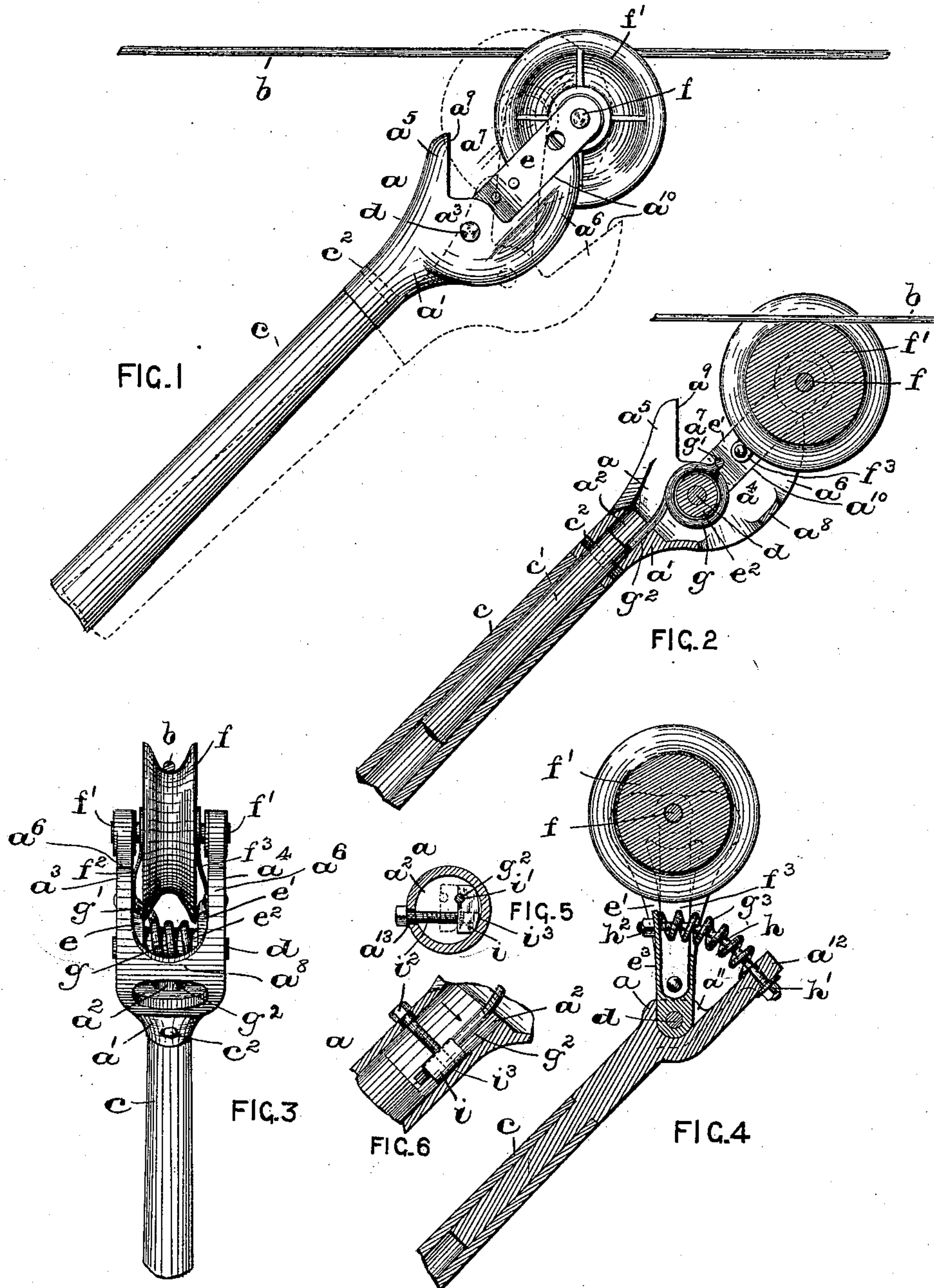


(No Model.)

W. M. WHITING.
TROLLEY FOR ELECTRIC RAILWAYS.

No. 570,078.

Patented Oct. 27, 1896.



WITNESSES:

Wm. H. Campfield, Jr.
Chas. Basil Hooper.

INVENTOR:

WILLIAM M. WHITING.

BY

Fred C. Fraentzel,
ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM M. WHITING, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO
RACHEL M. WHITING, OF SAME PLACE, AND CHRISTOPHER RICH-
ARDSON, OF NEW YORK, N. Y.

TROLLEY FOR ELECTRIC RAILWAYS.

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To all whom it may concern:

Be it known that I, WILLIAM M. WHITING, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Trolleys for Electric Railways; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to trolleys, and has for its primary object to provide a trolley-carrier with suitable means for controlling the position of the trolley-wheel against the trolley-wire and restrain it from jumping the wire, at all times retaining its operative contact with the latter, irrespective of the pivotal movement of the trolley-pole at its pivotal support on the roof of the car, when passing over switches, crossovers, and other inaccuracies in the line construction.

A further object of this invention is to provide a trolley-wheel construction in which the "arc-ing," as it may be termed, is, if not entirely overcome, reduced to a minimum.

The invention therefore consists in the arrangement and combination with a trolley-head adapted to be secured on the end of the trolley-pole, having a pivotally-arranged or swinging trolley-wheel carrier, and means connected with said carrier and the head to control the movement of the trolley-wheel irrespective of the movement of the trolley-pole.

The invention consists, furthermore, in certain other novel arrangements and combinations of parts, such as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

The invention is illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a side view of one form of trolley embodying the principles of my invention. Fig. 2 is a longitudinal vertical section of the same, and Fig. 3 is an end elevation of the trolley illustrated in said Figs. 1 and 2.

Fig. 4 is a longitudinal vertical section of a trolley of a slightly-modified form of construction, but still embodying the principles of my invention. Figs. 5 and 6 are detail sectional views of parts of the trolley-head and the end portion of the spring connected therewith, illustrating one means for adjusting the tension of said spring.

Similar letters of reference are employed in each of the above-described views to indicate corresponding parts.

In said drawings, *c* indicates the trolley pole or support, of the usual form and construction, and *b* is the trolley-wire.

To the upper end of the trolley pole or support *c* is secured, by means of a pin *c*² or in any other well-known manner, a rod *c*¹, carrying a trolley-head *a*, comprising therein a tubular portion *a*¹, forming, with the upper end of said rod *c*¹, a socket *a*², substantially as illustrated in Fig. 2. Said head is provided with two sides *a*³ and *a*⁴, having the upwardly-extending fingers or lugs *a*⁵ and *a*⁶, forming a fork *a*⁷. On a pin *d*, secured in perforations or holes in said sides *a*³ and *a*⁴, I have pivotally arranged the two arms *e* and *e*¹ of the trolley-wheel carrier, which are connected at the bottom by a sleeve-like portion *e*², rotatively arranged on said pin *d* and snugly fitted between the inner surfaces of said sides *a*³ and *a*⁴. Said arms *e* and *e*¹ are provided at the top with holes or perforations, in which is secured a pin *f* for the usual form of trolley-wheel *f*¹. The ordinary forms of spring-contacts *f*² and *f*³ are used to conduct the current from the wheel *f*¹ down through the trolley-pole *c* into the motor in the car. A stout spring *g* of the proper tension is made to encircle said sleeve-like portion *e*², one end, *g*¹, of said spring being made fast in a hole in the arm *e* of the trolley-carrier and the other end, *g*², of said spring being in holding contact with the edges of the socket *a*² of the trolley-head, as will be clearly seen from Fig. 2. The fingers or lugs *a*⁶ are preferably connected at the back by a piece *a*⁸ to give additional strength. Normally the action of said tension-spring *g* is to force the upper portions of said arms *e* and *e*¹, which are suitably curved to extend into the forked portions *a*⁷, between

the fingers a^5 and a^6 , against the edges a^9 of the fingers a^5 , as indicated in dotted outline in Fig. 1; but when the trolley-wheel is brought against the wire b the action of the spring at the lower end of the trolley-pole c is sufficient to overcome the active power of the spring g , and the arms e and e' will be held against the edges a^{10} of the fingers a^6 , resulting in a practically rigid trolley-pole, trolley-head, and trolley-wheel carrier; but when the trolley-wheel passes over switches or crossovers or other inaccuracies in the construction of the line-wire the trolley-wheel is generally displaced from its operative contact with the wire by suddenly coming in contact with the partial obstructions presented, the mainspring at the lower end of the trolley-pole being too slow in recovering its original position, which is due to the weight of the long pole on the said spring. In this instance the pole c will assume the position indicated in dotted outline in Fig. 1, and the tendency of the spring g is to force the arms e and e' of the trolley-wheel carrier away from the edges a^{10} of the fingers a^6 , whereby a constant operative contact is maintained by the trolley-wheel with the wire b , as will be evident. At the same time the spring at the bottom of the trolley-arm has recovered its original position and the fingers a^6 will again be in supporting engagement with the arms e and e' of the trolley-wheel carrier, and this, too, while a constant contact has been maintained by said trolley-wheel with the wire b .

It is a well-known fact that in the constructions now ordinarily employed the trolley-wheel in passing over switches or crossovers in the line-wire, if not entirely displaced, will be caused to slightly jump the wire, but immediately finds its position again on the wire, according to the speed of the car. This causes electrical contact to be broken, and a spark is the result, which is injurious to the contact-surface of the wheel and the parts in the line-wire.

My construction of trolley is such that the trolley-wheel is constantly and yieldingly forced into operative contact with the wire, and hence the sparking, if not entirely overcome, is reduced to a minimum.

In Fig. 4 I have illustrated a slightly-modified form of construction, in which the trolley-wheel carrier is pivotally arranged between the sides a^{11} of the form of trolley-head shown in said figure. Said head is provided at the back with an upwardly-extending post a^{12} , while the arms e and e' of the trolley-wheel carrier are connected at the front by a web or plate e^3 . Said arm a^{12} and plate e^3 are perforated and are connected by a suitably-bent rod h , held in place by bolts h' and h^2 , substantially as shown. Encircling said rod h is a coiled spring g^3 , having its free ends bearing against said arm a^{12} and the plate e^3 . The action of the parts of this form of trolley is similar to that described in connection with the construction of trolley illustrated in Figs.

1, 2, and 3, causing the trolley-wheel at all times to be constantly and yieldingly forced into operative contact with the trolley-wire, as will be clearly understood. In some instances the end g^2 of the spring g may be provided with an adjusting means for changing the tension of said spring. The said adjusting means consists, essentially, as will be seen from Figs. 5 and 6, of a plate or block i , having a groove i' , in which said end g^2 of the spring g rests, and loosely arranged in a hole a^{13} in the socketed portion a^2 of the trolley-carrier is a bolt i^2 , which is screwed into said plate or block i . The normal tendency of said spring-arm g^2 is to force said block i against the inner surface of said socket a^2 in the direction of the arrow shown in Fig. 6; but when said bolt is turned the block or plate will move on the thread of the bolt, being prevented from turning with the same by the pressure of the end portion of said arm g^2 in the groove i' , and the result will be that the tension of the spring g can be varied without any danger of the bolt i^2 being displaced, for the reason that its end i^3 is constantly held against the inner surface of said socket a^2 , but still freely turns in said socket.

I do not wish to be understood as limiting myself to the exact arrangement and construction of parts herein shown, as I am fully aware that they may be varied without departing from the scope of my invention.

Having thus described my invention, what I claim is—

1. In a trolley for electric cars, the combination, with a trolley-arm and trolley-head secured thereto, and fingers on said head, of a pivoted trolley-carrier having a trolley-wheel, and means coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, and said fingers on the trolley-head being adapted to be brought against said carrier to act as stops, substantially as and for the purposes set forth.

2. In a trolley for electric cars, the combination, with a trolley-pole, of a pivoted trolley-carrier, comprising a sleeve-like portion e^2 and arms e and e' having a trolley-wheel between them, and a spring encircling said sleeve-like portion, coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, substantially as and for the purposes set forth.

3. In a trolley for electric cars, the combination, with a trolley-pole, of a trolley-head a , comprising therein, forked sides or fingers, and a pivoted trolley-carrier having arms e and e' adapted to engage with said forked sides, and means coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, and said fingers on the trolley-head being adapted to be brought against said carrier to

act as stops, substantially as and for the purposes set forth.

4. In a trolley for electric cars, the combination, with a trolley-pole, of a trolley-head
5 *a*, comprising therein forked sides or fingers, and a pivoted trolley-carrier having arms *e* and *e'* adapted to engage with said forked sides, and a spring coöperating with said carrier to constantly and yieldingly force said
10 trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, and said fingers on the trolley-head being adapted to be brought against said carrier to act as stops, substantially as and for the purposes set forth.

5. In a trolley for electric cars, the combination, with a trolley-pole, of a trolley-head
20 *a*, comprising therein, forked sides, a pivoted trolley-carrier, consisting of a sleeve-like portion *e²* and arms *e* and *e'*, having a trolley-wheel between them, and a spring encircling said sleeve-like portion, coöperating with said carrier to constantly and yieldingly force said
25 trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, substantially as and for the purposes set forth.

6. In a trolley for electric cars, the combination, with a trolley-arm, and a trolley-head, and fingers on said head, of a pivoted trolley-
30 carrier having a trolley-wheel, and a spring coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley-wire, irrespective of the movements of the trolley-pole, and said fingers on

the trolley-head being adapted to be brought 35 against said carrier to act as stops, substantially as and for the purposes set forth.

7. In a trolley for electric cars, the combination, with a trolley-pole, of a trolley-head, comprising therein, forked sides, a pivoted
40 trolley-carrier having arms adapted to engage with said forked sides, and a spring coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley-wire, irrespective of the movements 45 of the trolley-pole, and an adjusting device connected with said spring, substantially as and for the purposes set forth.

8. In a trolley for electric cars, the combination, with a trolley-pole, of a trolley-head, 50 comprising therein, forked sides, a pivoted trolley-carrier having arms adapted to engage with said forked sides, a spring coöperating with said carrier to constantly and yieldingly force said trolley-wheel against the trolley- 55 wire, irrespective of the movements of the trolley-pole, and an adjusting device connected with said spring, comprising therein, a grooved block or plate *i* and an adjusting screw or bolt *i²*, substantially as and for the 60 purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 2d day of May, 1895.

WILLIAM M. WHITING.

Witnesses:

FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.