(No Model.) 2 Sheets—Sheet 1.

R. A. BALDWIN.

ELECTRIC RAILWAY SWITCH.

No. 545,870. Patented Sept. 10, 1895.

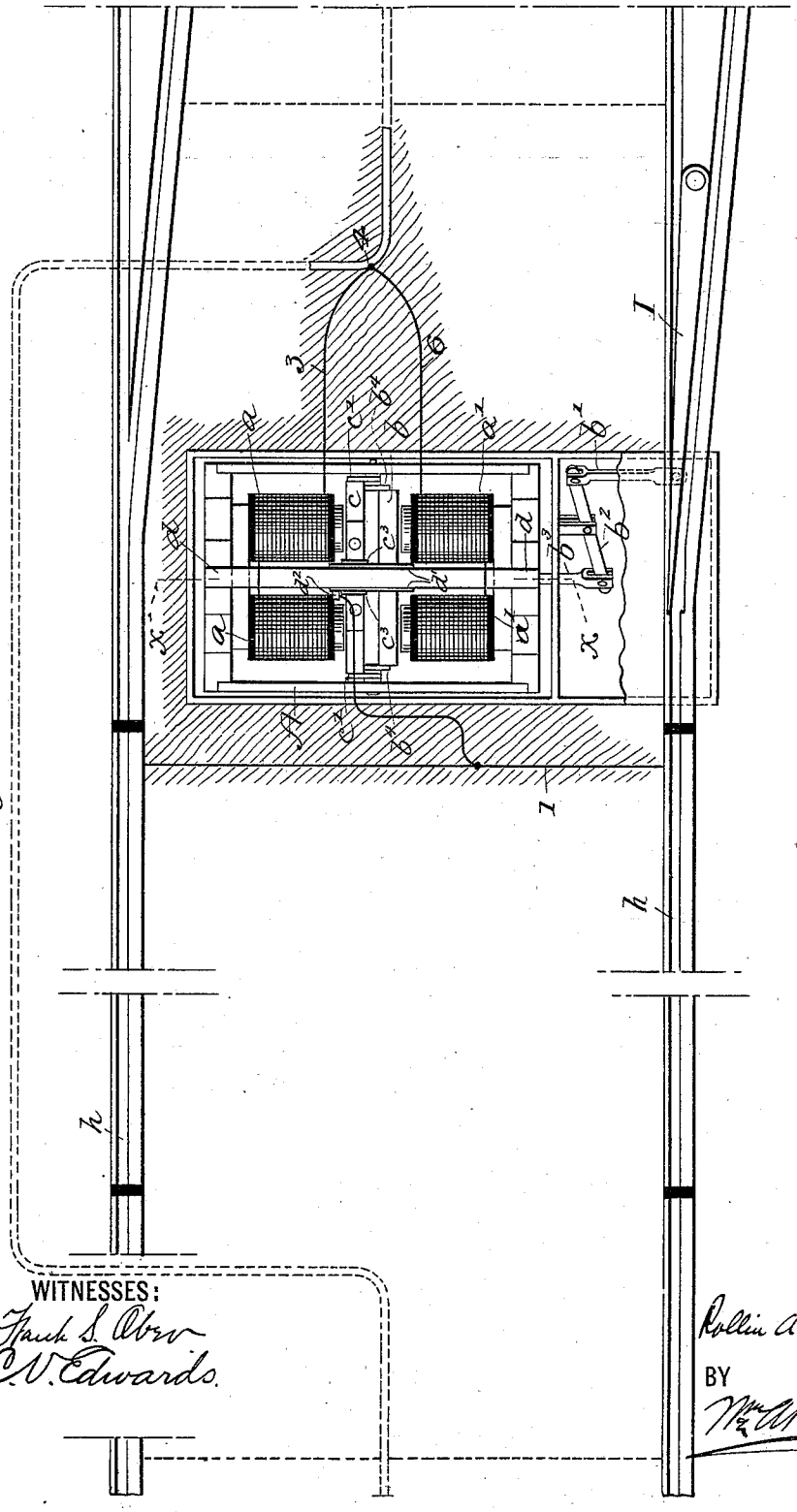

Fig. 1.

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Fig. 2.

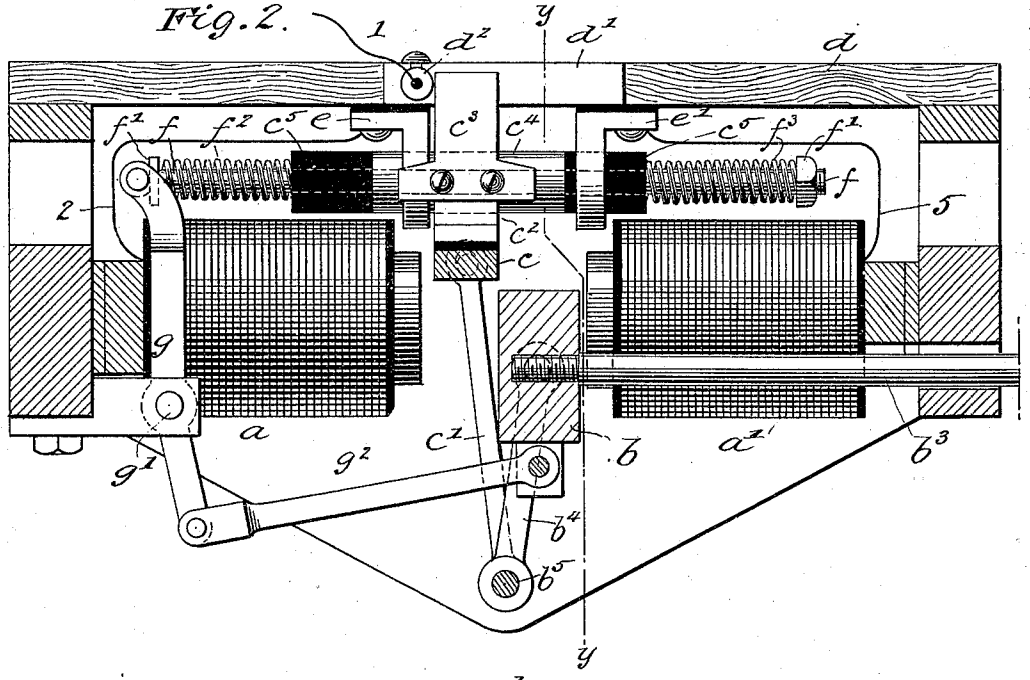
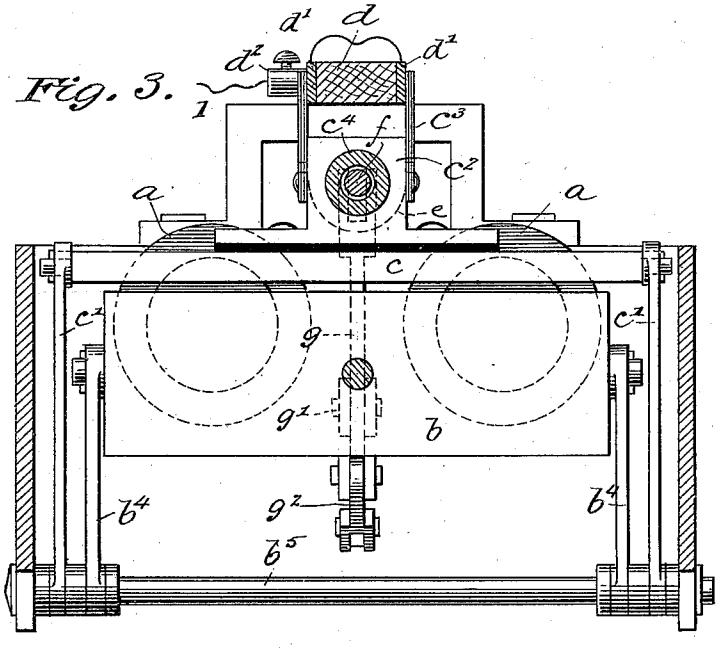


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROLLIN A. BALDWIN, OF SOUTH NORWALK, CONNECTICUT.

ELECTRIC-RAILWAY SWITCH.

SPECIFICATION forming part of Letters Patent No. 545,870, dated September 10, 1895.

Application filed January 4, 1895. Serial No. 533,793. (No model.)

To all whom it may concern:

Be it known that I, ROLLIN A. BALDWIN, a citizen of the United States, residing at South Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electric-Railway Switches, of which the following is a full, clear, and exact description.

This invention relates to electrically-operated railway-switches designed for use on electric railways. Its object is to provide a switch which shall be thoroughly reliable in operation and which will throw the switch or not, at the will of the motormen upon the vehicles.

The invention consists of the combination and arrangement of parts hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 represents a plan of my improved switch mechanism shown in the road-bed with a section of track. Fig. 2 is a sectional view of the switch-box, taken on line $x\ x$ of Fig. 1; and Fig. 3 is a section of the mechanism, taken on line $y\ y$ of Fig. 2.

The mechanism is supported in a frame A, which will be placed in a tight box sunk in the road-bed adjacent to a movable switch-point, as I. The switch-point is moved positively in opposite directions by the respective electromagnets a and a', the armature b of which being common to both magnets and connected with the switch-point I by rod b', lever b^2, and rod b^3. Armature b is mounted to swing between the facing poles of the magnets by means of two links b^4 b^4 at each end turning on a pivotal rod b^5, extending across the bottom of the frame. Besides the armature b there is also a second armature c, somewhat smaller, because its work is less, and located just above it. This is also mounted to swing between the polar faces, and for that purpose is hung on links c', also pivoted to rod b^5. The two armatures are entirely independent of each other. To the armature c is attached a casting c^2, which carries two contact-brushes c^3 c^3, shaped like an inverted T. These project above the casting and embrace a cross-piece d, to the sides of which, where the brushes bear, are attached two metallic plates d', electrically connected together. Beneath the cross-piece and suitably insulated are two lugs e and e' depending therefrom. Each is provided with an opening, and they are located on either side of the armature c, permitting of its movement between the pole-pieces of the magnets. The casting c^2 has attached to it or integrally formed with it a metallic tube c^4, extending in both directions therefrom through the openings in lugs e and e'. The ends of the tube are formed of insulating material c^5. In the tube is loosely placed a brass rod f, projecting some distance from both ends and tipped with nuts or other abutments f' f'. Between each abutment and its corresponding end of the tube is a spiral spring f^2 or f^3, which is either compressed or relaxed, according to the distance of the abutment from the end of the tube. One end of rod f is attached to a lever g, pivoted at g' and connected with the large armature b by a link g^2. The contact-brushes c^3 bear continuously upon plate d', and when stationary are also in contact with one or the other of the lugs e and e'.

The electric circuits are as follows: A section of the return circuit of the railway (track or other conductor) immediately preceding the switch-point is insulated, the regular return circuit shunting around it. This insulated section is represented in Fig. 1 by h, and from it a wire 1 leads to binding-post d^2, attached to plates d'. From lug e a wire 2 leads to magnet a; thence a wire 3 connects with the main return circuit of the railway at 4. Lug e' is connected by wire 5 with magnet a'; thence a wire 6 leads to the point 4.

One of the normal positions of the mechanism is shown in Fig. 2. The other would show the armatures in reverse positions. When a car approaches a switch, the motorman, if he finds it properly placed, shuts off the current and allows the car to pass over the insulated section of return conductor by its momentum. If he wishes to move the switch, he allows his car to be propelled over the insulated section by the current. The return current then travels from the insulated section of rails by wire 1 to the plates d' d', brushes c^3, lug e, wire 2, magnet a, wire 3 to the main return conductor. Magnet a being thus energized attracts both armatures, causing b to swing across the space between the magnet-poles and holding or locking c in its same position.

The movement of armature b throws the

switch-point I and swings the upper end of lever g inward, thus sliding the rod f through the tube c^4 and compressing spring f^2. The tube is, however, held stationary, because it is attached to armature c, which is being held by the magnet. When the car passes off the insulated section of track, there being no current flowing through the switch-box, spring f^2 exerts the power before stored in it and pushes tube c^4 to the right, thereby breaking the connection between the brushes and lug e and making it between the brushes and lug e'. Hence the next time current is sent through the switch-box the circuit will include magnet a' instead of a, and the switch-point I will be reversed. This time spring f^3 will be compressed, and as soon as magnet a' is de-energized it will reverse the position of the brushes. Thus it will be observed that by the use of the two armatures I am able to throw the switch-point and set the mechanism to reverse it at each operation. It is also pointed out that while a car is on the insulated section of track the motorman may throw the switch as often as he pleases by repeatedly cutting the current on and off.

With this apparatus the road cannot be blocked because of the failure of the switch to operate electrically, for it will be observed that the switch-point may be moved by hand at any time, and after each such operation the parts will be in position to operate electrically.

Having thus described my invention, I claim—

1. The combination of a railway switch-point, two electro-magnets adapted to move the same in opposite directions, a circuit changer acting to change the path of the current from one magnet to the other, and an armature common to both magnets and controlling the circuit changer to hold it in a given position until the flow of current ceases and then to permit it to operate, substantially as described.

2. The combination of a railway switch-point, two electro-magnets, an armature connected with the switch point and adapted to move the same in opposite directions, a second armature common to both magnets, a contact device carried by said second armature, two contact points in circuit respectively with said magnets and adapted to be engaged alternately by the contact device on the armature and means for moving the second armature when the flow of current ceases.

3. The combination of the two electro-magnets, armature c, a tube attached thereto, a contact device carried by the tube, two contact points with which said device is adapted to engage and which are in circuit respectively with said electro-magnets, a rod passing loosely through the tube and projecting from both ends thereof, springs interposed between the ends of the tube and the ends of the rod respectively, and a second armature and connections between the same and the rod, whereby movements of the rod will compress one of the springs, for the purpose set forth.

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

ROLLIN A. BALDWIN.

Witnesses:

FRANK S. OBLR,

C. V. EDWARDS.