(No Model.)

# R. M. HUNTER.

## CURRENT COLLECTING DEVICE FOR ELECTRIC RAILWAYS.

No. 444,566. Patented Jan. 13, 1891.

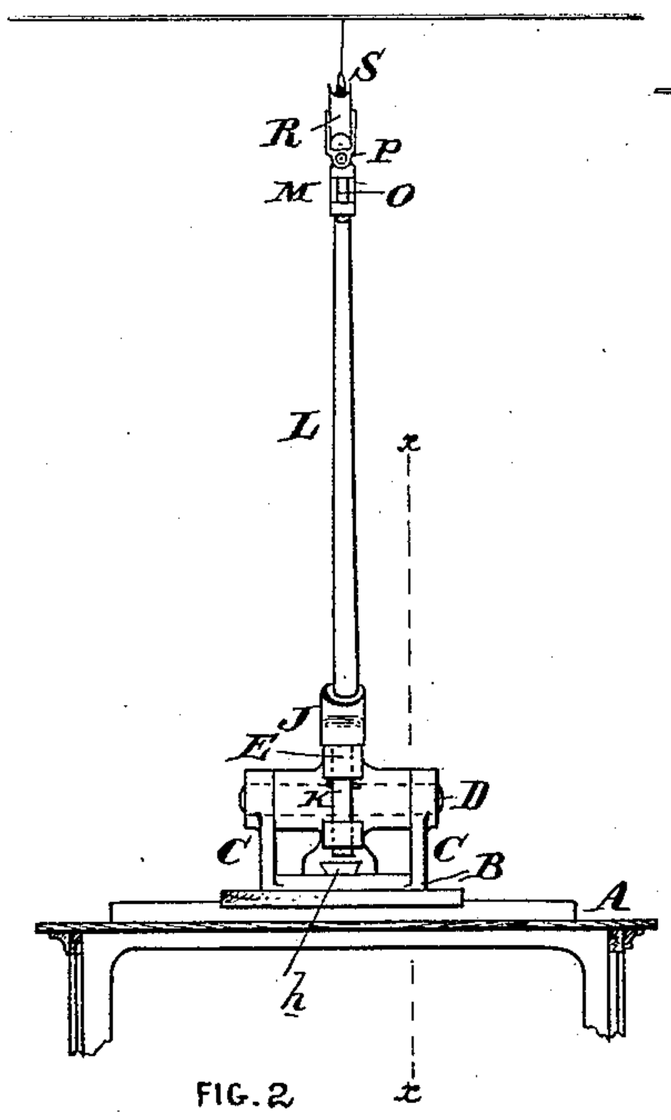


FIG. 2

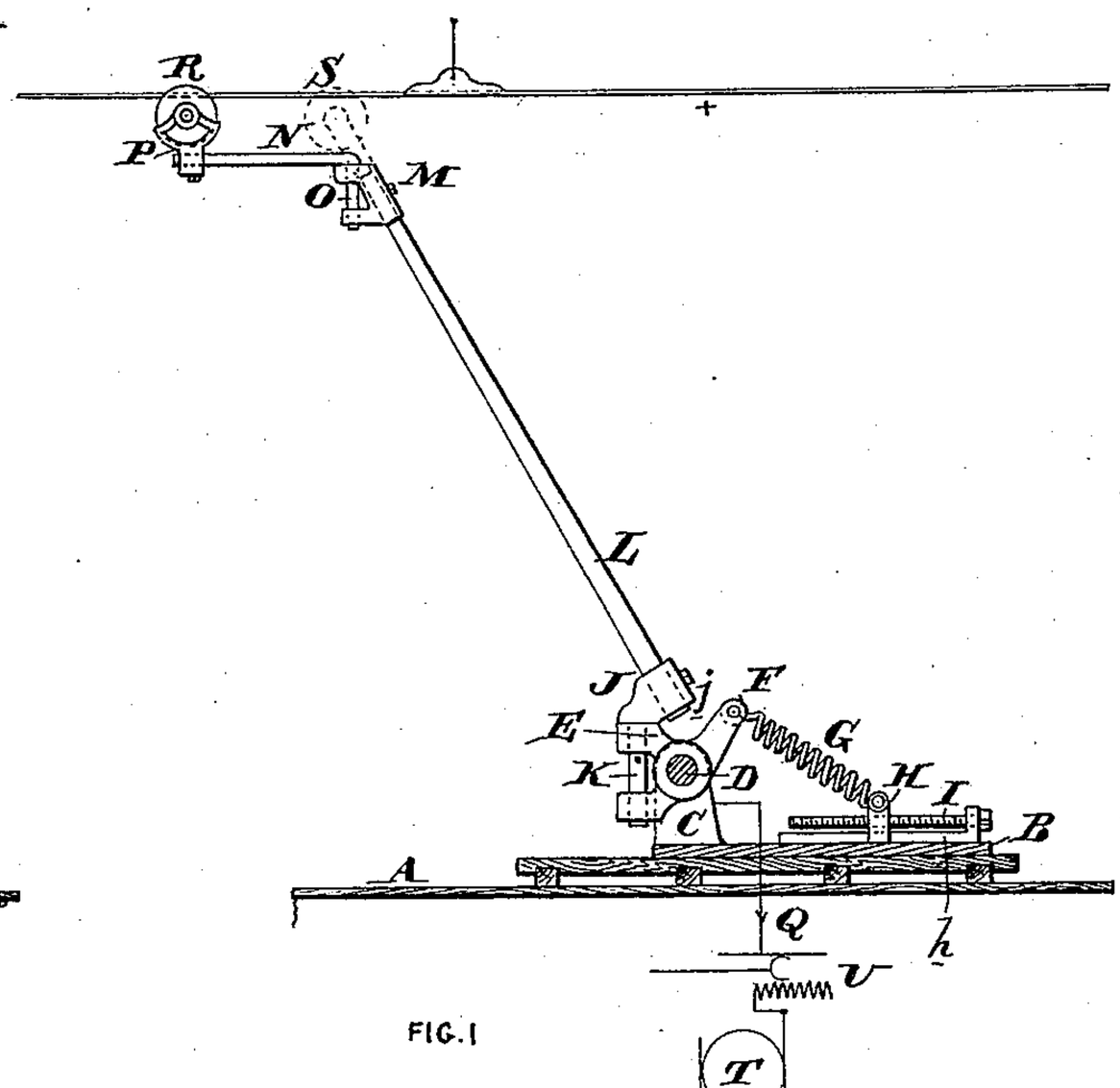


FIG. 1

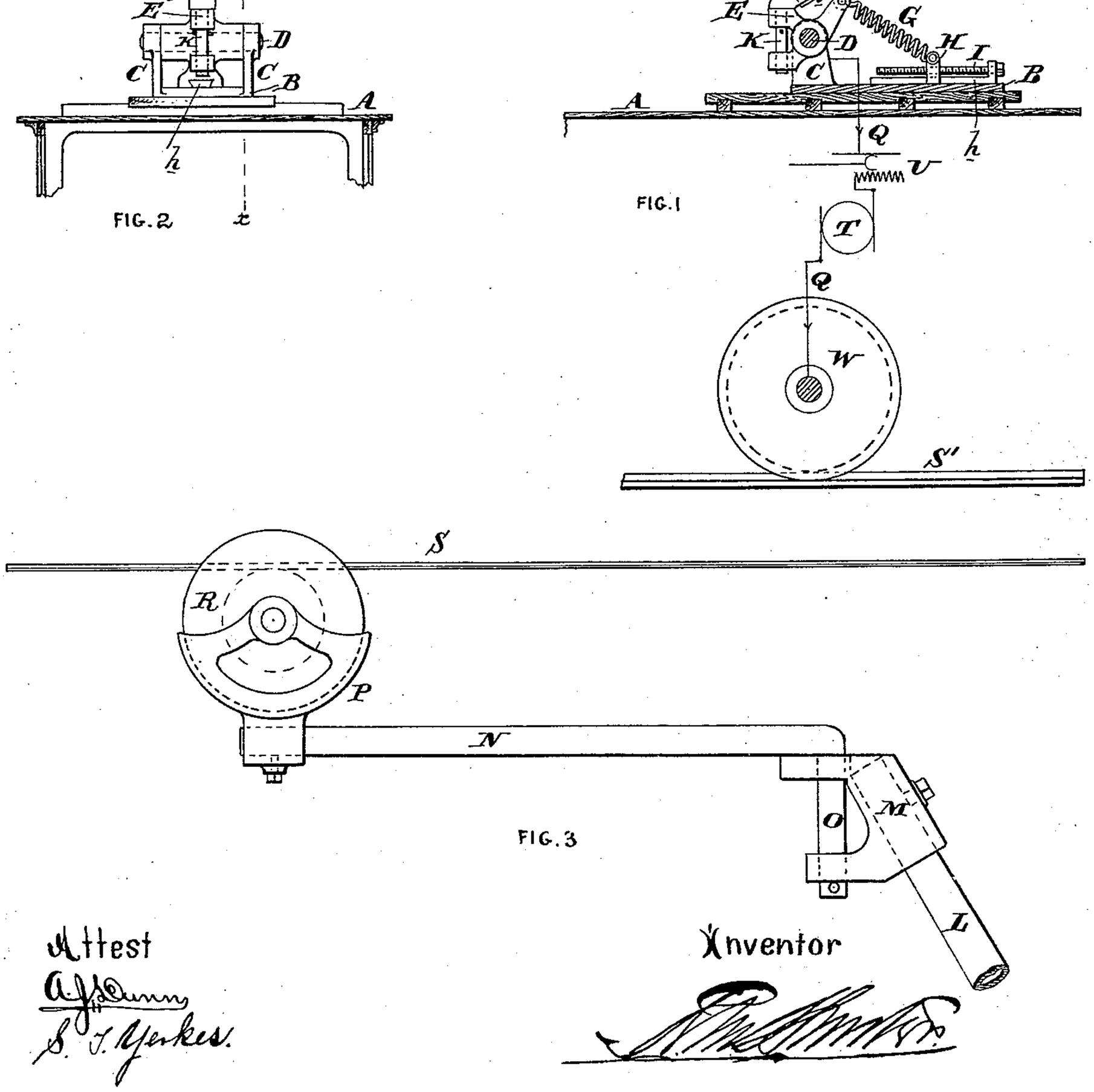


FIG. 3

Attest
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# UNITED STATES PATENT OFFICE.

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

## CURRENT-COLLECTING DEVICE FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 444,566, dated January 13, 1891.

Application filed August 12, 1890. Serial No. 361,771. (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 Current-Collecting Devices for Electric Railways, of which the following is a specification.

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

My invention, set out in this specification, (Case No. 160,) comprehends a construction of collecting device which is especially adapted to extend above the top of the car and make a running contact with the under side of a suspended conductor arranged above the railway and car, and having an under unobstructed surface.

In carrying out my invention I support the upwardly and rearwardly extending trolley-arm in a frame journaled on a transverse axis arranged adjacent to the car, and also make it movable about an axis arranged in the plane of the travel of the car, and preferably vertical. This last-mentioned vertical or substantially vertical axis of the trolley-arm will vary in its position with the rise and fall of the arm in following the alignment of the conductor. I provide a spring acting on the frame journaled on the transverse axis to hold the trolley-arm upward with an elastic pressure. The upper end of the trolley-arm may be provided with a contact-shoe or grooved roller, in the groove of which the conductor is received, and upon which the trolley-wheel or contact-shoe is guided. If desired, the contact shoe or wheel may be journaled on the free end of a horizontal or rearwardly-extending arm, jointed at its forward end to the upper end of the trolley-arm on a vertical or substantially vertical axis. By this means I am enabled to use a heavy upwardly-extending arm which will be capable of being held in such an upright position that no bending will result, and the contact or wheel be so supported that it may move laterally for the slightest or greatest lateral variations in the conductor and readily follow the switches without the least danger of jumping the conductor. Where large numbers of switches or cross-overs are employed in suspended-conductor railways, it has heretofore been found necessary to have the trolley-arm extend rearwardly with great obliquity, and this excessive obliquity increased the leverage to bending of the arm and made it difficult to maintain the arm in good condition. By my improvement I am enabled to overcome this defect.

My improvements will be more fully understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of my improved current-collecting device, taken on line *x x* of Fig. 2. Fig. 2 is an end elevation of same, and Fig. 3 is an enlarged view of the upper part of Fig. 1.

A is the car or vehicle roof or other part thereof for supporting the collector.

B is a frame secured to the car A in any suitable manner, and has the two uprights C C, in which is journaled on a transverse axis D the frame E, having an arm F and suitable journal-bearings for the trolley-arm.

L is the trolley-arm, and may be of wood or metal. It is detachably secured at the bottom in a socket *j*, formed on the casting J, which casting is connected with the frame E on a vertical or substantially vertical axis K and about which the arm L swings. The arm L is made to extend rearward to some extent, so that the upper or free end may have lateral motion about K as a center and vertical motion about D as a center. A spring G is connected at one end to the arm F and at the other to a block H, guided on a V-shaped guide *h* and adjusted by a screw I. By turning the screw I the tension of the spring may be varied to modify the upward tendency of the free end of the arm L. Any other suitable spring and means of adjustment may be employed, if desired.

The upper end of the arm L may carry the contact shoe or roller, as indicated in dotted lines, Fig. 1; but I prefer to support the said contact shoe or roller R in a frame P, carried on the rear end of an arm N, hinged at its forward end to the upper or free end of arm L on a vertical or substantially vertical axis

O, formed in a casting M on the end of arm L. The arm N may be of any length and is preferably horizontal, but may be arranged obliquely, if desired, and in practice would have more or less obliquity from the combined movements given to the arm L.

S is the suspended conductor, which may be supported above the car, as is usual, so as to be out of reach of persons on the track. It is suspended from above so as to leave an exposed under surface for contact. The shoe or roller R is deeply grooved, so as to maintain its position with respect to the conductor.

The rails S′ may be employed as the return-conductor.

Q is the motor-circuit on the car, and includes the regulator U, motor T, and wheel W of the car.

I do not limit myself to the particular details of construction shown, as they may be modified without in the least departing from the principles of my invention, and while I have described my invention as especially adapted to overhead conductors it may be employed for other locations of the conductor, even to that which would require the complete inverting of the apparatus.

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

1. A current-collecting device for an electric railway, consisting of an obliquely-arranged arm connected to the car with provision for lateral and vertical motion at its free end, in combination with a rearwardly-extending part jointed to the free end of the arm with freedom of lateral motion and carrying at its rear end a contact adapted to press against a conductor extending along the railway.

2. A current-collecting device for an electric railway, consisting of an obliquely-arranged arm connected to the car with provision for lateral and vertical motion at its free end, in combination with a spring to move said arm vertically, and a rearwardly-extending part jointed to the free end of the arm with freedom of lateral motion and carrying at its rear end a contact adapted to press against a conductor extending along the railway.

3. The combination of a suspended conductor extending along a railway, a traveling car, an upwardly and rearwardly extending collecting-arm movable on a transverse axis and supported by the car, and a rearwardly-extending part carrying a contact making a connection with the under surface of the conductor and jointed to the upper or free end of the arm with freedom of lateral movement.

4. The combination of a suspended conductor extending along a railway, a traveling car, an upwardly and rearwardly extending collector-arm movable on a transverse axis and supported by the car, a spring to cause the arm to move on its free end toward the conductor, and a rearwardly-extending part carrying a contact making a connection with the under surface of the conductor and jointed to the upper or free end of the arm with freedom of lateral movement.

5. The combination of a suspended conductor extending along a railway, a traveling car, an upwardly and rearwardly extending collector-arm movable on both a vertical and a transverse axis and supported by the car, and a rearwardly-extending part carrying a contact making a connection with the under surface of the conductor and jointed to the upper or free end of the arm with freedom of lateral movement.

6. The combination of a suspended conductor extending along a railway, a traveling car, an upwardly and rearwardly extending collector-arm movable on both a vertical and a transverse axis and supported by the car, a spring to cause the arm to move on its transverse axis to raise its free end toward the conductor, and a rearwardly-extending part carrying a contact making a connection with the under surface of the conductor and jointed to the upper or free end of the arm with freedom of lateral movement.

7. The combination of a suspended conductor extending along the railway, a traveling car, a frame hinged to the car on a transverse axis, and a rearwardly-extending arm having a contact for connection with the conductor and supported by said frame on an axis in the plane of the travel of the vehicle.

8. The combination of a suspended conductor extending along the railway, a traveling car, a frame hinged to the car on a transverse axis, a rearwardly-extending arm having a contact for connection with the conductor and supported by said frame on an axis in the plane of the travel of the vehicle, and a spring to hold the free end of the arm toward the conductor with an elastic pressure.

9. The combination of a suspended conductor extending along the railway, a traveling car, a frame hinged to the car on a transverse axis, a rearwardly-extending arm having a contact for connection with the conductor and supported by said frame on an axis in the plane of the travel of the vehicle, a spring acting on the frame to rotate it, and means to adjust the tension of the spring.

10. In a trolley for an electric car, the combination of a frame hinged to the car on a transverse axis, an obliquely and rearwardly extending trolley-arm carried by said frame and movable about a vertical or substantially vertical axis, and a spring to move said arm about the transverse axis.

11. In a trolley for an electric car, the combination of a frame hinged to the car with provision for movement on both vertical and transverse axes and having a socket, and a trolley-arm carrying at its free end a contact device and detachably connected in the socket.

12. In a trolley for an electric car, the combination of a frame hinged to the car with provision for movement on both vertical and

transverse axes and having a socket, and a trolley-arm carrying at its free end a contact device and detachably connected in the socket, and a spring to cause said frame to move about the transverse axis.

13. In a trolley for an electric car, the combination of a frame connected to the car with provision for universal movement and having a socket, and a trolley-arm having a contact at its free end and at its lower end fitting into the socket of the frame.

14. In a trolley for an electric car, the combination of a frame connected to the car with provision for universal movement and having a socket, a trolley-arm having a contact at its free end and at its lower end fitting into the socket of the frame, and a spring device to raise and lower the trolley-arm.

15. In a trolley for an electric car, the combination of a spring-actuated primary part loosely connected to the car, and a laterally-movable secondary part extending obliquely rearward and carried by the primary part.

In testimony of which invention I hereunto set my hand.

R. M. HUNTER.

Witnesses:
A. J. DUNN,
ERNEST HOWARD HUNTER.