

No. 643,205.

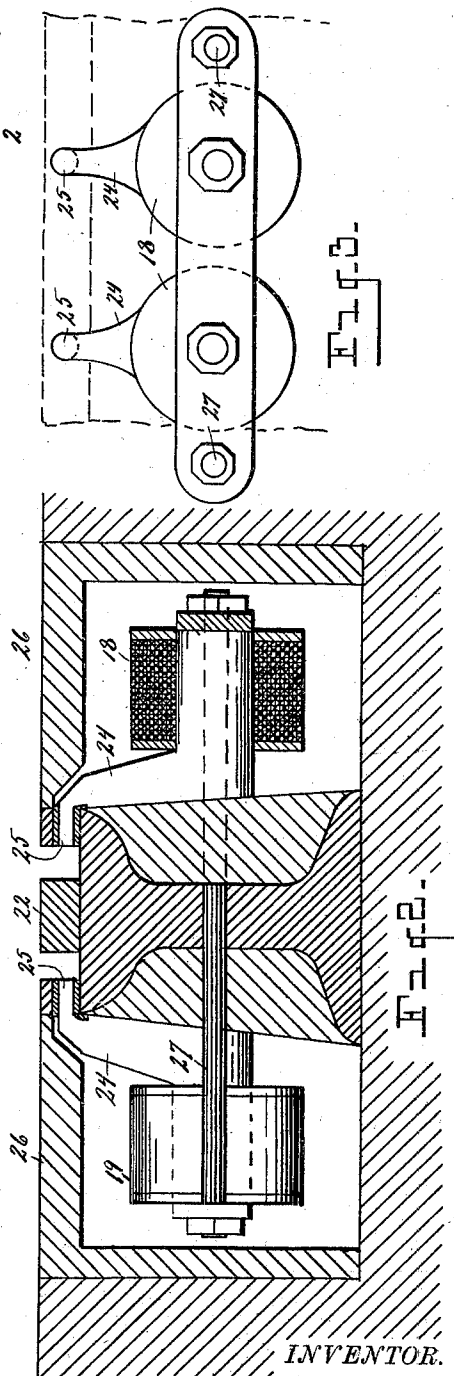
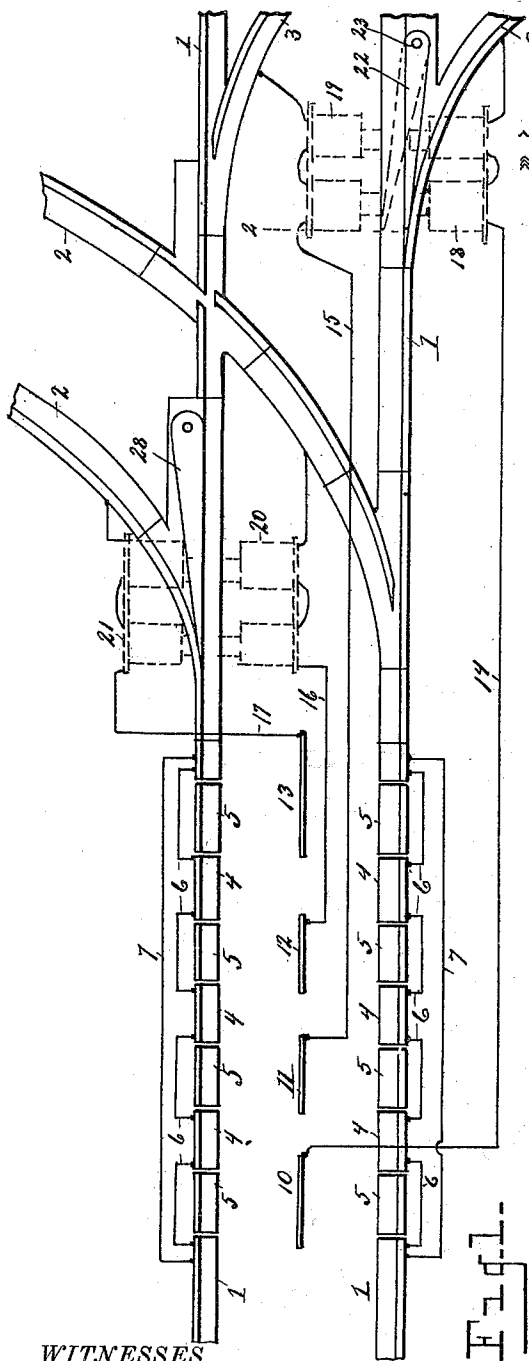
A. W. RUMSEY.
SWITCH.

(Application filed Nov. 16, 1899.)

Patented Feb. 13, 1900.

(No Model.)

2 Sheets—Sheet 1.



WITNESSES.

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ALBERT W. RUMSEY, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
PHILLIP BINGMAN, OF SAME PLACE.

SWITCH.

SPECIFICATION forming part of Letters Patent No. 643,205, dated February 13, 1900.

Application filed November 16, 1899. Serial No. 737,181. (No model.)

To all whom it may concern:

Be it known that I, ALBERT W. RUMSEY, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Switches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in electrically-actuated switches, more especially designed for street-railways; and it consists in the construction and arrangement of the parts hereinafter fully set forth, and pointed out particularly in the claims.

One object of the invention is to produce a switch of the character described adapted to be actuated by the motor-current and in which the arrangement is such as to enable the utilization of the current after passing through the motor in the operation of propelling the car for throwing the switch.

A further object is to provide magnets of a peculiar construction which render them adaptable for moving the pivoted tongue and at the same time provide for the development of sufficient magnetic force therein to insure at all times a perfect operation of the switch.

The above objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a track system embodying my invention. Fig. 2 is an enlarged transverse section through a portion of the switch and operating-magnets as on line 2 2 of Fig. 1. Fig. 3 is an end elevation of one of the magnets. Fig. 4 is a diagrammatic view of the electric circuit, showing in elevation a section of the track and a car thereon, through the movable contact of which the circuit is completed. Fig. 5 is a like view showing a plan of a portion of the track and a car thereon, illustrating the course of the

circuit through the motor to central conductor, to switch-operating magnets, and to the track.

Referring to the characters of reference, 1 designates the main track, which in Fig. 1 is shown provided with two branches 2 and 3, respectively, having suitable curves provided with switches. The rails of the main track at a proper distance from the switches are divided into insulated sections 4 and 5. The sections 4 are connected together and to the main tracks by means of bonds or conductors 6, while the sections 5 have no electrical connection with the track and, in fact, are dead-sections. The main rails of the track are electrically connected around the sections 4 and 5 by means of a bond or conductor 7. The main rails of the track, as will be understood and as shown in Figs. 4 and 5, are connected with the source of the electric energy 8, with which the overhead conductor 9 is also connected. The car carries a trolley running in contact with the overhead conductor, through which the electric current is directed to the motor which propels the car, as hereinafter explained.

Located in the center of the track between the main rails and opposite the insulated track-sections 5 are the contact-sections 10, 11, 12, and 13, connected to the main rails of the track by their respective lines 14, 15, 16, and 17. Included in each of said lines are electromagnets 18, 19, 20, and 21, which are employed to actuate the pivoted tongues of the switches in changing the direction of the car. It will therefore be seen that the electromagnets which operate the switches are in fact included in the bonded circuit of the track and are in series with the motor on the car through the central sections in circuit therewith and the contact, hereinafter explained, carried on the car, by means of which the negative current after passing through the motor may be shifted from the ordinary bonded conductors through the conductors in which said electromagnets are located.

The switch connecting the branch 3 with the main track is provided with a tongue 22,

pivoted at 23 and adapted to be drawn from side to side to change the direction of the car in the ordinary manner. The electromagnets 18 and 19 are located upon opposite sides of said tongue, and the cores 24 of said magnets extend upwardly and are provided with right-angled end portions 25, which project adjacent to the opposite sides of the tongue 22. This formation of the cores of the magnets enables the poles to be presented in proximity to the pivoted tongue of the switch and the magnets to be located sufficiently below the grade of the track to be out of the way. The cores, as will be seen in Fig. 3, are tapering, being of large size where they receive the winding of the magnetic coils and of reduced size at the point where they are presented to the tongue of the switch, whereby their magnetic force is concentrated and their energy rendered sufficient to insure the operation of the tongue of the switch under all conditions. The extreme ends 25 of the cores of the magnets project through the fixed rails of the track and are insulated therefrom, as shown at 28 in Fig. 2. The coils of the magnets are located in a suitable housing 26, set into the bed of the track, and are supported on the transverse rod 27, passing through the track-rail.

The description just given of the magnets 18 and 19 will apply as well to magnets 20 and 21, which are in like manner placed to operate the pivoted tongue 28 of the switch in the branch track 2.

Carried on the car 29 and adapted to be operated by the motorman is a contact 30, which is in circuit with the motor 31 through the car-frame and which is adapted to have contact with the sections 10 to 13, inclusive, in the center of the track at the will of the motorman. When approaching the first switch from the left and it is desired to pass straight along the main track instead of following the branch 2, the contact 30, carried on the car, is caused to engage the central track-section 13 in circuit with the magnet 21, at which time the wheels of the car will rest upon the dead or insulated section 5 of the track, (see diagram Fig. 5,) so that the motor-current which is drawn through the trolley 31 from the overhead conductor, being unable to find escape through the main rails of the track because of the insulated section 5, upon which the wheels of the car are resting, is diverted through said contact 30 to the conductor 17 and the electromagnet 21 to the rails of the track, thereby energizing said electromagnet and drawing the pivoted tongue 22 over to the position shown in said Fig. 5, whereby the same current which passes through the motor to drive the car is directed through the electromagnet to actuate the switch, by which arrangement it will be seen that in energizing the electromagnet to operate the switch the negative current is simply diverted through the conductor in which said magnet is located,

making said magnet a part of the bonded system of the track, whose large coils require but little power in addition to what would be necessary to pass the current through the ordinary bond-wire, thereby economizing in the use of the power. To operate the tongue 28 in the opposite direction, so as to cause the car to follow the curve of the branch 2, the contact 30, carried by the car, is caused to engage the central track-section 12, whereby the current which passes through the motor will be directed through magnet 20 and the tongue 28 will be drawn over, so as to direct the car on the branch 2, as will be well understood. The tongue 22 of the second switch is in like manner operated through the central sections 10 and 11 and through the medium of the contact 30, carried by the car, which is caused to engage said sections, whereby the motor-current is directed through their respective lines to the magnets 18 and 19.

It will be understood that the insulated sections 5 will be several rods in length and that the central sections will be of corresponding length, so as to give ample opportunity to operate the switches.

Having thus fully set forth this invention, what is claimed is—

1. In an electric switch, the combination with the overhead conductor, of the rails of the track, said rails having insulated sections, a central rail-section between said insulated sections of the track, said central section in circuit with the main-track rails and an electromagnet included in said circuit, a pivoted tongue located in the track adjacent to said magnet, a car having a motor in circuit with said overhead conductor, a contact carried by the car, in circuit with said motor and adapted to be placed in contact with said central rail-section, to place said magnet in the motor-circuit.

2. In an electric railway-switch, the combination with the overhead conductor and the rails of the track in circuit with a source of electricity, said track-rails having insulated sections, independent sections located in the track between said insulated rail-sections, separate lines leading from said independent sections to the main rails of the track, an electromagnet located in each of the said lines, a pivoted tongue in the track-rails adjacent to the poles of said electromagnets, a car carrying a motor which is in circuit with the overhead conductor and with the rails of the track, a movable contact on the car also in circuit with the motor, said contact being adapted to be caused to engage said central sections whereby the motor-current may be diverted through said electromagnets to the rails of the track.

3. In an electrical switch, the combination of the track and overhead conductor in circuit with a source of electricity, a movable tongue in said track, an electromagnet adja-

cent to said tongue and adapted to actuate it, and a car having a motor in circuit with said overhead conductor and said electric magnet.

5 4. In an electric switch, the combination with a track, having a movable tongue therein, an electromagnet, said magnet having a core upon which the coil is mounted, said core having an upwardly-projecting tapered end provided with a right-angled portion stand-

ing adjacent to said tongue and means for 10 passing an electric current through said magnet.

In testimony whereof I sign this specification in the presence of two witnesses.

ALBERT W. RUMSEY.

Witnesses:

P. BINGMAN,
E. S. WHEELER.