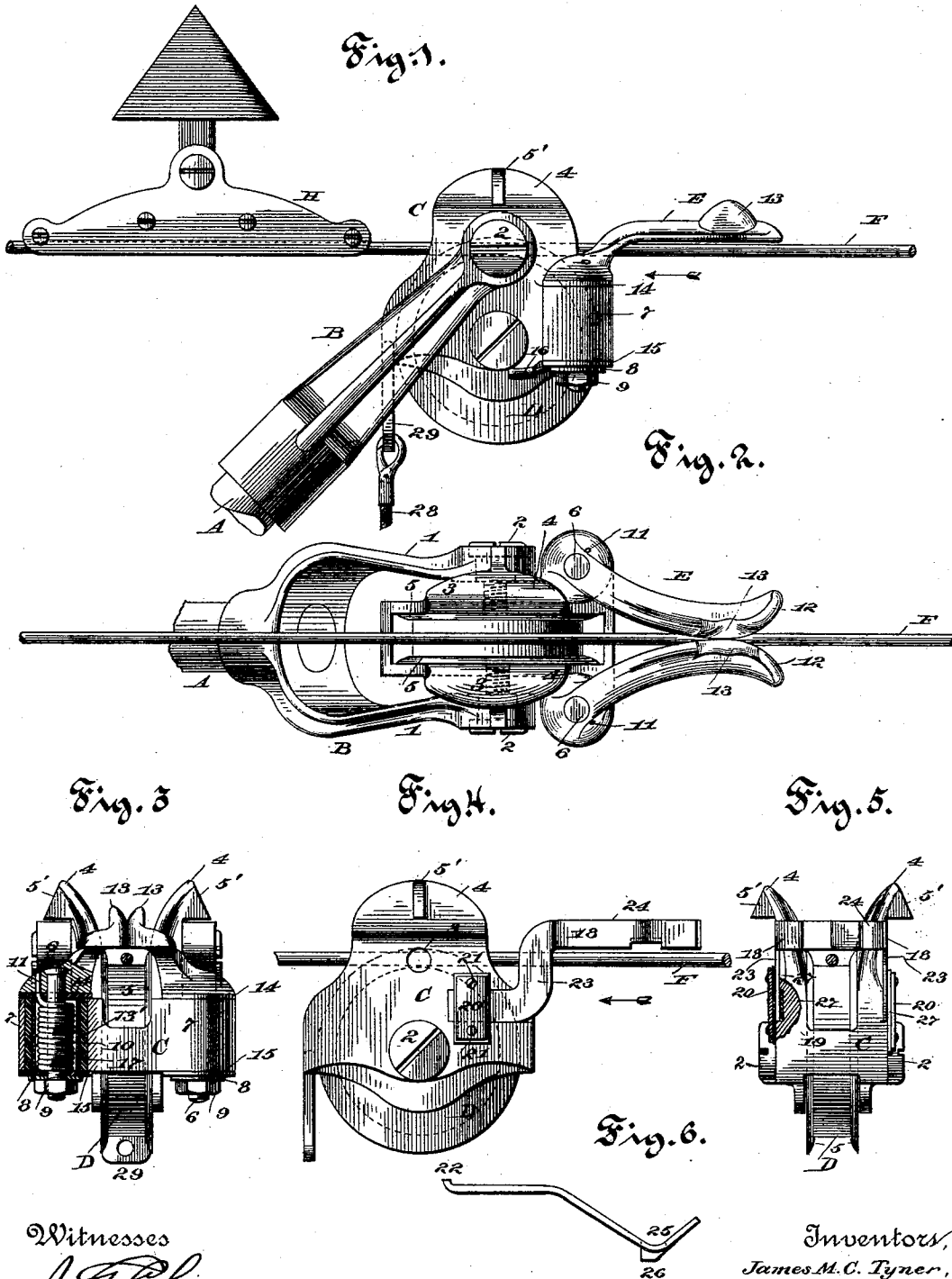


(No Model.)

J. M. C. TYNER & S. S. IRVING.
TROLLEY FOR ELECTRIC RAILWAYS.

No. 482,325.

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Witnesses
J. F. Coleman
Chas. Elliott

By Their Attorney

Wm. Hunter Myers

Inventors,
James M. C. Tyner,
Samuel S. Irving.

UNITED STATES PATENT OFFICE.

JAMES M. C. TYNER AND SAMUEL S. IRVING, OF MINNEAPOLIS, MINNESOTA.

TROLLEY FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 482,325, dated September 6, 1892.

Application filed November 30, 1891. Serial No. 413,588. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. C. TYNER and SAMUEL S. IRVING, citizens of the United States of America, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Trolleys, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in trolleys.

The objects of the invention are, first, to provide means for keeping the trolley-wheel in operative position with relation to the trolley-wire under all circumstances while in use, and, secondly, to provide means whereby the trolley may be readily released from or be brought into engagement with the trolley-wire when such a procedure is necessary.

With these objects in view the invention consists, broadly, in a trolley carrying a detent adapted to occupy a position over the trolley-wire at a point in rear of the trolley-wheel, whereby the trolley-wheel when in operation will be prevented from leaving the said wire from any cause.

The invention further consists in a trolley having a balanced oscillatory head or casing carrying a trolley-wheel and a series of fingers adapted to meet over the trolley-wire, whereby the said head will automatically adjust itself to the various angles assumed by the trolley-pole and will be held in its proper relation to the trolley-wire.

The invention further consists in a trolley having a balanced oscillatory head carrying the trolley-wheel and a series of spring-pressed fingers adapted to meet over the trolley-wire, whereby the said fingers will be automatically closed after having been automatically opened by contacting with the hangers or switches, to which the said wire is secured.

In the drawings, Figure 1 is a side elevation of our improved trolley, showing the latter in engagement with a section of trolley-wire and the fingers carried by the trolley extending over the said wire. Fig. 2 is a top plan view of the trolley, showing more clearly the configuration of the fingers. Fig. 3 is an end view of the trolley, partly in section, looking in the direction of the arrow shown in

Fig. 1, showing more particularly one of the springs for actuating the fingers, and also the insulator used in connection therewith. Fig. 4 is a side elevation of a trolley, showing a modified form of finger or arm. Fig. 5 is an end view, partly in section, of the trolley shown in Fig. 4, looking in the direction of the arrow thereon, showing the manner of insulating the modified form of fingers or arms. Fig. 6 is a detail plan view of one of the modified form of fingers.

Referring to the drawings, A designates the trolley-pole, to which is secured our improved trolley, consisting of a yoke B, rigidly mounted on said pole, a balanced trolley head or casing C, in which is journaled the trolley-wheel D, and a detent E, carried by the trolley-head and adapted to lie parallel with and above the trolley-wire F.

The yoke B is of the ordinary construction, and its two arms 1 are apertured near their upper ends to form bearings for screw-bolts 2, which engage threaded openings 3 in the trolley-head, whereby to allow the latter to oscillate with freedom. The trolley-head, which may be made either of a solid piece of metal, as shown, or of two connected sections, is balanced by locating the bolts 2 near the top of its sides, thus throwing the combined weight of the lower portion of the head and of the trolley-wheel some distance below the center of gravity, and by this arrangement the trolley-head will be caused to occupy a position always at right angles to the trolley-wire, irrespective of the angle the trolley-pole may occupy with relation to the head. The head C is provided with two flanges 4, extending some distance above the trolley-wheel and forming guides between which the trolley-wire works. The inner wall of each of these flanges is inclined or flared outward from the trolley-wheel, as clearly shown in Figs. 3 and 5, whereby the trolley-wire is constantly guided toward and kept between the flanges 5 of the trolley-wheel, thus assuring a perfect contact between the two parts. The head is further provided on both sides with a vertical strengthening rib or flange 5', designed to prevent any spreading of the flanges 4 should the latter come into violent contact with one of the hangers or with a switch.

The detent E, to which reference has been

made, consists of two fingers constructed of a suitable metal, preferably of a non-oxidizable metal. To the inner end of each of the fingers is rigidly secured a pintle 6, which works in an apertured lug 7 on the side of the head C, a washer 8 and a nut 9, screwed on the lower end of each pintle, serving to hold it in proper operative position, so as to allow the fingers to open in a plane normally parallel with the trolley-wire. In order to cause the fingers to retain the closed or locked position shown in Fig. 2, a coiled spring 10 is employed on each pintle, one end of which spring is secured in an opening 11 in the finger and the other end extends outward and bears against the side of the head, as clearly shown in Fig. 1. It is to be understood that any other form of spring may be employed for actuating the fingers; but for convenience and cheapness the coiled spring illustrated is in most instances preferred. The outer ends of the fingers diverge and are beveled outward, as at 12, not only for the purpose of facilitating the bringing together of the trolley-wheel and the trolley-wire, but also to form a practically-flat surface at the meeting-point of the two fingers, which surface is designed to contact with the trolley-wire, and thus prevent any undue oscillation of the head from causing the wire to open the fingers, which would result if the fingers met at a point. The upper portion of each finger is provided with an outward beveled lug 13, the two coacting with the divergent ends in guiding the trolley-wire between the fingers.

The bores or apertures of the lugs 7 are of greater diameter than the pintles 6, in order to afford space for a suitable insulator, whereby to insulate the fingers from the head, in order to prevent sparking when the fingers contact with the trolley-wire. The insulator employed in this instance consists of a tube 13' of insulating material, which fits tightly in each of the lug-apertures, insulating-disks 14, interposed between the fingers and the lugs, similar disks 15, interposed between the washers 8 and the lugs, and a block of non-conducting material interposed between the ends of the springs and the head. To prevent the friction incident to the expansion and contraction of the springs caused by the opening and the closing of the fingers from cutting the tubes 13', metallic tubes 17 are fitted within the tubes 13', against which former the springs bear.

In the modified form of trolley shown in Figs. 4 and 5 the trolley proper is of the same general construction as that shown in Fig. 1, the only difference being in the arrangement of the fingers 18, which are constructed of a spring metal instead of a rigid metal, as in the case of those shown in Fig. 1. Instead of pivoting the fingers in lugs, these lugs are dispensed with, and on each side of the head is formed a rectangular recess 19, in which the lower portion of the fingers fit, a strap 20 and screws 21 serving to hold the fingers in posi-

tion. The end of each of the fingers is flanged, as at 22, to prevent them from working out of the recesses. Just beyond the head the metal of the fingers extends upward, as at 23, and then outward and parallel with the trolley-wire, as at 24. At the point 25, where the fingers diverge, there is formed a flange 26, against which the trolley-wire contacts, for the same purpose as that stated in connection with the flat surface described in connection with Fig. 1. The fingers are insulated by means of strips of insulating material 27, interposed between the head and the fingers and the fingers and the strap 20.

Having thus described the different parts of our invention, we will explain the manner of its operation—that is, the manipulations necessary to bring the trolley-wheel into or remove it out of contact with the trolley-wire. When it is desired to remove the trolley-wheel from contact with the trolley-wire, as at the end of a route, when the trolley is reversed, a cord 28, connecting with a projection 29 on the head, is pulled downward, and as the pole is lowered the trolley-wire will slip between the fingers and cause the head to swing until the fingers occupy a vertical instead of a horizontal position, when the trolley-wheel will open them and slip between them. When the trolley-wheel is to be brought into engagement with the trolley-wire, the same operation is repeated in order to throw the fingers up to cause them to contact with the trolley-wire, which latter opens them by passing between their divergent outer ends in a manner that will be obvious. When the trolley is in motion and comes to a switch or to one of the hangers H on the trolley-wire, the fingers are automatically opened by the switch or the hanger and instantly closed by the springs, and as the fingers are always above the wire when the trolley is in its operative position it follows that the latter will always be kept in its proper position with relation to the wire under all circumstances. It is to be understood that the spring-fingers shown in Fig. 4 operate in the same manner as those shown in Fig. 1, so that a detailed description of their operation is deemed unnecessary.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A trolley carrying a detent adapted to occupy a position over the trolley-wire at a point in rear of the trolley-wheel.

2. A trolley carrying a series of fingers adapted to meet over the trolley-wire at a point in rear of the trolley-wheel.

3. A trolley carrying a series of insulated fingers adapted to meet over the trolley-wire.

4. A trolley carrying a series of spring-pressed fingers adapted to meet over the trolley-wire at a point in rear of the trolley-wheel.

5. A trolley carrying a series of insulated spring-pressed fingers adapted to meet over the trolley-wire.

6. A trolley having an oscillatory head car-

rying a series of fingers adapted to meet over the trolley-wire.

7. A trolley having an oscillatory head carrying a series of insulated fingers adapted to meet over the trolley-wire.

8. A trolley having an oscillatory head carrying a series of insulated spring-pressed fingers adapted to meet over the trolley-wire.

9. A trolley having an oscillatory balanced head carrying a series of fingers adapted to meet over the trolley-wire.

10. A trolley having an oscillatory balanced head carrying a series of insulated fingers adapted to meet over the trolley-wire.

11. A trolley having an oscillatory balanced head carrying a series of insulated spring-pressed fingers adapted to meet over the trolley-wire.

12. A trolley having a flanged trolley-wheel and an oscillatory head having flanges extending above the flanges of the trolley-wheel,

in combination with fingers carried by the said head and meeting over the trolley-wire.

13. A trolley having a flanged trolley-wheel and an oscillatory head having flanges extending above the flanges of the trolley-wheel, in combination with spring-pressed fingers carried by the said head and meeting over the trolley-wire.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES M. C. TYNER.
SAMUEL S. IRVING.

Witnesses to the signature of James M. C. Tyner:

R. M. ELLIOTT,
WM. HUNTER MYERS.

Witnesses to the signature of Samuel S. Irving:

J. C. MCINTYRE,
D. W. JONES.