

# INSTRUCTIONS

## For Installation and Operation

### GENERAL

#### CAUTION

**The equipment covered by this publication must be selected for a specific application and it must be installed, operated, and maintained by qualified persons who are thoroughly trained and who understand any hazards that may be involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.**

These instructions are for field installation and operation of the S&C Bypass Accessory. This accessory permits exercising of Circuit-Switcher and checkout of relaying equipment without opening the high-voltage circuit.

The S&C Bypass Accessory consists of a set of three single-pole, stick-operated devices. When furnished as original equipment with Circuit-Switcher, inclusion of the

accessory is designated by the addition of the suffix “-B1” or “-B2” to the Circuit-Switcher catalog number.

Catalog number suffix “-B1” signifies inclusion of a bypass accessory rated 800 amperes continuous, 20,000 amperes momentary—applicable for Mark V Circuit-Switchers, Integer Style rated 34.5 kV through 69 Kv; and Vertical-Break Style rated 34.5 kV through 138 kV.

Catalog number suffix “-B2” signifies inclusion of a bypass accessory rated 1200 amperes continuous, 61,000 amperes momentary—applicable for Mark V Circuit-Switchers, Vertical-Break Style rated 34.5 kV through 161 kV; and Center-Break Style, ■ with extruded-aluminum weldment bases, rated 115 kV through 230 kV.

The S&C Bypass Accessory may also be furnished for field addition to certain existing Mark II, Mark III, Mark IV, and Mark V Circuit-Switcher installations.

■ Requires rigid bus (by user) connected at rotating-insulator end of Circuit-Switcher.

### INSPECTION SCHEDULE AND PROCEDURES

To assure continued proper performance of the bypass accessory, it should be inspected in accordance with S&C's recommended schedule and procedures contained in S&C Instruction Sheet 711-590. (These procedures, incidentally,

take the place of the annual exercising which has, up until the October 28, 1985 issuance of Instruction Sheet 711-590, been recommended for Circuit-Switcher.)

### INSTALLATION AND ALIGNMENT

Install and/or adjust the bypass accessory only after Circuit-Switcher has been completely assembled and adjusted.

An S&C Bypass Accessory rated 800 amperes continuous (Circuit-Switcher catalog number suffix “-B1”), when furnished as original equipment, is usually assembled to the Circuit-Switcher and accurately aligned before shipment, in which case the following installation and alignment steps may be omitted.

An S&C Bypass Accessory rated 1200 amperes continuous (Circuit-Switcher catalog number suffix “-B2”) cannot be assembled to Circuit-Switcher before shipment because of mechanical interference with Circuit-Switcher's base-mounted power-train components. In this case, as well as for any bypass accessory to be added to an existing Circuit-Switcher installation, install as directed in the following steps for the Circuit-Switcher style applicable.



**INSTALLATION AND ALIGNMENT — Continued**

**Integer Style Circuit-Switchers**

**Step 1**

The S&C Bypass Accessory, when furnished as original equipment with an Integer Style Circuit-Switcher, is already installed and adjusted at the factory and, under normal circumstances, readjustment should not be necessary.

If a bypass accessory is to be added to an existing Integer Style Circuit-Switcher, and/or if adjustment is required, follow the procedure described in Steps 2 through 4 for Vertical-Break Style Circuit-Switchers.

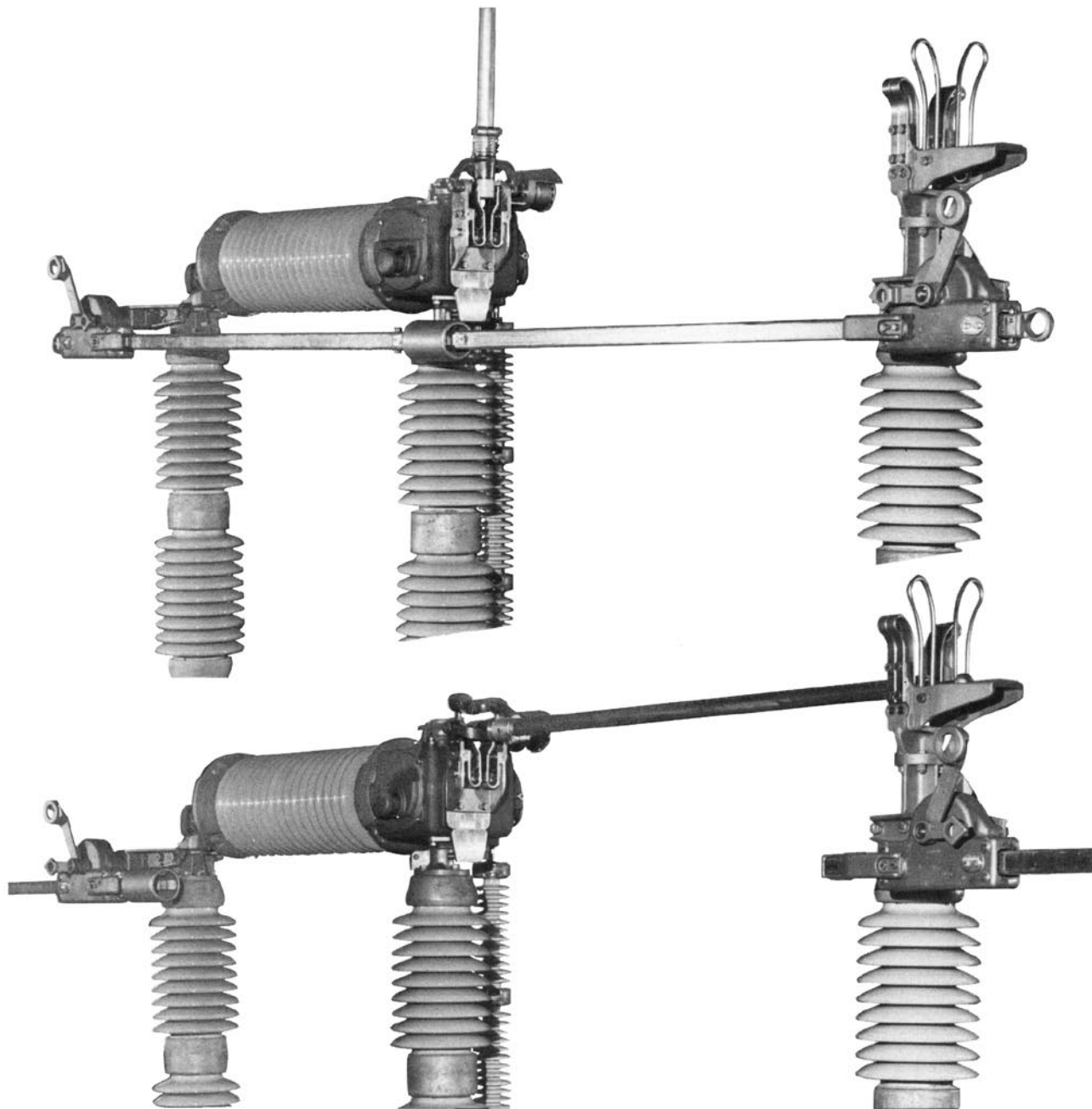


Figure 1. One pole-unit of an S&C Mark Vertical-Break Style Circuit-Switcher rated 138 kV, equipped with 1200-ampere S&C Bypass Accessory. Top view shows bypass accessory in current-carrying position. Bottom view shows Circuit-Switcher in current-carrying position.

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**Vertical-Break Style Circuit-Switchers**

**Step 2**

Place the Circuit-Switcher's disconnect blades in their fully closed positions.

Before installing the bypass accessory (which is to be attached to the right-hand side of each Circuit-Switcher pole-unit—as viewed from the interrupter end), thoroughly wire-brush the aluminum mating surfaces. Immediately coat these surfaces, as well as the mounting-bolt threads, with Penetrox A (available from Burndy Corporation). Then, for each pole-unit, install the bypass accessory as follows, using the  $\frac{5}{8}$ "— $11 \times 1\frac{1}{4}$ " hex-head stainless-steel bolts and lockwashers furnished. Refer also to Figure 2.

Attach the jaw-contact assembly of the bypass accessory to Circuit-Switcher's interrupter end, bolting to the two tapped holes at the side of the terminal casting.

Attach the tongue-contact assembly of the bypass accessory to Circuit-Switcher's disconnect end, bolting to the two tapped holes at the side of the terminal-support

casting—just above the top of the insulator.

**Step 3**

Refer to the instructions under OPERATION, pages 6 through 8, for bypass-accessory actuation. Move the blades toward their closed positions to check blade-contact entry. If contact engagement is not smooth, sight along the blades to determine whether repositioning of the jaw-contact assembly and/or the tongue-contact assembly is required. Make the adjustment as directed below. (As a matter of information, any minor horizontal misalignment is somewhat simpler to correct at the tongue-contact assembly end.) *Do not use shims to attain alignment.*

**Step 4**

To reposition the bypass accessory's tongue-contact assembly (which is attached to the disconnect end of Circuit-Switcher):

- (a) for upward or downward adjustments, loosen the bolts which fasten the accessory assembly to Circuit-Switcher. Shift the assembly to move the bypass

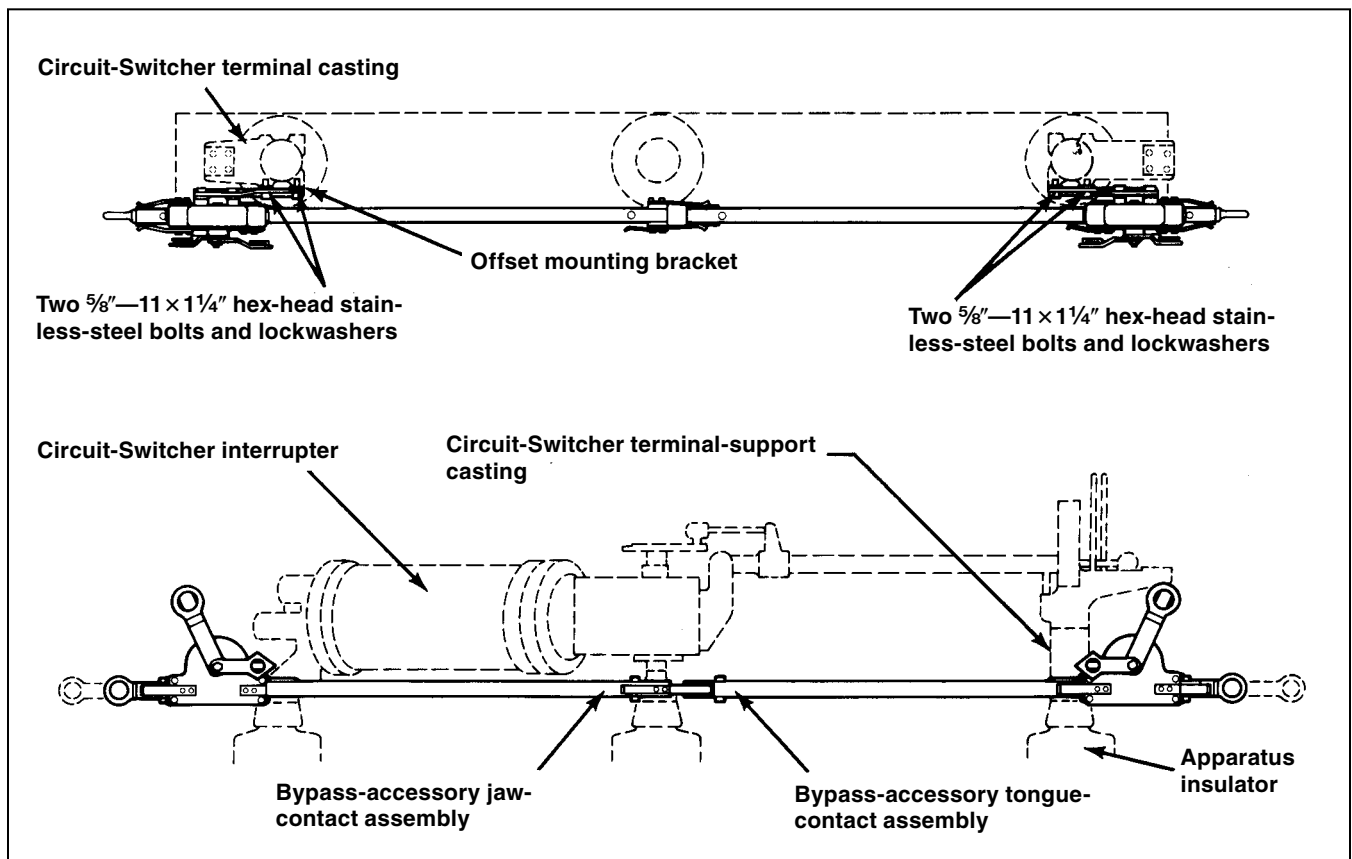


Figure 2. Detail of 800-ampere bypass accessory attached to a Vertical-Break Style Circuit-Switcher (1200-ampere bypass-accessory detail is similar).

**INSTALLATION AND ALIGNMENT — Continued**

blade upward or downward as required and securely retighten the bolts;

- (b) *for horizontal adjustments*, loosen the bolts which fasten Circuit-Switcher's terminal-support casting to the apparatus insulator. Swivel the casting to bring the bypass blade into alignment and securely retighten the bolts. If any appreciable movement of the casting was required, make sure that Circuit-Switcher's stationary jaw-contact surfaces are parallel to the sweep of the blade. If necessary, loosen the mounting bolts at the top of the terminal-support casting, reposition Circuit-Switcher's jaw contact, and securely retighten the bolts.

To reposition the bypass accessory's jaw-contact assembly (which is attached to the interrupter end of Circuit-Switcher):

- (a) *for upward or downward adjustments*, loosen the bolts which fasten the accessory assembly to Circuit-Switcher. Shift the assembly to move the bypass blade upward or downward as required and securely retighten the bolts;
- (b) *for horizontal adjustments*, loosen the bolts which fasten Circuit-Switcher's terminal casting to the apparatus insulator, as well as to the interrupter itself. This permits independent movement of the terminal casting (to which the bypass-accessory assembly is attached). Swivel the casting to bring the bypass blade into alignment and retighten all of the bolts which had been loosened for this procedure.

**Center-Break Style Circuit-Switchers**

**Step 5**

Rigid bus must be installed at Circuit-Switcher's rotating-insulator end.

Place the Circuit-Switcher's disconnect blades in their fully closed positions.

Before installing the bypass accessory (which is to be attached to the right-hand side of each Circuit-Switcher pole-unit—as viewed from the interrupter end), thoroughly wire-brush the aluminum mating surfaces. Immediately coat these surfaces, as well as the mounting-bolt threads, with Penetrox A (available from Burndy Corporation). Then, for each pole-unit, install the bypass accessory as follows. Refer also to Figure 3.

Attach the jaw-contact assembly of the bypass accessory to Circuit-Switcher's interrupter end, bolting its ratchet-mechanism housing to the offset mounting bracket which is already attached to Circuit-Switcher's terminal casting.★ Use two 5/8"—11 × 1½" hex-head stainless-steel bolts and lockwashers furnished. See Figure 3.

Attach the tongue-contact assembly of the bypass accessory to Circuit-Switcher's disconnect end, bolting its mounting bracket in place between the top surface of Circuit-Switcher's terminal pad and the connector for the rigid bus (hardware not furnished). See Figure 3.

**Step 6**

Refer to the instructions under OPERATION, pages 6 through 8, for bypass-accessory actuation. Move the blades toward their closed positions to check blade-contact entry. If contact engagement is not smooth, sight along the blades to determine whether repositioning of the jaw-contact assembly and/or the tongue-contact assembly is required. Make the adjustment as directed below. *Do not use shims to attain alignment.*

**Step 7**

To reposition the bypass accessory's tongue-contact assembly (which is attached to the disconnect end of Circuit-Switcher):

- (a) *for upward or downward adjustments*, loosen the two bolts which fasten the accessory assembly to the mounting bracket. Shift the assembly to move the bypass blade upward or downward as required and securely retighten the bolts;
- (b) *for horizontal adjustments*, loosen the four bolts which fasten the accessory assembly's mounting bracket to Circuit-Switcher's terminal pad. Swivel the assembly to bring the bypass blade into alignment and securely retighten the bolts.

To reposition the bypass accessory's jaw-contact assembly (which is attached to the interrupter end of Circuit-Switcher):

- (a) *for upward or downward adjustments*, loosen the two bolts which fasten the accessory assembly's ratchet-mechanism housing to the offset mounting bracket. Shift the housing to move the bypass blade upward or downward as required and securely retighten the bolts;
- (b) *for horizontal adjustments*, loosen the bolts which fasten Circuit-Switcher's terminal casting to the apparatus insulator, as well as to the interrupter itself. This permits independent movement of the terminal casting (to which the bypass-accessory assembly is attached). Swivel the casting to bring the bypass blade into alignment and retighten all of the bolts which had been loosened for this procedure.

★ When the bypass accessory is furnished for addition to an existing Circuit-Switcher installation, the offset mounting bracket, as well as a spacer adapter, is shipped assembled to the bypass accessory. The bracket and adapter must be detached and separately assembled to Circuit-Switcher's terminal casting. See Figure 3, View A-A.



INSTALLATION AND ALIGNMENT — Continued

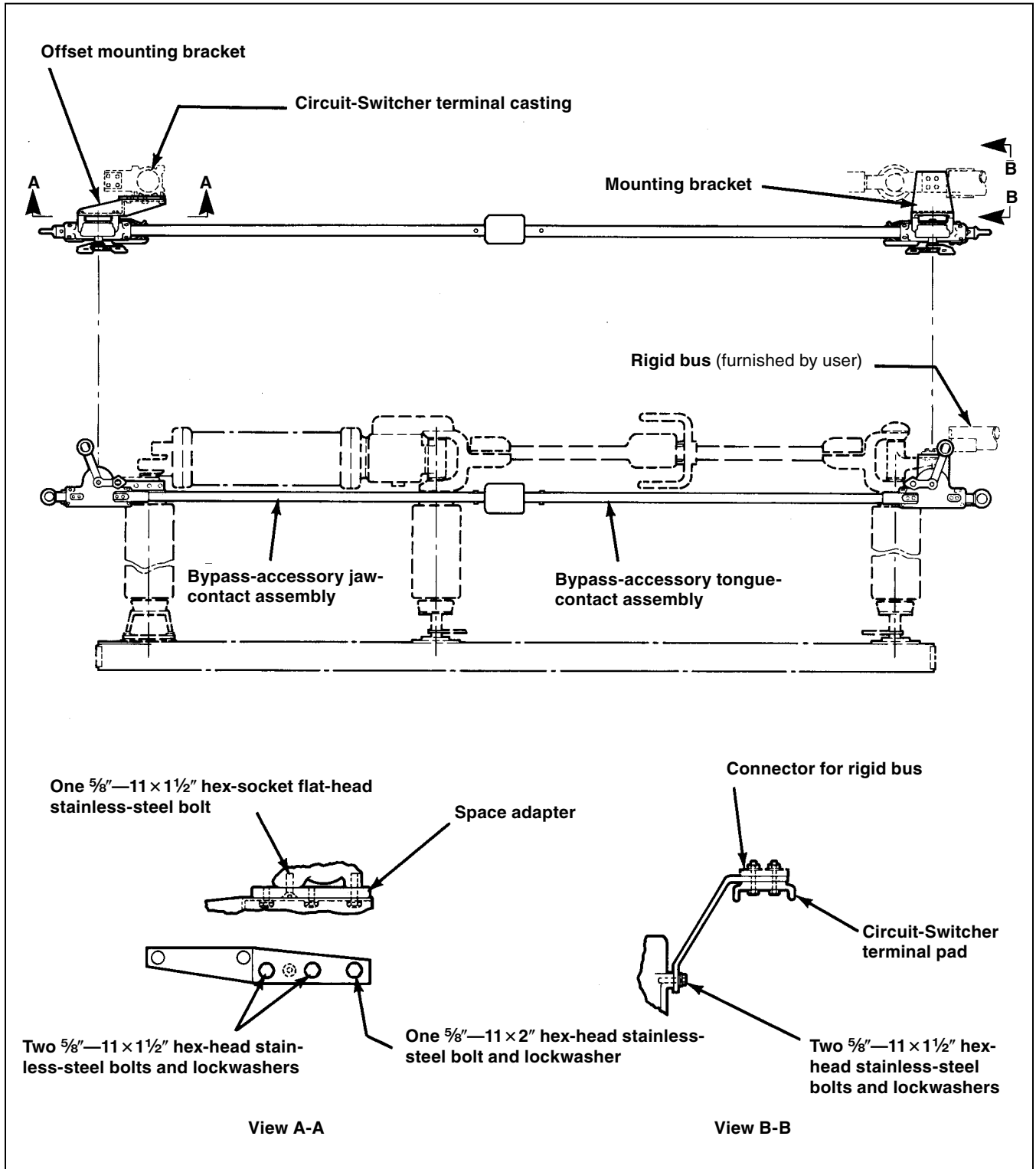


Figure 3. Detail of 1200-ampere bypass accessory attached to a Center-Break Style Circuit-Switcher.

**OPERATION**

These operating instructions apply to either 800-ampere or 1200-ampere bypass accessories used with any Circuit-Switcher style.

**⚠ CAUTION**

If the circuit is energized, make certain that Circuit-Switcher's disconnect blades are closed *before* opening or closing the bypass blades.

For each bypass blade, a stick-operated ratchet mechanism controls the opening and closing movements. See Figure 4. The direction of movement is dependent on the position of the arrow-shaped direction-control arm, which

can be rotated through 180 degrees. The arm points in the direction that the blade will travel when the ratchet-mechanism operating lever is moved up and down. The two blades on each pole-unit are operated individually. When fully open or fully closed, the blade will remain locked in position until the direction-control arm position is reversed.

To operate, use a hookstick to position the direction-control arm, Figure 5, such that its arrow points in the desired direction of travel. Use the ratched-mechanism operating lever, Figure 6, to move the blade to its fully open or fully closed position, with the blade stop-pin, Figure 8, bearing against the mechanism housing.

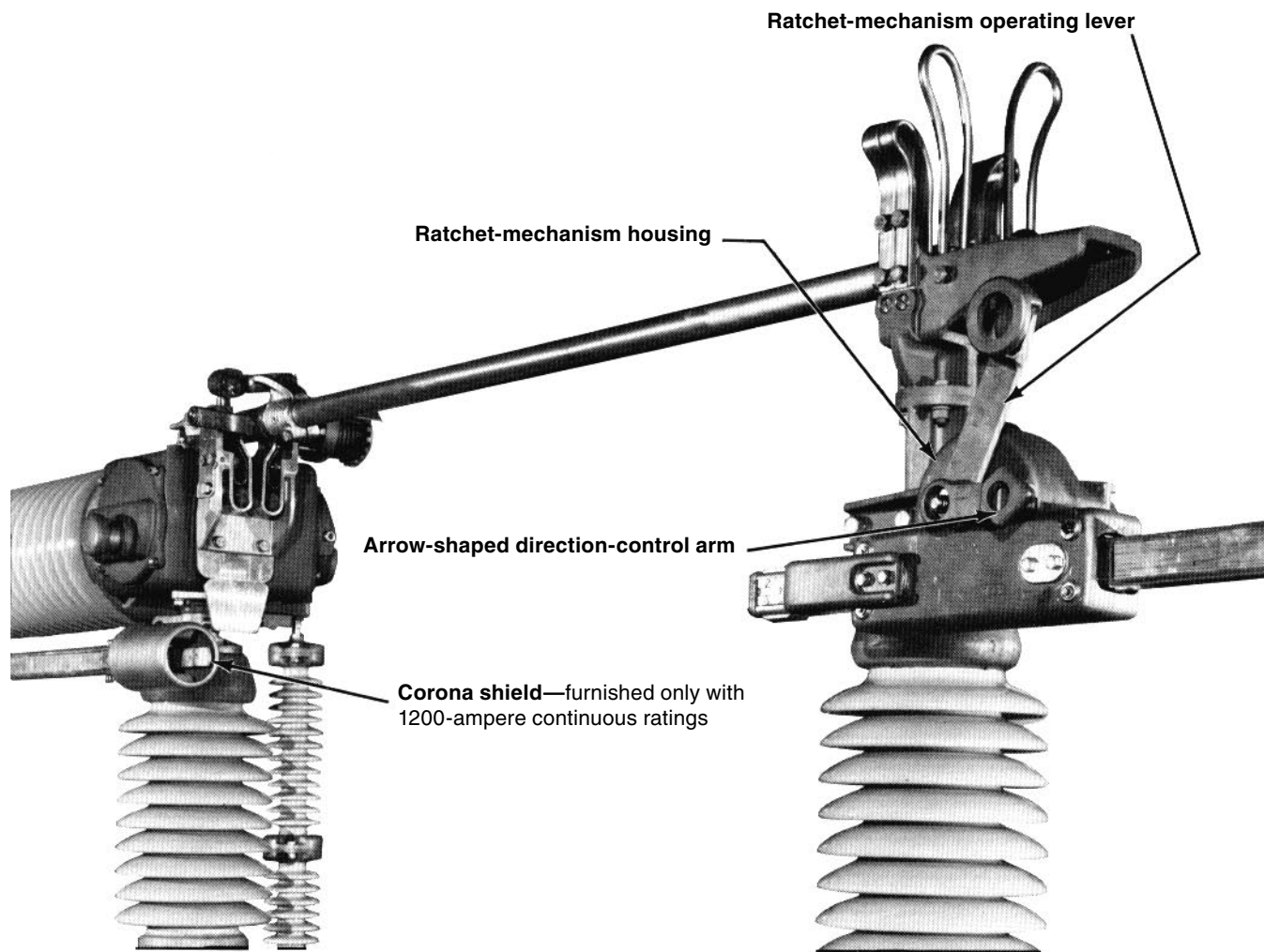


Figure 4. Closeup showing jaw-contact blade of bypass accessory (at left) fully closed and tongue-contact blade (at right) fully open.

## OPERATION — Continued

Actually, for a quick traverse, each blade can be moved freely in the direction determined by the positioning of the direction-control arm by applying force on the pull-ring at the end of the blade. See Figure 7. The ratchet-mechanism operating lever is required, however, to initiate opening and closing operations, and can be used to complete the contact engagement during closing operation as well as to ensure positive-stop positioning in either direction.

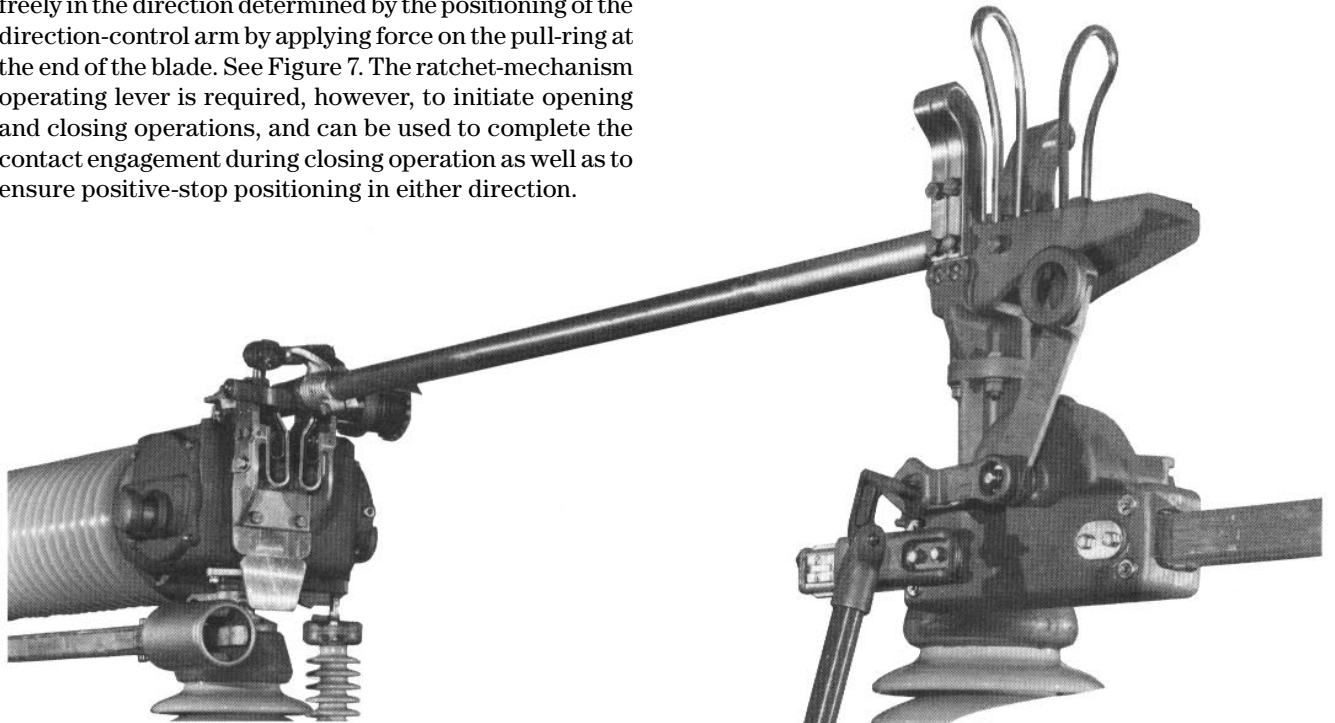


Figure 5. Placing the arrow-shaped direction-control arm in position for closing the tongue-contact blade of the bypass accessory.

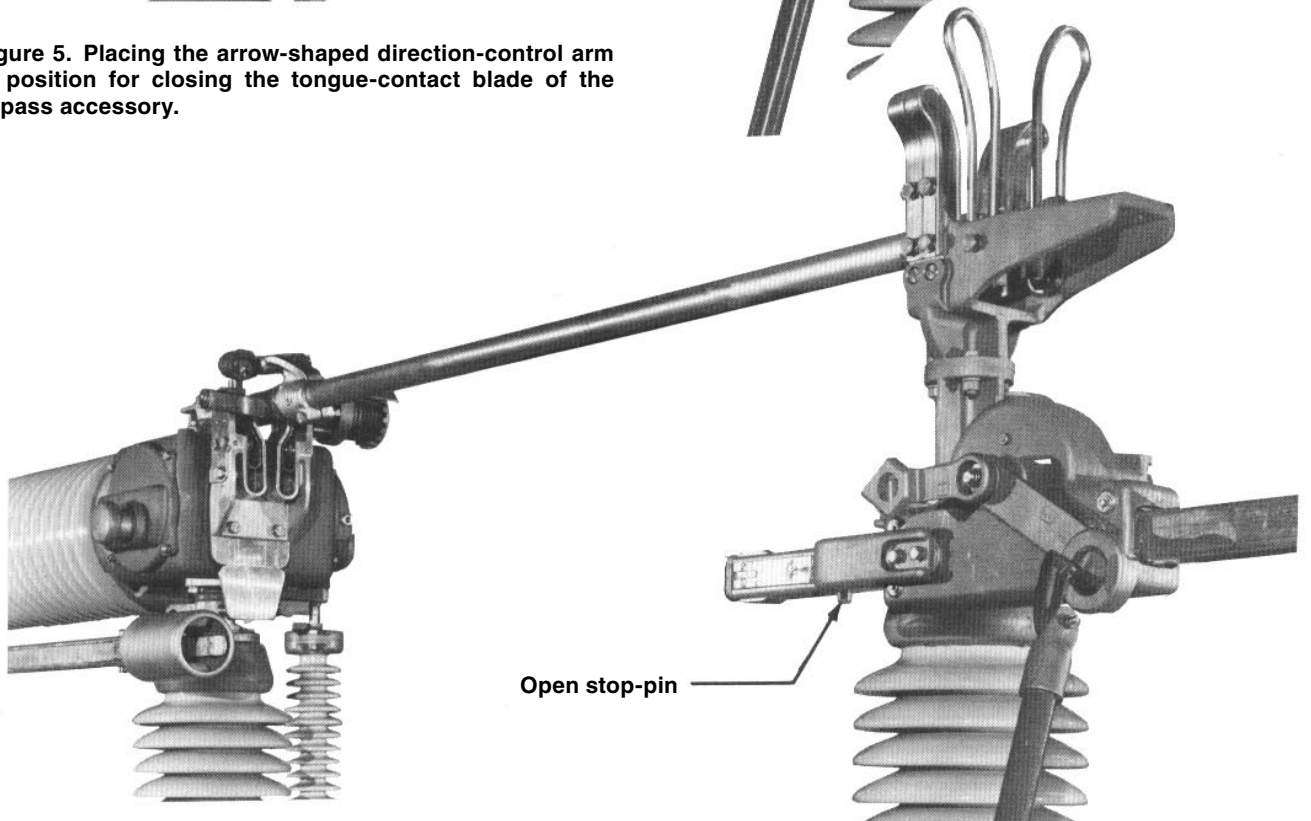


Figure 6. Using the ratchet-mechanism operating lever to close the bypass blade.



**OPERATION — Continued**

When the blades have been moved to the desired positions—fully open or fully closed—make sure that the arrow of each direction-control arm remains pointed in the corresponding opening or closing direction, respectively. This ensures positive locking of the blades in either position. Do not reverse the direction-control arms until ready to move the blades to their alternate positions.

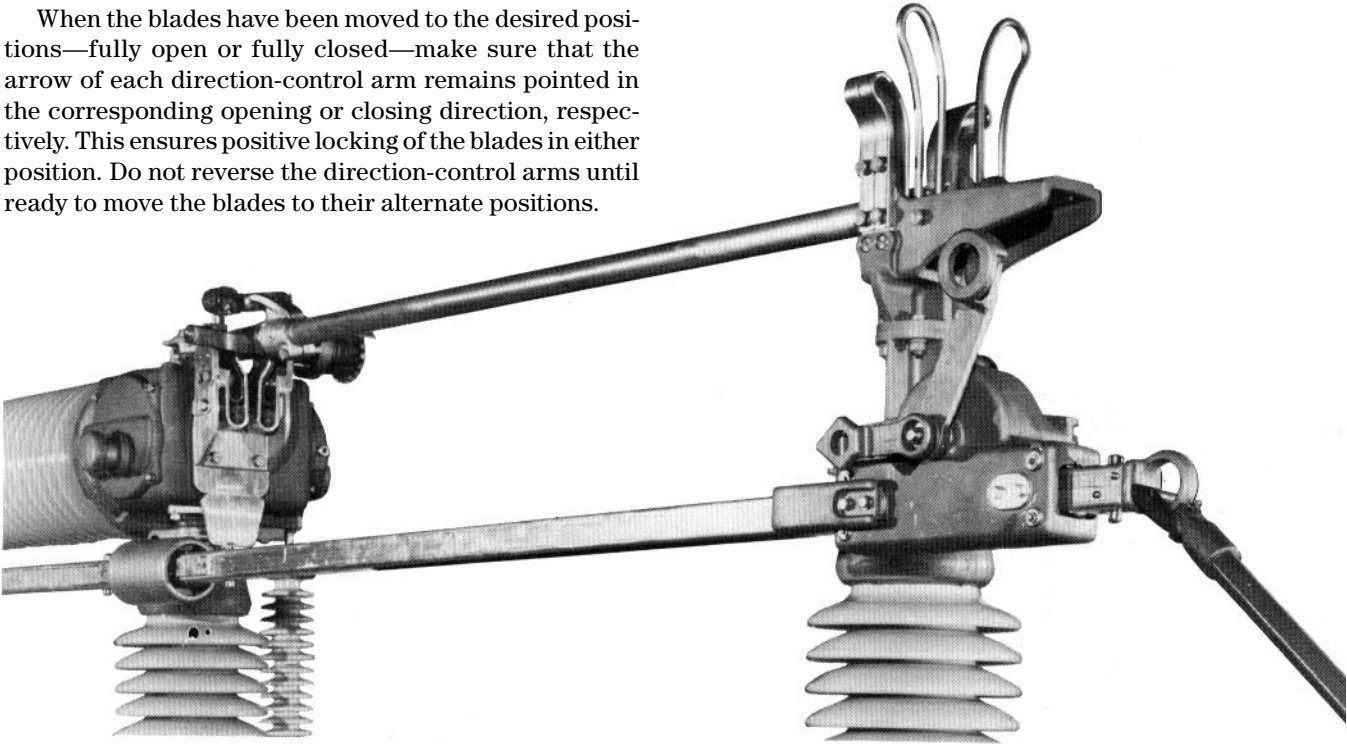


Figure 7. Using the blade pull-ring for a quick-traverse closing operation. Note that the closed stop-pin is not against the mechanism housing, indicating that use of the ratchet-mechanism operating lever is necessary to complete the contact engagement.

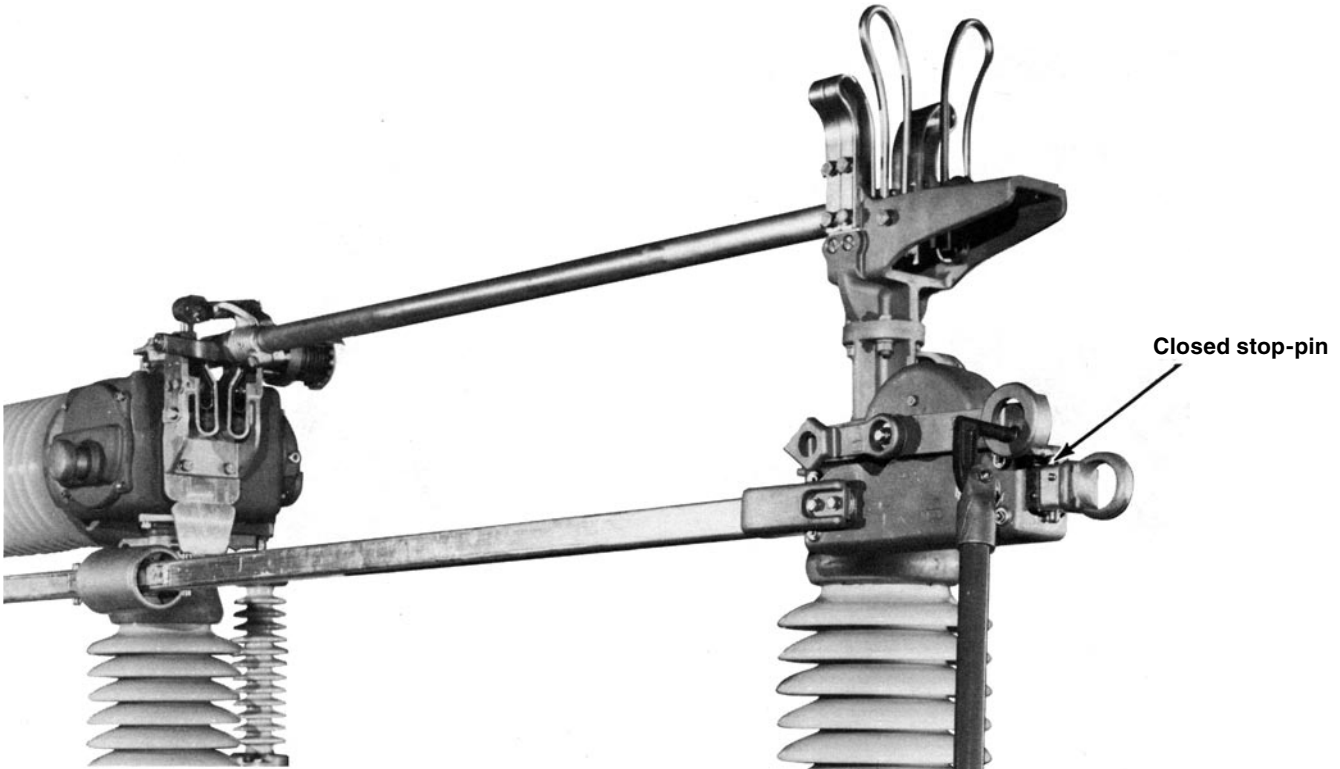


Figure 8. Using the ratchet-mechanism operating lever to complete the contact engagement.

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