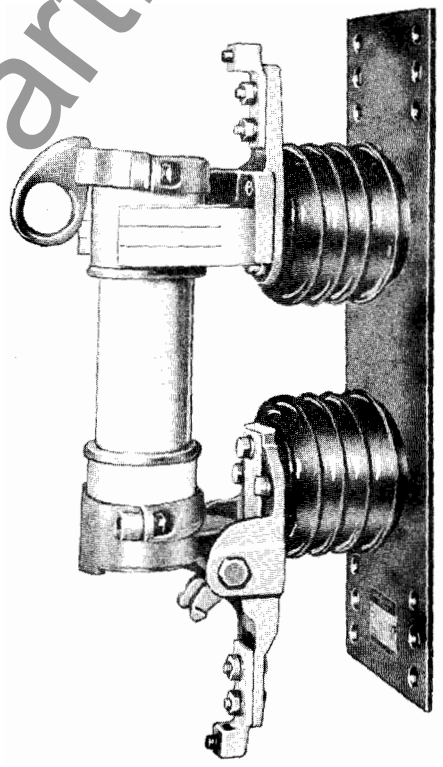
GEI-10952G

INSTRUCTIONS

Switchgear

FUSE SUPPORTS AND FUSE-DISCONNECTING SWITCHES

FOR TYPE EJ CURRENT-LIMITING FUSE UNITS



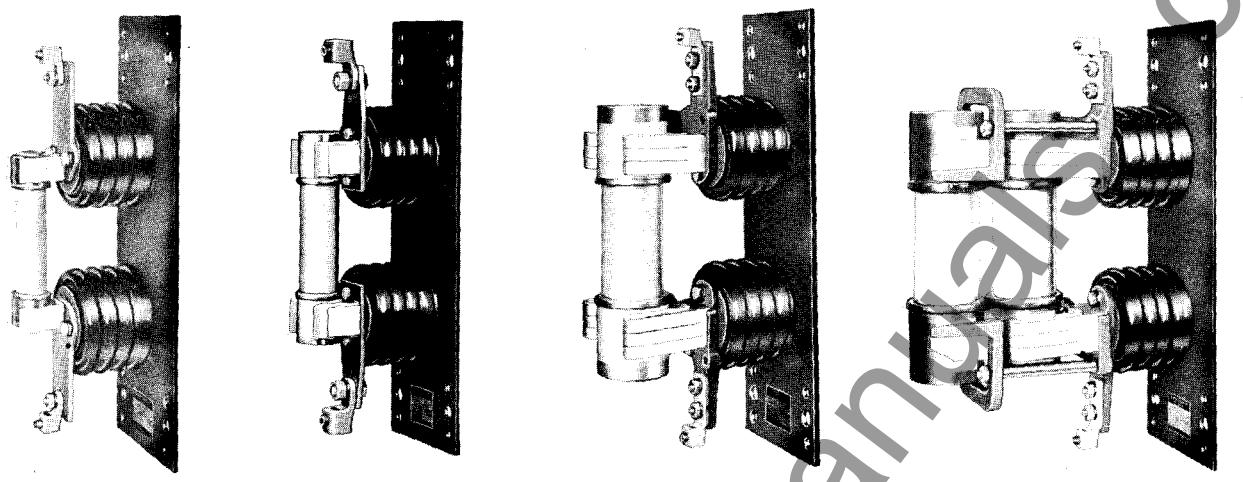
Type EK

HIGH VOLTAGE SWITCHGEAR DEPARTMENT

GENERAL ELECTRIC

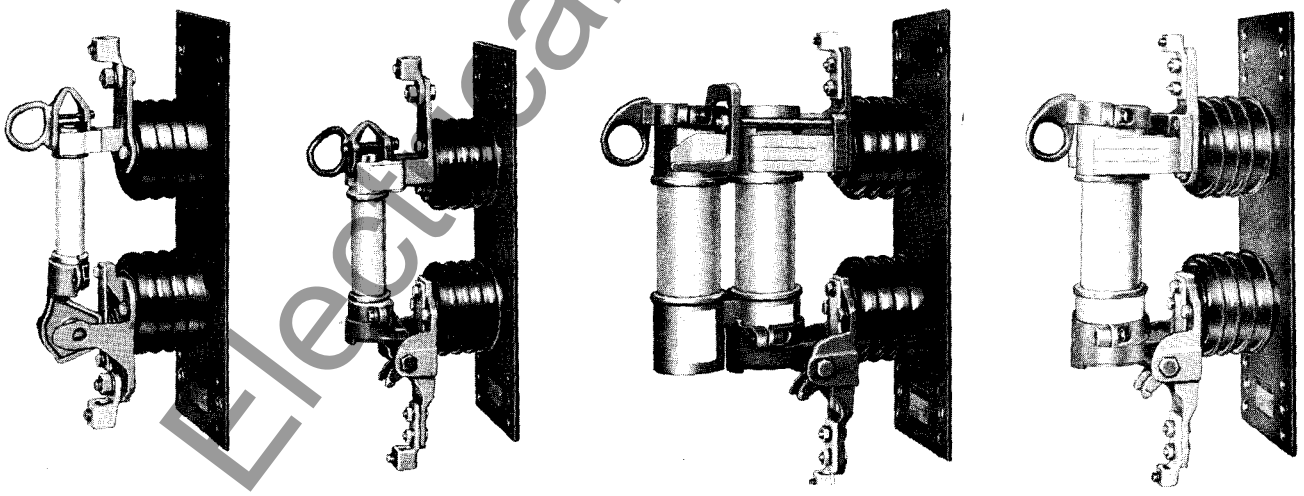
PHILADELPHIA, PA.

INDOOR



EK-1B EK-1C EK-1D EK-1DD

Fig. 1 Type EK-1 Fuse Supports



EK-3B EK-3C EK-3D EK-3DD

Fig. 2 Type EK-3 Fuse Disconnecting Switches

Fig. 1 (8019008, 8019035, 8019005 & 8019006)

Fig. 2 (8019027, 8019026, 8019004 & 8019002)

Cover (8019004)

AKW

FUSE SUPPORTS AND FUSE DISCONNECTING SWITCHES TYPE EK FOR TYPE EJ CURRENT-LIMITING FUSE UNITS

INTRODUCTION

The complete lines, and all sizes of Type EK fuse supports and fuse disconnecting switches are shown in the photographs, figures one through four inclusive. (For instructions on obsolete EK-2 or EK-4 switches, or special mountings, the information in this booklet is supplemented by Instruction Book GEI-25323.)

G-E Type EK fuse supports and switches accommodate Type EJ current-limiting fuse units. The fuse voltage rating, current rating and in turn the size (ferrule diameter) is determined by service requirements. Type EK switches and supports are used for indoor installations, while Type EKO are used outdoors. The dash one (-1) designation indicates a fuse support, and the dash three (-3) a fuse disconnecting switch. The letter suffix following the (-1) or the (-3) shows the fuse size. Example: Type EK-1B indicates that the device is an indoor fuse support for a size B Type EJ current-limiting fuse unit. Ferrule diameters corresponding to fuse sizes are shown in Table I.

TABLE I

Fuse Size	Ferrule Diameter
B	1-9/16 inches
C	2 inches
D	3 inches
DD	two--3 inch in parallel

APPLICATION

Type EK fuse supports, with Type EJ current-limiting fuses, are used for short-circuit protection of power transformers and feeder circuits. The Type EK fuse disconnecting switches are similar, except that the contact assemblies are designed to permit the fuse unit to be used as a disconnecting switch.

RATINGS

The EK mountings are available in voltage ratings from 2400 to 34,500. The standard terminals furnished on Type EK fuse mountings are adjustable to take a range of conductor sizes from #2 wire to 1/0 cable.

RECEIVING, HANDLING AND STORAGE

RECEIVING

Immediately upon receipt of a fuse support or switch, examine it for any damage or loss sustained in transit. If injury or rough handling is evident file a damage claim at once with the transportation company and promptly notify the nearest General Electric Apparatus Sales Office. Also, check the contents of all crates and boxes, separate from the switch parts, against the shipping memorandum for the quantity of parts received. Notify the General Electric Sales Office of any shortages or discrepancies.

All indoor supports and disconnecting switches are shipped fully assembled.

Outdoor supports and switches are fully assembled for domestic shipment. For export shipments, channel bases, switch or support parts, and insulators, are each packed separately.

One set of fuse unit fittings is included with a Type EK-3 or EKO-3 fuse disconnecting switch, and is always shipped tied to the switch parts.

HANDLING

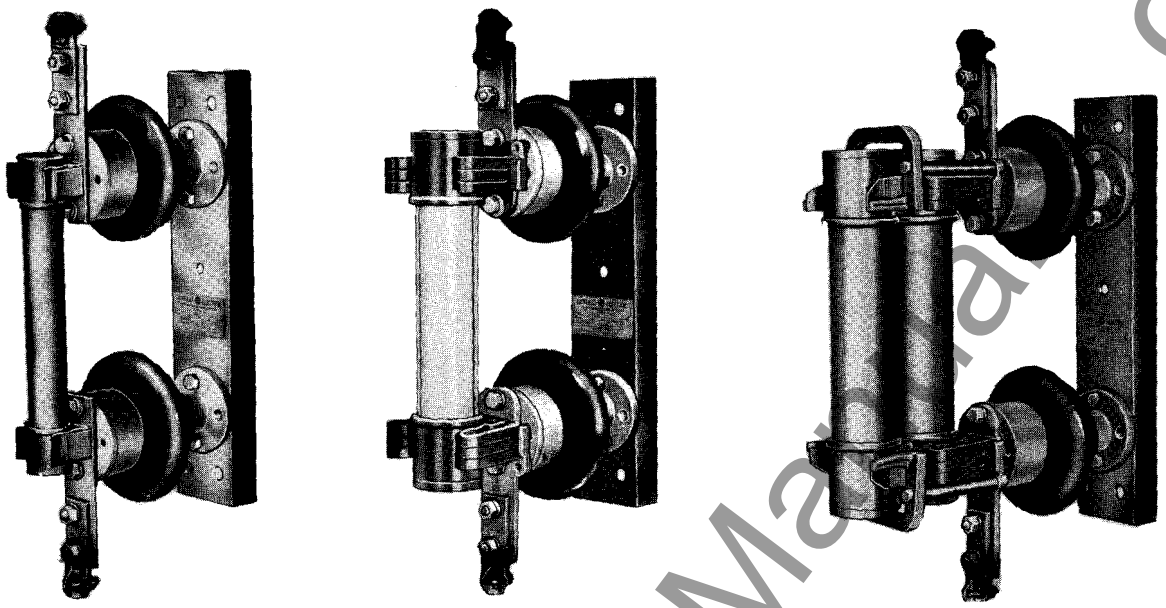
Care should be exercised in handling the insulators and fuses since they are breakable.

STORAGE

Supports and switches for indoor service should be kept in a dry place before installation. Support and switches for outdoor service may be stored anywhere, but if outdoors, care should be taken to see that the insulator units are kept upright to prevent the collection of water inside the porcelain parts.

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.

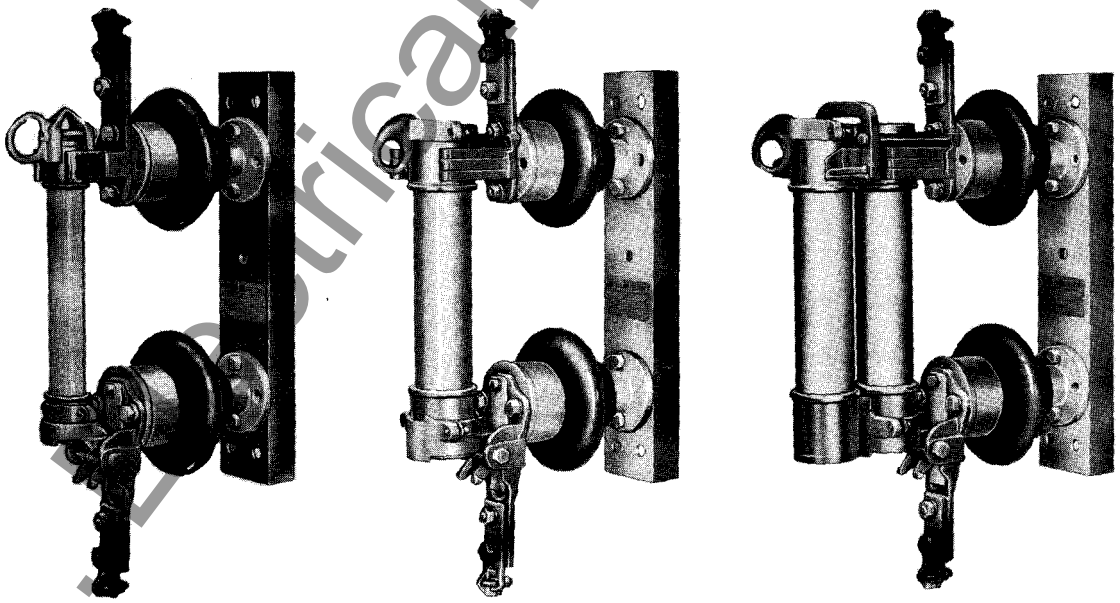
OUTDOOR



EKO-1C EKO-1D EKO-1DD

Fig. 3 (8003131, 8003132 & 8003128)

Fig. 3 Type EKO-1 Fuse Supports



EKO-3C EKO-3D EKO-3DD

Fig. 4 (8003139, 8003134 & 8003130)

Fig. 4 Type EKO-3 Fuse Disconnecting Switches

INSTALLATION

LOCATION

Type EK-1 or EKO-1 supports may be mounted either vertically, or horizontally with the fuse on top. Fuse, disconnecting switches, Type EK-3 or EKO-3 must be in the vertical position. When indoor supports or switches are mounted on a flat surface, 1/2 inch spacers must be placed under the base in order to provide clearance for the insulator mounting bolt heads.

Minimum phase spacing, recommended between center lines of the poles for outdoor fuse mountings appear in Table II.

TABLE II

Nominal Rating in Volts	Spacing in Inches	Max. Design Voltage
2,400	18	2,750
4,800	18	5,500
7,200	18	8,250
14,400	24	15,500
23,000	30	25,800
34,500	36	38,000

For phase spacing of indoor fuse mountings, refer to the approved outline drawing applying to the particular rating involved. If not previously obtained, a copy may be secured by sending a request to the General Electric Sales Office through which the mounting was purchased; giving the catalog number, and if possible, the G-E requisition number applying to the order.

There should be ample room for installing and removing the fuse units. In the case of fuse disconnecting switches, clearance is necessary for opening the switch. The outline drawings also show the recommended clearances, maximum dimensions etc.

Indoor mountings may be front or back connected, or a combination of both. A back-connected support is shown in Fig. 5 and a combination support is shown in Fig. 6.

The Type EK-3B fuse disconnecting switch is available in a 70 degree opening angle. A 180 degree opening angle is available upon request. Fig. 7 shows the 70 degree opening angle support.

MOUNTING

After unpacking, and before installation on the supporting structure, the location of the mounting holes in the base should be compared with those in the structure. In case of a discrepancy check with the approved outline drawing and take appropriate action.

Fig. 5 (8019007)

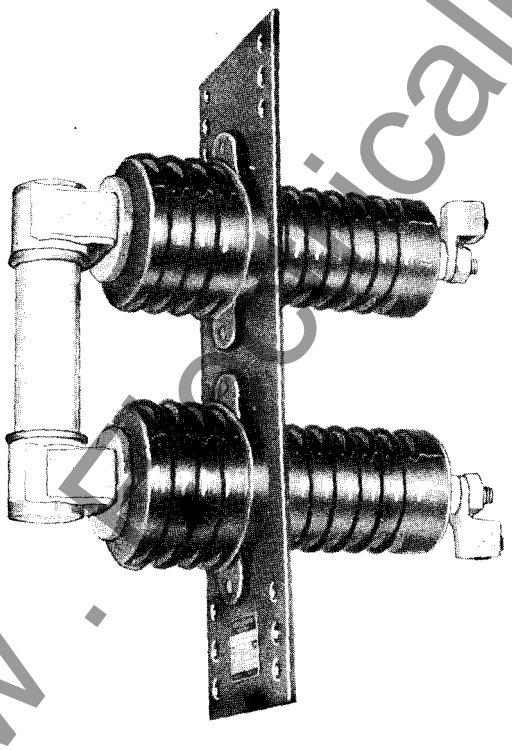


Fig. 5 EK-1C with Two Back Connected Insulators

Fig. 6 (8019010)

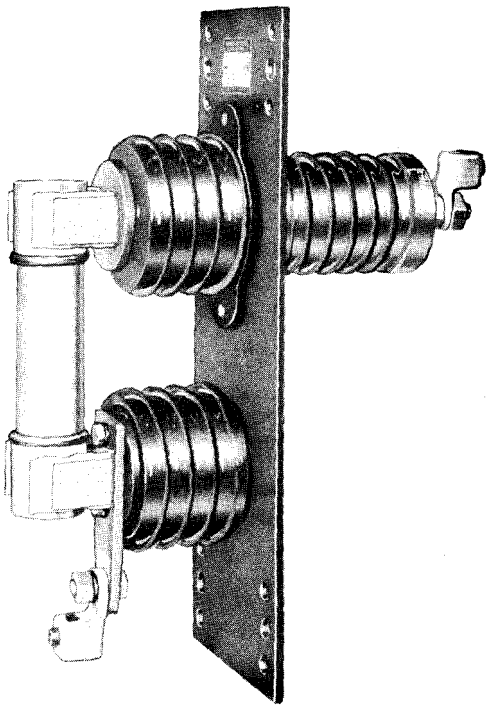


Fig. 6 EK-1C with One Front Connected and One Back Connected Insulator

In mounting the fuse supports and switches, especially those with outdoor insulator units, the rigging should be attached to the bases, and not to the insulator units, contacts or other parts which might be injured during the hoisting operation.

When in mounting position, check to see that the base is supported evenly, so it will not be distorted when the mounting bolts are tightened.

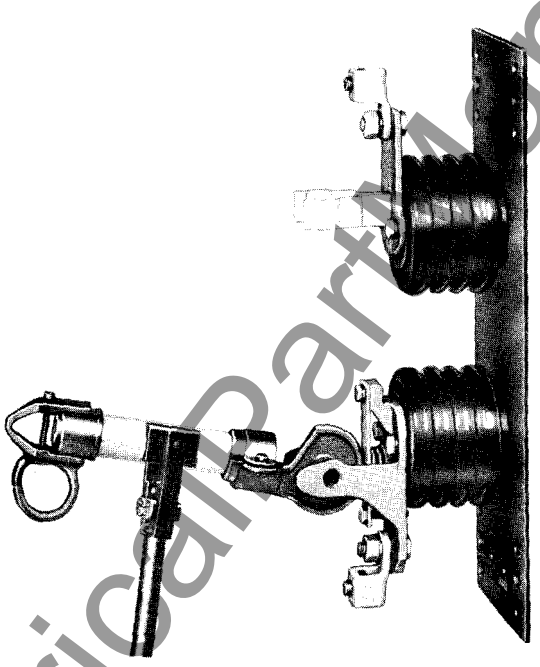
CONNECTIONS

The conductors should be clean and bright before connecting to the terminals. In the case of flat bars, there should be no dents or burrs. The standard terminals accommodate conductors from #2 wire to 1/0 cable.

The insulators should not be subject to mechanical or thermal stresses transmitted through the conductors. Bar or pipe connections from buses should be provided with flexible connectors, unless they are so shaped as to eliminate strain due to expansion and contraction of the bus.

ADJUSTMENTS

If the support is properly mounted, so there is no buckling of the base, there should be no need for adjustment of switch parts. If, in the case of the disconnecting switches, the fuse strikes the clip on one side more than the other, the bolts holding the hinge support to the lower insulator may be loosened and the hinge support adjusted so the upper fuse ferrule enters the clips centrally. Tighten the bolts when correct adjustment is obtained.



70° Opening

Fig. 7 Type EK-3B Indoor Fuse Disconnecting Switches

Fig. 7 (8019028)

OPERATION

When a fuse support or switch is energized, the fuse units should only be inserted by means of suitable insulated fuse tongs. The fuse unit should only be removed by hand after the circuit has been completely de-energized and grounded for maintenance.

EK-1 OR EKO-1 SUPPORTS

To remove the fuse unit from an EK-1 or EKO-1 fuse support, the tongs should first be made to grip the fuse unit firmly by rotating the shaft, causing the jaws on the tongs to close. The fuse unit may then be removed, as shown in Fig. 8.

When inserting a new fuse unit be sure the fuse is firmly seated in the clips before removing the tongs.

EK-3 OR EKO-3 SWITCHES

Before inserting the fuse unit in the EK-3 or EKO-3 switches, the fittings shown in Fig. 10 must be assembled on the fuse unit. For size DD fittings, the connecting block should seat firmly in the slot cut in the hinge fitting. The fittings are provided with slotted cap screws to hold the fuse firmly. These screws should only be tightened firmly with a hand screwdriver; excess force may cause the glass to crack.

Fig. 8 (8019009)

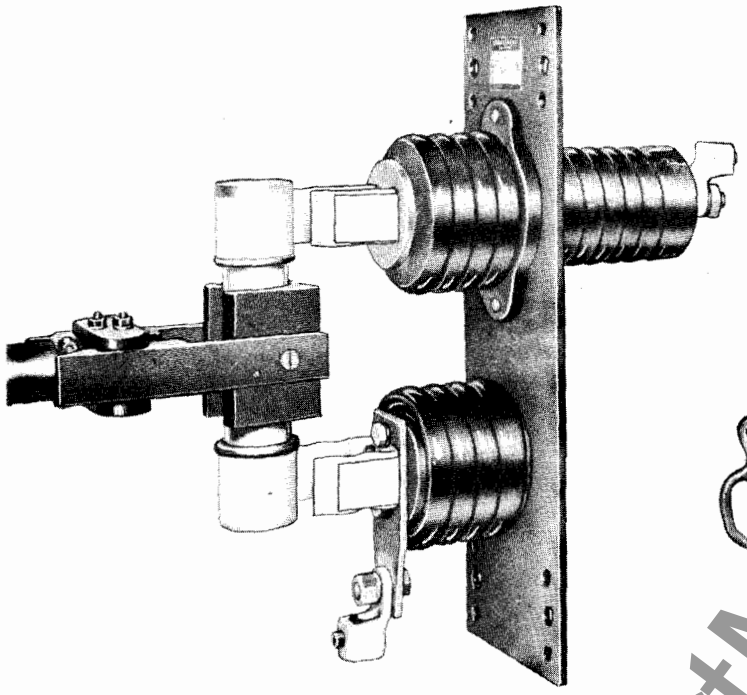


Fig. 8 Removal or Insertion of Fuse Unit from EK-1C Support

Fig. 9 (8019024)

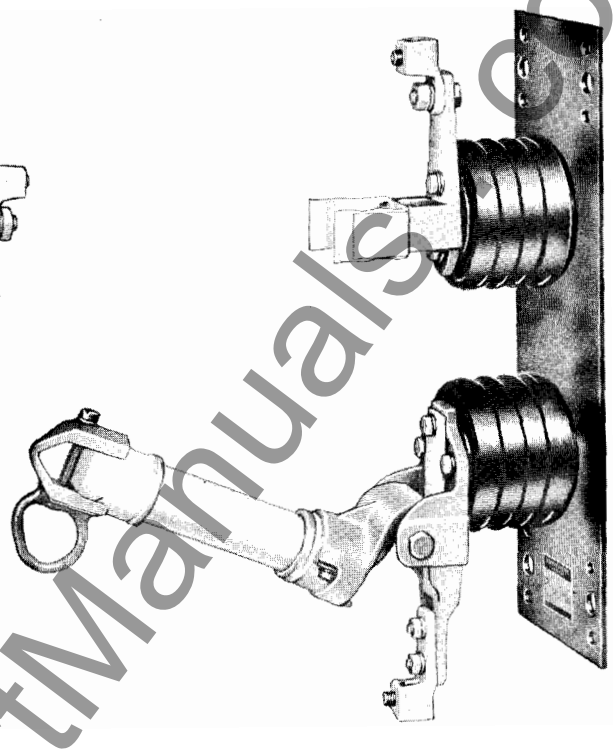


Fig. 9 EK-3C Fuse Disconnecting Switch in the Open Position

8009129 & 8019025)

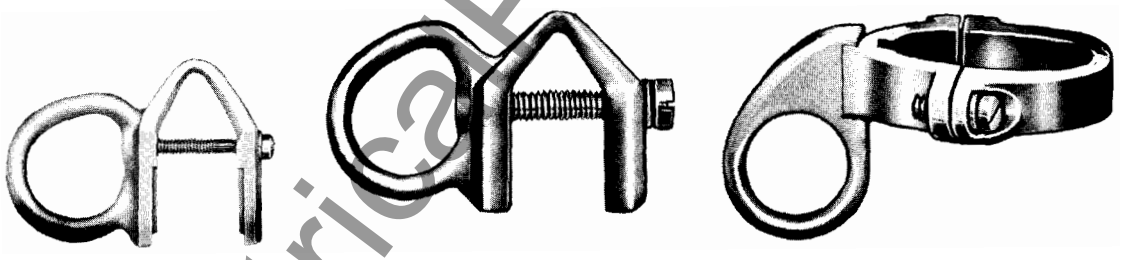


Fig. 10 (8009128

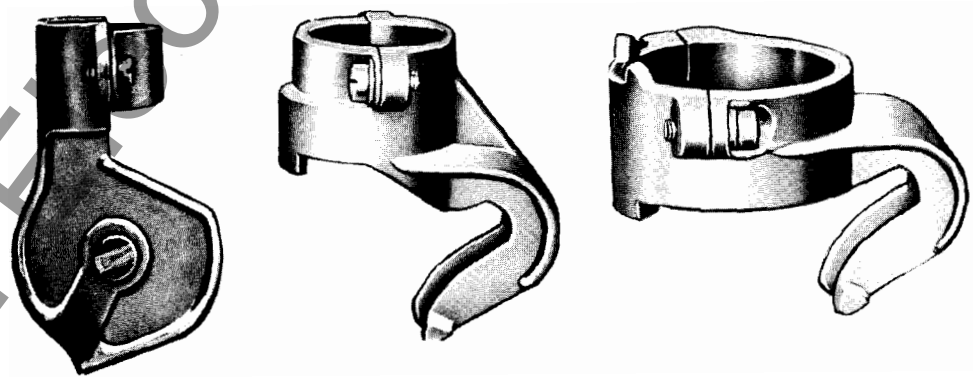


Fig. 10 Fuse Fittings for Type EK-3 and EKO-3 Fuse Disconnecting Switches

To insert size C, D, or DD fuse units, grip the tube firmly with the tongs. Insert the point of the hinge fitting behind the hinge bolt and lower the unit until it rests on the bolt. The tongs can then be removed. Then insert the fuse hook in the operating eye and rotate the blade into the closed position.

To remove the C, D, or DD unit from the switch, insert the hook in the operating eye and open the switch to the position shown in Fig. 9. Grip the tube firmly in the jaws of the fuse tongs and lift straight up.

The EK-3B is capable of a 70 degree opening angle, (see Fig. 7). A 180 degree opening angle is available upon request. To remove the fuse unit from either of these types of switches, the switch must be opened to its maximum position, and the tongs placed around the tube. From this position, the fuse is lifted straight up with a slight closing motion until it is free of the hinge support.

MAINTENANCE

When installing a new fuse unit in a support or switch, care must be taken to place the indicating end in a position where it can be seen. Further information on the fuse units can be found in fuse instruction sheets GEI-10951 (EJ-1), GEI-13543 (EJ-2), or GEI-18020 (EJ-3).

With disconnecting switches, the time required to replace a "blown" fuse is considerably shortened if spare fuse units, with fittings attached, are kept on hand.

INSPECTION

At intervals of about one year, or more often depending on local conditions, an inspection of contact surfaces and other parts should be made. The insulators and fuse tubes should be wiped clean, contacts brightened, and any damaged parts replaced.

RENEWAL PARTS

When ordering renewal parts, refer to the Renewal Parts Bulletin GEF-3524. In the absence of a renewal parts bulletin, address the nearest General Electric Sales Office, specify the quantity required, describe the part, and give the complete data from the nameplate.