

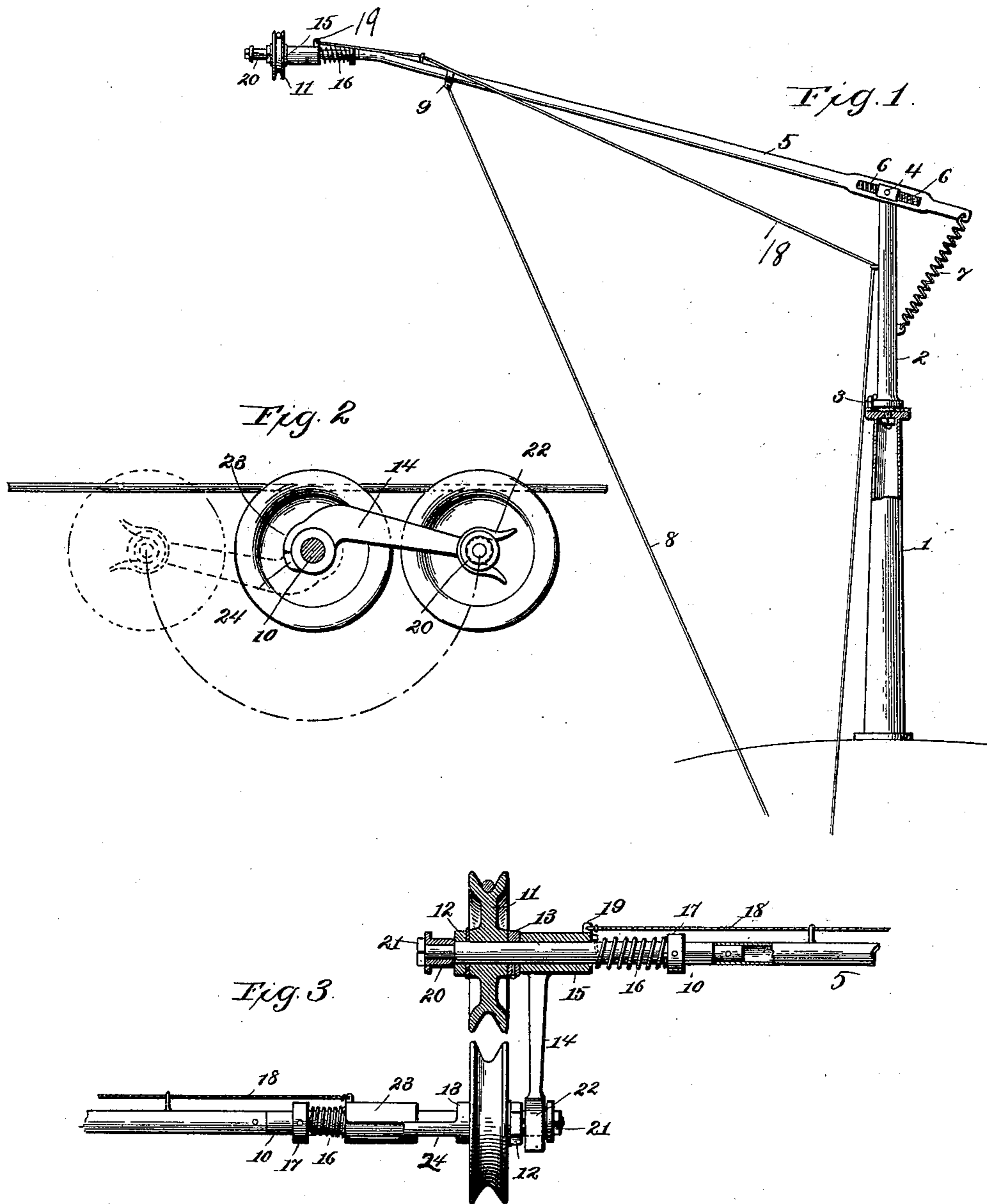
(No Model.)

2 Sheets—Sheet 1.

C. H. JOHNSON.  
TROLLEY.

No. 598,937.

Patented Feb. 15, 1898.



WITNESSES:

*E. W. Warden*  
*S. Williamson*

INVENTOR

*Charles H. Johnson*

BY

*Geo. H. Holgate*

ATTORNEY.

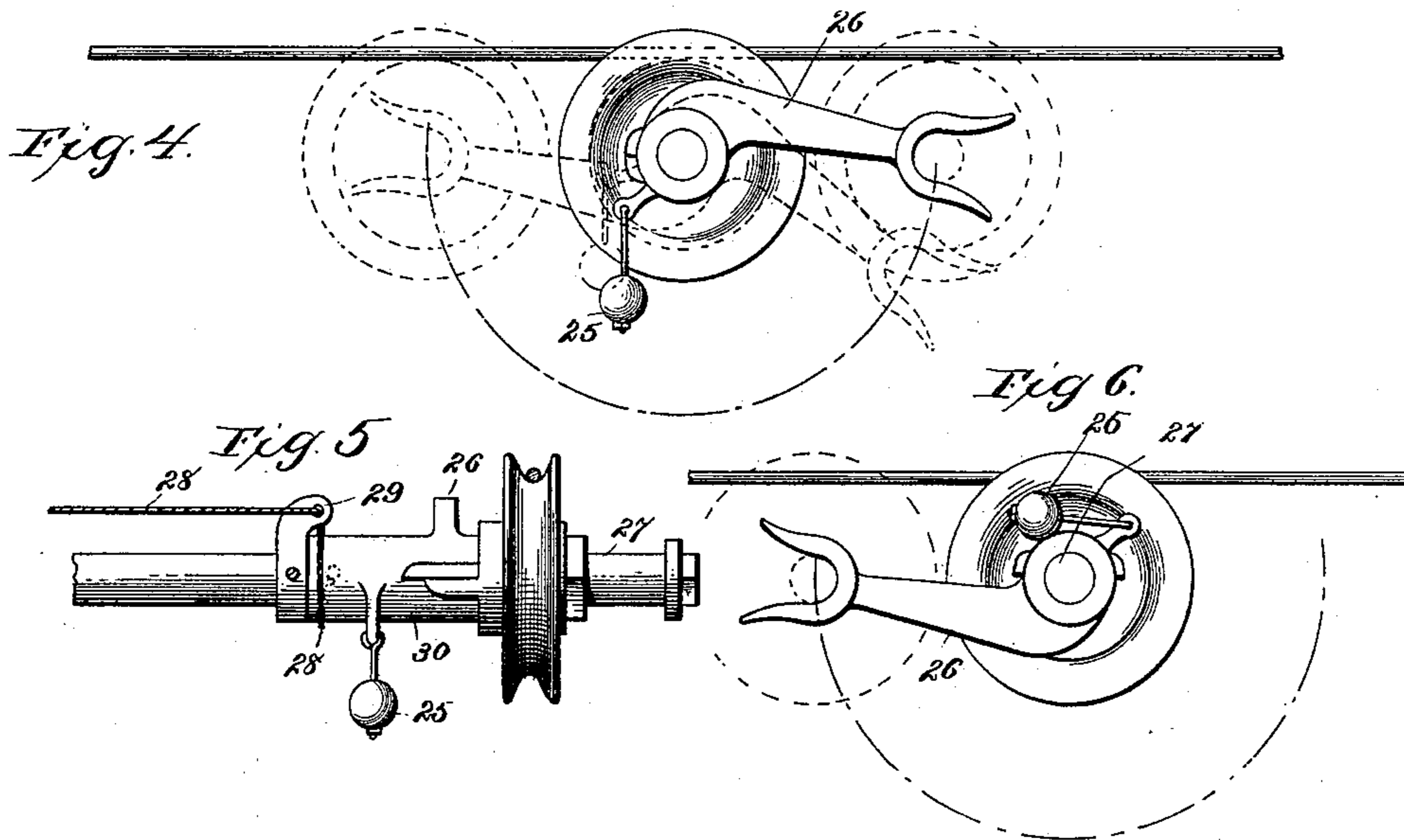
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# UNITED STATES PATENT OFFICE.

CHARLES H. JOHNSON, OF ELMHURST, CALIFORNIA.

## TROLLEY.

SPECIFICATION forming part of Letters Patent No. 598,937, dated February 15, 1898.

Application filed October 24, 1896. Serial No. 609,869. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. JOHNSON, a citizen of the United States, residing at Elmhurst, in the county of Alameda and State of California, have invented a certain new and useful Improvement in Trolleys, of which the following is a specification.

My invention relates to a new and useful improvement in trolleys for electric cars, and especially to that class of trolleys known as "double" trolleys, and has for its object to provide a simple and efficient device of this description whereby two cars running in opposite directions may use one and the same feed-wire and the trolleys be permitted to pass each other without injury; and a further object is to put within the control of the conductor or motorman mechanism to give his car the right of way, and when this mechanism is operated to determine thereby which trolley shall remain upon the feed-wire and which shall pass thereunder.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an elevation of a trolley-pole and trolley made in accordance with my improvement; Fig. 2, an enlarged side view of the trolley; Fig. 3, an elevation of one trolley and a section of another, the former passing beneath the latter; Fig. 4, a view similar to Fig. 2, illustrating a slight modification thereof, the crank-arm being shown in one position in full lines and in two positions in dotted lines; Fig. 5, a front view of this modification, showing the trolley upon the feed-wire; Fig. 6, a view similar to Fig. 4, showing in full lines the position of the crank-arm after having described a half-circle in carrying a trolley beneath its trolley.

In carrying out my invention as embodied in Figs. 1, 2, and 3, 1 represents an upright or standard, which has revolubly secured to the upper end thereof the post 2, which is

provided with a pawl 3, adapted to engage with the ratchet-teeth formed upon the enlarged top of the standard. The object of this pawl and ratchet is to hold the post 2 in the desired position when the trolley is in use, as will hereinafter appear.

To the upper end of the post is pivoted a block 4, upon which the inner end of the trolley-pole 5 is fitted by having a slot formed therein which embraces said block, and within this slot are placed the springs 6, one upon each side of the block, said springs so acting upon the pole as to maintain the ends of the slot at equal distance from the block, and yet when strain is brought to bear upon the pole lengthwise thereof it will be permitted to move in either direction to a limited extent. A coil-spring 7 connects the inner end of the pole with the post and is of such tension as to overbalance the outer end of the pole, thereby giving the latter a constant tendency upward, which may be overcome by the rope 8, attached to the trolley 9, secured upon the pole and leading downward within easy reach of the conductor.

The upper end of the trolley-pole has fitted thereto an extension 10, which is pinned or otherwise secured, so as to prevent its withdrawal, and upon this extension is journaled the trolley-wheel 11, which may be of usual design and held against lateral movement by the collars 12 and 13. Also upon this extension is journaled the crank-arm 14 by the hub 15 thereof surrounding a portion of the extension, and this hub is not only fitted to revolve upon the extension, but is also adapted to move lengthwise thereof, and is normally held against the collar 13 by the coil-spring 16, interposed therebetween and the collar 17, which latter is secured in any convenient manner upon the extension. One end of this spring is attached to the collar 17 and the other to the hub in such manner as to hold the crank-arm in its normal position, (represented by full lines in Fig. 2,) but to permit the swinging of said arm when sufficient force is brought to bear thereon to the opposite side of the trolley-wheel, as indicated in dotted lines in said figure. A cord 18 is attached at 19 to the hub 15 and passing through suitable guides leads downward to the car and in easy reach of the conductor or

motorman, so that when occasion requires this cord may be drawn upon, thereby sliding the hub 15 upon the extension against one action of the spring 16, and when this hub is thus moved longitudinally of the extension the crank-arm 14 will be carried from one vertical plane to another, for the purpose hereinafter set forth.

The extension 10 projects beyond the collar 12 and is reduced in diameter and has fitted thereon a roll 20, which latter is held in place by the nut 21.

Now from this it will be seen that when two trolleys built in accordance with my improvement are passing along the same feed-wire in opposite directions the crank-arm upon the one having the right of way is left in its normal position, which, by the action of the spring 16, will be held in the position shown in full lines in Fig. 2 and the hub thereof caused to bear against the collar 13, while the crank-arm upon the one not having the right of way will be drawn away from the collar, so as to be out of line with the roll 20 upon the other trolley, thus causing the engagement of the roll 20 of the trolley not having the right of way with the forked end 22 of the crank-arm of the trolley having the right of way, so that by a continued movement of either or both of the trolleys the one not having the right of way will be forced downward by the swinging of the crank-arm, thus carrying it under the one having the right of way and to the opposite side thereof, as shown in dotted lines in Fig. 2, after which the roll will pass out of engagement with the forked end of the crank-arm, releasing the latter and permitting it to be returned by the action of the spring 16 to its normal position, it being understood that the crank-arm is limited in its return movement by the shoulder 23 thereof coming in contact with the pin 24, formed upon the collar 13, as clearly shown in Fig. 3.

If found desirable, the upper prong of the fork 22 may be utilized as a cam for carrying the roll 20 when entering into engagement therewith below the dead-center of the extension of the opposite trolley, thus facilitating the swinging movement of the crank-arm.

A slight modification of the described construction is shown in Figs. 4, 5, and 6 and consists in the substitution of a weight 25 for the spring 16, so that the crank-arm 26 may return to its normal position, and in this modified form the necessity of drawing said arm to one side of the roll 27 of the opposite trolley is obviated by the cord 28 passing through the eye 29 and being partially coiled about the hub 30 and attached thereto, so that when the opposite trolley is to be given the right of way this cord is pulled upon sufficiently to revolve the crank-arm from the position shown in full lines in Fig. 4 to the position shown in dotted lines at *a*, which will carry the forked end of the crank-arm below the line of travel of said roll, thus permitting the latter to pass said arm without engage-

ment therewith. When this is the case, it will be understood that the forked end of the arm of the opposite trolley will engage with the roll of the trolley giving the right of way.

If desired, the bridge may be made of copper or other suitable metal and shod with steel, so as to increase its durability.

As shown in Fig. 1, the trolley-pole is fitted to the post by a slot therein embracing the block, and this arrangement will permit the go and come of the pole in either passing around a curve or in following a wire which is out of line with the track upon which the car is traveling.

One of the advantages of my improvement is that the upright and post are of such a height as to carry the trolley-pole above the top of the car sufficient to permit the free passage of persons beneath said pole, thereby adapting the top of the car for the accommodation of passengers after the manner of a double-deck car.

From what has been said it will be seen that but a single feed-wire is needed for the operation of two lines of cars each running in opposite directions, and this will obviously accomplish a great saving in the construction and operation of an electric railway and especially when such railway passes through a thinly-settled district and is of considerable length, while in practice no inconvenience will be occasioned in one trolley passing another.

Having thus fully described this invention, what is claimed as new and useful is—

1. A trolley, consisting of a trolley-wheel carried by a pole, a crank-arm also carried by said pole, said crank-arm having a forked end, and a roll also carried by the pole with which the forked end of one trolley may engage for the bridging of another trolley to the opposite side of the first-named trolley, as specified.

2. A trolley, consisting of an extension of the pole, a trolley-wheel journaled thereon, a crank-arm also journaled on said extension, a spring for holding said arm in its normal position, a fork formed upon the end of the arm, and a roll carried by the extension, with which the crank-arm of one trolley may engage for passing the first-named trolley to the opposite side thereof, as specified.

3. The herein-described combination of an extension, a trolley-wheel journaled thereon, a crank-arm also journaled on said extension, a spring for holding said arm in normal position, a cord for drawing said arm out of its normal position, and a roll carried by the extension for engagement with the crank-arm of another trolley, substantially as and for the purpose set forth.

4. The herein-described combination of an upright secured to the top of a car, a post fitted thereto so as to revolve, means for holding said post in one of two positions, a block pivoted to the top of the post, a trolley-arm having a slot therein embracing said block,

springs arranged within the slot for maintaining a normal position of the pole, a spring 7 for overbalancing the outer end of the pole, and a trolley carried by said outer end, substantially as and for the purpose set forth.

5. In a device of the character described, a pole, a block pivoted thereto, a trolley-arm having a slot embracing the block so as to allow the block to slide therein, springs arranged 10 within the slot for maintaining a normal position of the pole and means for retaining the arm in an elevated position, as and for the purpose described.

6. A trolley consisting of a trolley-wheel 15 carried by a pole, a crank-arm journaled on the pole, and a projection on the pole with which the crank-arm of another trolley may engage for bridging the first-named trolley to the opposite side of the second-named trolley.

20 7. A trolley consisting of a pole, a trolley-wheel, journaled thereon, a crank-arm also journaled on the pole, means for holding the crank-arm normally in one position, a projection carried by the pole for engaging the 25 crank-arm of another trolley to cause the crank-arm of that trolley to swing and carry with it the first-named trolley, as and for the purpose described.

30 8. In a trolley, a pole, a trolley-wheel journaled thereon, a crank-arm slidably journaled on the pole, said crank having a forked end, a collar having a pin secured on the pole, a coil-spring connecting the crank-arm to the

pole adapted to normally hold the crank-arm in engagement with the collar and cause the 35 pin of the collar to engage a shoulder of the crank-arm, a roll journaled on the pole to engage the forked end of the crank-arm of another trolley and a cord attached to the crank-arm to draw said arm against the action of the 40 spring, substantially as described.

9. In a trolley, a pole, a roll and a trolley-wheel journaled on the pole, a collar having a projecting pin rigidly secured on the pole, a crank-arm slidably journaled on the pole, 45 a forked end on said crank-arm to engage the roll of another trolley, a shoulder on the crank-arm, a spring connected to the crank-arm and pole adapted to impart to the crank-arm a rotary movement to cause the shoulder to bear 50 against the pin and a longitudinal movement to cause it to lie in a position to engage the roll of another trolley and a cord attached to the crank-arm by which said crank-arm may be drawn against the longitudinal action of 55 the spring, out of the position for engagement with the roll of another trolley, as and for the purpose described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses. 60

CHARLES H. JOHNSON.

Witnesses:

S. S. WILLIAMSON,  
R. M. PIERCE.