

UNITED STATES PATENT OFFICE.

JAMES H. REINHARDT, OF NEWARK, NEW JERSEY, ASSIGNOR OF TWO-THIRDS TO PIERRE VAN ALSTYNE AND CHARLES E. HILL, OF NEW YORK, N. Y.

TRAMWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 488,132, dated December 13, 1892.

Application filed November 19, 1891. Serial No. 412,412. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. REINHARDT, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Street-Railway Switches; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to switches which are adapted to be shifted by the cars as they approach or pass onto the switch; and its object is to provide improved means for controlling the switch from the car itself, so that it may be operated or not, as desired, by the approaching car.

Particularly is it my purpose to so construct the controlling devices as to require very little power for their operation, while the actual shifting of the switch is accomplished with absolute certainty by the weight of the car.

In the drawings, Figure 1 is a plan view of a railway-switch having my improvements applied thereto, the covering-plate over the operating devices being removed and a portion of a car being shown. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section on the line xx of Fig. 2, showing the parts in normal position; and Fig. 4 is a similar section, but showing the parts in the position which they assume when the switch is operated. In Figs. 3 and 4 the switch-tongue is also shown in section for the purpose of illustrating its relation to the operating devices.

The rails M of the main line, the turn-out rails N, the guard-rails P, and the movable switch-tongues A, connected by the rod Q, may be all as usual.

Beneath one rail in a suitable cavity is supported a rock-shaft B, having near one end an arm C, which engages with one of the switch-tongues A. At or near the other end of the rock-shaft is fixed a horizontal arm D, to which is pivoted a lever E. A plate F is suitably pivoted to play in a slot in the covering-plate or in the rail and is normally

pressed upward by a spring f , so that its free end may be struck and moved downward by the car-wheel as it approaches the switch. The lever E plays beneath the free end of said plate F and is slightly overbalanced by a spring, so as to stand normally out of the path of said plate. While the lever stands in its normal position, no effect will be produced upon the switch-tongue by the passage of a car-wheel over the plate F, the switch-tongue being held in one position by a weight or spring b , applied to one of the arms of the rock-shaft. When it is desired to shift the switch, the application of a slight power to the lever E will cause it to stand in the path of the plate F, and the passage of the car-wheel over said plate will then shift the switch-tongue.

The means for setting the lever E comprises an electro-magnet G in a circuit, (indicated by full and dotted lines,) which includes a small battery K, and has its terminals in the rail M and in a bar L, fixed at any convenient point near said rail. Upon the approach of a car which it is desired should shift the switch the circuit will be completed from the rail through the wheel S, axle T, frame V, and a contact W, preferably a steel brush, from one of said terminals to the other. The electro-magnet G is placed in such proximity to the lever E that when it is energized it will attract the lever and cause it to assume the position shown in Fig. 4.

Normally the circuit including the magnet is open and the arm E stands as shown in Fig. 3. The passage of a car which does not carry a contact W or which bears a contact which is not depressed or otherwise so placed as to complete the circuit between itself and the plate L will depress the pivoted plane, but will not shift the switch by reason of the fact that the lever E is clear of the path of the plate F. If, however, the brush carried by the car is in such position as to contact with the plate L, the circuit will be completed and the lever E will be moved by the magnet into the path of the plate F. Then as the plate F is depressed by the car-wheel the lever E will be carried downward, rocking the

shaft B and shifting the tongue A. As the lever E, when free of the plate F, may be moved upon its pivot by a very slight force and as it cannot be clogged by dirt which may enter the cavity from the street, a very small battery may be relied upon to control the switch.

In localities where the rail is liable to be insulated at times by ice and so prevent the completion of the circuit it may be desirable to add another device to supplement the electro-magnet. To this end I support a permanent magnet H upon pivots *h*, with its neutral point overlying the end of an arm *e'*, which extends from the lever E, and with its poles upturned, as at *h'*, to stand near enough to the plate L to permit the contact or brush W, carried by the car, to pass within the magnetic field. The result is that when a car passes with its brush in position to contact with the plate L the poles of the magnet H will move toward the brush, the lever E will be thrown into the path of the plate F, and the switch will be shifted, whether the electro-magnet G be energized or not. In order to prevent a constant attraction of the magnet H, it will be desirable to form the plate L of some non-magnetic conducting material.

I claim as my invention—

1. The combination, with a movable switch-tongue and a spring-supported plate adapted to be depressed by the movement of a car, of a rock-shaft journaled beneath said tongue, a vertical arm fixed to one end of said shaft and directly engaging said tongue, a horizontal arm fixed to the other end of said shaft, a vertical lever pivoted to said horizontal arm beneath said plate and bearing the armature for a magnet, an electric circuit adapted to be closed by the passage of a car, and an electro-magnet included in said circuit and adapted to move said lever into the path of

said plate, substantially as shown and described.

2. The combination, with a movable switch-tongue and a spring-supported plate adapted to be depressed by the movement of a car, of a rock-shaft journaled beneath said tongue, a vertical arm fixed to one end of said shaft and directly engaging said tongue, a horizontal arm fixed to the other end of said shaft, a vertical lever pivoted to said horizontal arm beneath said plate and bearing the armature for a magnet, an electro-magnet adapted to move said lever into the path of said plate, an electric circuit including said magnet and having one pole connected to a track-rail and the other to a fixed contact plate or bar, and a contact carried by the car and connected by an electric conductor to a wheel of the car, substantially as shown and described.

3. The combination, with a movable switch-tongue and a spring-supported plate adapted to be depressed by the movement of a car, of a rock-shaft journaled beneath said tongue, a vertical arm fixed to one end of said shaft and directly engaging said tongue, a horizontal arm fixed to the other end of said shaft, a lever pivoted upon said arm and having a vertical arm beneath said plate and a horizontal arm, a permanent magnet pivoted with its neutral point overlying the horizontal arm of said lever and with its poles near the surface, and an armature for said magnet carried by the car, substantially as shown and described.

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

JAMES H. REINHARDT.

Witnesses:

A. N. JESBERA,
A. WIDDER.