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CIRCUIT CONTROLLER FOR TROLLEY SIGNALS.

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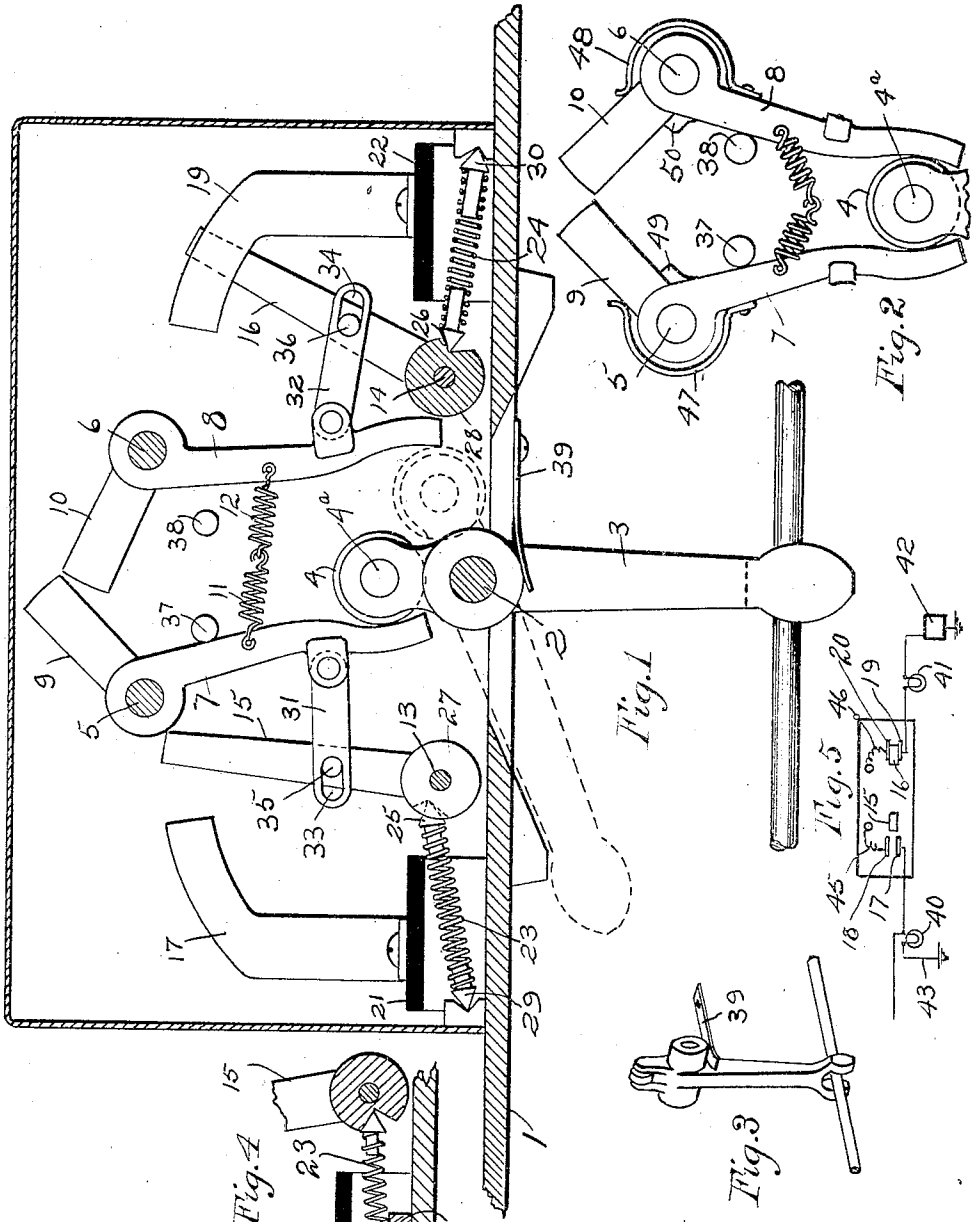


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Witnesses

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CIRCUIT-CONTROLLER FOR TROLLEY-SIGNALS.

No. 911,698. Specification of Letters Patent. Patented Feb. 9, 1909.

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To all whom it may concern:

Be it known that I, ALEXANDER BEVAN, a citizen of the United States, residing at the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Circuit-Controllers for Trolley-Signals, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to automatic signaling apparatus for trolley-cars, and has for its object to provide a simple and effective circuit-controller for operating the signals, said circuit closer being actuated through a lever hanging in the path of the passing trolley-wheel.

My present improved construction is adapted to be used in connection with any system of automatic signaling for trolley roads, and is of such design as to be readily adapted to control either a single circuit or two separate circuits.

To this end the complete device consists essentially of a centrally located actuating lever, a pair of arms separately operable by said lever, a circuit closer operably connected to each of said arms, and a pair of circuit terminals arranged to be bridged independently by one or the other of said circuit closers according to the direction in which the actuating lever is moved.

The above construction is suited for use on the main line where the cars going in one direction will operate to set the signals, and going in the opposite direction will operate to clear the signals, while by slight changes in the construction and electric connections this circuit controller may be used on the sidings or turnouts where the cars will operate the same only when going in a given direction.

Essential features of my improved construction are the manner of automatically arresting the return motion of the actuating lever in its central position after each actuation of the same, and also the method of prolonging the contact for a sufficient length of time to insure effective operation.

The features of construction and manner of operation will be readily understood from the following description and explanation, reference being made to the accompanying drawings, in which:—

Figure 1—is a side elevation of my improved device illustrating one side of the casing as being removed and showing one of the arms in its normal and one in its operative position. Fig. 2—is a detail showing both of the arms in their normal or inactive position. Fig. 3—is a perspective view showing the actuating lever and the contact spring electrically connecting the same to the frame. Fig. 4—is a detail illustrating means for starting a circuit closer in its return direction by means of exerting an upward tension on the restoring spring. Fig. 5—is a diagrammatic view illustrating means for indicating that the circuit closer has effectually operated.

At 1 is represented a suitable base which serves as a support for all the working parts, said base being preferably mounted upon the trolley wire in any suitable manner, so as to be engaged by the passing car. Suspended midway of the base on the pivot pin 2 is the actuating lever 3, the lower end of which is forked to straddle the trolley wire, and the upper end carries the pivotally mounted roller 4. Mounted on the pivot pins 5 and 6 are the arms 7 and 8, which are provided with the lugs or projecting portions 9 and 10; the purpose of said lugs being to prevent the operation of either one of said arms while the other is in operative position, as will hereinafter be more fully explained. A pair of springs 11 and 12 are connected to each other and to the said arms, the purpose of which is to assist in returning the parts to normal after each actuation, in which position said arms rest against stop pins 37 and 38. Mounted upon the pivot pins 13 and 14 are the circuit closers 15 and 16, which are adapted to bridge the pairs of circuit terminals 17—18 and 19—20 respectively. The said terminals are mounted on suitable insulating blocks 21 and 22, one of each pair being electrically connected to the base, as shown at 45 and 46, in Fig. 5. Restoring springs 23 and 24 are arranged to return the said circuit closers with increasing speed as they approach the normal or open position. These restoring springs fit snugly over the shanks of wedge-shaped heads 25 and 26, whose knife edges bear upon the bottoms of correspondingly shaped depressions in the hubs 27 and 28 of the circuit closers 15 and 16, while the other heads 29 and 30 of said springs have suitable bear-

ings on the base of the controller. Pivoted to the arms 7 and 8 are the link bars 31 and 32, provided with slots 33 and 34, through which the pins 35 and 36 pass to the circuit closers 15 and 16.

A spring 39 presses against the shoulder of the actuating lever to maintain always a good electrical contact between said lever and the controller frame, otherwise injurious sparking is liable to occur between said lever and its bearing when the trolley wheel breaks contact with said lever after an actuation, especially when the car is traveling at a high rate of speed.

An additional feature of my invention is that means have been provided for affording an indication that the circuit has been closed. This is accomplished by arranging a lamp, or other visible or audible signal, in one or both the circuits operated by the controller, as shown in Fig. 5 at 40 and 41. These signals 40 and 41 should be suitably located for observation by the motorman, and may be included in the circuit of the main signal 42 or in a branch circuit 43.

The operation of the device may be described as follows: When the actuating lever 3 is thrown to the left, as indicated in dotted lines, the movable parts at the right of the controller are moved to the positions shown in Fig. 1. This movement throws lug 10 into the path of movement of lug 9, so that arm 7 cannot be operated until after the return of arm 8 to normal, and hence arm 7 will arrest the return motion of the actuating lever 3 when it reaches the vertical or normal position. It will be further noted that the movement of circuit closer 16 to the right has thrown its restoring spring 24 into a position in which its action is on the "dead center" line with the pivoting point of said closer, and hence it can exert no restoring action on the said closer while in this position. The springs 11 and 12, however, act at once to start the return of the arm 8 and its pivotally attached bar 32. When this movement has proceeded far enough to cause the farther end of slot 34 to bear upon pin 36 the circuit closer 16 will be started on its return, whereupon the restoring spring 24 will be raised above the "dead center" line, allowing its action to be sufficiently effective to complete the return movement of said circuit closer to normal. It should be explained that the springs 11 and 12 are of such length and tension as is necessary to take up the lost motion due to the slot 34 and start the circuit closer 16 sufficiently to carry the restoring spring 24 out of the line of dead center action into a position of effective action, and thus allow the same to complete the return movement of all the parts to normal, but springs 11 and 12 cease to act as soon as spring 24 begins to act effectively.

The same ends may be gained without the use of the springs 11 and 12 by placing a block 44, as shown in Fig. 4, under the restoring springs, so that when the circuit closers are thrown over to make contact said springs 23 and 24 will be bent downward as well as compressed, and hence will exert a restoring action on the circuit closers even when in their extreme outward positions. The lugs or extending portions 9 and 10 are shown in Fig. 1 as being formed integral with the arms 7 and 8, but they might also be made separate from said arms and pivoted on the same pivot pins 5 and 6, and then operated by means of stiff springs 47 and 48, or other adequately yielding connection, said lugs being adapted to rest normally against stops 49 and 50, so that in case one of the arms should fail for any reason to be returned to normal, the other arm could be operated by a car going in the opposite direction without breaking the mechanism.

My invention is not restricted to the precise construction and arrangement of parts herein shown and described, as the same may be modified or re-arranged in various particulars without departing from the spirit and scope of my invention, one practical embodiment of which has been herein illustrated and described without attempting to show all of the various forms and modifications in which my invention might be embodied.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A circuit controller including a pair of circuit closers, an actuating lever for said closers, and means whereby the actuation of either closer operates means to lock the other.

2. A circuit controller including a pair of circuit closers, an actuating lever for said closers, and means whereby neither closer can be effectively actuated by said lever during the operation of the other closer.

3. In a circuit controller, the combination of a pair of circuit closers, an actuating lever pivotally hung between said closers, and means whereby when one closer is moved by said lever to its operative position the other of said closers is locked against movement until the return of said first closer to normal.

4. A circuit controller including a pair of circuit closers, an actuating lever for said closers, means whereby the actuation of either closer by said lever operates means to prevent the actuation of the other closer by said lever, and means for prolonging the contact of each closer.

5. In a circuit controller, the combination of a pair of circuit closers, an actuating lever pivotally hung between said closers, means whereby when one closer is moved by said lever to its operative position the other of said closers is locked against movement

until the return of said first closer to normal, and means for prolonging the contact of each closer.

6. In a circuit controller, a pair of interlocking arms, an actuating lever between said arms, and means whereby an actuation of either arm by said lever prevents an actuation of the other arm by said lever.

7. In a circuit controller, an actuating lever, an arm on either side of said lever, and means whereby an actuation of one arm by said lever prevents an actuation of the other arm by said lever until after the return of the first arm.

8. A circuit controller including a pair of arms, an actuating lever pivotally hung between said arms, and means whereby the operation of one arm moves a stop into the path of movement of the other arm to prevent the latter arm from being operated until the former has returned to normal.

9. In a circuit controller, a pair of arms, an actuating lever therefor, a circuit closer operatively connected to each arm, and means whereby either arm may make a portion of its return stroke before starting the return of its circuit closer.

10. A circuit controller including a pair of circuit closers, an actuating lever for moving each of said closers into operative position, auxiliary means for effecting the initial return movement of said closer, and means for completing said return stroke after having been started by said auxiliary means.

11. In a circuit controller, an actuating lever, a pivoted circuit closer, a restoring spring acting only to return said closer to open position after an actuation, and means whereby the restoring action of said spring is made ineffective until after the said closer has been started on its return movement from operative position.

12. In a circuit controller, a pair of interlocking arms, an actuating lever therefor, a pair of circuit closers, means whereby said closers may be operated to close their respective circuits, and means whereby the return of said closers may be delayed to prolong the contact.

13. In a circuit controller, an actuating lever, a pair of arms, a pair of circuit closers, a restoring spring for each circuit closer, means whereby said closers may be operated to close their respective circuits, and means whereby the restoring action of said springs will be least effective when the circuit closers are at their limit of operative movement.

14. In a circuit controller, the combination of an actuating lever, a circuit closer, means whereby said closer may be operated only to close a circuit, restoring means acting only to return said closer to oper circuit position, and means whereby the effective force of said restoring means will increase with the return of said closer to normal position.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER BEVAN.

Witnesses:
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