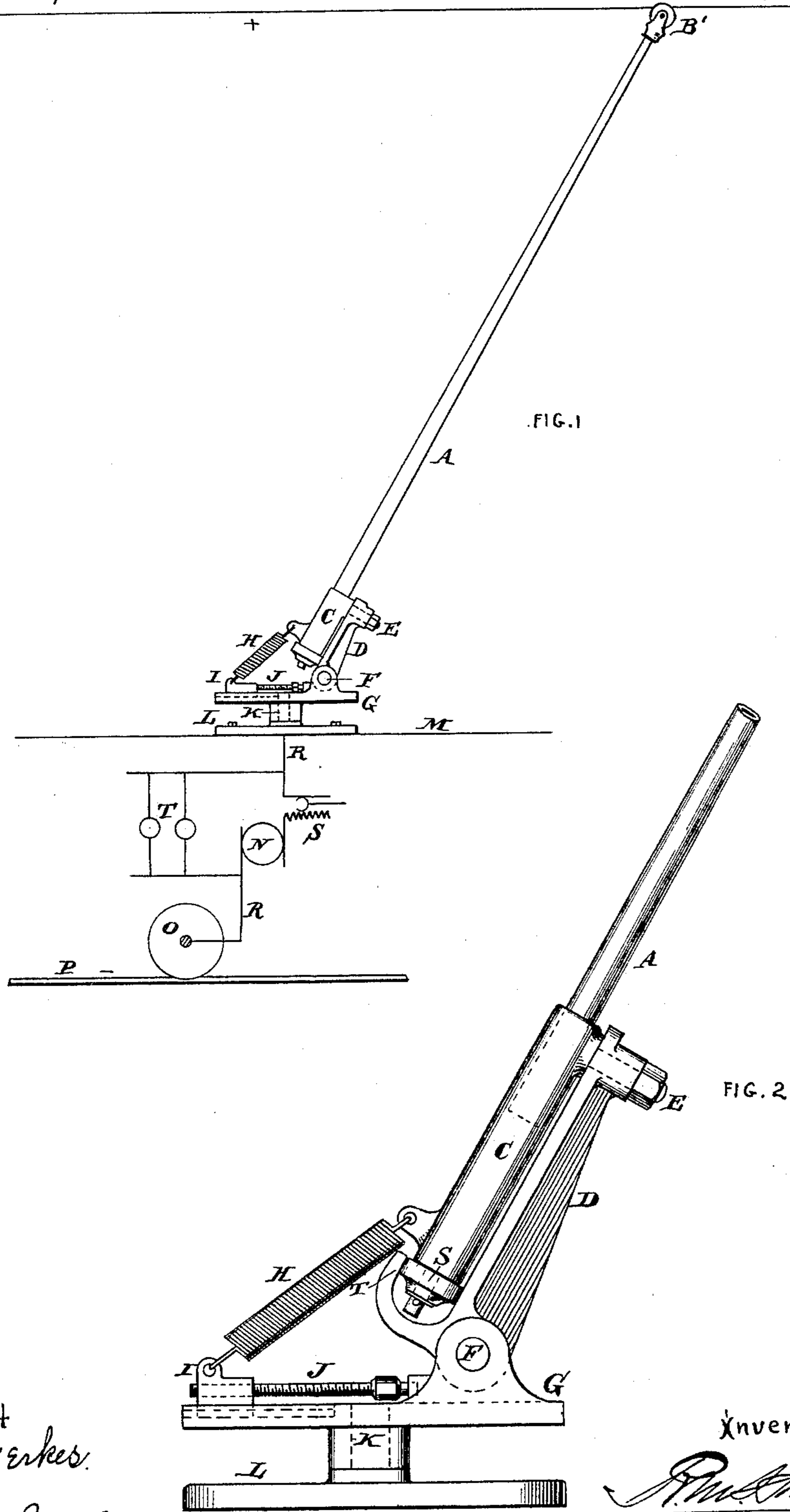


(No Model.)

R. M. HUNTER.  
ELECTRIC RAILWAY TROLLEY.

No. 462,219.

Patented Oct. 27, 1891.



Attest  
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC-RAILWAY TROLLEY.

SPECIFICATION forming part of Letters Patent No. 462,219, dated October 27, 1891.

Application filed July 1, 1891. Serial No. 398,148. (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-Railway Trolleys, of which the following is a specification.

My invention has reference to trolleys for electrically-propelled vehicles; and it consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings, which form a part thereof.

The invention set out in this application (Case No. 200) has special reference to current-collecting devices for use with suspended or overhead conductors.

In carrying out my invention I support on the roof or other portion of the vehicle a supporting-plate, preferably pivoted upon a vertical axis. To this supporting-plate and pivoted upon a transverse axis is a movable frame adapted to move in the plane of travel of the car. Pivoted to this movable frame on an axis also in the plane of travel of the car is a socket-piece or holder, which carries the upwardly-extending trolley-arm, which is provided at its upper part with a suitable contact of any description, but preferably of the grooved-roller type. The lower end of the socket-piece or holder is connected by a spring with the supporting-plate and is preferably adjustable as to tension. By these means the trolley-arm may swing in a vertical and also a lateral direction and may be rotated entirely round upon a vertical axis, such, for instance, as is necessary in reversing the direction of the travel of the car.

Referring to the drawings, Figure 1 is a side elevation of my improved trolley or current-collector, showing its connections between the conductors and the motor, lighting apparatus, and regulator on the car; and Fig. 2 is an enlarged view of the lower portion of the trolley.

A is the trolley-arm and extends obliquely upward from the top of the car M and is provided with a suitable contact device B, preferably making an underrunning contact with a suspended conductor. The lower part of this trolley-arm A is supported in the socket or supporting piece C, which is pivoted at its upper end by a pin E to the upper free end

of the movable frame D. The lower end of this frame D is pivoted upon a transverse axis F, the pin forming the axis being carried upon a supporting-plate G, which is preferably in turn pivoted upon a vertical axis or pin K, carried upon the base-plate L, the said base-plate being directly secured upon the car-roof. The lower end of the socket-piece C is connected to the upper end of a spring H, the lower or other end of this said spring being connected to an adjustable block I, adjustable upon the supporting-plate G, by means of an adjusting-screw J. If desired, the lower end of the socket-piece C may be provided with a roller S, which may run in guides T upon the movable frame D to prevent excessive strain coming upon the pin E under the action of the spring H and backward movement of the trolley-arm.

This construction has the following advantages: The trolley-arm may swing about the transverse axis F, and thus rise and fall at its free end with respect to the suspended conductor. It may have large lateral vibrations at its free end by swinging about the vertical axis K, and through this axis it may also be entirely reversed, and in addition to the above the trolley may have a transverse movement at its free end upon the axis E, which permits the trolley-arm at its free end to move laterally without causing the grooved trolley of the wheel or collector to assume an abnormal position with respect to the suspended trolley-wire. Without the movement about the axis E reliance would have to be placed for lateral movement wholly upon the axis K, and if the trolley were required to extend laterally a distance which would necessitate the turning of it at right angles to the line of railway the trolley-wheel would be exactly at right angles to the wire and would thereby be released. By my improved construction the greatest lateral movement required may be obtained without abnormal displacement of the trolley of the wheel with respect to the alignment of the conductor. The action of the spring H simultaneously holds the trolley-arm in a vertical plane in the direction of the travel of the car and also permits the said trolley-arm to be vibrated laterally upon E as an axis as well as the trolley-arm and its supporting-frame D to

be revolved upon the transverse axis F. These various movements are in no wise interfered with by the swinging action of the trolley about the vertical axis K.

5 P represents the rails or return-conductor. O is the wheel of the car.

R is the motor-circuit, extending from the trolley to the car-wheel and including the motor N and the resistance changer or regulator S.

10 T are electric lamps or other translating devices upon the car, in parallel with the motor.

I do not limit myself to the mere details of construction here shown, 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—

20 1. In a current-collecting device for an electric car, the combination of a frame pivoted on a transverse axis, a socket-piece pivoted to said frame on an axis in the plane of travel of the vehicle, an upwardly-extending current-collecting arm carried by said socket-piece and provided at the top with a contact, and a spring connecting with the socket-piece at a point below its pivotal connection with the frame, whereby the spring normally tends to move the frame about its transverse axis and hold the socket-piece against lateral movement upon its pivotal point.

2. In a current-collecting device for an electric car, the combination of a frame pivoted on a transverse axis, a socket-piece pivoted to said frame on an axis in the plane of travel of the vehicle, an upwardly-extending current-collecting arm carried by said socket-piece and provided at the top with a contact, a spring connecting with the socket-piece at a point below its pivotal connection with the frame, whereby the spring normally tends to move the frame about its transverse axis and hold the socket-piece against lateral movement upon its pivotal point, and means to adjust the tension of the spring.

3. In a current-collecting device for an electric car, the combination of a frame pivoted on a transverse axis, a socket-piece pivoted to said frame on an axis in the plane of travel of the vehicle, an upwardly-extending current-collecting arm carried by said socket-piece and provided at the top with a contact, a spring connecting with the socket-piece at a point below its pivotal connection with the frame, whereby the spring normally tends to move the frame about its transverse axis and hold the socket-piece against lateral movement upon its pivotal point, and a pivoted turn-table or plate movable about a vertical axis supporting the said transverse axis and spring.

4. In a current-collecting device for an electric car, the combination of a frame pivoted on a transverse axis, a socket-piece pivoted to said frame on an axis in the plane of travel of

the vehicle, an upwardly-extending current-collecting arm carried by said socket-piece and provided at the top with a contact, a spring connecting with the socket-piece at a point below its pivotal connection with the frame, whereby the spring normally tends to move the frame about its transverse axis and hold the socket-piece against lateral movement upon its pivotal point, means to adjust the tension of the spring, and a pivoted turn-table or plate movable about a vertical axis supporting the said transverse axis and spring.

5. In a trolley for an electric railway, the combination of a plate, a movable frame hinged to the plate on a transverse axis and provided with a transverse guideway near its axis, a socket-piece or holder pivoted to the free end of the movable frame on an axis arranged substantially in a vertical plane through the line of travel of the vehicle, a trolley-arm having a contact at its free end, carried by said socket-piece or holder, a roller arranged upon the free end of the socket-piece or holder and movable in the guide, and a spring between the lower end of the socket-piece or holder and the supporting-plate.

6. In a trolley for an electric railway, the combination of a plate, a movable frame hinged to the plate on a transverse axis and provided with a transverse guideway near its axis, a socket-piece or holder pivoted to the free end of the movable frame on an axis arranged substantially in a vertical plane through the line of travel of the vehicle, a trolley-arm having a contact at its free end, carried by said socket-piece or holder, a roller arranged upon the free end of the socket-piece or holder and movable in the guide, a spring between the lower end of the socket-piece or holder and the supporting-plate, and means to adjust the tension of the spring.

7. In a trolley for an electric railway, a base-plate, a supporting-plate pivoted to the base-plate and movable about a vertical axis, a frame pivoted to the supporting-plate upon a transverse axis, an upwardly-extending current-collector arm pivoted to the movable frame upon an axis arranged in a vertical plane, and a spring to hold the arm in an upright position.

8. In an electric railway, the combination of a conductor extending along the railway, a traveling vehicle, a current-collecting device carried upon the vehicle and making a traveling contact with the conductor and consisting of a contact part movable laterally about an axis normally arranged in vertical plane through the conductor, and a support for said contact device movable upon a vertical axis and in which the said axes are arranged at an angle to each other.

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

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,  
JOHN ALEX. BRAMLEY.