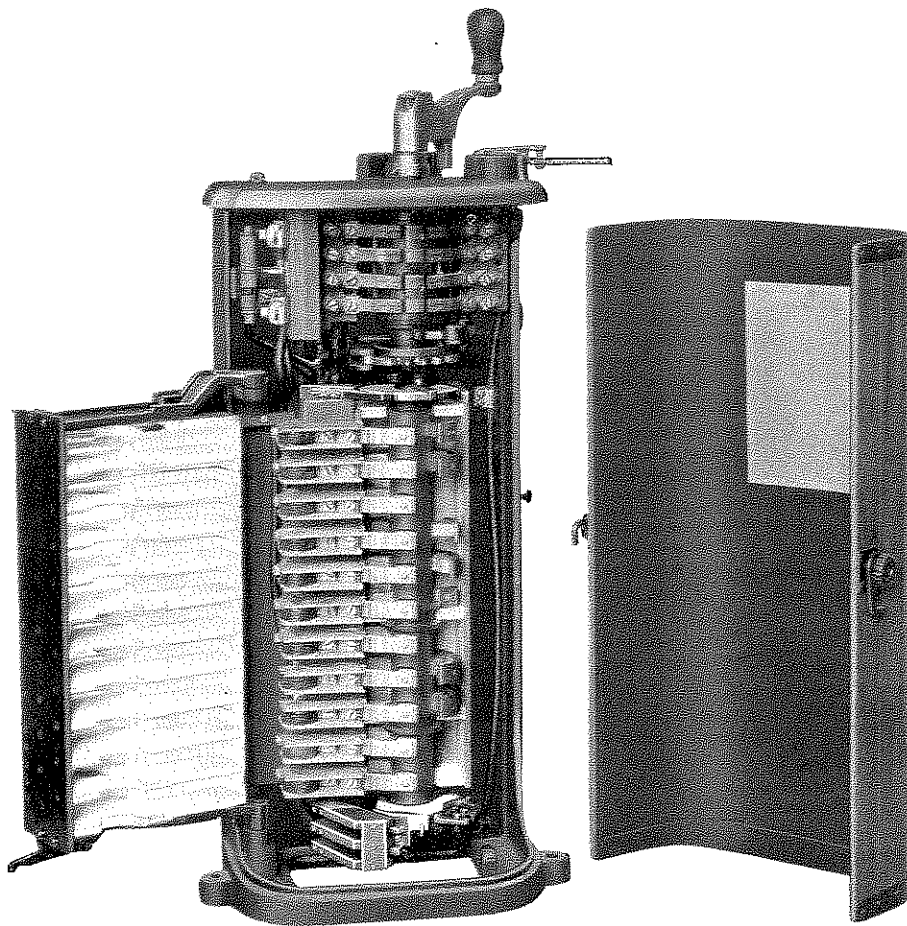




INSTALLATION *of* LINE BREAKER OPERATING SWITCH (RATCHET TYPE)

In Railway Drum Controllers

G-E line breakers improve operating conditions by eliminating severe arcing from the controller and preventing improper starting and running practices. This is accomplished by using a line breaker or contactor, located under the car, to break the main circuit and a switch mounted on the main shaft of the controller to operate the contactor. Such an arrangement increases the life of the entire electrical equipment, and greatly decreases maintenance costs.



Type K-36 Controller, Showing Line Breaker Operating Switch and Ground Finger

The switch unit consists of a ratchet mechanism, the switch proper, and an arc chute, all of which are usually located at the bottom, and a ground finger located near the top, of the controller.

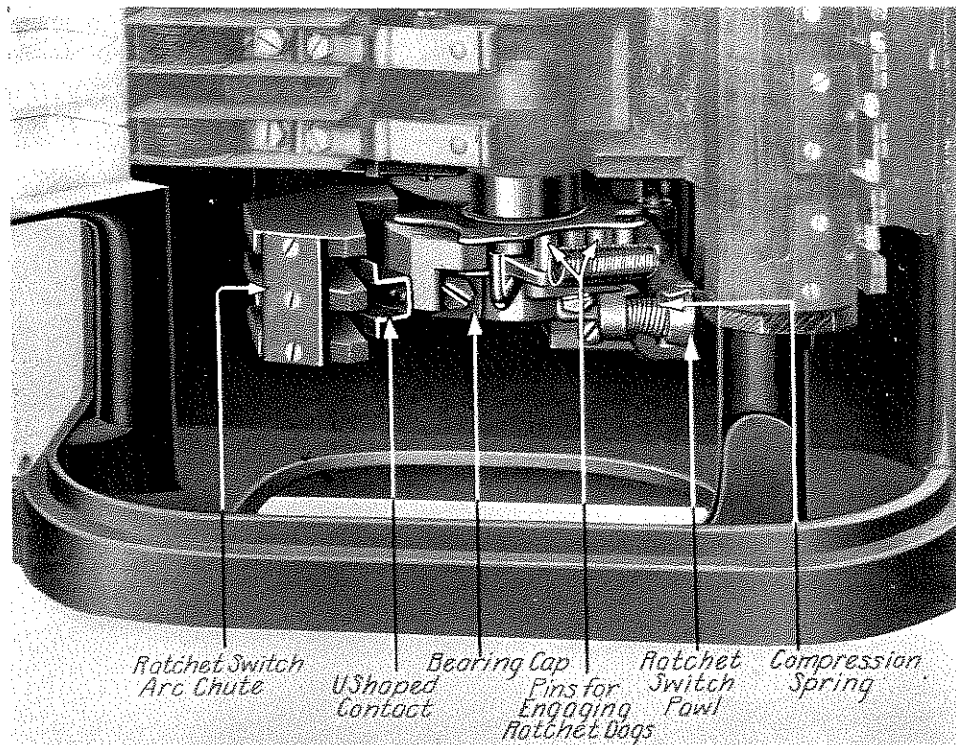
General Electric Company, Schenectady, N. Y.

SALES OFFICES IN ALL LARGE CITIES



LINE BREAKER OPERATING SWITCH

The operation of the switch is briefly as follows: When the main controller handle is turned to the first point, the ratchet mechanism is actuated, and the switch closes, admitting current to the coil of the line contactor, which closes. As the controller handle is moved forward through the other points, the ratchet switch remains closed. Should the controller handle be notched back from any point, the ratchet is released, and the switch opens, breaking the coil circuit of the line contactor, and causing it to open. Moreover, the ratchet switch will remain open until the controller handle is turned to the "off" position, and cannot be closed again until the handle is moved to the first point.



Controller, Showing Ratchet Switch Installed

The function of the ground finger is to regulate the resistance in the coil circuit of the line contactor so as to insure its prompt and positive closing, and to prevent undue heating of the coil. This is accomplished as follows: When the controller handle is turned to the first point, the finger makes contact with its segment, completing a circuit that cuts out part of the resistance in the line contactor coil circuit, permitting an initial flow of current sufficiently high to close the contactor. As the controller handle is turned further, the finger runs off the segment, and the full amount of resistance is again inserted in the coil circuit, limiting the current to a value sufficient to hold the contactor in without overheating the coil.

Instructions for Installing

The following instructions apply specifically to controllers having the individual finger type of blowout, but also give the procedure used in installing a ratchet switch in any railway drum controller. Detailed instructions with drawings are sent out with each shipment of ratchet switches.

The following directions are given for installing the ratchet switch:

- 1st. Remove the controller cap plate, and the upper and lower bearing caps.
- 2nd. Loosen the screws holding the finger block until the block can be bent backward enough to allow the removal of the main cylinder. If this is done it is unnecessary to take the fingers off.

NOTE. This need not be done in the case of the K-35 type, as there is sufficient room for the main cylinder to be taken out, if the reverse cylinder is first slid off the shaft.



LINE BREAKER OPERATING SWITCH

3rd. Remove the steel spacing collar from the bottom of the shaft, and discard it. Assemble in its place first the ratchet mechanism, and then the steel spacing collar furnished with it. This should bring the collar next to the lower bearing when the assembly is completed. The set screw should be set up tight and swelled into the threads of the ratchet wheel with a cape chisel or a center punch. This will prevent the ratchet mechanism from working loose.

4th. Reassemble the controller and fasten the ratchet switch arc chute with the two contact fingers to the bearing cap so that the fingers will line up with the U shaped copper segment on the ratchet mechanism. The fingers should have between two and three pounds pressure to insure a good contact. Since the two fingers are subject to trolley potential, care should be taken to allow safe creepage distance to all grounded parts.

5th. Assemble the check pawl on the bearing bracket and put the compression spring in place.

6th. The ground finger mechanism is installed as follows: The ground finger and finger base are fastened in place on the upper beveled portion of the finger block with the screws that are furnished with them. The finger must line up with the copper segment that has been inserted in the control cylinder, and should have from two to three pounds pressure to insure good contact.

When controllers are used on metallic return systems, two control fingers are furnished, which should be mounted one above the other so as to make contact with the same copper segment on the controller cylinder. The forward finger, with offset finger base, should be mounted on the front of the main finger block, and the rear finger on the beveled surface at the end.

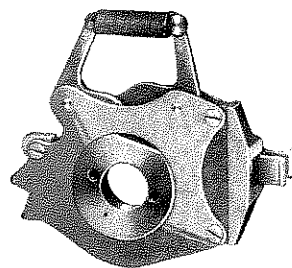
SET OF PARTS NECESSARY TO EQUIP CONTROLLERS FOR AUXILIARY LINE BREAKER OPERATION



Finger Base, Finger and Compression Spring for Check Pawl



Check Pawl with Roller, and Finger Block with Fingers, Arcing Plates, Terminals, etc.

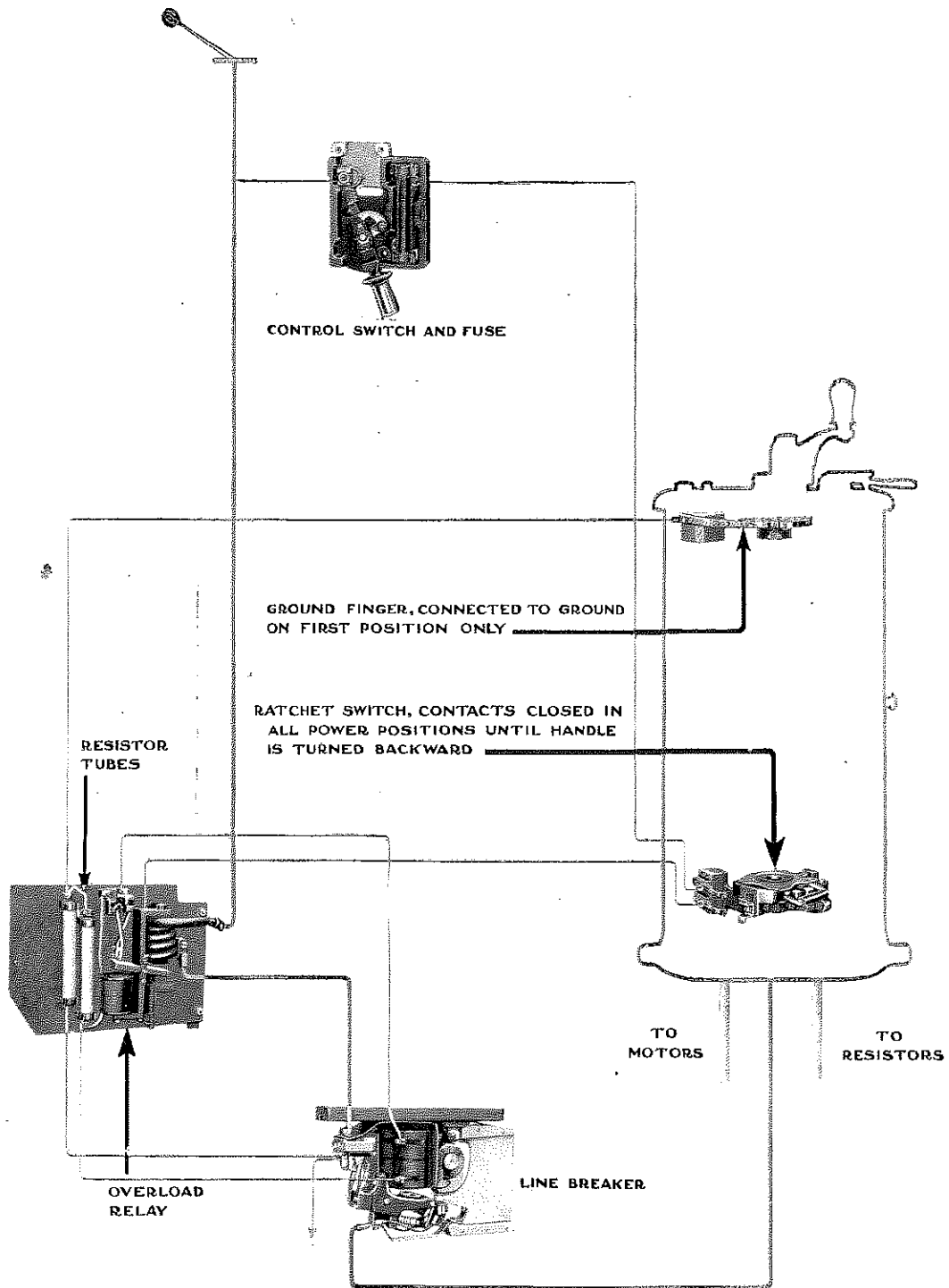


Spacing Collar and Complete Ratchet Mechanism



LINE BREAKER OPERATING SWITCH

Schematic Diagram



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