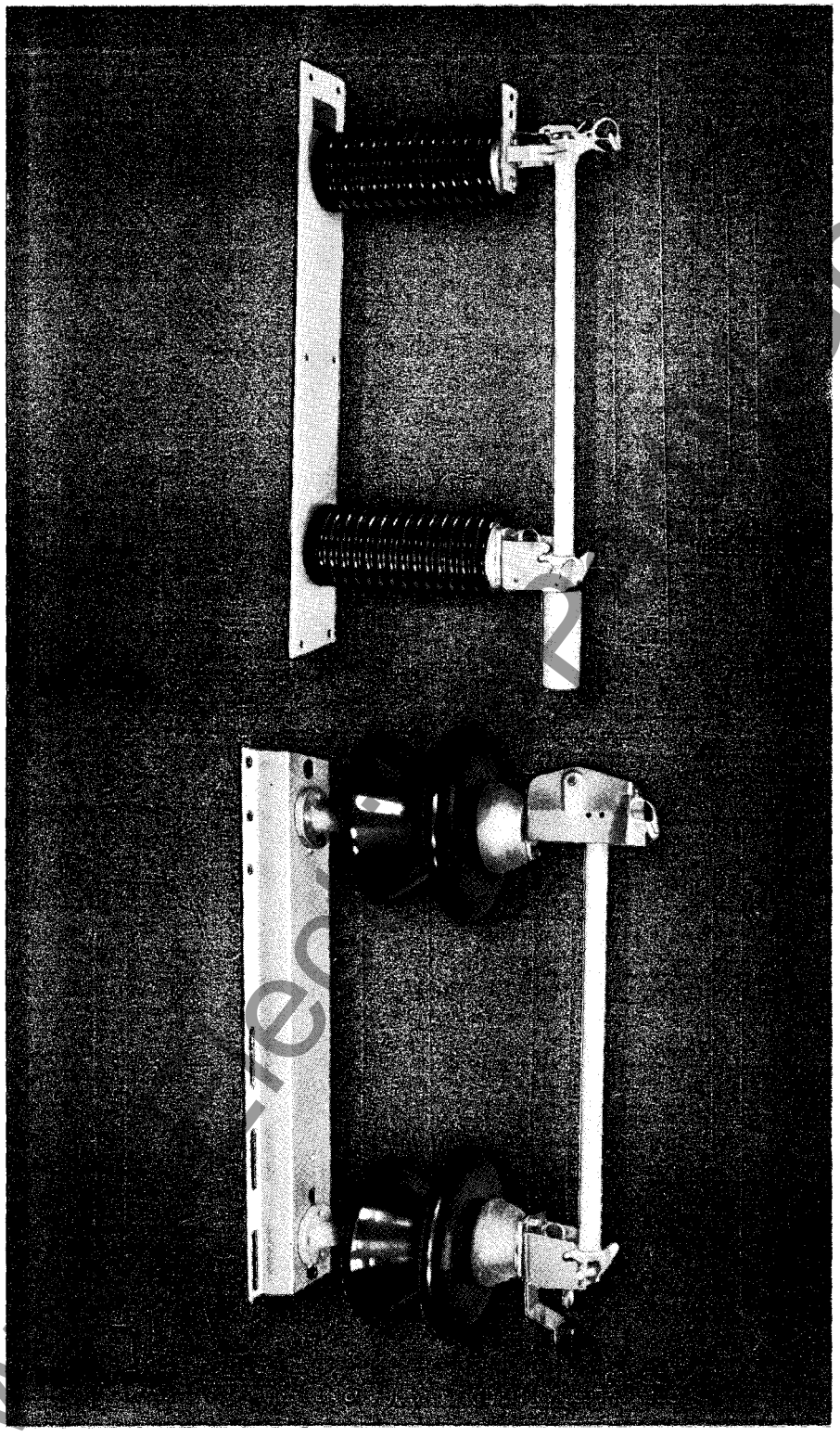
Westinghouse

High Voltage Power Fuses Indoor Type RBA-200-400-800 Outdoor Type RDB-200-400-800

4.8 to 34.5 Kv



Application

Type RBA and RDB De-ion power fuses provide effective protection for circuits and equipment which operate on voltages from 2400 to 34,500 volts inclusive. They are applicable in utility and industrial power plants for indoor and outdoor use. The fuses are designated for use on:

- Power Transformers
- Feeder Circuit Sectionalizing
- Street Lighting Transformers
- High Voltage Capacitors
- Pad-Mounted Transformers
- Distribution Transformers
- Potential Transformers

These fuses can also be used in combination with various types of load break switches to provide a non-automatic load interrupter with high short circuit protection, or can be placed in fuse cabinets for indoor or outdoor use.

Advantages

- High Interrupting Capacity
- Excellent Low Current Interrupting Capabilities
- Positive Blown Fuse Indication on Outdoor Dropout Type
- Wide Variety of E-Ampere Fuse Ratings Available
- Fuse Refills not Affected by Wide Temperature Changes
- Light Weight Fuse Holders Ease Installation on Outdoor Mountings
- Numerous Types of Fuse Mountings Available
- Stock Shipments on all Fuse Refills
- Attachments are Available for Fuse Operation in Totally Enclosed Cabinets, Limited Space or Indoor Installations.
- Fuse Refills Installed with Ease
- Shunt Assembly Within Fuse Holder not Damaged by Fuse Operation
- Main Operational Parts can be Separately Purchased
- Conversion From Indoor to Outdoor Fuse Holder Readily Accomplished

Further Information

Prices: Price List 36-624
Application: Application Data 36-664
Dimensions: Technical Certification Sheet 36-674

February, 1969
Supersedes DB 36-300 dated June, 1952
E, D, C/1971/DB

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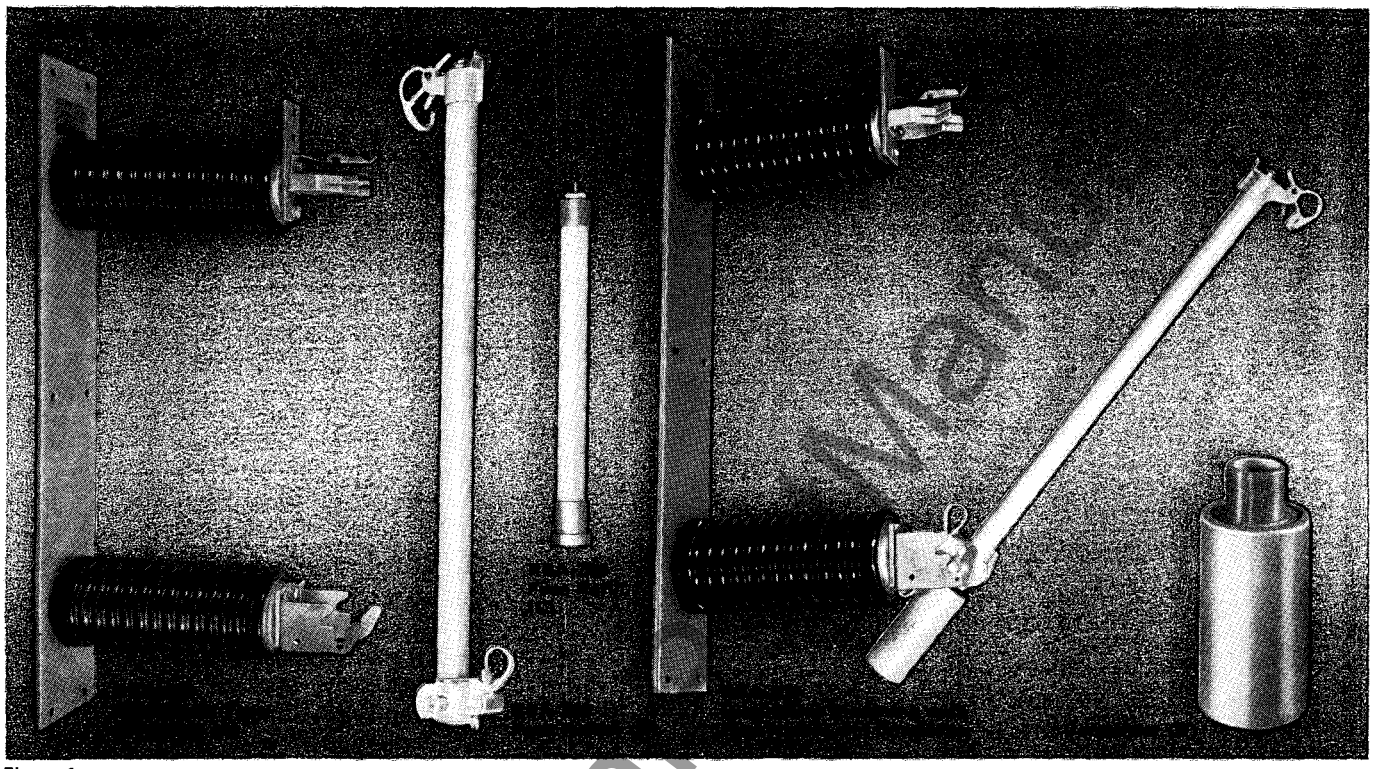


Figure 1

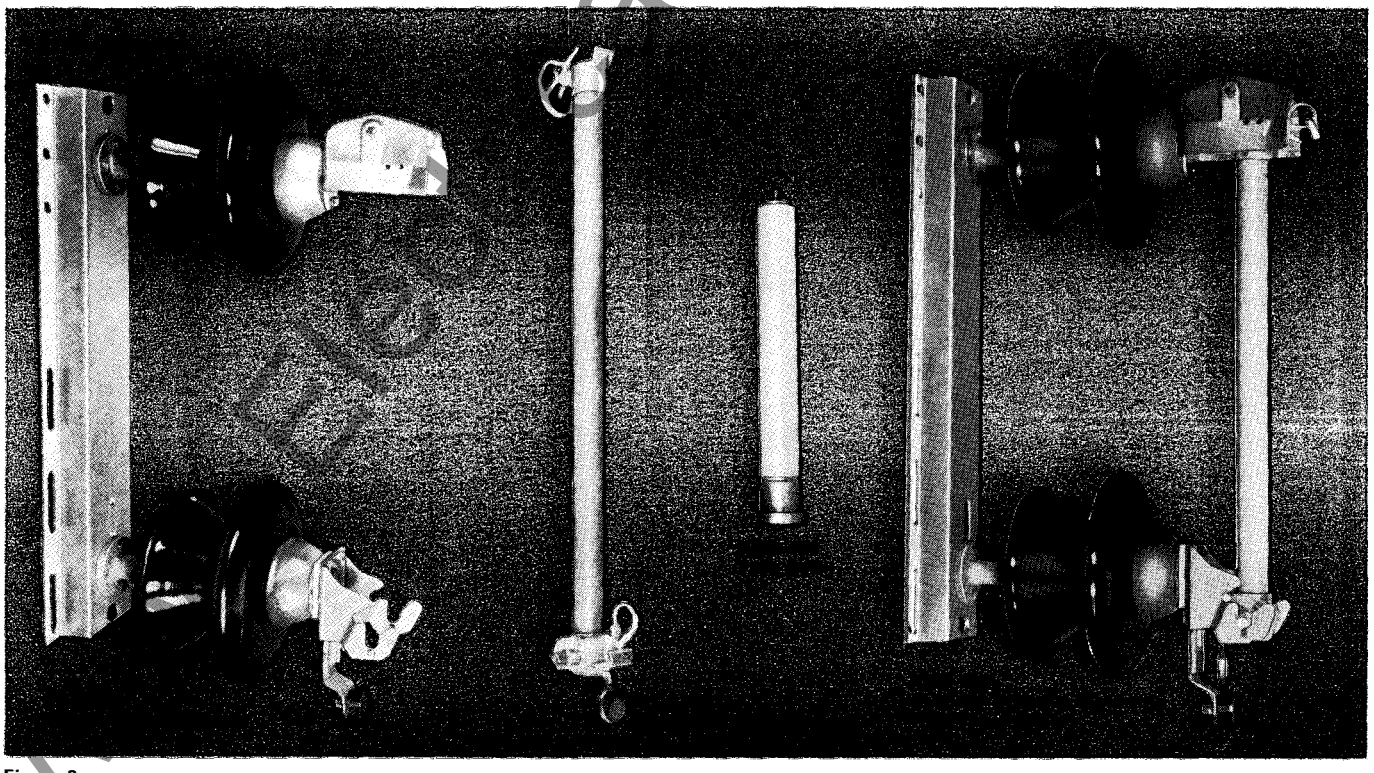


Figure 2

High Voltage Power Fuses Indoor Type RBA-200-400-800 Outdoor Type RDB-200-400-800

4.8 to 34.5 Kv

Description

The Indoor RBA fuse is available in the hookstick operated disconnect or non-disconnect type. The complete fuse consists of the following components (a) mounting (b) fuse holder (c) refill (d) discharge filter or condenser. (Fig. 1).

The Outdoor RDB is a hookstick operated disconnect type of fuse with a dropout feature, a complete fuse consists of the following components: (a) mounting (b) fuse holder (c) refill. (Fig. 2).

In voltage classes from 7.2 to 34.5 kv, Type RBA-RDB-200 fuse refills are available in standard melting time currents from 10E to 200E amperes. The RBA-RDB-400 refills range from ½E to 400E amperes for 7.2 to 14.4 kv and do not go above 300E ampere for 23.0 and 34.5 kv. The 7.2 kv refills are used for 48 kv and below.

Time-lag fuse refills are also available for the RBA-RDB-200-400 ranging from 20E to 200E ampere for voltage classes 7.2 to 34.5 kv.

The Indoor RBA disconnect type mountings have been designed to meet practically all applications. These mountings can be obtained as front connected, rear connected or in a combination of front and rear connections.

Positive electrical connections are maintained at both ends of the mounting by the use of cadmium chromium copper spring fingers at the hinge end and clip type contacts on the break end. The spring fingers are compressed on closing of the fuse holder, the electrical current path made directly from the terminal pad to the fingers and fuse holder. (Fig. 3).

To assure good electrical connections at the break end and maintain it, the hookstick operated fuse holder is closed into the main upper contacts and locked into the stainless steel latch. Cadmium, chromium copper used for contacts is a highly conductive, extremely strong, heat treated spring copper alloy.

The Indoor RBA non-disconnect mountings utilize a latch and gate assembly and a silicon bronze screw with a bakelite head to assure stability and proper contact. Various combinations of non-disconnect mounting are also available. (Fig. 4).

The Outdoor RDB is a hookstick disconnect dropout type mounting which incorporates at the break end a sleet hood shelter, cable terminal, and dropout mechanism into one unit. The sleet hood made of aluminum bronze shelters the dropout mechanism against ice and snow to insure proper performance under all conditions. Electrical contact between the sleet hood and main contacts is provided by a bolted connection and high contact pressure is maintained by the charged ejector spring and spring latch assembly locking the fuse holder in the main contacts. (Fig. 5).

The hinge end of this type mounting is identical to the RBA, except for the dropout stop. Mountings are normally furnished with cap and pin insulators. Station post insulators, or insulators with next higher BIL can be furnished. (Fig. 6).

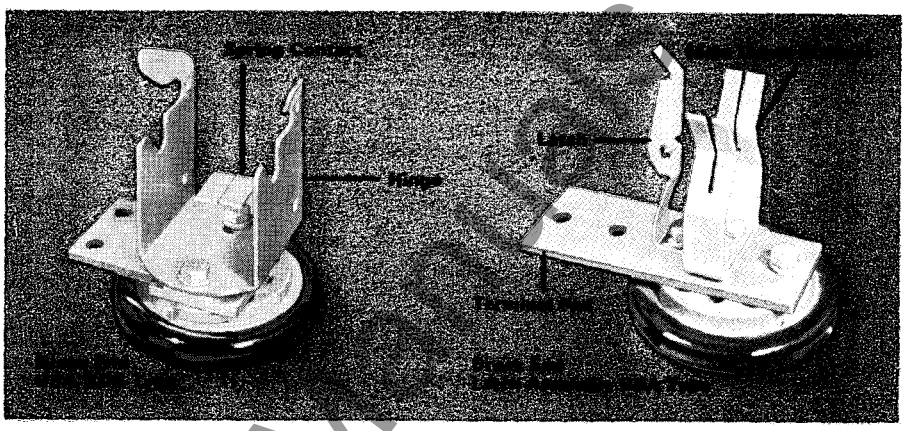
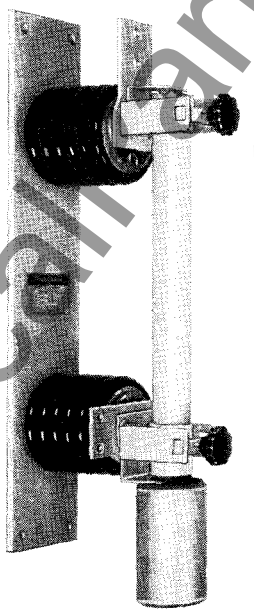


Fig. 3



RBA-400 Non-Disconnect Mounting with Fuseholder and Discharge Filter

Fig. 4

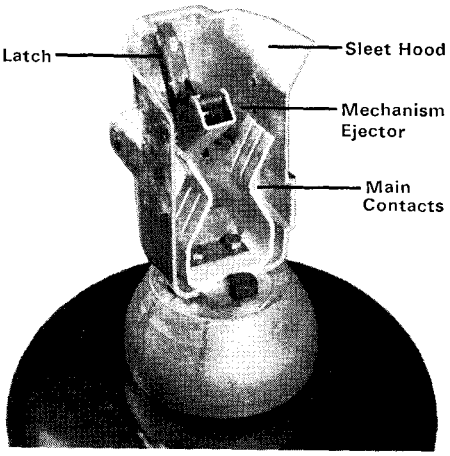
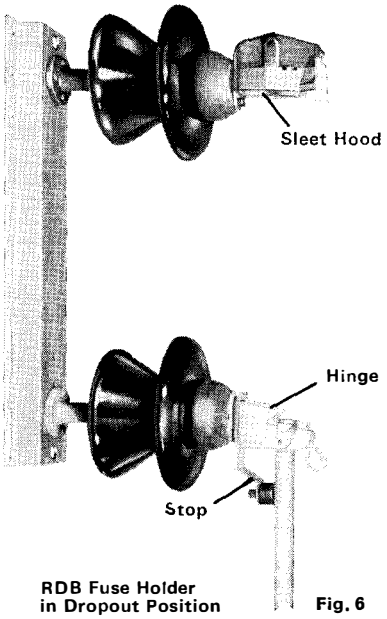


Fig. 5



RDB Fuse Holder in Dropout Position

Fig. 6

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Fuse Holders

The RBA-RDB fuse holders are filament wound glass epoxy tubes which enclose the fuse refill and the operating spring and shunt assembly. Except for the shunt and spring assembly, top cap and gravity-operated cap, the RDB outdoor is identical to the RBA indoor disconnect type fuse holder. Conversion kits are available to change indoor fuseholder to the outdoor type, or the outdoor type to indoor type. (See Fig. 7).

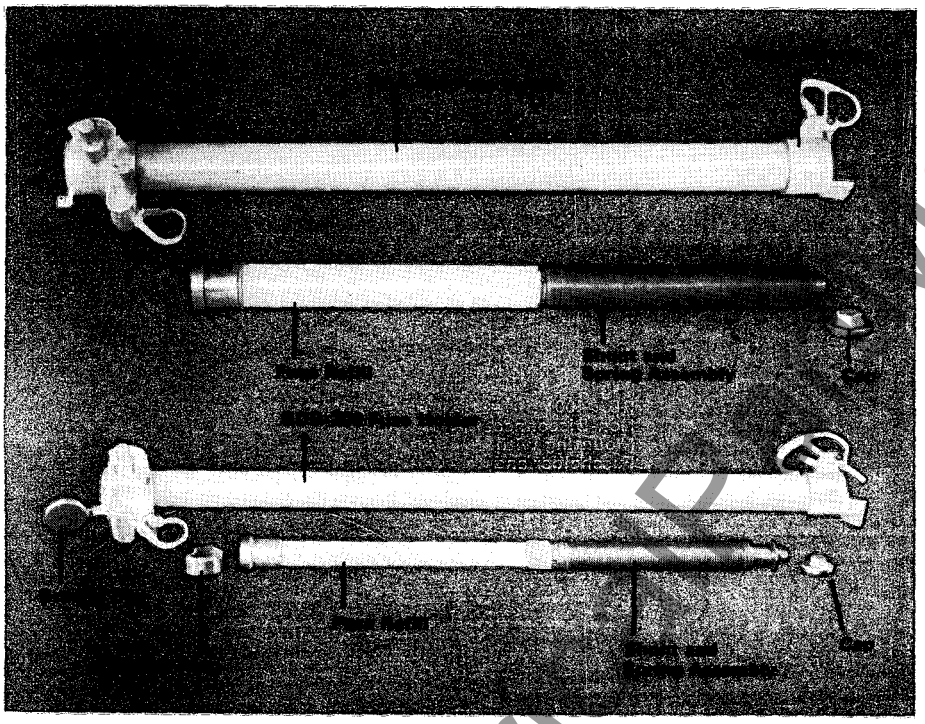


Fig. 7

Non-disconnect RBA fuse holders are similar in design to the indoor disconnect type except for the main upper and lower contacts on the fuse holder tube. (See Fig. 8).

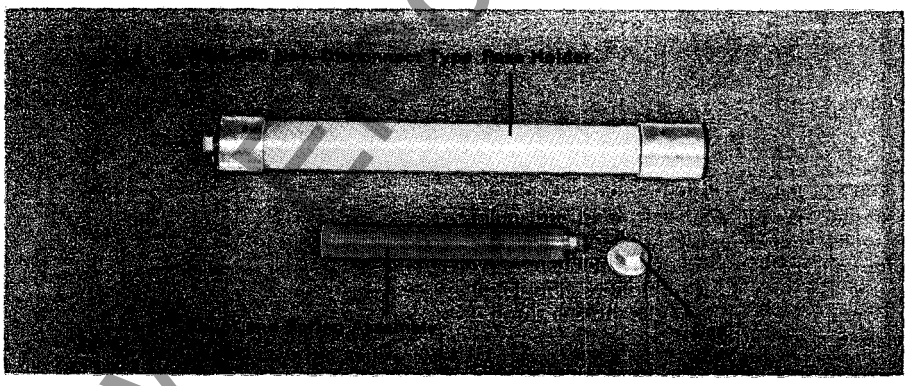
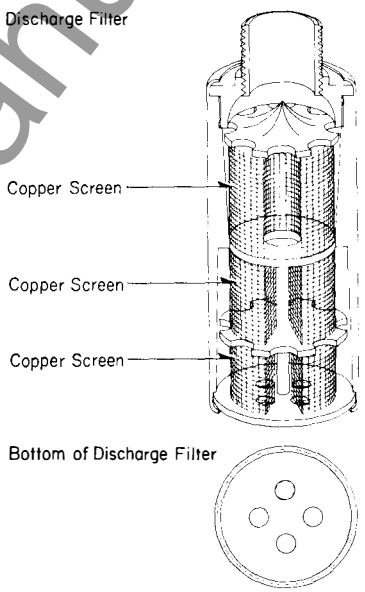


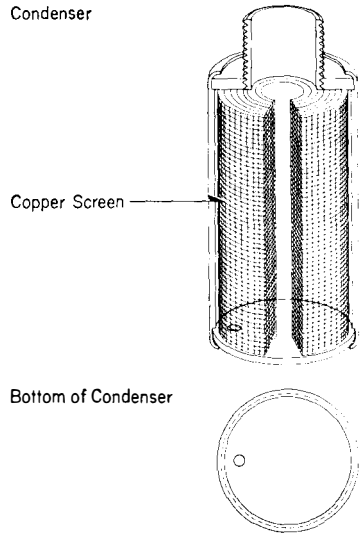
Fig. 8

Discharge Filter-Condenser

In cases where installations clearances are small, the attachment of a discharge filter or condenser will minimize the noise and contain the arc within the fuse. (See Fig. 9). The discharge filter and condenser are metallic containers with copper screen to absorb and dissipate arc heat and to condense the steam to water.

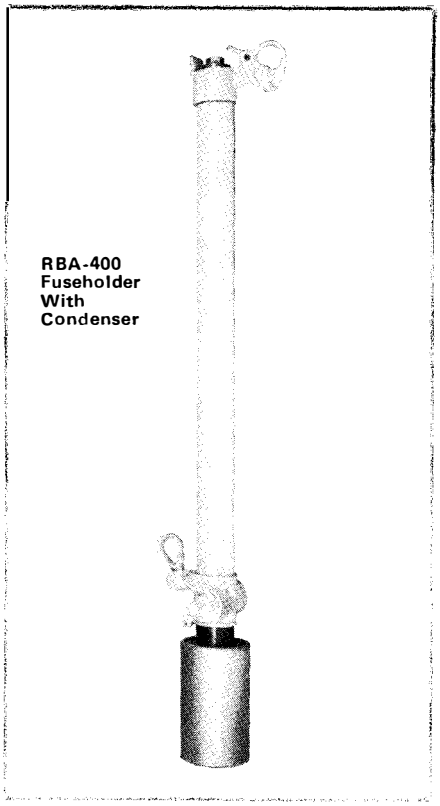


Although the inner and outer metals of the discharge filter and condenser are similar, the internal design and method of venting give the discharge filter a higher interrupting rating than the condenser. The condenser in its design fully restricts the discharge of steam lowering the interrupting rating.



High Voltage Power Fuses Indoor Type RBA-200-400-800 Outdoor Type RDB-200-400-800

4.8 to 34.5 Kv



RBA-400 Fuseholder With Condenser

Fuse Refill

The boric acid refill is probably the most important component of the RBA-RDB fuse. It is designed to interrupt currents of short circuit magnitude within ½ cycle, and through its two de-ionizing chambers in parallel, have selective operation and interruption for both low-current and high current faults. This is achieved by movement of the arc through the boric acid cylinder by a helical spring and rod. Intense heat from the arc, as it strikes decomposes the dry boric acid. On decomposition the boric acid forms water vapor and inert boric oxide. The electrical interruption is caused by the steam de-ionizing the arc as it is drawn through the cylinder by the action of the spring and rod. The high particle turbulence of boric acid causes the rate of de-ionization in the cylinder to exceed the ionization rate of the electrical arc. This action prevents the arc from restriking.

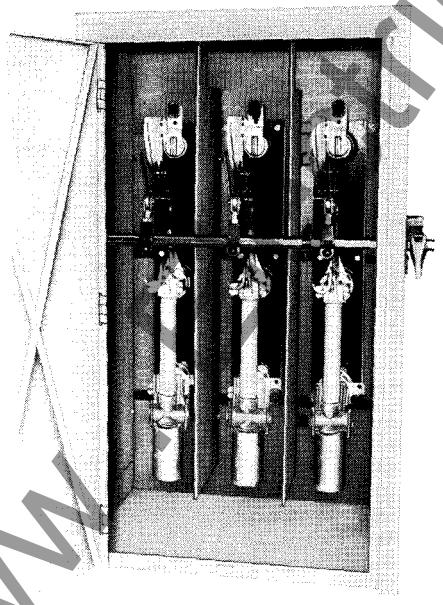
Upon operation of the fuse under fault condition, the fuse holder is disconnected, the fuse refill removed, and replaced with a new refill.

The illustrations on page 6 illustrate the operation of the RBA fuse. (See Fig. 10).

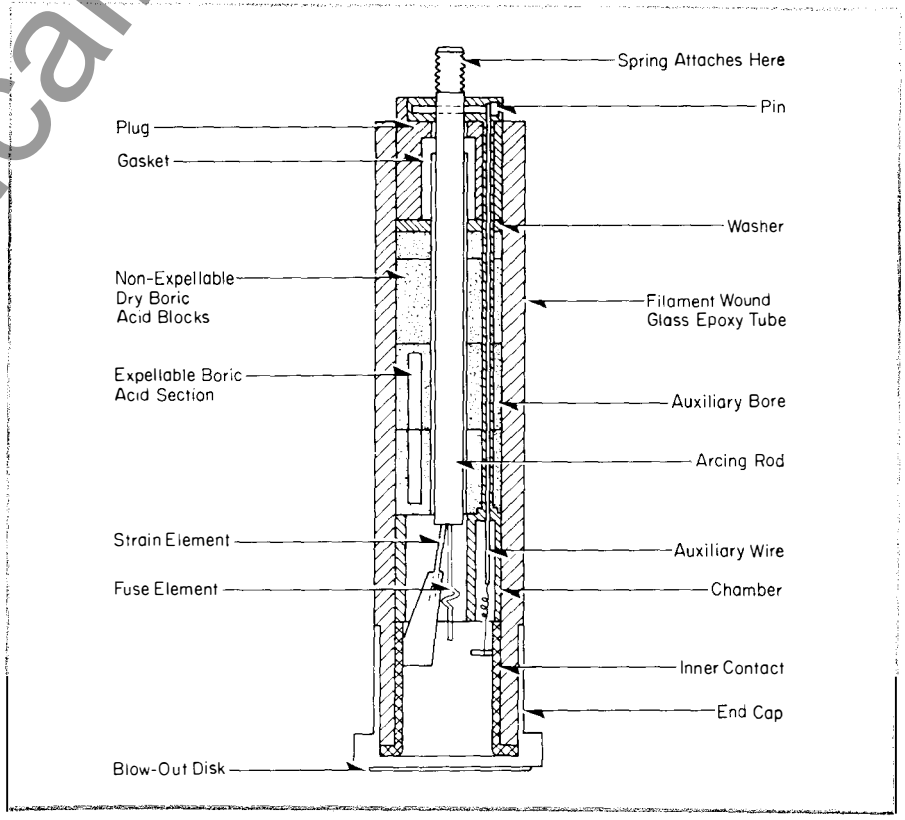
The RDB outdoor fuses operate on the same principal as the RBA except for the addition of the dropout feature. On closing the fuse holder with a hookstick, the ejector assembly, located under the sleet hood, is forced downward, charging the ejector springs while locking the fuse holder into the spring operated latch mechanism. (See Fig. 11).

Under fault conditions, the fuse element melts, the helical spring pulls the arcing rod and arc through the cylinder. The top portion of the helical spring assembly contains a free moving inertia drive pin. The upward movement of the spring sets into motion the inertia drive pin which drives through the small hole located in the cap on the fuse holder and strikes the latch mechanism. The latch releases the fuse holder causing the charged ejector spring to move the ejector assembly against the fuse holder forcing it outward to swing through a 180° arc into a dropout position. This dropout action provides immediate visual indication that the fuse has operated. (See Fig. 12).

In cases where the full load exceeds 400 amperes the RBA-RDB-800 fuses are available. (See Fig. 13).



LCB Switch With RBA-400 Indoor Disconnect Type Fuses



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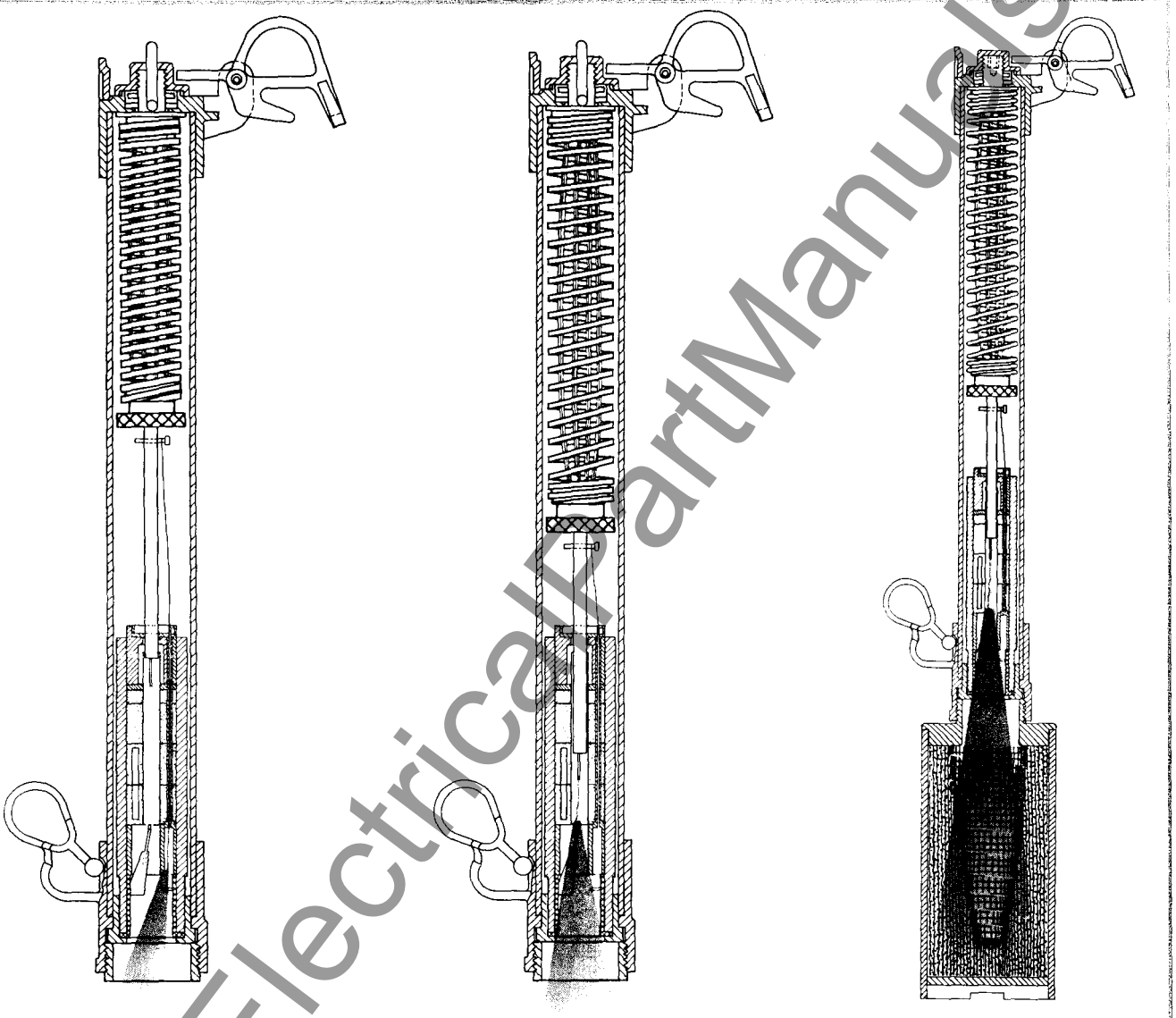
Fuse Operation



Low-Current Fault
When an overload of low-current magnitude occurs, the main fuse link blows. The auxiliary fuse wire shorts out the main fuse and the arc is extinguished in the small bore by a blast of water vapor evolved from the boric acid. The arcing rod, drawing no arc, moves to the open position by the spring action.

High-Current Fault
An overload of heavy current magnitude blows the main fuse link and transfers to the auxiliary fuse. In the small bore the arc creates a high voltage so that it restrikes in the main bore. The arcing rod then draws the arc through the main bore where sufficient water vapor quickly extinguishes it.

To Eliminate Noise and Flame
Because the principal de-ionizing agent in the boric acid fuse is water vapor; the flame discharge is incandescent steam. A condensing device, consisting of copper screen so constructed that the entire condensing area is exposed to the discharge, will readily liquefy the water vapor and silence the expulsion. With condenser, the fuse is noiseless and flameless.

Fig. 10

High Voltage Power Fuses
Indoor Type RBA-200-400-800
Outdoor Type RDB-200-400-800

4.8 to 34.5 Kv

Dropout Operation

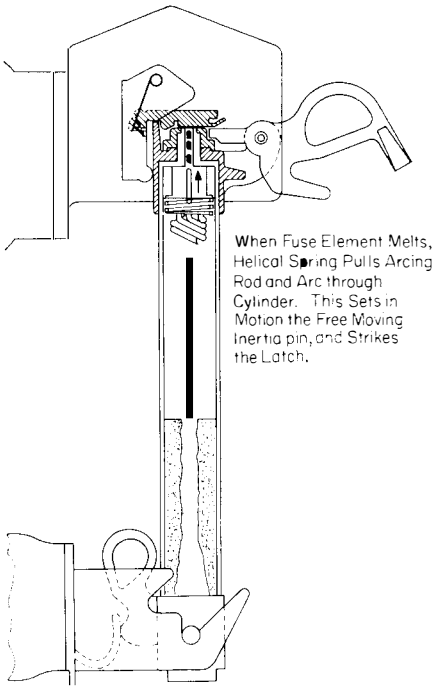


Fig. 11

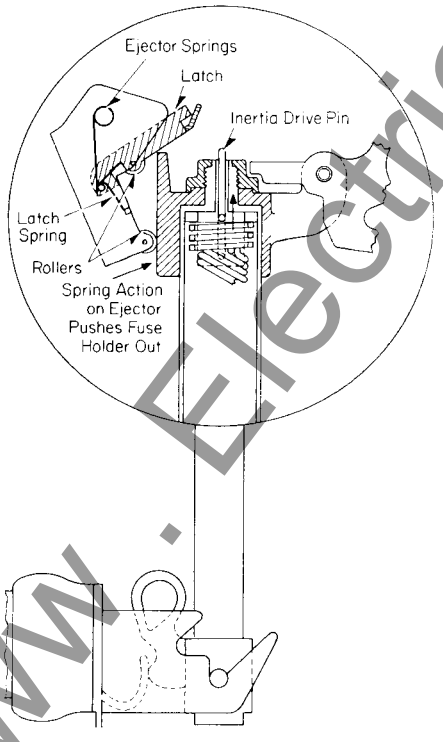


Fig. 12

RBA-RDB 800 Mountings

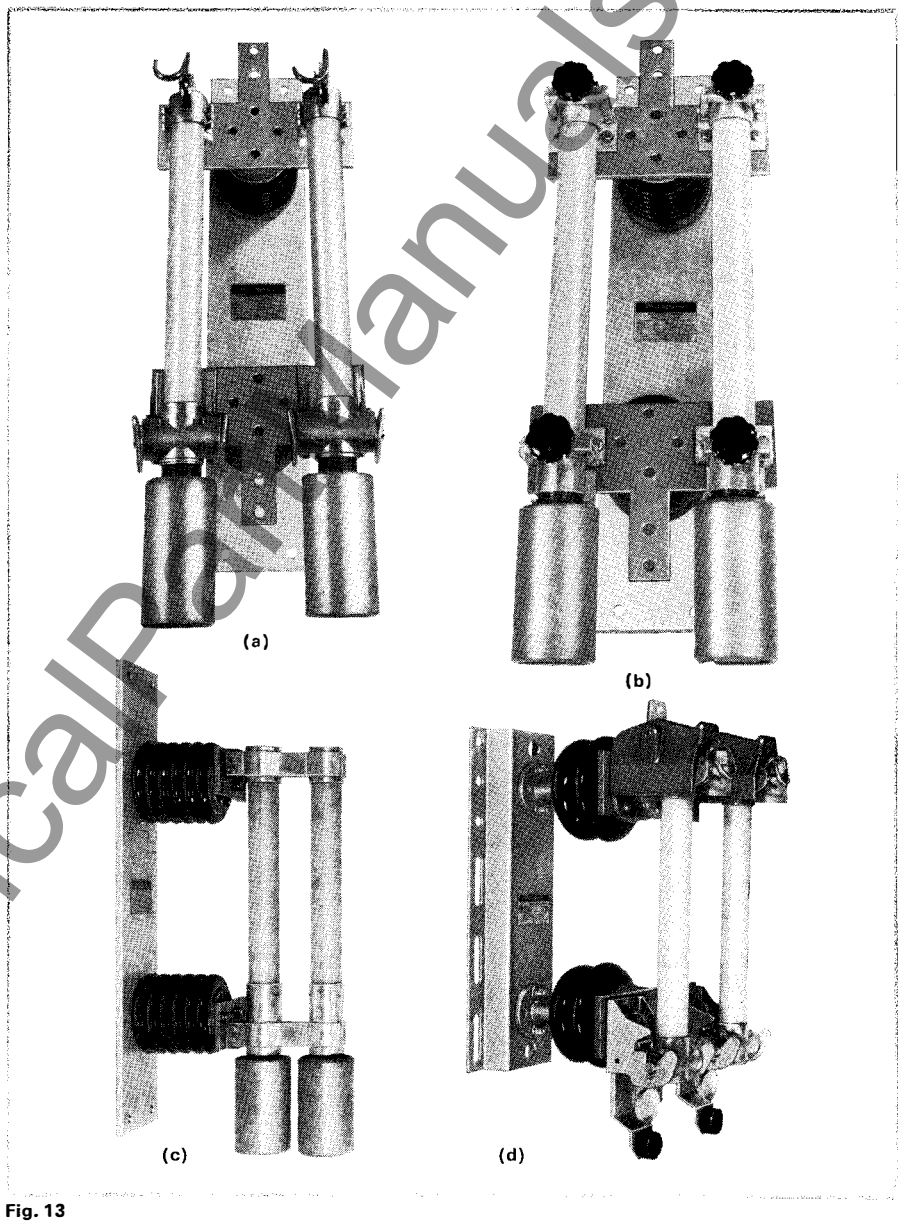


Fig. 13

The indoor RBA-800 type mountings have been designed to meet practically all applications and are available in the disconnect, non-disconnect and piggy-back type. (Fig. 13).

The disconnect (a) and non-disconnect type (b) mountings utilize two (2) single type RBA-400 fuse holders in parallel on a single mounting. The piggy-back type of fuse holder is composed of two single fuse holders and joined together to form a single fuse holder for use on a single type mounting (c).

The RDB-800 dropout type mounting (d) also utilizes two (2) single type RDB-400 fuse holders in parallel on a single mounting.

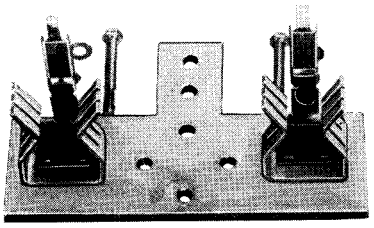
When paralleling two (4) 400E refills, the maximum allowable full load current is 720 amperes, or 540 ampere when two (2) 300E refills are used.

High Voltage Power Fuses
Indoor Type RBA-200-400-800
Outdoor Type RDB-200-400-800

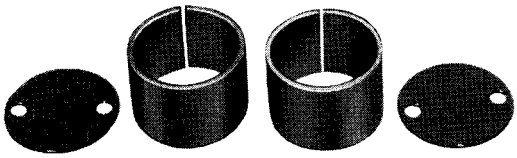
4.8 to 34.5 Kv

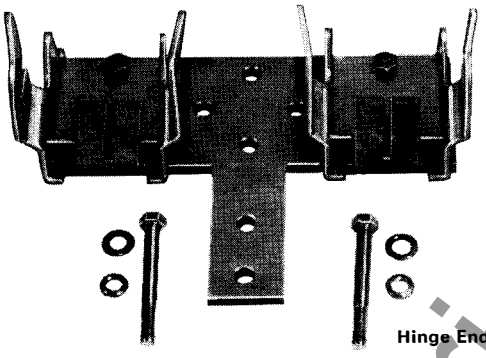
Live Parts Above Insulators

For existing mountings, the live parts above the insulators are available. This includes only hinge and break jaw assemblies, some of the available assemblies are shown below.



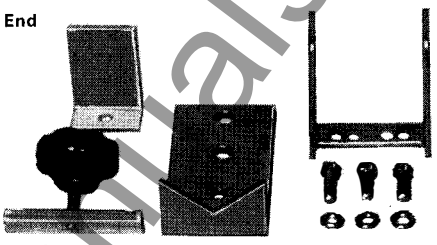
Latch End





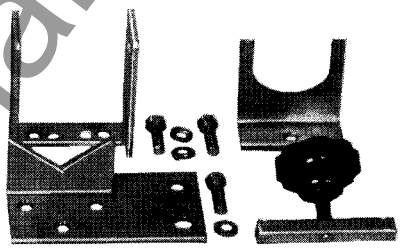
Hinge End

RBA-800 Disconnect Type

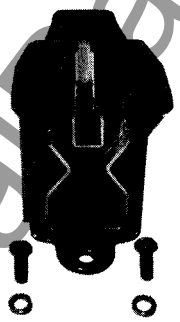


Top End

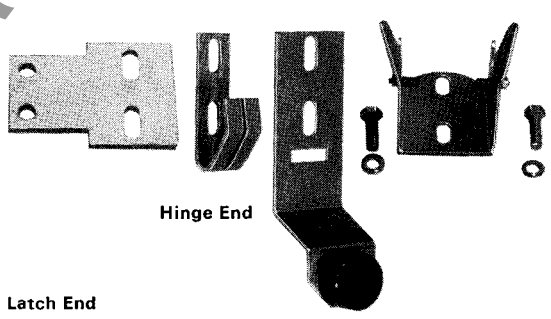
Bottom End



RBA-200 Non-Disconnect Type

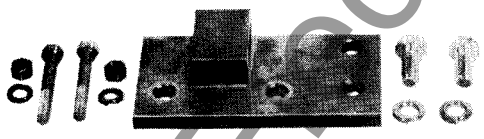


Latch End

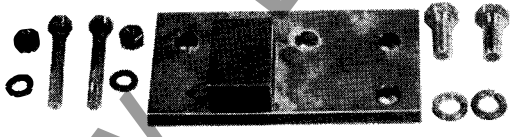


Hinge End

RDB-400 Outdoor Dropout Type

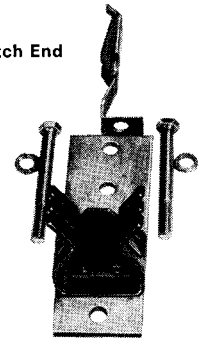


Top End

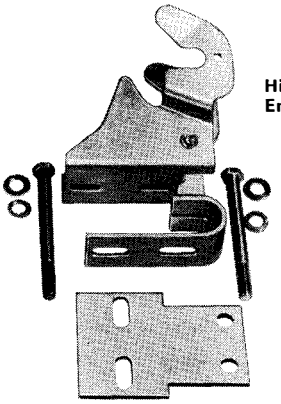


Bottom End

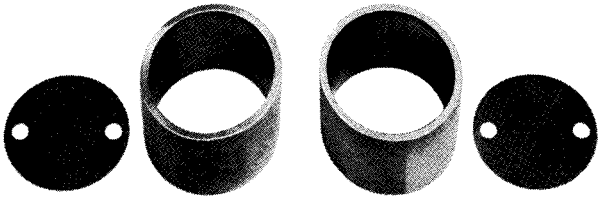
RBA-800 Non-Disconnect (Piggy Back) Type



Latch End



Hinge End



RBA-Indoor Disconnect Type

Westinghouse Electric Corporation
Switchgear Division, Power Switching Equipment, East Pittsburgh, Pa.
Printed in USA