

Westinghouse

Types

B-20-B and B-22-B Oil Circuit-Breakers

600- and 1200-Amperes, 15,000 Volts

INSTRUCTION BOOK

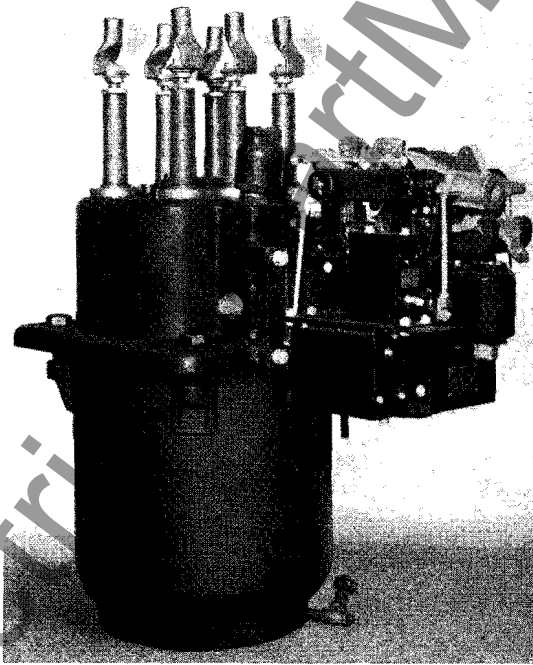


FIG. 1—TYPE B-20-B OIL CIRCUIT-BREAKER,
15,000 VOLTS, 600 AMPERES,
SOLENOID-OPERATED

Westinghouse Electric & Manufacturing Company
East Pittsburgh Works, East Pittsburgh, Pa.

Printed in U.S.A. (Rev. 1-38)

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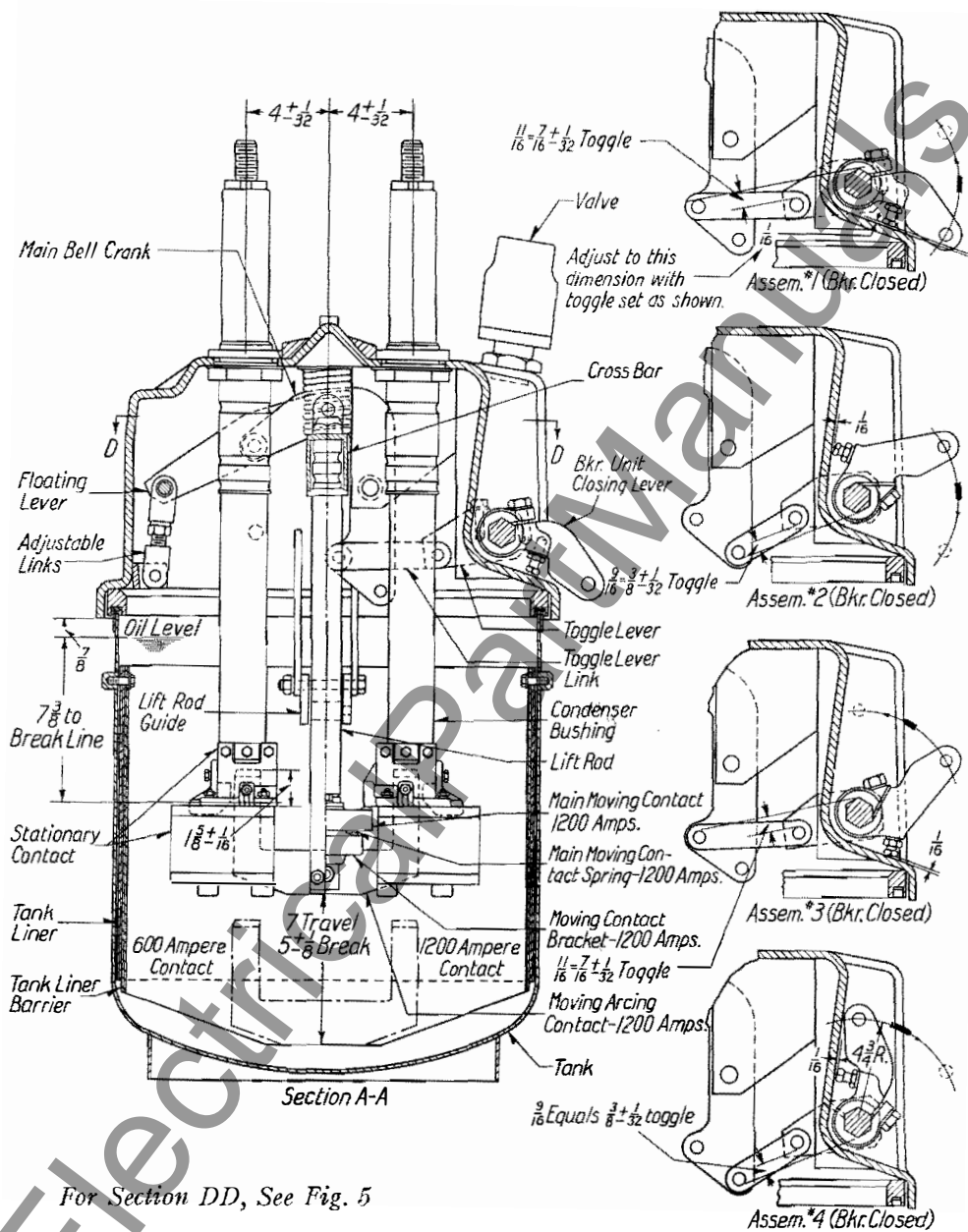


FIG. 2—CROSS SECTION OF TYPE B-20-B OIL CIRCUIT-BREAKER SHOWING VARIOUS ARRANGEMENTS OF TOGGLE LEVER AND LINK ASSEMBLY

Westinghouse

Types B-20-B and B-22-B Oil Circuit-Breakers

600- and 1200-Amperes, 15,000 Volts

Manually or Electrically Operated

(Lift-up Cell, Frame or Truck Mounted)

General Description

The Types B-20-B and B-22-B oil circuit-breakers are 3-pole single-throw breakers of non-oil-throwing design, with all poles contained in a single round tank. They are designed for a maximum of 15000-volt service in both the 600- and 1200-ampere sizes.

These breakers may be mounted in cells or trucks, on steel or pipe frames or as lift-up units.

Electrical operation may be by solenoid, when direct-current is available or by solenoid plus Rectox or motor mechanism when alternating-current is available. The breaker may also be operated manually.

These breakers are equipped with "De-ion Grid" Contacts, Fig. 4. The interruption takes place in the "De-ion Grid" chambers supported from the terminals. This chamber consists of a series of insulating plates having interspersed plates of magnetic material, all so disposed and vented that the arc is moved laterally into oil pockets where it vaporizes the oil. The resultant gases are then forced transversely through the conducting gases of the arc stream in such a manner as to de-ionize them and extinguish the arc.

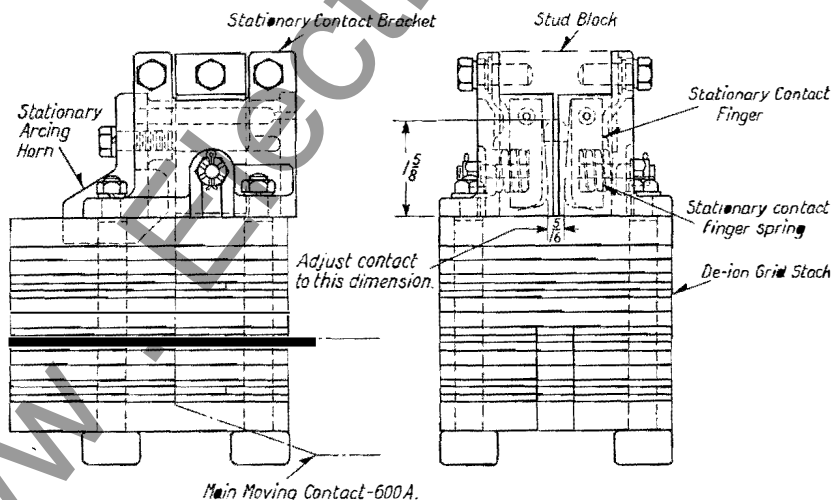


FIG. 4—DE-ION GRID ASSEMBLY

Installation

1. Attach the breaker to the supporting structure, first making sure that the structure is level.
2. Remove the tank and examine the inside for evidence of moisture and foreign matter. Flush with benzine.
3. Remove the wire which holds the breaker in the closed position and allow the breaker to open slowly.
4. When the mechanism is mounted separately from the breaker, connect the breaker and operating mechanism, making sure that full contact is secured and that the breaker rests on the bumpers when open.
5. Examine the contacts and note that they are clean and in alignment. For adjustment, see section covering Adjustment.
6. Operate the circuit-breaker by hand several times, watching each pole and the operating mechanism to be sure that all parts move freely.
7. Install connections to the breaker studs.
8. Insulate the connections with varnished cambric and non-elastic cotton tape in accordance with Westinghouse Standards for the various operating potentials. See Fig. 7.
9. Connect the vent pipe to the top of the venting valve. This pipe should be connected to the main venting header pipe, or outside the cell or truck in which the breaker is mounted. It should be so arranged that it will not be possible for rain or condensation to enter the piping. The piping should also be free of any pockets which would retard the drainage of any oil that might be discharged, back to the circuit-breaker.
10. With the tank removed, fill it with oil to within two inches of the top, or if more desirable, the oil can be added through the

Shipment

The breaker is shipped in the following manner:

1. Breaker and operating mechanism are assembled as a complete switching unit with the breaker tied in the closed position.
2. For remote control, the breaker and operating mechanism will be crated separately.

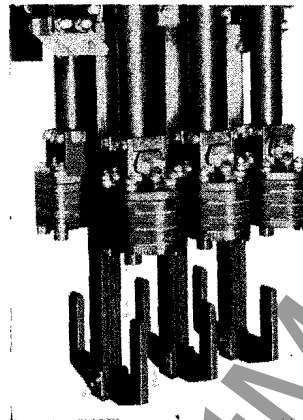
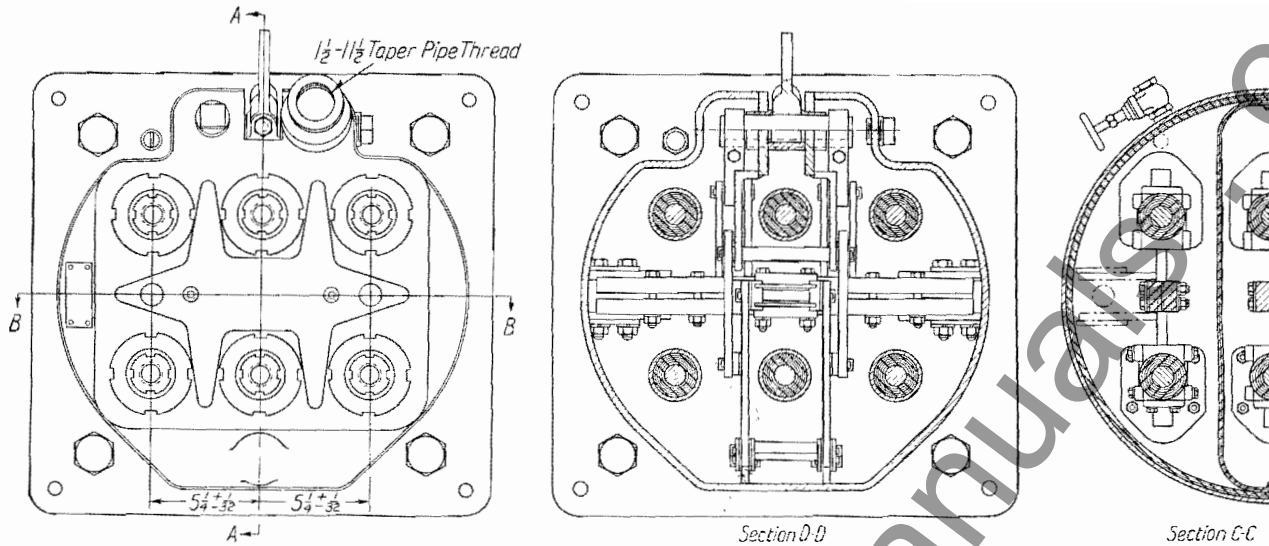


FIG. 3—TYPE B-22-B 600-AMPERE, 15,000-VOLT BREAKER CONTACT ASSEMBLY WITH "DE-ION GRIDS"

Westinghouse Types B-20-B and B-22-B Oil Circuit-Breakers



For Section AA, See Fig. 2.

FIG. 5—TOP AND SECTIONAL VIEWS FOR TYPE B-20-B CIRCUIT-BREAKER

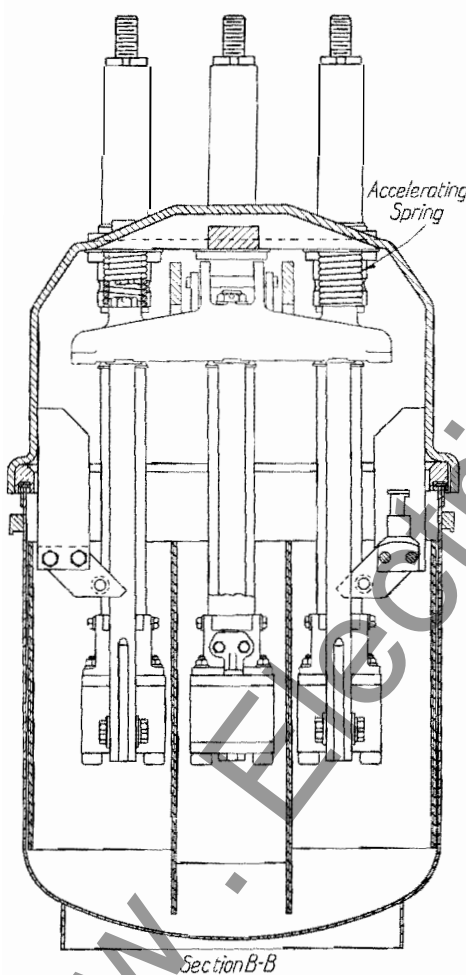


FIG. 6—CROSS SECTIONAL VIEW OF TYPE B-20-B CIRCUIT-BREAKER

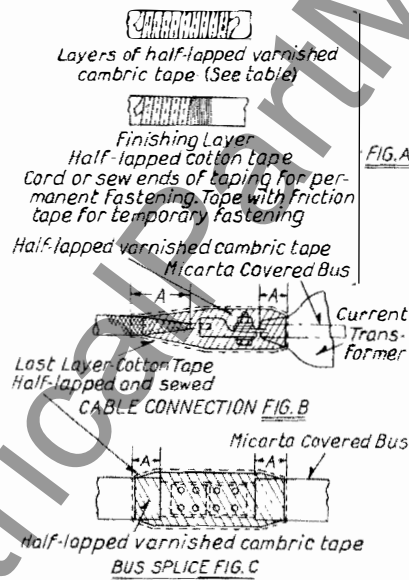


FIG. 7—INSTRUCTIONS FOR TAPING CONNECTIONS

The following instructions should be followed in taping all main connections on circuit-breaker trucks and switch-houses. All connections except joints are insulated at the factory, the joints being left open for purchaser's inspection. In order to obtain maximum safety of the equipment do not fail to complete taping before putting into service.

SERVICE VOLTAGE	LAYERS OF VARNISHED CAMBRIC TAPE	"A" CREPPAG INCHES
750	3	1
2500	4	1
4000	5	1
4500	6	1 1/2
6600	7	1 1/2
7500	8	1 1/2
13200	12	2
15000	13	2
25000	18	2
37000	28	2

Wrap with half-lapped layers of ".010 varnished cambric tape (Westinghouse No. 1225 Tan Treated Cloth) applying as many layers as given in the above table. Apply a coat of No. 9 insulating varnish (Westinghouse No. 311) between layers. Tape over the cambric with one layer of ".007 cotton tape and wrap the ends with cord to keep them in place. Finish with two coats of M-1736 black insulating varnish (Westinghouse No. 414).

11. Remove the small plug in the top of the oil gauge and move the oil float indicator up and down to see that it is free to move. The red cap at the top of the float should show in the top of the glass for the proper oil level.

12. Connect the breaker frame through one of the mounting bolts to ground. The National Electric Code requires grounding cable to have one-fifth of the main circuit capacity, except that it must never be smaller than No. 8 and need not be larger than No. 0, B. & S. gauge.
13. Check the operation of the breaker by operating it electrically in accordance with the instructions covering the mechanism used.

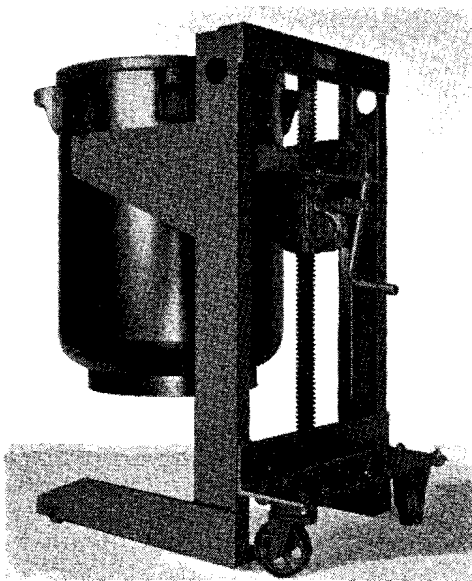


FIG. 8—TRUCK-TYPE TANK LIFTER

Adjustments

Breaker Mechanism—The toggle mechanism is designed for reversible operation, so that the direction of operation can be changed by a simple change in the location of the toggle pin which is located in the toggle lever. No adjustment is required on the toggle setting as this is set at the factory. This setting is such that with the breaker in the closed position there is a clearance of $\frac{1}{16}$ inch between the operating lever set screw and the breaker top. The toggle is set $\frac{3}{8}$ inch off center. See Fig. 2.

Changing the Direction of Operation—To change the direction of operation, use a shorter link and interchange toggle pin with the holes in the toggle lever.

CAUTION—Do not interchange links, levers or cross bars between breakers of different ampere-capacities, as certain parts are made of non-magnetic material. To interchange these parts may result in excessive heating.

The hydraulic bumper action is secured by reaction of the moving cross bar on two hydraulic stops—one on each end of the cross bar guides. This action is non-adjustable and requires no attention. Do not operate the breaker excessively without oil.

Contacts—The contact arrangement for the 600-ampere breaker is shown in Fig. 4. Adjustment is provided by means of adjustable links located in the breaker top at the rear. To

increase the amount of contact, the complete moving contact must be raised up. This is accomplished by making the links shorter. To decrease the amount of contact, the links should be made longer. For full contact, the distance between top of the "De-ion Grid" top plate and the top of the moving contact should be $1\frac{5}{8}$ inches $\pm \frac{1}{16}$ inch, with the breaker closed. This dimension is only for new parts. Some allowance must of course be made when contacts burn.

CAUTION—After adjustment has been made, be sure that the adjusting screw is securely locked in place with the lock nut.

When fitting new stationary contact fingers the adjustment should be so made that the distance between the fingers is $\frac{1}{16}$ inch. See Fig. 4. These fingers should also be adjusted symmetrically with respect to the slot in the grids.

The main contacts of the 1200 ampere capacity breaker (Figure 2) are adjustable by turning the bracket up or down on the lift rod. With the breaker in the closed position the distance between the contact cross bar and cross bar bracket should be $\frac{1}{8}$ to $\frac{5}{32}$ inch. It is important that this dimension be maintained.

These contacts make silver-to-silver contact and it is unnecessary to use

an abrasive to keep them bright. In fitting new contacts it is not necessary that perfect line contact be obtained. With the soft material (silver) good contact is obtained after a few operations. If it is necessary to renew the silver surfaces, return the parts to the factory as the blocks of silver are put on with special solder.

The moving contacts are tipped with a special arc-resisting tungsten alloy to insure long life. This can only be replaced at the factory.

"De-ion Grid" Stacks—It is important that the arrangement of the plates in the "De-ion Grids" be correct. Should it be necessary to renew parts of the stacks, it is recommended that they be returned to the factory for repair or complete new assembled stacks supplied.

Connections to Operating Mechanisms

When the breaker unit and its operating mechanism are shipped separately, it is important that the operating rod between the two units be properly adjusted. The adjustment should be made, so that there is a full $\frac{1}{16}$ inch clearance between the operating lever and the breaker top, when the breaker is fully closed and latched. See Fig. 2.

The adjustment should also be made so that the opening shock is absorbed

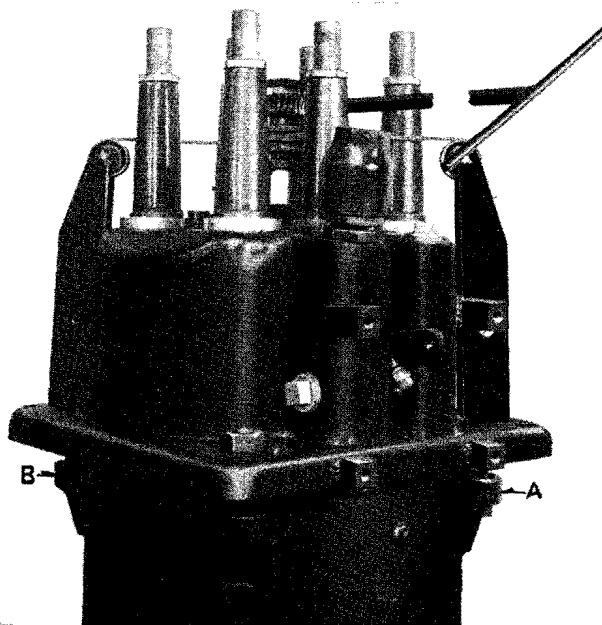


FIG. 9—WINDLASS TYPE TANK LIFTER

Westinghouse Types B-20-B and B-22-B Oil Circuit-Breakers

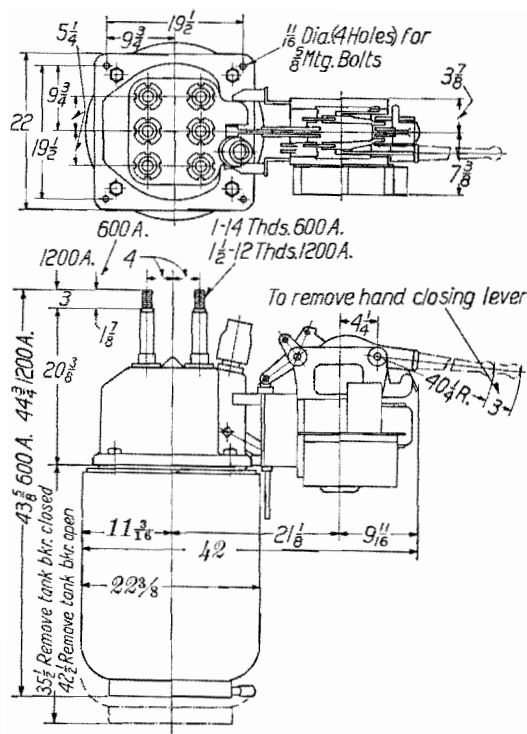


FIG. 10—TYPE B-22-B "DE-ION GRID" OIL CIRCUIT-BREAKER

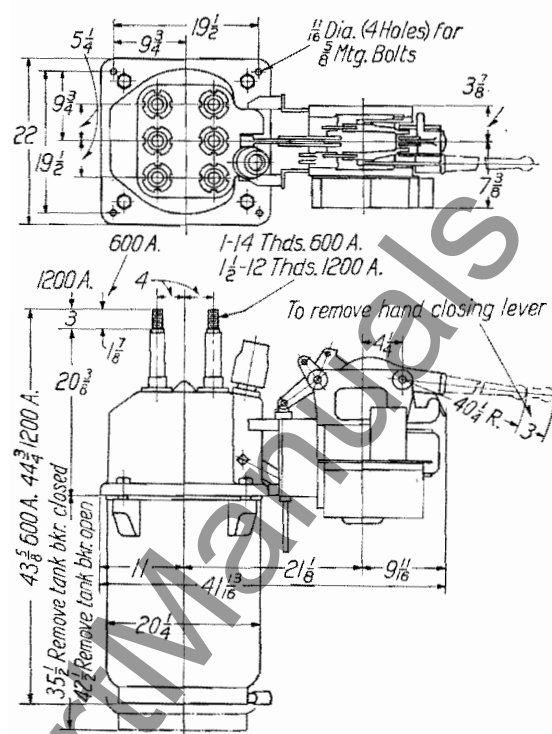


FIG. 11—TYPE B-20-B "DE-ION GRID" OIL CIRCUIT-BREAKER

on the bumpers and not on the operating mechanism.

Terminal Bushings—The surface of the bushing insulation should be smooth and well varnished. If the varnished surface is damaged or questionable, it should be smoothed off with fine sand paper and revarnished with three coats of good quality, clear, air-drying Spar varnish. Each coat should be allowed to dry for 24 hours.

Operation

Points to be Observed in Operating—

1. Before making any adjustment to any oil circuit-breaker, make sure that all lines leading to it are electrically dead.
2. Be sure that the breaker frame is grounded.
3. Do not operate the breaker excessively by the operating mechanism when the oil tanks are removed.
4. Examine all contacts frequently, especially after severe short-circuits. See that the contacts are aligned properly.
5. After making any adjustments, operate the apparatus carefully

by hand to make sure that it operates smoothly and correctly.

6. When testing, coat the contacts with a thin film of vaseline.
7. Inspect the oil regularly and after severe short-circuits. If it shows signs of moisture, carbonization or dirt, filter and retest it before replacing it in service. See that the oil level in the tanks is maintained at the proper height. See Fig. 2.
8. Remove all oil and thoroughly clean the tanks, tank liner, lift rod, terminal bushings, etc., at least once a year.
9. Occasionally inspect and tighten clamping nuts around the bushing on top the breaker.
10. Arrange for regular inspection to see that the apparatus is in adjustment as explained.

Insulating Oil—Dielectric tests of the oil should be made every three months, to show if it is reasonably good for circuit-breaker work. Samples should not be taken until the oil has remained undisturbed for at least four hours. In testing for indication of water, take the sample from the bottom through the tank drain. If for indica-

tion of carbon, and after a heavy short-circuit, take the sample from the surface of the oil. For instructions as to the care and testing of insulating oil, see Instruction Book 5336.

Operating Mechanisms—For instructions covering the Type SA-3 Solenoid Mechanism, see Instruction Book 5567. For instructions covering the Type CFO Motor Mechanism, see Instruction Book 5334. For instructions covering Rectox Unit, see Instruction Leaflet 1782.

Windlass Type Tank Lifter— Fig. 9

To operate the windlass type tank lifter it must be first bolted in place as shown. Tank bolts A and B must be removed, and the cable inserted through the pulley supports, the supports should be then placed in the tank bolt holes, taking care to assemble support with clip in hole A. The swivel ends should be then screwed into the lugs on the tank and all slack in the cable taken up, using care to not unduly strain the cable. The two remaining tank bolts can be then removed and the tank lowered. The worm and worm wheel construction will permit the tank to hang in all positions without blocking. The lifter may be operated from the front or rear of the breaker.

Westinghouse Types B-20-B and B-22-B Oil Circuit-Breakers

RENEWAL PARTS DATA

Recommended Stock of Renewal Parts Types B-20-B and B-22-B Oil Circuit-Breakers 600 to 1200 Amperes; 15,000 Volts; 2 and 3 Poles; Single Throw For Illustration of Parts, see Figs. 2 and 4

The following is a list of the Renewal Parts and the quantities of each that we recommend should be stocked by the user of this apparatus to minimize interrupted operation caused by breakdowns. The parts recommended are those most subject to wear in normal operation or those subject to damage or breakage due to possible abnormal conditions. This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shut-downs is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

For Breakers in use up to and including.....	2-POLE			3-POLE			Style No. of Part
	No. Per Breaker	1	5	No. Per Breaker	1	5	
Name of Part		Recommended for Stock		Recommended for Stock			
Breaker Complete.....	1	0	0	1	0	0	...
Breaker Unit Complete.....	1	0	0	1	0	0	...
*Accelerating Spring.....	2	0	1	2	0	1	841 625
*Bumper Spring.....	2	0	1	2	0	1	840 068
*Moving Contact Complete.....	2	0	0	3	0	0	...
Lift Rod—600 Amperes.....	2	0	1	3	0	1	1019 421
Lift Rod—1200 Amperes.....	2	0	1	3	0	1	1019 422
Main Moving Contact—600 Amperes.....	2	0	1	3	0	1	850 330
Main Moving Contact—1200 Amperes.....	4	0	2	6	0	2	850 333
Moving Contact Bracket—1200 Amperes.....	2	0	0	3	0	0	881 670
Main Moving Contact Spring—1200 Amperes.....	8	1	4	12	1	4	841 729
Moving Arcing Contact—1200 Amperes.....	2	0	1	3	0	1	850 334
*Stationary Contact Complete.....	4	0	0	6	0	0	...
Condenser Bushing—600 Amperes, Standard.....	4	0	2	6	0	2	825 703
Condenser Bushing—600 Amperes, Lift-Up.....	4	0	2	6	0	2	841 732
Condenser Bushing—1200 Amperes, Standard.....	4	0	2	6	0	2	825 610
Condenser Bushing—1200 Amperes, Lift-Up.....	4	0	2	6	0	2	841 778
Stationary Contact—600 Amperes.....	4	0	0	6	0	0	825 710
Stationary Contact—1200 Amperes.....	4	0	0	6	0	0	825 711
De-ion Grid Stack.....	4	0	2	6	0	2	841 775
Main Stationary Contact—1200 Amps., R.H.....	4	0	2	6	0	2	809 989
Main Stationary Contact—1200 Amps., L.H.....	4	0	2	6	0	2	809 988
Stationary Contact Finger.....	8	8	16	12	12	24	834 159
Stationary Contact Finger Spring.....	8	1	4	12	1	4	841 665
Stationary Arcing Horn.....	4	4	8	6	6	12	850 328
Tank Complete—Type B-20-B Breaker.....	1	0	0	1	0	0	858 564
Tank Liner.....	1	0	0	1	0	0	858 566
Tank Liner Barrier.....	1	0	0	1	0	0	858 565
Tank Complete—Type B-22-B Breaker.....	1	0	0	1	0	0	1070 603
Tank Liner.....	2	0	1	2	0	1	1070 604
Tank Liner Barrier.....	2	0	1	2	0	1	875 755
*Type SA-3 Operating Mechanism.....	1	0	0	1	0	0	See I.B. 5567
*†Closing Coil.....	1	0	0	1	0	0	†
*†Trip Coil.....	1	0	1	1	0	1	†
*Type CF-O Operating Mechanism.....	1	0	0	1	0	0	See I.B. 5334
*†Rectox Unit.....	1	0	0	1	0	0	†

* Not listed on illustrations.

† When ordering, specify identification number stamped on Part.

Parts indented are included in the part under which they are indented.

ORDERING INSTRUCTIONS

When ordering Renewal Parts, always specify the name of the part wanted as shown on the illustration in this Instruction Book, giving Shop Order Number, and the type of Circuit-Breaker as shown on the name plate. For Example:

One Moving or Stationary Contact Complete, 600 Amperes for Type B-20-B or B-22-B Circuit Breakers, S.O. 5-F-277, shown in Instruction Book 5660-A, Figure 2.

To avoid delays and misunderstandings, note carefully the following points:

1. Send all correspondence and orders to the nearest Sales Office of the Company.
2. State whether shipment is to be made by freight, excess or parcel post. In the absence of instructions, goods will be shipped at our discretion. Parcel post shipments will be insured only on request. All shipments are at purchaser's risk.
3. Small orders should be combined so as to amount to a value of at least \$1.00 net. Where the total of the sale is less than this, the material will be invoiced at \$1.00.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Business Addresses

Headquarters, Pittsburgh, Pa.

- *AKRON, OHIO, 106 South Main St.
- *ALBANY, N. Y., 456 No. Pearl St.
- *ALEXANDRIA, VA., 121 Frazier Ave.
- *ALLENTOWN, PA., 522 Maple St.
- *APPLETON, WISC., 1708 N. Drew St., P.O. Box 206
- †APPLETON, WISC., 1029 So. Outagamie St.
- *ATLANTA, GA., 426 Marietta St., N. W.
- *ATTICA, N. Y.
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- †BALTIMORE, MD., 501 East Preston Road
- *BALTIMORE, MD., 40 S. Calvert St.
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- *BINGHAMTON, N. Y., Suite 704, Marine Midland Bldg., 86 Court St.
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- *BOISE, IDAHO, P. O. Box 1597
- *BOSTON, MASS., 10 High St.
- †BOSTON, MASS., 12 Farnsworth St.
- †BRIDGEPORT, CONN., Bruce Ave. & Seymour St.
- ①*BUFFALO, N. Y., 814 Ellicott Square Bldg.
- †BUFFALO, N. Y., 1132 Seneca St.
- *BURLINGTON, IOWA, 1708 River St.
- ①BURLINGTON, VER., 207 Park Ave.
- *BUTTE, MONTANA, 129 West Park St.
- *BUTTE, MONTANA, 742 Bryant Ave.
- *CANTON, OHIO, Market & Tuscarawas Sts.
- ①CEDAR RAPIDS, IOWA, 813 18th St., S.E., P. O. Box 148
- *CHARLOTTE, N. C., 210 East Sixth St.
- *CHARLESTON, W. VA., 107 Oakmont St., P. O. Box 865
- *CHATTANOOGA, TENN., 536 Market St.
- *CHICAGO, ILL., 20 N. Wacker Drive
- †CHICAGO, ILL., 2211 W. Pershing Road
- *CHICOPEE FALLS, MASSACHUSETTS
- *CINCINNATI, OHIO, 207 West Third St.
- *CLEVELAND, OHIO, 1216 West Fifty-Eighth St.
- *COLUMBIA, S. C., 912 Lady St.
- *COLUMBUS, OHIO, Gay & Third Sts.
- *DALLAS, TEXAS, 209 Browder St.
- *DALLAS, TEXAS, 1712 Carter St.
- *DAVENPORT, IOWA, 206 E. Second St.
- *DAYTON, OHIO, 30 North Main St.
- *DENVER, COLORADO, 910 Fifteenth St.
- *DENVER, COLORADO, 1700 Sixteenth St.
- †DENVER, COLORADO, 988 Cherokee St.
- *DENVER, COLORADO, Gas & Elec. Bldg.
- *DERRY, PA.
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- *DETROIT, MICH., 5757 Trumbull Ave.
- *DULUTH, MINN., 10 East Superior St.
- *EAST PITTSBURGH, PA.
- ①EL PASO, TEXAS, Oregon and Mills Sts.
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- *EL PASO, TEX., % Zork Hdw. Co., 309 N. El Paso St.
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- *EMERYVILLE, CALIF., 6161 Green St.
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- *FORT WORTH, TEXAS, 501 Jones St.
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- *GREENVILLE, S. C., West Earle St.
- *HAMMOND, IND., 235 167th St.
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- *HOUSTON, TEXAS, 2313 Commerce Ave.
- *HOUSTON, TEXAS, 2315 Commerce Ave.
- *HOUSTON, TEXAS, 611-15 Petroleum Bldg.
- ①HUNTINGTON, W. VA., 1029 Seventh Ave.
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- *INDIANAPOLIS, IND., 551 West Merrill St.
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- *JOHNSTOWN, PA., 47 Messenger St.
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- *LIMA, OHIO
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- *LITTLE ROCK, ARK., % Fones Bros. Hdw., 2nd & Rock Sts.
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- *MILWAUKEE, WISC., 1669 N. Water St.
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- †NEWARK, N. J., Haynes Ave. & Lincoln Highway
- *NEWARK, N. J., Plane & Orange St.
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- †NEW ORLEANS, LA., 333 St. Charles St.
- *NEW ORLEANS, LA., 527 Poydras St.
- *NEW YORK, N. Y., 150 Broadway
- *NEW YORK, N. Y., 460 West Thirty-Fourth St.
- *NIAGARA FALLS, N. Y., 205 Falls St.
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- ①OKLAHOMA CITY, OKLA., 120 N. Robinson St.
- *OKLAHOMA CITY, OKLA., Third & Alie Sts.
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- *OMAHA, NEB., 117 N. 13th St.
- *PEORIA, ILL., 104 E. State St.
- †PHILADELPHIA, PA., 3001 Walnut St.
- *PHOENIX, ARIZONA, 11 West Jefferson St.
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- *PITTSBURGH, PA., 306 4th Ave., Box 1017
- †PITTSBURGH, PA., 543 N. Lang Ave.
- *PORTLAND, MAINE, 142 High St.
- *PORTLAND, OREGON, 309 S. W. Sixth Ave.
- †PORTLAND, OREGON, 2138 N. Interstate Ave.
- *PORTLAND, OREGON, 720 N. Thompson St.
- *PROVIDENCE, R. I., 16 Elbow St.
- *RALEIGH, N. C., 803 North Person St.
- *RALEIGH, N. C., P. O. Box 443.
- *READING, PA., 619 Spruce St.
- *RICHMOND, VA., Fifth & Byrd
- *ROANOKE, VA., 726 First St., S. E.
- *ROCHESTER, N. Y., 410 Atlantic Ave.
- *ROCKFORD, ILL., 130 South Second St.
- *SACRAMENTO, CALIF., 1805 20th St.
- *SALT LAKE CITY, UTAH, 10 West First South St.
- †SALT LAKE CITY, UTAH, 346 A Pierpont Ave.
- *SALT LAKE CITY, UTAH, McCormick Bldg.
- *SAN ANTONIO, TEXAS, 115 W. Travis St.
- ①SAN FRANCISCO, CALIF., 1355 Market St.
- *SAN FRANCISCO, CALIF., 1 Montgomery St.
- *SEATTLE, WASH., 603 Stewart St.
- †SEATTLE, WASH., 3451 East Marginal Way
- *SHARON, PA., 469 Sharpville Ave.
- *SIOUX CITY, IOWA, 2311 George St.
- *SOUTH BEND, IND., 216 East Wayne St.
- *SOUTH BEND, IND., 107 E. Jefferson St.
- *SOUTH PHILA. WKS., Essington, Pa.
- *SOUTH PHILA. WKS., P. O. Box 7348, Philadelphia, Pa.
- *SPOKANE, WASH., So. 158 Monroe St.
- *SPRINGFIELD, ILL., 601 E. Adams St., Box 37
- *SPRINGFIELD, MASS., 395 Liberty St.
- *SPRINGFIELD, MASS., 653 Page Boulevard
- *ST. LOUIS, MO., 411 North Seventh St.
- †ST. LOUIS, MO., 717 South Twelfth St.
- *SYRACUSE, N. Y., 420 N. Geddes St.
- *TACOMA, WASH., 1023 "A" St.
- *TAMPA, FLA., 417 Ellamae Ave., Box 230
- *TOLEDO, OHIO, 245 Summit St.
- *TULSA, OKLA., 303 East Brady St.
- *TUTICA, N. Y., 113 N. Genesee St.
- *WASHINGTON, D. C., 1434 New York Ave., N. W.
- *WATERLOO, IOWA, 328 Jefferson St., P. O. Box 598.
- *WICHITA, KAN., 233 So. St. Francis Ave.
- *WILKES-BARRE, PA., 267 N. Pennsylvania Ave.
- *WORCESTER, MASS., 32 Southbridge St.
- *YORK, PA., 143 So. George St.
- *YOUNGSTOWN, OHIO, 25 E. Boardman St.

Where address and P. O. box are both given, send mail to P. O. box, telegrams to address indicated.

WESTINGHOUSE ELECTRIC SUPPLY COMPANY

Fully equipped sales offices and warehouses are maintained at all addresses

ALBANY, N. Y., 454 No. Pearl St.
 ALLENTOWN, PA., 522 Maple St.
 ATLANTA, GA., 96 Poplar St., N. W.
 AUGUSTA, MAINE, 90 Water St.
 BALTIMORE, MD., 40 South Calvert St.
 BANGOR, MAINE, 175 Broad St.
 BINGHAMTON, N. Y., 87 Chenango St.
 BOSTON, MASS., 76 Pearl St.
 BURLINGTON, VT., 208 Flynn Ave.
 BUTTE, MONTANA, 50 East Broadway
 CHARLOTTE, N. C., 210 East Sixth St.
 CHICAGO, ILL., 113 North May St.
 CLEVELAND, OHIO, 3950 Prospect Ave.
 COLUMBIA, S. C., 915 Lady St.
 DALLAS, TEXAS, 409 Browder St.
 DES MOINES, IOWA, 218 W. Second St.
 DETROIT, MICH., 547 Harper Ave.
 DULUTH, MINN., 308 W. Michigan St.
 EVANSVILLE, IND., 201 N. W. First St.
 FLINT, MICH., 1314 N. Saginaw St.
 FORT WORTH, TEXAS, 501 Jones St.
 GRAND RAPIDS, MICH., 507 Monroe Ave., N. W.
 GREENVILLE, S. C., 200 River St.
 HOUSTON, TEXAS, 1903 Ruiz St.

INDIANAPOLIS, IND., 137 S. Pennsylvania St.
 JACKSONVILLE, FLA., 37 South Hogan St.
 LOS ANGELES, CALIF., 905 East Second St.
 MADISON, WISC., 1022 E. Washington Ave.
 MIAMI, FLA., 1036 North Miami Ave.
 MEMPHIS, TENN., 366 Madison Ave.
 MILWAUKEE, WISC., 546 N. Broadway
 MINNEAPOLIS, MINN., 215 South Fourth St.
 NEWARK, N. J., 49 Liberty St.
 NEW HAVEN, CONN., 240 Cedar St.
 NEW YORK, N. Y., 150 Varick St.
 NORFOLK, VA., 254 Tazewell St.
 OAKLAND, CALIF., Tenth & Alice Sts.
 OKLAHOMA CITY, OKLA., 10 E. California St.
 OMAHA, NEB., 117 North Thirteenth St.
 PEORIA, ILL., 104 East State St.
 PHILADELPHIA, PA., 1101 Race St.
 PHOENIX, ARIZONA, 315 West Jackson St.
 PORTLAND, OREGON, 134 N. W. Eighth Ave.
 PROVIDENCE, R. I., 66 Ship St.
 RALEIGH, N. C., 322 S. Harrington St.
 READING, PA., 619 Spruce St.
 RICHMOND, VA., 301 South Fifth St.
 ROANOKE, VA., 726 First St., S. E.

ROCHESTER, N. Y., 240 St. Paul St.
 ST. LOUIS, MO., 1011 Spruce St.
 ST. PAUL, MINN., 145 East Fifth St.
 SACRAMENTO, CALIF., 20th and R Sts.
 SALT LAKE CITY, UTAH, 235 West South Temple St.
 SAN ANTONIO, TEXAS, 1201 E. Houston St.
 SAN FRANCISCO, CALIF., 260 Fifth St.
 SEATTLE, WASH., 558 First Ave., South
 SIOUX CITY, IOWA, 1005 Dace St.
 SPOKANE, WASH., 152 So. Monroe St.
 SPRINGFIELD, MASS., 46 Hampden St.
 SYRACUSE, N. Y., 961 W. Genesee St.
 TAMPA, FLA., 417 Ellamae St.
 TOLEDO, OHIO, 812 Lafayette St.
 TRENTON, N. J., 245 N. Broad St.
 TULSA, OKLA., 303 East Brady St.
 TUTICA, N. Y., 113 N. Genesee St.
 WASHINGTON, D. C., 1216 "K" St., N.
 WATERLOO, IOWA, 328 Jefferson St.
 WICHITA, KANSAS, 233 So. St. Francis Ave.
 WILMINGTON, DEL., 216 E. Second St.
 WORCESTER, MASS., 24 Southbridge St.
 YORK, PA., 143 S. George St.

* Sales Office † Service Shop x Works % Warehouse
 ① Changed or added since previous issue.

② First Class Mail Only % Merchandising Products Only z Headquarters ‡ Apparatus Products Only
 January, 1938