No. 861,233. PATENTED JULY 23, 1907.

H. W. FELLOWS & I. A. CAMMETT.

AUTOMATIC TROLLEY POLE.

APPLICATION FILED JULY 16, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

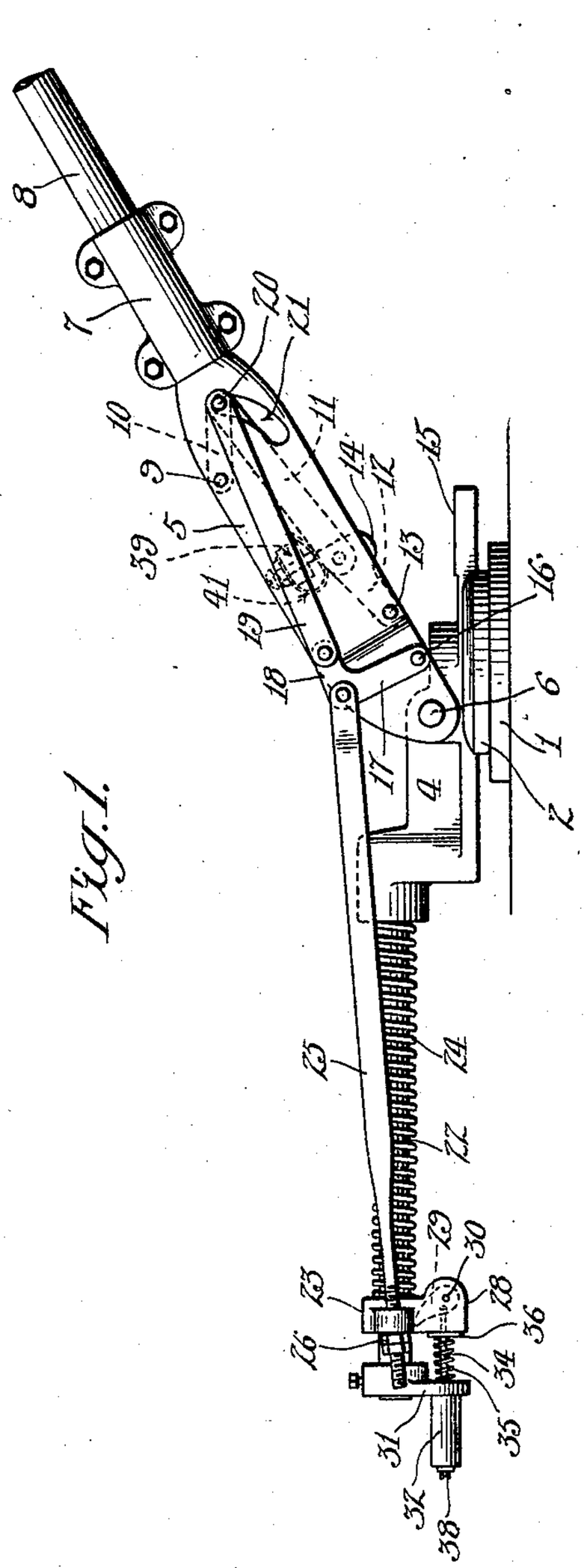
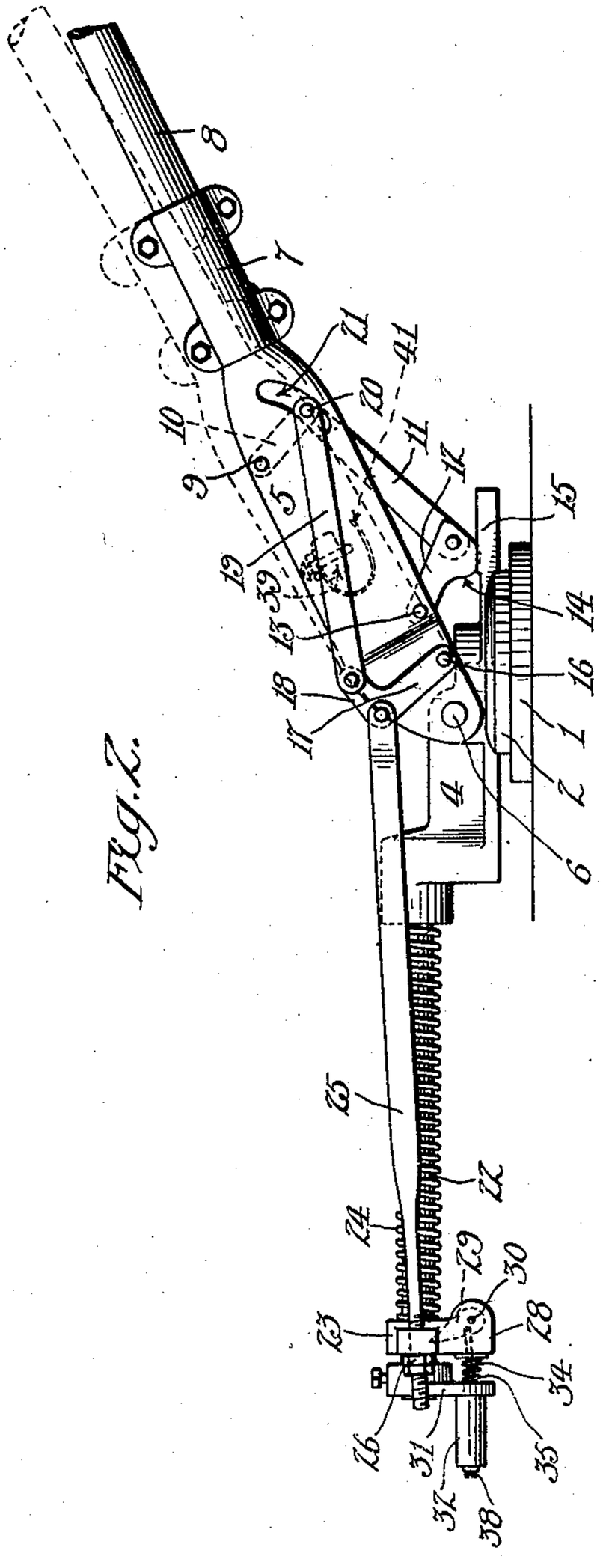


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

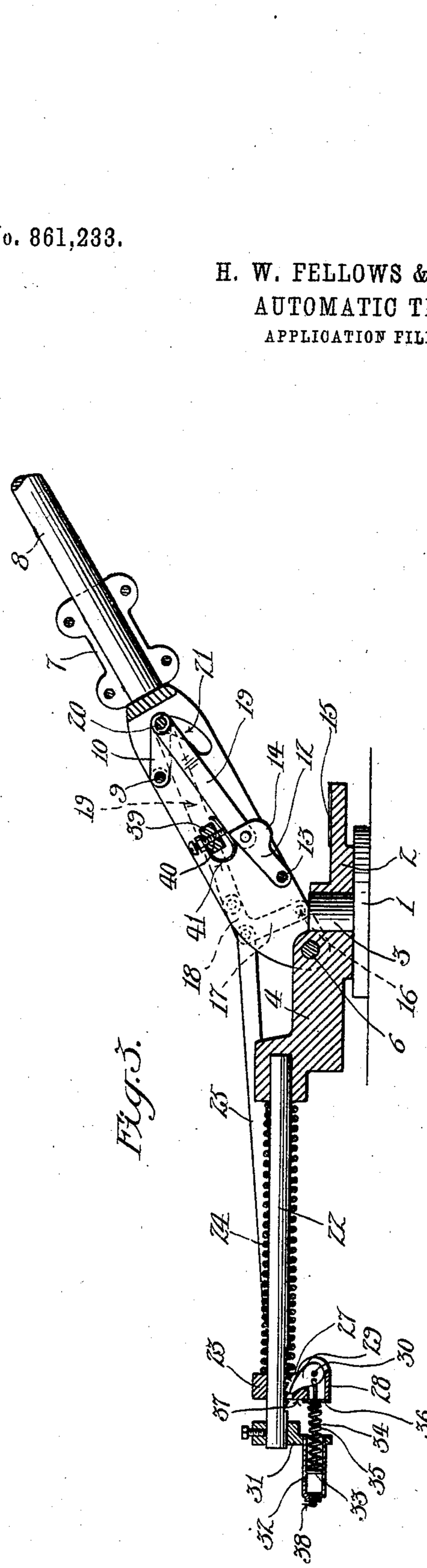
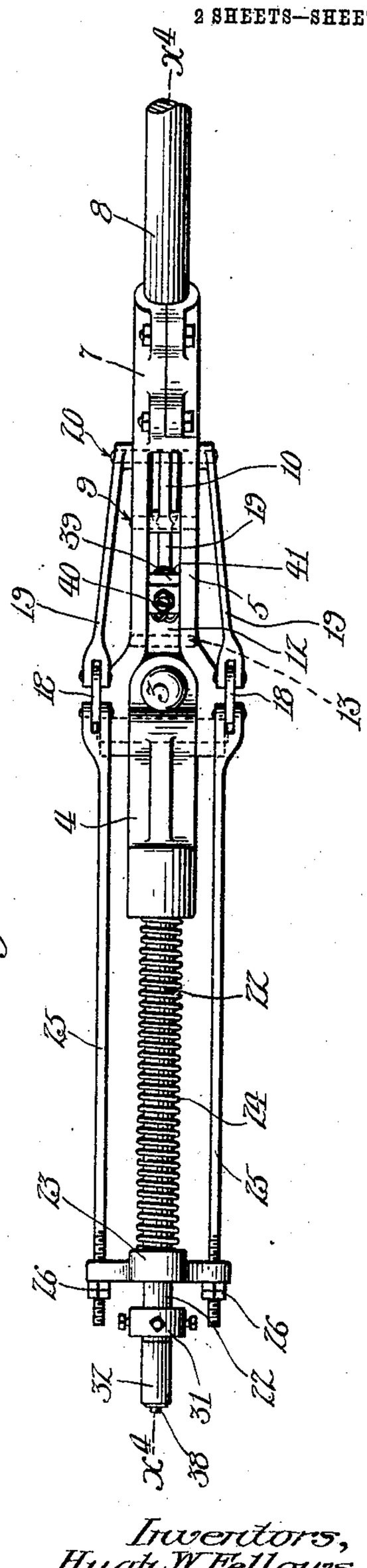


Fig. 4.



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UNITED STATES PATENT OFFICE.

HUGH W. FELLOWS, OF CAHUENGA, AND IRA A. CAMMETT, OF HOLLYWOOD, CALIFORNIA.

AUTOMATIC TROLLEY-POLE.

No. 861,233. Specification of Letters Patent. Patented July 23, 1907.

Application filed July 16, 1906. Serial No. 326,517.

To all whom it may concern:

Be it known that we, HUGH W. FELLOWS and IRA A. CAMMETT, both citizens of the United States, the former residing at Cahuenga, in the county of Los Angeles and State of California, and the latter residing at Hollywood, in the county of Los Angeles and State of California, have invented a new and useful Automatic Trolley-Pole, of which the following is a specification.

Former applications of ours filed Sept. 15, 1905, Serial No. 278,590; Nov. 23, 1905, Serial No. 288,678; and Apr. 13, 1906, Serial No. 311,446, show and describe a trolley base which operates to normally hold the trolley pole raised with the trolley resting against the wire, and which operates to drop the trolley pole below the wire when the trolley slips off from the wire, thus to prevent damage to the trolley pole or trolley which might result from the trolley or trolley pole striking against overhead work such, for example, as span wires or bridges.

The present invention relates to a similar type of device and the objects of the invention are to improve the construction, one of the main objects being to eliminate friction in the working parts of the device, and thus make the apparatus more sensitive and lively and to enable the apparatus to be more easily reset by hand after having operated to drop the pole.

The operation of the apparatus in the former application, was controlled by a weight or lag-bar which operated by its inertia to trip the parts of the mechanism, and another object of the present invention is to eliminate the lag-bar and employ a dash pot for tripping the apparatus and thus render the device more sensitive and simple.

The accompanying drawings illustrate the invention, and referring thereto:—Figure 1 is a side elevation of the device showing the parts in the position they have when the trolley is resting against the wire. Fig. 2 is a similar view, showing in full lines the position of the parts when the trolley has dropped below the wire, the dotted lines indicating the normal position as shown in Fig. 1, and indicates the movement from one position to the other. Fig. 3 is a vertical section taken longitudinally through the apparatus on line x^4—x^4 Fig. 4, the parts being in the same position as shown in Fig. 1. Fig. 4 is a plan view of the apparatus.

1 designates a bearing plate on the roof of the car or other supporting structure on which bearing is mounted a swivel plate 2, the plate 1 having a pin 3 forming a pivot for the swivel plate 2. The swivel plate 2 has a forward extension 4, to which is pivoted a bifurcated supporting arm 5 by means of a pin 6. The outer end of the supporting arm 5 is provided with a sleeve 7 which forms a socket for the trolley pole 8. Pivoted at 9 within the fork of the supporting arm 5 is a rock arm 10, to the lower end of which is connected a link 11, the other end of the link 11 being connected with a short link 12 which is pivoted at 13 in the fork of the supporting arm 5, the two links 11 and 12 forming a toggle. The short link 12 has a rounded knuckle 14 which is adapted to bear against an abutment or shelf 15 which projects rearwardly from the swivel plate 2.

Pivoted at 16 on opposite outer faces of the supporting arm 5 are rock levers 17, each having a right angled extension 18, and a pair of links 19 arranged on opposite sides of the supporting arm 5 connect the two rock levers 17 with the rock arm 10, the latter having a pin 20 to which the links 19 are connected, the socket of the supporting arm 5 being provided with slots 21 formed concentric with the pin 9, to allow the pin 20 to project through both sides of the arm to connect with the links 19, and allow the rock arm 10 to freely swing through its required arc of movement. The two slots 21 are made larger than the pin 20 to allow free movement of the same and do not guide the movement of the toggle lever 11, the guiding being accomplished by the rock arm 10, thus eliminating all sliding friction along the slot.

Projecting forwardly from the extension 4, is a spring guide 22 on which is slidably mounted a spring bar 23, there being a coil compression spring 24 encircling the spring guide 22 and lying between the extension 4 and the spring bar 23. The opposite ends of the spring bar 23 are perforated to receive a pair of draw-bars 25, the stems of which are somewhat smaller than the perforations in the spring bar and are threaded and provided with lock nuts 26 which bear against the outer face of the spring bar 23. Each draw-bar 25 at its rear end is connected to its respective rock lever 17.

As clearly shown in Fig. 3, the underside of the spring guide 22 is formed with a series of teeth 27. The spring bar 23 has a downward extension 28 which is slotted to receive a detent 29 which is pivoted therein at 30, and which when swung up from the position shown in Fig. 3, is adapted to engage with one of the teeth 27. Adjustably secured to the end of the spring guide 22 is a supporting plate 31 which carries a dash pot 32, the plunger 33 of which is connected by a rod 34 with the detent 29, while a coil spring 35 bears against the plunger 33 and against a washer 36 which lies against the forward face of the downward extension 28. The spring 35 normally holds the plunger 33 forward, so that the detent 29 rests against an abutment 37 formed in the extension 28, in which position the toe of the detent clears the teeth 27. The dash pot 32 is provided with a regulating screw 38 for regulating the passage of air through the wall of the dash-pot.

The supporting arm 5 is provided with a bridge 39 through which an adjustable stop bolt 40 passes, which bolt limits the upward position of the toggle, and the bolt should be so adjusted that the two pivotal points 13 and 20 of the toggle are on a line slightly below the

knuckle pivot of the toggle. A spring 41 is supported by the bridge 39 and bears against the upper edge of the toggle with a slight pressure sufficient to depress the joint of the toggle and flex the same when the strain on the toggle is removed, as hereinafter described.

The parts of the apparatus normally have the position shown in Figs. 1, 3 and 4 when the trolley is resting on the wire. When in this position the spring 34 bears against the spring bar 23 and exerts a forward tension on the draw-bars 25, which tension is transmitted from the draw-bars through the rock levers 17, to exert a forward tension on the links 19, which tension is transmitted from the links 19 to the toggle levers 11 and 12 in a forward direction tending to move the pivotal points 20 toward the pivot 13 and to thus hold the joint of the toggle raised with the link 11 firmly pressed against the screw 40, and this tension is sufficient to prevent the spring 41 from flexing the toggle. With the parts under this tension the trolley pole may swing gradually up and down in its normal arc of movement to suit the varying height of the trolley wire as the car travels along, the spring 35 constantly exerting its pressure against the spring bar 23. When the trolley jumps from the wire, the spring 24 moves the spring bar 23 forward very quickly as all resistance to its forward movement has been removed, and as the spring bar 23 thus moves forward it advances the plunger 33 at a rate faster than the air within the dash pot can escape past the screw 38, and thus the air is compressed somewhat within the dash pot which arrests further forward movement of the plunger and results in tilting up the detent 29 into engagement with one of the teeth 27. At the moment the trolley jumps from the wire as the forward tension on the toggle levers 11, 12 is thus relaxed, the spring 41 acts down upon the toggle and flexes the same so that the toggle drops into the position shown in Fig. 2.

It is obvious that even though the detent 29 should not engage one of the teeth 27 that the spring bar 23 would ultimately strike against the plate 31 and thus be arrested, which thus positively prevents a certain abnormal raise of the trolley.

The spring 41 is not absolutely necessary as the toggle would drop by its own weight, but it is preferred to employ the spring to insure absolute flexing of the toggle. As the toggle flexes, the supporting arm 5 being relaxed drops together with the trolley pole into approximately the position shown in Fig. 2, thus lowering the trolley away from the wire and preventing damage to the overhead structure as well as damage to the pole and trolley.

When it is desired to raise the trolley pole the trolley rope, not shown, is pulled to depress the pole and supporting arm 5 still further and as the supporting arm is thus moved down the knuckle 14 of the toggle being held against the shelf 15 causes the toggle to be straightened and restored to its normal position with the link 11 resting against the screw 40, and during this downward movement of the supporting arm 5 the spring bar 23 is retracted so that the pressure of the detent 29 against the tooth 27 is relaxed which allows the spring 35 to draw the detent out of engagement therewith, whereupon the trolley pole is again placed under the power of the spring 22 and may be guided on to the wire by manipulating the trolley rope.

We do not limit ourselves to the employment of a pneumatic dash pot as one operating with liquid could obviously be substituted.

What we claim is:—

1. In combination, a pivoted trolley pole, a supporting spring, a toggle with one member pivoted to the pole, a rock arm pivoted to the pole and pivotally supporting the other member of the toggle, means operated by said spring for normally exerting a tension on the toggle, and means operating by a sudden movement of the pole for preventing expansion of the spring allowing the toggle to flex and the pole to drop.

2. In combination, a swivel plate, a trolley pole pivoted thereon, a supporting spring, a spring guide carried by the swivel plate, a spring bar normally operated by the supporting spring, a connection from the trolley pole to the spring bar, a rack on the spring guide, a detent carried by the spring bar for engaging the rack, and a dash pot for operating the detent, a toggle carried by the trolley pole and forming a part of said connection and normally held straightened and under tension when the pole is under the restraining pressure of the trolley wire, and a spring for assisting said toggle to flex when the tension on said toggle is removed.

3. In combination, a swivel plate, a trolley pole pivoted thereon, a supporting spring, a spring guide carried by the swivel plate, a spring bar normally operated by the supporting spring, a connection from the trolley pole to the spring bar, a rack on the spring guide, a detent carried by the spring bar for engaging the rack, and a dash pot for operating the detent, a toggle carried by the trolley pole and forming a part of said connection and normally held straightened and under tension when the pole is under the restraining pressure of the trolley wire, a spring for assisting said toggle to flex when the tension on said toggle is removed, and a regulating screw forming an abutment against which the toggle is held normally.

4. In combination, a swivel plate, a trolley pole pivoted thereto, a spring guide extending from said swivel plate, a spring bar slidable on the spring guide, a rack formed on the spring guide, a detent carried by the spring bar adapted to engage the rack, a dash pot carried by the spring guide and connected with the detent for operating the same, a toggle with one member pivoted to the pole, a rock lever pivoted to the pole and pivotally supporting the other end of the toggle, a pair of rock levers pivoted to the pole, links connecting said rock levers with the rear end of said toggle, and draw bars connected to said rock levers and to said spring bar.

In testimony whereof, we have hereunto set our hands at Los Angeles California this 7th day of July 1906.

HUGH W. FELLOWS.
IRA A. CAMMETT.

In presence of—
GEORGE T. HACKLEY,
FRANK L. A. GRAHAM.