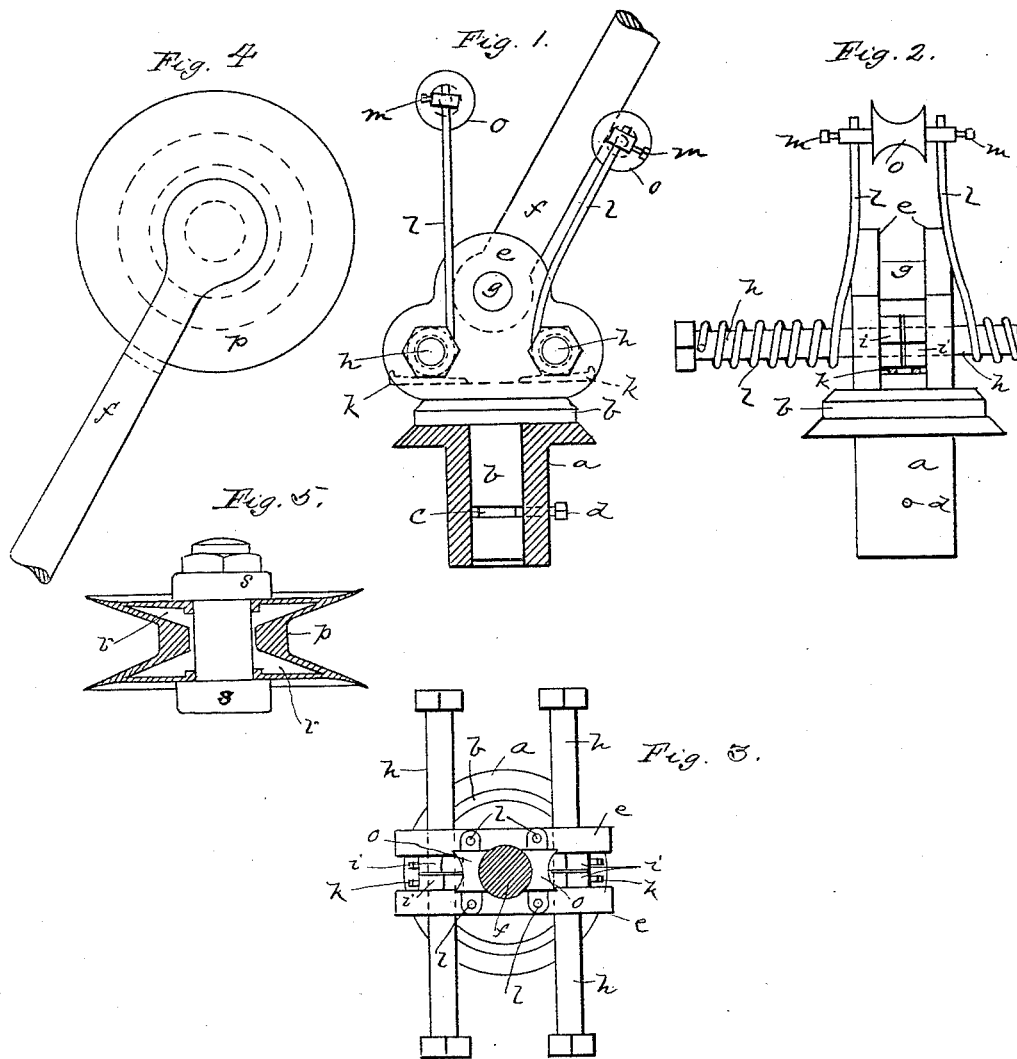


(No Model.)

W. DUNCAN.
ELECTRIC CAR TROLLEY.

No. 454,536.

Patented June 23, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM DUNCAN, OF ALLEGHENY, PENNSYLVANIA.

ELECTRIC-CAR TROLLEY.

SPECIFICATION forming part of Letters Patent No. 454,536, dated June 23, 1891.

Application filed June 25, 1890. Renewed May 20, 1891. Serial No. 393,490. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DUNCAN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Car Trolleys; 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved electric-car trolley; and it consists in certain details of construction and combination of parts, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a side elevation of the trolley-pole stand, showing the arrangement of the tension-springs. Fig. 2 is a side elevation of the same having the pole removed therefrom. Fig. 3 is a plan view with the springs detached. Fig. 4 is a side elevation of the trolley-wheel. Fig. 5 is a sectional plan view of the same.

To put my invention into practice I provide a socket *a* and secure the same on the roof of a railway or other car. Operated in this socket *a* is a swivel *b*, which is held in position by means of a groove *c*, formed about the shank, and a small set-screw *d*, passed through the socket *a*. This swivel *b* is provided with two parallel upwardly-extending flanges *e*, between which the trolley-pole *f* is pivoted by means of a transverse pin *g*.

Beneath the pivot *g* of the pole *f* and at each side of the same are secured four horizontal bolts *h*, which are held in position by means of nuts *i*, placed between the flanges *e*. These bolts *h* are provided with a left-hand thread to engage with the nuts *i* on the opposite sides of the flanges *e*, and with right-hand threads on the other side, and each nut *i* provided with a key or pin *k* to lock the same to prevent turning. Secured to each of these bolts *h* at its outer extremity is one end of a spiral or coil spring *l*, which is wound about the bolt *h*, and the inner ends projecting upward and secured to two spools or rollers *m*, located on opposite sides of the pole *f* and adapted to bear against the same.

Attached to the top of the pole *f* is a trolley or small metallic wheel *p*, which is adapted to engage with an overhead electrically-charged wire, for a purpose well known to the art. This wheel *p* is provided with a hollow space *r* for the purpose of placing therein a suitable lubricant to properly lubricate the bearings *s* of the same.

In operation this trolley-pole *f* may be revolved to occupy an inclined position to either end of the car by means of the swivel arranged at its base. When the wheel *p* is engaged with the overhead wire, the pole *f* occupies an inclined position, which throws the weight of the same against the roller *m* on one side, which, being attached to two of the springs *l*, will keep the wheel *p* in close contact with the said wire. Should the springs *l* become weak, the tension may be regulated by revolving the bolts *h*, and then holding the same rigid by means of the keys *k*; or by elevating or lowering the rollers *m* the tension of the springs *l* may be altered or the same adjusted to balance the pole *f*.

Having thus described my invention, I claim—

1. The herein-described means for balancing trolley-poles, consisting of the bolts *h*, a means for locking the same, and the springs *l*, coiled about the said bolts *h* and projecting upward and provided with rollers *m*, substantially as described.

2. The combination, with a trolley-pole, of the upright spring-arms arranged on one side of the pole, and a supporting-roller carried by said spring-arms and adapted to contact with the trolley-pole, substantially as described.

3. The combination, with a trolley-pole, of upright spring-arms arranged on one side of said pole, and a supporting-roller carried by said arms and adjustable vertically thereon, substantially as described.

4. The combination of a swiveled base, a trolley-pole pivoted thereon, the upright spring-arms carried by said base and arranged on one side of said pole, and the supporting-roller mounted on said spring-arms and arranged in relation to the pole to contact with the lower side of the same when it is in an inclined position, substantially as described.

5. The combination, with a trolley-pole, of

the pins or shafts, the springs coiled around said shafts and having the upright arms arranged on one side of the trolley-pole, and the supporting-roller carried by said upright arms and arranged to contact with the trolley-pole, substantially as described.

6. The combination, with a trolley-pole, of the bolts or pins adapted to be turned axially in their bearings, means for normally locking said bolts or pins in place, the coiled springs attached to said pins and having the upright arms, and the supporting-roller carried by said arms and arranged to contact with the trolley-pole, substantially as described.

7. The combination, with a trolley-pole, of two pairs of upright spring-arms, one pair ar-

ranged on one side of said pole and the other pair on the opposite side of the pole, and two supporting-rollers which are carried by the upright arms and one adapted to contact with the pole when it is inclined in one direction and the other to likewise contact with the pole when it is inclined in the reverse direction, substantially as described.

In testimony that I claim the foregoing I hereunto affix my signature this 5th day of May, A. D. 1890.

WILLIAM DUNCAN. [L. S.]

Witnesses:

M. E. HARRISON,
H. J. LEVIS.