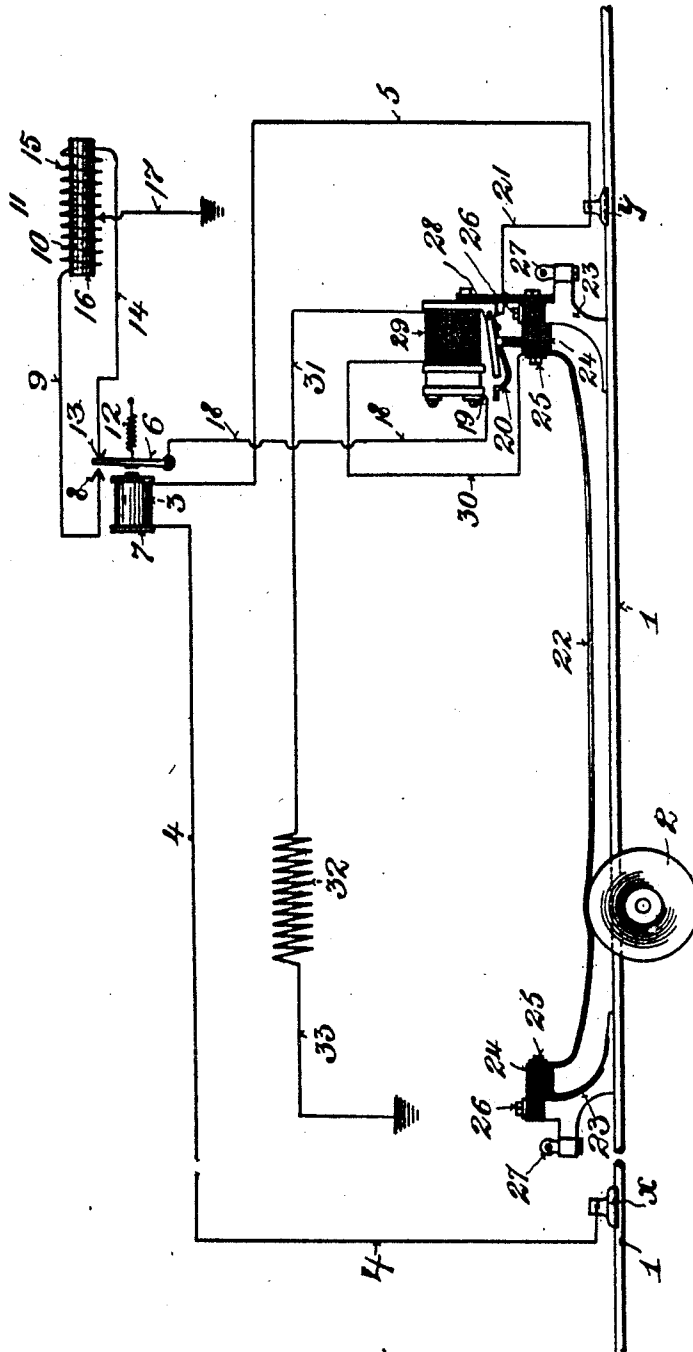


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 AUTOMATIC SWITCH FOR TROLLEY ROADS.
 APPLICATION FILED JULY 7, 1911.

1,035,115.

Patented Aug. 6, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

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AUTOMATIC SWITCH FOR TROLLEY-ROADS.

1,035,115.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed July 7, 1911. Serial No. 637,328.

To all whom it may concern:

Be it known that I, OGDEN ELLERY EDWARDS, Jr., a citizen of the United States, and a resident of the city of New York, county of Kings, and State of New York (whose post-office address is 206 Broadway, New York city), have invented a new and useful Improvement in Automatic Switches for Trolley-Roads, of which the following is a specification.

The object of my invention is to provide a switching device of the class shown in the Cheatham Patents 612,702, 696,313, 787,827 and 917,541, as well as in the Cheatham application 634,799, filed June 22nd, 1911. In each of these patents and in this application is shown and described an automatic switching device in which a motor current in a trolley car passing under the devices causes the switch to be thrown in one direction, and less than a motor current in the same car will cause the switch to be thrown in the other direction. The same result is obtained by my invention, but in a different way. In each of these Cheatham patents, and in the application, the motor current is drawn through the winding of the magnet of a relay when the trolley wheel of the car is on a conductor insulated from the trolley wire. In my invention the trolley wire is not interrupted, but is continuous, or the conductor on which the trolley wheel rests is in electrical connection with the trolley wire without the intervention of the winding of a magnet or anything else. The magnet of a relay, such as is used in telegraph instruments is connected to two separate points on the trolley wire, so that when a motor current is drawn through a trolley wheel, between these points, a difference in potential is established between these points, and then a current will flow through the magnet of the relay, and the difference in potential will be sufficient to draw the armature of the relay toward the magnet. When less than a motor current is taken through the trolley wheel, this armature will remain at rest

away from the magnet. The armature of the relay is connected with a double solenoid, the same as in the Cheatham patents and application, and a circuit is established between the trolley wire and the armature in any of many ways, and preferably as shown herein, the general scheme being that shown and described in the Farmer Patent No. 552,057, although it is obvious that any other arrangement may be employed which will prevent the continuous flow of current through the double solenoid when the device is not in use.

For a more particular description of my invention, reference is to be had to the accompanying drawing, forming a part hereof, in which the figure shows a diagrammatic view of one embodiment of my invention.

A trolley wire 1 is mounted in any suitable way and is adapted to be engaged by a trolley wheel 2 in the conventional manner. A relay 3, which may be of any suitable form, but is preferably of the type used in telegraphy, is connected to the trolley wire 1 by a wire 4 which runs to a point x , and another wire 5 which runs to a point y on the wire 1. The distance which separates the points x and y may be varied to suit the conditions of service and it is desirable that no feeder wire come to the trolley wire between these points. When a motor current is drawn through the trolley wheel 2, a difference of potential is established between the points x and y which is sufficient to draw the armature 6 of the relay 3 toward the magnet 7, and then this armature 6 connects with a contact 8 which has a wire 9 running to a coil 10 of the double solenoid 11. At this time the energizing of the magnet 7 is sufficient to overcome the energy of the retracting spring 12 which may be adjusted in any convenient way, so as to cause the armature 6 to remain at the contact 13 except when moved in response to a motor current, as above described. The contact 13 is connected by a wire 14 to the other winding 15 of the dou-

ble solenoid 11. This double solenoid is provided with a core 16 which is shifted one way or the other, depending on which coil is energized, as shown in said Cheatham patents, or otherwise, as desired. Both of these coils are grounded through a wire 17 in the conventional manner.

It is obvious that when the device is in use and at no other time, the armature 6 must be supplied with electricity if the device is to be operated, and if there is to be no waste of current. Many means may be employed for permitting current to flow to this armature at the proper time and I describe one with the understanding that any other may be substituted, if desired, the one shown being substantially that shown in the said Farmer Patent 552,057, dated December 24th, 1895. In my invention the armature 6 is connected to a wire 18 that runs to a contact 19 which is adapted to be engaged by an armature 20, which is preferably a gravity armature which is connected to a wire 21 that runs to the trolley wire 1 at any convenient point as the contact y . The armature 20 is normally away from the contact point 19, so that the circuit through the wire 18 is open at this point when the device is not in use. The means for closing the circuit at this point when the device is in use is as follows: A ribbon of metal or other suitable material 22 is supported above the trolley wire 1 by means of suitable brackets 23, the lower parts of which may be made of metal and secured to the trolley wire 1 in any suitable manner, and the upper parts 24, are blocks of insulating material to which the ribbon 22 is secured by bolts 25, or other suitable means, and these insulating blocks 24 may be secured by bolts 26. These brackets 23 also have projections with eyelets 27 adapted to receive guide-wires or other suitable means for holding them in place. One of the brackets 23 is provided with a projection 28 to which is secured a relay 29 of which the part 20 is the armature. This relay 29 has its magnet connected to a bolt 25 by a wire 30 and the other end of the winding of the magnet of this relay 29 is connected by a wire 31 to a resistance 32 which is connected to the ground by a wire 33, or in any other suitable manner, so that when the trolley wheel 2 is in contact with the ribbon 22, a circuit is established direct to the ground through the relay 29 and resistance 32. Only a very small amount of current will leak in this way so that no destructive arcing will result between the ribbon 22 and the trolley wire 1.

Near the point x the trolley wire is shown broken. This is done to indicate that the exact location of the point x is not material, provided it is sufficiently remote from

the point y to permit the necessary difference in potential. This point is preferably outside of the brackets 23 so that the armature 6 will make and break with the contacts 13 and 8 when they are not energized, whereby excessive sparking is avoided. This may be changed if desired, but the best embodiment of my invention known to me is the one I have shown.

It will be noted that in the embodiment of my invention herein shown and described, the elements are all old, but I claim that the combination is new. It is not material what the precise form of these elements is, provided the combination is substantially as set forth, so as to bring about the following operation: When the trolley wheel has no motor current passing through it and passes between the points x and y , the armature 6 remains in contact with the point 13 because the tension of the spring is not overcome by the magnet 7, light, heat and air brake motor currents not being sufficient to cause a difference of potential great enough to energize the magnet 7 so that it will overcome the tension of the spring 12. When the wheel 2 comes in contact with the ribbon 22, a circuit is immediately established to the ground through the winding of the magnet of the relay 29, and then the armature 20 is drawn to the contact 19 when a circuit is established directly from the trolley wire 1 to the armature 6, so that the coil 15 of the double solenoid 11 is energized. When a motor current is drawn through the trolley wheel 2 the action is the same as that above described, except that the difference in potential between the points x and y is sufficient to cause a current to flow through the magnet 7 which will energize it enough to overcome the tension of the spring 12, and throw the armature 6 against the contact 8, in which event the winding 10 of the double solenoid 11 is energized instead of the winding 15.

When using this device, the motorman should be careful to have his motor current off or on, according to the way he wishes to go, when the trolley wheel 2 is in contact with the ribbon 22.

Having thus described my invention, what I claim is:—

In a device of the class described, a trolley wire, a trolley wheel, a relay with its magnet connected to said trolley wire at separated points, an armature for said relay and two contacts against one or the other of which, said armature normally rests, means for holding said armature in its normal position when the magnet of the relay is not sufficiently energized to draw this armature, a double solenoid with one end of each coil grounded and the other end connected to one of said contacts so that either

one but not both of said coils may be energized at one time by a current passing through said armature and means controlled by the trolley wheel for causing a
5 current to pass through said armature when the trolley wheel is on a predetermined part of such trolley wire, so that when the device is in use, a motor current will cause one of

the coils of the solenoid to be energized and 10 less than a motor current will cause the other of said coils to be energized.

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Witnesses:

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