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CIRCUIT CLOSER FOR TRACK SWITCHES.
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1,220,701.


To all whom it may concern:

Be it known that I, CHARLES W. SQUIRES, of Beverly, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Circuit-Closers for Track-Switches, of which the following is a specification.

My invention relates to that class of switches, especially for electric railways, in which an instrument mounted on the trolley wire is operated by a passing car to close a circuit so as to operate a track switch or not according to whether the passing car is drawing current at the moment of passing or not. This application is a division of application Serial No. 47,579, filed August 27, 1916.

My present invention relates to a circuit closer which is mounted on the trolley wire and may be connected with any of the well known forms of switch-throwing mechanism.

My invention will be understood by reference to the drawings in which the apparatus, which I have called an actuator, is shown in its preferred form.

Figure 1 is a side elevation, partly in section, of the actuator and its connecting parts. Figs. 2 and 3 being sections on lines 2—2 and 3—3 of Fig. 1.

It will be understood that, as is at present customary, the device in practice is covered by a suitable enclosure to protect it from the weather, etc. This enclosure is not shown in the drawings and may be of any desired shape as will be well understood.

This mechanism is mechanically operated by the car and is mounted on the trolley wire. It comprises a baseboard G made of wood or other insulating material and a rigid frame G which acts as a support for certain of the parts which are mounted therein and are insulated therefrom. Preferably the frame itself is made of insulating material. The frame G is supported on the baseboard G by angle-irons g, one at each end, attached to the baseboard G by cross pieces g preferably of metal, these cross pieces having openings g through which pass attaching bolts g, g. The baseboard G is preferably mounted upon a metal plate G which extends the length of the baseboard and which is electrically connected with the trolley wire on which it is mounted and to which it is clamped in a way well known. The trolley wire and this clamping means are not shown.

The plate G is also electrically connected with a contact finger G, as for example by means of the wire g which the bolt g serves as a binding screw, the bolt g being in this case electrically connected by contact wire with the plate G. G is a carrier to support and operate the contact finger G. This carrier as shown comprises a heavy wire one end of which is bent at right angles to the body thereof and is mounted to swing in bearings g, the other end being also bent at right angles to the body and then bent back upon itself to form a loop g. As a matter of convenience one end of the contact finger G is bent around the first named end of the carrier G so that it is free to swing loosely with relation thereto, and it is passed through the loop g so that it may be lifted or pulled down by the movement of the swinging support.

H is an actuator or lever mounted on the baseboard G to swing with relation thereto, the baseboard and the parts below it being slotted, and the actuator passes down through the slots into position to be struck by the trolley wheel mounted on the passing car. This actuator has a toe-piece suitable placed to engage the under surface of the loop portion g of the carrier G and lift it and the contact as the trolley passes beneath the instrument.

J is a terminal mounted in a hanger carried by the frame G and suitably insulated therefrom, being connected by the wire j with the instrument by which the throwing of the track switch is controlled, an opening being provided for this purpose in the frame G. In order to reduce the current which would naturally pass through the wire j when its circuit is closed I prefer to insert a resistance j.

The action of the actuator H is to lift the contact finger G, and the terminal J is located to be struck by the contact finger G during its downward movement. If the movement of the contact finger G was in a vertical plane it will be seen that in its operation by the actuator H it would make contact with the terminal J both in its upward and downward movement. In order to prevent this, I have provided a cam plate J which is mounted on the baseboard G and supported at its top from the frame G,
from both of which it is insulated, or it may be made of insulating material. In this cam plate is a slot J and through this slot projects the body of the contact finger G. This slot is partly diagonal in shape at its lower end and somewhat wider than the body of the contact finger, its upper end being vertical and narrow.

The lower portion of the slot J is about midway the side edges of the cam plate so that the body of the contact finger near its end normally rests in the angle at the lowest part of the slot. It will be seen that upon the contact finger being lifted by the swinging support, which is engaged by the actuator H, it will strike the upper surface of the slot J and, its joint being loose, it will be guided laterally along the upper edge of the slot as shown at 1 and into the vertical portion of the slot as shown at 2 (see Fig. 3). Thus it will be seen that it will pass by the end of the terminal J, which as shown in Fig. 3 is bent somewhat to conform to the shape of the slot J. When it is released, however, upon the passing of the trolley by the actuator H and the consequent dropping of the actuator into the position shown in Fig. 1, the tendency of the contact finger G will be to drop vertically, being guided by the vertical portion of the slot J until it strikes the slanting lower surface thereof, when its end G which is enlarged for the purpose, will strike the bent portion of the terminal J as shown at 4 in dotted line in Fig. 3, and make the necessary contact, which will be of short but appreciable duration, and so cause the closing of the circuit from the trolley wire through the wire J.

It will thus be seen that the important feature of this invention is the arrangement of a swinging arm or finger with relation to the other terminal so that when the swinging finger is moved in one direction it cannot engage with the stationary terminal and upon return to its former position it will of necessity engage the stationary terminal, this operation being caused by a guiding slot or the like which cooperates with the loose pivoting of the swinging finger and the means for giving motion to the swinging finger.

The embodiment of the invention shown in the drawings is that preferred by me, but I do not mean to limit myself to it as it may be embodied in other ways. In this art it is valuable because the circuit which the contact finger closes is one closed after the actuator is released by the trolley wheel, at which moment the contact finger is free to fall so that the passing car may be stopped below the instrument without in any way making or prolonging the contact between the contact finger and the stationary terminal. What is needed in many electric track switch instruments is a momentary contact as a contact which is more than momentary makes possible the burning out of the line. This is impossible with my circuit closer above described.

What I claim as my invention is:—

1. In combination with means for energizing an electromagnet, a circuit closer having a movable member and a stationary member, means for moving said movable member from its normal position into operative position and then releasing it, and means for guiding said movable member after its release into contact with said stationary member and thereafter into its normal position.

2. In a device of the kind described, in combination with a track switch operating mechanism, a circuit closer comprising a movable member and a stationary member, means operated by a passing car whereby said movable member will be moved into operative position and released, said stationary member being located to be engaged by said movable member after its release and during its return to its inoperative position.

3. In a device of the kind described, a circuit closer comprising a movable arm and a terminal, means for lifting and releasing said movable arm whereby it may fall by gravity, means for guiding said movable arm during its fall whereby it will be brought into momentary contact with said terminal.

4. In a device of the kind described, a circuit closer comprising a loosely hinged movable arm and a terminal, means for lifting said arm comprising a trolley actuated lever, a hinged carrier for said arm adapted to be engaged by said lever to move said arm, and a cam plate provided with a cam surface to guide said arm out of reach of said terminal during its movement in one direction and into contact with said terminal on its movement in the other direction.

5. A circuit closer having a movable member and a stationary member, means for moving said movable member from its normal position into operative position and then releasing it, and means for guiding said movable member after its release into contact with said stationary member and thereafter into its normal position.

6. A circuit closer comprising terminal members one of which is movable, means for moving said movable member from a normal to an operative position and releasing it whereby it may return to its normal position, and means operable during its return travel whereby it will make momentary contact with the other terminal.

CHARLES W. SQUIRES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."