

(No Model.)

R. A. GRANT.
ELECTRIC RAILWAY TROLLEY.

No. 526,897.

Patented Oct. 2, 1894.

Fig. 1.

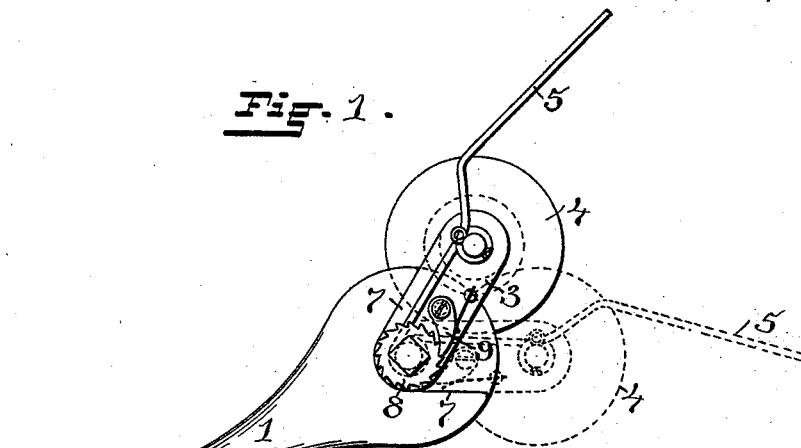


Fig. 2.

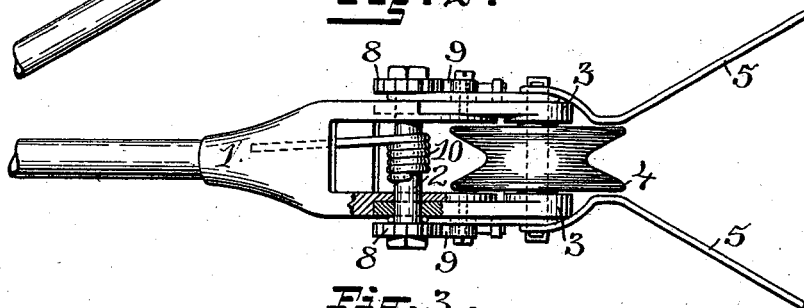
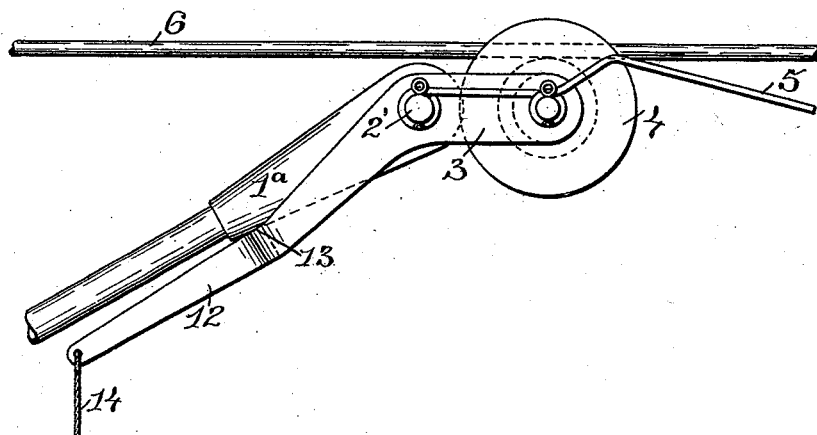


Fig. 3.



WITNESSES:

Henry J. Miller
Chas. H. Luther Jr.

INVENTOR:

Robert A. Grant
Joseph A. Miller & Co.
Atty's.

UNITED STATES PATENT OFFICE.

ROBERT A. GRANT, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF THREE-FOURTHS TO AUGUST F. BORCHARDT, CLIFTON A. HALL, AND JOHN CONRAD SCHOTT, OF SAME PLACE.

ELECTRIC-RAILWAY TROLLEY.

SPECIFICATION forming part of Letters Patent No. 526,897, dated October 2, 1894.

Application filed January 22, 1894. Serial No. 497,649. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. GRANT, of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful improvements in Trolleys; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention has reference to an improvement in the support of the trolley-wheels at the end of a mast-arm by which the electric energy is transmitted from the trolley-wire and conveyed by conductors to the electric-motor.

In electric railways where the trolley-wire is usually supported over the track, the carriages are each supplied with a mast-arm pivotally connected at one end with the top of the carriages and provided at the other end with a grooved wheel which runs in contact with the trolley-wire. An arrangement of springs is used to hold the mast-arm and the trolley-wheel in the raised position and permit the trolley-wheel to maintain the contact with the trolley-wire under the varying positions of the trolley-wire in height as well as laterally. The motion of the car when running, and the contact of the trolley-wheel with supporting-clips, or other slight obstructions on or conditions to the trolley-wire, impart blows to the heavy free end of the trolley-mast and the trolley-wheel and cause the trolley-wheel to break the connection with the trolley-wire. This heavy free end under a slight blow frequently carries the trolley-wheel so far below the trolley-wire that, when the springs at the lower end of the mast-arm raise the upper free end, the trolley-wheel will miss the trolley-wire and the car is stopped until the trolley is again placed on the trolley-wire. In the hurry incident to such accidents and particularly at night when the usual electric lights in the car are extinguished the proper connecting of the trolley-wheel with the trolley-wire is difficult. On electric street-railroads the connection with the trolley-wire is reversed at each end of the route,

or when the direction of the car is to be changed, and at all such times, by day and night, the proper placing of the trolley-wheel is difficult.

One object of this invention is to facilitate the connection of the trolley-wheel with the trolley-wire and to insure its proper contact with the groove of the trolley-wheel.

Another object of the invention is to secure more permanent contact of the trolley-wheel with the trolley-wire and prevent the jumping of the wheel off from the wire.

To these ends the invention consists in supporting the trolley-wheel in cheek-pieces or in a frame pivotally connected with the free end of the trolley-mast, and in means for holding the trolley-wheel in contact with the trolley-wire during any vibration of the free end of the trolley-mast; and the invention further consists in the peculiar and novel arrangement of the guard wires or arms in connection with the pivoted support in which the trolley-wheel is journaled, as will be more fully set forth hereinafter.

Figure 1 of the drawings is a side view of the end of a trolley mast-arm showing, in solid lines, the trolley-wheel and guard-wires in the positions assumed when the trolley-wheel is being connected with the trolley-wire, and, in broken lines, in the position when the trolley-wheel is pressed hard against the trolley-wire. Fig. 2 is a front view showing a spring wound on the shaft forming the pivot on which the trolley-wheel frame is secured, and the means for regulating the tension of the spring. Fig. 3 is a side view of a modified form of my device showing the trolley-wheel supported in a pivoted frame and in contact with the trolley-wire.

In the drawings 1 and 1^a indicate the end-piece of the mast-arm; 2, the pivot-shaft on which the side-frames 3 are pivoted, the trolley-wheel 4 being journaled in said side-frames.

The guide-wires 5 are secured to the side-frames 3 so as to move with the same. These guides 5 may be formed in one piece with the side-frames and may be of any desired cross-section, provided their ends are separated.

rated sufficiently and they are constructed to form a large opening and guide the trolley-wire 6 on to and into the groove of the trolley-wheel.

5 In the preferred form, shown in Figs. 1 and 2, the end-piece 1 is provided, preferably, on each side with the projecting shoulders 7 which form stops for the frames 3 and limit their movement and the movement of the
10 trolley-wheel at the position shown in Fig. 1 in solid and in broken lines.

The side-frames 3 are journaled on the pivot-shaft 2 and support, near their outer ends, the shaft of the trolley-wheel 4. The
15 pivot-shaft 2 has secured to one or both ends the ratchet-wheel 8 provided with a wrench-head. The spring-pawl 9 engages with the ratchet-wheel 8. The spring 10 is coiled around the pivot-shaft 2. One end is secured
20 to the shaft and the other end bears on or is secured to the end-piece 1, so that by turning the pivot-shaft, by a wrench applied to the wrench-head, the tension of the spring can be regulated.

25 In practice it is desirable to adjust the spring so that the bearing of the trolley-wheel on the trolley-wire is at all times cushioned on the spring and the trolley-wheel will be kept in contact with the trolley-wire auto-
30 matically and independent of any shaking or vibration of the end of the trolley-mast, so that when, from any cause, the trolley-wheel is pushed away from the trolley-wire the wheel will be quickly brought in contact with
35 the trolley-wire independent of the movement of the mast-arm, at the same time the guides 5 will prevent the lateral displacement of the trolley and guide the trolley-wheel on to the trolley-wire automatically.

40 In the modified form the side-frames 3 are extended forward and unite in the lever 12. This extension of the side-frames 3 and the lever 12 is made of such weight as will overbalance the weight of the trolley-wheel and the side-frames beyond the pivot 2', so that
45 the weight of the lever 12 will act in the same manner as does the spring 10 in the preferred form and keep the trolley-wheel in contact with the trolley-wire automatically and in-

dependent of the shaking motion of the end 50 of the trolley-mast.

The union of the two side-frames 3 with the lever 12 at 13 forms a stop against the end-piece 1^a of the mast. The operating rope 14, usually secured to the trolley-mast, may
55 be secured to the end of the lever 12, as shown, so that in moving the trolley from one end to the other the guides 5 will be placed into the raised position and facilitate the connection of the trolley-wheel with the trolley-wire. 60
The same result will, however, be effected when the rope is secured in the old manner to the trolley-mast, for the over-weighted lever 12 will automatically raise the trolley-wheel and the guides 5 when the free end of 65 the trolley-mast is pulled down.

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

1. The combination with the trolley-mast 70 and the bifurcated end piece 1, of the pivot shaft 2, the side frames 3 pivotally connected with the end piece by the shaft 2 and forming the journal bearing for the trolley-wheel 4, the spring 10, and the stops 7, as described. 75

2. The combination with the trolley-mast, the end piece secured thereto, and the pivot shaft 2, of the bifurcated side frame 3 pivotally connected to the shaft 2 outside of the end piece, the trolley-wheel 4 journaled in 80 the bifurcated side frame, and the lever 12, the whole adapted to overbalance the weight of the trolley-wheel and support and form a stop, as described.

3. The combination with the end piece 1, 85 the pivot-shaft 2, the side-frames 3, and the trolley-wheel 4, of the spring 10, the ratchet-wheel 8, and pawl 9, as described.

4. The combination with the end-piece 1 of the trolley-mast, the pivot-shaft 2, the side- 90 frames 3, and the trolley-wheel 4, of the spring 10, the ratchet-wheels 8, the pawls 9, and the guides 5, as described.

ROBT. A. GRANT.

Witnesses:

JOSEPH A. MILLER,
JOSEPH A. MILLER, Jr.