

F. F. SMITH.
TROLLEY FOR ELECTRIC RAILWAYS.

No. 460,163.

Patented Sept. 29, 1891.

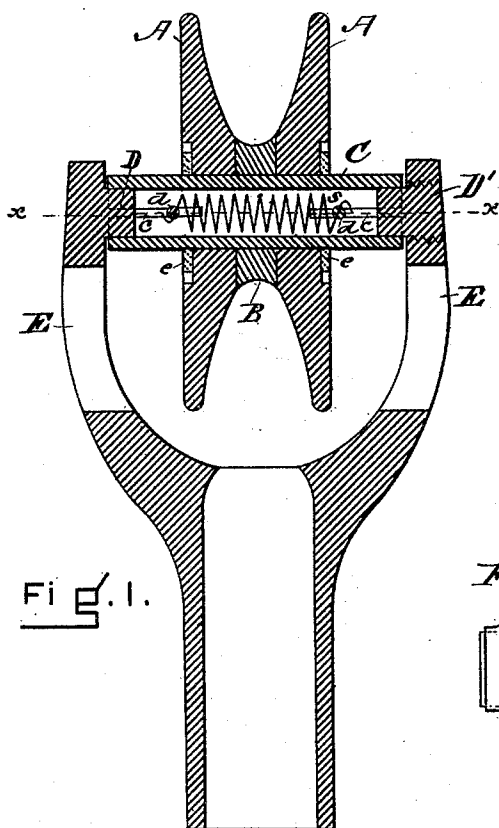


FIG. 1.

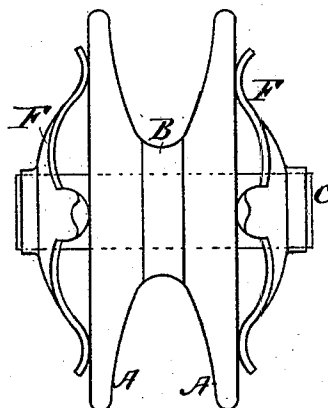


FIG. 3.

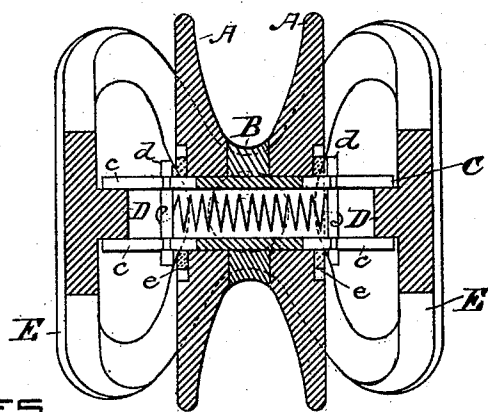


FIG. 2.

WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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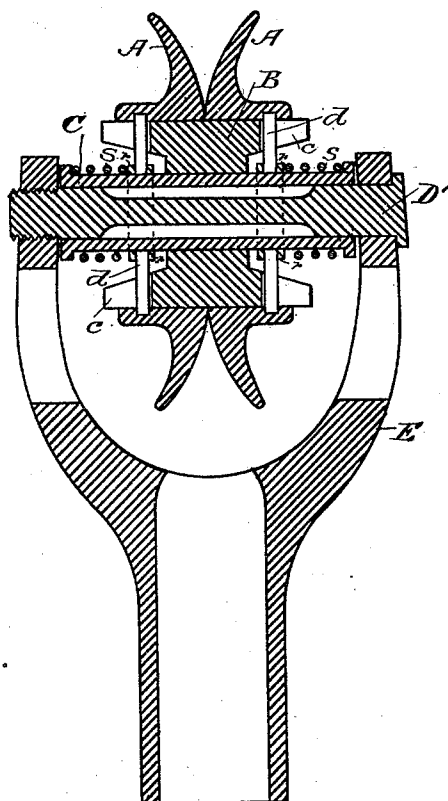


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERIC F. SMITH, OF WOBURN, MASSACHUSETTS.

TROLLEY FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 460,163, dated September 29, 1891.

Application filed December 20, 1890. Serial No. 375,304. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC F. SMITH, of Woburn, in the county of Middlesex and State of Massachusetts, have invented certain
5 Improvements in Trolleys for Electric Railway Cars, of which the following description, together with the accompanying drawings, is a specification.

My invention relates to improvements in
10 trolleys used chiefly with the overhead system of electrical railways; and it consists in making the two flanges of the trolley separate disks supported by a spindle upon which they freely turn and also upon which they may freely
15 slide within prescribed limits, and I preferably control these movable disks by means of springs which are applied so as constantly to force the said disks toward one another, but at the same time so as to permit the said disks
20 to be forced apart when any unusual pressure is brought to bear upon their inner surfaces by the trolley-wire which runs between them.

My invention is intended to prevent the trolley from being thrown off the trolley-wire
25 when the car is passing around curves, and thus obviate the great annoyance in this respect incident to the present construction of trolleys.

In the drawings forming a part of this specification, Figure 1 is a vertical section of my
30 improved trolley and its spindle and the supporting-yoke which is attached to the upper end of the trolley-pole. Fig. 2 is a horizontal section through the center of the spindle and
35 trolley in a plane $x x$, Fig. 1. Fig. 3 is an elevation of my improved trolley with springs applied upon the outside of the trolley-disks instead of within the hollow spindle, as illustrated in Figs. 1 and 2. Fig. 4 illustrates a
40 modification in which the spiral springs are placed around the outside of the spindle upon each end and the trolley-disks in contact.

Referring to the drawings, A A are the trolley flanges or disks, formed in the shape of
45 flat truncated cones. These two cones may be arranged to bear directly against one another; but I prefer to place upon the spindle between these two cone disks a bearing-ring B, upon which the trolley-wire will run when
50 the car is moving in substantially straight lines. The particular benefit of this bearing-

ring is that when it is worn out by the action of the trolley-wire it may be readily replaced by taking off one of the trolley-disks, removing the worn ring, and slipping a new one upon
55 the spindle in its place.

C is the trolley-spindle. In Figs. 1 and 2 it is shown as a hollow tube with slots c extending inward from each end, in which slots
60 pins d are inserted, and to each of which pins d is attached one end of a spiral spring s , placed within the hollow spindle, the normal condition of the spring being that of close contact in its several convolutions, so that when it is
65 extended and the ends fastened to the said pins d , as illustrated in Figs. 1 and 2, it will tend to pull those pins inward or toward one another along the slots c in the spindle. To prevent the trolley-disks from binding against
70 the pins d when they are forced outward by the trolley-wire, I place washers e upon the outside of each trolley-disk, preferably in circular depressions, against which the ends of the pins d are brought to bear by the action
75 of the spring s .

The hollow spindle C is supported by trunnions D, which project from the supporting-yoke E. When the two sides of the yoke E are integral with a single cylindrical stem into
80 which the trolley-pole is inserted, I provide a removable trunnion D', Fig. 1, which is screwed into the arm of the yoke upon one side. I prefer to place the spring s within a
85 hollow spindle, as illustrated in Figs. 1 and 2, as it is thereby free from exposure to the weather and from contact with extraneous objects. It will be readily understood, however, that a spiral spring may be placed around the
90 outside of the spindle upon either side of the trolley, as illustrated in Fig. 4, or flat leaf-springs F may be placed upon the spindle upon each side of the trolley, as illustrated in Fig. 3.

In the modification illustrated in Fig. 4 the removable trunnion D' extends entirely
95 through the hollow spindle, one end of this trunnion being provided with a head or shoulder and the other with a screw-thread which screws into the yoke E; also, the pins d are fastened to washers or rings r upon the spindle C, and slots c for the pins to slide in are
100 made in the bearing-ring B.

The essential feature of my invention is to provide a trolley the two flanges of which will readily and independently yield to any unusual pressure brought to bear upon them by reason of an abrupt curve in the trolley-wire, and which also will return automatically to their normal position as soon as the pressure is relieved. This construction will, as heretofore stated, prevent the trolley from being thrown off the wire, as frequently happens when the car passes around a curve, as at a street-corner, at its normal rate of speed, for the reason that as soon as the trolley-wire presses upon either flange with a force sufficient to overcome the tension of the spring that flange will yield by sliding along the spindle away from the pressure of the trolley-wire, and the other flange will yield in the opposite direction as the convex side of the curved wire presses upon it, and as soon as the curve is passed the two disks or flanges of the trolley will assume their normal position upon the spindle.

I claim—

25 1. A trolley for an electric car, consisting of a supporting-spindle, a pair of independent disks which freely move thereon, and one or more springs which constantly tend to press

said disks toward one another, substantially as described. 30

2. In a trolley for an electric car, the combination of a supporting-spindle, a pair of truncated-cone flanges adapted to be independently moved thereon, and a spring to hold them normally in contact and to permit them to be readily separated, substantially as described. 35

3. In a trolley for an electric car, the combination of a supporting-spindle, a pair of independent disks which move freely thereon, an intermediate bearing-ring upon the same spindle, and a spring which holds said disks normally in contact with the bearing-ring, substantially as described. 40

4. In a trolley for an electric car, the combination of a pair of flanges which move independently of one another, a hollow supporting spindle therefor, a pair of flange-controlling pins which project through slots in said spindle, and a spring therein to move said pins toward one another, substantially as described. 45 50

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Witnesses:

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