

No. 743,435.

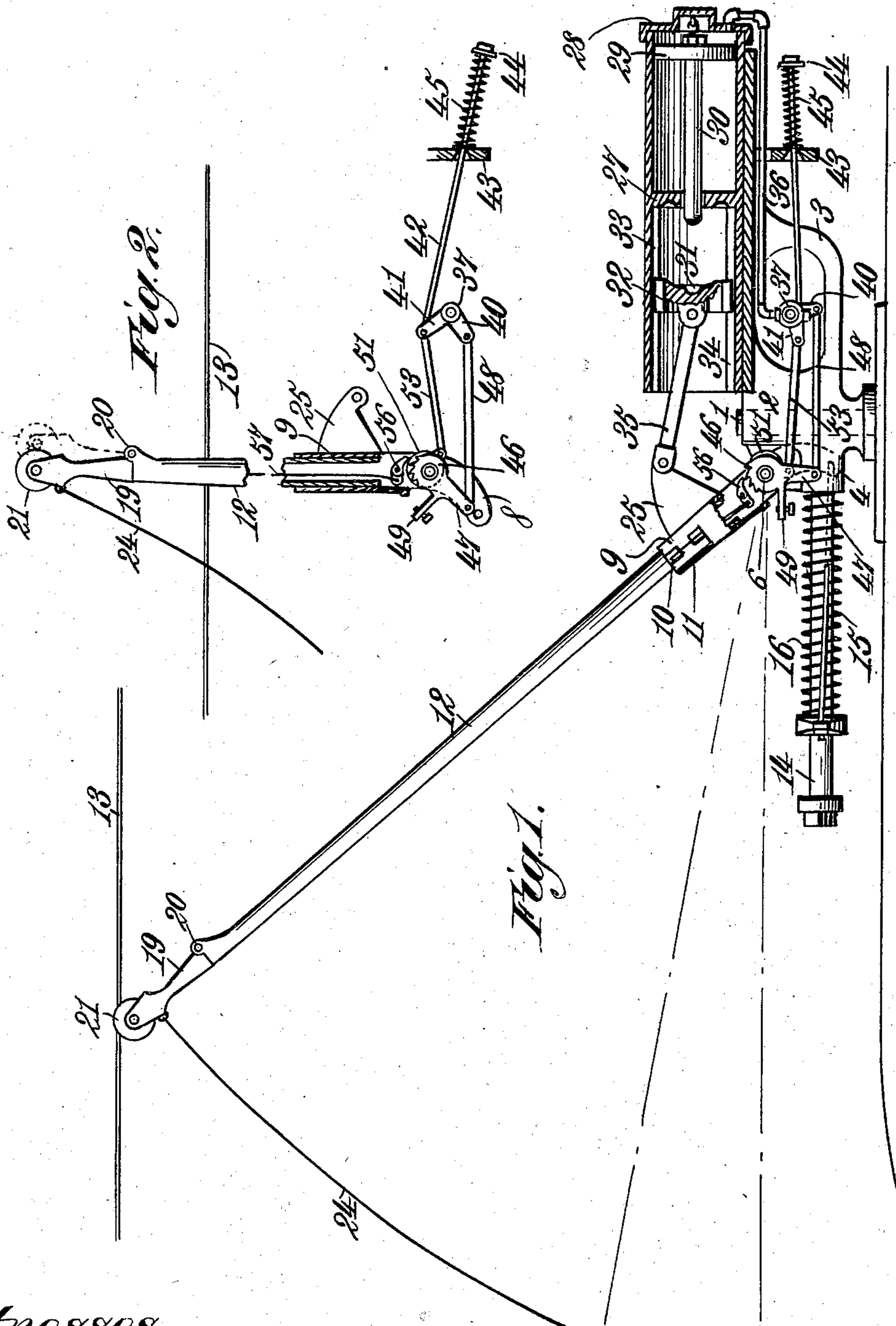
PATENTED NOV. 10, 1903.

J. L. BOGUE & D. M. JENNINGS.
APPARATUS FOR CONTROLLING TROLLEY POLES.

NO MODEL.

APPLICATION FILED MAY 2, 1903.

2 SHEETS—SHEET 1.



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Fig. 5.

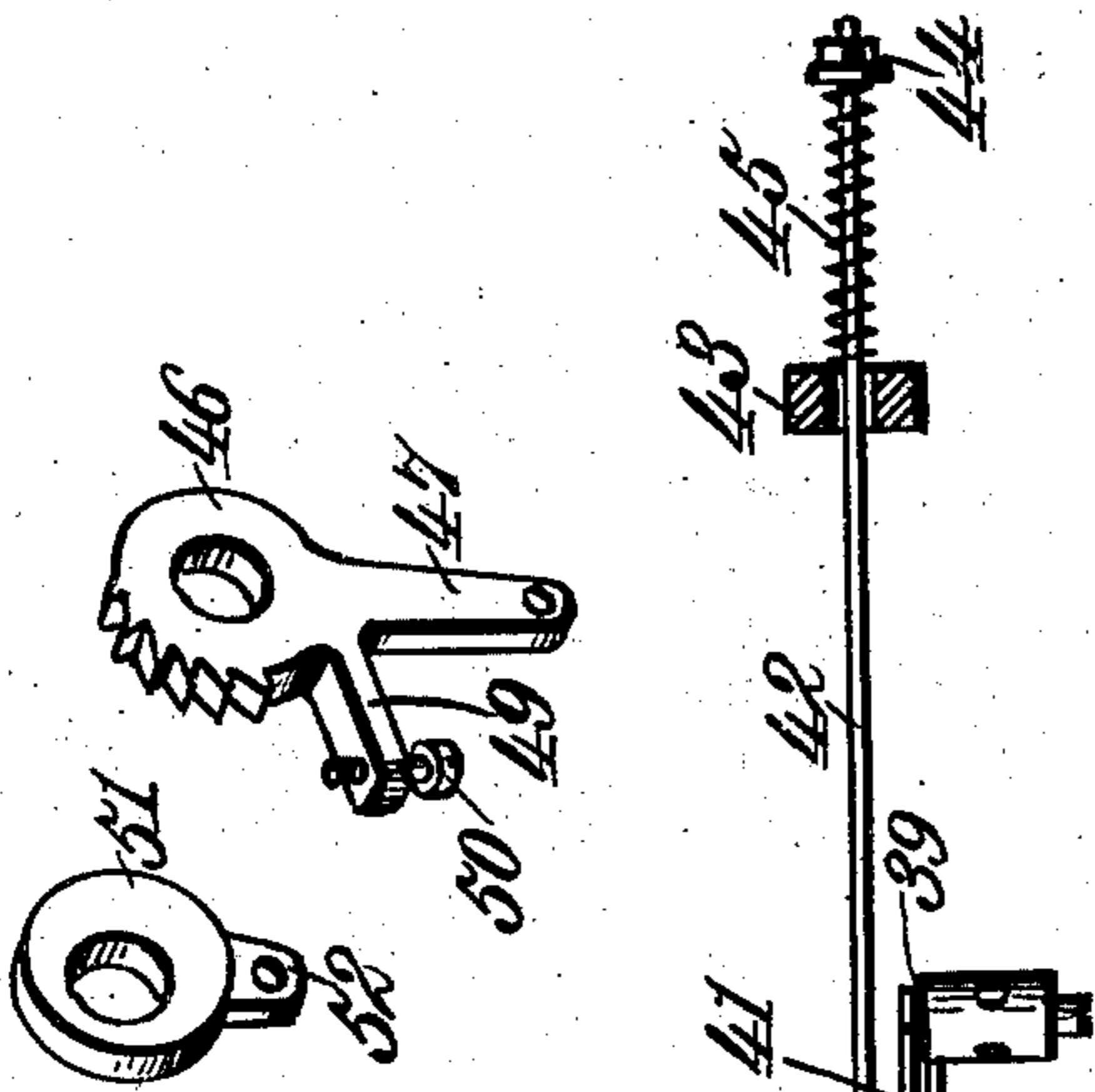


Fig. 4.

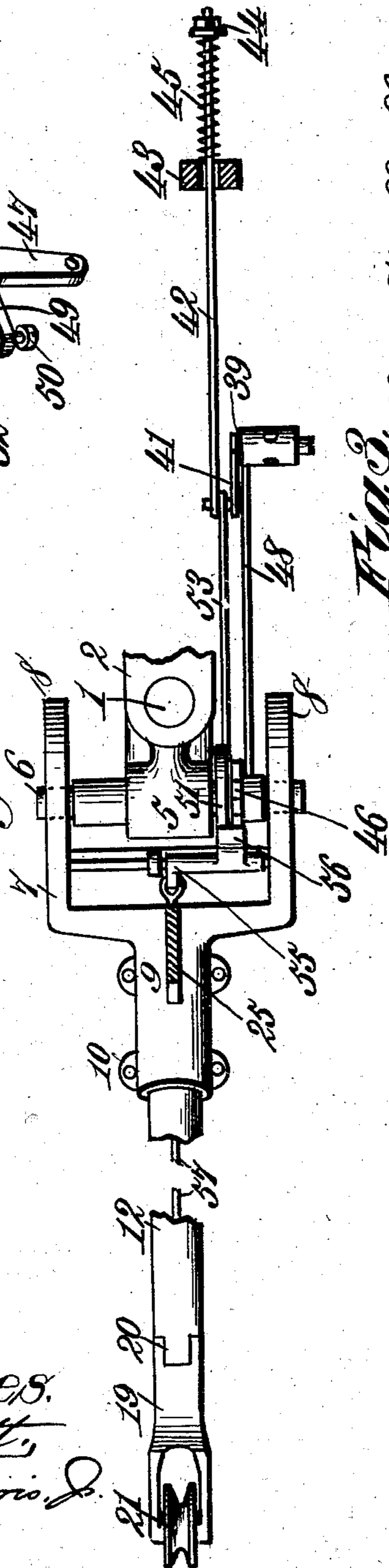
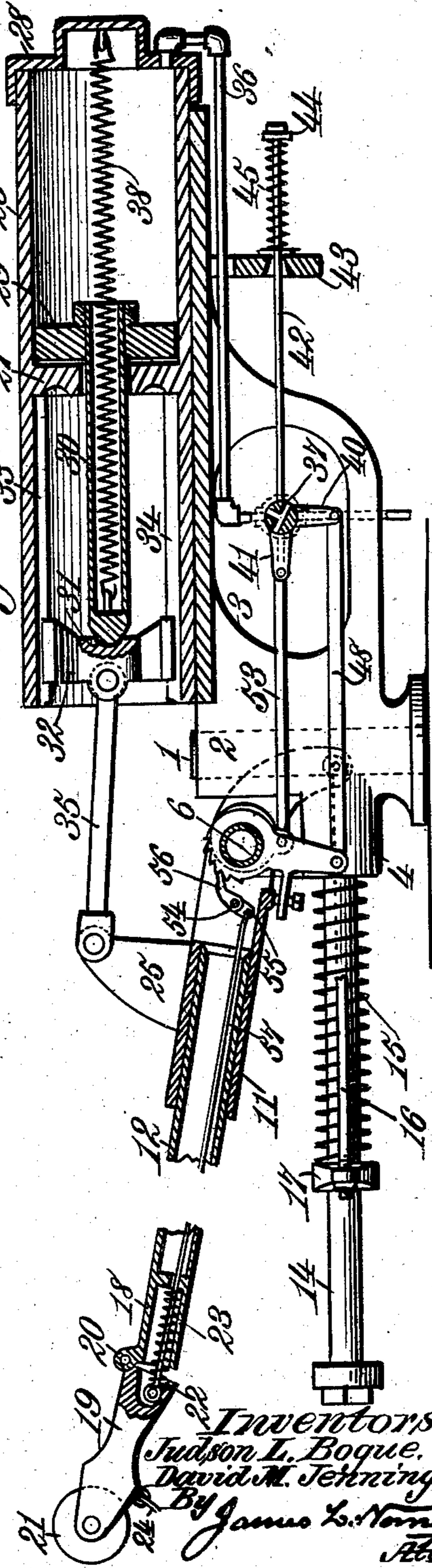


Fig. 3.



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UNITED STATES PATENT OFFICE.

JUDSON L. BOGUE AND DAVID M. JENNINGS, OF DENISON, TEXAS.

APPARATUS FOR CONTROLLING TROLLEY-POLES.

SPECIFICATION forming part of Letters Patent No. 743,435, dated November 10, 1903.

Application filed May 2, 1903. Serial No. 155,331. (No model.)

To all whom it may concern:

Be it known that we, JUDSON L. BOGUE and DAVID M. JENNINGS, citizens of the United States, residing at Denison, in the county of Grayson and State of Texas, have invented new and useful Improvements in Apparatus for Controlling Trolley-Poles, of which the following is a specification.

This invention relates to an apparatus for controlling trolley-poles employed for effecting electrical connection between a trolley-wire and a motor on a car, and has for its object to provide improved means for automatically throwing the trolley into position to be placed in engagement with the trolley-wire in the event of the trolley being accidentally displaced therefrom, the apparatus being so constructed and arranged that the trolley may be freely placed in engagement with and disengaged from the trolley-wire by hand without throwing into operation the trolley-operating mechanism.

To these ends our invention consists in the features and in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view, partly in elevation and partly in section, showing our improved device attached to a car and the trolley in contact with the trolley-wire. Fig. 2 is a detail view illustrating the position the trolley-pole assumes when the trolley leaves the wire and also showing the eccentric in position for throwing the pole out of engagement with the ratchet-wheel. Fig. 3 is an enlarged sectional view showing the trolley-pole in a partially-lowered position and the compressed air cut off from the cylinder. Fig. 4 is a top plan view showing the relative positions of the ratchet-wheel and eccentric and the connections with the valve, and Fig. 5 is a detail perspective view showing the eccentric and the ratchet-wheel.

Referring to the drawings, the numeral 1 indicates a vertical pintle fixed to the top of the car, on which is rotatably mounted the swivel comprising a sleeve 2, provided on its front side with a horizontally-extending bracket-arm 3 and on its rear side with a horizontally-

extending socket 4. On the upper rear side of the sleeve 2 is formed or fixed a horizontal transverse sleeve 5, through which extends a pivot-pin 6. The numeral 7 indicates a substantially U-shaped yoke, the pendent members 8 of which are curved in the manner shown, and said members are provided with two registering perforations through which the pivot-pin 6 passes, and by means of which latter the yoke is pivotally attached to the swivel, so as to be free to oscillate thereon. The upper portion of the yoke is provided with a semicylindrical portion 9, provided on its sides with laterally-projecting perforated lugs 10, and adapted to be secured to said portion is a semicylindrical sleeve 11, which is also provided with lugs corresponding to the lugs 10, before referred to. The trolley-pole 12, consisting of a hollow metallic rod, as usual, is clamped at its lower end between the semicylindrical portions 9 and 11 of the yoke and is provided at its upper end with a trolley or contact-pulley of ordinary and well-known construction and which will be hereinafter referred to, that is adapted to make electrical contact with the trolley-wire 13. Fixed in the socket 4 is a rod 14, on which is arranged a coiled spring 15. To the lower ends of the arms 8 of the yoke are secured rods 16, which are attached at their outer ends to a collar 17, which is movably arranged on the rod 14. The spring 15 bears at one end against the socket 4 and at its other end against the collar 17. The spring operates to force the collar 17 rearwardly and through the medium of the rods 16 and pendent arms 8 of the yoke operates to throw the trolley-pole upward to place the trolley in engagement with the trolley-wire 13.

Fixed on the free end of the trolley-pole 12 is an extension comprising two parts 18 and 19, connected together by a butt-hinge 20, and in the outer end of the part 19 is rotatably mounted the trolley-wheel 21. The part 18 of the extension is fitted over the end of the trolley-pole, and the adjacent ends of the two parts 18 and 19 of said extension are provided with sockets 22, in which is arranged a compressed coiled spring 23, which operates normally to break the hinge—that is to say, to throw the parts 18 and 19 out of alignment. To the member 19 of the extension

is attached the trolley-controlling cord 24. Fixed to and forming part of the yoke 7 is a segment-shaped arm 25, the purpose of which will be hereinafter explained. Fixed on the bracket-arm 3 is a cylinder 26, closed at its opposite ends by heads 27 and 28 and in which is arranged to reciprocate a piston 29, provided with a hollow piston-rod 30, which passes through a suitable perforation formed in the head 27 of the cylinder. The outer end of the piston-rod is preferably rounded and is normally loosely seated in a concave socket 31, formed centrally in a cross-head 32. The cross-head 32 moves back and forth between guideways 33 and 34. The guideway 33 consists of a rib formed on the upper edge of the bracket-arm 3, and the guideway 34 consists of a similar rib which forms an extension of the cylinder 26. To the cross-head 32 is pivotally connected one end of a pitman 35, the other end of which is pivotally connected to the segment-shaped arm 25, attached to the socket in which is fixed the trolley-pole. Communicating with the rear end of the cylinder 26 is an air-pipe 36, which leads from any suitable reservoir of compressed air carried by the car and not herein shown. Arranged in said air-pipe is a three-way valve 37, fixed on the bracket-arm 3, said air-valve being of ordinary construction and adapted when turned in one position to admit compressed air to the cylinder 26 and when turned in another direction to cut off the supply of air to said cylinder and when turned to a third position to place the cylinder in communication with the atmosphere to exhaust the compressed air from the cylinder. A contractile coiled spring 38 is arranged in the cylinder 26 and hollow piston-rod 30 and is fixed at one end to the head 28 of the cylinder and its other end to the closed end of the hollow piston-rod 30, said spring operating when the three-way valve is turned into position to place the cylinder in communication with the atmosphere to retract the piston as the air is exhausted from the cylinder. Fixed on the stem 39 of the three-way valve are two crank-arms 40 and 41, and pivoted to the free end of the crank-arm 41 is one end of a rod 42, said rod passing loosely through a fixed portion 43 of the bracket-arm 3 and is provided at its extreme end with a nut and washer 44. Arranged between the washer and the fixed portion 43 of the bracket is a compression coiled spring 45. Journaled on the sleeve 5, forming a part of the swivel, is a ratchet-disk 46, which is provided with a crank-arm 47, said crank-arm being connected to the crank-arm 40 of the three-way valve by a link 48. The ratchet-disk 46 is also provided with a bracket-arm 49, in which is arranged a set-screw 50 for a purpose hereinafter made apparent. Journaled on the sleeve opposite the ratchet-disk is an eccentric 51, provided with a perforated ear or lug 52, to which is pivoted one end of a link 53, the other end of the latter being pivoted to the free end

of the crank-arm 41 of the three-way valve. Pivoted, as at 54, to the yoke 7 is a rocking arm 55, to one end of which is pivoted a pawl 56, that is adapted to engage the teeth of the ratchet-disk 54 and which is also adapted to be engaged by the periphery of the eccentric 51. To the other end of the rocking arm 55 is attached a rod 57, which passes up through the hollow trolley-pole 12 and through the member 18 of the extension and also through the spring 23 and is attached at its end to the member 19 of said extension.

The operation of our improved device is as follows: Normally the spring 15 operates to hold the trolley-pole 12 in a partially-elevated position to maintain the trolley-wheel 21 in contact with the trolley-wire 13, said spring in practice exerting a pressure of approximately thirty-five pounds upon the trolley-pole. While in this position the two members 18 and 19 of the extension of the trolley-pole are held in alinement, thus closing the butt-hinge and compressing the spring 23. When the parts are in this position, the rod 57 will be forced downward and will hold the pawl 56 out of engagement with the ratchet-disk 46. Should the trolley-wheel 21 from any cause become disengaged from the trolley-wire, the spring 23 will immediately expand, throwing the extension member 19 upward and out of line with the trolley-pole and will also draw up the rod 57, thus rocking the arm 55 upon its fulcrum and throwing the pawl 56 into engagement with the teeth of the ratchet-disk 46. The trolley-pole being no longer held down by the trolley-wire, the spring 15 will operate to throw it into a vertical position, and as it assumes such a position the pawl 56 will turn the ratchet-disk 46 and through the medium of the crank-arms 47 and 40 and the link 48 will partially open the three-way valve. This movement will raise the crank-arm 41 above the center of the valve-stem, whereupon the spring 45 will immediately expand and will still further raise the crank-arm 41, thus throwing the three-way valve wide open and admitting compressed air to the cylinder 26. The piston 29 will thus be moved, and the piston-rod 30 bearing against the cross-head 32 will move the latter also rearward and through the medium of the link 35 and segment-shaped arm 25 will throw the trolley-pole downward into nearly a horizontal position. At the same time the spring 45 expands and opens the three-way valve, as before described, a crank-arm 41 will, through the medium of the link 53, partially rotate the eccentric 51, causing the high side of the latter to engage the pawl 56 and throw the latter out of engagement with the teeth of the ratchet-disk. As the trolley-pole is thrown downward to assume a nearly horizontal position a shoulder 58 of the yoke 7 will engage the set-screw 50, carried by the bracket-arm 49 on the ratchet-disk, and will thereby partially rotate the ratchet-disk, which through the medium of the cranks

47 and 40 and link 48 will rotate the three-way valve to close the communication between the cylinder and the compressed-air reservoir and the atmosphere and will throw the crank-arm 41 on a dead-center. The parts will then normally remain in the positions described. To again place the trolley-wheel in engagement with the trolley-wire 13, it is only necessary by pulling upon the cord 24 to first draw the trolley-pole entirely down to a horizontal position, and in assuming such position the shoulder 58, bearing against the screw 50, will still further rotate the ratchet-disk 46 and through the medium of the parts before described will turn the three-way valve and place the cylinder in communication with the atmosphere, thus exhausting said cylinder. At the same time the crank-arm 41 will be thrown below the center, and in assuming such position said crank-arm through the medium of the link 53 will restore the eccentric 51 to its original position, thus permitting the pawl 56 to engage the teeth of the ratchet-disk. The pawl at this time, however, will not engage said teeth, for as the spring 15 expands and operates to raise the trolley-pole, the operator holding the cord 24 to guide the trolley into engagement with the trolley-wire, the members 18 and 19 of the extension are straightened out or held in alinement, thereby moving the rod 57 endwise and through the medium of the rocking-arm 55 holding the pawl out of engagement with the teeth of the ratchet-disk. The trolley-wheel can thus be guided back into engagement with the trolley-wire without actuating the ratchet-disk 46 and through it the three-way valve. It will thus be seen that the trolley-wheel by means of the cord 24 may be thrown into and drawn out of engagement with the trolley-wire without moving the three-way valve at all—as, for example, in changing from one wire to another or in reversing the trolley-pole; but the moment that the trolley is accidentally thrown out of engagement with the trolley-wire the parts will immediately operate in the manner and to produce the results before described.

It will of course be understood that when compressed air is admitted to the cylinder and moves the piston 29 rearwardly to force the trolley-pole to nearly a horizontal position the piston will abut the forward head 27 of the cylinder, and its motion will thus be arrested, and as the piston-rod 30 only bears loosely against the cross-head 32 and is not connected thereto in any manner whatsoever the pole is free to be drawn down to a perfectly horizontal position by the cord 24, the cross-head at such time moving away from the end of the piston-rod.

Having thus fully described our invention, what we claim is—

1. In a trolley for electric railways, the combination with a swivel, of a trolley-pole pivoted to the swivel and provided with a hinged extension carrying a trolley-wheel, means for

normally holding the pole and its extension out of alinement, a cylinder and piston for lowering the trolley-pole, a spring for raising it, a valve arranged to admit fluid-pressure to, cut it off, and exhaust it from the cylinder, a cable attached to said extension for guiding the trolley into contact with the trolley-wire, and means actuated by the movement of said hinged extension for controlling said valve, for the purpose specified.

2. In a trolley for electric railways, the combination with a swivel, of a trolley-pole pivoted to the swivel and provided with a hinged extension carrying a trolley-wheel, means for holding the pole and its extension out of alinement when the trolley is out of contact with the trolley-wire, a pneumatic motor for lowering the pole, means for raising it, a cord attached to the extension for guiding the trolley-wheel into contact with the trolley-wire, and means actuated by said extension, when the latter is thrown out of alinement with the pole on the trolley accidentally leaving the wire, for placing the pole-lowering mechanism in operation, substantially as described.

3. In a trolley for electric railways, the combination with a swivel, of a trolley-pole pivoted to the swivel and provided with a hinged extension carrying a trolley-wheel, said extension being arranged to be held in alinement with the pole by the pressure of the trolley-wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, means for raising the trolley-pole, a pneumatic motor for lowering it, said mechanism being thrown into operation by the upward movement of the pole as the latter assumes a vertical position, a cord for guiding the trolley-wheel into contact with the wire, and means actuated by said extension, when the latter is thrown out of alinement with the pole on the trolley accidentally leaving the wire, for placing the pole-lowering mechanism into position to be actuated by the upward movement of the pole, for the purpose specified.

4. In a trolley for electric railways, the combination with a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the trolley-wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the trolley-pole, a pneumatic motor for lowering it, said mechanism being thrown into operation by the movement of the pole as the latter assumes a vertical position when the trolley leaves the wire, and out of operation by the downward movement of the pole, means for guiding the trolley into contact with the wire, and means actuated by said extension, when the latter is thrown out of alinement with the pole on the trolley accidentally leaving the wire, for placing the pole-lowering mechanism into position to be actuated by the

upward movement of the pole, for the purpose specified.

5. In a trolley for electric railways, the combination with a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the trolley-wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, means for raising the pole, a cylinder and piston for automatically lowering it when the trolley accidentally leaves the wire, and means actuated by the extension, when the latter is thrown out of alinement with the pole for throwing the pole-lowering mechanism into operation, substantially as described.

6. In a trolley for electric railways, the combination with a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the trolley-wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, means for raising the pole, a cylinder and piston for automatically lowering it when the trolley accidentally leaves the wire, means actuated by the extension when the latter is thrown out of alinement with the pole for throwing the pole-lowering mechanism into operation, and a cord attached to said extension for guiding the trolley into contact with the wire, said cord, when employed for guiding the trolley into position operating to hold the extension in alinement with the pole and thereby holding the pole-lowering mechanism out of operation, substantially as and for the purpose specified.

7. In a trolley for electric railways, the combination with a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, means for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, mechanism, actuated by the movement of the pole in assuming an erect position when the trolley leaves the wire, for opening the valve, and means actuated by the extension as the latter is thrown out of alinement with the pole by the spring, for placing said mechanism in operative relation with the pole, substantially as and for the purpose specified.

8. In a trolley for electric railways, the combination of a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, mechanism, actuated

by the movement of the pole in assuming an erect position when the trolley leaves the wire, for opening the valve, means actuated by the extension, as the latter is thrown out of alinement with the pole by the spring, for placing said mechanism in operative relation with the pole, and a cord attached to said extension for guiding the trolley onto the wire, substantially as described.

9. In a trolley for electric railways, the combination of a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel and connections between the latter and the valve for turning the valve, a pawl carried by the pole for turning the ratchet-wheel and opening the valve, as the pole assumes an erect position on the trolley leaving the wire, and means actuated by the extension as the latter is thrown out of alinement with the pole by the spring for throwing said pawl into engagement with the ratchet-wheel, for the purpose specified.

10. In a trolley for electric railways, the combination of a trolley-pole having a hinged extension carrying the trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel and connections between the latter and the valve for turning the valve, a pawl carried by the pole for turning the ratchet-wheel and opening the valve as the pole assumes an erect position on the trolley leaving the wire, means actuated by the extension as the latter is thrown out of alinement with the pole by the spring for throwing said pawl into engagement with the ratchet-wheel, and means actuated toward the end of the opening movement of the valve for throwing said pawl out of engagement with the ratchet-wheel, substantially as described.

11. In a trolley for electric railways, the combination of a trolley-pole, a hinged extension carrying the trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel and connections between the latter and the valve for turning the valve, a pawl carried by the pole for turning the ratchet-wheel and opening the valve as the

pole assumes an erect position on the trolley leaving the wire, means actuated by the extension as the latter is turned out of alinement with the pole by the spring for throwing said pawl into engagement with the ratchet-wheel, and an eccentric disposed alongside the ratchet-wheel and arranged to be turned toward the end of the opening movement of the valve for engaging said pawl and lifting it out of engagement with the ratchet-wheel, substantially as described.

12. In a trolley for electric railways, the combination of a trolley-pole, a hinged extension carrying the trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel, crank-arms on the ratchet-wheel and valve-stem, a link connecting said crank-arms, a pawl carried by the pole for turning the ratchet-wheel and opening the valve as the pole assumes an erect position on the trolley leaving the wire, means actuated by the extension, as the latter is thrown out of alinement with the pole by the spring for throwing said pawl into engagement with the ratchet-wheel, and means actuated toward the end of the opening movement of the valve for throwing said pawl out of engagement with the ratchet-wheel, substantially as described.

13. In a trolley for electric railways, the combination of a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel, crank-arms on the ratchet-wheel and the valve-stem, a link connecting said crank-arms, a pawl carried by the pole for turning the ratchet-wheel and opening the valve as the pole assumes an erect position on the trolley leaving the wire, means actuated by the extension as the latter is thrown out of alinement with the pole by the spring for throwing said pawl into engagement with the ratchet-wheel, an eccentric disposed alongside of the ratchet-wheel, and a crank-and-link connection between the valve and eccentric for throwing the latter, toward the end of the opening movement of the valve, into engagement with said pawl to lift it out of engagement with the ratchet-wheel, substantially as described.

14. In a trolley for electric railways, the combination of a trolley-pole provided with a hinged extension carrying a trolley-wheel and arranged to be held in alinement with the pole by the pressure of the wheel against

the trolley-wire, a spring for throwing the extension out of alinement with the pole when the trolley leaves the wire, a spring for raising the pole, a cylinder and piston for lowering it, a valve for admitting fluid-pressure to the cylinder, a ratchet-wheel and connections between the latter and the valve for turning the valve, a rocking arm on the pole, a pawl carried by one end of said arm for turning the ratchet-wheel and opening the valve as the pole assumes an erect position on the trolley leaving the wire, a rod connected with said extension, and a rocking arm arranged to rock the arm and throw the pawl into engagement with the ratchet-wheel when said extension is thrown out of alinement with the pole, and means actuated toward the end of the opening movement of the valve for throwing said pawl out of engagement with the ratchet-wheel, substantially as described.

15. In a trolley for electric railways, the combination of a trolley-pole, of a spring for raising it, a cylinder and piston for lowering it, a rotary valve for admitting fluid-pressure to and exhaust it from the cylinder, a crank-arm on the valve-stem, a rod connected at one end to said crank-arm, and at its other end to an expansible spring arranged to draw the rod away from the valve, means actuated by the movement of the trolley-pole in assuming an erect position when the trolley leaves the wire, for turning the valve to throw the crank-arm above the center and permit the spring and rod to throw the valve wide open, and means actuated by the downward movement of the trolley-pole for throwing the crank below the center to permit the spring and rod to turn the valve in the reverse direction and exhaust the cylinder, substantially as described.

16. In a trolley for electric railways, the combination of a trolley-pole, a spring for raising it, a cylinder and piston for lowering it, a rotary valve for admitting fluid-pressure to and exhaust it from the cylinder, a crank-arm on the valve-stem, a rod connected at one end to said crank-arm and at its other end to an expansible spring arranged to draw the rod away from the valve, means actuated by the movement of the trolley-pole in assuming an erect position when the trolley leaves the wire for turning the valve to throw the crank-arm above the center, and permit the spring and rod to throw the valve wide open, said means when the trolley-pole is moved to nearly a horizontal position being arranged to throw the crank on a dead-center and turn the valve into a position to cut off the supply of fluid-pressure from the cylinder, substantially as described.

17. In a trolley for electric railways, the combination of a trolley-pole, a spring for raising it, a cylinder and piston for lowering it, a rotary valve for admitting fluid-pressure to and exhaust it from the cylinder, a crank-arm on the valve-stem, a rod connected at one end to said crank-arm, and at its other

end to an expansible spring arranged to draw the rod away from the valve, means actuated by the movement of the trolley-pole in assuming an erect position when the trolley leaves the wire for turning the valve to throw the crank-arm above the center, and permit the spring and rod to throw the valve wide open, said means when the trolley-pole is moved to nearly a horizontal position being arranged to throw the crank on a dead-center and turn the valve into a position to cut off the supply of fluid-pressure from the cylinder, and means arranged to throw said crank below the center and permit the spring and rod to turn the valve to exhaust the cylinder when the pole is drawn to a horizontal position, substantially as described.

18. In a trolley for electric railways, the combination of a trolley-pole, a spring for raising it, a cylinder and piston for lowering it to nearly a horizontal position, a rotary valve for admitting fluid - pressure to and exhaust it from the cylinder, a crank-arm on the valve-stem, a rod connected at one end to said crank-arm and at its other end to an expansible spring arranged to throw the rod away from the valve, means actuated by the move-

ment of the trolley-pole in assuming an erect position when the trolley leaves the wire for turning the valve to throw the crank-arm above the center, and permit the spring and rod to throw the valve wide open, said means when the trolley-pole is moved to nearly a horizontal position being arranged to throw the crank on a dead-center and throw the valve into a position to cut off the supply of fluid-pressure to the cylinder, means arranged to throw said crank below the center and permit the spring and rod to turn the valve to exhaust the cylinder when the pole is drawn down to a horizontal position, and a cord attached to the trolley - pole for guiding the trolley onto the wire, and for drawing the pole down past the point to which it has been moved by the cylinder; substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JUDSON L. BOGUE.
DAVID M. JENNINGS.

Witnesses:

F. N. PUCKETT,
A. B. SMITH.