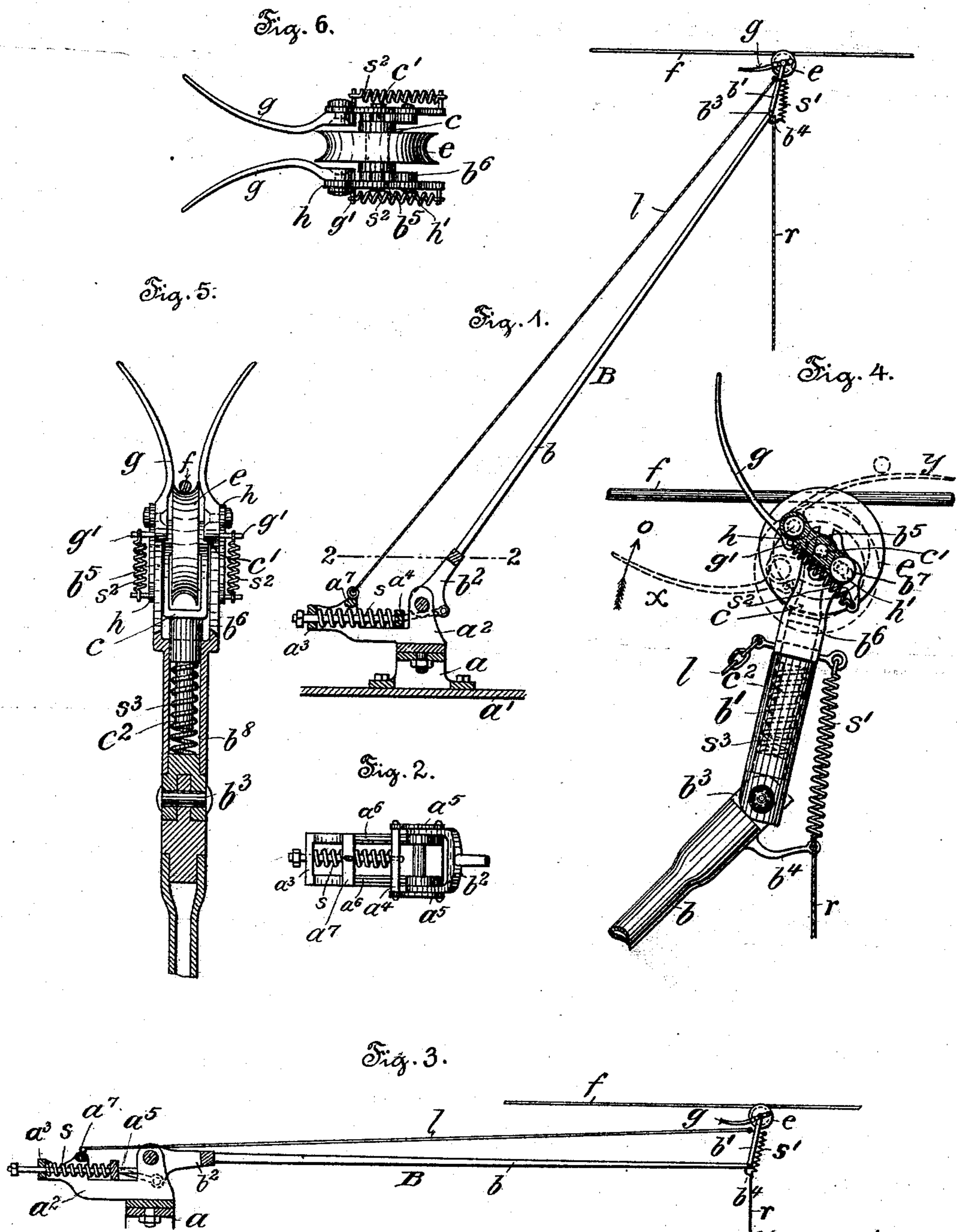


(No Model.)

F. W. RIESS.
TROLLEY ARM AND WIRE FINDER.

No. 544,794.

Patented Aug. 20, 1895.



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FREDERICK W. RIESS, OF PHILADELPHIA, PENNSYLVANIA.

TROLLEY-ARM AND WIRE-FINDER.

SPECIFICATION forming part of Letters Patent No. 544,794, dated August 20, 1895.

Application filed June 10, 1895. Serial No. 552,240. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. RIESS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Trolley-Arms and Wire-Finders, of which the following is a specification.

My invention relates to trolley-arms and wire-finders for electric cars, and has for its object to so construct the arm as that the trolley-support and the guides or wire-finders will always be held in the same relative position to the feed-wire no matter what inclination to the horizontal the arm occupies. It is a well-known fact that the trolley-wheel, when a car passes under low bridges or places in the railroad where the feed-wire is located only a few feet from the top of a car, it leaves the feed-wire more frequently than on portions of the road where the said wire is located at a substantial or usual height of about twelve feet; and if any guides or wire-finders are mounted to the trolley-arm they will, when the arm is much depressed, be entirely ineffective, owing to the varying inclinations of the trolley-arm and the relative positions of guides with the feed-wire. To overcome these and other disadvantages, a trolley-arm is provided which is pivoted in the usual or any preferred manner to the top of a car, and consists of two parts hinged together. The upper and very short part, provided with a sliding fork containing the trolley-wheel and guards or wire-finders, is normally held in axial line, or nearly so, with the lower part of the arm by a spring, and a chain or cord is fastened to the upper part of the arm and the pivotal support for the same, so that when the arm is depressed by passing under a low feed-wire the upper part of the arm, together with the guards or wire-finder, maintain the same relative position to a low feed-wire as if the latter was located at its usual height—*i. e.*, ten or twelve feet above the top of the car.

My invention further consists of wire guards or guides of novel construction mounted on the upper part of the trolley-arm to insure the engagement of the trolley-wheel with the feed-wire, and my invention further consists

of the improvements hereinafter more fully described, and pointed out in the claims.

My invention will be more fully understood taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a general view of my improved two-part or knee-jointed trolley-arm provided with wire-finders or guards and pivotally attached to a shoe mounted on top of a car, the said knee-jointed arm being shown in position to pass under a feed-wire located at a usual height of about twelve feet above the car. Fig. 2 is a section on line 2 2 of Fig. 1, showing a frame with springs to maintain the trolley-arm in elevated position. Fig. 3 is a view similar to that of Fig. 1, showing the knee-jointed arm in position to pass under a feed-wire located near the top of the car. Fig. 4 is an elevation of the hollow upper part of the trolley-arm having mounted therein a resilient sliding fork in which the trolley-wheel is journaled, and showing a guard or wire-finder at each side of the upper part of the trolley-arm. Fig. 5 is a longitudinal section, partly in elevation, of the parts shown in Fig. 3; and Fig. 6 is a top view of a portion of Fig. 3.

Referring now to the drawings for a further description of my invention, *a* is a shoe or bed fastened to the top *a'* of a car. *a*² is a rotatable frame to which the lower part *b* of the two-part trolley-arm B is fulcrumed at *b*². This frame may be of any suitable or preferred construction and contain any number of suitable springs or devices to hold the arm B in position to maintain contact between trolley-wheel *e* and feed-wire *f*. In the present instance, and as shown in Figs. 1 and 2, a spring *s* is mounted between the cross-bar *a*³ of the frame *a*² and a cross-head *a*⁴ slidably mounted on the ways of the frame *a*². The cross-head *a*⁴ is connected to the lower forked extremity *b*² of the trolley-arm B by the link *a*⁵, so that when the trolley-arm B is more or less inclined to the horizontal, the spring *s* is more or less compressed and tends to elevate the upper or free end of the arm B, as will be readily understood.

The trolley-arm B comprises the lower part *b*, having the bifurcated extremity *b*², and the upper part of extension *b'*, which is hinged

and jointed to the lower part b to form a knee-joint b^3 , for a purpose to be presently described.

To the rear side of the upper part or extension b' of the arm B is secured one end of a spring s' , which, with its other end, is attached near the knee-joint b^3 to an arm b^4 of the lower part b of the arm B. On the opposite or front side of the upper part b' and near the top end thereof is fastened one end of a chain, cord, or other link l , whose other end is secured to a cross-bar a^7 of the frame a^2 , Figs. 1, 2, and 3, so that the upper part or extension b' of the arm B is at all times maintained in substantially the same inclination, while the inclination of the part b of the arm B may range from the horizontal to almost the vertical.

The advantages of the arrangement are apparent when guards, guides, or other devices mounted on the trolley arm are employed to insure constant contact of trolley-wheel with feed-wire, because if such guards are not kept in the same relative position to the feed-wire in all positions of the trolley-arm they will be entirely useless, as will be readily understood by those skilled in the art.

The upper part or extension b' of the arm B is hollow and formed at its uppermost end into a forked guideway b^6 , having slots b^5 , Figs. 4, 5, and 6.

Within the forked guideway b^6 and extending into the hollow upper part or extension b' of the arm B is contained a sliding fork c , in which the trolley-wheel e is journaled by means of the shaft or arbor c' . This arbor c' is extended beyond each side of the fork c and guideway b^6 and engages with its offset ends the slots b^5 of the guideway b^6 , for a purpose to be described.

At each side of the guideway b^6 is provided a stud b^7 , to which a lever h , having a slot h' at one end, is pivoted. Adjacent to the slot h' of each lever h is a bearing in which the outer ends of the arbor c' are journaled, so that when the trolley-wheel e is forced or permitted to be thrown upward it oscillates the levers h about the slotted connection $b^7 h'$. On the free extremity of each lever h is hinged a guard g , which is provided with a pin g' , bearing against the under side of the lever h , to prevent a swinging motion in one direction and to allow a swinging motion around its pivotal connection with the lever h in an opposite or upward direction, as indicated by the arrow o in Fig. 4. A spring s^2 is interposed between the pin g' and the slotted or pivoted end of the lever h , to maintain the pin g' in contact with the lever h , or, in other words, to keep the guards g normally in about axial lines with the levers h . These guards are of peculiar shape and are designed and arranged on the trolley-arm b' as to be entirely out of engagement with the feed-wire or its accessories when the trolley-wheel e is in contact with the feed-wire and bears against the same with a pressure sufficient to counteract a

spring s^3 , placed around the stem c^2 of the sliding fork c and inside the bore b^8 of the part b' . The spring s^3 is of such strength as to readily and quickly force the sliding fork c outward and the trolley-wheel e against the feed-wire f as soon as the pressure with which the wheel e is forced against the feed-wire is smaller than the tension of the spring s^3 . It follows, therefore, that as soon as the wheel e tends to leave the wire f , through shock, jarring, swaying up and down of the wire, &c., the spring s^3 forces the sliding fork c and with it the wheel e outward and into normal operative position with the wire f . The levers h by the upward movement of the sliding fork c and wheel e are oscillated about the studs b^7 and force the guards g upward, as shown in full lines in Fig. 4. In this position the guards g allow the feed-wire f considerable sway sidewise as well as in vertical direction, and it is almost impossible for the feed-wire f to leave the guards g . Should the guards, or only one of them, in the running of the car strike against a cross-wire or any other obstacle or means which are necessary to hold the feed-wire f in position, they or it will easily swing backward about its pivot, as shown at y in dotted lines, and regain its former position quickly by the action of the spring s^2 . If the springs s in the frame a^2 has again brought the wheel e into proper contact with the feed-wire f and applied a pressure upon the wheel e to counteract the spring s^3 , by which the stem c^2 of the sliding fork c is depressed into the bore b^8 , the levers h and guards g are also depressed and occupy a position as shown in dotted lines at x , Fig. 4. Should the trolley-wheel e , however, leave the feed-wire f entirely the guards g are then thrown in position, as shown in full lines, Fig. 4, and act as a wire-finder. In such a case the trolley-arm B is operated by the rope r , and the guards g being inclined and curved from the wheel e outwardly, Fig. 5, serve to guide the feed-wire between them and onto the wheel e , as will be readily understood.

It may be remarked that as each of the guards g is separately pivoted to a lever the trolley will be securely guided and guarded on curved roads, because the feed-wire is held only by cross wires or guys located on the outer side of the curve, and the trolley-wheel e , tending to jump to the outer side, is prevented by the guard g running continuously on the inner side of the curved wire f , while the other guard g on the other side of the curve passes under all the cross wires or guys with which it may come into contact.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A trolley-arm comprising two parts hinged together, the lower part fulcrumed to a swivel-shoe containing springs for the elevation of the free or upper extremity of the two-part arm, a trolley and guards operatively mounted in the upper part of the trol-

ley arm, a chain fastened with one end to the swivel shoe and with the other to the upper extremity of the upper part of the trolley-arm, and a spring between the two parts forming the trolley-arm, substantially as and for the purposes set forth.

2. A trolley-arm composed of two parts hinged together, the lower part fulcrumed to a swivel shoe having devices for elevating the free end of the trolley-arm the upper hinged part of said arm adapted to support a trolley-wheel, a spring between said parts constituting the trolley-arm and a cord or chain attached to the upper part of the trolley-arm and the said shoe, substantially as and for the purposes set forth.

3. In a trolley-arm the combination with a two-part arm, of a hollow forked guide-way formed on the upper of said parts, a sliding-fork mounted in said hollow guide-way, a trolley-wheel journaled on an arbor of said sliding-fork, a spring for forcing the sliding-fork and trolley-wheel outwardly, a lever hinged to each side of the guide-way by a slotted connection and pivoted to extensions of the said arbor, a wire guard pivoted to the free end of the said lever, a pin or projection on said guard to contact with the said lever to form a back-stop for the guard, and a spring interposed between the said back-stop and the hinged end of the said lever, substantially as and for the purposes set forth.

4. In a trolley-support the combination with a two-part arm, of a guide-way formed in the upper part of said arm, a trolley-wheel journaled to an arbor carrying levers pivoted to opposite sides of the said guide-way, said arbor journaled in bearings slidably mounted in said guide-way, a guard pivoted to each of said levers and having back-stops contacting with the said levers, and a spring to keep the guard in about axial line with the said levers, substantially as and for the purposes set forth.

5. In a trolley-support, the combination with a two-part arm, of a guide-way formed in the upper part of said arm, a trolley-wheel journaled to an arbor slidably mounted in said guide-way a lever pivoted to each end of said arbor and hinged by a slotted connection to opposite sides of the guide-way, and a resilient wire-guard or wire-finder pivoted to the free end of said lever, substantially as and for the purposes set forth.

6. In a trolley-support the combination of an arm fulcrumed to a swivel bed, means for

holding the free end thereof in an elevated position, an extension or upper portion hinged to the free and upper extremity of the said arm and provided with a guide-way, a chain or cord secured to the swivel bed and the upper end of the said extension, a spring between said arm and extension tending to keep both in axial line, a sliding fork mounted in said guide-way, means for forcing the said fork out of the guide-way, a trolley-wheel journaled on an arbor of the said fork, a lever pivoted to each end on the said arbor and hinged by a slotted connection to opposite sides of the guide-way, a curved wire-guard pivoted to each of the said levers, a back-stop for each of said guards and a spring between each guard and lever, substantially as and for the purposes set forth.

7. In a trolley-support the combination of an arm fulcrumed to a bed, means for holding the free end thereof in an elevated position, an extension hinged to the upper end of said arm and having a guide-way, a chain or cord secured to the said bed and the upper end of said extension, means attached to the said arm and said extension tending to force the same into axial line, a trolley-wheel journaled on an arbor slidably mounted in said guide-way, a lever pivoted to each end of said arbor and hinged to opposite sides of the guide-way, a curved guard, having a back-stop pivoted to the said lever and a spring for normally holding the guard in axial line with the said lever, substantially as and for the purposes set forth.

8. In a trolley-support, the combination of a trolley wheel journaled on an arbor slidably mounted in a guide-way formed in an extension pivoted to a trolley-arm, levers pivoted to said arbor and hinged to opposite sides of the said guide-way, guards having back-stops pivotally secured to said levers and adapted to be brought into operative position when the arbor and wheel are forced outwardly, and springs to keep the said guards in normal position with the said levers, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FREDERICK W. RIESS.

Witnesses:

HERMANN BORMANN,
O. BORMANN.