

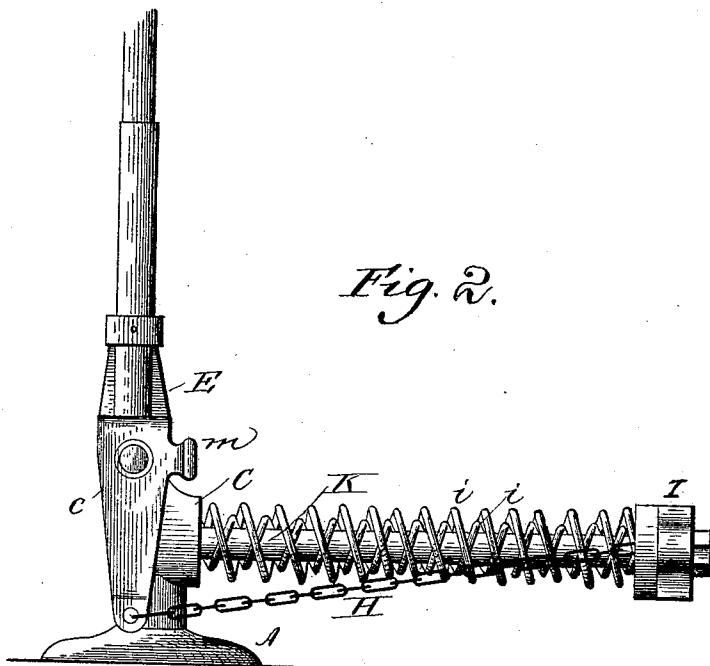
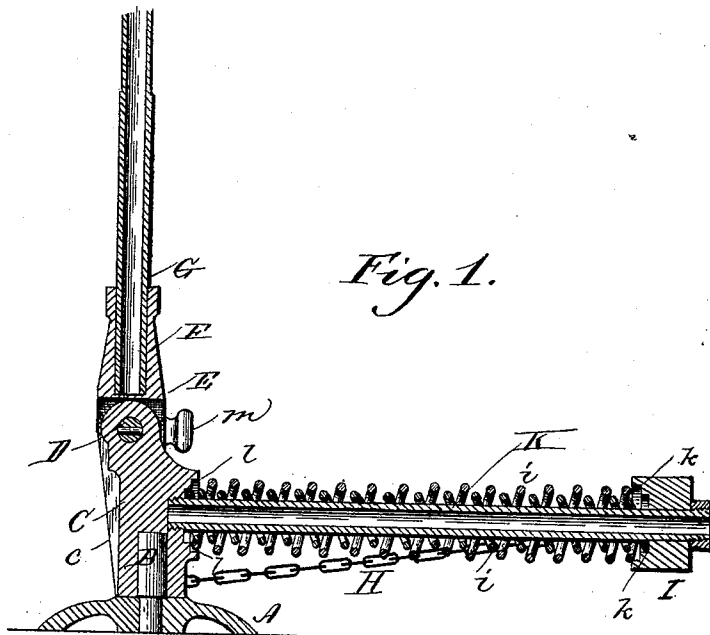
(No Model.)

2 Sheets—Sheet 1.

R. D. NUTTALL.
ELECTRIC RAILWAY TROLLEY.

No. 498,723.

Patented May 30, 1893.



Witnesses:
J. B. McGirr.
W. C. McLeod.

Inventor.
R. D. Nuttall
by *Connelly Bros*
Attys

(No Model.)

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Fig. 3.

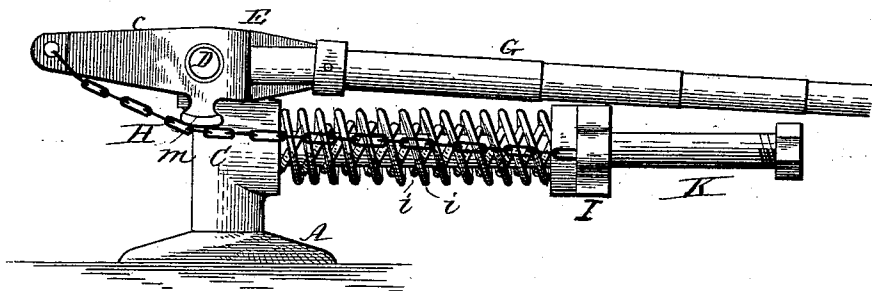
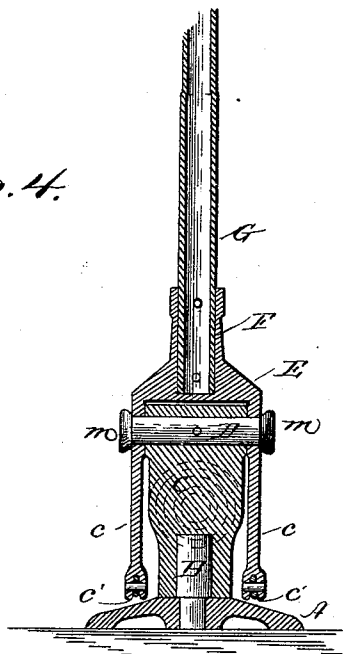


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT D. NUTTALL, OF ALLEGHENY, PENNSYLVANIA.

ELECTRIC-RAILWAY TROLLEY.

SPECIFICATION forming part of Letters Patent No. 498,723, dated May 30, 1893.

Application filed May 10, 1892. Serial No. 432,508. (No model.)

To all whom it may concern:

Be it known that I, ROBERT D. NUTTALL, 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 Trolleys for Electric Cars; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention has relation to trolleys for electric cars, and has for its object the provision of certain improvements in that class of trolleys in which the spring or springs are compressed by the action of the trolley rod instead of being stretched.

These improvements consist, first, in the novel application of two or more compressible springs of different diameters and strengths, nested one within the other, and so arranged that all will be compressed simultaneously; second, in the novel construction, arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view of a trolley embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation, with the trolley rod depressed. Fig. 4 is a transverse sectional view on the line X—X of Fig. 1.

A. designates the base of the trolley, consisting of a casting, bolted or otherwise secured to the roof of the car, and carrying an upright central pin or post B., upon which is swiveled the head C., having a hole bored through its upper end for the passage of the yoke pivot D.

E. designates the yoke, consisting of an inverted V-shaped casting, formed with a socket

F., for the reception of the trolley rod G., and having holes for the passage of the pivot pin D., upon which the yoke swings or turns. The depending limbs *c. c.* of the yoke are cleft at *c'. c'.* for the insertion and connection of the end links of chains H., the extreme ends of which are attached to a head I., which bears against the outer ends of the springs *i. i.* and which is socketed at *k. k.* to seat the ends of said springs. The face of the swivel head C. is similarly socketed at *l. l.* to receive the inner ends of the springs. A horizontal rod K. is screwed into the head C. at the center of the sockets, and passes loosely through a hole in the center of the head I. so that the latter is guided and supported in its movement under the compression and expansion of the springs. The springs *i. i.* are of different diameters and strength and are so made, in order to be more sensitive to the motions of the trolley rod, than a single spring of equal bearing capacity.

The yoke E. is cast or provided with abutments *m. m.* on one side on a line with the pivotal center, and when the trolley rod is depressed, these abutments bear upon the chains, so as to prevent the production of a dead center or alignment with the pivotal centers of the yoke.

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

In a trolley, the combination with compressible spiral springs one inside the other, a cross head at the outer ends thereof a pivoted yoke having projections on one side of each limb, and flexible connections between said yoke and the cross head substantially as described.

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

ROBERT D. NUTTALL.

Witnesses:

JOS. B. CONNOLLY,
THOS. A. CONNOLLY.