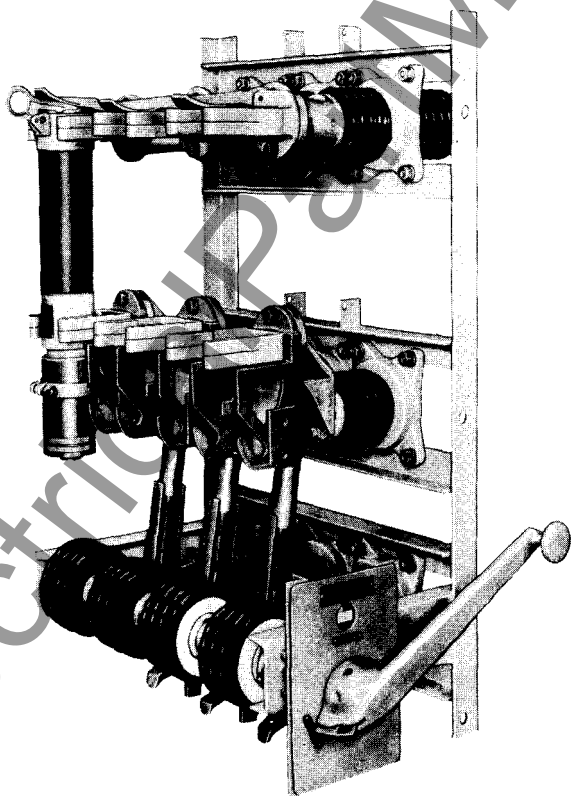
Instruction Manual
for
INSTALLATION, OPERATION AND MAINTENANCE

INTERRUPTER SWITCHES

(Plunger Type)



Barriers and two fuse holders removed.

SEPTEMBER 1954

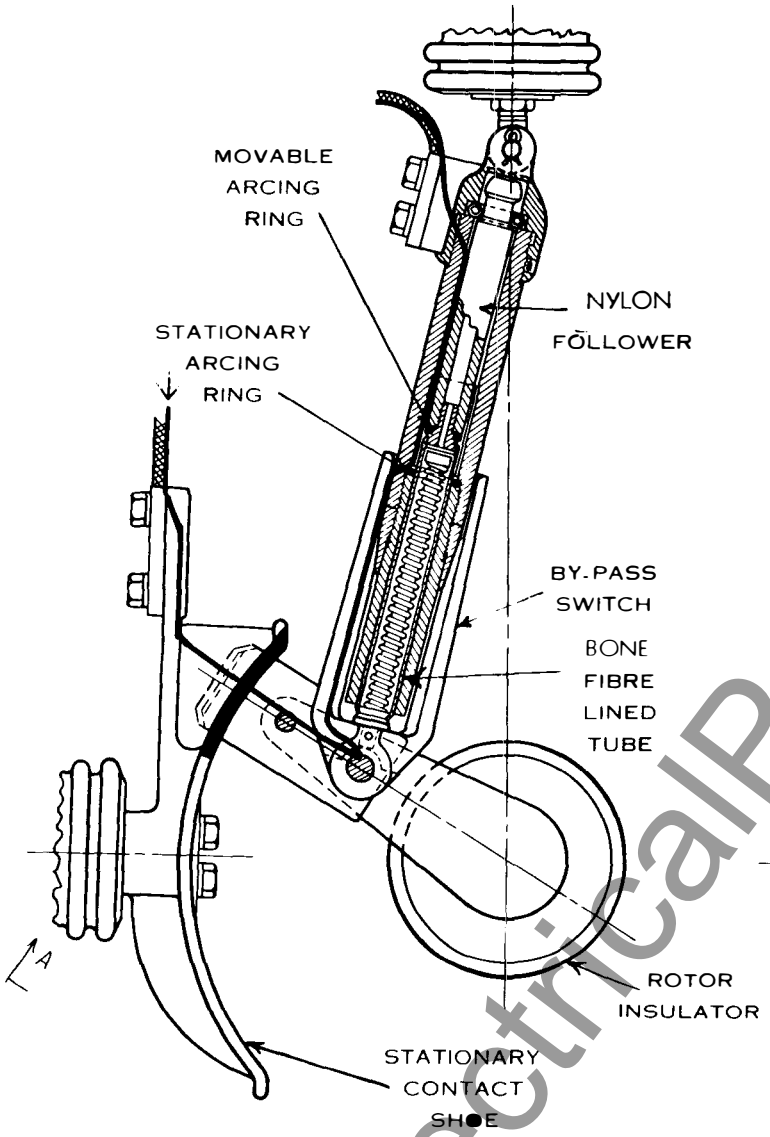
I-T-E CIRCUIT BREAKER COMPANY

OPERATING SEQUENCE OF A TWO POSITION –

Closed Position

CIRCUIT CLOSED - By-Pass Switch Closed - Isolating Switch Closed

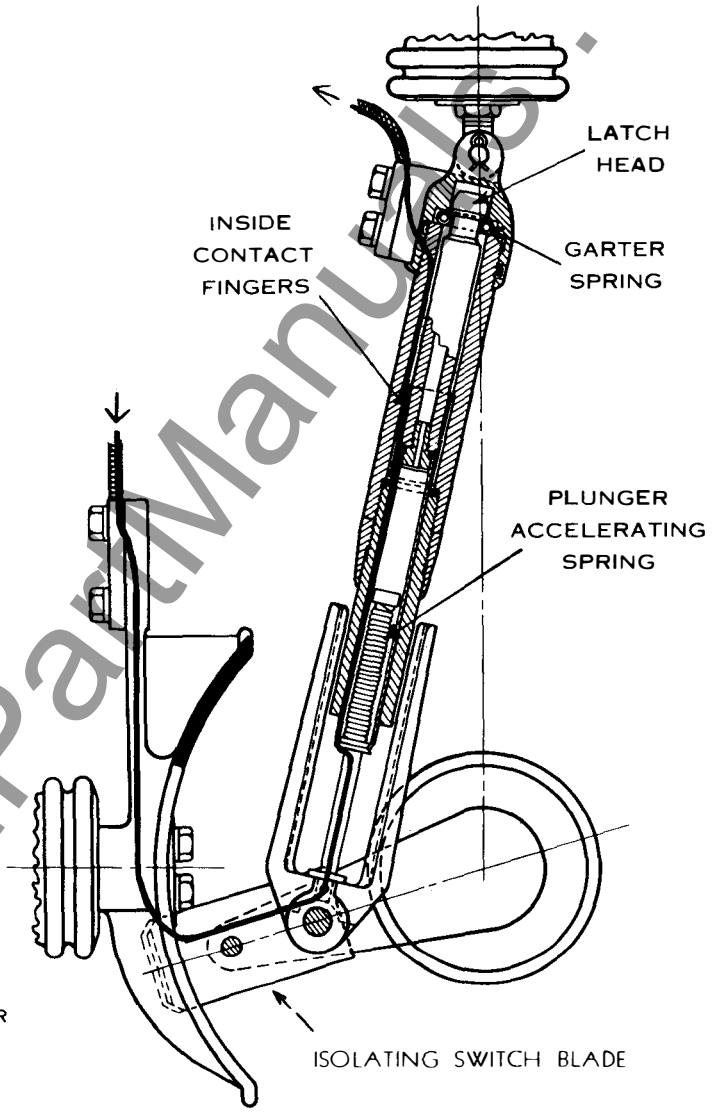
FIG. 1



First Intermediate Position

CIRCUIT CLOSED - By-Pass Switch Open - Isolating Switch Closed

FIG. 2



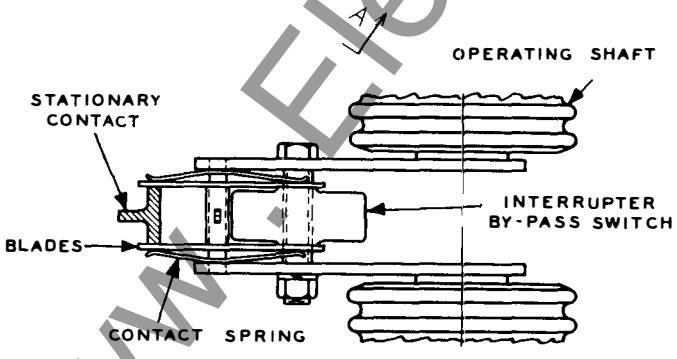


FIG. 5

VIEW "A-A"

When the isolating disconnect is rotated toward the closed position, the plunger of the interrupter unit is moved with it, but when the disconnect switch is rotated toward the open position, the plunger is retained in the closed position by a latching device.

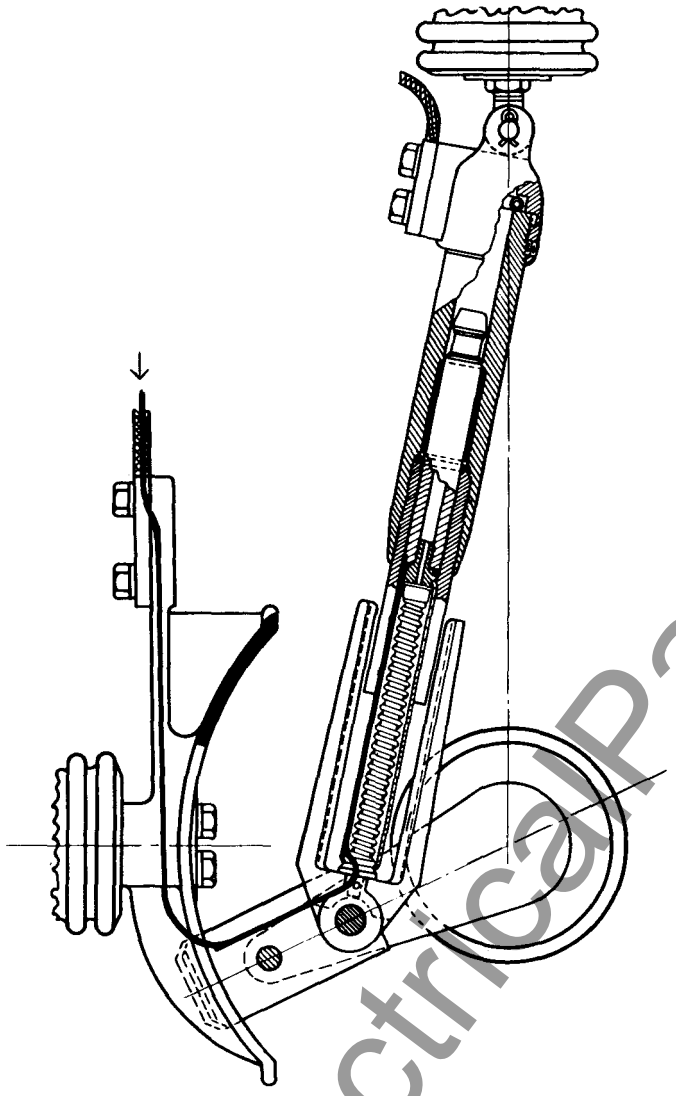
When the accelerating spring contained in the plunger assembly is fully compressed, the plunger is pulled free of the catch. The accelerating spring moves the plunger quickly into the open position, which causes a nylon follower to be pulled down into a bone fibre lined tube, establishing a gap in the circuit. The stationary arcing ring is located at the upper end of the tube while the moving ring is located at the lower end of the nylon follower on the plunger

SINGLE THROW INTERRUPTER SWITCH

Second Intermediate Position

CIRCUIT INTERRUPTED—By-Pass Switch
Open - Isolating Switch Closed

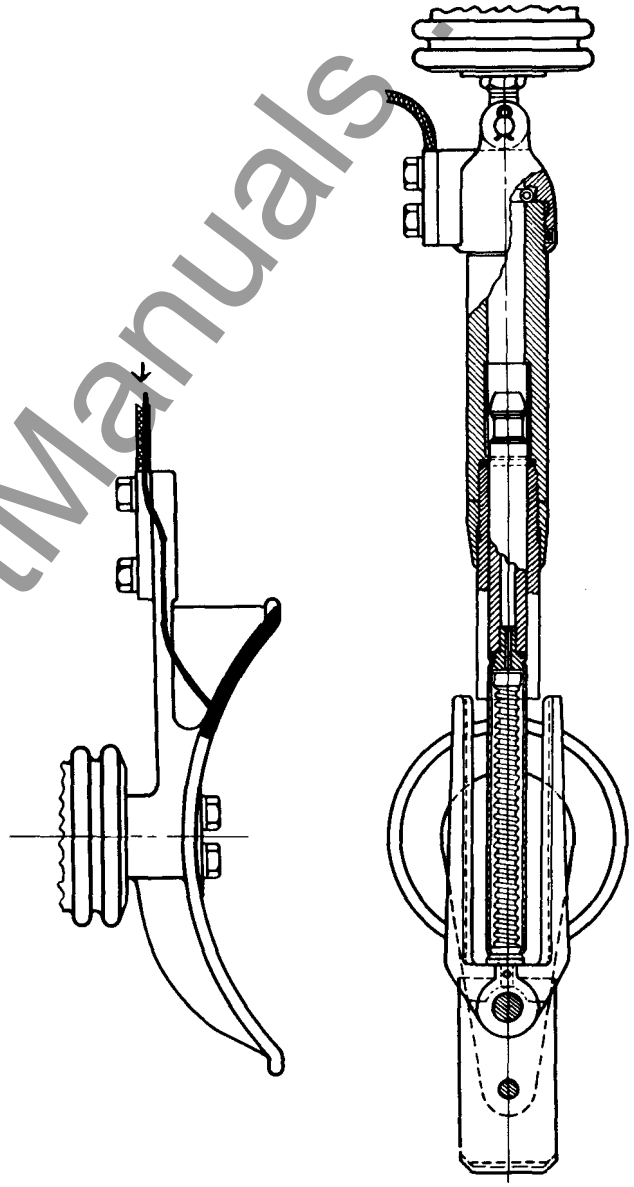
FIG. 3



Open Position

CIRCUIT OPEN—By-Pass Switch
Open - Isolating Switch Open

FIG. 4



assembly. When the plunger is in the open position, the arc is drawn out between these two rings and in the narrow space between the nylon follower and the bone fibre lining of the interrupter chamber or tube. This causes interruption.

One of the outstanding features of this Interrupter Switch is the mechanical arrangement that makes it impossible to open the interrupter before it is fully closed. All present designs of interrupter switches have to be completely closed before they will properly interrupt, but, to the best of our knowledge, none of the competitive designs have any sequencing arrangement to insure this. The I-T-E Interrupter cannot be opened until fully closed, eliminating this hazard.

The interrupter unit is easily removed for inspection and a replacement unit can be installed with little effort.

Since the interrupter units are pivoted at the top in the same plane as the rotor carrying the floating disconnect blades, you can readily see why the same interrupter can be used for both single-throw (two-position) and double-throw (three-position) assemblies. The rotor rotation for single-throw is 120 degrees and for double-throw 240 degrees.

INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE

SINGLE THROW (2 POSITION)

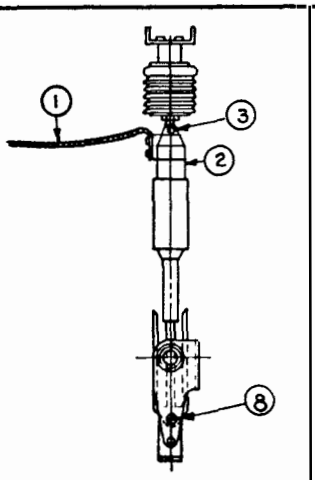


Fig. 1

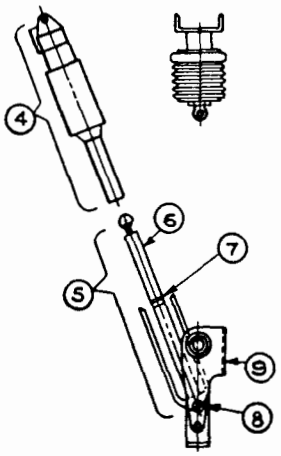


Fig. 2

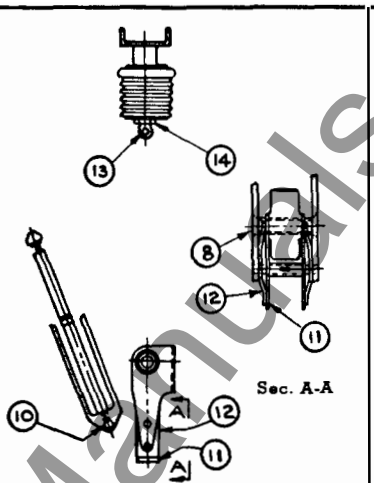


Fig. 3


Fig. 4

HOW TO REMOVE
(refers to single phase)

1. Place switch in open position.
2. Be sure switch circuit is de-energized and grounded before proceeding further.
3. Remove flexible connection (1) from interrupter cap (2), Figure 1.
4. Remove pin (3) and swing interrupter chamber assembly (4) to rear of switch and remove from plunger assembly (5), Figure 2.
5. Examine nylon follower (6) and if it has been eroded more than 1/32" from original outside diameter or if arcing ring (7) shows bad erosion at any one place, the entire interrupter chamber and plunger assembly should be returned to the factory for re-conditioning. It is advisable to carry in stock at least enough replacement parts for one switch (3 interrupter chamber assemblies (4) and 3 plunger assemblies (5)).
6. To remove the plunger assembly, remove the two flat head screws (8) with Allen wrench. Disassemble plunger assembly (5) from crank (9) and remove pin (10), Figure 3. For proper alignment pin (10) should always be replaced in the same crank-throw from which it was removed.
7. Assemble interrupter chamber (4) and plunger assembly (5) into fully closed position, Figure 4.
8. Return to factory for credit on replacement units.

HOW TO INSTALL AND ADJUST
(refers to three phase)

1. Replace new plunger assembly (5) in reverse order of above. Be sure blades (11) and springs (12) are in proper position before replacing screws (8). Tighten screws (8) with Allen wrench.
2. Replace interrupter chamber assemblies (4) on plunger assemblies (5) and force interrupter chamber assemblies down into fully closed position, that is, as far as they will go with a very firm push. Close switch slowly, making sure operating handle has latched. Loosen lock nuts (14) and adjust eyes (13) down as far as possible and still permit pins (3) to be inserted without forcing. Tighten lock nuts (14) being very sure eyes (13) are aligned in planes parallel to crank rotation. Open switch in normal manner, then close slowly. If adjustment is proper, all interrupter chamber assemblies (4) will be against the rubber washers on plunger assemblies (5). If not, re-adjust LOCK EYES AND REPLACE COTTER KEYS IN PINS (3).
3. After completing adjustment, inspect switch to see that all flat head screws (8) are tight, and that lock nuts (14) on eyes (13) are tight after eyes are properly aligned and that cotter pins are in pins. (3).

During Maintenance

Lubricate bearings with no-oxide grade E grease or equivalent. Apply thin coat of same on contact surfaces.

INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE

DOUBLE THROW (3 POSITION)

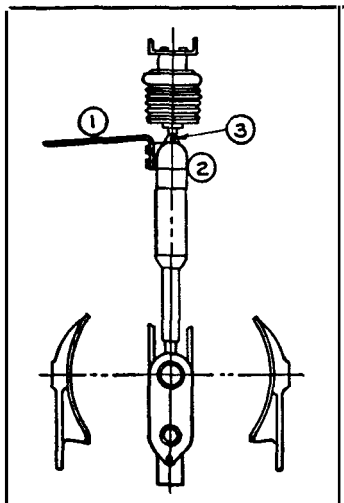


Fig. 1

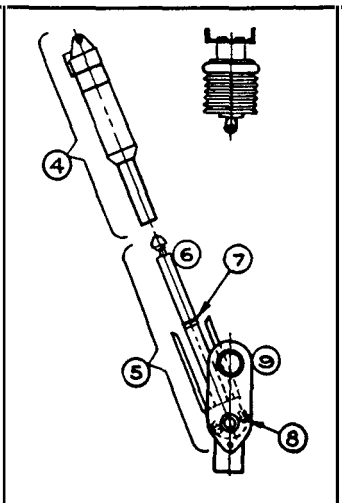


Fig. 2

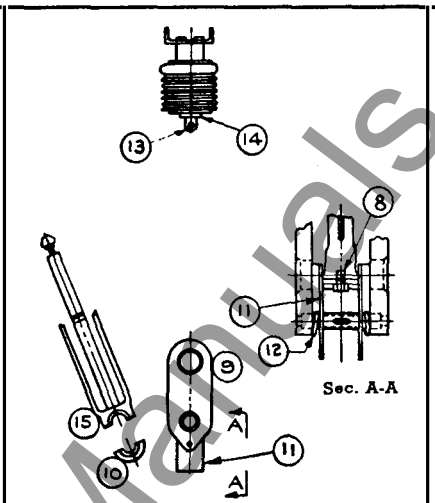


Fig. 3

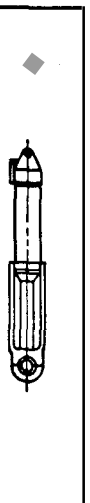


Fig. 4

HOW TO REMOVE
(refers to single phase)

1. Place switch in open position.
2. Be sure switch circuit is de-energized and grounded before proceeding further.
3. Remove flexible connection (1) from interrupter cap (2), Figure 1.
4. Remove pin (3) and swing interrupter chamber assembly (4) to front or rear of switch and remove from plunger assembly (5), Figure 2.
5. Examine nylon follower (6) and if it has been eroded more than 1/32" from original outside diameter or if arcing ring (7) shows bad erosion, the entire interrupter chamber and plunger assembly should be returned to the factory for re-conditioning. It is advisable to carry in stock at least enough replacement parts for one switch (3 interrupter chamber assemblies (4) and 3 plunger assemblies (5)).
6. To remove the plunger assembly, remove the two cap screws (8) and bearing cap (10). Disassemble plunger assembly (5) from crank (9), Figure 3.
7. Assemble interrupter chamber (4) and plunger assembly (5) into fully closed position, Figure 4.
8. Return to factory for credit on replacement units.

HOW TO INSTALL AND ADJUST
(refers to three phase)

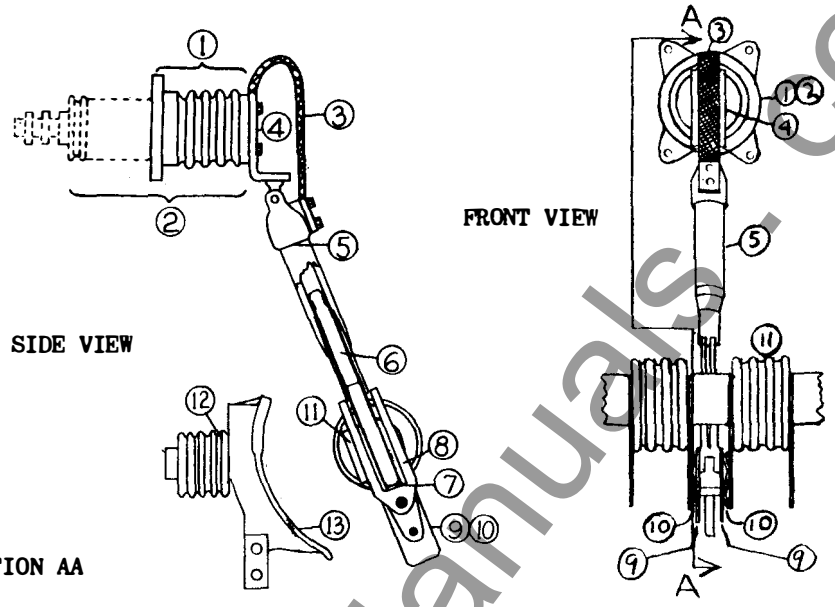
1. Replace new plunger assembly (5) in reverse order of above. Be sure blades (11) and springs (12) are in proper position and bearing cap (10) is matched to transfer switch casting (15) according to marking before replacing cap screws (8). Tighten cap screws (8).
2. Replace interrupter chamber assemblies (4) on plunger assemblies (5) and force interrupter chamber assemblies down into fully closed position, that is, as far as they will go with a very firm push. Move operating handle slowly into one of the closed positions, making sure operating handle has latched. Loosen lock nuts (14) and adjust eyes (13) down as far as possible and still permit pins (3) to be inserted without forcing. Open switch and close slowly into other position. If operating handle will not latch in this closed position, remove pins (3) and adjust eyes (13) up as required. Lock eyes (13) with nuts (14), being sure they are in planes parallel to crank rotation. Close switch slowly into each of its two closed positions. The interrupter chamber assemblies should be against the rubber washers on plunger assemblies in the one closed position and not more than 1/16" apart in the other. If the distance is greater than 1/16", tilt direct drive operating handle mounting plate as required to obtain not more than 1/16" between interrupter chamber and washer on plunger. For chain drive mechanisms, adjust turn buckles on sprocket chain as required. Re-adjust eye (13) up or down as necessary. When all adjustments are complete, LOCK EYES AND REPLACE COTTER KEYS IN PINS (3).
3. After completing adjustment, inspect switch to see that all cap screws (8) are tight, and that lock nuts (14) on eyes (13) are tight after eyes are properly aligned and that cotter pins are in pins (3).

During Maintenance

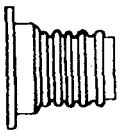
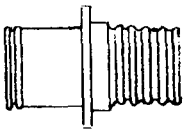
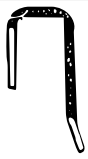
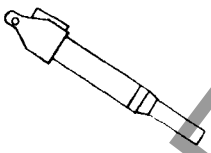
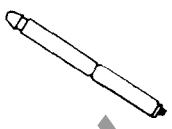
Lubricate bearings with no-oxide grade E grease or equivalent. Apply thin coat of same on contact surfaces.

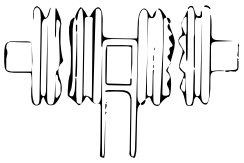
RENEWAL PARTS LIST

SINGLETHROW, TWO POSITION INTERRUPTER SWITCHES



DETAILS OF PARTS

	ITEM	NO/POLE	DESCRIPTION
	1	*	B-Type Insulator Post
	2	*	Through Bushing (Does not incluce stud)***
	3	1	Flexible Connector
	4	1	Adapter
	5	1	Interrupter Chamber 400 Ampere 600 Ampere
	6	1	Plunger
	7	1	Shock Absorber

	ITEM	NO/POLE	DESCRIPTION
	8	1	Transfer Contact
	9	2	Blade
	10	2	Blade Spring
	11	**	Crankshaft Assembly
	12	*	A-Type Insulator Post
	13	1	Contact Shoe

* Number per pole depends on type switch
** One per switch (two or three pole)
*** Stud can be furnished upon receipt of serial number of switch.

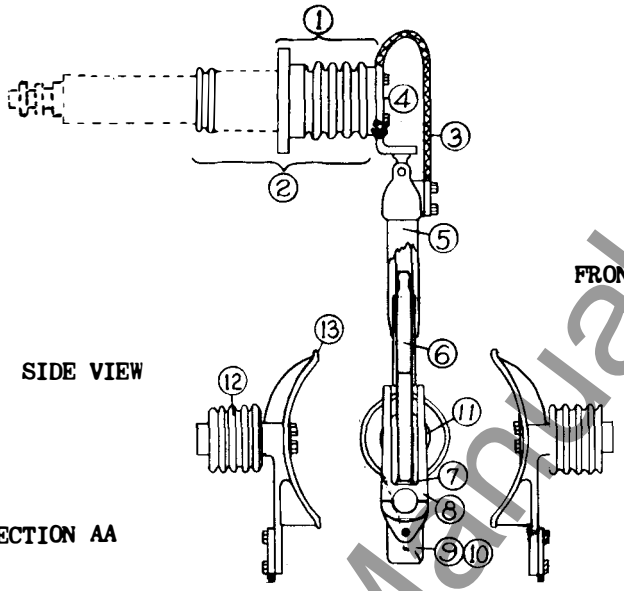
Recommended spare parts which should be stocked when installation is made--
For one of three switches - 3 of item 5.
- 3 of item 6.
For four to ten switches - 6 of item 5.
- 6 of item 6.

This recommendation is based on the assumption that one switch is overhauled at a time. If two or more switches are overhauled at one time, the above number of spare parts recommended can be increased as required.

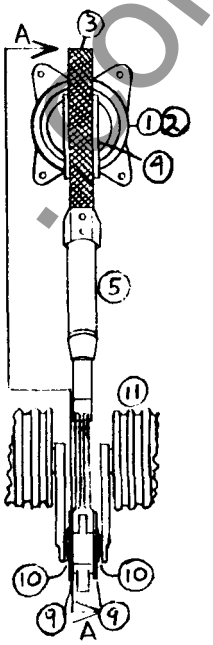
RENEWAL PARTS LIST

DOUBLETHROW, THREE POSITION
INTERRUPTER SWITCHES

SIDE VIEW

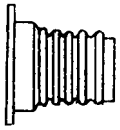
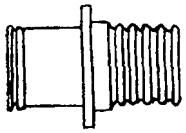
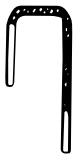
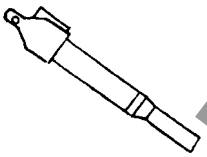
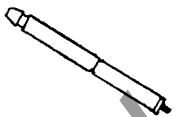


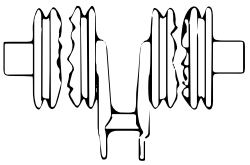
SECTION AA



FRONT VIEW

DETAILS OF PARTS

	ITEM	NO/POLE	DESCRIPTION
	1	*	B-Type Insulator Post
	2	*	Through Bushing (Does not include stud)***
	3	1	Flexible Connector
	4	1	Adapter
	5	1	Interrupter Chamber 400 Ampere 600 Ampere
	6	1	Plunger
	7	1	Shock Absorber

	ITEM	NO/POLE	DESCRIPTION
	8	1	Transfer Contact
	9	2	Blade
	10	2	Blade Spring
	11	**	Crankshaft Assembly
	12	*	A-Type Insulator Post
	13	1	Contact Shoe

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*** Stud can be furnished upon receipt of serial number of switch.

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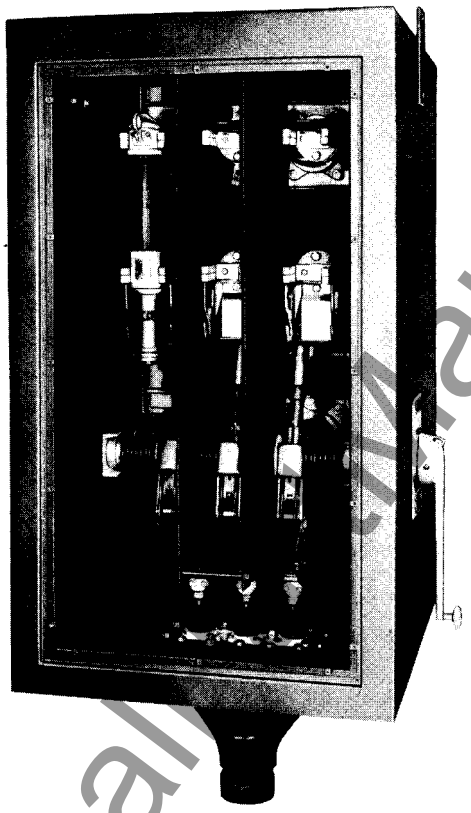
For one of three switches - 3 of item 5.
- 3 of item 6.

For four to ten switches - 6 of item 5
- 6 of item 6

This recommendation is based on the assumption that one switch is overhauled at a time. If two or more switches are overhauled at one time, the above number of spare parts recommended can be increased as required.



The I-T-E Interrupter Switch is a plunger type interrupter unit in combination with a rotary disconnect. This design requires a minimum space and lends itself exceptionally well to two position, single-throw, or three position, double-throw designs.

I-T-E CIRCUIT BREAKER COMPANY
GREENSBURG, PENNSYLVANIA

Repro. in U.S.A.
3M-IB-1360A-9-54
2M-2-56
500-2-60