosing of the circuit breaker and assures that the momentarily rated pick-up coil receives only intermittent service.

ELECTRICAL TRIPPING

The circuit breaker can be electrically tripped by either pushing the trip button on the circuit breaker or by turning the control switch to the "TRIP" position. Either of the above means energizes the shunt trip coil (TC). The movement of the shunt trip armature rotates the trip lever and shaft enough to release the trip latch, resulting in consequent tripping of the circuit breaker.

The circuit breaker is electrically tripped in a similar manner by any other tripping device with which it may be equipped.

MANUAL CLOSING

CAUTION: NEVER CLOSE THE CIRCUIT BREAKER MANUALLY WHILE IT IS IN THE "OPERATING" POSITION IF THE BUS IS ENERGIZED.

The circuit breaker may be closed manually by inserting the manual closing handle in the socket of the manual closing lever (4, Fig. 6) and bear