DESCRIPTION • INSTALLATION • MAINTENANCE

INSTRUCTIONS

LOAD INTERRUPTER SWITCH
Type LCB
2.5 to 15 Kv. Gang Operated Three-Pole Single Throw

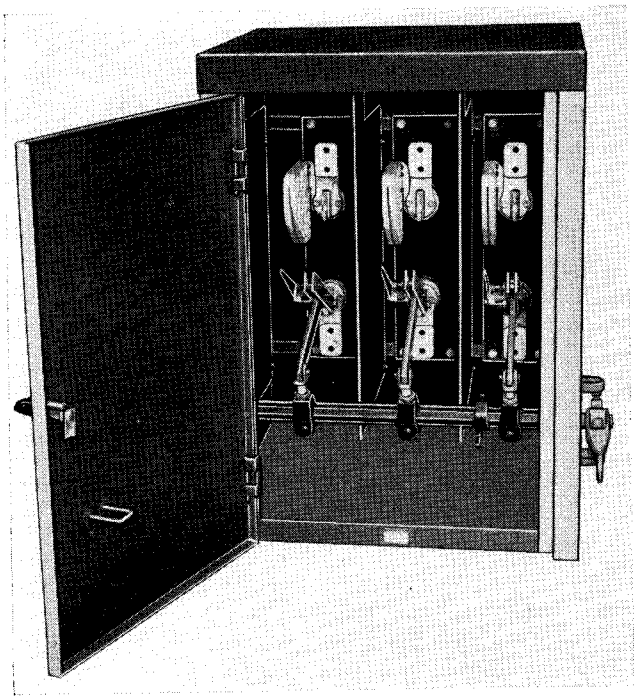


FIG. 1. Type LCB Interrupter Switch, 3-Pole-Cabinet Door Open

GENERAL INFORMATION

AN INTERRUPTER SWITCH is a switch combining the functions of a disconnecting switch and a circuit interrupter, for interrupting at rated voltage, current within its interrupting rating. The interrupter switch differs from the circuit breaker in that it cannot interrupt overload or short circuit currents.

Caution. *Since an interrupter switch may be opened or closed during overload or short-circuit conditions, it is recommended that adequate protection be provided for personnel. This protection may consist of a metal enclosure for the switch, a remote operating mechanism, proper interlocking or a combination of these protective features.*

OPEN TYPE HOOK-STICK OPERATED POLE UNITS ARE RECOMMENDED ONLY FOR INTERRUPTING MAGNETIZING OR CHARGING CURRENTS.

Description. The Westinghouse type LCB interrupter switch may be opened, while carrying current within its normal rating, in complete safety. This is made possible by the transferring of the load current from the switch blades to the "De-ion" arc chambers. When the switch is opened, the main current carrying blades open first and shunt the current through the auxiliary or quick-break blades. Further travel of the main blades causes the auxiliary blades to separate from their contacts and the arcs are drawn in the "De-ion" arc chambers. The arcs are then interrupted by the de-ionizing action of the arc chambers.

Fuses. When overload and short-circuit protection is desired, the type LCB interrupter switch is furnished with power fuses in series with the switch. When a fault condition occurs, the fuses will operate to clear the circuit. Before renewing the fuse refills it is desirable to open the interrupter switch so as to isolate the fuses from the connected load, and to prevent the possibility of closing them in against a fault.

INSTALLATION

Storage and Handling. These units should remain in their packing cases until ready to install. They should be completely protected from weather, building dirt, cement dust and the like. Reasonable care is necessary when unpacking to prevent damage. All dust and packing material should be cleaned from the interrupting chambers, contacts, and insulators.

When welding, sanding, drilling, filing or sawing operations are performed near-by, the contacts, interrupting chambers, insulators and mechanism parts should be covered and kept clean.

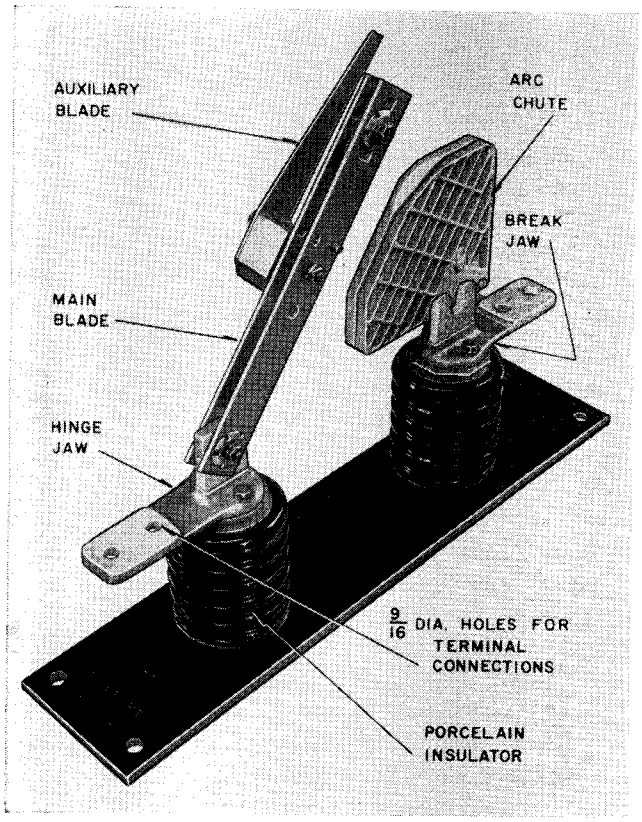


FIG. 2. Type LCB Interrupter Switch shown in Open Position.

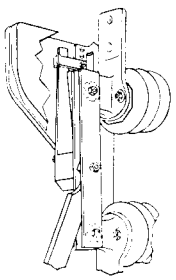
Arrangement. Unless otherwise specified, the operating eye or mechanism crank will be to the right when facing the front of the switch or enclosure door. By re-assembly of parts, it is possible to change the operating means to the left side. On open type switches, almost any installation requirements can be met by proper location and adjustment of mechanism parts.

Mounting. It is recommended that installation be made with the switch in its closed position. When mounting switch bases or cabinets, care should be taken to use spacing shims where necessary, to avoid distortion when tightening the mounting bolts. No bolt should be tightened until the gap between the switch base and the mounting surface has been reduced to less than .020 of an inch. After being mounted, the unit should be inspected to insure that all moving parts act freely and that contacts are in alignment. Switch blades should never be bent or contacts filed or ground to correct misalignment. Instead, loosen bolts and shift parts slightly until the trouble is corrected and then retighten the bolts.

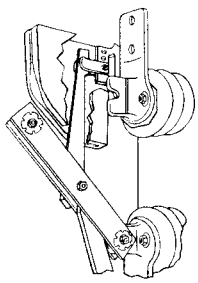
Power Connections. When individual bare or insulation covered connections are used, suitable inlet and outlet bushings are necessary in the enclosure wall. When cables enter and leave through conduit, suitable insulation covering is required to supply adequate leakage distance over the conductors between the end of the conduit and live parts. The use of potheads with lead covered cable is recommended as a permanent and dependable insulation method. It is recommended that open connections be taped, only after the installation is complete and the operation has been checked.

Adjustment. It is recommended that pole unit levers be so adjusted that the open gap between the blade and edge of the interrupting chamber be 3″ for 2.5 KV, 3½″ for 5 KV, 4½″ for 7.5 KV and 6″ for 15 KV. Adjustable stops are provided on the main operating lever for the purpose of properly limiting blade travel. Also, clearances from live parts to grounded metal should be at least equal to

SWITCH CLOSED . . . When the switch is closed, practically all of the current flows through the main blade.



MAIN BLADE OPENS . . . As the contact on the main blade separates, current is transferred momentarily to the quick-break blade, which is maintained to the circuit by the high-pressure contact fingers in the arc chute.



QUICK-BREAK BLADE OPENS . . . The main blade opens until stop on quick-break blade hinge prevents further angular movement between main and quick-break blades. This starts quick-break blade out of contacts in arc chamber. The additional pull of a torsional spring snaps the quick-break blade into open position at high speed—regardless of the speed with which the disconnecting blade is pulled. The heat of the arc, meanwhile, releases a blast of de-ionizing gas from the gas-generating lining of the arc chamber. This combination of quick-break and De-ion action quickly extinguishes the arc and the complete circuit is safely disconnected.

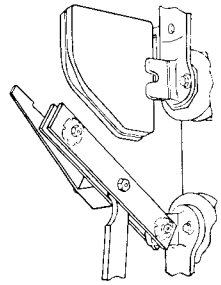


FIG. 3. Various Operations of LCB Interrupter Switch

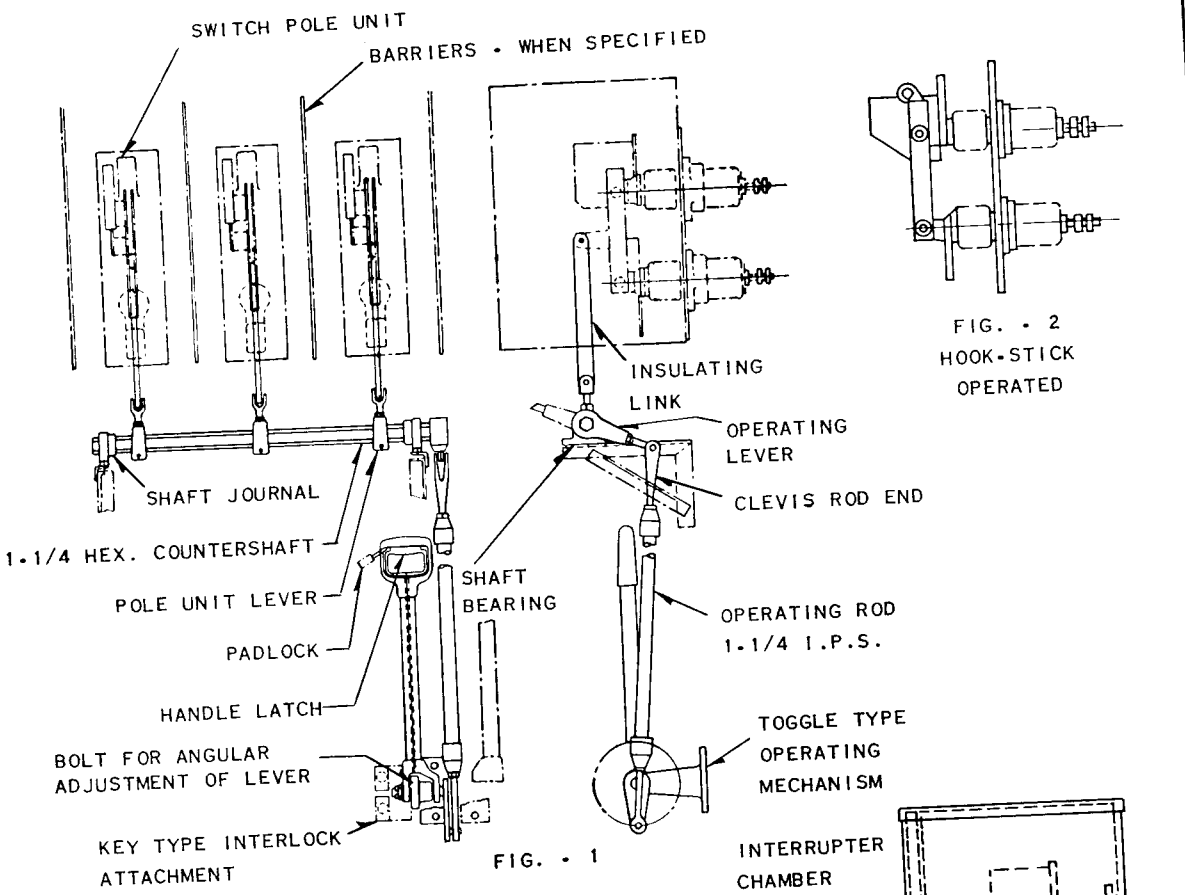


FIG. • 1

FIG. • 2
HOOK-STICK OPERATED

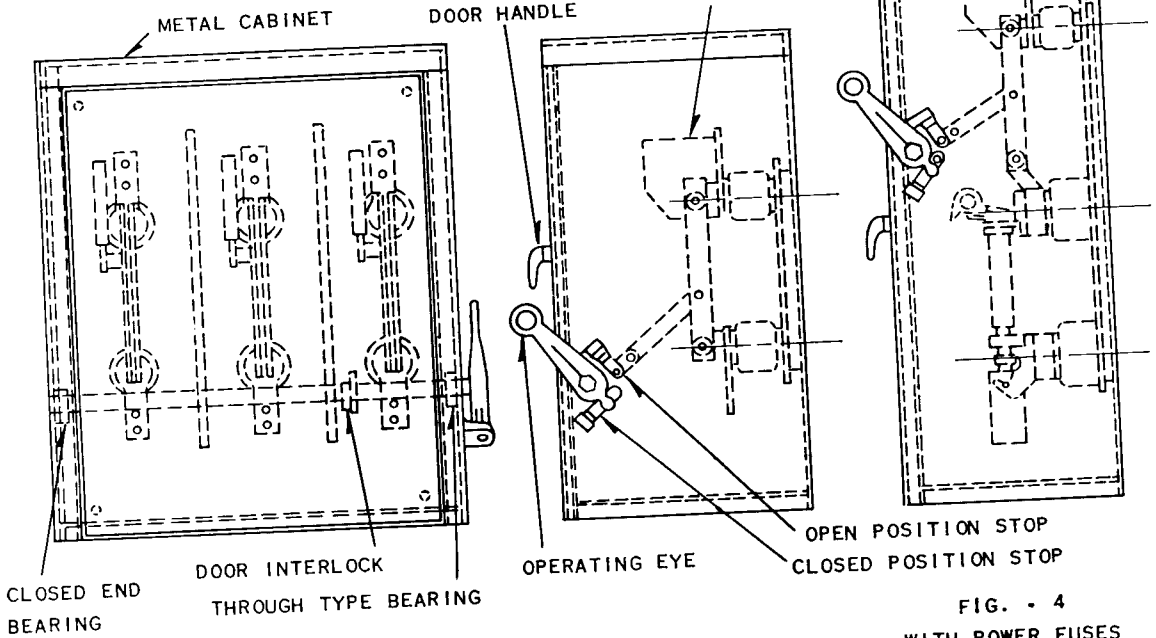


FIG. • 3

FIG. • 4
WITH POWER FUSES

FIG. 5. Typical Installation of LCB Interrupter Switch

PARTS IDENTIFICATION

The following is a list of the parts on this apparatus that are most subject to wear in ordinary operation, and to damage or breakage due to possible abnormal conditions. Parts recommended to be kept in stock are listed on the basis of the number of units in service. When ordering any parts, always specify the part name, the figure and item numbers, and the number of this instruction book. Also, always supply full information from the nameplate on the apparatus.

RECOMMENDED SPARE PARTS FOR TYPE LCB POLE UNITS

5 and 7.5 KV—400 and 600 Amperes

Arc Chute and Quick Break Blade . . S# 1615515

15 KV—400 and 600 Amperes

Arc Chute and Quick Break Blade . . S# 1802635

WESTINGHOUSE ELECTRIC CORPORATION
EAST PITTSBURGH PLANT • SWITCHGEAR APPARATUS DEPTS. • EAST PITTSBURGH, PA.
(Rep. 6-60) Printed in U.S.A.

these distances. Cabinet enclosed units are adjusted at the factory so that all pole units close and open properly. The full closed position is usually slightly past the toggle position of the shaft levers and the insulating links. This insures proper contact and uniform opening of the pole units. The mechanism should be checked to insure that it has not become misaligned during shipment. A door interlock is provided that prevents opening of the cabinet door when the switch is closed. The proper functioning of this interlock should be checked after mounting.

Final Inspection. After mounting, adjusting and completing electrical connections, the switch should be opened by hand from its operating eye; or, if remote control, with the operating mechanism disconnected. It should then be closed by hand to a point where it can be definitely determined that all switch parts are in proper alignment and that the quick-break blades enter the interrupting chambers freely and contact properly.

CAREFULLY INSPECT THE "DE-ION" ARC CHAMBER AND BE SURE THAT THE AUXILIARY BLADE ENTERS FREELY. EXCESSIVE FRICTION DUE TO MISALIGNMENT WILL RETARD QUICK OPENING ACTION AND MAY CAUSE FAILURE.

MAINTENANCE

Inspection Schedule. With ordinary usage and relatively small currents, interrupting chambers should require no maintenance. The normal life of the interrupting chamber is 500 operations at its full rating. When the current interrupted is smaller, the life is proportionately longer. The arcing chambers should be occasionally inspected. After about 300 operations the arc chambers should be opened and if there appears to be considerable wear, they should be replaced. Maintenance requirements will depend on frequency of operation and the values of current.

When arc chambers are replaced, each pole unit should be disconnected from the operating shaft and adjusted individually prior to group operation. Care in initially checking correct individual alignment will avoid damage to contacts and insure free action of the quick-break blades in opening. After it is found that pole units open and close freely, the operating mechanism parts can be connected, permitting group operation.

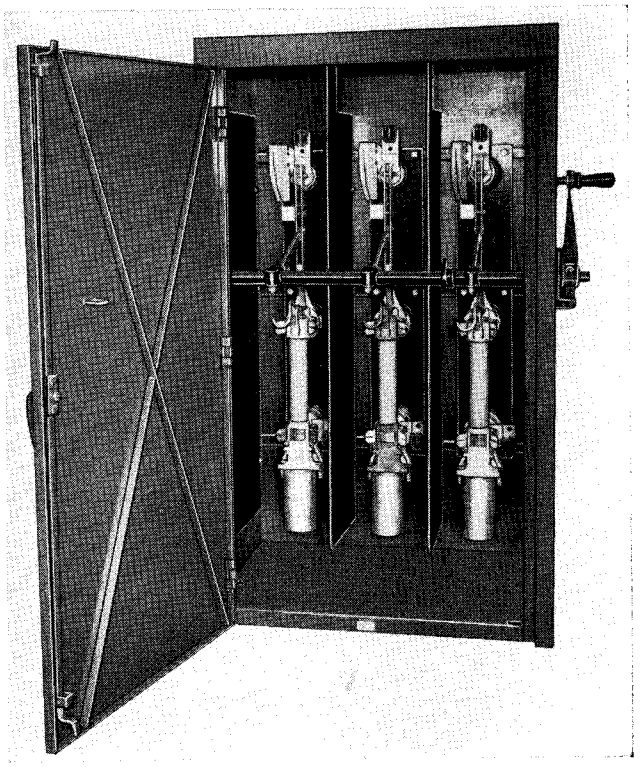


FIG. 4. Type LCB Interrupter Switch Shown in Closed Position

Contacts. The disconnecting switches are provided with multiple line, high pressure silver-to-silver contacts which require a minimum of attention. It is recommended that they be opened and closed and wiped off occasionally to remove excessive dust accumulation. CONTACTS SHOULD NEVER BE CLEANED WITH ABRASIVE MATERIAL. THE CONTACT PRESSURE HAS BEEN ADJUSTED AT THE FACTORY, AND SHOULD NOT BE CHANGED THROUGHOUT THE LIFE OF THE SWITCH.

Mechanism. The operating details should require no attention except an occasional oiling of the bearings, depending on frequency of operation. At reasonable intervals, it is recommended that the bolts be checked for tightness. Shifting or settling of the mounting structure may cause loosening of bolts or binding in bearings and should be corrected.


WESTINGHOUSE

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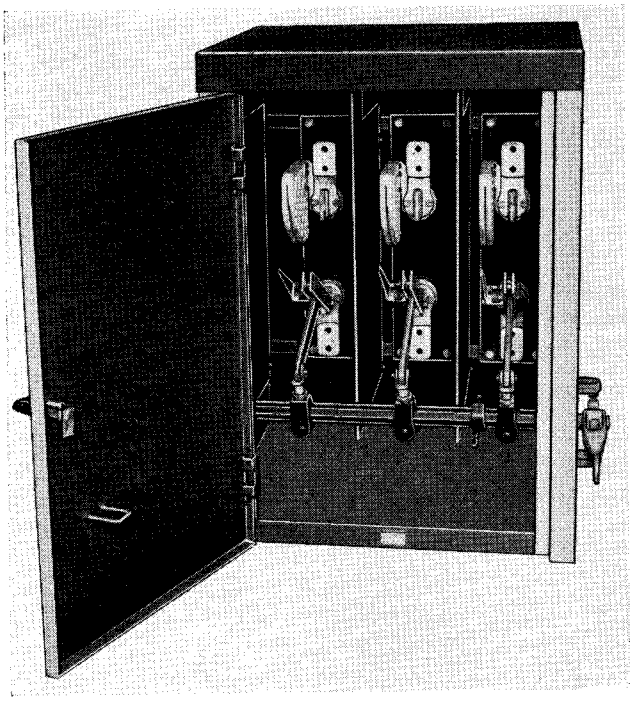

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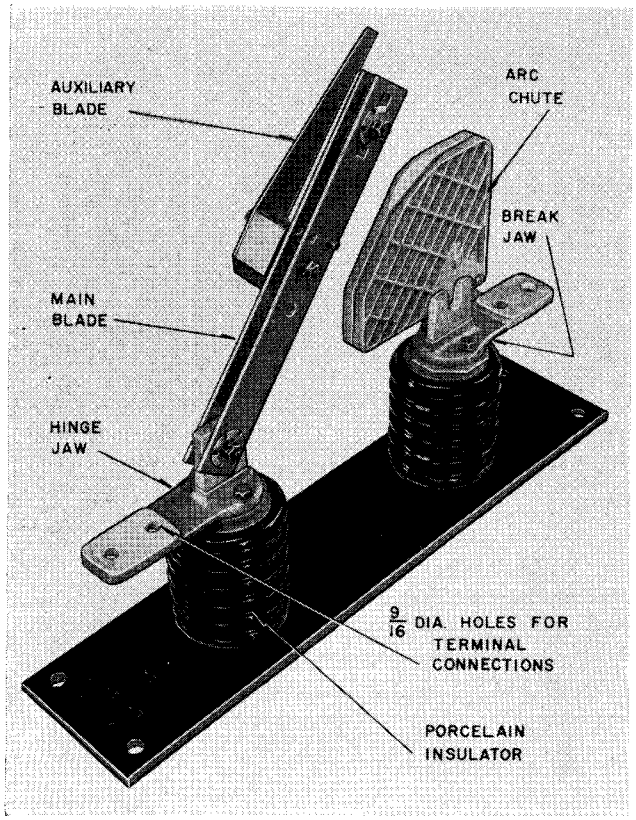

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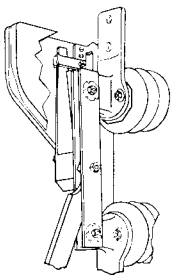

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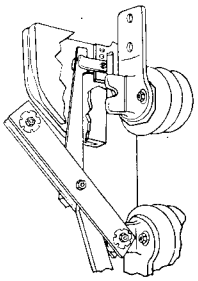

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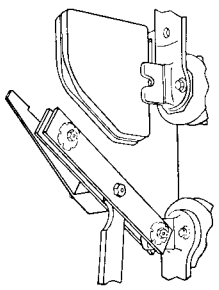

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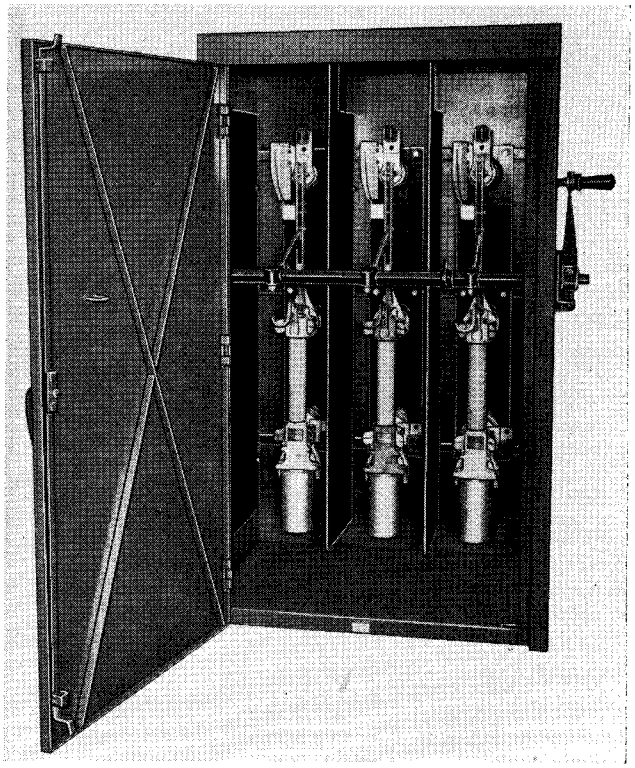

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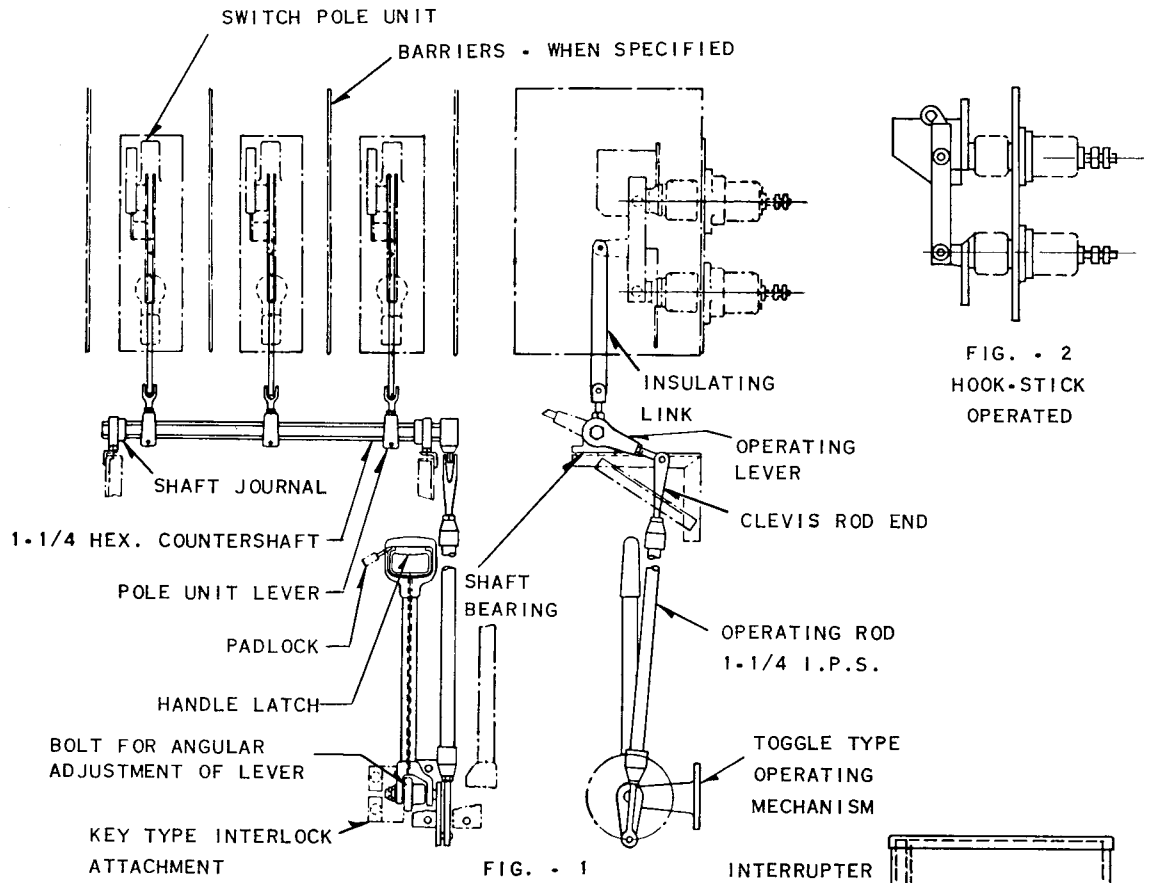

FIG. - 1

FIG. - 2
HOOK-STICK OPERATED

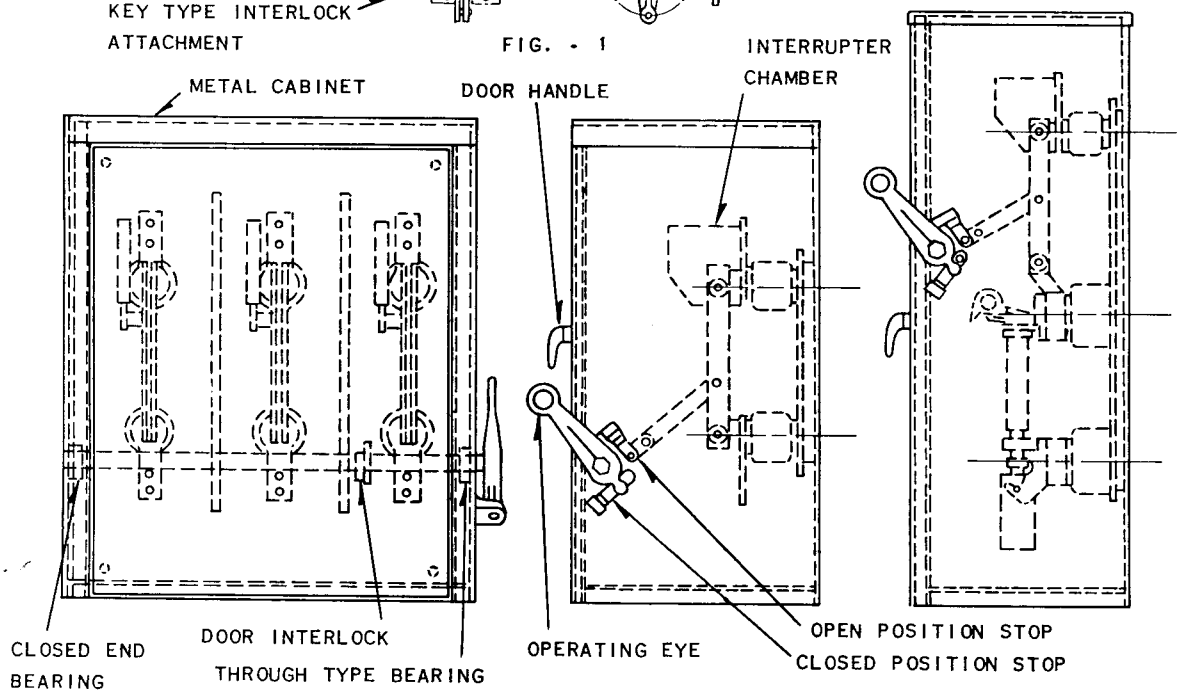

FIG. - 3

FIG. - 4
WITH POWER FUSES

FIG. 5. Typical Installation of LCB Interrupter Switch