

INSTRUCTIONS

TRIPPING REACTORS

TYPE XBC11A

*Switchgear*

**GENERAL  ELECTRIC**  
SCHENECTADY, N.Y.

# TRIPPING REACTORS

## TYPE XBC

*These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.*

### APPLICATION

Where a reliable direct-current tripping source is not available, tripping reactors, Fig. 1, may be used in conjunction with overcurrent relays to operate the trip coils of circuit breakers from the current in the secondaries of current transformers. A tripping reactor permits the use of a circuit closing contact and it reduces this relay's contact-closing duty by eliminating the excessive fault current from the contact circuit. At least one tripping reactor and one three-ampere trip coil are required for each overcurrent relay.

These reactors are designed to be used with trip circuits consisting of a 3 ampere trip coil and a 1 ampere target coil, see Figs. 2 and 3, having a maximum impedance as shown in the paragraph entitled Trip-Circuit Burdens. To obtain the minimum contact closing duty a reactor should be used that has a trip-circuit rating just in excess of the trip-circuit burden. The secondary fault current must be in excess of four amperes to ensure positive tripping with the three ampere trip coil. The non-linear characteristic of the reactor may increase the operating time of the overcurrent relay, depending upon the accuracy of the current transformer used, if connected as in Fig. 3. An operational check will most easily determine its magnitude.

### OPERATION

Prior to relay contact closure all of the secondary current from the current transformer must pass through the tripping reactor. After relay contact closure part of this current passes through the trip coil, the remainder, passing through the reactor. The tripping circuit should be so proportioned that sufficient current will always be avail-

able to energize the trip coil if the relay operates. This condition will be obtained if the trip circuit does not have a total burden including leads in excess of the values given in the tabulation found in the paragraph entitled Trip-Circuit Burdens. It is desirable, of course, to use the reactor with the lowest burden characteristics so as to keep to a minimum the total burden on the current transformer.

### TRIP-CIRCUIT BURDENS

The XBC tripping reactors will carry trip circuit burdens rated in ohms for the three standard frequencies as follows:

Frequency	60	50	25
12XBC11A1	3	2.5	1.25
12XBC11A2	6	5.0	2.50
12XBC11A3	12	10.0	5.00

### THERMAL RATINGS

The XBC tripping reactors have continuous current ratings as follows:

12XBC11A1	-	10 amperes
12XBC11A2	-	7 amperes
12XBC11A3	-	5 amperes

These reactors will handle 100 ampere-fault current from the secondary of the current transformer for tripping duty and will limit the relay contact current to less than 10 amperes.

### BURDEN

The burden imposed on the current transformer by the tripping reactor is not a fixed value, since the reactor is a saturating device, but has characteristics as shown in Fig. 4. Calculations involving tripping reactors should be performed by the use of these curves. When calculations are made at frequencies other than 60 cycles per sec., the reactor will develop a terminal volt of 50/60 and 25/60 of the curve values for the same current for 50 and 25 cycles respectively.

## SHIPPING-UNPACKING-STORAGE

### SHIPPING

The tripping reactor is shipped in a suitable container carefully packed to prevent damage during transit. If, upon receipt, injury or rough handling is evident, a damage claim should be filed at once with the transportation company and the nearest General Electric Sales Office should be notified.

### UNPACKING

Care should be exercised in unpacking the unit to avoid damage. Sharp instruments should not be pressed into the container for fear of injuring the unit.

### STORAGE

The unit should be stored in a dry location. If it is accidentally immersed in water it should be unpacked and air dried immediately.

## INSTALLATION

### MOUNTING

The tripping reactor may be mounted in any position on the same panel with the over-current relays. The unit is provided with a suitable bracket for mounting on any flat surface by means of two bolts or screws. The drilling plan is shown in Fig. 5.

### CONNECTIONS

External connections should be made by the use of the cup type terminals provided on each stud of the reactor. The leads between the reactor, relay, and trip coil should be as short and direct as possible. Under no

condition should the total burden of the trip circuit exceed the amount as specified under the paragraph entitled Trip Circuit Burdens.

### INSPECTION

After installation the circuit should be checked for proper operation by setting the relay for minimum operating current, which should not be less than four amperes, and current applied in the primary circuit of sufficient value to operate the relay. Correct installation will be noted by both relay and trip coil operation.

## OPERATION AND MAINTENANCE

With reasonable careful handling and treatment, tripping reactors should not require care or attention after they are installed other than periodic inspection or connections to see that they are clean and tight.

## RENEWAL PARTS

When ordering Renewal Parts address the nearest Sales Office of the General Electric Company, specify the quantity required, the name of the part wanted, and the complete nameplate data.

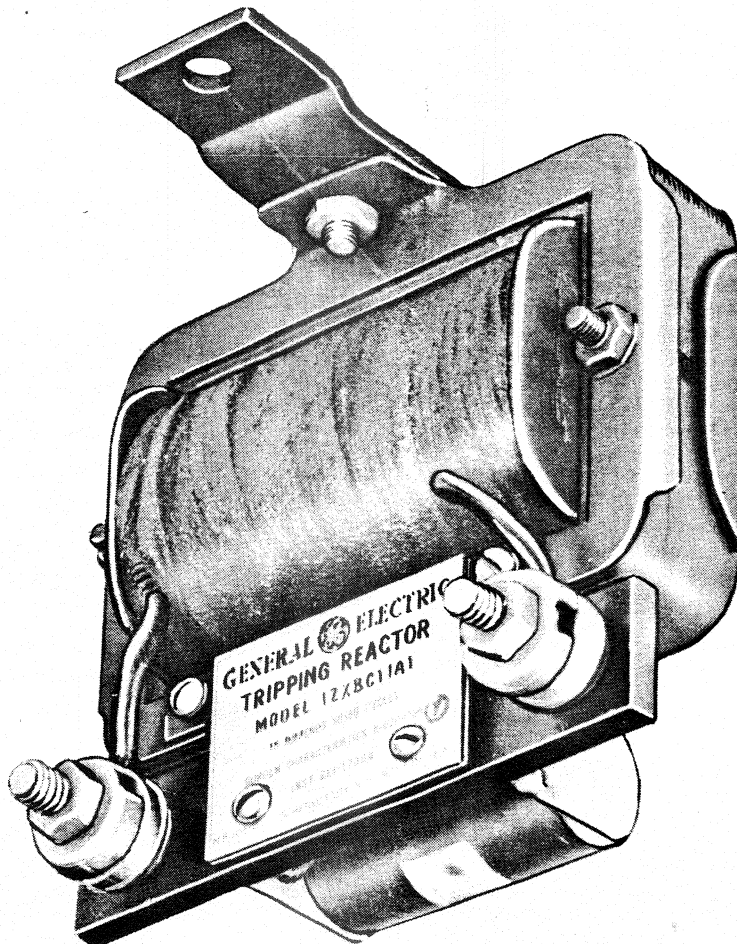


FIG. 1  
TRIPPING REACTOR TYPE XBC11A

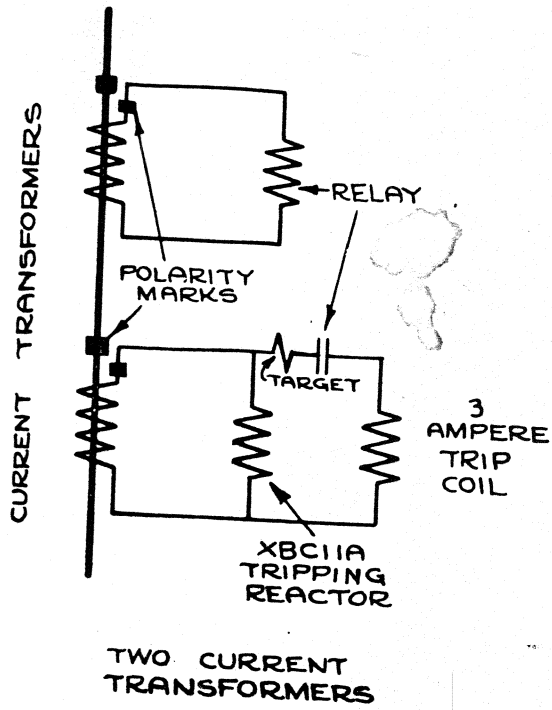


FIG. 2

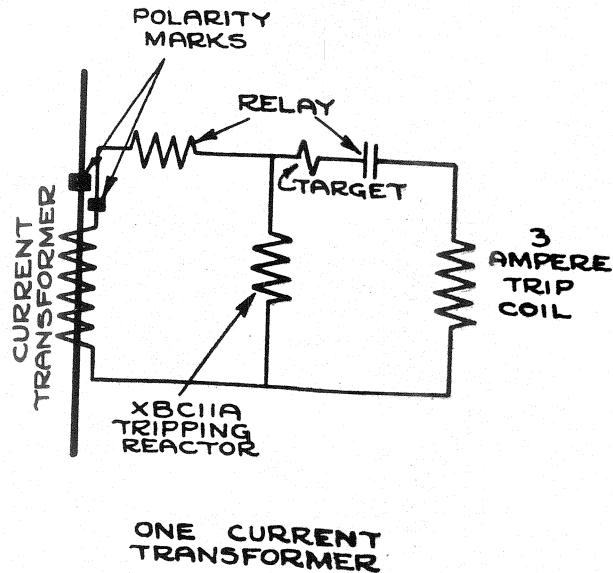


FIG. 3

TYPICAL REACTOR TRIPPING USING TYPE XBC11A TRIPPING REACTORS.

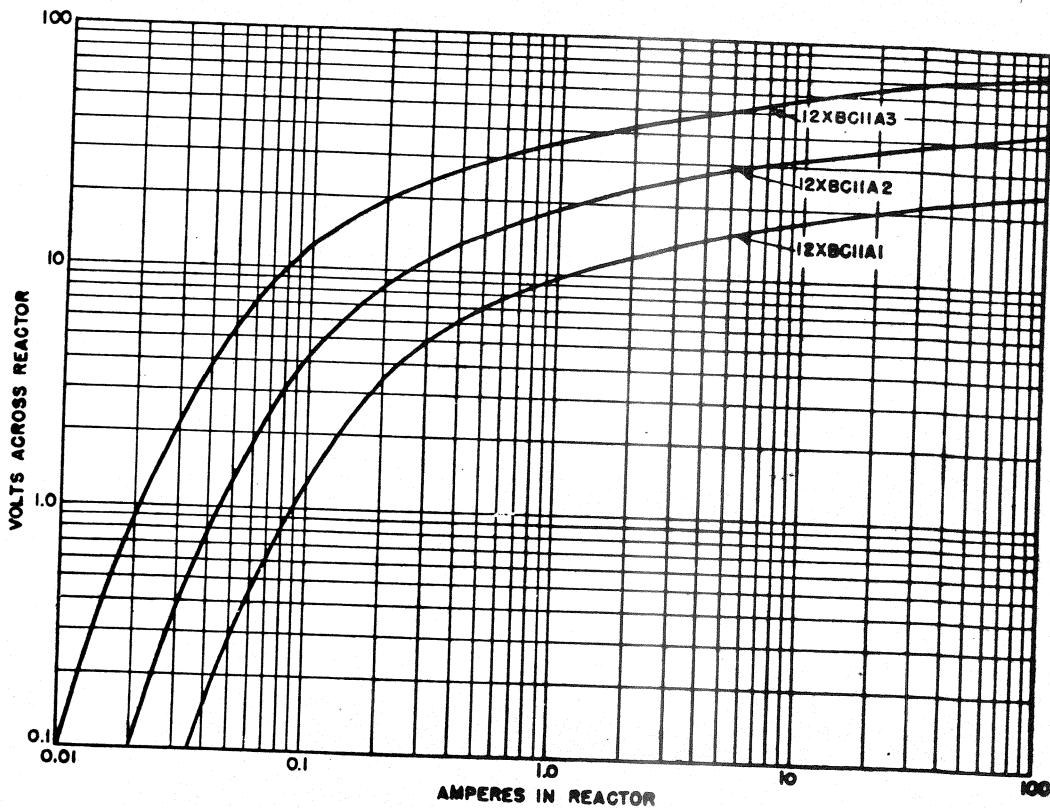
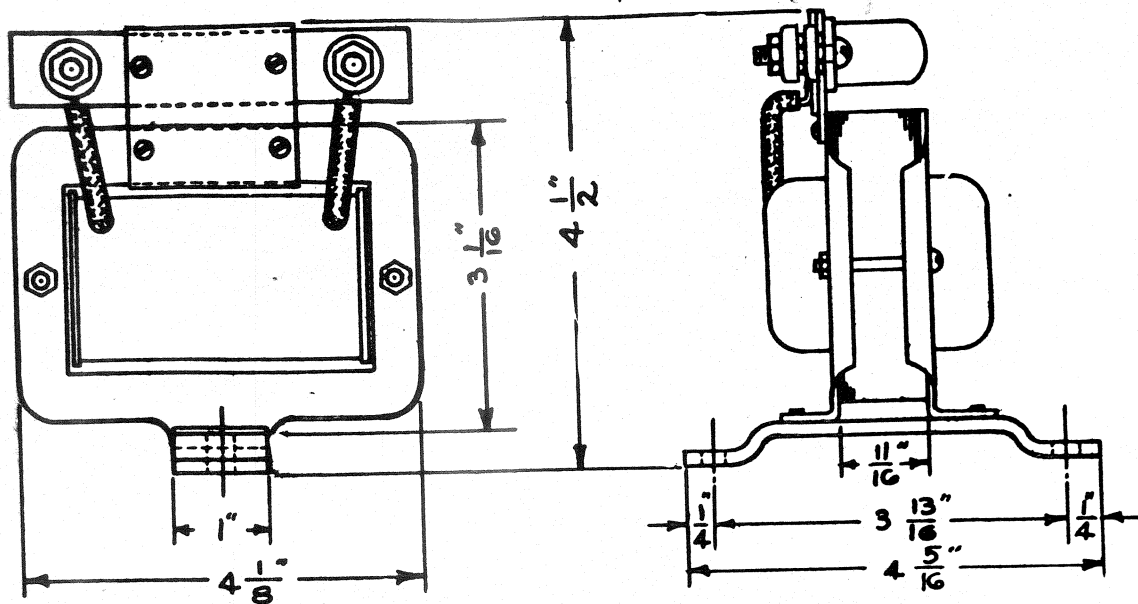


FIG. 4

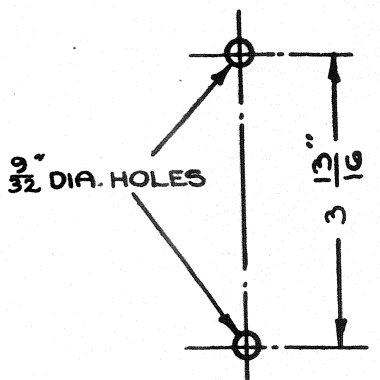
60 CYCLE CHARACTERISTICS OF TYPE XBC11A TRIPPING REACTORS.

(K-6209784)

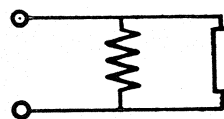
(K-6305926)



OUTLINE



PANEL DRILLING



INTERNAL CONNECTIONS

FIG. 5  
 OUTLINE, PANEL DRILLING AND INTERNAL CONNECTIONS OF THE  
 TYPE XBC11A TRIPPING REACTOR.

# IF YOU REQUIRE SERVICE

**IF AT ANY TIME** you find it necessary to repair, recondition, or rebuild your G-E apparatus, there are 26 G-E service shops whose facilities are available day and night for work in the shops or on your premises. Factory methods and genuine G-E renewal parts are used to maintain the original performance of your G-E apparatus. If you need parts only, immediate shipment of many items can be made from warehouse stock.

The services of our factories, engineering divisions, and sales offices are also available to assist you with engineering problems. For full information about these services, contact the nearest service shop or sales office listed below:

## APPARATUS SERVICE SHOPS

Atlanta, Ga.....496 Glenn St., S.W.  
\*Baltimore 30, Md.....920 E. Fort Ave.  
Buffalo 11, N. Y.....318 Urban St.  
Charleston 28, W. Va...306 MacCorkle Ave., S.E.  
Chicago 80, Ill.....849 S. Clinton St.  
Cincinnati 2, Ohio.....215 W. Third St.  
Cleveland 4, Ohio.....4966 Woodland Ave.  
Dallas 2, Texas.....1801 N. Lamar St.  
Denver 5, Colo.....3353 Larimer St.  
Detroit 2, Mich.....5950 Third Ave.  
Houston 1, Texas.....1312 Live Oak St.  
Johnstown, Pa.....841 Oak St.  
Kansas City 8, Mo.....819 E. 19th St.  
Los Angeles 1, Calif.....6900 Stanford Ave.  
Milwaukee 3, Wisc.....940 W. St. Paul Ave.  
Minneapolis 1, Minn.....410 Third Ave., N.  
New York 14, N. Y.....416 W. 13th St.  
Philadelphia 23, Pa.....429 N. Seventh St.  
Pittsburgh 6, Pa.....6519 Penn Ave.  
St. Louis 1, Mo.....1110 Delmar Blvd.  
Salt Lake City 9, Utah...141 S. Third West St.  
San Diego 1, Calif.....2045 Kettner Blvd.  
San Francisco 3, Calif.....1098 Harrison St.  
Seattle 4, Wash.....1508 4th Ave., S.  
West Lynn 3, Mass.....920 Western Ave.  
Youngstown 3, Ohio.....121 E. Boardman St.  
\* Convenient G-E Renewal Parts Center for over-the-counter purchases of industrial parts, located at same address.



## APPARATUS SALES OFFICES

Akron 8, Ohio.....335 S. Main St.  
Albany 1, N. Y.....90 State St.  
Allentown, Pa.....1014 Hamilton St.  
Amarillo, Texas.....701 E. Fifth St.  
Atlanta 3, Ga.....167 Spring St., N.W.  
Bakersfield, Calif.....211 E. 18th St.  
Baltimore 1, Md.....39 W. Lexington St.  
Bangor, Maine.....77 Central St.  
Beaumont, Texas.....398 Pearl St.  
Binghamton, N. Y.....19 Chenango St.  
Birmingham 2, Ala.....600 N. Eighteenth St.  
Bluefield, W. Va...P.O. Box 447, Appalachian Bldg.  
Boston 1, Mass.....140 Federal St.  
Buffalo 3, N. Y.....535 Washington St.  
Butte, Mont.....20 West Granite St.  
Canton 1, Ohio.....700 Tuscarawas St., W.  
Cedar Rapids, Iowa.....203 Second St., S.E.  
Charleston 28, W. Va...306 MacCorkle Ave., S.E.  
Charlotte 1, N. C.....200 S. Tryon St.  
Charlottesville, Va.....123 E. Main St.  
Chattanooga 2, Tenn.....832 Georgia Ave.  
Chicago 80, Ill.....840 S. Canal St.,  
P.O. Box 5970A  
Cincinnati 2, Ohio.....215 W. Third St.  
Cleveland 4, Ohio.....4966 Woodland Ave.  
Columbia 23, S. C.....1225 Washington St.  
Columbus 15, Ohio.....40 S. Third St.  
Dallas 2, Texas.....1801 N. Lamar St.  
Davenport, Iowa.....511 Pershing Ave.  
Dayton 2, Ohio.....25 N. Main St.  
Denver 2, Colo.....650 Seventeenth St.  
Des Moines, Iowa.....418 W. Sixth Ave.  
Detroit 2, Mich.....700 Antoinette St.  
Duluth 2, Minn.....14 W. Superior St.  
El Paso, Texas.....109 N. Oregon St.  
Erie 2, Pa.....10 E. Twelfth St.  
Evansville 19, Ind.....123 N.W. Fourth St.  
Fairmont, W. Va.....511 Jacobs Bldg.  
Fergus Falls, Minn.....102 W. Lincoln Ave.,  
P.O. Box 197  
Fort Wayne 2, Ind.....127 W. Berry St.  
Fort Worth 2, Texas.....408 W. Seventh St.

Fresno 1, Calif.....Tulare and Fulton St.  
Grand Rapids 2, Mich...148 Monroe Ave., N.W.  
Greenville, S. C.....106 W. Washington St.  
Hagerstown, Md.....Professional Arts Bldg.  
Hartford 3, Conn.....410 Asylum St.  
Houston 1, Texas.....1312 Live Oak St.  
Indianapolis 4, Ind.....110 N. Illinois St.  
Jackson, Mich.....120 W. Michigan Ave.  
Jackson 1, Miss.....203 W. Capitol St.  
Jacksonville 2, Fla.....237 W. Forsyth St.  
Jamestown, N. Y.....2 Second St.  
Johnston, Tenn.....334 E. Main St.  
Johnstown, Pa.....841 Oak St.  
Kansas City 6, Mo.....106 W. Fourteenth St.  
Knoxville 08, Tenn.....602 S. Gay St.  
Lincoln 8, Neb.....1001 "O" St.  
Los Angeles 54, Calif.....212 N. Vignes St.  
Louisville 2, Ky.....455 S. Fourth St.  
Madison 3, Wisc.....111 S. Hamilton  
Manchester, N. H.....839 Elm St.  
Medford, Ore.....2015 E. Main St., P.O. Box 1349  
Memphis 3, Tenn.....8 N. Third St.  
Miami 32, Fla.....25 S.E. Second Ave.  
Milwaukee 3, Wisc.....940 W. St. Paul Ave.  
Minneapolis 2, Minn.....12 S. Sixth St.  
Mobile 13, Ala.....54 St. Joseph St.  
Nashville 3, Tenn.....234 Third Ave., N.  
Newark 2, N. J.....744 Broad St.  
New Haven 6, Conn.....129 Church St.  
New Orleans 12, La.....837 Gravier St.  
New York 22, N. Y.....570 Lexington Ave.  
Niagara Falls, N. Y.....253 Second St.  
Norfolk 10, Va.....229 Bute St.  
Oakland 12, Calif.....409 Thirteenth St.  
Oklahoma City 2, Okla.....119 N. Robinson St.  
Omaha 2, Nebr.....409 S. Seventeenth St.  
Pasco, Wash.....421 W. Clark St.  
Philadelphia 2, Pa.....1405 Locust St.  
Peoria 2, Ill.....410 Main St.  
Phoenix, Ariz.....435 W. Madison St.  
Pittsburgh 22, Pa.....535 Smithfield St.  
Portland 3, Maine.....477 Congress St.

Portland 7, Ore.....920 S.W. Sixth Ave.  
Providence 3, R. I.....Industrial Trust Bldg.  
Raleigh, N. C.....304 So. Salisbury St.  
Reading, Pa.....31 N. Sixth St.  
Richmond 17, Va.....700 E. Franklin St.  
Riverside, Calif.....3972 Main St.  
Roanoke 11, Va.....202 S. Jefferson St.  
Rochester 4, N. Y.....89 E. Ave.  
Rockford, Ill.....110 S. First St.  
Rutland, Vt.....38½ Center St.  
Sacramento 14, Calif.....1107 Ninth St.  
St. Louis 2, Mo.....112 N. Fourth St.  
Salt Lake City 9, Utah.....200 S. Main St.  
San Antonio 5, Texas.....310 S. St. Mary's St.  
San Diego 1, Calif.....861 Sixth Ave.  
San Francisco 6, Calif.....235 Montgomery St.  
San Jose, Calif.....177 W. Santa Clara Ave.  
Savannah, Ga.....16 Drayton St.  
Seattle 11, Wash.....710 Second Ave.  
Shreveport 39, La.....803 Jordan St.  
Sioux City 13, Iowa.....507 Sixth St.  
South Bend 11, Ind.....112 W. Jefferson Blvd.  
Spokane, Wash.....S. 162 Post St.  
Springfield, Ill.....607 E. Adams St.  
Springfield 3, Mass.....1387 Main St.  
Syracuse 2, N. Y.....113 S. Salina St.  
Tacoma 1, Wash.....1019 Pacific Ave.  
Tampa 6, Fla.....1206 North A St.  
Toledo 4, Ohio.....420 Madison Ave.  
Trenton, N. J.....214 Hanover St.  
Tulsa 3, Okla.....320 S. Boston Ave.  
Utica 2, N. Y.....258 Genesee St.  
Washington 5, D. C.....806 Fifteenth St., N.W.  
Waterbury 89, Conn.....111 W. Main St.  
Waterloo, Iowa.....716 Water St.  
Wheeling, W. Va.....40 Fourteenth St.  
Wichita 2, Kan.....200 E. First St.  
Wilmington, Del.....1326 Market St.  
Williamston, N. C.....Town Hall  
Worcester 8, Mass.....507 Main St.  
York, Pa.....56 W. Market St.  
Youngstown 3, Ohio.....25 E. Boardman St.

Hawaii: W. A. Ramsay, Ltd., Honolulu

Canada: Canadian General Electric Company, Ltd., Toronto

**APPARATUS DEPARTMENT, GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.** ②