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INSTRUCTIONS

Switchgear

Types IBC31D IBC34C IBC39B IBC42B
IBC32D IBC35C IBC40B IBC42C
IBC33C IBC38B IBC41B

DIRECTIONAL OVERCURRENT RELAYS

In Universal and Drawout Cases

GENERAL  ELECTRIC

DIRECTIONAL OVERCURRENT RELAYS

TYPE IBC

The Type IBC relays covered by this book are directional-overcurrent relays consisting of three units. The bottom unit is an instantaneous power directional unit. The top unit is a time-over-current unit which is directionally controlled by the directional unit. The instantaneous overcurrent unit is mounted behind the time-overcurrent unit and is not directionally controlled. The target for the time-overcurrent unit is below the contact plate and the target for the instantaneous overcurrent unit is mounted above the contact plate of the top unit.

INVERSE TIME CHARACTERISTIC

The Type IBC31D relay is similar to the Type IBC31A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 3 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC32D relay is similar to the Type IBC32A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 4 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC35C relay is similar to the Type IBC35A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 5 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC38B relay is similar to the Type IBC38A relay but with an instantaneous overcurrent element added. The internal connections are shown in Fig. 12 and the outline and panel drilling in Figs. 1 and 2.

VERY-INVERSE TIME CHARACTERISTIC

The Type IBC33C relay is similar to the Type IBC33A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 6 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC34C relay is similar to the Type IBC34A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 13, and the outline and panel drilling in Figs. 1 and 2.

The Type IBC39B relay is similar to the Type IBC39A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 10 and the outline and panel drilling in Figs. 1A and 2.

The Type IBC40B relay is similar to the Type IBC40A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 7 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC41B relay is similar to the Type IBC41A relay with an instantaneous attachment added. The internal connections are shown in Fig. 11 and the outline and panel drillings in Figs. 1A and 2.

The Type IBC42B relay is similar to the Type IBC42A relay with an instantaneous overcurrent unit added. The internal connections are shown in Fig. 8 and the outline and panel drilling in Figs. 1 and 2.

The Type IBC42C relay is similar to the Type IBC42B relay except the overcurrent units, both time delay and instantaneous, have their contacts in series with an additional directional unit contact. Thus, both overcurrent units are ineffective unless the directional unit contacts are closed. The directional unit also has a special backstop which allows the directional contact to open further for external faults thus increasing its closing time and minimizing the possibility of incorrect tripping due to transients resulting when an external fault is cleared. The additional closing time allows the instantaneous or the time overcurrent units to reset if they have closed for the external fault. The internal connections for this relay are shown in Fig. 14 and the outline and panel drilling dimensions are shown in Fig. 2.

INSTANTANEOUS ATTACHMENT

The instantaneous attachment is mounted on the rear of the top unit frame opposite the tapped operating coil with which its coil is connected in series.

Operation

The instantaneous attachment operates over a 4 to 1 range and has its calibration stamped on the tube surrounding the plunger. The five different coils that are available for use have current ranges of 2 to 8, 4 to 16, 10 to 40, 20, to 80 and 40 to 160 amp respectively. The pick-up is adjusted by raising or lowering the plunger. This is done by turning the adjusting worm stud having a slotted end protruding through the permanent magnet shield at the lower left-hand corner. Turning this adjusting worm stud in a counter-clockwise direction raises the plunger to obtain a lower pickup current value and in a clockwise direction to lower the plunger to obtain a higher pick-up current value.

The time-current curves for the instantaneous attachment are given in Fig. 9.

Contact Adjustment

The contact tips should be the same horizontal plane and about 1/16" from the silver disk when the plunger is down. The contacts should close, when the plunger is raised to its highest position, and the contact tips should be deflected vertically at least 1/32" before striking the two stop screws. These stop screws also determine the "drop-out" of the instantaneous attachment.

With the above exceptions the instructions for the above relays are the same as given in included copy of GEH-1159.

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.

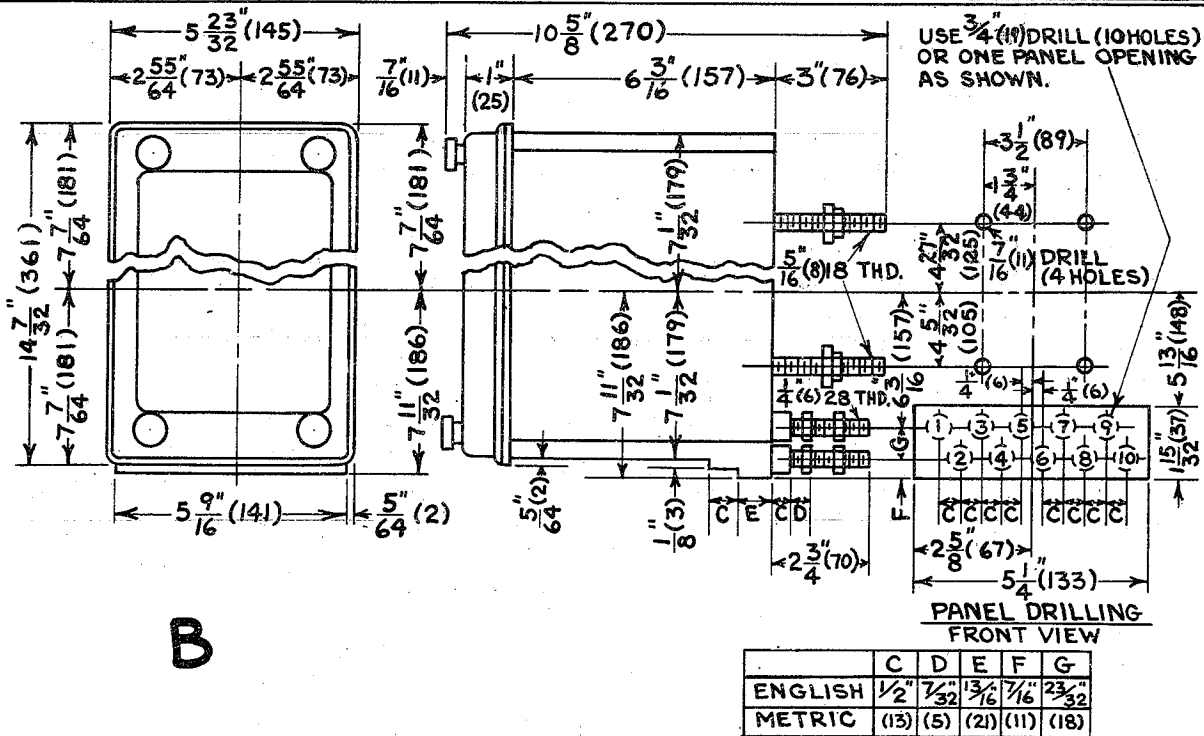
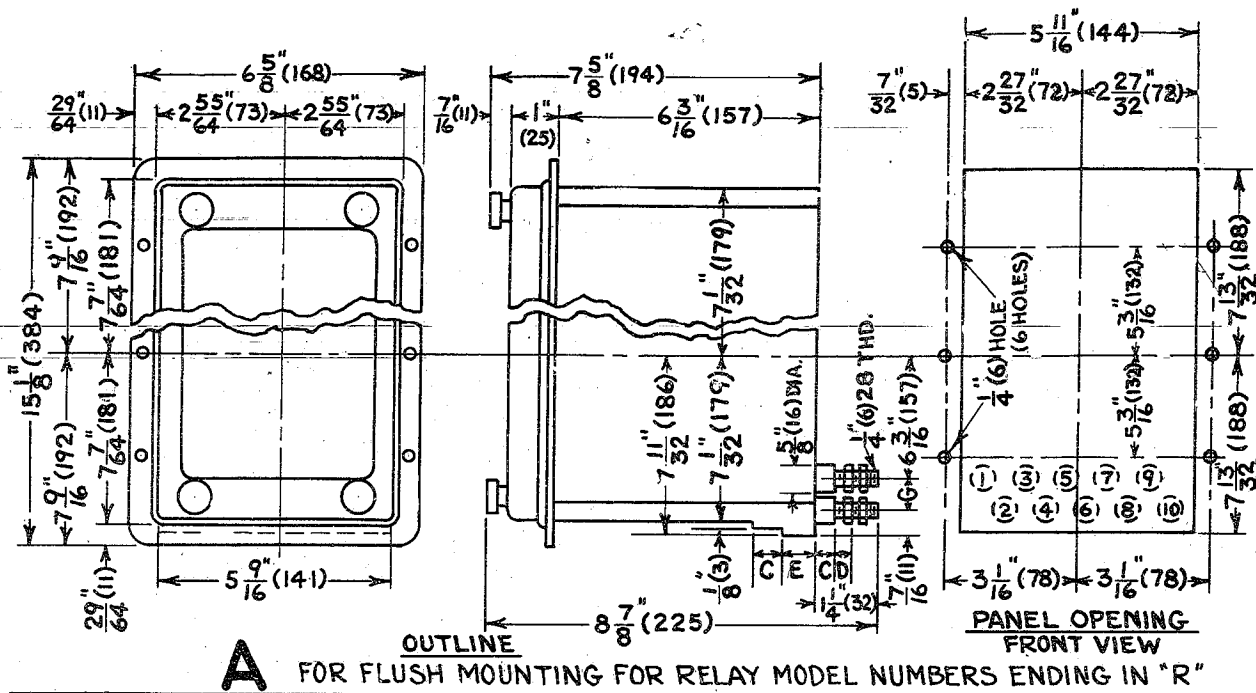


FIG. 2
OUTLINE AND PANEL DRILLING FOR DRAWOUT CASE - TWO UNIT - SINGLE END

(K-6174673)

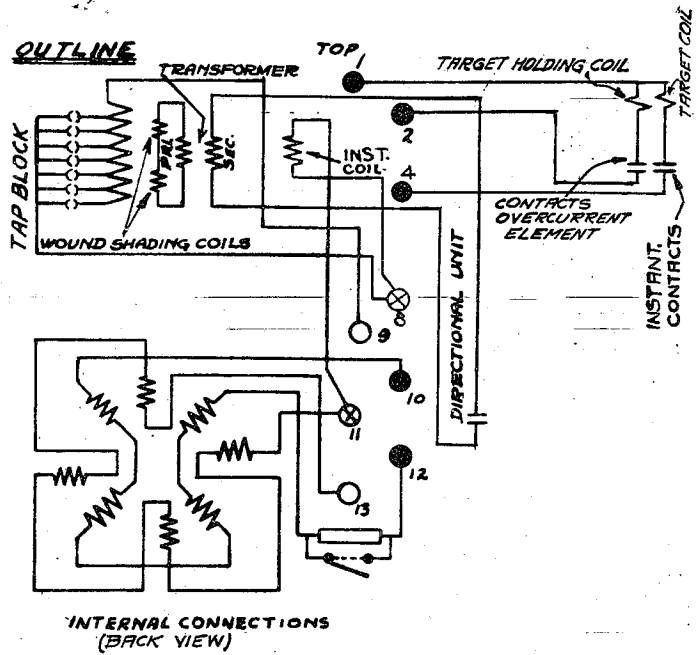
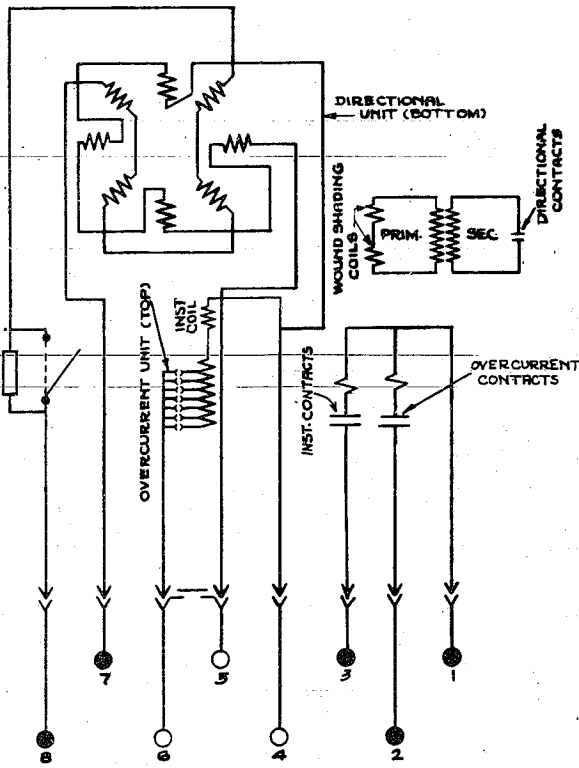


FIG. 3

INTERNAL CONNECTIONS FOR TYPE IBC31D RELAY

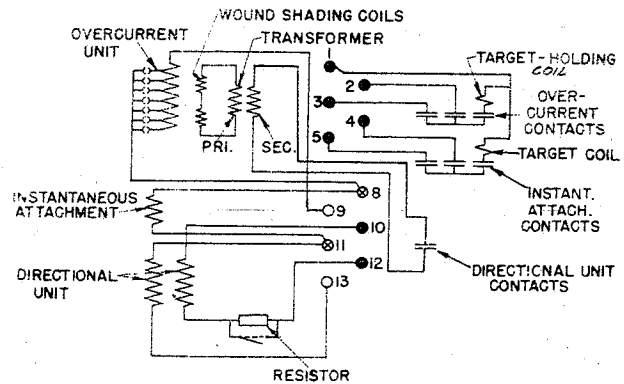
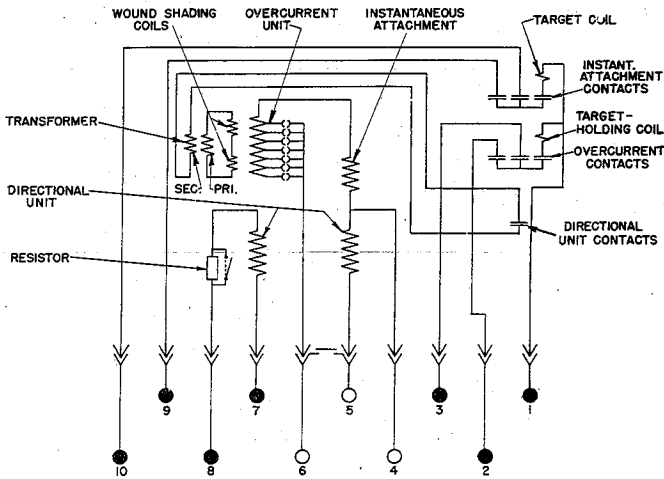


FIG. 4

INTERNAL CONNECTIONS FOR TYPE IBC32D RELAY

(K-6209058)

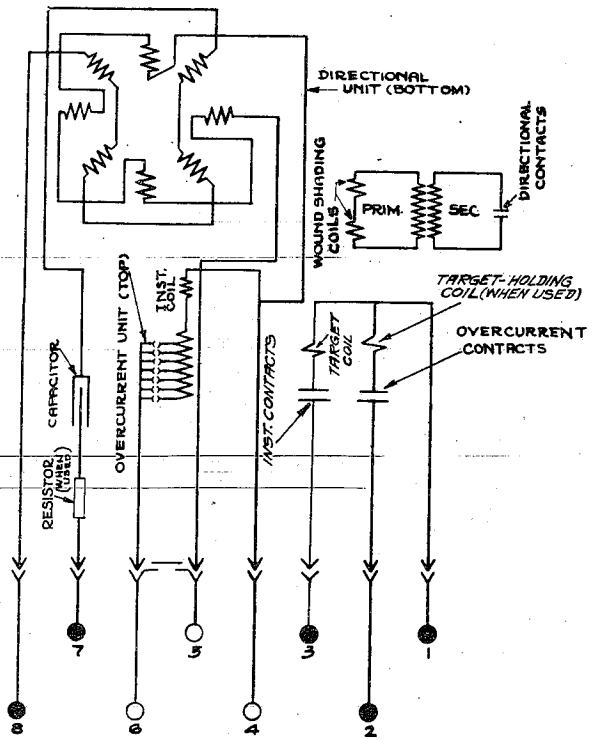
(K-6209057)

(K-6209060)

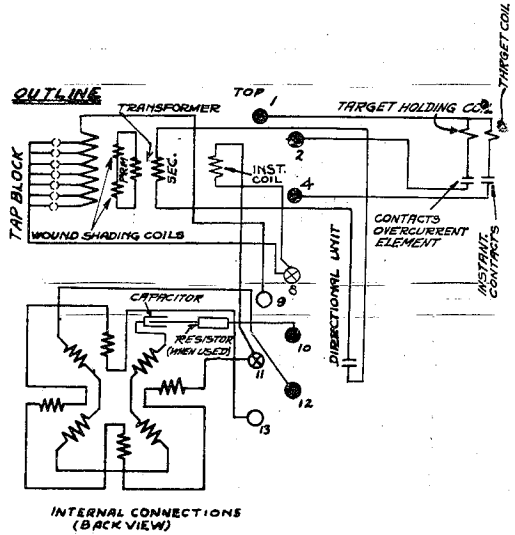
(K-6209061)

(K-6209064)

(K-6209065)



(a) Drawout Case



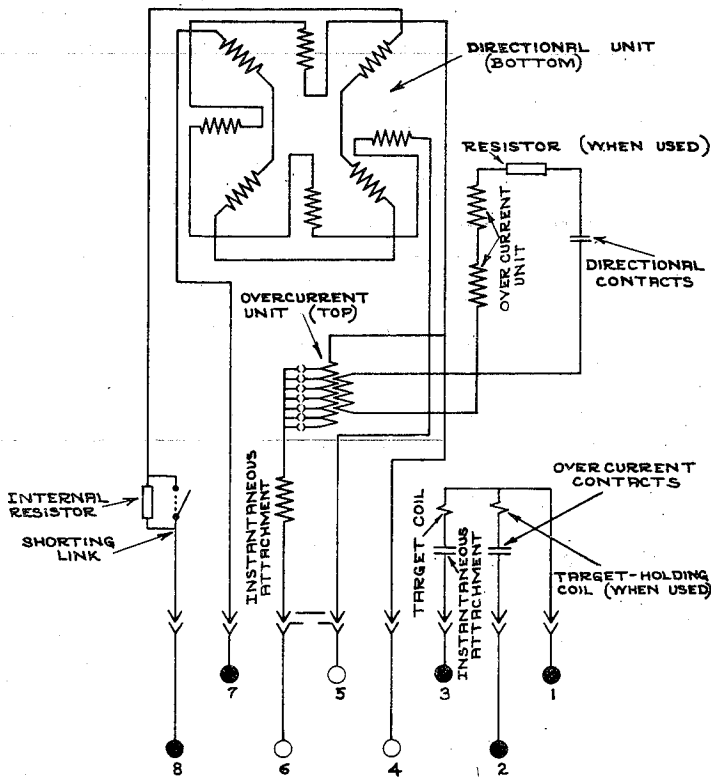
(b) Universal Case

FIG. 5

INTERNAL CONNECTIONS FOR TYPE IBC35C RELAY

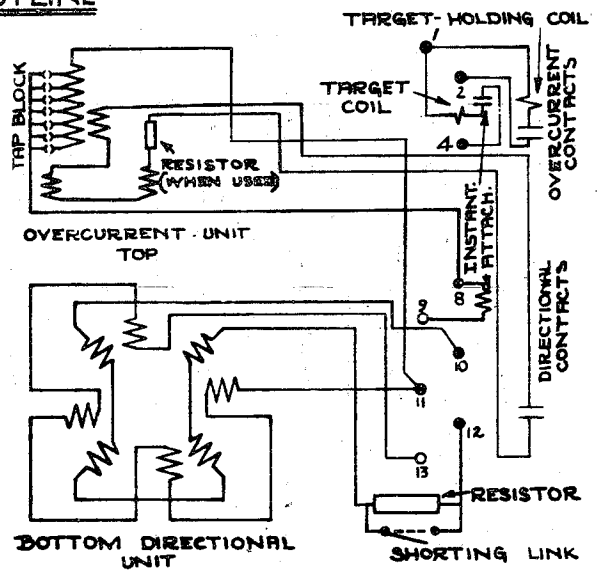
(K-6209062)

(K-6209063)



(a) Drawout

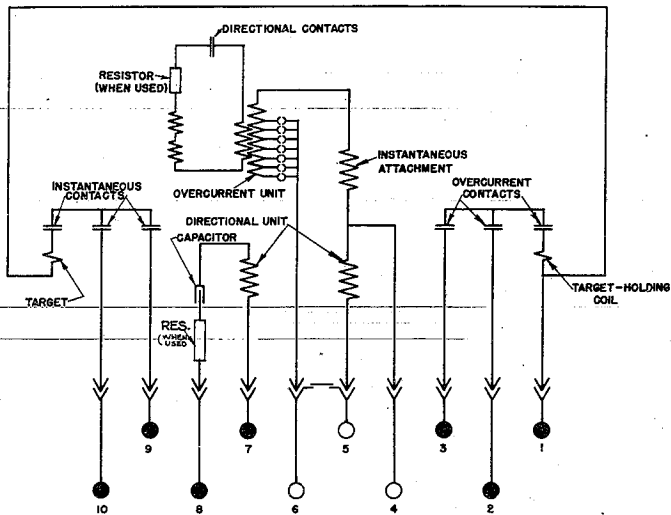
OUTLINE



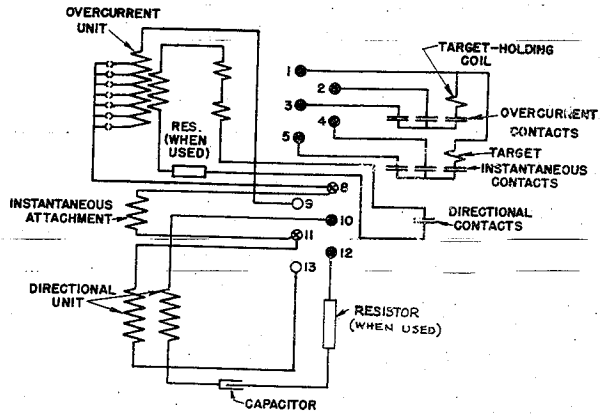
(b) Universal

FIG. 6

INTERNAL CONNECTIONS FOR TYPE IBC33C RELAY



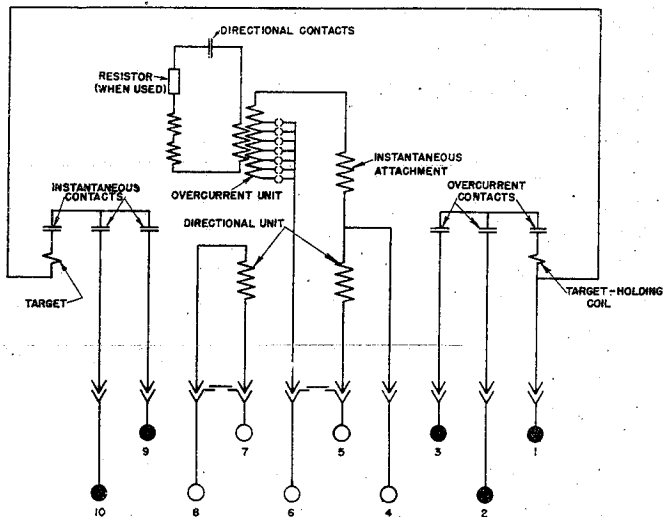
(a) Drawout



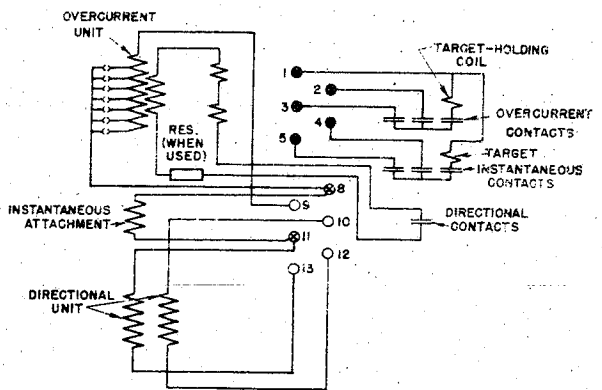
(b) Universal

FIG. 7

INTERNAL CONNECTIONS FOR TYPE IBC40B RELAY



(a) Drawout



(b) Universal

FIG. 8

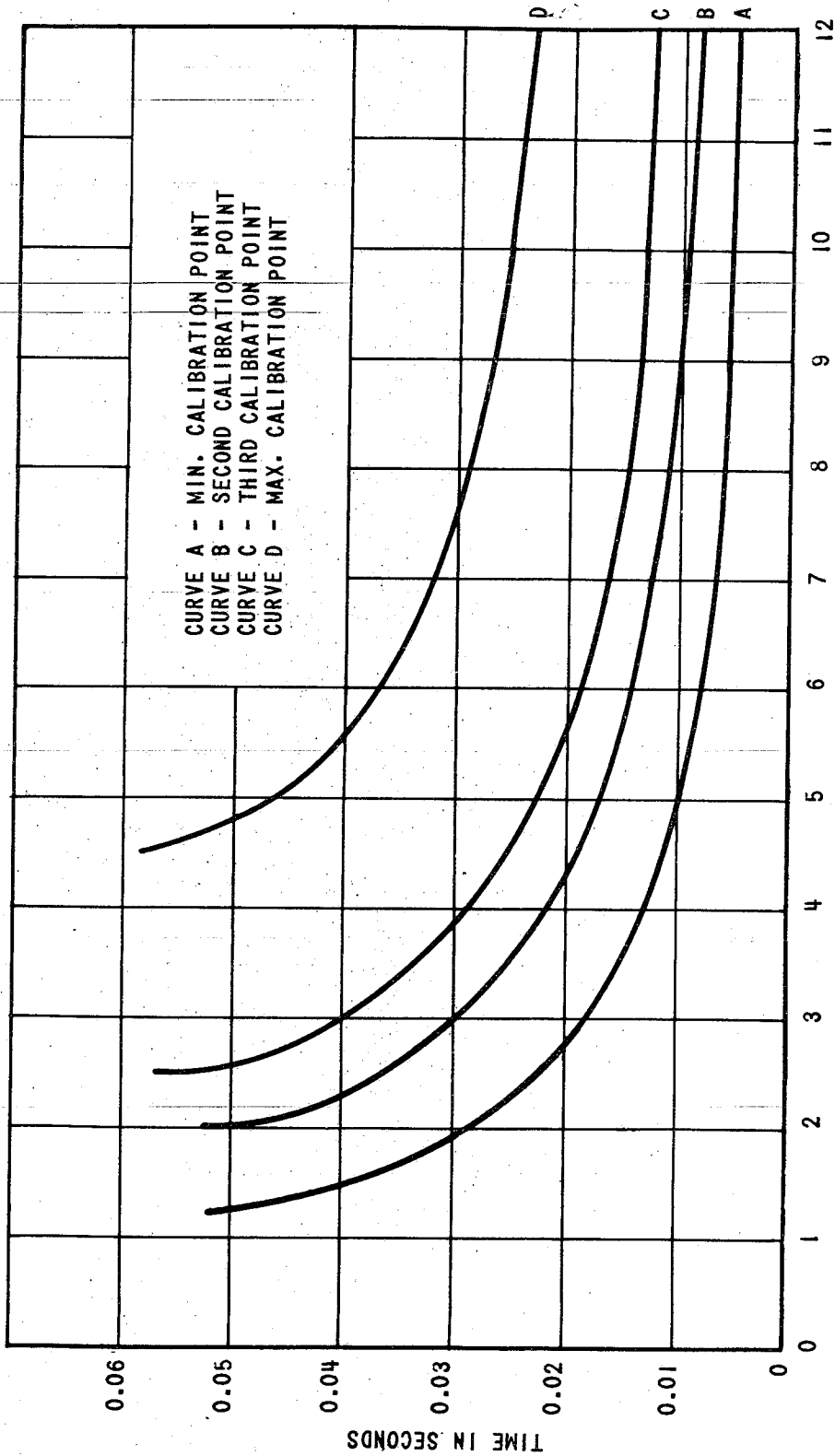
INTERNAL CONNECTIONS FOR TYPE IBC42B RELAY

(K-6154917)

(K-6154918)

(K-6154938)

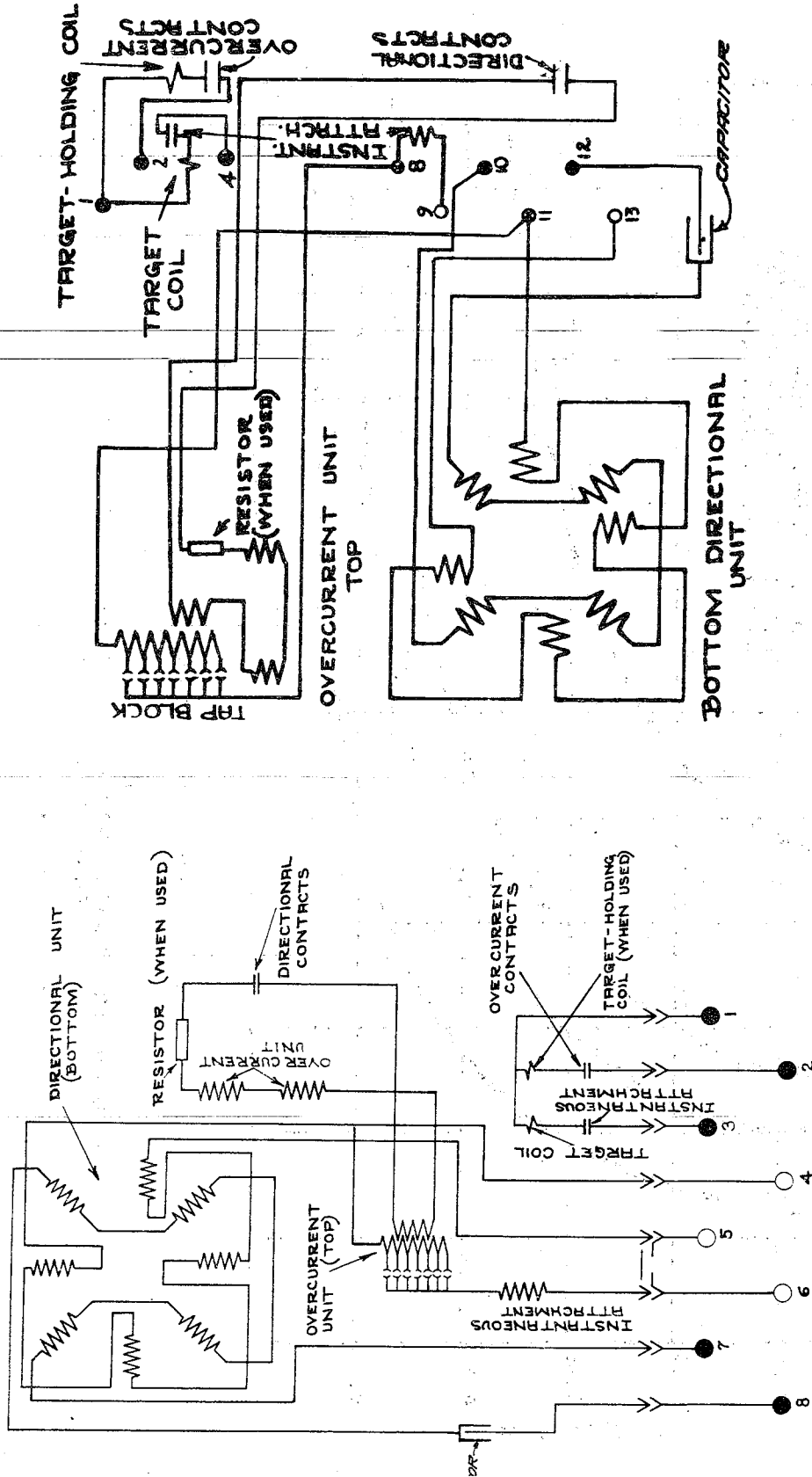
(K-6154937)



CURVE A - MIN. CALIBRATION POINT
CURVE B - SECOND CALIBRATION POINT
CURVE C - THIRD CALIBRATION POINT
CURVE D - MAX. CALIBRATION POINT

FIG. 9
TYPICAL TIME CURRENT CURVES FOR INSTANTANEOUS ATTACHMENT CIRCUIT
CLOSING CONTACTS, 60 CYCLES

(K-6178953)

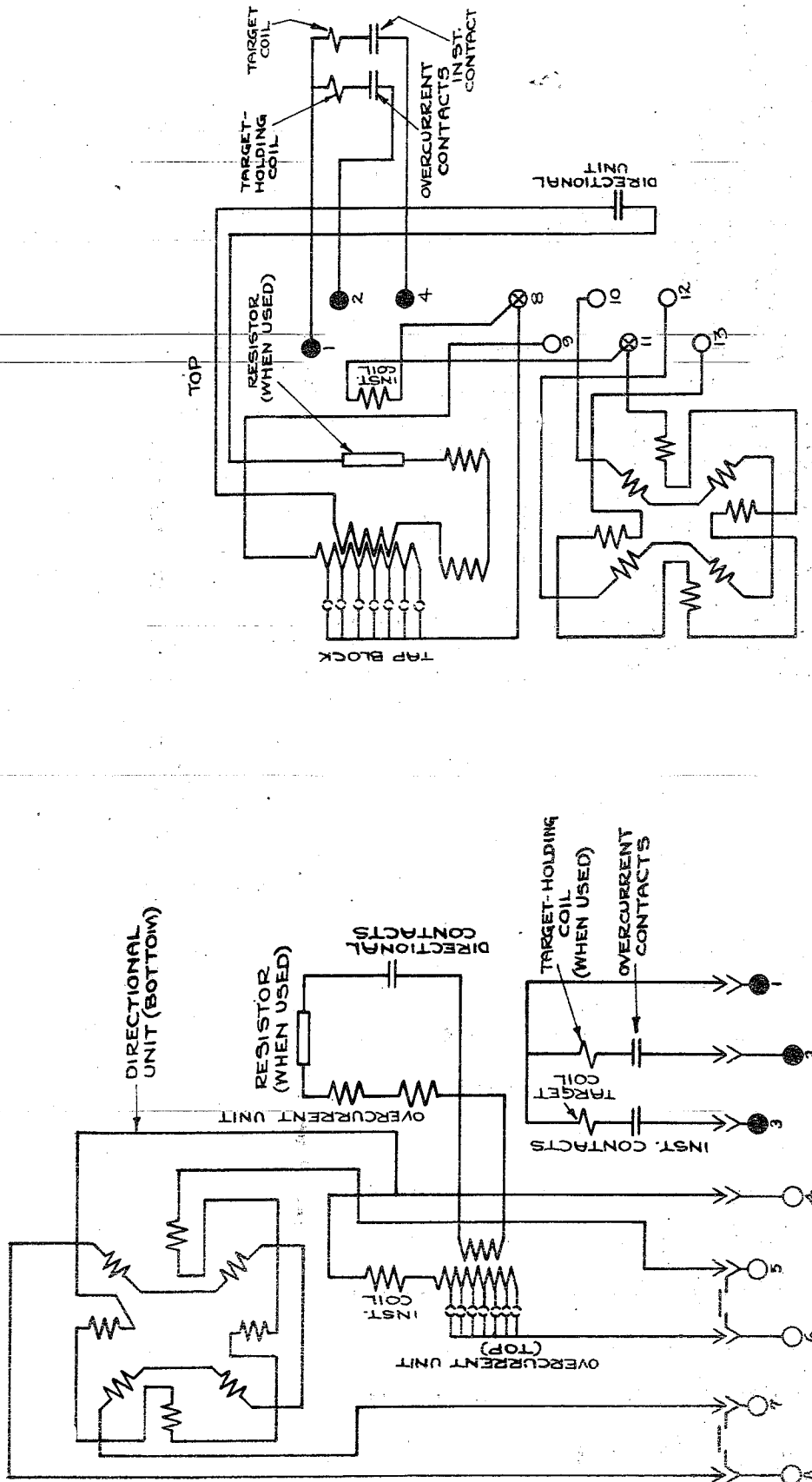


(a) Drawout (b) Universal

FIG. 10 INTERNAL CONNECTIONS FOR TYPE IBC39B RELAY, BACK VIEW

(K-6209706)

(K-6209707)



(b) Universal

(a) Drawout

FIG. 11
INTERNAL CONNECTIONS FOR TYPE IBC41B RELAY, BACK VIEW

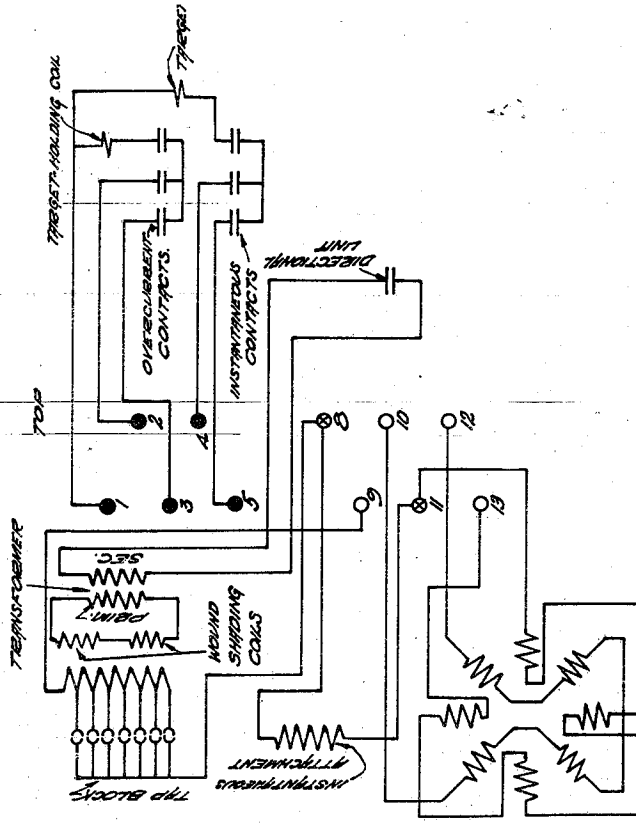
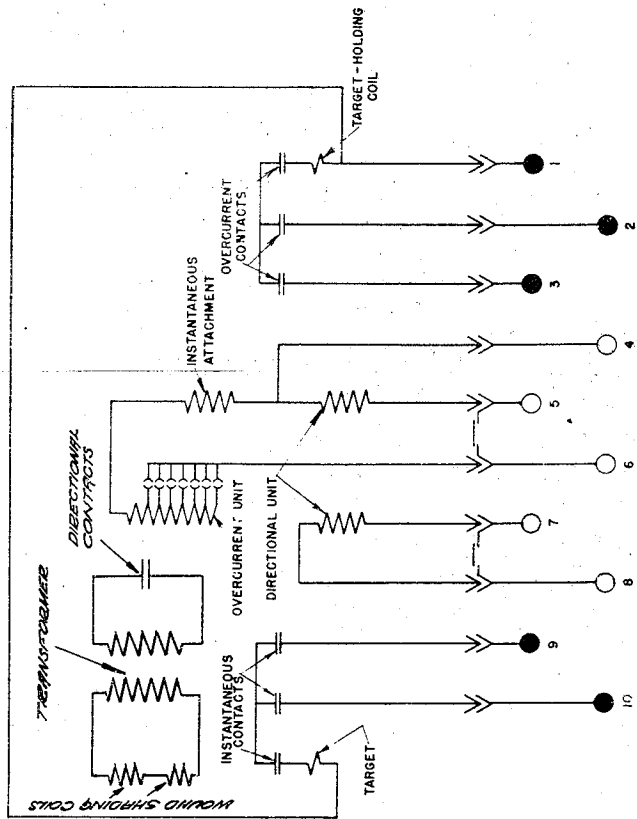
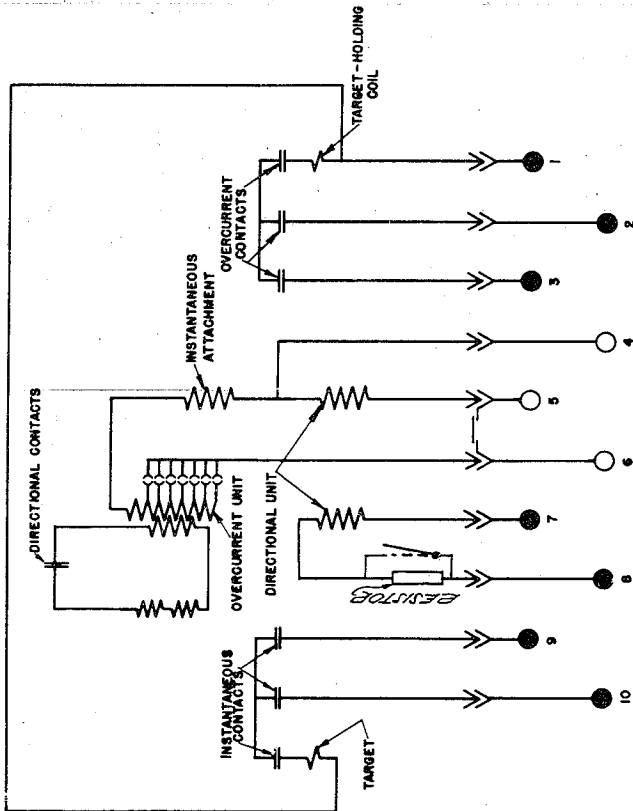


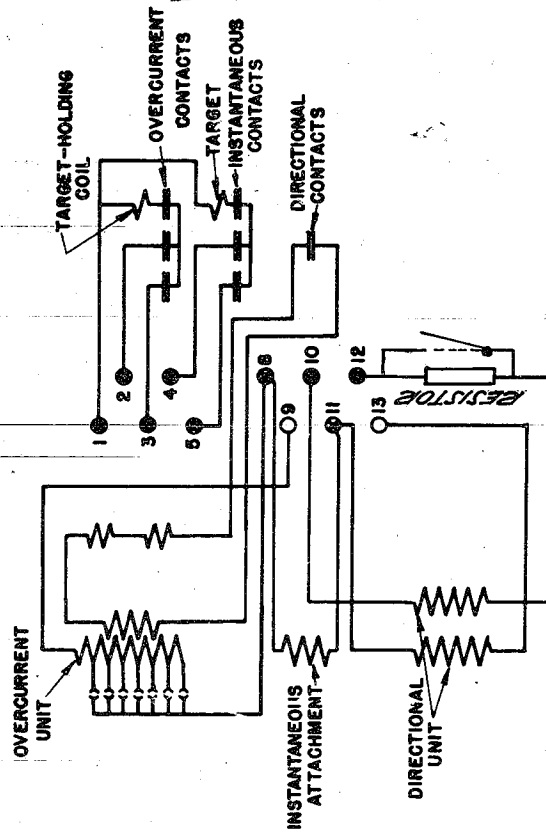
FIG. 12
INTERNAL CONNECTIONS FOR TYPE IBC388 RELAY, BACK VIEW

(K-6306976)

(K-6306977)



(a) Drawout



(b) Universal

FIG. 13
INTERNAL CONNECTIONS FOR TYPE IBC34C RELAY, BACK VIEW

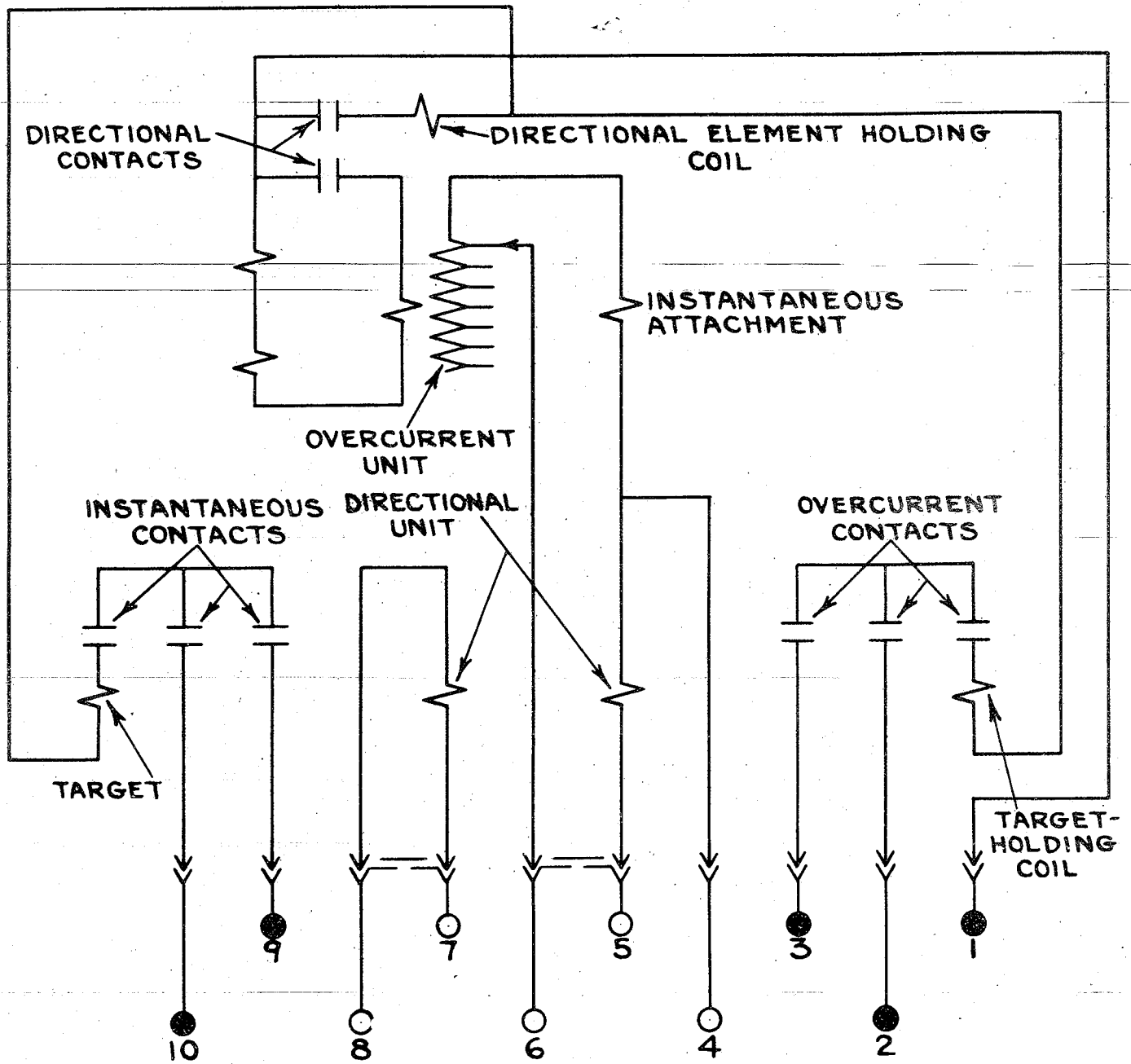


FIG. 14
INTERNAL CONNECTIONS FOR TYPE IBC42C RELAY - BACK VIEW

(K-6305871)

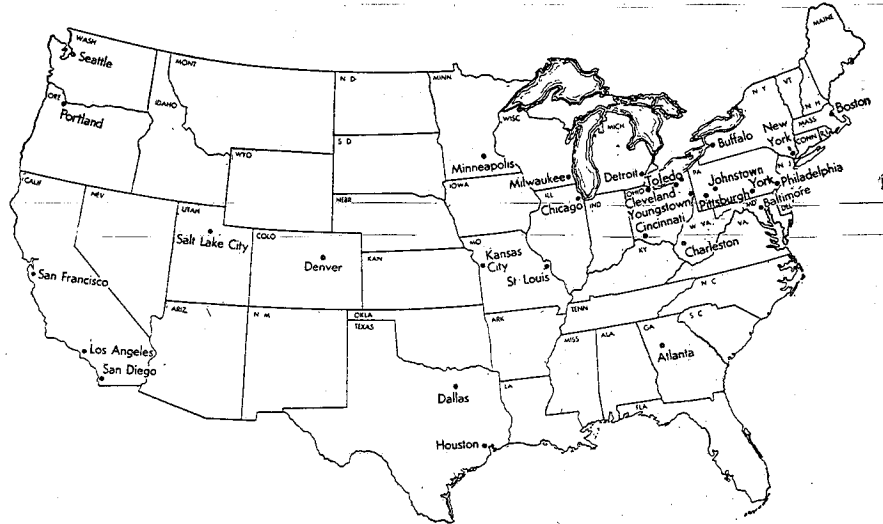
IF YOU REQUIRE SERVICE

IF AT ANY TIME you find it necessary to repair, recondition, or rebuild your G-E apparatus, there are 29 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:

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 Toledo 4, Ohio.....1 So. St. Clair St.
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 Peoria 2, Ill.....410 Main St.
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 Shreveport 39, La.....803 Jordan St.
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 South Bend 11, Ind.....112 W. Jefferson Blvd.
 Spokane 8, Wash.....S. 162 Post St.
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 Springfield 3, Mass.....1387 Main St.
 Stockton, Calif.....11 So. San Joaquin 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.....321 W. Eighteenth St.
 Wheeling, W. Va.....40 Fourteenth St.
 Wichita 2, Kan.....201 E. First St.
 Williamston, N. C.....Town Hall
 Wilmington, Del.....1326 N. Market St.
 Worcester 8, Mass.....507 Main St.
 York, Pa.....56 W. Market St.
 Youngstown 3, Ohio.....25 E. Boardman St.

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