No. 711,036. Patented Oct. 14, 1902.

W. M. CHAPMAN.

CIRCUIT CLOSER FOR TROLLEY SIGNALS.

(Application filed Mar. 9, 1901.)

(No Model.)

FIG. 1

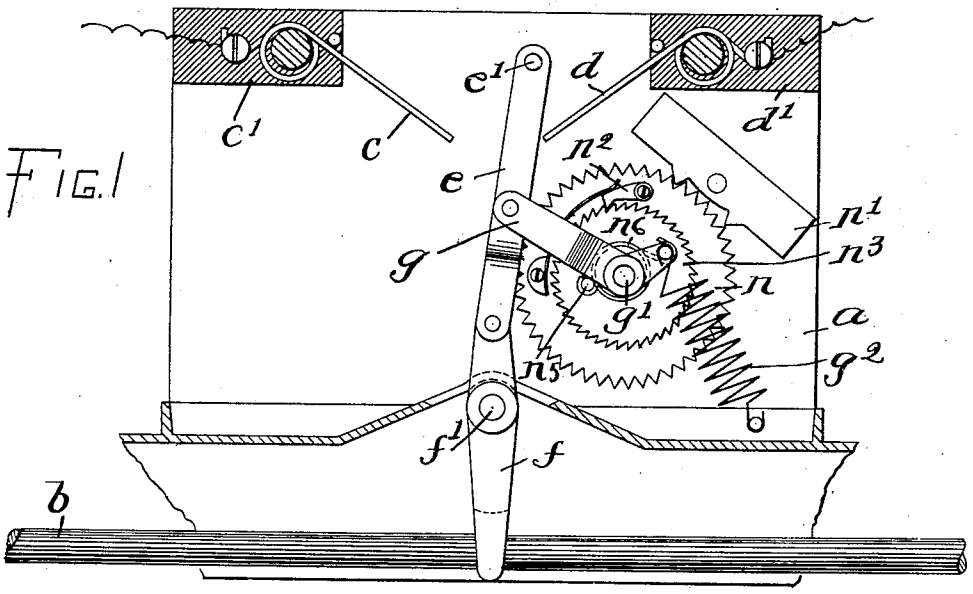
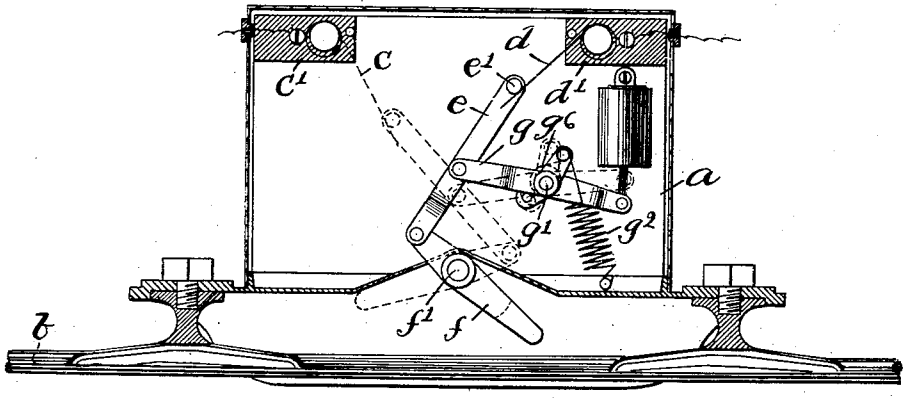


FIG. 2



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CIRCUIT-CLOSER FOR TROLLEY-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 711,036, dated October 14, 1902.

Application filed March 9, 1901. Serial No. 50,439. (No model.)

To all whom it may concern:

Be it known that I, WINTHROP M. CHAPMAN, of Newton, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Circuit-Closers for Trolley-Signals, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In trolley-signaling it is customary to provide a circuit-closer for operating the signals and to locate the same adjacent the trolley-wire and to dispose the actuating-lever of said circuit-closer relative to said trolley-wire so as to be hit by the trolley of a passing car. The contact made by the operation of said actuating-lever is very short, even if the car is proceeding at a moderate speed, and if the car is proceeding at a high speed the contact will be so short as to be at times ineffective. Consequently means have been provided for holding the contact closed for a suitable length of time to operate the signals.

This invention has for its object to construct a circuit-closer of improved construction and mode of operation especially adapted for trolley-signals, but which may be used for other purposes, to the end that a single actuating-lever may be employed in conjunction with a pair of contacts, which lever when moved one way will close one of said contacts and when moved in the opposite way will close the other contact.

A further object of the invention is to provide a circuit-closer comprising the above-mentioned parts with a retarding device whereby a prolonged closure of the circuit is obtained whenever either contact of the pair is closed by the movement of the actuating-lever in one direction or the other.

To the above ends the invention consists in a circuit-closer comprising a pair of contacts and a two-way-moving actuating-lever provided with the devices and combinations of devices hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art from the following description.

A preferred form of my invention is illustrated in the accompanying drawings; but it is to be understood that, except as defined in the claims, my invention is not limited to the details of construction therein shown.

Referring to the drawings, Figure 1 shows a circuit-closer for a trolley-signal embodying this invention, the parts being in their normal position of rest, the side wall of the frame being removed to expose the parts. Fig. 2 is a similar view showing the parts in the position they will occupy when the actuating-lever is moved to the right, a modified form of retarding device being, however, herein shown.

a represents the frame of the apparatus, it being made as a box-like structure of suitable shape and size to contain and support the operating parts and to be properly supported in position relative to the trolley-wire *b*.

c d represent a pair of contacts which may be of any suitable construction and preferably mounted on blocks of insulating material, as *c' d'*. These contacts *c* and *d* are located so as to receive between them a contact-closing arm *e*, the contact *e'* of which is adapted to engage either contact *c* or *d*, according to which way said arm *e* is moved. In this connection it is to be noted that any suitable means may be provided whereby the movement of arm *e* in either direction causes the closing of either contact, although the construction above described, in which a contact is carried by the arm, is the one I prefer, as it possesses advantages which will hereinafter appear.

The actuating-lever *f* is pivoted at *f'* to the frame and extends down into position to be hit by the trolley of a passing car, and said actuating-lever is adapted to be moved both ways from normal—toward the right and toward the left—and when moved one way is adapted to operate the contact-making arm and close one of the contacts of the pair and when moved the other way to operate said contact-making arm and close the other contact. Hence said actuating-lever, when capable of moving both ways from normal to accomplish certain results, is herein termed a "two-way-moving" actuating-lever.

g represents an arm which is pivoted at *g'* to the frame, and said arm is connected by a link to the two-way-moving actuating-lever *f*. As herein shown, the contact-closing arm *e*

serves as said link, it loosely connecting said arm and lever together. While I have herein shown the contact e' as borne at the extremity of the arm, it is obvious that it may be placed thereon at any desirable point, and as the important function of said arm is to serve as the link connection between the actuating-lever f and arm g it is therefore immaterial how it may be constructed or how or where the contact e' may be mounted on it or may be connected with it.

By connecting the actuating-lever f with the pivoted arm g by a link arranged as herein shown it will be seen that as said actuating-lever is moved either way—to the right or left—the pivoted arm g will be moved by it, but always in the same way. Hence said arm is herein referred to as a "one-way-moving" arm. A restoring-spring g^2 is attached at one end to said arm g—as, for instance, to the projection thereon—and said spring g^2 serves to restore the parts when the actuating-lever has been moved in either way by a passing car.

Referring to Fig. 2, full lines, it will be seen that the actuating-lever has been moved toward the right and the contact e' thereby brought into engagement with the contact d, the pivoted arm g being moved and the restoring-spring stretched, while in dotted lines it will be seen that the actuating-lever has been moved toward the left and the contact e' thereby brought into engagement with the contact c and the pivoted arm g also moved, but in the same way, the restoring-spring being likewise stretched. In the dotted lines, Fig. 2, the actuating-lever is represented as moved by a trolley-wheel having a deeper groove than the trolley-wheel which moved it in the opposite way. A retarding device is connected with said one-way-moving arm g, and, so far as my invention is concerned, any usual or suitable form or construction of retarding device may be employed. Referring to Fig. 1, a retarding device of common form is shown, consisting of an escape-wheel n, pallet n', pawl n^2, carried by the escape-wheel, and a ratchet-wheel n^3, engaged by said pawl, while in Fig. 2 another common form of retarding device is shown, consisting of what is frequently termed a "dash-pot," a detailed description and illustration of which is deemed unnecessary. The retarding device (either or any form) is connected with the one-way-moving arm g in a yielding manner for many reasons, and, referring to Fig. 1, the arm g is mounted loosely on the pivot g' and normally bears against a pin n^5, projecting laterally from the ratchet-wheel n^3, so that as said arm is drawn down the ratchet-wheel will be turned by it, and a strong spring n^6 is connected to said pin n^5, which passes around the pivot g' and engages a pin on the projecting portion of said arm, to which the restoring-spring is attached. This spring n^6 is very strong and under ordinary circumstances forms a rigid connection between the pivoted arm g and ratchet-wheel; yet in case the arm g should be suddenly lifted by any accidental cause the spring n^6 will yield to prevent any of the parts from breaking.

The operation of the circuit-closer above described is as follows: Normally the lever f and arm e are in the position shown in Fig. 1. When a car passes in either direction, the actuating-lever f is moved into either the full or dotted line position (shown in Fig. 2) by the contact therewith of the trolley-wheel. During the first part of the movement of lever f a rapid movement is imparted to the upper end of arm e to bring the pin e' into engagement with the contact d or c. After the pin has engaged the contact, however, the continued movement of lever f imparts only a slight oscillating movement to the arm e, and thereby the contact-pin e' is not pressed against the contact d or c with sufficient force to injure the contact or to become wedged against it, so as to prevent the return movement of the arm, even if the movement imparted to lever f is considerable. After the pin e engages the contact d or c the continued movement of lever f imparts a longitudinal movement to the arm e, and thereby rubs the contact-pin e' along the contact d or c, thereby keeping the contacts clean and insuring a good electrical connection. During the downward longitudinal movement of arm e the lever g is moved about its pivot g', the retarding device having no effect upon the lever during this movement. After the trolley-wheel has passed from under the lever f the arm e and lever f are returned to their original position by the action of spring g^2 upon lever g. This return movement is retarded by the action of the retarding device, so that the pin e' remains in engagement with the contact d or c a sufficient length of time to cause the signals to be operated.

It will be seen that by the circuit-closer herein shown the actuating-lever may be operated in both ways to accomplish certain results, and the return movement of the contact-making arm will be retarded in both ways by the employment of a single retarding device.

While the mechanism herein described is especially adapted to trolley-signaling purposes, it is not desired to limit it entirely to that purpose, as it is evident that it might be used for a variety of purposes.

I claim—

1. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame and connected to said two-way-moving actuating-lever by a link, and a restoring-spring connected to said one-way-moving arm, substantially as described.

2. In a circuit-closer, a pair of contacts, a

two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a link connecting said arm with said lever, a contact borne by said link for engaging either contact of the pair, and a restoring-spring, substantially as described.

3. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a link connecting said arm with said lever having an extension projecting between the pair of contacts, and bearing a contact adapted to engage either contact of the pair, and a restoring-spring substantially as described.

4. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, and connected to said two-way-moving arm by a link connection, and a retarding device also connected with said one-way-moving arm, substantially as described.

5. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, and connected to said two-way-moving arm by a link connection, and a retarding device yieldingly connected with said one-way-moving arm, substantially as described.

6. In a circuit-closer, means for operating a circuit-closing contact consisting of a two-way-moving actuating-lever pivoted to the frame, a one-way-moving arm also pivoted to the frame, a link connecting said arms together, a restoring-spring connected to said one-way-moving arm and a retarding device also connected to said one-way-moving arm for retarding its movement in one direction, substantially as described.

7. In a circuit-closer, a pair of contacts, a contact-closing arm mounted to oscillate and move longitudinally, a contact borne by said arm, a two-way-moving actuating-lever connected thereto to move said arm to close either contact, a restoring-spring and a retarding device for the arm, substantially as described.

8. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a contact-closing arm forming a link connecting said one-way-moving arm and said lever, and a restoring-spring, substantially as described.

9. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a contact-closing arm forming a link connecting said one-way-moving arm and said lever, a restoring-spring, and a retarding device connected with said one-way-moving arm, substantially as described.

10. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a link connecting said arm with said lever, a contact borne by said link for engaging either contact of the pair, a restoring-spring, and a retarding device connected with said one-way-moving arm, substantially as described.

11. In a circuit-closer, a pair of contacts, a two-way-moving actuating-lever pivoted to the frame to close one or the other contact of the pair according to which way it is moved, a one-way-moving arm pivoted to the frame, a link connecting said arm with said lever having an extension projecting between the pair of contacts, and bearing a contact adapted to engage either contact of the pair, a restoring-spring, and a retarding device connected with said one-way-moving arm, substantially as described.

12. In a circuit-closer, a pair of contacts, a pivotally-mounted contact-closing arm, a two-way-moving actuating-lever connected thereto to move said arm to close either contact, a restoring-spring, a retarding device and a yielding connection between said device and said arm, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WINTHROP M. CHAPMAN.

Witnesses:
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B. I. RUSSELL.