

UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 481,905, dated August 30, 1892.

Application filed September 21, 1891. Serial No. 406,408. (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 of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

This application (Case No. 206) has special reference to systems employing conductors arranged below the car, though, broadly considered, the conductor may be arranged at any elevation.

In carrying out my invention the conductor of electricity is supported parallel to the track, so as to expose the under side, with which a traveling contact carried by the car makes electrical connection for supplying current to the motor on the car. The collector is preferably supported upon the axle or axles independently of the car-body, and the contact thereof is preferably movable vertically independently of the collector-body for the purpose of switching from one track and conductor to another track and conductor. The branch conductor meets the main line at an angle, and a space is left between the two conductors, though they may be electrically connected by a conducting-wire out of the path of the collector. At a lower elevation than the main-line and branch conductors and adjacent to their juncture is a switching-section of conductor, with which the contact is made to form an electrical connection at the moment of passing from the main line to the branch track, or vice versa. By this construction there are no movable switch-points; but in lieu thereof there is a movable contact, which is under the control of the operator.

Referring to the drawings, Figure 1 is a plan view of an electric railway, showing the location of the slotted conduit. Fig. 2 is a sectional elevation of same on line xx . Fig. 3 is a perspective view illustrating the relative positions of the conductors thereof. Fig. 4 is a plan view of the conductors and showing

the position of the contact, and Fig. 5 is a cross-section on line yy of Fig. 2.

A is the main track or railway, and B is the branch track or railway. This branch track may be an extended line or simply a turn-out.

C is a conduit, preferably arranged upon the outside of the track, and is formed of the yokes S, by which the rails T are supported, and the top of the conduit is formed by means of slot-irons W W, secured to the yokes so as to leave a narrow slot.

F is the main-line conductor and is suspended by suspenders f from above, thereby leaving the lower surface of the conductor F unobstructed. In practice this conductor is preferably a single wire, such as is used in overhead-electric-railway work. G is a similar conductor for the branch track and is suspended by suspenders g . These conductors F and G are insulated from the conduit and rails and form the positive conductors of the system. The rails, earth, and conduit form the return-circuit of the system. The branch conductor G terminates in a rigid section H, if so desired, and said rigid section extends close to the conductor F, and yet so as to leave a space or passage-way h through which the shank of the collector N may pass.

Arranged at a lower elevation than the conductors F and G and curved so as to be partly under the conductor F and partly under the rigid section H of the conductor G is a conductor I, supported upon insulators J and preferably having the ends curved downward, as at i . This conductor I is sufficiently low down to leave a space K between it and the conductors F and G.

L is the electrically-propelled car and is provided with an electric motor M, mechanically connected to rotate the axles in any well-known manner.

m is the motor-circuit for conveying current from the collector N to the motor through a resistance changer or regulator M'. The collector N is shown as carried by the axle independent of the car-body and is arranged upon the outside of the axle-box. (See Fig 5). Projecting downward through the slot and insulated therefrom is a metallic piece, to

which is pivoted at *o* a rearwardly-extending arm O, carrying upon its rear end an under-running grooved contact-wheel P, making an underrunning contact with the conductors F and G.

p is a rod extending down through the collector and connecting with the arm O for the purpose of raising or lowering it. A spring Q encircles the rod *p* for the purpose of raising the arm O and normally holding the contact P against the under surface of the conductor with an elastic pressure.

R is a bell-crank carried by the collector for directly operating the rod *p*.

r' is a lever upon the front platform and is connected by a link or rod *r* with the bell-crank R for the purpose of operating the collector-arm O.

When the car is to pass from the main track A to the branching track B, the lever *r'* is moved so as to throw the arm O of the collector down to the dotted position in Fig. 2. The momentum of the car carries the contact P onto the conductor I, as shown in Fig. 3. As the car passes around the curve to the branch track the operator liberates the lever *r'*, and the spring Q immediately raises the arm O and brings the collector-wheel in contact with the under side of the conductor G or its terminal section H, and the car continues down the branch track. By this means it is not necessary to rely upon the momentum of the car in passing from one track to another. It is evident that, if desired, the conductor I may be dispensed with, though in practice it is preferable to employ it.

It is immaterial to my invention whether a conduit is employed or not or whether the conductors F and G are arranged below the surface or at some other elevation; but my invention is particularly applicable to cases in which the conductors are housed in a slotted conduit, as herein set out.

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

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the junction of the tracks a distance sufficient to allow a downwardly-extending collector to pass, an electrically-propelled vehicle, and a downwardly-extending collector carried by and connected to said vehicle above the conductors and having a vertically-adjustable contact making a traveling electrical connection with the under side of either of the conductors of the main line or branch.

2. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance sufficient to allow the collector to pass, an electrically-propelled vehicle, a branch, and a current-collecting device carried by the vehicle, formed of a rearwardly-extending arm pivoted upon a transverse axis and having a grooved contact device at its free end, adapted to make an underrunning contact with the under surface of the conductor of the main line or branch.

3. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance sufficient to allow a downwardly-extending collector to pass, an electrically-propelled vehicle, a downwardly-extending collector carried by and connected to said vehicle above the conductor and having a vertically-adjustable contact making a traveling electrical connection with the under side of either of the conductors of the main line or branch, and a mechanical connection between said arm and the forward part of the vehicle to control the raising and lowering of said contact.

4. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance sufficient to allow a downwardly-extending collector to pass, an electrically-propelled vehicle, a downwardly-extending current-collecting device carried by and connected to the vehicle above the conductor and formed of a downwardly-extending and rearwardly-extending arm pivoted upon a transverse axis and having a grooved contact device at its free end, adapted to make an underrunning contact with the under surface of the conductor of the main line or branch, and a mechanical connection between said arm and the forward part of the vehicle to control the raising or lowering of said contact.

5. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance

sufficient to allow a downwardly-extending collector to pass, an electrically-propelled vehicle, and a downwardly-extending current-collecting device carried by and connected to the vehicle above the conductors and consisting of a rearwardly-extending spring-actuated arm pivoted upon a transverse axis and having a grooved contact device at its free end, adapted to make an underrunning contact with the under surface of the conductor of the main line or branch.

6. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance sufficient to allow the collector to pass, an electrically-propelled vehicle, a collector carried by said vehicle, having a vertically-adjustable contact making a traveling electrical connection with the under side of either of the conductors of the main line or branch, and a short section of electrical conductor arranged partly below the conductors of the main line and branch at the branching point of the railway for supplying current to the collector when passing the separation between the conductors of the main line and branch.

7. In an electric railway, the combination of a main track and a branch track, a conductor arranged along the main track and having its under side exposed or unobstructed, a conductor arranged along the branch track and having its under side exposed or unobstructed and separated from the main conductor at the branching point a distance sufficient to allow the collector to pass, an electrically-propelled vehicle, a current-collecting device carried by the vehicle, formed of a rearwardly-extending arm pivoted upon a transverse axis and having a grooved contact device at its free end, adapted to make an

underrunning contact with the under side of the conductor of the main line or branch, a mechanical connection between the said arm and the forward part of the vehicle to control the raising or lowering of said arm, and a short section of electrical conductor arranged partly below the conductors of the main line and branch at the branching point of the railway for supplying current to the collector when passing the separation between the conductors of the main line and branch.

8. In an electric railway, a slotted conduit arranged along a railway, a suspended conductor arranged within the slotted conduit and insulated therefrom, an electrically-propelled vehicle, and a current-collecting device carried by the vehicle, extending through the slot of the conduit, and having a rearwardly-extending pivoted arm provided with a contact making an underrunning electrical connection with the suspended conductor, and a spring arranged above the slot of the conduit to hold the contact in connection with the conductor.

9. In an electric railway, a slotted conduit arranged along a railway, a suspended conductor arranged within the slotted conduit and insulated therefrom, an electrically-propelled vehicle, and a current-collecting device carried by the vehicle and consisting of a frame extending through the slot of the conduit and having a rearwardly-extending pivoted arm provided with a contact making an underrunning electrical connection with the suspended conductor, a spring to hold the contact in connection with the conductor, and a mechanical device leading to the front end of the car for moving the said contact device away from the conductor.

In testimony of which invention I have hereunto set my hand.

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,
S. T. YERKES.