

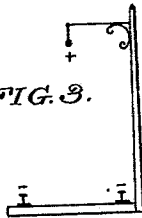
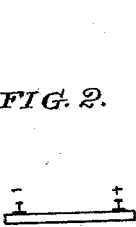
2 Sheets—Sheet 1.

Patented June 23, 1896.

No. 562,766.

A schematic diagram of a four-wire transmission line. The top two wires are labeled B' and B , with an arrow pointing right between them. The bottom two wires are labeled B' and B , with an arrow pointing left between them. A shunt load is connected across the bottom two wires. The load consists of a resistor I^5 in series with a parallel combination of two branches. The first branch contains a switch I^6 and a component I^7 . The second branch contains a switch I^8 and a component I^9 . A dashed line indicates a continuation of the line to the right. On the far left, a gear-like symbol is labeled A/Q .

FIG. 5.



A schematic diagram of a vehicle, represented as a rectangular block with rounded ends, resting on two wheels. A vertical line connects the top center of the vehicle to a point labeled C on a horizontal line labeled B' . Inside the vehicle, a horizontal line is labeled E^2 . Below this line, a spring-damper system is shown, consisting of a spring (represented by a zigzag line) and a damper (represented by a rectangle with a diagonal line). This system is connected to a point labeled D^2 on the vehicle's chassis. A dashed line connects the center of the front wheel to the point D^2 . The ground is represented by a horizontal line at the bottom, labeled B .

A diagram showing a vertical rod with a central vertical line and two horizontal lines at the bottom, labeled C' and C^2 .

Henry Denny
Wm. L. Evans

Frederick

(No Model.)

2 Sheets—Sheet 2.

R. M. HUNTER.
ELECTRIC RAILWAY.

No. 562,766.

Patented June 23, 1896.

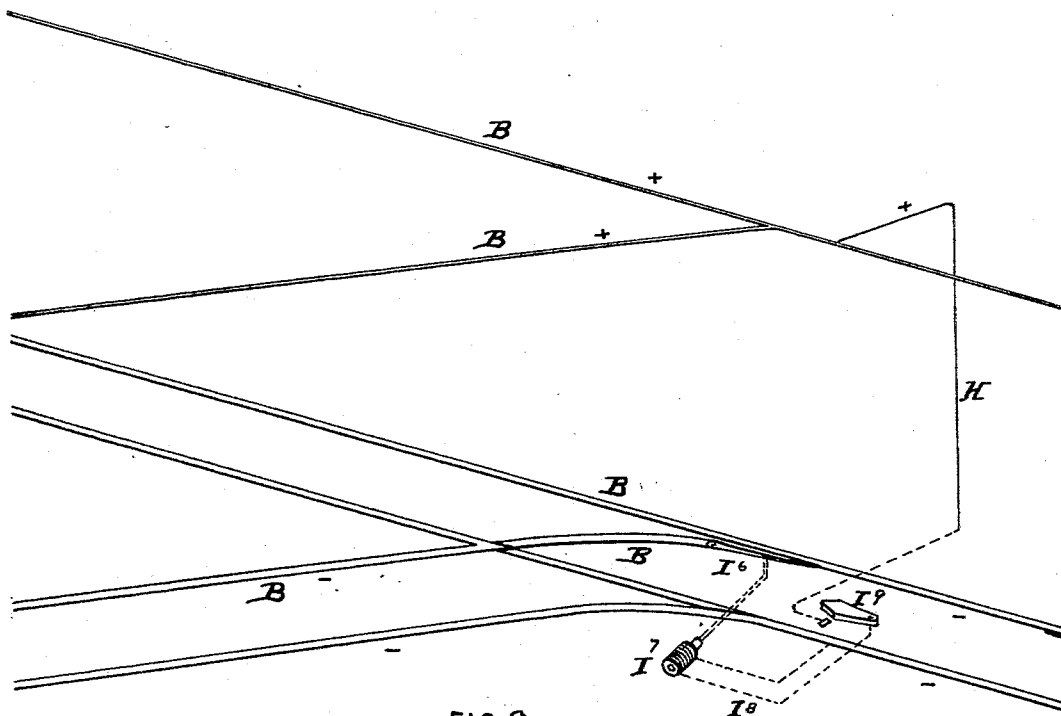


FIG. 8

WITNESSES

Wm. L. Kraus
R. M. Kelly

INVENTOR:

J. M. Smith

UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE ELECTRIC CAR COMPANY OF AMERICA, OF SAME PLACE.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 562,766, dated June 23, 1896.

Original application filed September 23, 1886, Serial No. 214,309. Divided and this application filed July 11, 1895. Serial No. 555,627. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Electric Railways, of which the following is a specification.

My invention has reference to electric railways; and it consists in certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

This application (Case No. 284) is a division of my application, Serial No. 214,309, filed September 23, 1886.

My improvements comprehend certain features comprising a main track and a branch track with an electrically-actuated switch adapted to be controlled by or from a traveling vehicle, and will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic plan view of an electric railway embodying my improvements. Figs. 2, 3, 4, and 5 are cross-sections showing modified arrangements of the electric circuits which may be used upon the railway. Fig. 6 is a side elevation of an electric car adapted to use with invention. Fig. 7 is an end view of a modified form of current-collector, and Fig. 8 is a perspective view showing my electrically-actuated switch applied to railways having suspended conductors.

Referring to Fig. 1, I have the branch railway I^2 arranged parallel to the main track, and with the electric conductors BB' arranged in the order shown, in which the conductors of different polarity on the main line and branch tracks are arranged alternately and electrically connected to the corresponding poles of the generator A' . The branch line of conductors I^3 has connection with the main line by a moving switch-point I^6 .

A car may be run upon the main track and down upon the branch track, or vice versa, the switch admitting of this without turning the car end for end. This branch track may be used to store surplus cars, or may be operated as one of the main branches to the main track in carrying passengers.

The switch may be operated automatically as follows: An electric motor I^7 (two forms being shown) is connected to move the switch-point I^6 , and is operated in a derived circuit I^8 , connected with positive and negative line conductors. This derived circuit is provided with a switch I^9 , which is operated to make or break the circuit I^8 , and this is secured by means of rollers i' on the cars. By making the switch I^6 to close under a spring-action due to spring i , the cars of the main track may pass freely up the main track contrary to the point of the switch; and in returning, where they are not required to go upon the branch track, the rollers i of the car C operate the switch I^9 so as to cause the motor to open the track-switch I^6 and permit the cars to return on the main line. In those cases where the cars are to run upon the branch track the car need not be provided with rollers i' , and in this case the cars will be directed onto the branch track by the switch-point. In other words, normally, the circuit I^8 is broken, and the switch I^6 closed, so that cars which do not operate the circuit-closer switch I^9 might pass on down the branch track, but those which must pass down the main line are arranged to automatically close the circuit I^8 and thus control the motor I^7 , causing it to open the switch I^6 to permit the cars to pass on; and as the car passes the switch I^6 , to open the circuit-closer switch I^9 and thereby break the circuit I^8 , allowing the switch I^6 to once more close.

It is evident that if desired the main line may be left open normally and certain of the cars arranged to close the switch and pass to the branch track.

Various forms of switch-operating devices might be used, that shown being merely illustrative of the principle involved.

Fig. 1 shows the diagram of circuits, which are indicated as the rails. In this case the construction would be similar to that shown in Fig. 2 and the rails would be the means of supplying current to the car. If desired, the two track-rails may supply current of one polarity, and the third rail or conductor may supply current of another polarity, as indicated in Fig. 5. It is also evident that, if desired, the track-rails may be the return-

conductors, and a suspended conductor used as the positive conductor; as shown in Fig. 3. It is also evident that one or both of the conductors may be placed in a conduit, as indicated in Fig. 4.

Fig. 6 shows an electric car adapted, for example, to the particular system shown in Fig. 3. D^2 is the electric motor. E is the motor-circuit; e^2 , the current-controlling device or regulator, and C the collector. In case of the conduit the collector is made in the form shown in Fig. 7, which makes a traveling contact with the conductors by means of roller-contacts C^2 , arranged on the bottom of the shank C' , which is carried by the car and extends through the slot of the conduit.

The switch I^6 is adapted to any of the conductors or rails as may be found necessary. In the cases where the rails are used as conductors the wheels act as collectors or contacts, and these are guided by the electrically-actuated switch.

My invention applied to the system of railway of Fig. 3 is shown in Fig. 8, in which the rails B act as the negative conductor or return, and the suspended conductors B' act as the positive conductors.

I^6 is the track-switch and is operated by the electromagnetic device I^7 . The switch I^9 , moved by the car, controls the circuits I^8 H, which supply current from the suspended conductors B' to the electromagnetic device I^7 .

I do not confine myself to the mere details of construction, as they may be modified in various ways without departing from my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a main railway, a branch or turnout railway, a switch-point for the track at the junction of the two railways, an electric-power device for moving the switch-point, a source of electric energy, circuits for supplying energy to the electric-power device, a switch for opening and closing the electric circuit adapted to remain open or closed of itself and maintaining the electric circuit in open or closed condition for periods of time after the car has ceased to act upon it, a traveling car, and means upon the car for both closing and opening the electric-circuit switch in a positive manner.

2. The combination of a main railway, a branch or turnout railway, a switch-point for the track at the junction of the two railways, an electric-power device for moving the switch-point, a source of electric energy, circuits for supplying energy to the electric-power device, a switch for opening and closing the electric circuit and maintaining it in open or closed condition for periods of time, a traveling car, and means upon the forward and rear portions of the car for closing the circuit-switch and after it has remained closed and the car passed upon the branch track to open the circuit-switch.

3. In an electric railway the combination

of a main track and a branch track, a track-switch movable at the juncture of said tracks, an electromagnetic device for operating the track-switch, electric circuits extending along the main line and branch tracks and including the track-switch, circuits from the electrical conductors and including the electromagnetic device, a controlling-switch for controlling the said circuit for maintaining the same open or closed, an electrically-propelled car receiving current from the electrical conductors, and means upon the car for both positively opening and closing the controlling-switch for controlling the electromagnetic device.

4. The combination in an electric railway of a main line and branch track having a track-switch at their juncture and constituting with the switch a working conductor of one polarity, a line conductor extending along the main line and branch track and past the track-switch and constituting a working conductor of the other polarity, an electromagnetic-power device for moving the track-switch, a circuit connecting the two conductors and including the electromagnetic-power device, a controlling-switch for opening and closing the circuit of the electromagnetic-power device, an electrically-propelled car receiving current from the two conductors of opposite polarity while passing over either of the tracks and over the track-switch, and means upon the car for actuating the controlling-switch in the circuit of the electromagnetic-power device.

5. The combination in an electric railway of a main line and branch track having a track-switch point at their juncture and constituting with the switch a working conductor of one polarity, a line conductor independent of the track extending along the main line and branch track and past the track-switch and constituting a working conductor of the other polarity, an electromagnetic-power device for moving the track-switch, a circuit connecting the two conductors and including the electromagnetic-power device, a controlling switch for opening or closing the circuit of the electromagnetic-power device, an electrically-propelled car receiving current from the two conductors of opposite polarity while passing over either of the tracks and over the track-switch, means upon the car for actuating the controlling-switch in the circuit of the electromagnetic device, and a regulator upon the electric car to control its speed in passing from one track to the other and over the switch devices.

6. A main railway, a branch railway, and a track-switch at their junction electrically connected with the rails of the main and branch railways, in combination with suspended working conductors extending along the main and branch railways and past the switch, a source of electric energy for supplying current of one polarity to the suspended conductors and of the other polarity

to the tracks and switch, an electromagnetic-
power device to positively shift the switch to
open or close the main track, an electric cir-
circuit connecting electrically with the suspend-
ed conductor and tracks to supply current to
the electromagnetic-power device, an electric-
ally-propelled car, and means on the car for
positively closing and opening the electric

circuit of electromagnetic-power device while
the car is passing the track-switch.

In testimony of which invention I hereunto
set my hand.

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,
ROSE M. KELLY.