

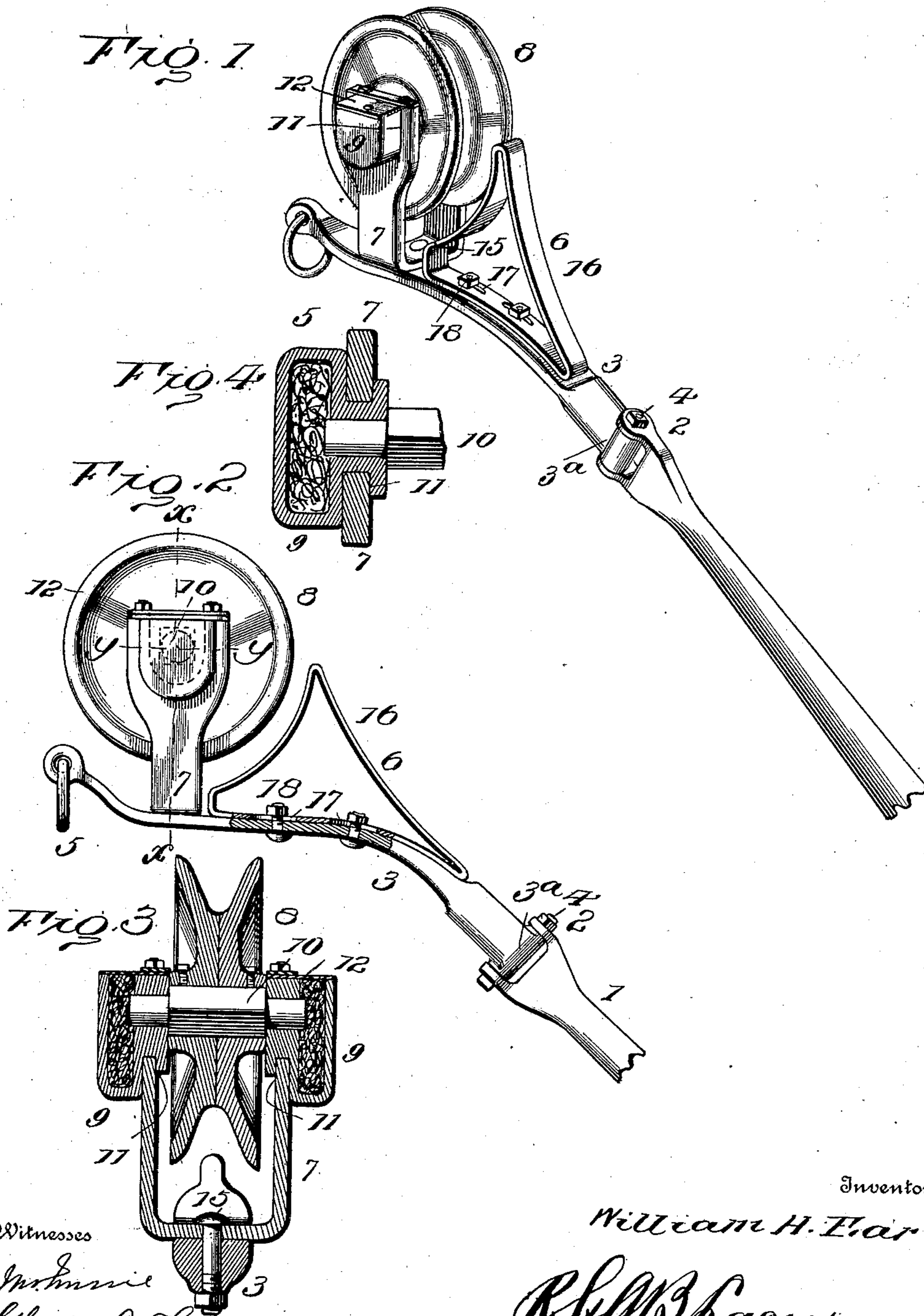
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Patented Dec. 11, 1900.

W. H. EARL.  
TROLLEY FOR ELECTRIC CARS.

(Application filed Aug. 14, 1900.)

(No Model.)



Inventor

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Witnesses

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# UNITED STATES PATENT OFFICE.

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## TROLLEY FOR ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 663,740, dated December 11, 1900.

Application filed August 14, 1900. Serial No. 26,861. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. EARL, a citizen of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Trolleys for Electric Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to trolleys for electric cars, the purpose being to devise a device of this character of novel formation and which will prevent injury to guys and cross-wires in the event of the trolley leaving the conductor or lead and which will adapt itself to curves and lateral deviations and insure electric connection between the shaft of the trolley and the mountings therefor, which is essential in this class of devices.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the appended description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a trolley constructed in accordance with and embodying the essential features of this invention. Fig. 2 is a side elevation, parts being broken away. Fig. 3 is a transverse section on the line *x x* of Fig. 2. Fig. 4 is a horizontal section on the line *y y* of Fig. 2.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The trolley-pole 1 is adapted to be attached to a car in any of the usual ways and is bifurcated at its upper or free end, forming parallel perforated ears or a hinge-section 2, the latter being pivotally connected to the perforated end 3<sup>a</sup> of a harp or arm 3, which supports the trolley-wheel and the adjunctive parts. The harp or arm 3 is approximately of ogee form in side elevation, and its stem 3<sup>a</sup> is piv-

oted to the pole 1 by means of the bolt 4. This construction admits of the trolley-wheel having a sidewise movement to accommodate itself to lateral variations in the conductor or lead without causing strain or tending to displacement of the trolley-wheel when the car is in motion. A ring 5 is applied to the outer or free end of the harp 3, and the operating cord or rope (not shown) is attached thereto. The outer portion of the harp is flattened and receives the guard 6 and mounting 7 of the trolley-wheel 8, the latter being made in two sections and bolted to the square portion of the shaft 10. The mounting 7 is of the form of an inverted yoke and supports in its upper ends journal bearings or boxes 9, which receive the end portions of the trolley-shaft 10. The shaft 10 has preferably a central square portion and round reduced ends, the latter being journaled in the bearings 9. A groove 11 is provided in the boxes, whereby they are seated and supported in the seats in the mountings 7. The boxes are enlarged somewhat on the sides and form receptacles for a lubricant, said receptacles being closed by caps 12. The yoke 7 is pivotally connected at its lower end with the harp or arm 3, so as to turn laterally to any angular position about a vertical axis, thereby permitting the trolley-wheel 8 to follow sharp curves and bends in the conductor without tending to leave the same. The pivot-fastening 15 between the parts 3 and 7 may be a bolt, rivet, or like device, so long as it will admit of the attainment of the desired result. The guard 6 is approximately of triangular shape, its lower side fitting snugly upon the intermediate portion of the harp 3 and the side adjacent to the trolley-wheel 8 being curved approximately in conformity thereto, whereas the third side 16 inclines upwardly from the stem of the harp, so as to cause the trolley-pole when off the line to run beneath guys and crossing wires without tearing the same from their fastenings or causing injury to the trolley-pole and the parts cooperating therewith. The guard acts in the capacity of a stop to limit the turning of the yoke 7, and for this purpose the end adjacent to the base of the yoke is made square and spaced therefrom a short distance, the latter depending upon the desired amount of

angular play to be given to the trolley-wheel. In order that this space may be varied, it is desirable to adjustably connect the guard 6 with the harp, and for this purpose slots 17  
5 are formed in the side of the guard adjacent to the harp 3 to receive the bolts 18, mounted in said harp and adapted to secure the guard in an adjusted position.

By having the trolley-wheel 8 secured to  
10 the shaft 10, so as to turn therewith as one part, and by having the journal-boxes 9, journal-bearings 10, and yoke 7 connected together, as described, the chances for interrupting the electric circuit are reduced to a  
15 minimum, and the construction is greatly simplified and cheapened.

Having thus described the invention, what is claimed as new is—

1. In combination with a trolley-pole, a  
20 harp or arm hinged to the upper end thereof to swing laterally, and a support for the trolley-wheel having pivotal connection with the said harp and adapted to turn about a vertical axis, substantially as set forth.

25 2. In combination with a trolley-arm and a trolley-wheel, a mounting for the trolley-wheel having pivotal connection with the

said trolley-arm to turn laterally, and a guard applied to the trolley-arm and constituting a stop to limit the turning movements of the  
30 trolley-wheel mounting, substantially as described.

3. In combination with a trolley-arm, the trolley-wheel, and a mounting therefor having pivotal connection with the trolley-arm,  
35 a guard located in front of the trolley-wheel and adjustable toward and from the trolley-wheel mounting to form a variable stop therefor, and means for securing the said guard in an adjusted position, substantially as speci-  
40 fied.

4. A trolley-arm, and a trolley-wheel, in combination with a mounting for the trolley-wheel having pivotal connection with the  
45 trolley-arm, and means for limiting the turning movement of the trolley-wheel mounting and having adjustable connection with the trolley-arm, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. EARL.

Witnesses:

ORVILLE W. WILDER,

JAMES K. RAYL.