

E. P. WARNER.
CONTROLLER ROLLER FOR ELECTRIC CARS.

No. 505,686.

Patented Sept. 26, 1893

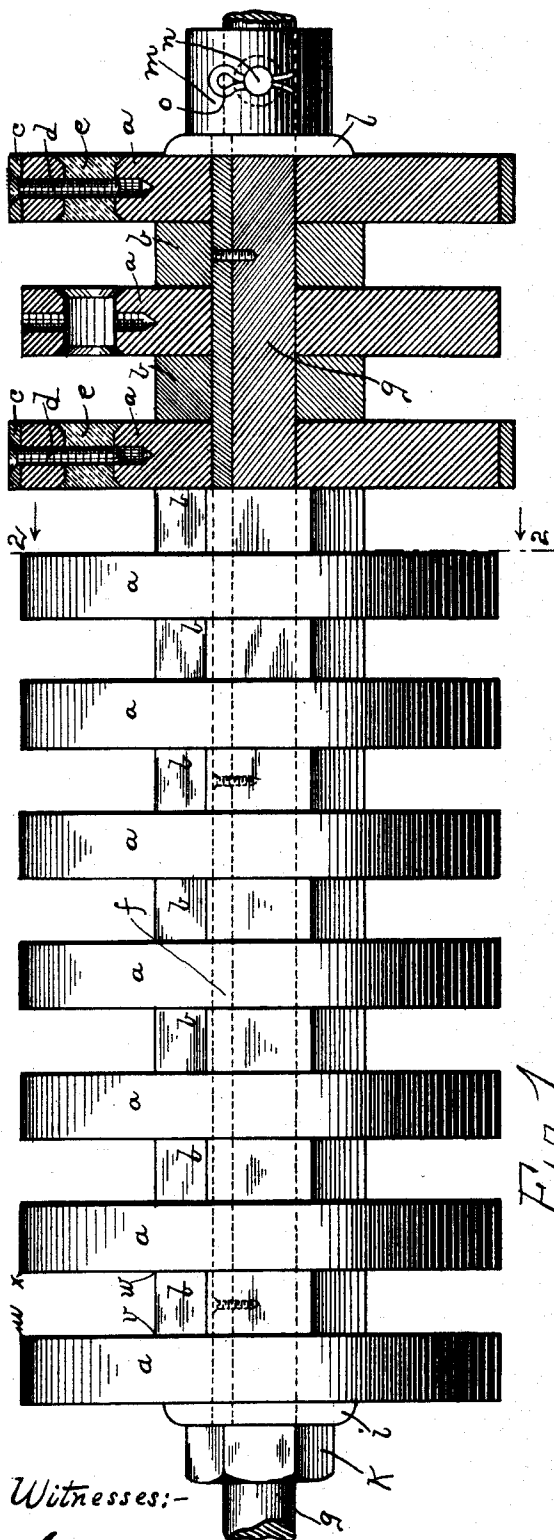
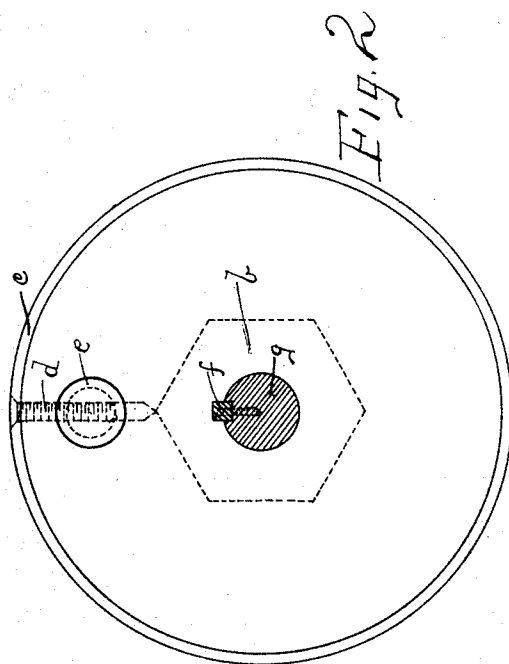


Fig. 1



Witnesses:-

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W. Clyde Jones.

Inventor:-

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Attys

(No Model.)

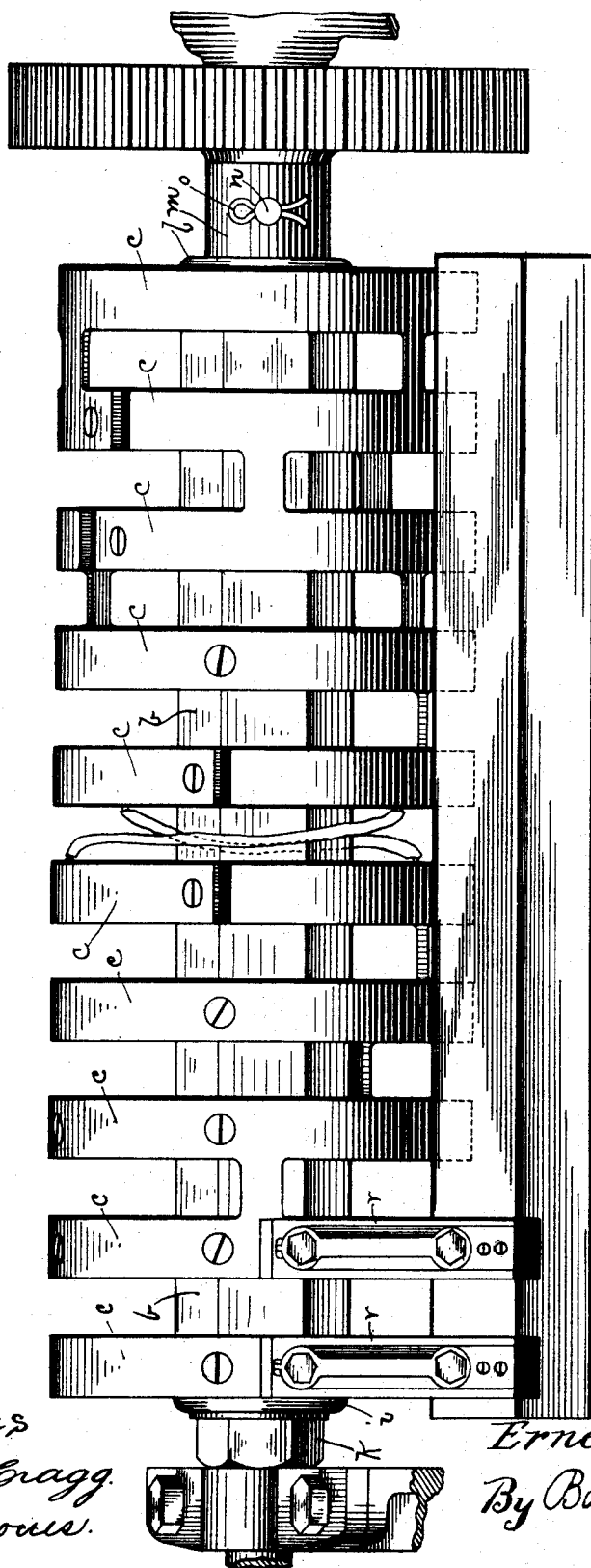
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

ERNEST P. WARNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

CONTROLLER-ROLLER FOR ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 505,686, dated September 26, 1893.

Application filed June 21, 1892. Serial No. 437,505. (No model.)

To all whom it may concern:

Be it known that I, ERNEST P. WARNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Controller-Rollers for Electric Street-Railway Cars, (Case No. 50,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to controller rollers for electric railway cars, and its object is to provide a controller roller that shall obviate the trouble caused by the sparking between the adjacent conducting strips and a consequent destruction of the insulating material between such strips and the loss of energy due to such sparking.

In the accompanying drawings—Figure 1 is a view of the roller with the conducting strips removed and showing a sectional view of some of the disks of which the roller is built. Fig. 2 is a sectional view being a section on line 2—2 of Fig. 1, showing strip attached. Fig. 3 is a view showing the roller with conducting strips attached and fingers bearing thereon for carrying the current to and from said conducting strips, eight of the fingers having been removed.

Like letters refer to like parts on the several figures.

The roller is built up of disks of slate or other insulating material. The disks are of two sizes, the diameter of one set being greater than the diameter of the other. The larger disks *a a* and the smaller disks *b b* are placed alternately upon a shaft provided with a feather *f* over which feather the disks slip, keyways being cut therein. This arrangement prevents any rotary movement of the disks upon the shaft. A sleeve *m* is fastened to the shaft *g* by means of a bolt *n* passing through a hole bored through the shaft and the sleeve, said bolt *n* being held in position by a cotter pin *o*. The sleeve *m* may be either separate or a part of the hub of the driving wheel by which the roller is revolved. Against the sleeve *m* is placed the collar *l* and upon this the large and the small disks *a a* and *b b* are alternately placed, and upon the last disk

a collar *i* is placed, and the nut *k* working upon a thread cut on the shaft *g* on being screwed against said collar *i*, clamps the disks *a a* and *b b* between the collars *l* and *i*.

The conducting strips are attached to the peripheries of the larger disks *a a* by means of screws. Holes are bored in the larger disks *a a* a short distance from the periphery and the ends counter-bored. Into these holes Bab-bitt-metal *e* or other soft metal is run and fits the holes and counter-bores. The metal that fills the counter-bores prevents the working out of the metal *e*. Into this plug *e* is tapped a hole for the screw *d*. In this manner the conducting strips may be firmly fastened to the disk *a*. Upon these strips thus attached and suitably connected, the fingers *r r* are adapted to bear, the current passing from finger to finger through the connections between the strips.

Previous to my invention controller rollers have been made by simply fastening the conducting strips upon the surface of a cylinder made of wood. When the potential difference between any two adjacent strips is unusual a spark is liable to be formed between the strips and this spark following the surface of the cylinder chars it, thus forming a carbon conductor between the adjacent strips and in consequence causes a waste of energy. This formation of a carbon conductor has in cases been obviated by the placing of strips of slate or other non-combustible insulating material between the conducting strips but this, though preventing waste by the leakage of current by the carbon conductor, does not prevent the passage of a spark when the potential is unusual, and the consequent loss thereby. When the roller is constructed of disks, in the manner set forth, the difference of potential between any two adjacent strips must be sufficient to break down the air medium *u x* Fig. 1 or to follow along the surface of the disk by the line *u v w x*. To obviate danger from the first cause, the disks may be placed at such a distance that the difference of potential may never be great enough between any two strips to cause a breaking down of the air space or maintain a persistent arc. As the distance *u v w x* may be made considerable by making the difference in the diame-

ters of the disks large there will be no danger of the spark passing along the surfaces represented by the line *u v w x*, unless, probably, in the case of the disks being covered with
 5 moisture, in which case, however, the mere passage of the spark will cause the vaporization of the moisture and the consequent extinguishment of the spark.

Having thus described my invention, what
 10 I claim as new, and desire to have secured by Letters Patent, is—

1. In a controller roller for electric railway cars, the combination with a shaft *g*, carrying a feather *f*, of disks of insulating material
 15 placed upon the said shaft, keyways being cut therein to prevent the rotary motion of the disks relatively to the shaft, of the sleeve *m* fastened to the shaft *g* and collars *l* and *i*, of the nut *k* adapted to clamp the disks between
 20 the collars *l* and *i*, the adjacent disks being of different diameters, the soft metal plug *e* fitting the counter-bored holes in the disks *a* *a*, holes being tapped therein to receive the screws *d d* to fasten the conducting strips *c c*
 25 to the disks *a a*, substantially as specified.

2. In a controller roller for electric railway cars, the combination with large and small disks of insulating material placed alternately upon a shaft, of means for clamping said disks
 30 upon said shaft, and means for preventing any

rotary motion of said disks relatively to said shaft, and conducting strips attached to the peripheries of said larger disks, substantially as specified.

3. In a controller roller for electric railway cars the combination with conducting strips,
 35 of screws passing through said conducting strips and fitting in tapped holes in soft metal plugs, which plugs are fitted into holes near the peripheries of the large disks of the roller,
 40 the holes being counter-bored, whereby the plug is held firmly in position, substantially as specified.

4. In a controller roller for electric railway cars, the combination with the conducting
 45 contact strips of spring fingers resting thereon, said conducting contact strips being supported upon the peripheries of disks of insulating material, said disks being mounted upon a shaft and adapted to rotate therewith,
 50 and disks of less diameter separating said disks carrying the contact strips, substantially as described.

In witness whereof I hereunto subscribe my name this 11th day of May, A. D. 1892.

ERNEST P. WARNER.

Witnesses:

W. CLYDE JONES,
 M. JEANE TALLETT.