

(No Model.)

3 Sheets—Sheet 1.

P. J. DOWLING.

APPARATUS FOR OPERATING TROLLEY ARMS.

No. 562,591.

Patented June 23, 1896.

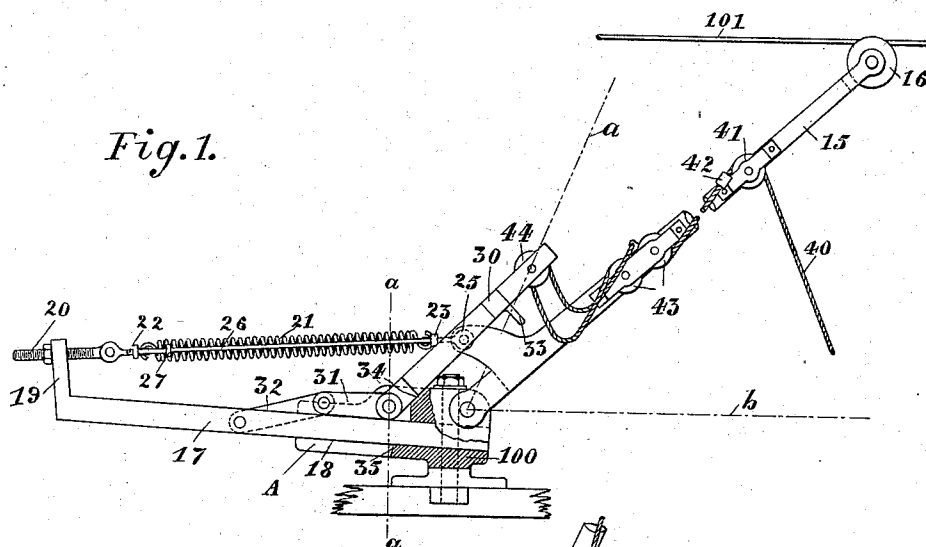


Fig. 1.

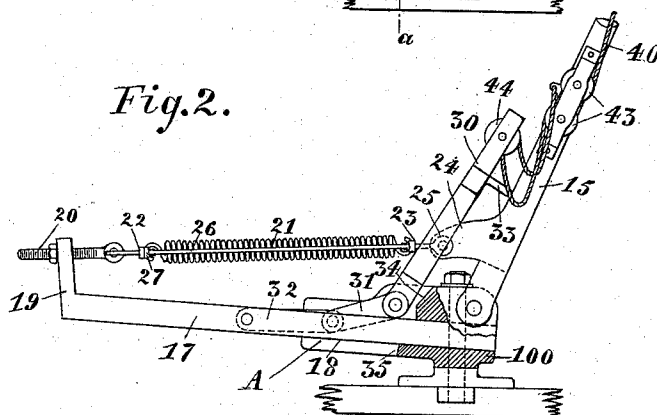


Fig. 2.

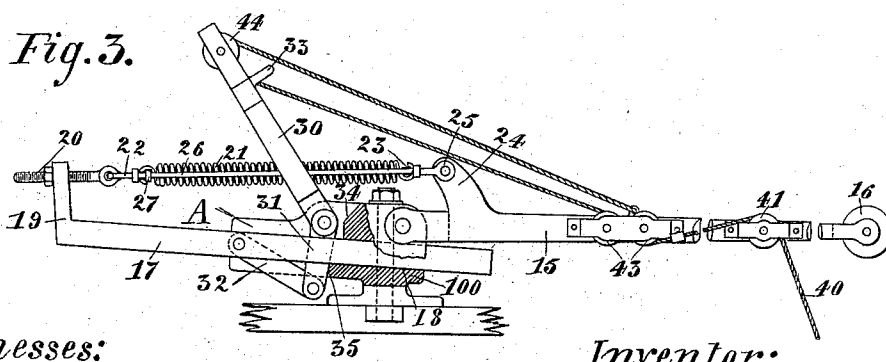


Fig. 3.

Witnesses:

S. W. Potts.

Fred. J. Dole.

Inventor:

Patrick J. Dowling.

By his Attorney

F. W. Richards.

(No Model.)

3 Sheets—Sheet 3.

P. J. DOWLING.
APPARATUS FOR OPERATING TROLLEY ARMS.

No. 562,591.

Patented June 23, 1896.

Fig. 10.

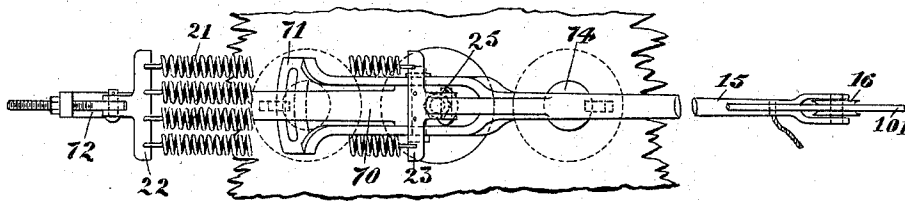
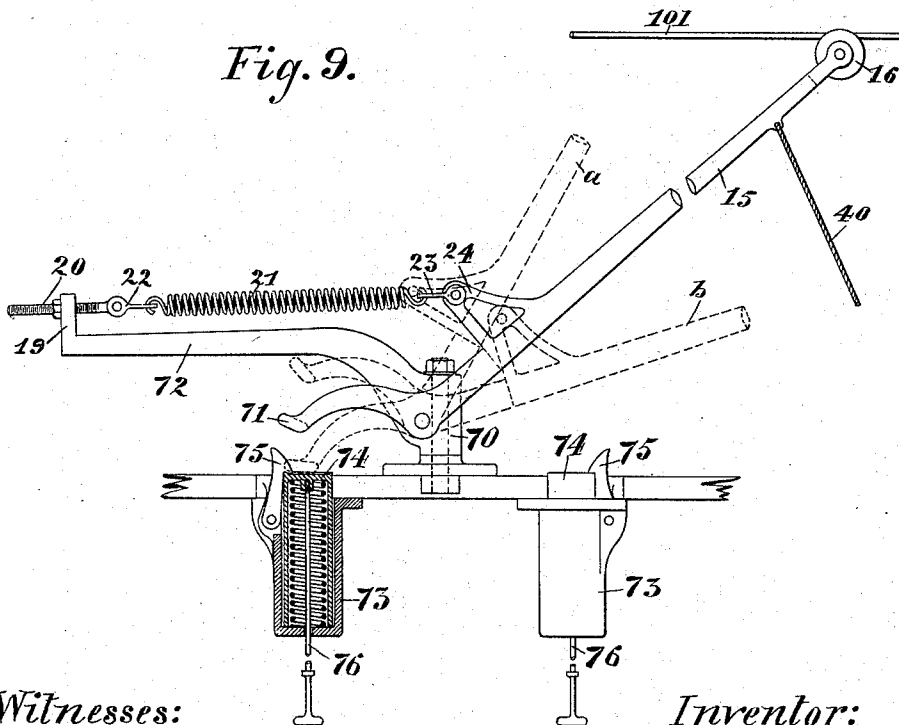


Fig. 9.



Witnesses:

S. W. Potts.

Fred. J. Dole.

Inventor:

Patrick J. Dowling

By his Attorney.

F. A. Richards.

UNITED STATES PATENT OFFICE.

PATRICK J. DOWLING, OF WATERBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF TO ARTHUR O. SHEPARDSON, OF SAME PLACE.

APPARATUS FOR OPERATING TROLLEY-ARMS.

SPECIFICATION forming part of Letters Patent No. 562,591, dated June 23, 1896.

Application filed July 23, 1895. Serial No. 556,866. (No model.)

To all whom it may concern:

Be it known that I, PATRICK J. DOWLING, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Operating Trolley-Arms, of which the following is a specification.

This invention relates to mechanism for operating trolley-poles, and the object of the invention is to provide a releasing or actuating mechanism in connection with the trolley-pole, whereby the pole will be prevented from striking cross or guy wires or other obstructions of the trolley-line system, when the pole is jarred or thrown out of its operative position with the line-wire.

A further object of the invention is to provide means for retracting or resetting the pole-releasing mechanism to thereby reset or bring said releasing mechanism into position to be operated, and thereby permit the trolley-pole to be drawn into operative position with the line-wire.

A further object of the invention is to provide mechanism for the purpose specified which is simple and durable in construction, and which will not be liable to get out of working order, and which will always actuate the pole whenever it is thrown out of engagement with the line-wire to prevent the same from striking or otherwise interfering with the cross, guy, or other wires of the system.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of one form of trolley-pole-operating mechanism, and shows the trolley-pole in its operative position with the line-wire, and also shows, by dotted lines, the positions the trolley-pole assumes when in its inoperative position. Fig. 2 is also a side elevation, partly in section, and shows the trolley-pole broken off and also shows the trolley-pole in its inoperative position relative to the line-wire and in position for actuating the releasing mechanism. Fig. 3 is likewise a side elevation, in section, and shows the trolley-pole in the position it assumes after the releasing mechanism has been operated. Fig. 4 is a top view of Fig. 1, a part thereof being broken away to more clearly illustrate the mechanism.

Fig. 5 is a transverse sectional view, partly in full lines, taken in line *a a*, Fig. 1, with the trolley-pole broken off. Fig. 6 is an end view looking toward the left hand in Fig. 1, and also shows the trolley-pole broken off. Fig. 7 is a side elevation, partly in section, of another form of trolley-pole-operating mechanism and shows the trolley-pole in operative engagement with the line-wire, said figure also showing, by dotted lines, the positions which the pole assumes when in its non-working position relative to the line-wire. Fig. 8 is a top view of the mechanism shown in Fig. 7, partly in section, and having parts thereof broken away. Fig. 9 is likewise a side elevation, partly in section, of another form of trolley-pole-operating mechanism for operating the trolley-pole, and shows the pole in operative position relative to the line-wire, and also shows, in dotted lines, the positions which the pole assumes when in its inoperative position relative to the line-wire; and Fig. 10 is a top view thereof with parts broken away.

Similar characters designate like parts in all the figures of the drawings.

By the terms "releaser" or "releasing mechanism," used in the specification and claims, is meant a suitable device or mechanism for actuating or operating the trolley-pole, when thrown from its line-wire, to throw the same out of the way of a cross or guy wire, or other obstruction in the trolley-line system.

This improved mechanism for operating trolley-poles comprises a suitable means for normally elevating the trolley-pole, a releasing or actuating mechanism for operating the trolley-pole when the same is jarred, knocked, or thrown into its non-working or inoperative position from the line-wire, and means for retracting or resetting the releasing mechanism, to thereby permit the trolley-pole to be drawn into working position relative to the line-wire.

In trolley-pole mechanisms, as usually constructed, when the pole is jarred or thrown from the line-wire at the switch-couplings, or at other places in the system, the trolley-pole—owing to the elevating means or springs usually used to hold the pole in contact with such

line-wire—draws the pole in substantially perpendicular position, whereby the upper end of the pole is drawn above the line-wire and above the usual cross or guy or other intersecting wires, so that the pole strikes these transverse wires with considerable force, often breaking such wires, and permitting them to fall onto the street, to the danger of the public, and also oftentimes to the serious injury of the car and the line-wires. In order to prevent such accidents, and provide an apparatus for this purpose, and which is also substantially in the nature of a safety mechanism for the trolley-line system and the trolley-pole, I have devised a mechanism adapted to prevent such accidents, and which, in the preferred form thereof herein shown and described, comprises a releasing or actuating mechanism adapted to throw a trolley-pole, when thrown from a line-wire, out of position to interfere with an intersecting, cross, or guy wire of the trolley-line system, (designated in a general way by A,) together with means for retracting or resetting the releasing mechanism, to thereby reset or bring into operative position such releasing mechanism, and thereby permit the trolley-pole to be drawn from its non-working or inoperative position into its operative position relative to the line-wire.

The apparatus, in the preferred form thereof herein shown and described, consists of a suitable base or carrier 100 in the nature of a turn-table, suitably swiveled or otherwise connected to the car-roof, or other means of support. Pivotally secured to this base, by a preferably bifurcated end in any suitable way, is a trolley-pole 15, carrying the usual trolley-wheel 16. A slide, or reach-arm slide 17, of any suitable construction, is adapted to slide longitudinally of the carrier in a suitable slideway 18 and preferably transversely of the pivotal point of said pole. This slide may, if desired, take the place of the usual reach-arm connected to the lower end of the trolley-pole for supporting one portion of the trolley-pole-elevating spring or springs. This slide 17 is provided at its outer end with an arm 19, adapted to receive an adjusting device 20 for the trolley-pole-elevating means or device, and which may consist of a threaded bolt and lock-nut supported for adjustment in the arm 19. This elevating device preferably consists of one or more springs 21, preferably coiled, secured at each end thereof to cross-bars 22 and 23. One of the cross-bars is herein shown secured to the adjustable locking device 20 in any suitable way—such as by pivoting the same by means of lugs and a pivot-pin. The other cross-bar, 23, is shown secured to the trolley-pole by means of a projection or projecting arm 24 on said pole, and to which the cross-bar 23 is pivoted by means of ears or lugs 25. Any other suitable means might be used for elevating the pole, if desired.

A suitable adjustable locking or support-

ing device for preventing the trolley-pole from falling too far forward when thrown from the line-wire is provided, and preferably consists of a rod or rods 26, secured to the cross-bar 23 and extending through apertures in the cross-bar 22, and in which apertured cross-bar the rods are adapted to slide. Suitable check-nuts 27 are provided for limiting the sliding movement of the rods.

The releaser or releasing mechanism, which is preferably in the nature of an oscillatory mechanism, consists, in the preferred form thereof herein shown and described, of a suitable oscillatory actuating-lever 30, pivoted to the base or carrier in any suitable way. This actuating-lever 30 has, preferably, a yoke-shaped portion to permit the cross-bar 23 and the elevating means or springs 21 to extend therethrough. Pivotally secured to the actuating-lever 30 is a toggle-joint, one member of which is formed by an extending arm or lever 31, preferably integral with the actuating-lever 30, and the other member consisting of an oscillatory locking device or locking link or lever 32, having one end pivotally secured to the arm or lever 31, which is preferably bifurcated for this purpose, and having its other end pivoted to the slide 17.

As one means for operating the actuating-lever 30, said lever is provided with a projecting arm or stud 33, against which the trolley-arm is adapted to strike when thrown from the line-wire and drawn forward by the elevating-springs 21. It is obvious, however, that the actuating-lever might be operated by a projection carried by the trolley-pole.

In order to prevent the actuating-lever from being drawn too far to the rear, the carrier or base 100 is preferably provided with a suitable stop or abutment, herein shown consisting of a beveled portion 34 of the carrier, and against which the actuating-lever is adapted to abut when said lever is in its normal position.

From the foregoing description it will be evident that when the trolley-pole is jarred or thrown from its position on the line-wire 101, by any cause, the elevating device will draw said trolley-pole forward substantially to the dotted line *a*, during which movement it abuts against the stud 33 on the actuating-lever 30, throws said lever into the position shown in Fig. 2, which actuates the locking-link 32 to unlock the slide 17, whereupon the elevating means or springs 21 cause said slide to move rearwardly in the slideway 18 and thereby release the tension of the elevating means to a certain extent on the trolley-pole, whereupon the pole falls by its own weight below the trolley-line and transverse wires into substantially the position shown in Fig. 3 and dotted line *b*, Fig. 1, and thereby out of the way of any obstruction in the trolley-line system. When the releaser reaches the position shown in Fig. 3, the arm 31 of the elevating-lever 30 abuts against a suitable stop device, shown herein preferably consist-

ing of a beveled portion of the base or carrier 35. By means of this stop device the movement of the slide in the slideway of the carrier by the elevating means is limited and the trolley-pole also prevented from striking the car in its downward movement by the elevating-springs, which exert a sufficient tension to prevent this, when the slide is stopped in its movement.

For retracting or resetting the releasing mechanism and permitting the trolley-pole to be brought into operative position, and also as a means for lowering the pole, as occasion requires, after the ordinary manner, a cord 40 is carried by the trolley-pole near the outer end thereof, whence it passes over a guide or pulley 41 and along the trolley-pole, and thence between guides or pulleys 43, and extends around a guide or pulley 44, carried adjacent to the outer end of the actuating-lever 30, and is then secured to the trolley-pole in any suitable way. The cord is provided with a suitable stop 42, which will abut against the trolley-pole and permit the same to be guided or drawn from the line-wire in the ordinary manner without actuating the actuating-lever 30. It is obvious, however, that separate means or cords might be used, one for operating the releasing mechanism and the other connected to the trolley-pole and used in the ordinary way for guiding the pole, when the elevating means draws the pole into engagement with the line-wire.

When the trolley-pole is in the position shown in Fig. 3, and it is desired to reset the mechanism and the pole into working position, the cord 40 is drawn down, whereby the actuating-lever 30 will be drawn out of the position it assumed when the pole fell and into the position shown in Fig. 1, thereby resetting the releasing mechanism, and forcing the slide 17 into its normal operative position and relocking the same, and resetting the elevating means or springs in their working position. The cord 40 is then released, whereby the trolley-pole is drawn by the elevating-springs into engagement with the line-wire 101 and the apparatus is in working position, ready to be actuated on the throwing of the pole from the line-wire to permit the pole to fall out of the way of the cross or transverse wire.

In order to adjust the tension of the elevating device by the adjustable locking device 20, it is simply necessary to manipulate the locking-nut carried on the screw-rod thereof, whereupon the tension of the springs will be increased or decreased, as desired.

In the modification of my invention shown in Figs. 7 and 8 another form of construction is shown. In the construction shown in said figures the general features of the construction illustrated and described above are also preferably present. The releaser or releasing mechanism in this case, however, preferably consists of an oscillatory locking device or locking-catch, which, in the preferred form

thereof herein shown and described, consists of a pawl or lever 60, pivotally secured to the base or support and carrying on its pivot-pin a catch 61, adapted to extend below the end of the slide 17 and hold the same in its forward position. As a means for actuating said pawl 60 to thereby release the catch 61 from the end of the slide 17, the trolley-pole is preferably provided with an actuating-arm 62, which swings with said pole, and which, when the pole is drawn by the elevating device into substantially the position represented by the dotted line *a*, said arm 62 will strike the pawl 60 to raise the catch 61 and thereby permit the slide to be moved rearwardly by the elevating device until the tension of said device is substantially overcome and the trolley-pole permitted to fall out of the way of intersecting or cross wires.

The actuating means for retracting or resetting the locking mechanism consists of an oscillatory actuating-lever 30, substantially similar to the lever 30, (shown in Figs. 1, 2, and 3,) and is pivoted adjacent to its lower end to the carrier or base 100, and is connected to the slide 17 by means of a projecting stud 63 and elongated slot 64. This actuating-lever is likewise prevented from extending too far backward by an abutment, substantially similar to the abutment 34, (shown in Fig. 1, 2, and 3,) if desired, and the movement of the slide 17 is limited by an abutment 35, likewise substantially similar to that shown in Figs. 1, 2, and 3, if desired.

The means for operating the actuating-lever 30 is preferably substantially similar to that shown and described in reference to Figs. 1, 2, and 3; and when the actuating-lever 30 has been drawn into its normal operative position, the slide will be drawn forward to permit the locking-catch 61 by its own gravity, or by a spring, if desired, to relock the slide 17 and thereby reset the releasing mechanism. The locking-catch 61 is prevented from being thrown upward too far by the roof or other abutment on the base or support-carrier.

Another form of apparatus for actuating the trolley-pole for the purpose herein set forth comprises a positively-acting releaser or instrumentality releasable by a suitable releaser or releasing mechanism and adapted to overcome the force of the elevating device to thereby lower the trolley-pole when thrown from the line-wire, and operative either directly by the trolley-pole or through a suitable connecting device and is illustrated in Figs. 9 and 10, in the preferred form thereof, and consists of a suitable carrier or base 70, swiveled to the car-roof or other means of support and pivotally carrying a trolley-pole 15, having the usual trolley-wheel 16. This trolley-pole is preferably constructed with a laterally-extending or substantially fan-shaped lower end or arm 71 for the purpose hereinafter described. Secured to the base 70 is an extending or reach arm 72, adapted to support a trolley-pole-elevating device, and which may

be, if desired, substantially similar to the elevating device heretofore described, and which consists of a spring or springs 21, secured to cross-bars 22 and 23, one of which is pivotally secured to the trolley-pole and the other adjustably secured to the extending arm 72.

The actuating mechanism herein shown and described in the preferred form thereof comprises a suitable carrier or cylinder 73, preferably supported by the car-roof and preferably carrying a relatively powerful spring-actuated plunger or slide 74. This plunger is held in inoperative position by means of a suitable oscillatory releaser or releasing mechanism, which is shown consisting of a preferably beveled spring-latch 75, pivotally secured to the cylinder 73 or other means of support.

When the trolley-pole is jarred or thrown from its line-wire 101, the elevating device draws the same forward to substantially the position shown in dotted lines *a*, whereupon the lower end or arm 71 of the pole engages the beveled spring oscillatory releasing-latch 75, pushes the same outward, and thereby releases the plunger or slide 74, which slides up, whereupon the line-engaging end of the pole is immediately forced down below the line-wire and the transverse wires by the greater force of the spring plunger or slide, as compared with the elevating device, to the position shown in dotted lines *b*.

As a means for retracting or resetting the mechanism, the plunger or slide is provided with an actuating-rod 76, which preferably extends into the inside of the car, where it can be easily operated to draw the plunger or slide 74 down, and thereby permit the releaser 75 to hold the same in its inoperative position. In this form of apparatus it is usually desirable to have one releaser at or near each end of the car, in order that the pole may be actuated when the car is running in either direction.

When the releasing mechanism has been reset, the elevating device will draw the trolley-pole into position to reengage the line-wire, and the same can be guided in the usual way by means of the trolley-cord and stop device 42, secured to the pole.

Having thus described my invention, I claim—

1. In a trolley-pole mechanism, the combination with a carrier; of a trolley-pole pivotally supported thereon; a slide movable in said carrier; means for normally elevating the pole; and a releaser in position to be actuated by the trolley-pole above the pivotal point of said pole, on the movement of the pole beyond its working position, to thereby throw said pole away from the line system.

2. In a trolley-pole mechanism, the combination with a trolley-pole; of a carrier therefor having an abutment; a slide movable in said carrier; means for normally elevating the pole; and a releasing mechanism in position and operative, when said pole is thrown

from a line-wire, to throw said pole away from the line system, and embodying a locking device adapted to engage the abutment of the carrier, to limit the movement of said slide, and thereby prevent the trolley-pole from moving too far from the line-wire, when thrown from the line system.

3. The combination of a trolley-pole; a slide movable to intersect the vertical plane of the pivotal point of said trolley-pole; means secured to said pole, and adjacent to that end of the slide remotely disposed from said pole for normally elevating said trolley-pole; and oscillatory releasing mechanism operated by the pole, when said pole is thrown from a line-wire, to thereby release said slide and permit the trolley-pole to be thrown from the line system.

4. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor; of a horizontally-movable reach-arm slide adapted to slide in said carrier; means secured to said pole and adjacent to that end of the slide remotely disposed from said pole for normally elevating the trolley-pole; a releaser also secured to said slide in position and adapted to be operated by said pole when thrown from a line-wire, whereby said pole will be thrown away from the line system.

5. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor; of a slide adapted to slide in the carrier; means secured to said slide and pole for normally elevating the trolley-pole; a releasing mechanism adapted to be operated, when the pole is thrown from a line-wire, to permit said pole to be thrown away from the line system, and comprising an actuating-lever in position and adapted to be operated by the trolley-pole, and a locking-link pivoted to said actuating-lever, and a link pivoted to said slide and to said locking-link; and means for retracting said releasing mechanism, to thereby permit the engagement of the pole with a line-wire.

6. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor; of a slide adapted to slide in the carrier; means secured to said slide and pole for normally elevating the trolley-pole; a releasing mechanism adapted to be operated, when the pole is thrown from a line-wire, to permit said pole to be thrown away from the line system, and comprising an actuating-lever having an arm in position and adapted to be operated by the trolley-pole, and a locking-link pivoted to said actuating-lever and to said slide; and means for retracting said releasing mechanism, to thereby permit the engagement of the pole with a line-wire.

7. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor; of a slide adapted to slide in said carrier; means secured to said slide and pole for normally elevating the trolley-pole; a releasing mechanism comprising a locking mechanism pivotally connected to said slide, and a ver-

tically-disposed oscillatory actuating-lever connected to the locking mechanism, and in position and adapted to be operated by the trolley-pole to actuate said locking mechanism when the pole is thrown from a line-wire to permit said pole to be thrown away from the line system; and means for retracting said releasing mechanism, to permit the engagement of the pole with a line-wire.

8. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier having a slideway therein; of a reach-arm slide adapted to slide in said way; a spring secured to said pole and adjustably secured to that end of said slide remotely disposed from the trolley-pole for normally elevating said pole; a releasing mechanism pivotally connected to said slide and to said carrier, and in position and adapted to be operated by the trolley-pole, when said pole is thrown out of engagement with a line-wire, whereby said pole will be thrown away from the line system; and retracting means in operative connection with the releasing mechanism for retracting said releasing mechanism, to thereby permit the trolley-pole to be drawn by its elevating-spring into engagement with a line-wire.

9. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor having a slideway therein; of a slide adapted to slide in said way; a spring secured to said pole and adjustably secured to said slide for normally elevating said pole; a releasing mechanism adapted to be operated by the trolley-pole when said pole is thrown out of engagement with a line-wire, whereby said pole will be thrown away from the line system, and comprising an actuating-lever pivoted to the carrier, and adapted to be operated by the pole, and a locking-link having one of its ends pivoted to said lever adjacent to the lower end thereof, and its other end to said slide; and means for retracting said releasing mechanism, to thereby permit the engagement of the pole with a line-wire.

10. In a trolley-pole mechanism, the combination with a trolley-pole and its carrier; of means for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-wire, to throw said trolley-pole away from the line system; a cord secured to said trolley-pole and also to the releasing mechanism, whereby said releasing mechanism can be retracted to permit the pole to be drawn into operative engagement with the line-wire, said cord also having means adapted to engage said pole, whereby said trolley-pole can be actuated independently of the releasing mechanism.

11. In a trolley-pole mechanism, the combination with a trolley-pole and its carrier; of a slide movable in said carrier; of means secured to said slide and pole for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-

wire, to throw said pole away from the line system, and comprising an actuating-lever in position and adapted to be operated by the trolley-pole, and locking mechanism pivotally connected to said lever and to said slide; and a cord secured to said actuating-lever and adapted to retract the releasing mechanism, to thereby permit the elevating means to draw the pole into engagement with a line-wire.

12. In a trolley-pole mechanism, the combination with a trolley-pole and its carrier; of a slide movable in said carrier; means secured to said slide and pole for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-wire, to throw the pole away from the line system, and comprising an actuating-lever in position and adapted to be operated by the trolley-pole, and locking mechanism connecting said lever with said slide; and a cord secured to said actuating-lever and to the trolley-pole, whereby the releasing mechanism can be retracted, to thereby permit the pole to be drawn into operative relation with the line-wire, and whereby the pole can be actuated independently of the releasing mechanism.

13. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor having a slideway therein; of a slide adapted to slide in said way; a spring secured to said pole and adjustably secured to said slide, and adapted to normally elevate said pole; a releasing mechanism adapted to be operated by the trolley-pole when said pole is thrown out of engagement with a line-wire, whereby said pole will be thrown away from the line system, and comprising an actuating-lever pivoted to the carrier, and adapted to be operated by the pole, and a locking-link having one of its ends pivoted to said lever adjacent to the lower end thereof, and its other end pivoted to said slide; and a cord secured to the actuating-lever, and also secured to and guided on the trolley-pole, whereby said releasing mechanism can be retracted, to thereby permit the trolley-pole to be drawn by its elevating-spring into engagement with a line-wire, and whereby said pole can also be actuated independently of the releasing mechanism.

14. In a trolley-pole mechanism, the combination with a trolley-pole and its carrier; of a slide movable in said carrier; of means secured to said slide and pole for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-wire, to throw said pole away from the line system, and comprising an actuating-lever in position and adapted to be operated, when said pole is thrown from a line-wire, and a locking-link having one of its ends pivotally secured to said lever, and its other end pivoted to the slide; and a cord secured to said actuating-lever, and adapted to retract the releasing mechanism.

ism, to thereby permit the elevating means to draw the pole into engagement with a line-wire.

15 The combination of a trolley-pole and its carrier; means for normally elevating the pole; an oscillatory locking-releaser embodying an upright actuating-lever pivotally secured to the carrier and movable in the plane of movement of the trolley-pole by direct engagement of the pole therewith above the pivotal point of the pole, when said pole is thrown from a line-wire, to thereby permit the trolley-pole to be thrown from the line system; and means for retracting said releaser, to thereby permit the pole to be elevated into position relatively to the line-wire.

16 The combination of a trolley-pole; a slide; means secured to said pole and adjacent to that end of the slide remotely disposed from said pole for normally elevating the trolley-pole; and releasing mechanism in position and operative, when said pole is thrown from a line-wire, to thereby release said slide and permit the trolley-pole to be thrown from the line system.

17 The combination of a trolley-pole; a slide; means secured to said pole and adjacent to that end of the slide remotely disposed from said pole for normally elevating said trolley-pole; releasing mechanism in position and operative, when said pole is thrown from a line-wire, to thereby release said slide and permit the trolley-pole to be thrown away from the line system; and means for resetting said releasing mechanism, to thereby permit said pole to be elevated into position to engage the line-wire.

18 In a trolley-pole mechanism, the combination with a trolley-pole; of a carrier for the same having a beveled abutment thereon; a slide movable in said carrier; means secured to said slide and pole for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-wire, to throw said pole from the line system, and comprising an actuating-lever in position and adapted to be operated by the trolley-pole, and locking mechanism connected to said lever and slide and adapted to abut against the beveled abutment of the carrier, to prevent the trolley-pole falling too far from the line-wire; and means for retracting said releasing mechanism to permit the engagement of the pole with the line-wire.

19 In a mechanism of the class specified, the combination of a trolley-pole and a carrier therefor; a slide movable in said carrier; means secured to said slide and pole for normally elevating the trolley-pole; and releasing mechanism adapted to be operated, when the pole is thrown from a line-wire, to permit said pole to be thrown away from the line system, and comprising an actuating-lever in position and adapted to be operated by the trolley-pole; and a locking-link pivoted to said slide and to said lever.

20 In a trolley-pole mechanism, the combi-

nation with a trolley-pole and its carrier; of a slide movable in said carrier; means secured to said slide and pole for normally elevating the pole; releasing mechanism operative, when said pole is thrown from a line-wire, to throw said pole away from the line system, and comprising an actuating-lever in position and adapted to be operated, when said pole is thrown from a line-wire, and a locking-link having one of its ends pivoted to said lever, and its other end pivoted to the slide; a cord having one of its ends secured to said pole and in operative engagement with the actuating-lever whereby the releasing mechanism can be retracted, to thereby permit the pole to be drawn into operative engagement with the line-wire; and a stop device on said cord adapted to abut against the pole, whereby said pole can be guided or operated independently of the releasing mechanism.

21 In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor having a stop device thereon; of a slide movable in said carrier; means secured to said pole and slide for normally elevating the trolley-pole; a locking device coöperating with said slide and operative by the trolley-pole, when said pole is thrown from a line-wire, to throw the pole away from the line system; an actuating-arm coöperative with said slide and locking device and adapted to abut against the stop device on the carrier, whereby said arm is prevented from falling too far to the rear and also adapted to retract said slide and thereby the locking device, whereby said pole will be permitted to be drawn into engagement with a line-wire.

22 The combination of a trolley-pole and its carrier; a slide movable to intersect the vertical plane of the pivotal point of said pole; means secured to said pole and adjacent to that end of the slide remotely disposed from the pole for normally elevating said trolley-pole; oscillatory releasing mechanism pivotally connected to the carrier and directly actuated by the pole, when said pole is thrown from a line-wire, to thereby release said slide and permit the trolley-pole to be thrown away from the line system; and means for resetting said releasing mechanism, to thereby permit the pole to be elevated into position to engage the line-wire.

23 In a trolley-pole mechanism, the combination with a trolley-pole and a carrier therefor; of a slide movable to intersect the vertical plane of the pivotal point of said pole; means secured to said pole and slide, for normally elevating the trolley-pole; a locking device coöperating with said slide and operative by the trolley-pole, when said pole is thrown from a line-wire, to throw the pole away from the line system; and an actuating-arm coöperative with said slide and locking device, and adapted to retract said slide and thereby lock the locking device, whereby said pole will be permitted to be drawn into engagement with its line-wire.

24. In a trolley-pole mechanism, the combination with a trolley-pole, and a carrier therefor; of means for normally elevating the pole; a slide supported in position adjacent to the pole; an oscillatory releaser also supported in position adjacent to the trolley-pole to lock said slide against movement and directly actuated by said pole when the same is thrown from a line-wire to thereby release the slide to and permit the movement of said slide, and

thereby permit said pole to be thrown away from the line system; and means for retracting said slide to permit the releaser to relock said slide and thereby permit said pole to be brought into operative engagement with a line-wire.

PATRICK J. DOWLING.

Witnesses:

FRED. J. DOLE,
S. W. POTTS.