INSTRUCTIONS

for

the Installation, Care and Operation of Circuit Breakers and Accessories

10 PAGES NOW
10 LATER

TYPE "HD" MOVABLE PORTIONS

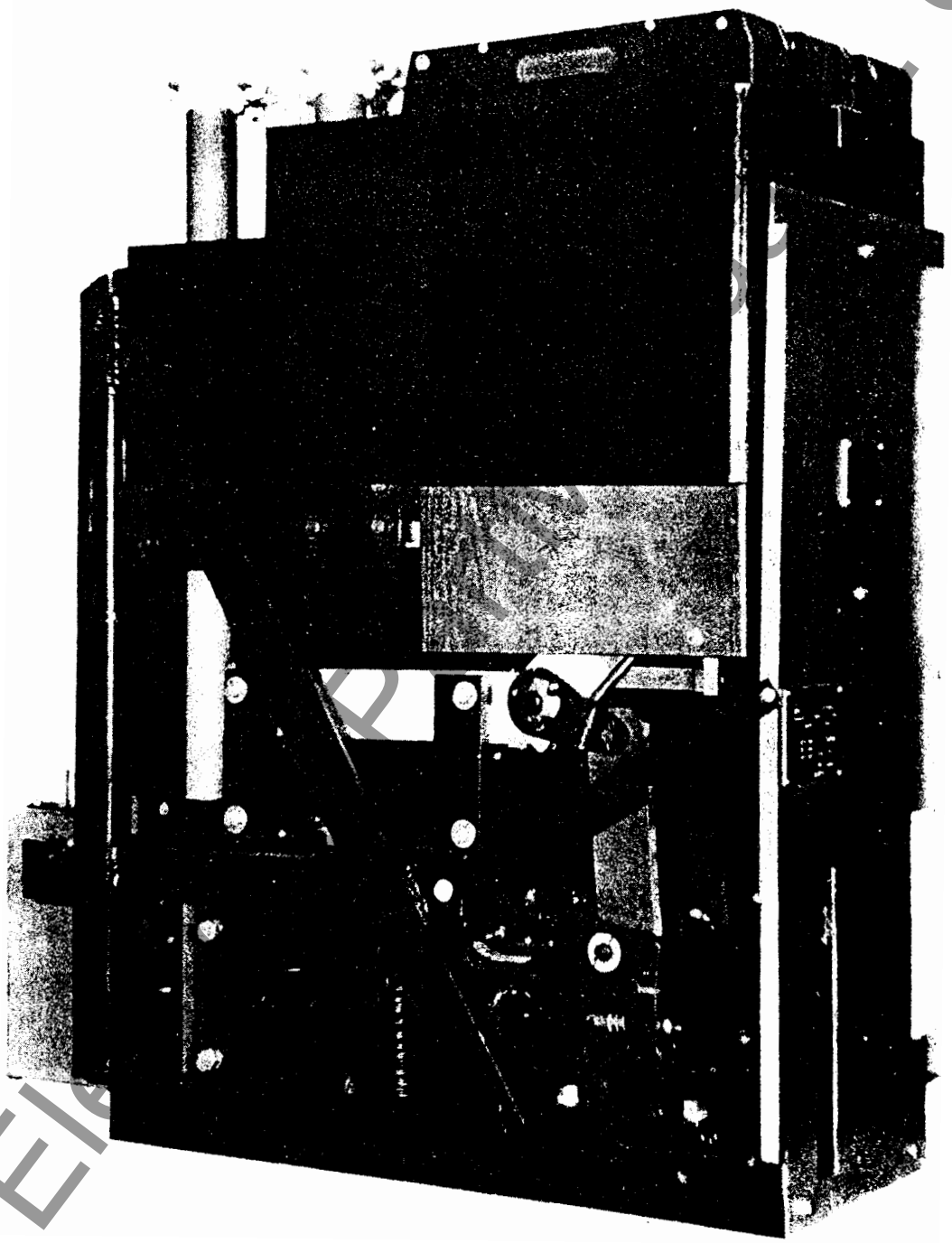
CONSISTING OF

TYPE AM-50C RUPTAIR MAGNETIC VERTI-LIFT BREAKERS
AND AUXILIARY EQUIPMENT

BOOK CBX 6288

ALLIS-CHALMERS MFG. CO.
BOSTON WORKS · BOSTON · MASS.

ALLIS-CHALMERS CIRCUIT BREAKER EQUIPMENT



TYPICAL ALLIS-CHALMERS
TYPE "HD" MOVABLE PORTION
600 AMPERE, 5KV., 50,000KVA.

Illustration CBX-62880

CBX-6288

INSTRUCTIONS FOR THE INSTALLATION AND OPERATION OF ALLIS-CHALMERS TYPE "HD" MOVABLE PORTIONS CONSISTING OF AM-50C RUPTAIR MAGNETIC VERTI-LIFT BREAKERS AND AUXILIARY EQUIPMENT

PROPER CARE IS ESSENTIAL TO GOOD SERVICE

1. The Allis-Chalmers type "HD" movable portion is a complete unit ready for installation in its fixed structure for metal-clad switchgear. It consists of the Allis-Chalmers type AM-50C Ruptair magnetic breaker, verti-lift arrangement, with the necessary auxiliary equipment such as auxiliary switches, relays, primary and secondary disconnect contacts, etc., attached.

2. The successful operation of this unit depends on the proper installation and maintenance, as well as proper design and manufacture.

3. The information and instructions included in this book are to aid you in installing and maintaining these units so that you will obtain the highly satisfactory service of which they are capable.

4. Please pass this information along to your engineers and erection and servicemen who will then be better able to aid you in realizing the best service from these units.

INSPECTION

5. Before leaving the factory, each movable portion has been carefully inspected and packed by workmen experienced in the proper handling of electrical equipment.

6. Upon receipt of the movable portion remove all packing traces and examine the breaker and auxiliary equipment carefully to see that no damage has occurred during transit. If any injury is disclosed, a claim for damages should be filed at once with the transportation company and the Allis-Chalmers Manufacturing Company notified.

HANDLING

7. In handling the "HD" movable portion, particular care should be taken so as not to damage or place strain upon insulating parts or fittings, arc chutes, etc.

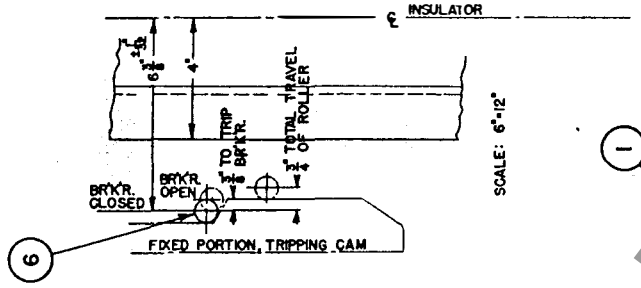
8. If the movable portion is handled with a crane, caution should be taken in the proper placing of slings so that all strain is distributed throughout the breaker frame. Slings should not bear on breaker parts.

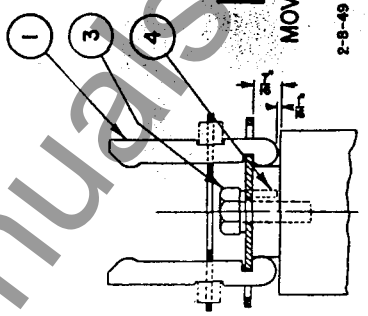
STORAGE

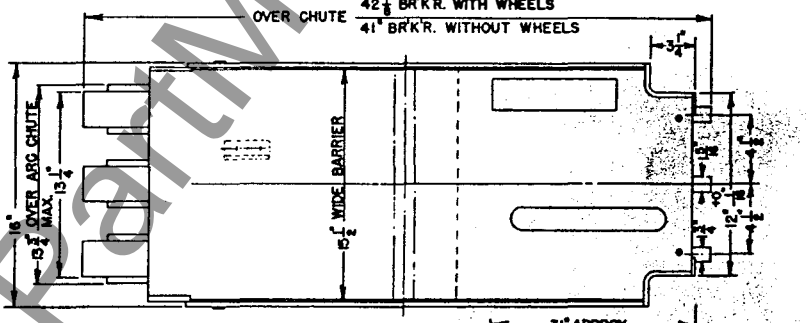
9. If the movable portion cannot be set up immediately in its permanent location,

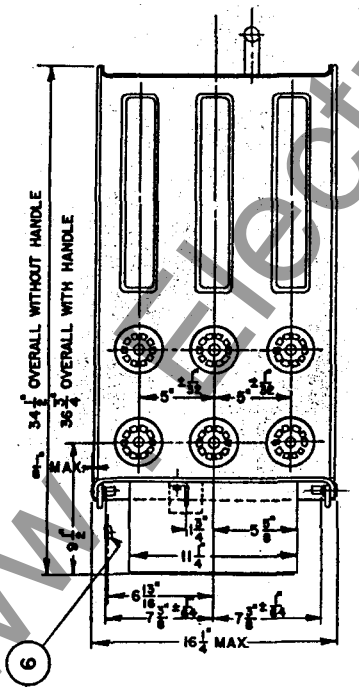
FIG. 1

MOVABLE PORTION
TYPE HD
2-8-49
7174-1-KB









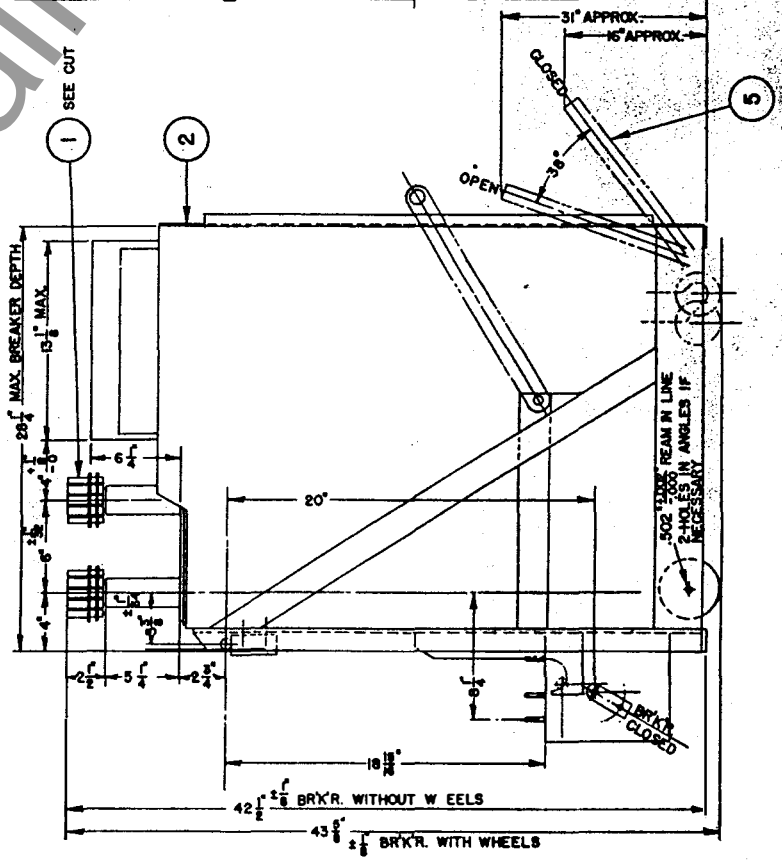


Illustration CBX-62881

and it is necessary to store the equipment, it should be kept in a clean dry place and protected from dust, the action of corrosive gases from coal combustion, etc., and from mechanical injury

INSTALLATION

10. The Allis-Chalmers Type "HD" movable portions are designed for operation within a fixed portion on metal-clad switchgear cubicle. Before the movable portion is installed, the cubicle should be cleaned of all foreign particles that may have been left inside from time of installation, insulating surfaces wiped down, and the lifting gear lubricated and tried. The movable portion should be inspected thoroughly to see that packed braces used to hold moving parts during shipment are removed. CAUTION:-BREAKER IS SHIPPED BLOCKED IN CLOSED POSITION. The breaker insulating surfaces, and bushings must be dry and clean, adjustments checked, fastenings made secure if necessary, moving parts properly lubricated and breaker operation tried. When installing the movable portion in cubicle for the first time make sure that the lift pins on breaker frame engage properly with hooks of lifting gear. As breaker unit is then raised into position, check to see that the grounding strap at rear of breaker makes properly with the stationary contacts in cubicle, and that primary and secondary contacts are in alignment for proper contact engagement. Also, make sure that there is no interference between breaker phase barrier and primary insulator tubes and shutters if used.

GENERAL DESCRIPTION

11. The Allis-Chalmers "HD" movable portion consists of the Ruptair magnetic circuit breaker for verti-lift arrangement and auxiliary equipment suitably arranged for best function and easy installation in a metal-clad cubicle.

12. The Ruptair magnetic circuit breaker differs essentially from oil breakers and air blast breakers in that it does not depend on any stored medium such as oil or compressed air for interruption.

13. Referring to Figure 2, the component parts of the breaker are mounted on a structural steel frame. The operator mechanism is mounted within the breaker frame and well shielded. The terminals studs are mounted vertically, are well shielded with bakelite tubing, and extend upward through the breaker top plate. The lower ends of the rear bushing studs support the movable contact arms, and the main current carrying contacts and tertiary contacts are mounted on the front terminal studs. The main arcing contacts are supported by insulating plates mounted in front of the blowout coils. The arc chutes are mounted between blowout plates and ahead of the front terminal studs.

CONTACTS

14. The contact structure is made up of three sets of stationary contacts, namely, main current carrying contacts, intermediate or tertiary contacts, and arcing contacts. The main current carrying contacts are an integral part of the front bushing studs, and the tertiary contacts are mounted on the upper front corner of the main contact. The main arcing contacts are mounted in front of the blowout coils and above the main and tertiary contacts. Electrically,

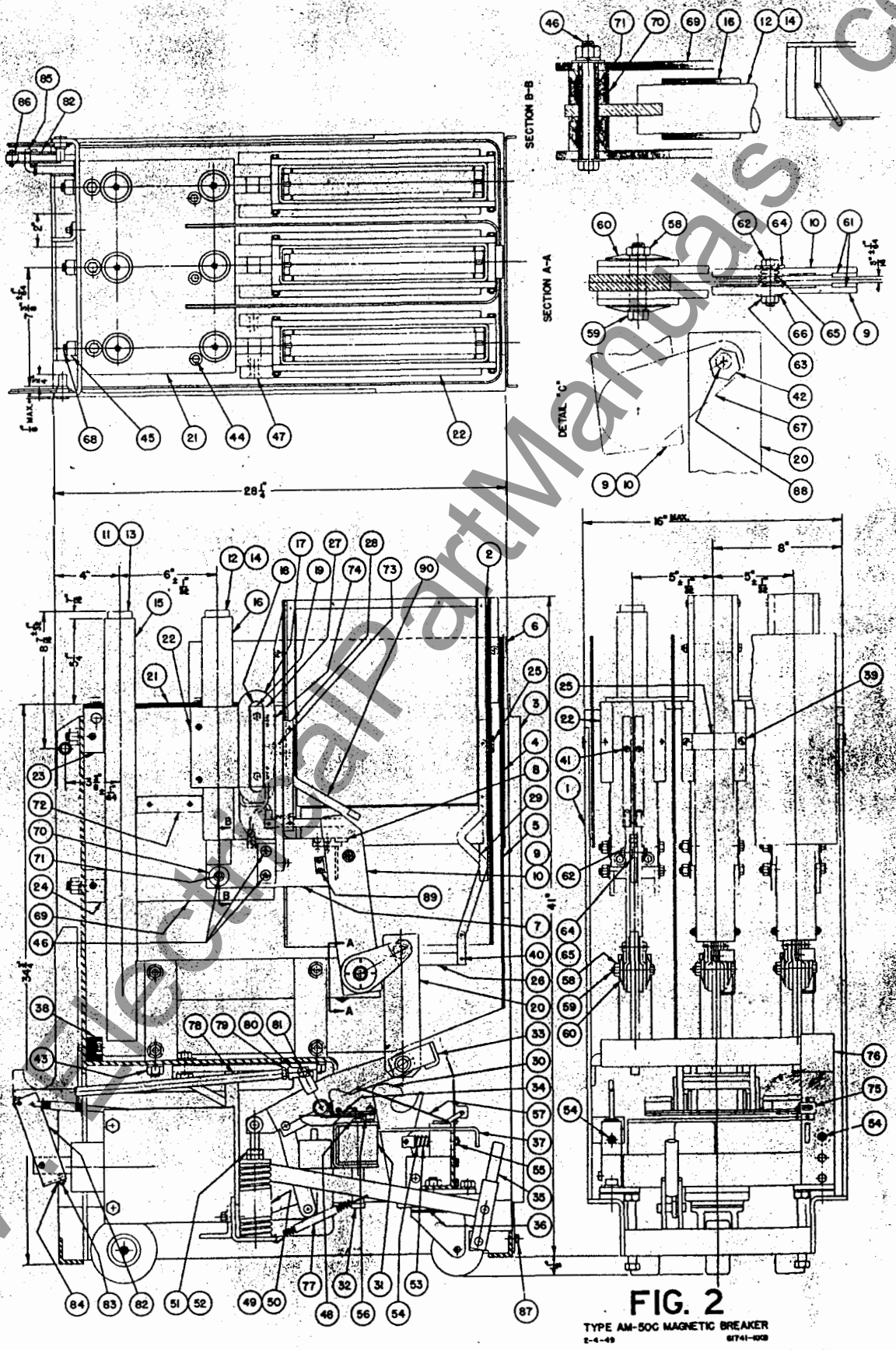


FIG. 2

TYPE AM-50G MAGNETIC BREAKER

2-4-49 81741-50GB

Illustration CBX-62882

the arcing contacts are permanently connected in series with the magnetic blow-out coils to the front bushing stud.

15. The movable contact blades pivot from the ends of the back studs. Current carrying contact surfaces are silver inlay, and arcing contact surfaces are silver Tungsten arc resisting alloy. All contacts are wedge type and have positive contact pressure when engaged.

ARC CHUTE

16. The arc chute assembly consists of an insulating shell in which are mounted the refractory interrupting unit, refractory side liners and the arc runner. The interrupting unit is made up of a number of refractory plates having vee-shaped slots of varying heights arranged in spaced relation to form a unit. The unit is vented at the top. The interrupting unit is essentially non-gas forming and is highly resistant to heat shock.

PHASE BARRIER UNIT

17. Full size barriers of high dielectric material isolate each phase and are arranged for easy removal.

BREAKER MECHANISM

18. The breaker mechanism consists essentially of movable contact arms and an insulating link which connects the contact arms to the operator mechanism.

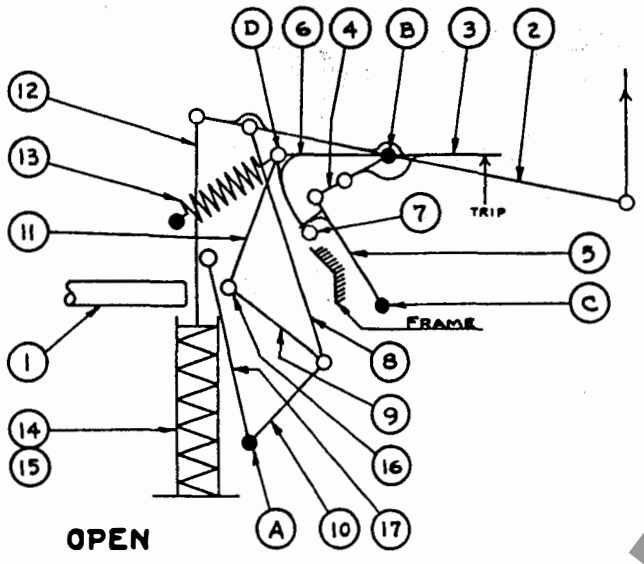
OPERATOR MECHANISM - CLOSING

19. Figure 3 shows the trip-free mechanism of the operator in the open position; points "A", "B", and "C" are fixed centers about which links (10), cranks (6), radius bar (2) and latch (5) rotate. Point "D" is a temporarily fixed center being restrained as long as latch (5) engages latch roll (7).

20. The closing force is applied at the toggle roll (16) by means of the plunger (1). For manual closing the closing force is applied on link (11) by means of crank (17), the rotation of which is controlled through a link (36) (Fig. 2) to crank located at front of breaker. The toggle linkage (9) and (11) in moving to the final over-center position rotates links (10) clockwise about its fixed center "A" causing, through links (8), the counter-clockwise rotation of radius bar (2). The rotation of radius bar (2) causes, thru insulating rods (20) (Fig. 2), the movable contact arms to rotate counter-clockwise, thus closing the breaker. With the counter-clockwise rotation of the crosshead the impulse and accelerating springs (14 and 15) are compressed. The breaker is held in the closed position by the over-center position of the mechanism toggle which is restrained by latch (5), holding point "D" stable.

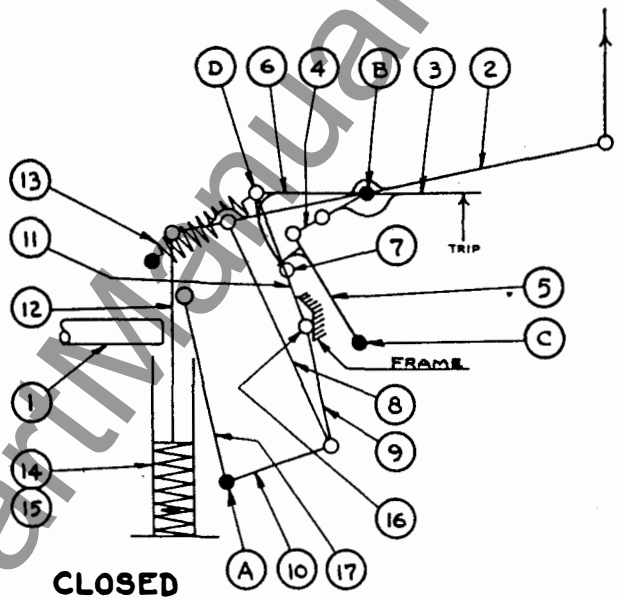
OPENING

21. Opening of the breaker is accomplished either electrically or manually.



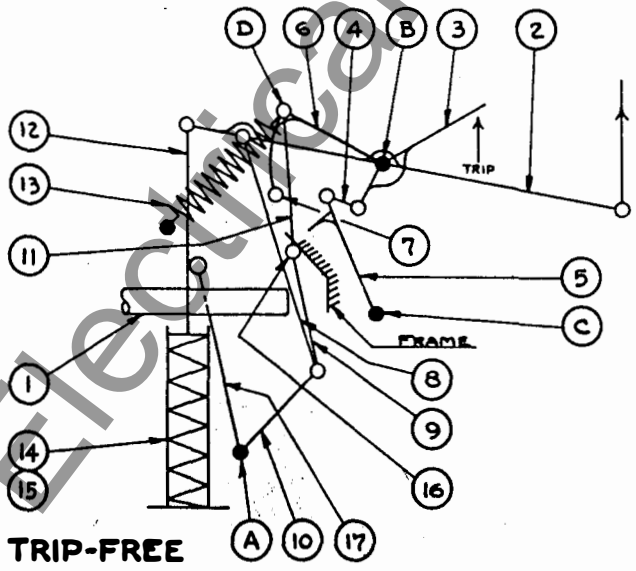
OPEN

FIG. 3



CLOSED

FIG. 4



TRIP-FREE

FIG. 5

●——FIXED CENTERS
o——MOVABLE CENTERS

Illustration CBX-62523

Electrically, a trip coil is energized which lifts its armature and trip pin to strike against and rotate the trip bracket (3) counter-clockwise. The breaker is tripped manually by pulling forward on the trip rod (37) (Fig. 2). The block attached to the trip rod engages and rotates the trip bracket. The counter-clockwise rotation of the trip bracket breaks the toggle formed by arm of bracket and link (4) and lifts latch (5) from latch roll (7). The lifting of latch frees the temporarily fixed point "D", releasing the cocked springs (14 and 15) which drive the crosshead (2) in a clockwise direction; this, in turn, pulls downward on connecting rod (20) (Fig. 2) to rapidly open the breaker.

22. With the lifting of latch (5), point "D" is driven upward and the toggle rolls (16) ride over a radius in operator frame, forcing the toggle to break on opposite side of center line. With the collapsing of the toggle, point "D" is snapped into position by means of spring (13) allowing the latch (5) to engage latch roll, holding point "D" stable for next closing operation.

AUXILIARY EQUIPMENT - (FIG. 1)

23. The plugging device located at bottom rear of breaker frame, houses the necessary auxiliary switch and relays. The auxiliary equipment is wired to the bayonet contacts of plugging device, such that when movable portion is raised into operating position in cubicle the bayonet contacts engage stationary contacts to complete the control circuit for operation of the breaker.

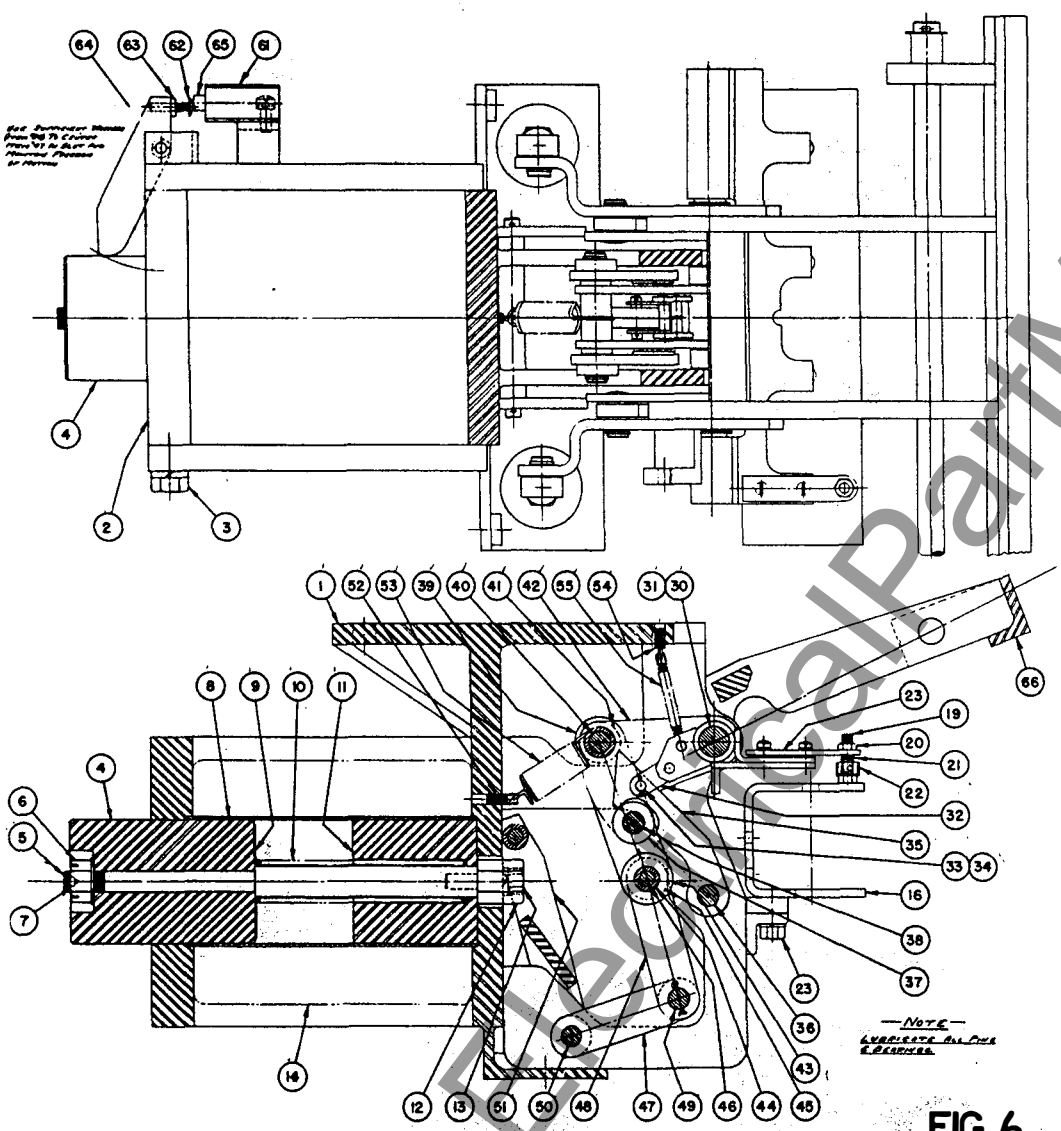
ADJUSTMENTS

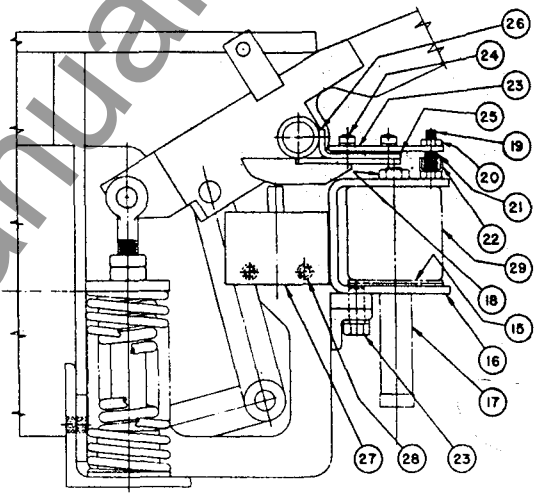
24. The breaker has been completely set up, adjusted and tested at the factory. However, adjustments or fastenings may be changed or become loosened during shipment, storage or installation. Manual operation of the breaker should be used for preliminary operation to see that all operating parts are free and work smoothly. The bushings and other insulating parts should be clean and dry. All contact surfaces should be inspected to see that they are clean and smooth. Removal of phase barriers, as per Paragraph 46, gives access to breaker for checking adjustments.

25. The adjustments for the AA-50 class of breakers are as follows:

a. The accelerating springs (56 and 57) (Fig. 6) located on both sides of operator are in proper adjustment when with the breaker in the full closed position, the springs (both sides) are compressed to a height of 4-1/4" to 4-3/8". With the breaker in the open position, adjustment is made by positioning the nuts (58). When proper adjustment has been made the checknuts (58) should be screwed firmly down and staked in position.

b. The latch toggle formed by link (32) (Fig. 6) and arm of trip bracket (26) is in correct adjustment when latch toggle is approximately on center and latch plate is stable on full voltage electrical closure.
Correct adjustment is made by adjusting nut (20) on screw (19) until there is a gap of 3/16 inch between rim surface





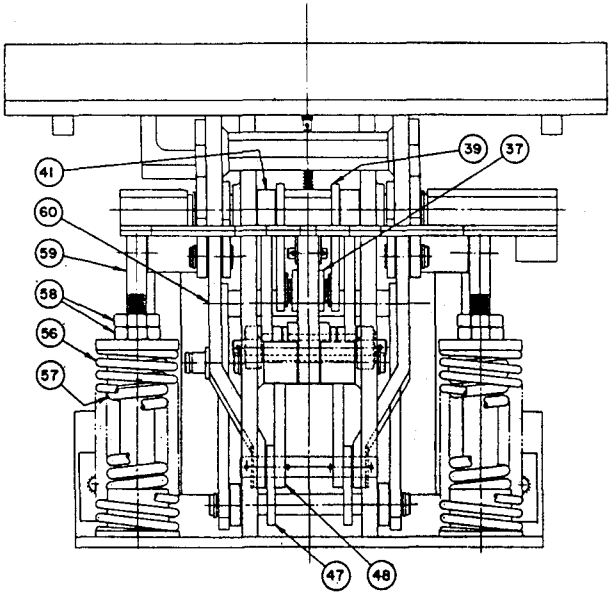


FIG. 6
SOLENOID OPERATOR
AM-50C MAGNETIC BREAKER
2-8-48 81741-10KB

Illustration CBX-62886

of spring cup (22) and the under-surface of plate (23), and adding or removing shims (25) until trip bracket is stable on full voltage electrical closure and breaker can be tripped at minimum trip voltage. After proper adjustment, screws that hold plate (23) in place should be tightened positively.

c. The rebound latches (30) should be so adjusted that when breaker is opened slowly the brass rolls (52) will just clear the nose of latches (30) by 1/16 inch. Adjustment is made by positioning the "Stover" locknuts (55) on screws (54) until rolls clear nose of latches by the required 1/16 inch.

d. A check on the alignment of contacts should be made before any operation of the breaker is attempted. When in proper alignment the stationary arcing contact (90) (Fig. 2), tertiary contact (8) and main contact (7) should be in the same vertical plane. The movable contact blades should be in alignment with stationary contacts and when fully closed their follow-up should be 1/32" on a side as they engage with the main arcing contacts (90), tertiary contacts (8), and main contacts (7). If any adjustment is necessary the tertiary contacts can be aligned with main contact by loosening the two socket head screws, positioning the tertiary contact and securing in position by tightening the screws. The arcing contact (90) can be aligned with main contact and tertiary contact by bending it slightly to the right or left, whatever is necessary. For the alignment of the movable contact arms, loosen nuts (43) under support blocks and by using the rear support block as a pivot point swing contact blades to right or left until properly aligned. When contacts are in alignment, check bushing alignment before tightening of nuts (43).

e. The contact pressure of the isolating switch blades should be adjusted with reference to Figure 2. The first step of proper adjustment is to have the hinge joint adjusted so that with spring screw (62) loose, and isolating contacts in fully closed position, a pull of 5 to 8# with register on a spring scale when hooked over spring cup (64) to move contacts toward open position. The second step is to adjust so that a 3/16" ℄ 1/64" diameter rod will just pass between the Elkonite tips on blades.
Adjustment of the hinge joint is made with contact blades in fully closed position and spring screw (62) loose. Hooking a spring scale over spring cup (64) adjust the "Stover" locknut (58) until scale registers 5 to 8# as contacts are pulled toward open position. Then adjust "Stover" locknut (66) on screw (62) until tension of spring (65) is such as to permit a 3/16" ℄ 1/64" diameter rod to pass between the arcing contact tips on isolating switch blades.

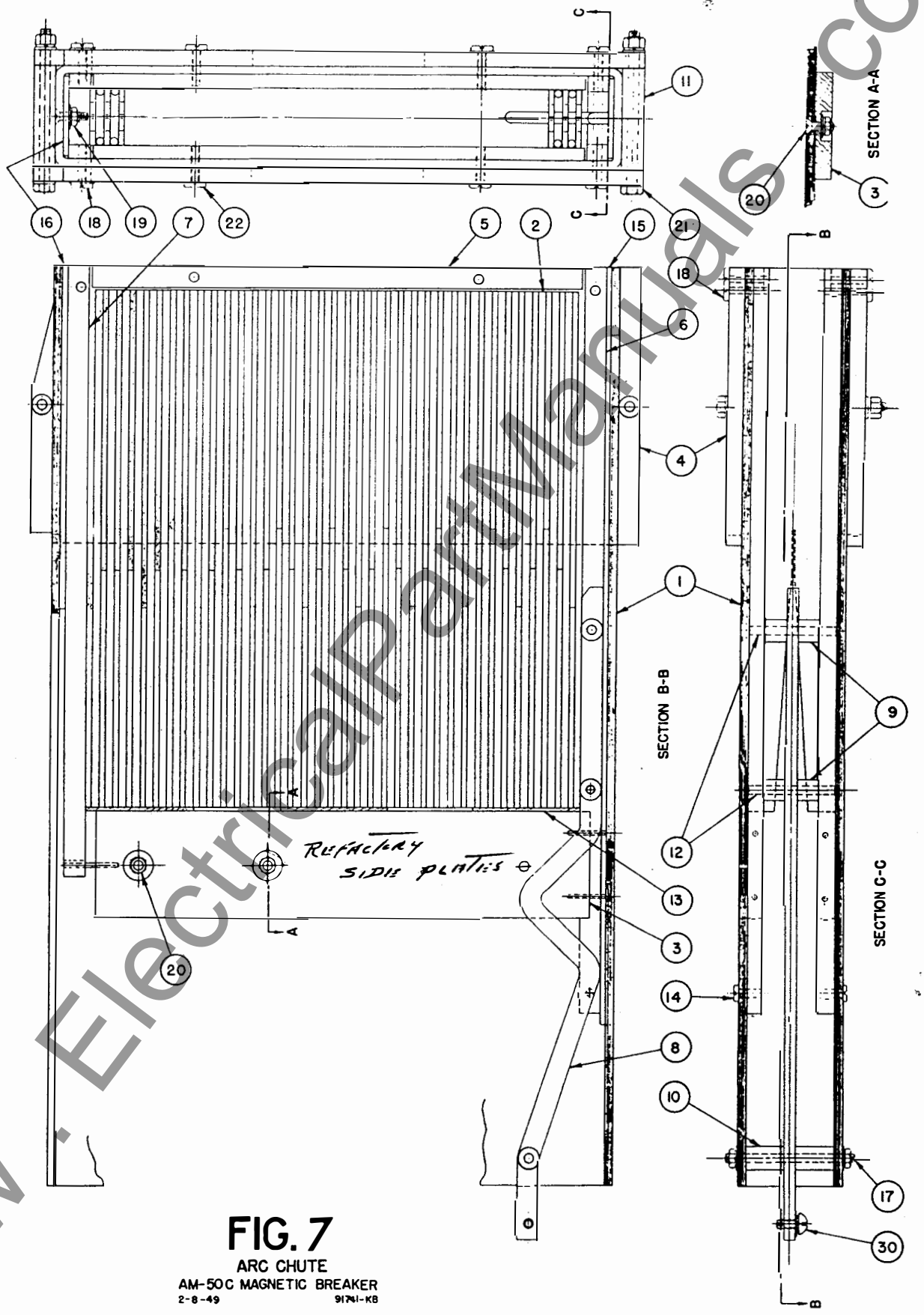


FIG. 7

ARC CHUTE

AM-50C MAGNETIC BREAKER

2-8-49 91741-K8

Illustration CBX-62887

f. The throw of the isolating switch contacts should be such that when breaker is closed by hand and contact blades are pulled back to take up pin slack, a clearance of 1/16" to 1/8" exists between bumpers (89) and edge of blades. If the required clearance does not exist, adjustment is made by removing pin (88) to disconnect operating rods (20) from crank (67), and rotating the eccentrically drilled hex bushing (42) until the clearance of 1/16" to 1/8" is obtained. Make sure all fastenings are secure on reassembly.

g. The auxiliary switch located within the box of plug-in device has been adjusted correctly at the factory. However, before the breaker is put into service, a check should be made to see that the auxiliary switch crank throws equidistant on either side of a vertical centerline. The adjustment for throw of crank is made by positioning clevis (80) (Fig. 2) on operating rod (78).

h. The limit switch located on the right-hand side of operator coil housing contains both the "a-a" and "b-b" stages of limit switch contacts. Correct adjustments have been made at the factory and no further adjustments should be necessary. However, a check should be made to see that there is a clearance of 1/16 inch between head of screw (62) and end of limit switch plunger (65) when solenoid armature (4) is solid against pole head (11).

i. The mechanical interlock crank located at back of breaker has been properly adjusted at the factory and no further adjustment should be necessary. However, a check should be made to see that the distance from the center of roll (6) (Fig. 1) crank to the centerline of rear bushing is 6-3/8" ℄ 1/32", that the breaker trips in the first 3/8" of linear travel of roll as crank (82) (Fig. 2) rotates toward breaker, and that the total linear travel exceeds 3/4 inch. Adjustments are made by first setting screw (83) until the distance from the center-line of rear bushing to centerline of roll on crank (82) is 6-3/8" ℄ 1/32", and then adjusting the length of rod (85) by screwing it in or out of block on hand trip rod until the breaker trips within the first 3/8" of linear travel of roll as crank (82) rotates toward the breaker. Finally, check to see that the total travel of roll in rotation of crank is at least 3/4". After adjustments are made make sure all fastenings are secure.

CALIBRATION ADJUSTMENT (REF. FIG. 8)

26. Referring to Fig. 8, loosen screw (3T-395) and thread armature (3T-234) up or down on rod (3T-396) until the white line corresponds to the calibration desired. Bend tab (3T-410) into pocket to prevent loosening.

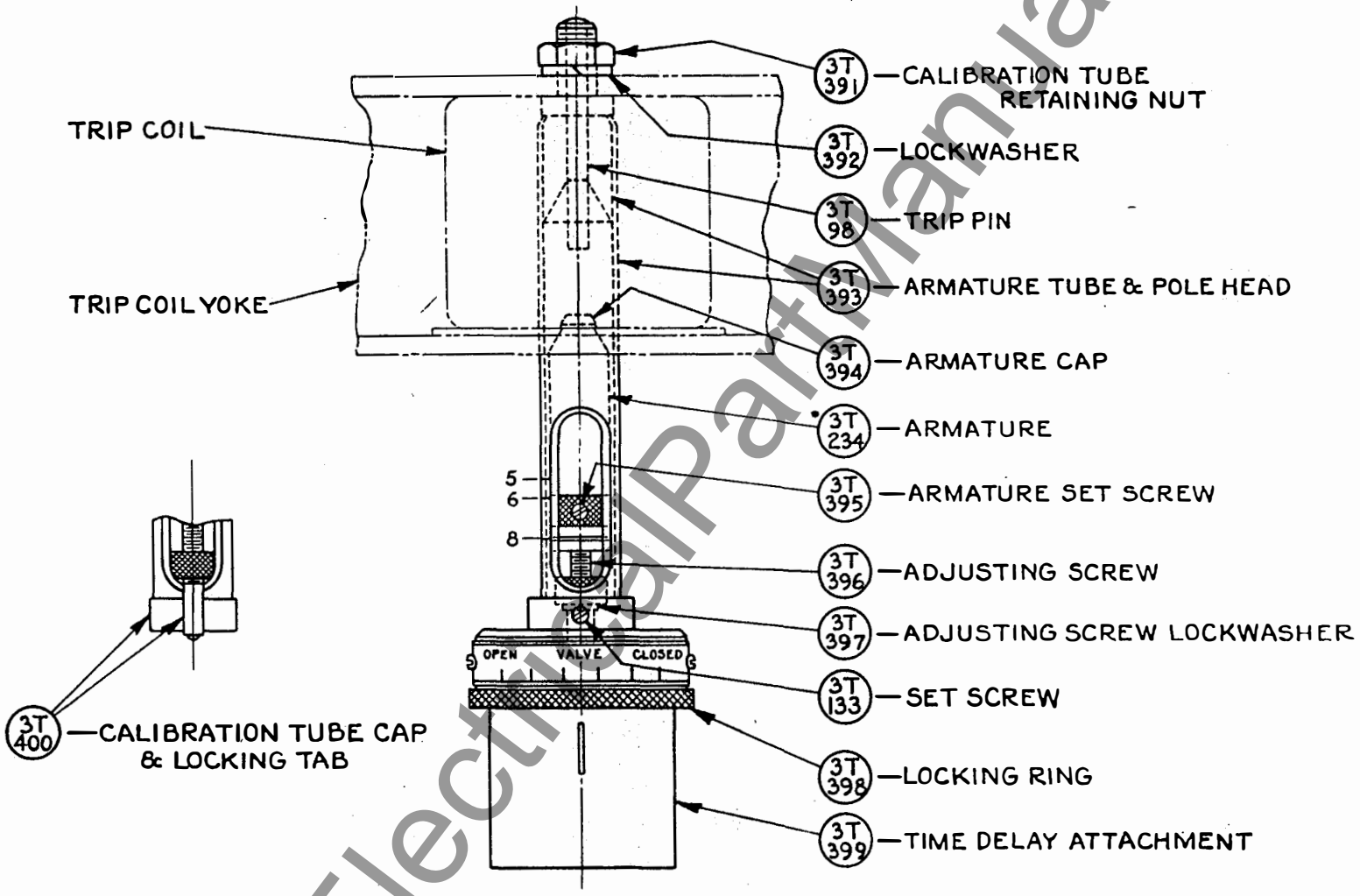


FIG. 8

Illustration CBX-62386

ALLIS-CHALMERS AC CIRCUIT BREAKER EQUIPMENT

INSTALLATION OF NEW CALIBRATION TUBE AND TRIP PIN (REF. FIG. 8)

27. When trip coil is added to an electrical operator in the field, it is necessary to install calibration tube and trip pin with the coil in the trip coil housing.

28. When coil is to replace another coil, the old calibration tube and trip pin may be retained only when overload trip coil for relay trip is on order When overload trip coil is ordered for series trip or transformer trip, it is advisable to order new calibration tube and trip pin, as this type coil is not interchangeable

INSTALLATION

29. Install the trip pin and tube and push up trip armature with thumb until breaker trips, and mark trip pin at top of pin guide. Then push armature up as far as it will go and make a second mark on trip pin at the top of pin guide. Measure the distance between marks and shorten pin by an amount equal to this distance less approximately 1/32". After the pin, as cut, has been reinstalled, check tripping action by raising trip plunger slowly with the thumb until the breaker trips. Observe that there is the required 1/32" further travel of the trip pin after breaker trips

CALIBRATION

30. Calibration tubes must be calibrated in the faceplate in which they are to be used. Therefore, when calibration tubes are shipped for installation in the field, they are not calibrated.

CAUTION: DO NOT MOVE TRIP TUBES AND PINS FROM ONE LOCATION IN A FACEPLATE TO ANOTHER, OR ANOTHER FACEPLATE WITHOUT CHECKING LENGTH OF TRIP PINS. TO DO SO MAY RESULT IN FAILURE OF BREAKER TO TRIP PROPERLY

TIME LIMITS (REF FIG. 8)

31. If time limits are furnished, their dashpots should be removed and filled with oil. The oil furnished is of special grade, carefully selected for its viscosity, known as "Reloil #10". Just enough oil is furnished with each container to fill one dashpot to the required level. To fill, remove machine screw from top of cover, set pot to "open" position, fill with oil, replace machine screw, and adjust pot for required setting.

32. The time limits may be adjusted for different settings by turning the dashpot through a small angle. The maximum time setting is obtained when the vertical line on the dashpot is opposite the word "closed" on valve scale, (See Fig. 8) and the minimum when it is opposite the word "open". Any intermediate time setting may be obtained by turning the dashpot (ST-309) to a corresponding point

between the positions. The dashpot may be locked at any setting with knurled lock ring (3T-398).

FINAL INSTALLING INSPECTION

33. Make sure that the Ruptair magnetic breaker is properly set up in accordance with the approved arrangement drawing.

34. Check to see that mechanism operates freely and that all shaft bearings have been lubricated with a light film of Gargoyle A - No. 0 grease or equal

35. Inspect all insulated wiring and check on all terminal connections. Test the wiring for possible grounds or short circuits.

36. Check to see that when installing the movable portion in cubicle the lift pins on breaker frame engage properly with hooks of lifting gear.

37. Check to see that grounding scrap at rear of breaker makes proper contact with stationary contacts in cubicle as breaker is raised into position.

38. As breaker is raised into final position, check to see that primary and secondary contacts are in alignment for proper contact engagement. With breaker fully raised against stop in cell, there should be 1/4" to 3/8" clearance between bakelite plates of movable and stationary portions of secondary disconnect device.

39. Check to see that the roll end of the mechanical interlock operating crank at rear of breaker falls into slot of tripping cam in fixed portion when breaker has been raised to its final position in cubicle. Check to see if breaker can be closed only in either its test position or in its final raised position.

40. The breaker should be operated several times in the test position to see that all parts are working smoothly before it is put in service.

MAINTENANCE

41. Upon the proper operation of the circuit breaker and auxiliary equipment depends the safety of the operators and the successful functioning of the connected apparatus, therefore, the breaker should have regular systematic, thorough and understanding inspection and maintenance.

a. Be sure that the breaker and its mechanism is disconnected from all electric power before any maintenance is attempted.

b. Inspect the breaker and auxiliary equipment mechanically and electrically at least once every six months.

c. Keep shaft bearings of breaker mechanism adequately lubricated with a light film of Gargoyle A - No. 0 or its equal.

d. Inspect all contacts frequently, depending on severity of service. Replace badly pitted or burned contacts before they are damaged to such an extent as to cause improper operation of the breaker.

e. Check the contact adjustment and breaker timing occasionally, also, check adjustments of auxiliary equipment and see that they function properly.

REPLACEMENT PARTS

42. When ordering replacement parts, refer to Figs. 2, 6, 7, and 8, and to the following Parts Lists. Specify quantity, reference numbers, catalog numbers, and give description of parts required. Also, give amperage, voltage and serial number of the breaker on which the parts are to be used.

EXAMPLE:-Refer No. 8, (Fig. 2), Catalog No. 73541GB, tertiary contact for Type AM-500, 600 ampere, 5000 volt, serial No. 272539, magnetic breaker.

43. A sketch of the part wanted will help materially if any uncertainty exists.

44. It is recommended that sufficient parts be carried in stock to enable operators of circuit breakers to replace without delay any worn, broken, or damaged parts. In the last two colums of the Replacement Parts List are given quantities of the parts which should be kept in stock.

INSTALLATION OF REPLACEMENT PARTS (REFER TO FIGS. 2, 6 & 7)

CAUTION:- BEFORE REMOVING ANY PART, MAKE SURE THAT THE BREAKER AND ITS OPERATING MECHANISM IS DISCONNECTED FROM ALL ELECTRIC POWER.

45. Before removing part to be replaced, observe its function and adjustment. By so doing, it is usually possible to avoid any appreciable amount of adjustment work after the installation of the replacement part.

PHASE BARRIERS - (FIG. 2)

46. To remove the phase barriers (4 and 5) remove the front panel (3) by taking out screws (87) and screws connecting bracket to rim of panel, pick up outer barrier to free clip (6) from carrier (5) and then withdraw both barriers from breaker. Installation is obvious. However, make sure that the inter-phase barrier (5) is inserted in slots of bar (38).

ARC-CHUTE ASSEMBLY - (FIG. 2)

47. When replacing an arc-chute assembly (2) remove the phase barriers (4 and 5), remove strap (25) by taking out screws (39), take out screw (40) to free arc-runner (29) and remove the arc-chute assembly by pulling forward. On reassembly, make sure that arc-runner is connected and all fastenings are secure.

ARC-CHUTE BARRIER STACK - (FIG. 7)

48. To remove the arc-chute barrier stack (2) from chute assembly, remove the

chute assembly from breaker as outlined in previous paragraph. Remove the two straps (5) from top inner edge of the arc-chute tube (1) by taking out the four screws (22) and withdraw barrier stack from tube. Replacement is obvious. However, make sure that the barrier stack is inserted with the "V" slots toward the bottom of the chute.

ARC RUNNER - FIG. 7)

49. When it is found necessary to replace an arc runner (8) remove the arc-chute assembly and barrier stack as outlined in previous paragraphs. Remove screws (20) to free the refractory side plates (3) from shell, remove stud (20) and bushing (10), remove screws (14 and 18) from both sides of shell and withdraw from bottom of chute the arc-runner (8), fiber strips (6), spacer boards (15) and refractory side plates (3) as an assembly. When assembly is once free of chute the removal of arc-runner (8) is obvious. For replacement the arc-runner, fiber strips, spacer board, and refractory side plates must be installed as an assembly. On making up assembly make sure that pins (12) and spacers (9) are in position and that the pins of side plates (20) are inserted in holes in fiber strips. Make all fastenings secure.

ARCING CONTACT - (FIG. 2)

50. To replace an arcing contact (90) remove the arc-chute assembly as outlined in paragraph (47). Then break the blowout coil connections at rear of arcing contacts and take out the four screws (41) and remove the arcing contact assembly. The replacement of arcing contacts is obvious.

BUSHING TUBES - FIG. 2)

51. The Bakelain bushing tubes (15 and 16) can be removed from the front or rear bushings by simply removing the contact finger assembly from top of stud and lifting tube from over stud. On replacement make sure that dowel pin is in hole in contact assembly.

STUD REMOVAL - (FIG. 2)

52. When it is found necessary to replace a terminal stud, remove the phase barriers and arc-chute assemblies from breaker as outlined in paragraphs 46 and 47. Remove pin (88) in order to disconnect insulating link (20) from crank arm of movable contact arms (9 and 10). Remove nuts (43) to free rear stud support, and then remove top plate (21) by taking out the six cap screws (44). Lift and slide rear bushing (11 or 13) forward approximately 1-1/2 inches. Remove the nuts (45) then slide the front bushing, blowout coils, core, stationary contact structure and side plates forward as a unit until the ends of bolts (68) clear back of breaker frame and then lift up and remove the assembly from the breaker. The rear stud with supports and movable contact can now be removed. With the front stud, blowout coil, etc., out of the breaker, the dismantling of the various parts can be done on the bench. The front stud can be segregated from the group by disconnecting blowout coil leads, and removing cap screws (46).

53. When reassembling the contact studs and assemblies in breaker, reverse the above procedure making sure that all fastenings are secure and all parts are in

alignment. When checking for alignment of contact studs, refer to dimensions on Figure 2. It is recommended that only one phase assembly be removed at a time and realigned before removal of the next.

BLOWOUT COIL - (FIG. 2)

54. To remove a blowout coil remove the phase barriers and arc-chutes as outlined in paragraphs 46 and 47. Remove the side plates (22) by taking out the flat head screws (47), break blowout coil connections at rear of arcing contacts and remove coil. Replacement is obvious. However, make sure that all fastenings and coil connections are secure. The flat head screws (47) must be "staked" when in final position.

TRIP COIL - (FIG. 6)

55. To remove a trip coil (29) back off nut (18) at top of calibration tube so tube can be withdrawn. Break coil connections and remove coil. Replacement is obvious. However, make sure that spacer washer (16) is in position under coil.

CLOSING COIL - (FIG. 6)

56. To remove the closing coil (14) remove the end plate (2) by taking out the four cap screws (3), break the coil connections, and remove the coil. On replacement make sure end of tube (8) is in recess in end plate and that all fastenings and connections are secure.

ALLIS-CHALMERS MFG. COMPANY

BOSTON WORKS

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RECOMMENDED SPARE PARTS LIST FOR TYPE AM-50C MAGNETIC BREAKER (REFER TO FIGS. 1 & 7)

REF NO	DESCRIPTION	CATALOG NO	RECOMMENDED FOR STOCK FOR 1 BRKR.	5 BRKRS
2	Arc Chute (complete)	8[illegible]3X8	1	1
6	Tertiary contact	73542DB	3	9
9	Contact arm (R.H.)	1454[illegible]JB	1	1
10	Contact arm (L.H.)	0454[illegible]JB	1	1
11	Terminal Stud (rear)-600 A.	1414[illegible]B	1	1
12	Terminal stud and main contact-(Front)-600 A	6414[illegible]HB	1	2
13	Terminal stud (rear)- 1200 A.	7414[illegible]HB	1	1
14	Terminal stud & Main contact-(Front)-1200 A.	8414[illegible]HB	1	2
15	Bushing tube (rear)	76096HB	1	2
16	Bushing tube (front)	77096HB	1	2
20	Connecting rod	0498[illegible]GB		
25	Connector	15096HB		
65	Spring	9511B		
90	Arcing contact	93541HB	1	3
8 (Fig. 7)	Barrier stack	29211HB		3
3 (Fig. 1)	Arm runner	07496JB	1	3

RECOMMENDED SPARE PARTS LIST
FOR
SOLENOID OPERATOR
FOR
TYPE AM-50C MAGNETIC BREAKERS
(REFER TO FIG. 6)

REF. NO.	DESCRIPTION	CATALOG NO.
10	Spring	50415
14	Closing coil*	4[illegible] (specify closing voltage)
17	Tripping unit a. Calibration tube (complete) b. T-5 time limit	3[illegible]
21	Spring	5511B
27	Latch check switch	60211HB
29	Tripping coil *	9229AB (specify trip voltage)
35	Latch	41356HB
53	Spring	42356GB
55	Spring	135960B
56	Spring (outer)	2911B
57	Spring (inner)	9711B
61	Limit Switch	35311HB

*If these coils are used on particular arrangement, sufficient spares should be carried in stock to take care of apparatus in service.