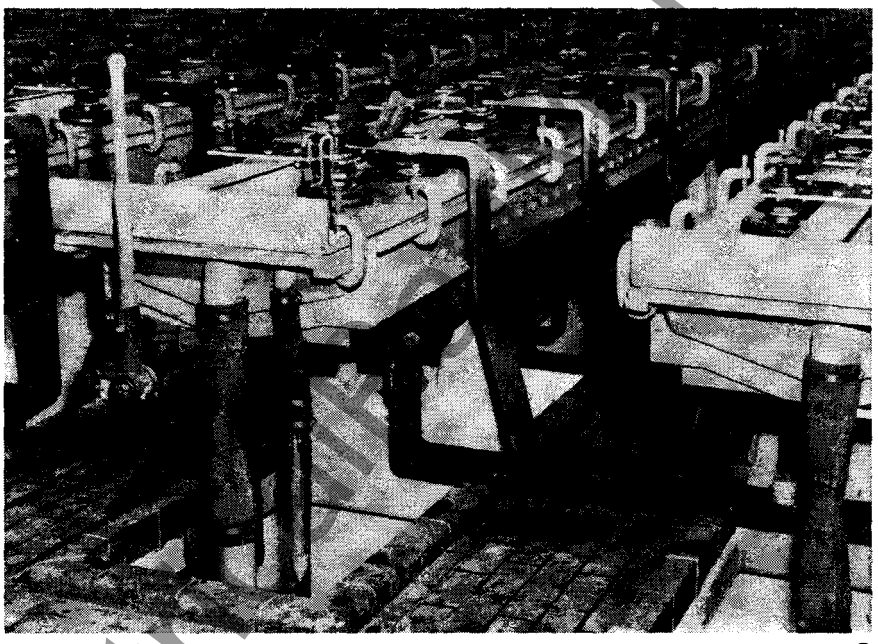
CR HIGH CURRENT SWITCHES

INSTRUCTIONS

UP TO 125 VOLTS, DC OR AC
3,000 AMPERES AND ABOVE, DC
2,000 AMPERES AND ABOVE, AC



4071C

Typical application of Type CR switches to electrolytic cell, showing auxiliary jack-shaft operating mechanism used on ratings, 21,000 to 36,000 amps.

- INSTALLATION
- OPERATION
- MAINTENANCE

I-T-E CIRCUIT BREAKER COMPANY

DESCRIPTION

The Type CR switch is a high current rotary air switch suitable for the switching of electrolytic cells, electric furnaces, electro-plating buses, and for any other low voltage switching up to 125 volts A.C. or D.C. (higher voltages available upon request).

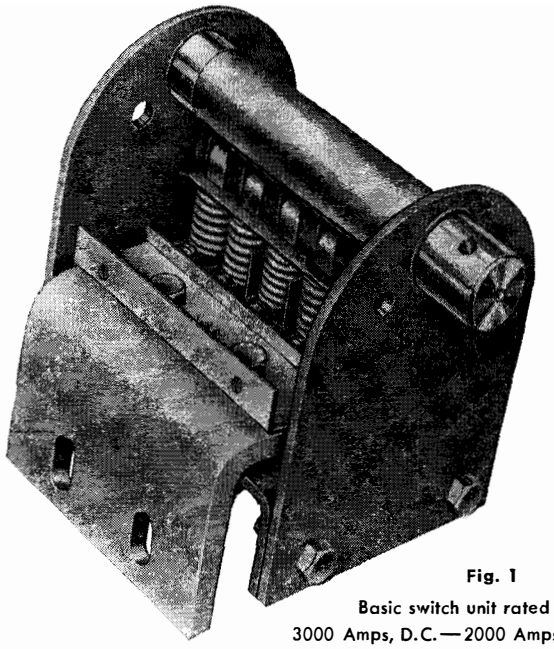


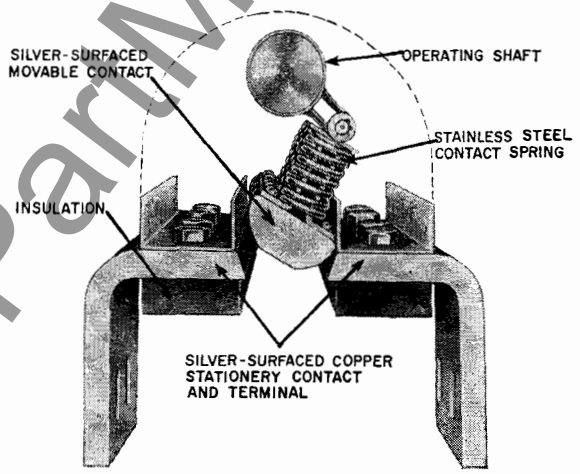
Fig. 1
Basic switch unit rated
3000 Amps, D.C.—2000 Amps., A.C.
Cat. No. 1CR3

These switches are furnished in six basic ratings: 3000, 4000, 5000, 6000, 8000 and 9000 amperes D.C. The A.C. rating is two-thirds of the D.C. rating for all units. A number of these basic single pole units may be assembled on a single shaft to provide any desired switching function. For low voltage buses, moving contact assemblies with suitable shaft supports may be assembled into the bus structure to provide compact, low resistance, and low reactance switching means.

Rotation of the shaft closes the switch by engaging the self-aligning bridging contacts directly between the terminals. Contact is made and broken with a high pressure wiping action to remove any foreign material or corrosion from the contact surfaces. The moving and stationary contacts and the terminals are silver-surfaced, and the entire current path is high conductivity hard drawn copper. (Figure 3).

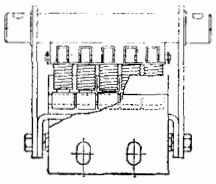
The contact pressure is applied by stainless steel compression springs (one for each contact). The contacts are self-aligning, full floating, and operate independently of each other.

The base and bearing plates are steel for direct current switches and aluminum for alternating current switches. The shaft is steel, and all other metallic parts are either stainless steel or silicon bronze. The terminals are insulated from the base with insulating blocks and insulating tubes surround the bolts.

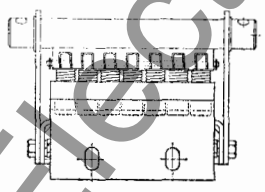


END VIEW SHOWING SWITCH CONTACTS OPEN

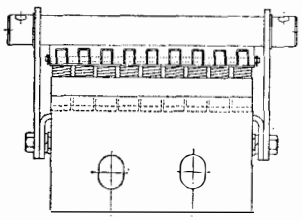
Fig. 3



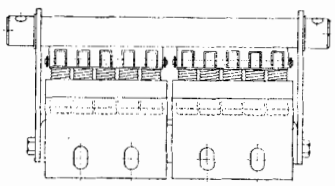
3000 Amp., D.C.
2000 Amp., A.C.



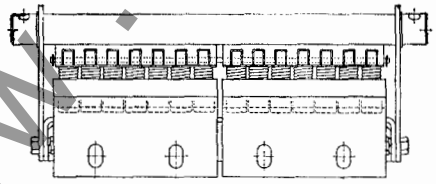
4000 Amp., D.C.
2650 Amp., A.C.



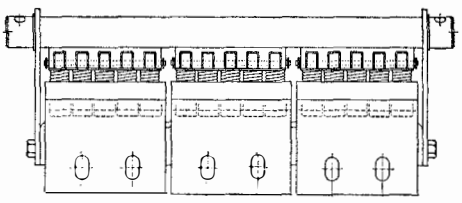
5000 Amp., D.C.
3300 Amp., A.C.



6000 Amp., D.C.
4000 Amp., A.C.



8000 Amp., D.C.
5300 Amp., A.C.



9000 Amp., D.C.
6000 Amp., A.C.

Fig. 2

INSTALLATION

Immediately upon receipt of shipment, the switch components should be unpacked and examined for evidence of shipping damage. Any claims should be placed promptly with the carrier.

The pole units of Type CR switches are completely assembled at the factory and require no adjustment before being placed in service. When two or more units are ganged together, these are coupled by means of a steel or insulating tube, as specified on the erection drawings certified for the order. The couplings are connected to the pole unit shaft extensions by means of rollpins which provide a connection substantially free from lost motion.

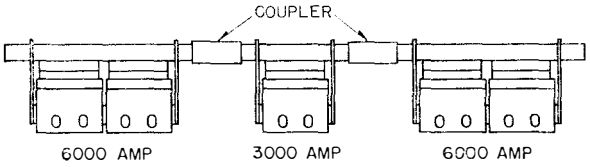


Fig. 4

The bus bar connections to the switch terminals should be fitted so that they do not place undue stress on the switch terminals. The bus and switch terminals should be clean and coated with a suitable corrosion inhibitor, such as No-ox-id Grade A Special, before the bolted connections are made. If cleaning of the terminal surfaces is required, care should be taken not to use abrasive material which may damage the silver surface. A fine grade of steel wool is suitable for this purpose.

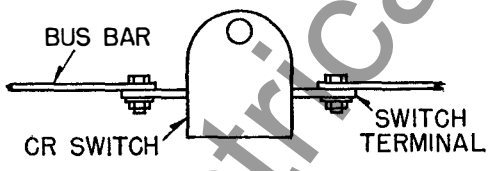


Fig. 5

OPERATION

Type CR switches may be arranged for manual, motor or pneumatic operation. Manually operated switches should be opened and closed with a sure uniform and rapid motion to minimize contact burning when closing or interrupting any current. Switches should be latched or padlocked in the open or closed position when not being operated. Pneumatic operators for these switches are arranged so that the switch is held in the open or closed position by means of air pressure in the operating cylinder. Such systems are provided with solenoid operating valves which are so constructed, that once started, a switch moves rapidly to the fully open or fully closed position. It cannot be stopped in an intermediate position where insufficient contact pressure could result in contact burning. Such systems are sometimes equipped with an emergency manual operating valve, which allows operation in the event of failure of the electric control power source. When such a control is used, care should be taken to make certain that the switch is always operated to either the fully open or the fully closed position. Motor operation varies according to application and should be specifically discussed with reference to that application.

MAINTENANCE

The design of the Type CR switch is such that it requires a minimum of maintenance. In corrosive or unclean atmospheres, the contact surfaces should be cleaned periodically and coated with No-ox-id, Grade A Special.

The switch is not designed to open load currents except when connected in parallel with an electrolytic cell where the voltage drop across the cell is less than 10 volts. In this case, contacts are subject to a slight amount of pitting on each operation. (Item 3, Fig. 6) This effect is cumulative, and if the switches are operated frequently, it is necessary to replace contacts periodically. Experience indicates that it will be necessary to replace contacts after approximately 500 operations or as indicated by operating experience.

SPARE PARTS

Replacement parts for use with Type CR switches are listed below. These parts may be obtained from the Greensburg factory by giving both the complete switch nameplate information, and the I-T-E order (S.O.) number. Only I-T-E replacement parts should be used.

Item No., Fig. 6	Description	Recommended Stock For Twenty 3,000 Amp. Units
1	Straight Terminal	8
2	Parallel Terminal	8
3	Moving Contact	20
4	Contact Guide	8
5	Insulating Tube	16
6	Insulating Block	16
7	Contact Spring	20

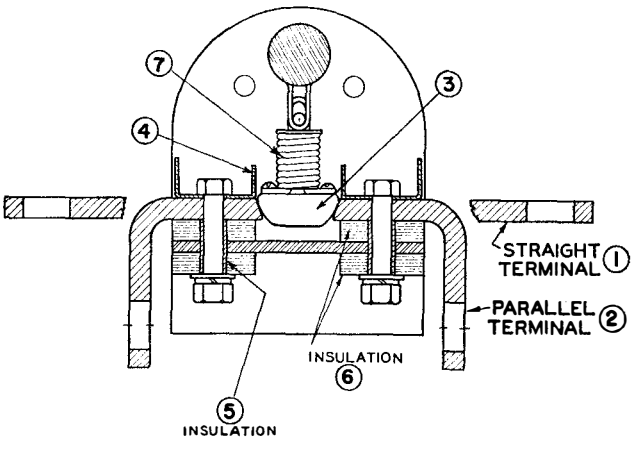


Fig. 6

Consult Our Sales Offices

The I-T-E Circuit Breaker Company is represented in all principal cities of the United States and Canada. These representatives are experienced and are competent to make correct applications, as well as give complete information and prices. We suggest you consult the representative nearest you.

I-T-E CIRCUIT BREAKER COMPANY
GREENSBURG, PENNSYLVANIA

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