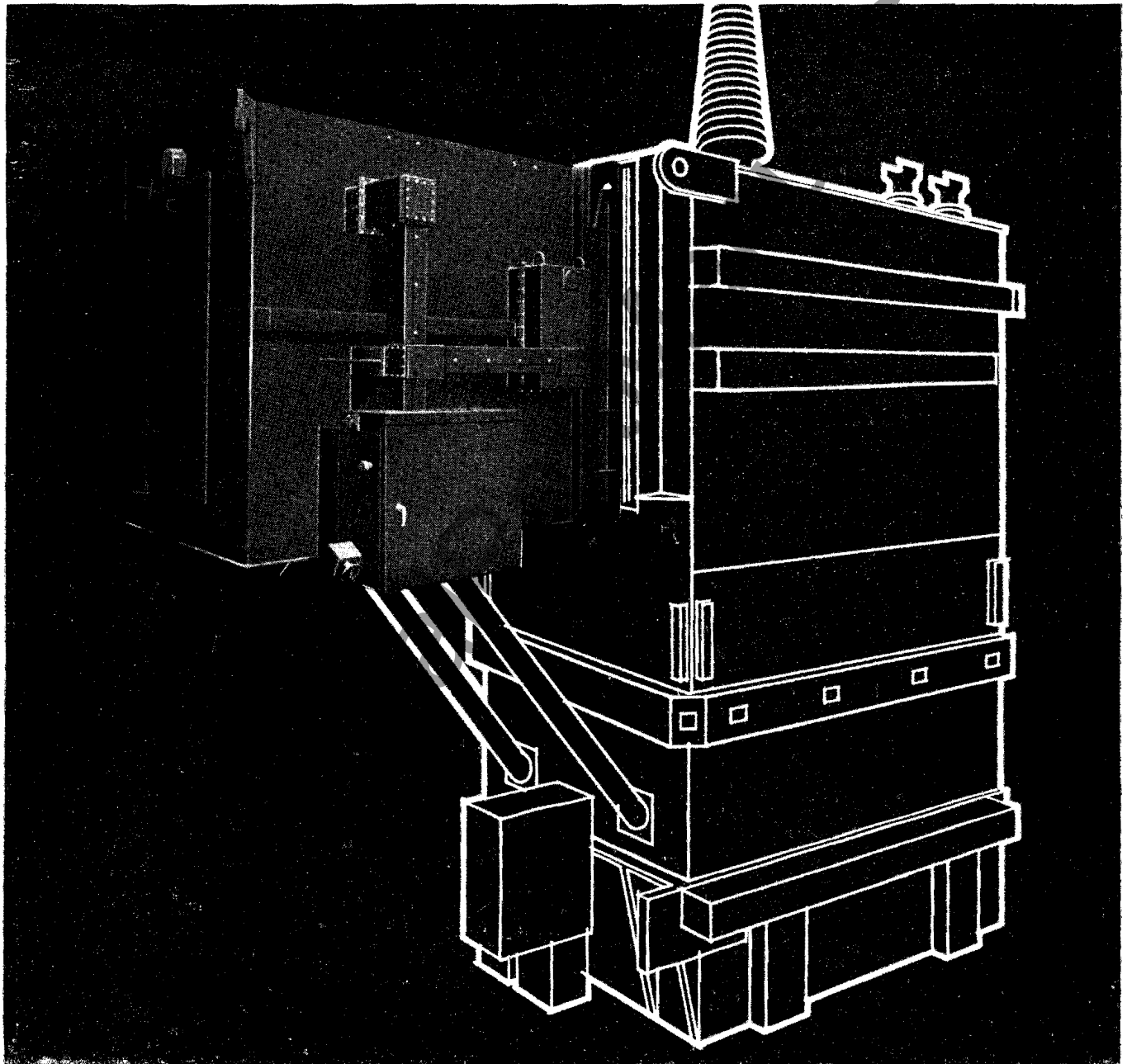


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**UTH Load Tap Changer**

650 and 1175 Kv BIL

**Application**

Westinghouse UTH-650 and UTH-1175 load tapchangers accomplish reliable, efficient regulation of extra high voltages to:

1. Control load.
2. Regulate voltage and circuit power factor.
3. Reduce circuit losses.
4. Control overexcitation during light loads.

The UTH high voltage tapchanger is designed in single or three phase assemblies as required by the transformer or regulator to which it is applied.

This tapchanger utilizes the resistance switching principle, eliminating the reactive component in the interrupting arc current thus significantly increasing switch contact

life. Functional life testing of the transfer switch confirms an anticipated contact life of 300,000 to 500,000 operations.

The tapchanger is designed for line voltage operation thereby eliminating the series transformer and significantly reducing the operating losses of the associated transformer.

**December, 1969**

Supersedes DB 48-655, pages 1-4, dated May, 1967

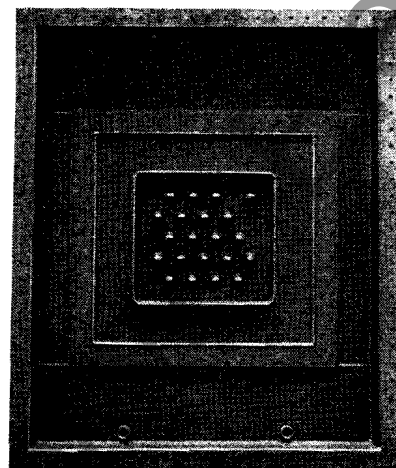
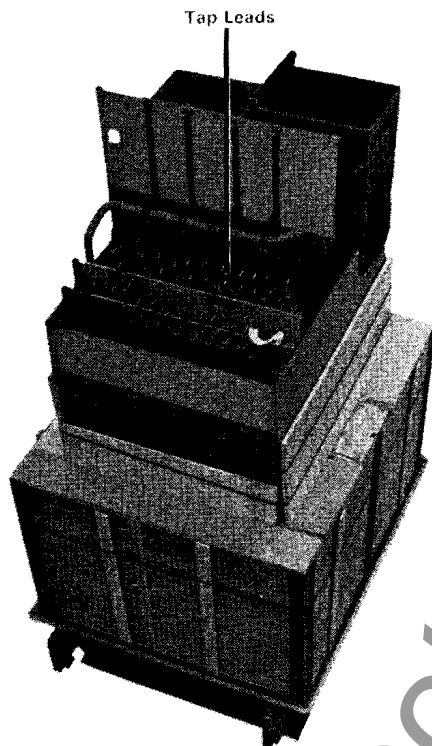
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### Design Features

The tap changer is composed of three basic components, the selector switch, the transfer switch with transition resistors and balance coils and the operating mechanism with its control. The selector and transfer switches are mounted in separate oil compartments. The tap leads are brought up from the phase assembly to a terminal board for connection to the selector switch, and from there connection is made to the transfer switches.



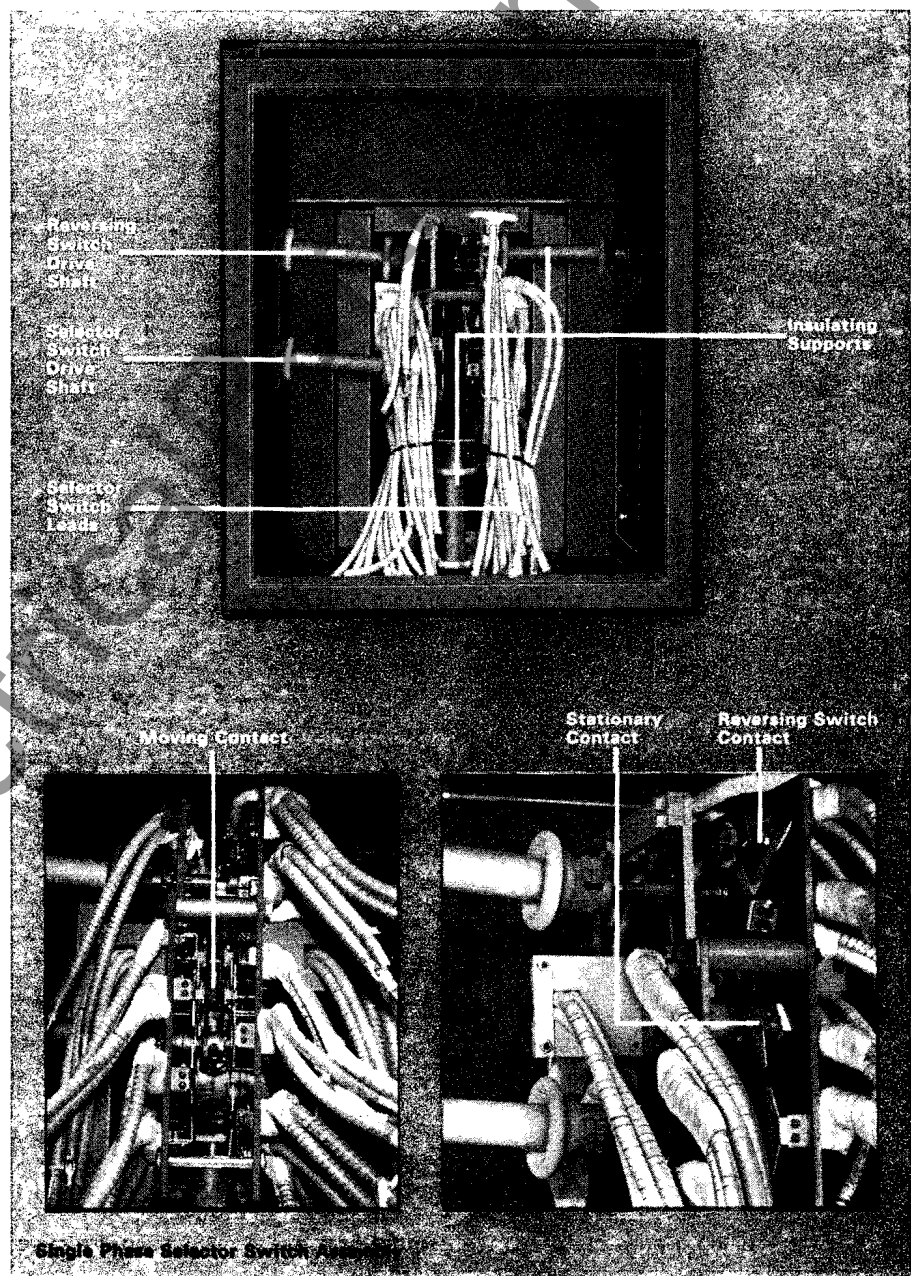
Transformer Mounted Terminal Board

### Selector Switch

The selector switch consists of circular arrangements of stationary contacts mounted on two Micarta® panels per phase. Adjacent winding taps are connected to stationary contacts on opposite Selector Switch panels to maintain electrical clearances.

Finger type moving contacts are directly driven by a geneva gear across the blade type stationary contacts.

Mechanically coupled selector switch and reversing switch drives extend through separate insulated shafts to all three phases of three mechanisms.

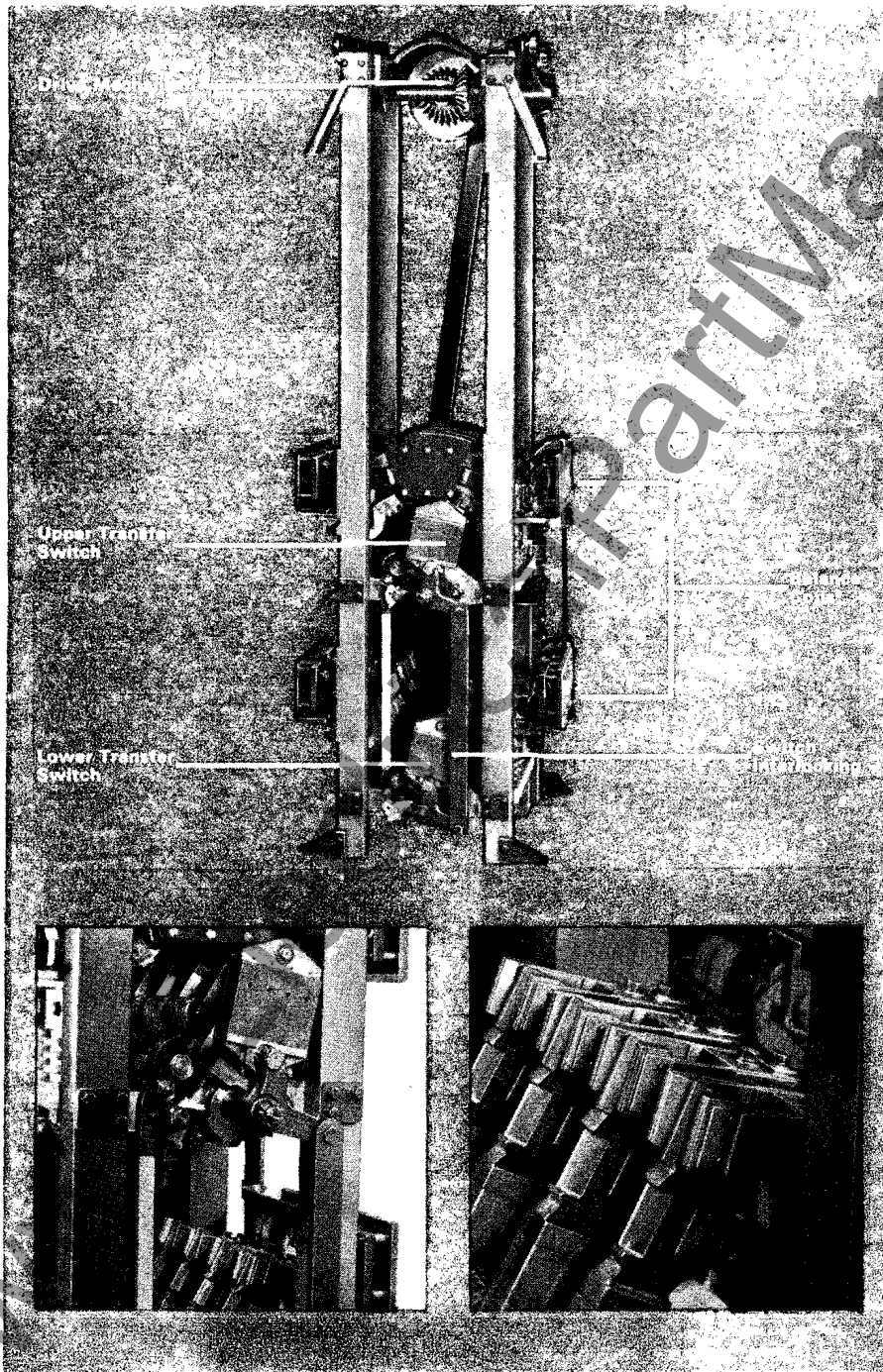


**UTH Load Tap Changer**

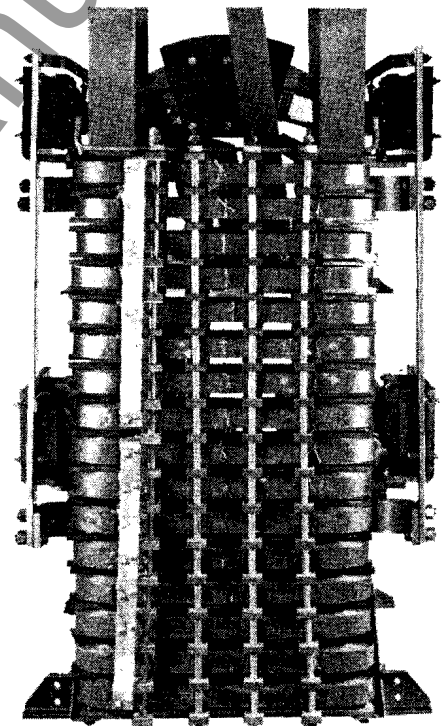
650 and 1175 Kv BIL

**Transfer Switch**

The transfer switch is a spring operated device consisting of two mechanically interlocked, three or four pole (as required), double-throw interrupters, with integral transition resistors and balance coils. The interrupters are mechanically sequenced so that the tripping of the upper switch trips the lower switch after a delay of approximately two cycles.



The transition resistor assemblies are composed of from eight to sixteen individual resistor coils as required for the particular application. These coils are connected in series-parallel combinations as necessary to obtain the desired switching resistance.

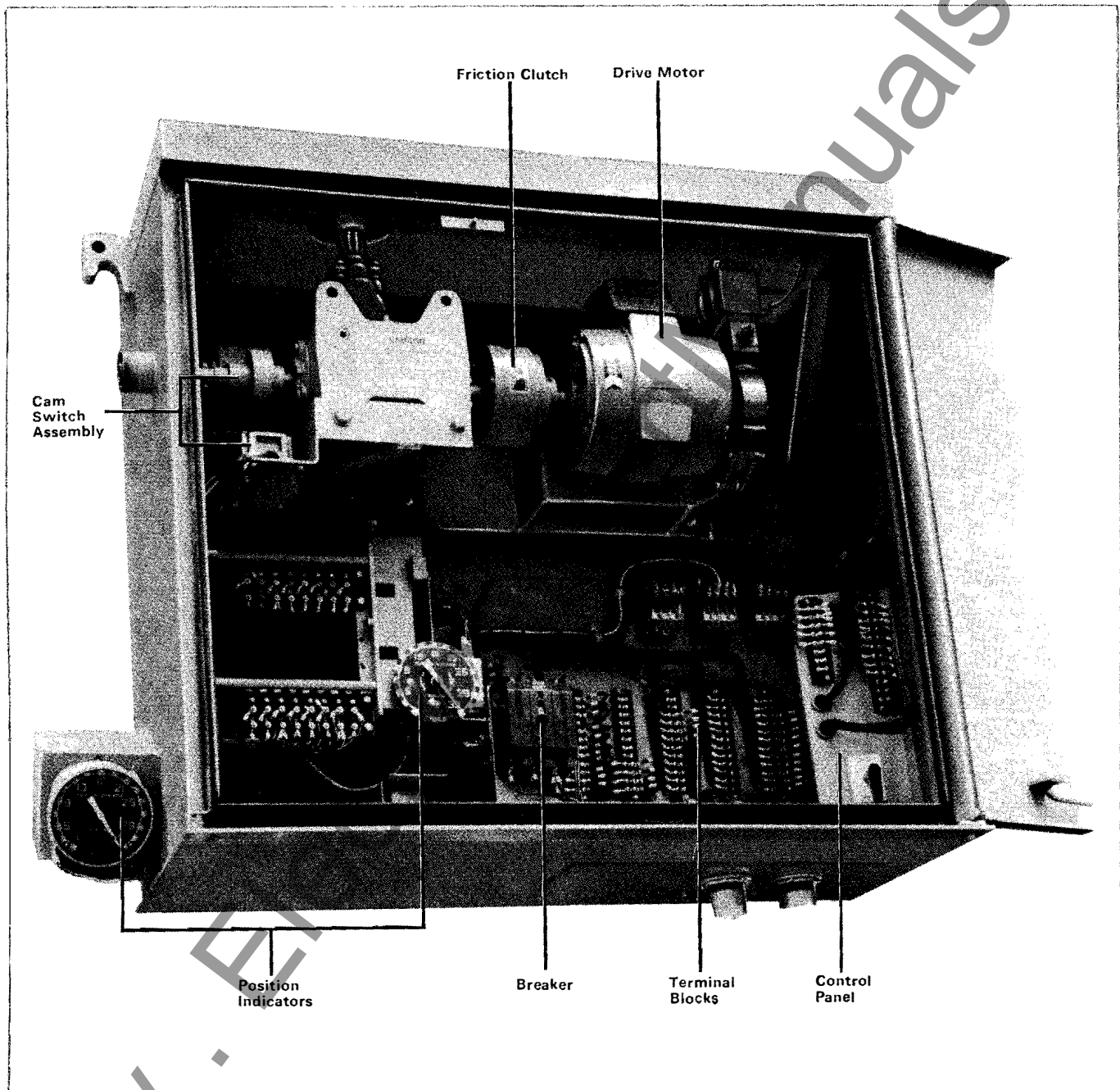
**Transition Resistor Assembly**

The individual coils are edge wound from corrugated nickel-chrome alloy strip. The turns are separated by layers of Insuldur kraft paper and placed so that the corrugations are vertical when mounted in the tap changer. The coils are stacked one above the other with Micarta spacers between coils to permit a free flow of oil for rapid cooling, eliminating the need for time delay between tap changes.

Since the resistor is only in the circuit for two cycles out of the five second operation of the tap changer and it is not in the circuit during normal transformer operation, the resistor power loss is negligible.

Balance coils are provided to divide the current equally through the three or four poles of the switch to maintain equal erosion of the arcing contacts.

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#### Control

The operating mechanism mounted in an air compartment on the side of the tap changer tank consists of the motor, gearing and shafting required for operating the tap changer. From this compartment steel shafts enter the oil insulated switch compartments

through packing glands. Inside these compartments insulated members operate the various switches. The air compartment also contains the cam operated control switches, control panel and position indicator. An externally mounted position indicator synchronized with the one inside the compart-

ment is provided for "on the ground" observation. A remote control compartment can be supplied for ground level operation of the tap changer.