

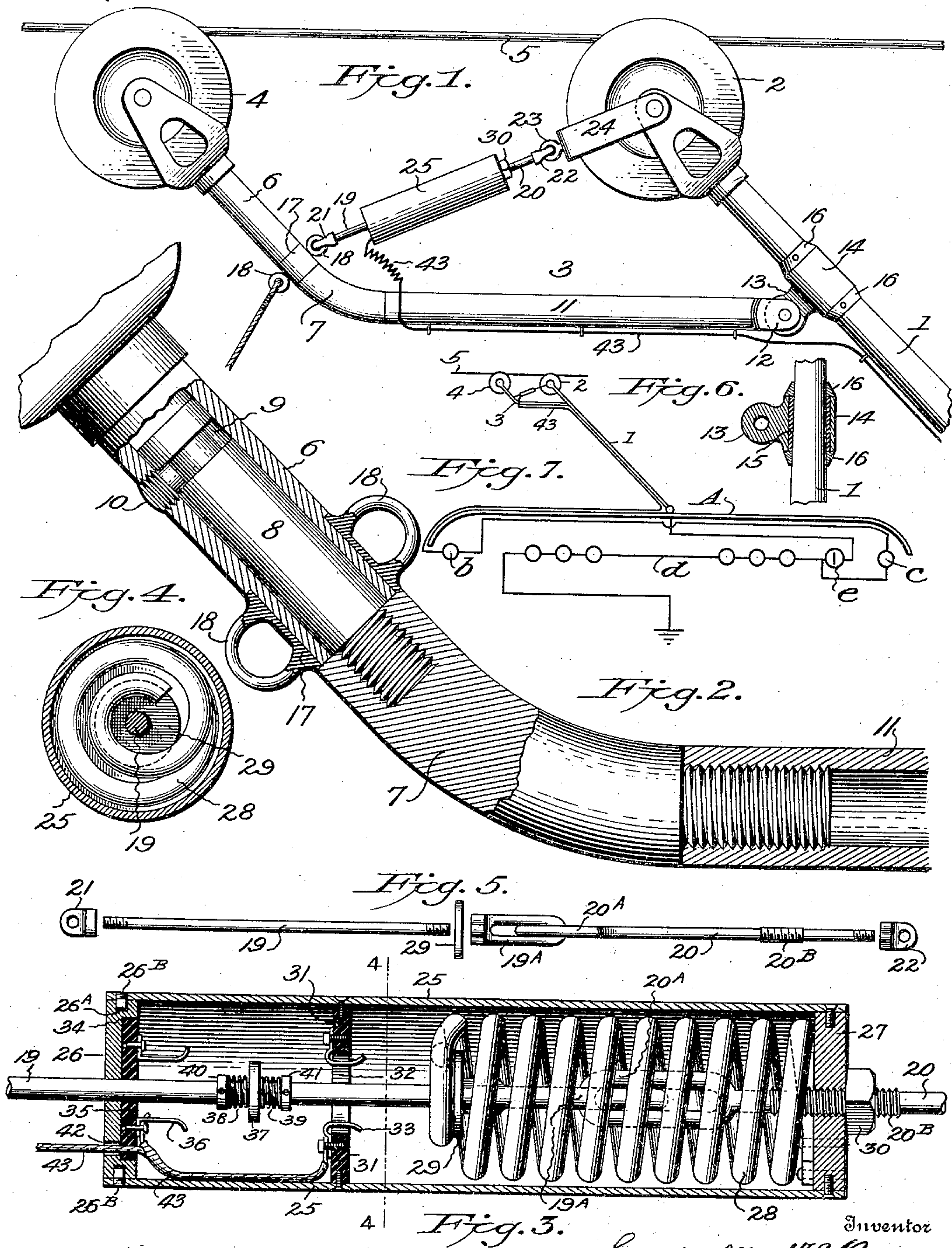
No. 768,674.

PATENTED AUG. 30, 1904.

L. M. McBRIDE.
TROLLEY FOR ELECTRIC CARS.

APPLICATION FILED JAN. 25, 1904.

NO MODEL.



Witnesses
J. Dargatz Elliott.
Bessie Thompson

Inventor
Lewis M. McBride
By
H. S. Bailey
Attorney

UNITED STATES PATENT OFFICE.

LEWIS M. McBRIDE, OF DENVER, COLORADO.

TROLLEY FOR ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 768,674, dated August 30, 1904.

Application filed January 25, 1904. Serial No. 190,462. (No model.)

To all whom it may concern:

Be it known that I, LEWIS M. McBRIDE, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Trolleys for Electric cars; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in trolleys for motor-cars.

The object of the invention is to provide an auxiliary contact-wheel and means for connecting the same to the trolley-pole, thus providing for a continuous and increased flow of electric fluid from the line-wire to the motor and to the light-circuit, thus preventing breaking of contact and consequent arcing should one of the trolley-wheels be thrown in passing a cross-wire or support.

A further object of the invention is to provide an improved manner of supporting the auxiliary wheel, whereby it will stand in the same relative position to the line-wire in rounding a curve as at other times, thereby greatly lessening the liability of its slipping the said wire, the said auxiliary-wheel support being held so that its wheel shall engage the line-wire by a spring-controlled mechanism electrically connected with the light-circuit, whereby when one or the other of the wheels slip the line-wire the circuit is closed and lights are turned on, which will notify the conductor or motorman of the occurrence.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation illustrating the trolley, the auxiliary wheel, and the manner of its connection with the trolley-pole. Fig. 2 is a sectional view showing the pivotal connection of the auxiliary-wheel fork with the supporting-arm. Fig. 3 is a longitudinal sectional view of the cylindrical casing, through which pass the rods connecting the auxiliary-

wheel-supporting arm with the trolley-pole, showing the spring which controls one of said rods and a circuit-closing mechanism which is connected with the light-circuit. Fig. 4 is a transverse sectional view through the casing on the line 4 4 of Fig. 3. Fig. 5 is a side view of the arm-supporting rods and their connections. Fig. 6 is a detail sectional view illustrating the manner of pivoting the supporting-arm to the trolley-pole, and Fig 7 is a diagrammatic view of the light-circuit and its connection with the arm-supporting mechanism of the trolley.

Referring to the accompanying drawings, the numeral 1 indicates the trolley-pole, and 2 the wheel, which are of the usual construction. To the trolley-pole a suitable distance below the wheel is pivoted one end of a horizontal arm 3, the opposite end of which is upturned at an angle and carries an auxiliary contact-wheel 4, which, with the wheel 2, engages the line-wire 5. This arm is preferably constructed, as shown in the drawings, comprising a hollow member 6, having a forked end which supports the auxiliary wheel 4, a solid member 7, having a pin 8 threaded into one of its ends, which fits in the hollow member 6 and having a circumferential groove 9 near its free end, the member 6 being adapted to turn upon the pin 8 and being held thereon by a screw 10, which passes through the member 6 and into the groove 9, the portion of the screw which enters the groove being unthreaded, and a horizontal tubular member 11, which screws upon the opposite threaded end of the member 7 and is provided at its opposite end with ears 12, which are pivoted to a lug 13, formed on a sleeve 14, which turns freely upon the trolley-pole 1. These poles are generally tapered, and in order that the sleeves may have a straight bearing a bushing 15 is interposed between the sleeve and the pole, the bore of which conforms to the taper of the pole, while its periphery is cylindrical and forms the bearing for the sleeve. The sleeve is held in place by collars 16, which are secured upon the pole above and below the sleeve by set-screws, thus preventing the sleeve from moving in the line of its axis, but permitting it to turn freely. The

lower end of the member 6, which turns upon the pin 8, is slightly reduced in diameter for a portion of its length, and upon this reduced portion is slipped a sleeve 17, having eyelets 5 18 upon opposite sides thereof. This sleeve is suitably secured, so as not to turn upon the end of the member 6 and is held against endwise movement in one direction by the end of the member 7 and in the opposite direction 10 by the shoulder formed by reducing the end of member 6.

To one of the eyelets 18 is secured the usual rope by which the trolley is manipulated, while to the other eyelet is secured one end of a combined support and circuit-closer, the other 15 end of which connects with a yoke which is pivoted upon the upper forked end of the trolley-pole. This support comprises a pair of rods 19 and 20, respectively, which are 20 linked together centrally, so as to be capable of a longitudinal movement upon each other. Upon the free end of the rod 19 is screwed an eyelet 21, which engages one of the eyelets 18 of the sleeve 17, while upon the free end 25 of rod 20 is screwed an eyelet 22, which engages an eyelet 23 of a yoke 24, which is preferably pivoted upon the extended ends of the axle-pin of the trolley-wheel 2. The link 19^A of the rod 19 is preferably screwed upon the 30 end of the said rod, while the link 20^A of rod 20 may be integral therewith, a portion of the rod substantially midway of its length being threaded, as shown at 20^B. These rods 35 pass through a cylindrical housing 25, having heads 26 and 27, the head 26 being provided with a circumferential groove 26^A, into which extends the ends of screws 26^B, which pass through the periphery of the housing and hold the head against endwise movement, but 40 permit the same to turn upon its axis.

The head 27 is rigidly secured within the end of the housing in any suitable manner and is provided centrally with a threaded hole, which is designed to receive the threaded portion 20^B of the rod 20, thus securing the housing 45 upon the said rod. To the head 27 is secured one end of a retracting coil-spring 28, the opposite of which is arranged to engage a washer 29 upon the rod 19, the said washer 50 abutting against the end of the link 19^A. The spring 28 exerts a constant pull upon the rod 19, which is communicated to the arms 3, causing the auxiliary wheel 4 to engage the line-wire, and if it is desired either to increase or diminish the power of the said 55 spring it is only necessary to unscrew a jam-nut 30 upon the threaded portion 20^B of rod 20, when the housing may be turned in either direction, thereby increasing or diminishing 60 the power of its spring, as may be desired.

A suitable distance beyond the free end of the spring 28 I secure within the housing a disk 31 of suitable non-conducting material having a central aperture 32, through which 65 the rod 19 passes, the said aperture being con-

siderably larger than the rod. At opposite points upon this disk are secured contact-springs 33, the free ends of which are bent to extend through the aperture of the disk parallel with the rod 19, as shown. The inner face of the head 26 is formed with a circular recess 34, in which is secured a disk 35 of non-conducting material, and the disk and the head are each provided with a central hole through which the rod 19 passes. At 75 opposite points upon the disk are secured contact-springs 36, similar to the springs 33 and the same distance apart. These springs also extend parallel with rod 19. Upon the rod 19 and midway between the two sets 80 of contact-springs is located a metal disk or washer 37, which is slightly greater in diameter than the distance between the two contact-springs of each set 33 and 36. This disk fits loosely upon the rod, so as to slide freely 85 thereon, and is held in its normal position by coil-springs 38 and 39, which bear, respectively, against opposite sides of the disk and are held under tension by collars 40 and 41, which are secured upon the rod by set-screws. 90 Through a hole 42 in the head 26 and a corresponding hole in the non-conducting disk 35 is passed one end of a wire 43, which connects with one of the springs 33 on the disk 31, a short branch from said wire connecting 95 with one of the springs 36 on the disk 35, the wire being insulated except when it connects with the springs. From the housing the wire passes under and along the arm 3 and down the trolley-pole to the top of the car A, where 100 it passes to a signal-light *b* at one end of the car and extends thence to a signal-light *c* at the opposite end of the car, after which it connects with the usual light-circuit *d* between the switch *e* and the ground. 105

The circuit between the contacts 33 36 and the signal-lights *b c* is normally open, and these lights are consequently out; but the circuit is closed in the following manner: In 110 passing a cross line-wire or a support or in rounding a curve the trolley frequently slips the wire, which stops the car and puts out the lights, if they are on, the car remaining dark and at a standstill until the trolley is again brought into engagement with the wire; but 115 with my improved arrangement one or the other of the trolley-wheels will engage the line-wire, thus maintaining the connection between line-wire and motor and obviating the stopping of the car or putting out of the 120 lights. If the main trolley-wheel should leave the wire, it will be thrown forward by the action of the usual springs at the base of the trolley-pole, carrying with it the rod 20 and housing 25, which is secured upon said rod. 125 This movement will cause the housing to slide upon rod 19, which is held stationary by its connection with the arm 3 and the spring 28, which is secured to the head 27 of the housing at one of its ends and engages the collar 29 of 130

rod 19 at its opposite end, will be stretched or expanded, and the links of the rods will have slid upon each other until their ends engage. At this point the contact-springs 36 will im-
 5 pinge upon or slip over the disk 37 on rod 19, pushing it against its coil-spring 39, which is thereby compressed. A circuit is now closed between rod 19 and signal-lamps *b* and *c*, which are lighted, and notify both conductor and
 10 motorman that one of the trolley-wheels has slipped the wire. If this occurs during the day, when the usual lights are turned off, then the current from rod 19 will pass through the signal-light circuit and into the usual light-
 15 circuit and light all the lamps in the car. Now if the auxiliary wheel 4 should slip the wire the arm 3 will be drawn up by the engagement of spring 28 with rod 19, which is connected to the said arm 3, and the disk 37 will
 20 pass between contact-springs 33, closing the circuit between rod 19 and the signal-lamps, as before described, and at the same time compressing its coil-spring 38.

The function of the coil-springs 38 and 39
 25 is to quickly throw the disk 37 from between the contact-springs 33 or 36, thereby to reduce sparking, and thus preventing burning of contacts. This operation occurs when either trolley-wheel is replaced, and is as follows: Assuming that the auxiliary wheel has slipped
 30 its wire, then the disk 37 is drawn between the contact-springs 33, thereby compressing its coil-spring 38, as previously mentioned. The pressure of the springs 33 is sufficient to hold the disk 37 tightly and, as the rod 19 is drawn
 35 out by the replacing of the trolley 4, the disk will be held, the spring 38 will expand again to its normal position, and spring 39 will be compressed to a point sufficient to overcome
 40 the resistance of the contact-springs 33, when it will instantaneously throw the disk from between the said springs and reduce the sparking, as previously stated. The operation of the springs 38 and 39 is the same when the
 45 main trolley-wheel is replaced and need not therefore be recited.

The pivotal connection of arms 3 with the trolley-pole by means of sleeve 14 and the pivotal connection of the auxiliary-wheel support with the arm 3 allows the auxiliary wheel
 50 to maintain a position parallel with the line-wire both while rounding curves and when the main trolley-wheel has slipped the wire, thus practically overcoming the liability of
 55 both wheels being off the wire at one time and the consequent stopping of the car.

My improvement is simple and practical, and not only provides for greatly-increased contact with the line-wire, but assures an un-
 60 broken flow of electric fluid to the motor and a simple manner of ascertaining when either trolley has slipped the wire.

Having fully described my invention, what I claim as new, and desire to secure by Letters
 65 Patent, is—

1. The combination with a trolley-pole having a contact-wheel, of an arm pivoted to said pole; a member pivoted to the opposite end of said arm, carrying an auxiliary contact-wheel; a yielding connection between the pole and
 70 the arm for holding the auxiliary wheel, in engagement with the line-wire, and means forming a portion of the said yielding connection to closing an electric circuit, to give notification when one or the other of the
 75 wheels has left the line-wire, substantially as shown.

2. The combination with a trolley-pole having a contact-wheel, of a sleeve adapted to turn upon said pole; an arm pivoted at one
 80 end to said sleeve and a member secured upon the opposite end of said arm so as to turn thereon, said member carrying an auxiliary contact-wheel; a yielding support connecting the arm and the pole, and means connected
 85 with said support for closing an electric circuit to give notification when one of the wheels has left the line-wire, substantially as shown.

3. In a trolley, the combination with a trolley-pole having a contact-wheel, of a horizontal
 90 arm pivotally connected to said pole, an upturned member secured to the opposite end of said arm so as to turn thereon, and an auxiliary contact-wheel carried by said upturned member; rods connecting the arm and pole,
 95 which are linked together, and spring-actuated and means connected with said arms for closing an electric circuit to give notification when one of the wheels has left the line-wire,
 100 substantially as shown.

4. In a trolley, the combination with a trolley-pole having a contact-wheel, an arm pivotally connected at one end with said pole, a member secured on the opposite end of said arm and an auxiliary contact-wheel carried by
 105 said member which is secured upon the end of said arm so as to turn thereon; of means for supporting the said arm and for closing an electric circuit, when one of the wheels has slipped the line-wire, to give notification
 110 thereof; comprising a rod connected with the trolley-pole, a housing adjustably secured upon said rod, carrying contacts which are connected with an electric circuit; a second rod linked to said first-named rod, its oppo-
 115 site end being connected to the arm carrying the auxiliary wheel; a spring connected at one end to said housing, and at its opposite end to said last-mentioned rod, said spring being adapted to exert a pull on said rod and
 120 a contact carried by the rod which engages the contacts of the housing, when one of the wheels leaves the line-wire, substantially as described.

5. The combination with a trolley-pole carrying a contact-wheel, an arm pivotally attached to said pole, a member secured upon the opposite end of said arms so as to turn
 125 thereon, and an auxiliary contact-wheel carried by said member; of means for supporting
 130

the said arm, and for closing an electric circuit when one of the trolley-wheels has slipped the line-wire, to give notification thereof, comprising a pair of rods which are linked together so as to move one upon the other, the free end of one rod being connected with the trolley-pole, while the free end of the other rod is connected with the arm carrying the auxiliary trolley-wheel; a cylindrical housing having a threaded axial hole in one of its heads which engages a threaded portion of one of the rods; a head secured within the opposite end of the housing so as to turn therein, said head having a disk of non-conducting material secured thereto, to which contact-springs are secured; a disk of non-conducting material secured within the housing, a suitable distance from the movable head, having contact-springs, attached thereto, and a wire connecting the contacts upon the rear and those upon the disk in a circuit having signal-lamps; a contact upon the other rod which closes the said circuit, when one of the wheels slips the wire, and a spring which exerts a pull upon the said rod, substantially as shown.

6. In a trolley for motor-cars, the combination with the trolley-pole and its wheel, an arm pivotally connected to said pole having an auxiliary trolley-wheel and a yielding support connecting said arm and said pole, of a branch circuit connecting said yielding support with the light-circuit of the car, said branch circuit having signal-lamps therein; and means connected with said yielding support for closing said branch circuit when one of the trolley-wheels slips the wire, thereby turning on the signal-lamps, substantially as shown.

7. In a trolley, the combination with the trolley-pole and its wheel, of a sleeve adapted to turn upon said pole; a horizontal arm pivoted to said sleeve, a projecting pin in the opposite end of said arm having an annular groove, near its free end; an auxiliary-wheel support, having a hollow shank which fits loosely upon said pin, and is held thereon by a screw which passes through the periphery of said shank and into the groove of the pin, linked rods which connect the said arm with the trolley-pole, a housing through which said rods pass which housing is secured upon one of said rods, a spring secured to one end of said housing, which exerts a constant pull upon

the other rod, contacts carried by the housing which connect with a lamp-circuit, and a contact upon the last-mentioned rod which closes the said circuit when one of the trolley-wheels slips the wire, substantially as shown.

8. In a trolley for motor-cars, the combination with the lamp-circuit the pole and its wheel, an arm pivotally secured to said pole, an auxiliary wheel carried by said arm and a yielding support connecting said arm and pole; of a branch circuit having signal-lamps therein, connecting said yielding support and said lamp-circuit, and means carried by said yielding support whereby said branch circuit is closed when one of the wheels slips the wire, substantially as shown.

9. In a trolley, the combination with the pole and its wheel and an arm pivotally attached to said pole having an auxiliary contact-wheel at its free end; of means for supporting said arm comprising a pair of linked rods, one of which is pivotally connected to the arm, while the other is pivotally connected to a yoke carried by the trolley-pole, and is threaded a short distance about centrally of its length; a housing having at one end a revoluble head with a central hole, and at its opposite end a fixed head with a threaded hole, which engages the threaded portion of said threaded rod; contact-springs carried by the revoluble head but insulated therefrom, similar contact-springs carried by a non-conducting ring, secured a suitable distance from said revoluble head and a wire connecting both sets of said contact-springs in a lamp-circuit; a sliding spring-controlled circuit-closer on the first-mentioned rod, which closes said lamp-circuit when a wheel slips the wire, and is thrown by the action of its springs when the wheel is replaced, to reduce sparking, and a spring secured to the fixed head of the housing, which exerts a constant pull upon the rod having the circuit-closer, the power of said spring being increased or diminished by turning the said housing one way or the other upon the threaded rod, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS M. McBRIDE.

Witnesses:

G. SARGENT ELLIOTT,
BESSIE THOMPSON.