

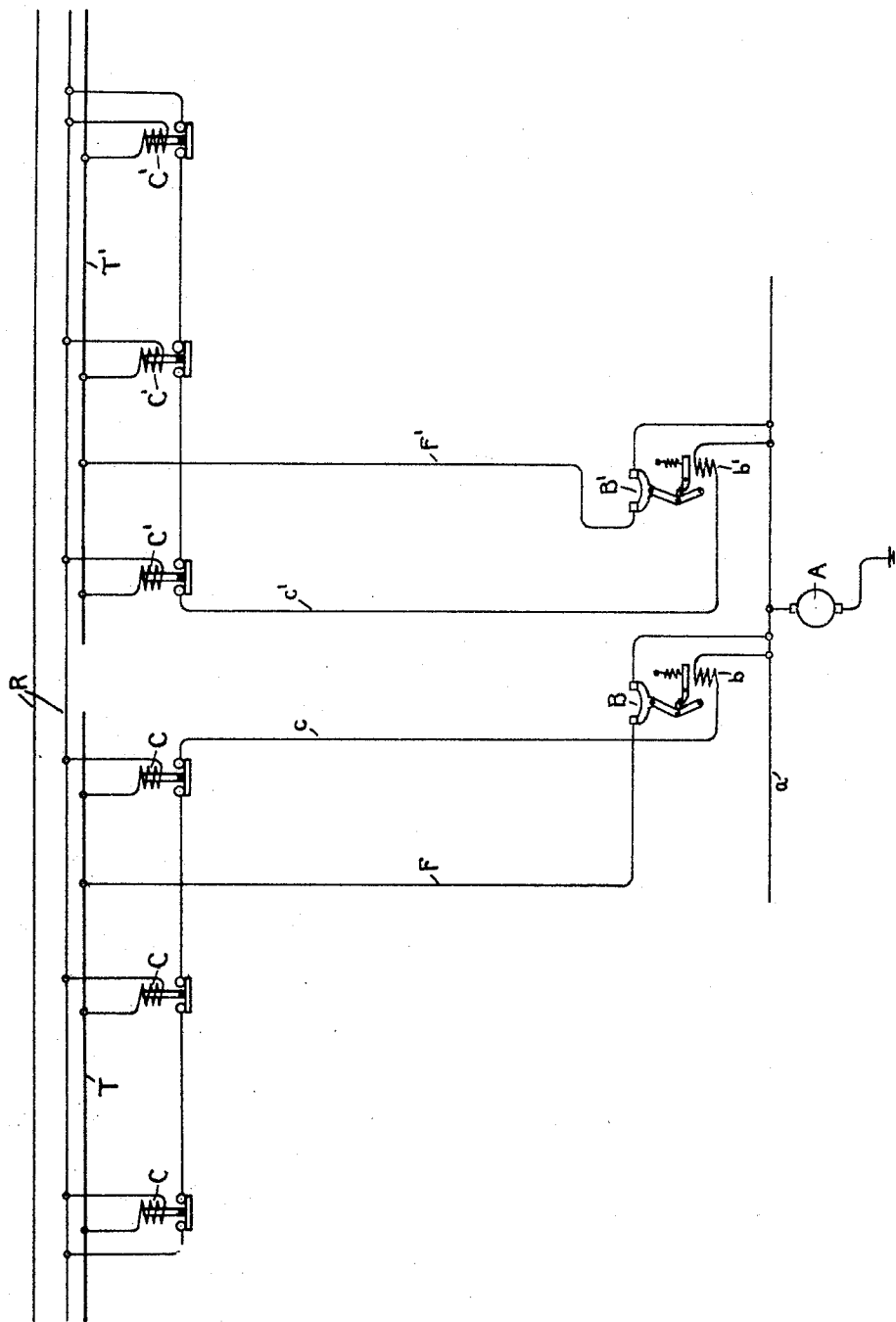
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C. E. BARRY.

MEANS FOR PROTECTION AGAINST SHORT CIRCUITS.

APPLICATION FILED JULY 15, 1904.



Witnesses

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MEANS FOR PROTECTION AGAINST SHORT CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 781,931, dated February 7, 1905.

Application filed July 15, 1904. Serial No. 216,643.

To all whom it may concern:

Be it known that I, CHARLES E. BARRY, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Means for Protection Against Short Circuits, of which the following is a specification.

My invention relates to devices for protecting against short circuits, and is particularly applicable to electric-railway systems.

It sometimes happens that a short circuit occurs between a collector-shoe traveling on a third rail and a truck of the car. A short circuit is thus produced directly from the third rail to ground with no circuit-breaker or fuse in the connection. The only way the short circuit can be broken is by lifting the collector-shoe from the third rail, and considerable damage may be done before the motorman can do this or realize the necessity for doing it. Also fuses or circuit-breakers occasionally fail to work, and short circuits may result with damage to the apparatus before the motorman can disengage the trolley or collector-shoe from the trolley-wire or third rail. Although the amount of current-flow in one of these short circuits is sufficient to damage the car, it frequently is insufficient to open the circuit-breaker at the power-house in the feeder supplying that section of the third rail, since the feeder and the circuit-breaker connected therein are frequently adapted for carrying the full-load current for a large number of cars or since the voltage-drop in the feeder and rail limits the current to a comparatively small amount.

The object of my invention is to provide protective means against such short circuits; and my invention consists in providing one or more switches normally held closed by magnet-windings connected between the section of the third rail and ground and controlling a circuit-breaker in the feeder supplying that section. With this arrangement if the third-rail section becomes grounded the current fails in the magnet-winding which normally holds the switch closed, thereby opening the circuit of a retaining-coil of the circuit-breaker in the feeder supplying the third-rail section.

My invention will best be understood by

reference to the accompanying drawing, which shows diagrammatically a portion of a railway provided with protective devices in accordance with my invention.

In the drawing, R represents the track-rails, and T T' two sections of a third rail.

A represents a generator or source of power with one terminal connected to the bus-bar *a* and the other terminal earthed. The bus-bar *a* is connected, through the circuit-breakers B and B', to the feeders F and F', which are connected, respectively, to the third-rail sections T and T'. A plurality of coils C C are connected between the third-rail section T and ground. Each of these coils controls a normally closed switch. The several switches are placed in series in a conductor *c*, which connects one terminal of the magnet-coil *b* to earth, the other terminal of this coil being connected to the bus-bar *a*. This coil *b* is the retaining-coil for the circuit-breaker B, which may be arranged in the manner of ordinary under-load circuit-breakers.

The operation is evident from the foregoing description. If a short circuit occurs at any place upon the third-rail section T, the voltage across the terminals of a coil C will fall, and the switch controlled thereby will be opened. The retaining-coil *b* will thereby be deenergized and the circuit-breaker B will open, breaking the circuit of feeder F and disconnecting the third-rail section T from the source of power.

It will be understood that I have illustrated my invention diagrammatically and that many modifications may be made in the construction and arrangement of parts without departing from the spirit of my invention. I aim in the appended claims to cover all such modifications.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination, a conductor, a source of power connected thereto, a magnet-winding connected between said conductor and the opposite polarity of the system, and means operative upon the deenergizing of said winding for disconnecting said conductor from said source.

2. In combination, a conductor, a source of

power connected thereto, a magnet-winding connected between said conductor and the opposite polarity of the system, a normally closed switch controlled by said magnet-winding, and
 5 means controlled by said switch for breaking the connection between said conductor and said source.

3. In combination, a conductor, a source of power connected thereto, a magnet-winding
 10 connected between said conductor and the opposite polarity of the system, a normally closed switch controlled by said magnet-winding, a circuit-breaker in the connection between said conductor and the source, and a retaining-coil
 15 for said circuit-breaker in circuit with said switch.

4. In combination, a conductor, a source of power connected thereto, a plurality of magnet-windings connected in parallel between
 20 different points on said conductor and the opposite polarity of the system, and means operative upon the deenergizing of any one of said windings for disconnecting said conductor from said source.

25 5. In combination, a conductor, a source of

power connected thereto, a circuit-breaker in said connection, a retaining-coil adapted to hold said circuit-breaker closed, a plurality of normally closed switches connected in series in the circuit of said coil, and a plurality of
 30 magnet-windings adapted to hold said switches closed and connected in parallel between different points on said conductor and the opposite polarity of the system.

6. In an electric-railway system, a sectional
 35 third rail, a source of power having one of its terminals connected to the sections of said rail and its other terminal to a ground-return, magnet-windings connected between the several sections and the ground-return, and nor-
 40 mally closed switches in the connections from the source of supply to the several sections of the third rail controlled by said magnet-windings.

In witness whereof I have hereunto set
 my hand this 13th day of July, 1904.

CHARLES E. BARRY.

Witnesses:

BENJAMIN B. HULL,
 HELEN ORFORD.