

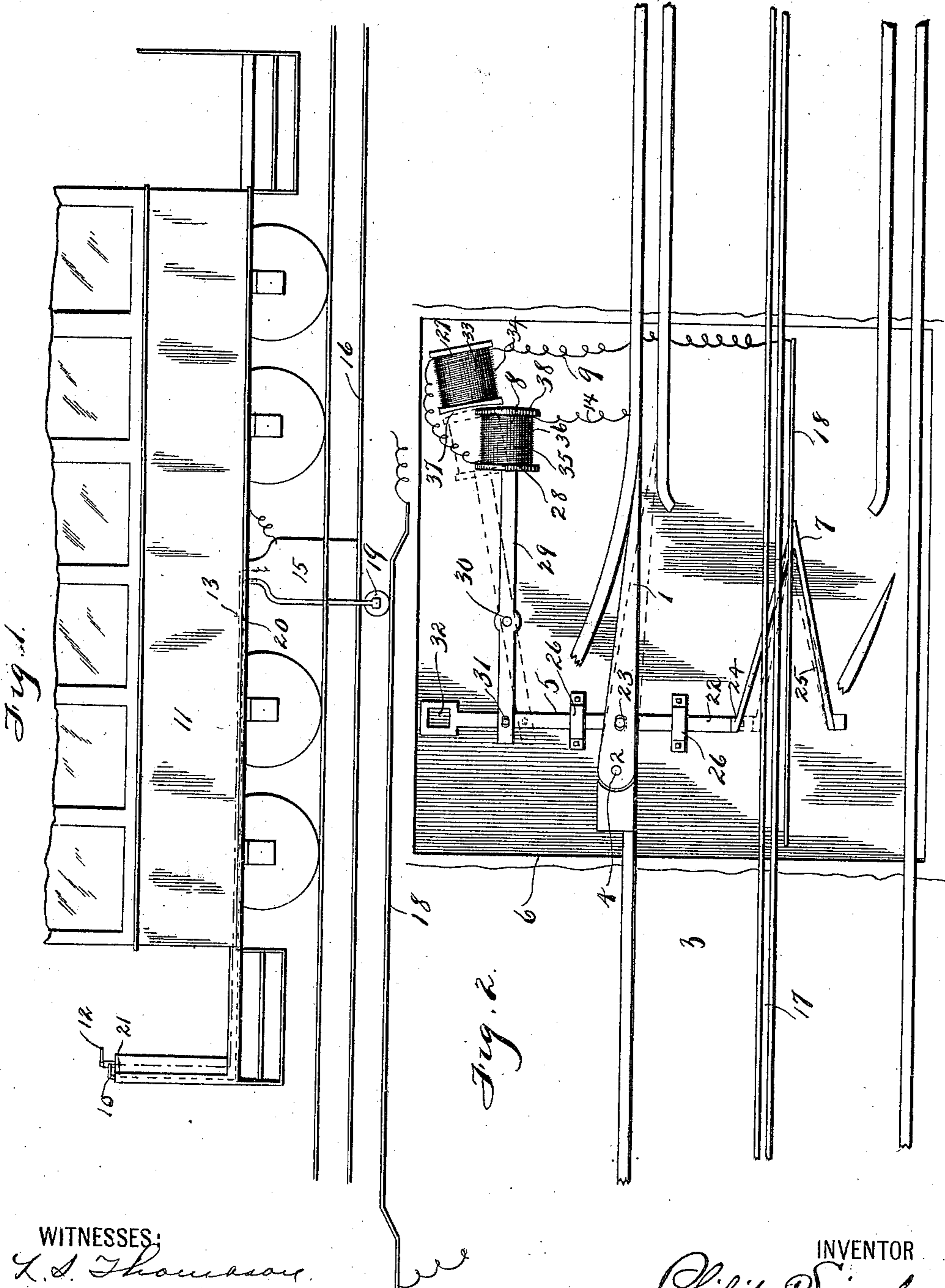
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P. SIEGEL.
ELECTRIC RAILWAY SWITCH.

(Application filed June 13, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ELECTRIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 688,797, dated December 10, 1901.

Application filed June 13, 1901. Serial No. 64,453. (No model.)

To all whom it may concern:

Be it known that I, PHILIP SIEGEL, a subject of the King of Roumania, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Railway-Switches, of which the following is a specification.

This invention relates to railway-switches which may be operated either by hand or by electricity, as desired; and it has for its object to provide an improved switch of this class which may be with facility controlled by hand or by the motorman or operator of the car by simply making or breaking an electrical circuit through switch-controlling agencies arranged in the road-bed. The current for actuating the switch-controlling agencies may be taken from the motor or light supply of the car either from overhead or beneath.

In the drawings, Figure 1 is a vertical sectional view of a portion of the road-bed of an electric railway and a portion of a car mounted thereon and showing the electrical circuits for supplying the car and for supplying the switch - controlling agencies which are mounted in the road-bed. Fig. 2 is a plan view of a portion of the road-bed of an electric railway provided with a switch and electrical controlling agencies for operating the same. In this view the road-bed is broken away in part to show the construction and arrangement of the several features of the invention.

Corresponding parts in both figures are denoted by the same reference characters.

Referring to the drawings, 1 designates the movable point of a switch 2, arranged in the road-bed 3 of an electric railway, said switch-point 1 being pivotally secured at its inner end, as at 4, and capable of movement laterally in the customary manner. The switch-point 1 is controlled by switch-controlling agencies 5, which are mounted in a suitable casing 6, which is arranged beneath the surface of the road-bed, and said switch-controlling agencies 5 embody tensional means 7 for maintaining the switch-point 1 in normal position, and also embody electromagnetic means 8 for actuating the switch-point in opposition to the energy of the tensional means 7 to "set" the switch-point 1 in operative po-

sition. The electromagnetic means 8 of the switch-controlling agencies 5 are fed by a line-wire 9, which may be energized by a circuit maker and breaker 10, mounted upon the car 11 in convenient position for control by the motorman or operator of the car. As illustrated, the circuit maker and breaker 10 is preferably arranged in juxtaposition to the controller 12 of the car and may take its current through the controller mechanism from the main supply - wire 13 of the car. The electromagnetic means 8 are also provided with a ground-wire 14.

The employment of the electromagnetic means 8 in a switch-controlling mechanism of the class described is manifestly equally well adapted to an overhead, underground, or storage system of electrical supply; but in the present case the controller 12 is shown as supplied by a main supply-wire 13, which is in electrical connection with a contact-shoe 15, which traverses an underground electrical main 16 through a road-bed slot 17 in the customary manner. The line-wire 9 is energized through the medium of a circuit member 18, which is arranged in the conduit through which extends the electrical main 16, and said circuit member 18 is energized by a supplemental contact - shoe 19, which likewise extends through the road-bed slot 17, being preferably connected with, but insulated from, the main contact-shoe 15. This supplemental contact-shoe 19 is electrically connected with the circuit maker and breaker 10 by a circuit-wire 20.

It is manifest from the above that by suitably manipulating the circuit maker and breaker 10 a closed circuit may be established through the electrical main 16, the main contact-shoe 15, the supply-wire 13, the controller mechanism 12, the circuit maker and breaker 10, which is electrically connected with the controller mechanism 12 by a circuit-wire 21, the circuit-wire 20, the supplemental contact-shoe 19, the circuit member 18, the line-wire 9, the electromagnetic means 8, and the ground-wire 14. The circuit member 18 is of sufficient length and is of proper arrangement and longitudinal extension with respect to the switch 2 and the switch - controlling agencies 5 to permit the setting of the switch

when the car 11 is at an appreciable distance from the switch. As soon as the supplemental contact-shoe 19 passes out of contact with the circuit member 18 the tensional means 5 9 move the switch-point 1 from operative or set position into normal position. If it is desired to pass the switch 2 without setting the same, the circuit maker and breaker 10 is not manipulated to close the circuit through the 10 electromagnetic means 8.

In the preferred form of construction the switch-controlling means 5 embody a reciprocating bar 22, which is arranged within the casing 6 to move transversely of the road-bed and has a loose pin-and-slot connection with 15 the switch-point 1, as at 23. The tensional means 7 are operatively connected with one end of the reciprocating bar 22, as at 24, and may consist of a strong spring 25, which is 20 mounted within the casing 6. The reciprocating bar 22 may be slidably suspended in spaced keepers 26, which are secured to the bottom of the casing 6.

The electromagnetic means 8 embody a 25 fixed member 27 and a movable member 28, which latter member may be mounted upon an oscillating arm 29, which is approximately centrally pivoted within the casing 6, as at 30, and mounted in a horizontal plane. The 30 end of the arm 29 opposite that which carries the movable member 28 of the electromagnetic means 8 has a loose pin-and-slot connection with the bar 22, as at 31, whereby the 35 movement of the movable member 28 of the electromagnetic means 8 in the proper direction will cause the endwise movement of the bar 22 against the power of the spring 25 to set the switch-point 1. The bar 22 may be 40 formed at one end, as at 32, to receive a suitable implement to enable the switch-point to be manually set, if desired.

The members 27 and 28 of the electromagnetic means 8 consist, respectively, of a fixed 45 pole or field element 33, which is provided with the customary winding 34, and an armature element 35, which is provided with the customary winding 36. The winding 36 of the armature element 35 is connected with 50 the ground-wire 14 and with the winding 34 of the pole element 33, which winding 34 is electrically connected with the line-wire 9. The pole element 33 is arranged in such a radius of a circle drawn through said pole element and the point 30 of pivotal support of 55 the arm 29 that when the electromagnetic means 8 are energized to bring the fixed member 27 and the movable member 28 of the electromagnetic means 8 into juxtaposition, or into the same radius of said circle, the switch- 60 point 1 will be set in operative position. The pole element 33 is provided with a concave end portion 37, and the armature element 35 is provided with a convex end portion 38, which is adapted to be received in the con- 65 cavity of the end portion 37 of the pole element when the electromagnetic means 8 are energized.

In Fig. 2 the members 27 and 28 of the electromagnetic means 8, together with the switch-point, are shown in full lines in inop- 70 erative position and in dotted lines in operative position.

The operation and advantages of my improved automatic electrical railway-switch will be readily understood by those skilled in 75 the art to which it appertains. When it is desired to set the switch-point 1 in operative position, the operator of the car manipulates the circuit maker and breaker 10 so as to close an electrical circuit through the electro- 80 magnetic means 8 and cause the arm 29 to swing the bar 22 transversely of the road-bed against the resistance of the spring 25, which normally maintains the switch-point in inoperative position. As soon as the electrical 85 circuit last mentioned has been broken or the supplemental contact-shoe 19 has passed beyond the circuit member 18 the switch-point 1 is returned to normal position by the spring 25. It will thus be seen that the condition 90 of the switch as a car approaches the same may be regulated entirely by the operator of the car without leaving the same, thus also obviating the necessity of providing a separate operator for the switch, which switch op- 95 erators are customarily stationed at railway-switches to set the same as required.

The casing 6, with the several parts of the switch-controlling agencies 5, may be conveniently arranged in the road-bed just beneath 100 the surface of the same and will effectually protect the working parts of the mechanism from injury or derangement.

The arrangement and provision of the several circuit wires and members and the elec- 105 trical supply for the same may be varied according to the system of electrical supply and transmission employed in a given railway and in accordance with the working conditions to be met with. 110

The entire switch-controlling mechanism is relatively simple and inexpensive in the construction of its several parts and is not liable 115 to get out of order or to deteriorate appreciably in use.

I do not desire to be understood as limiting myself to the details of construction and arrangement as herein described and illustrated, as it is manifest that variations and modifications may be made in the features of 120 construction and arrangement in the adaptation of the device to various conditions of use without departing from the spirit and scope of my invention and improvements. I therefore reserve the right to all such varia- 125 tion and modification as properly fall within the scope of my invention and the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Pat- 130 ent—

1. The herein-described railway-switch, comprising a switch proper consisting of a switch-point movably mounted in the road-

bed, and controlling agencies for the switch mounted beneath the surface of the road-bed and embodying a bar mounted to reciprocate transversely of the road-bed and provided with an opening for the insertion of a lever for manipulating the switch-point by hand and electrical means for also moving said switch-point.

2. The herein-described railway-switch, comprising a switch proper consisting of a switch-point movably mounted in the road-bed and controlling agencies for the switch mounted beneath the surface of the road-bed and embodying a bar mounted to reciprocate transversely of the road-bed and provided with an opening for the insertion of a lever for manipulating the switch-point by hand, an oscillating arm connected at one end to said reciprocating arm and provided at the other end with an electric device adapted to move said oscillating arm and means for operating said electric device.

3. The herein-described railway-switch, comprising a switch proper consisting of a

switch-point movably mounted in the road-bed, and controlling agencies for the switch mounted beneath the surface of the road-bed and embodying a bar mounted to reciprocate transversely of the road-bed and provided with an opening for the insertion of a lever for manipulating the switch-point by hand, an oscillating arm connected at one end with said reciprocating bar and provided at the other end with an armature, a pole or fixed member located adjacent to said armature and adapted, when the armature is attracted to the pole, to set said switch-point in operative position, tensional means for normally holding said switch-point in inoperative position, and means for energizing said pole and armature.

In testimony whereof I have signed my name in the presence of the subscribing witnesses.

PHILIP SIEGEL.

Witnesses:

GEO. VAIL HUPPERTZ,
J. R. LITTELL.