(No Model.) 2 Sheets—Sheet 1.

H. D. HINCKLEY.

ELECTRIC RAILWAY TROLLEY.

No. 571,120. Patented Nov. 10, 1896.

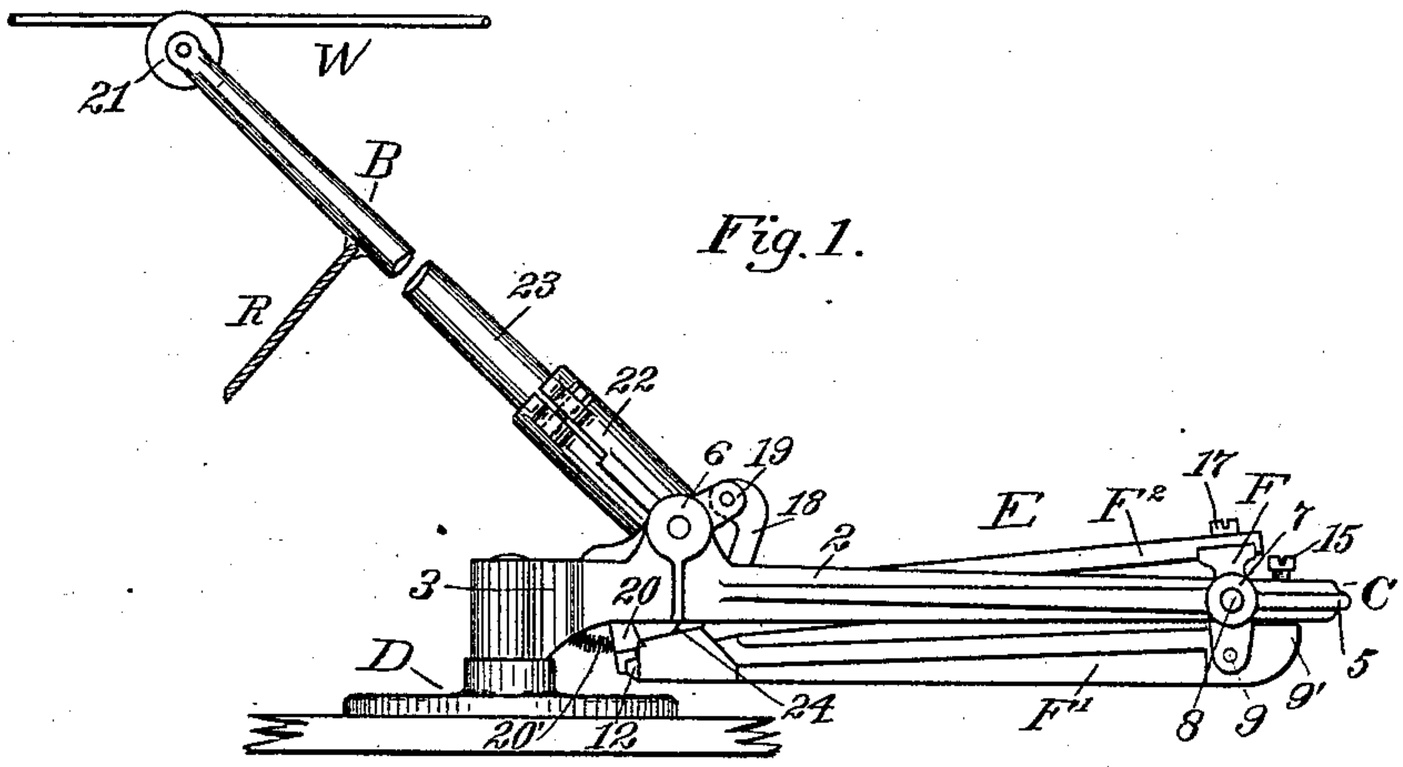


Fig. 1.

Fig. 2.

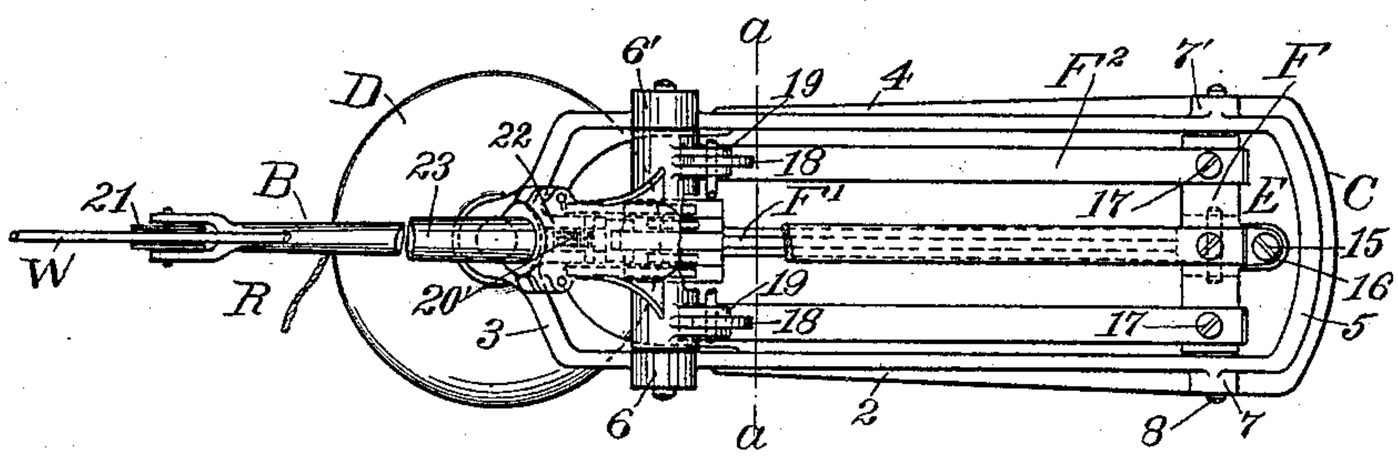


Fig. 4.

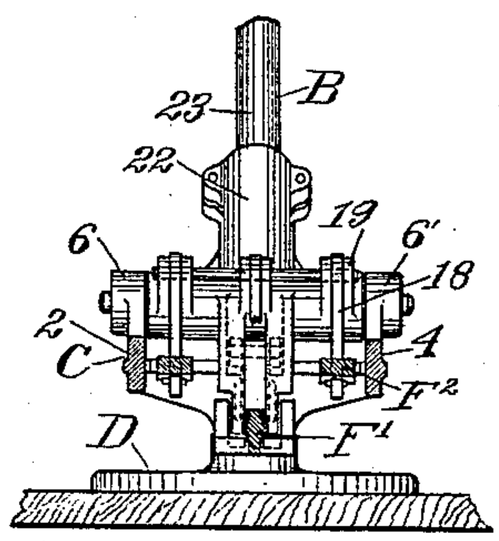
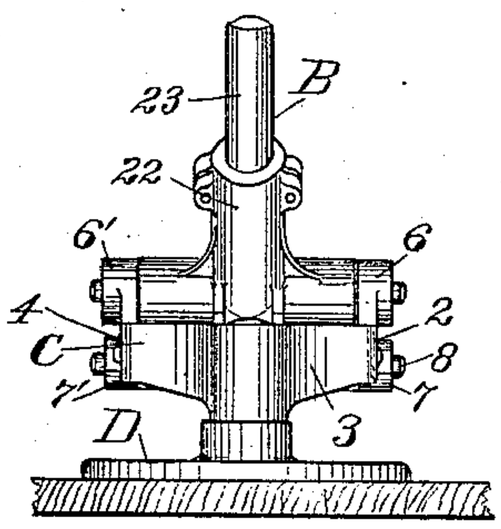


Fig. 3.



Witnesses:
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Fred. J. Dole.

Inventor:
Henry D Hinckley
By his Attorney
F. A. Richards.

(No Model.) 2 Sheets—Sheet 2.

H. D. HINCKLEY.

ELECTRIC RAILWAY TROLLEY.

No. 571,120. Patented Nov. 10, 1896.

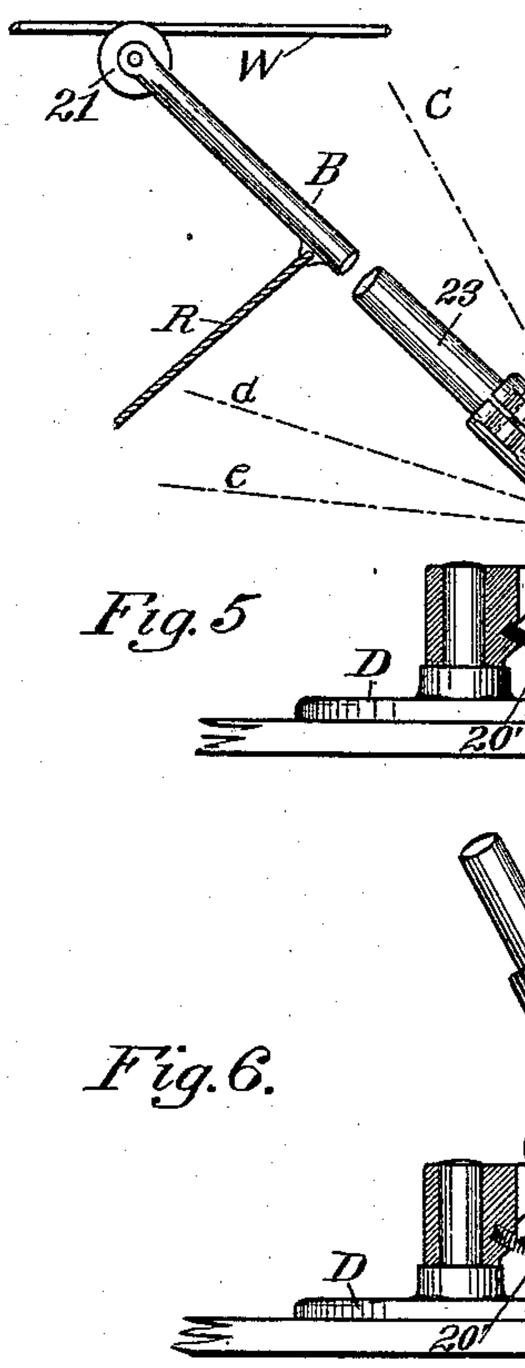


Fig. 5

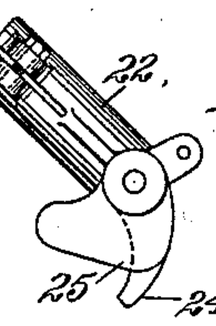


Fig 9

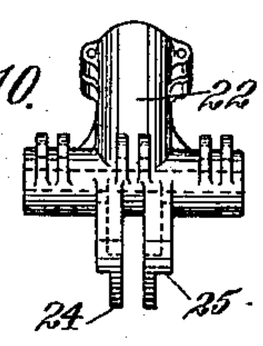


Fig 10.

Fig. 12.

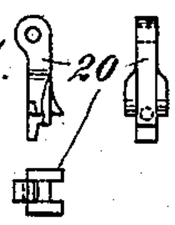


Fig. 11.

Fig. 13.

Fig. 6.

Fig. 14.

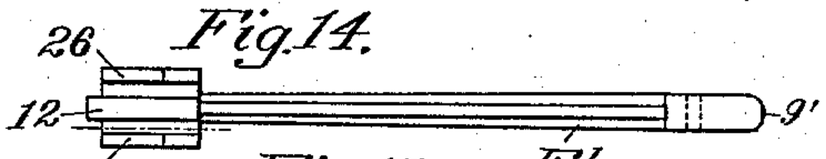


Fig. 15.

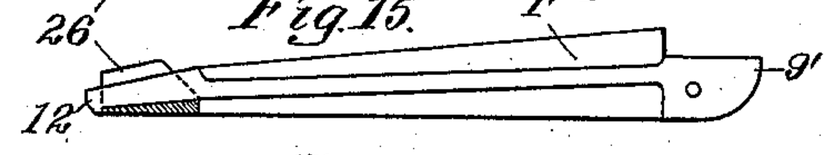


Fig. 17.

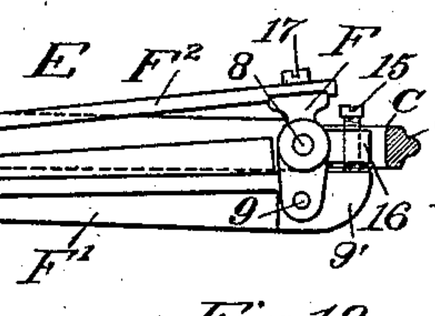


Fig. 16.

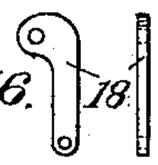


Fig. 18.

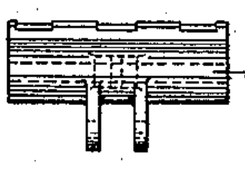
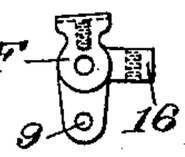


Fig. 19.



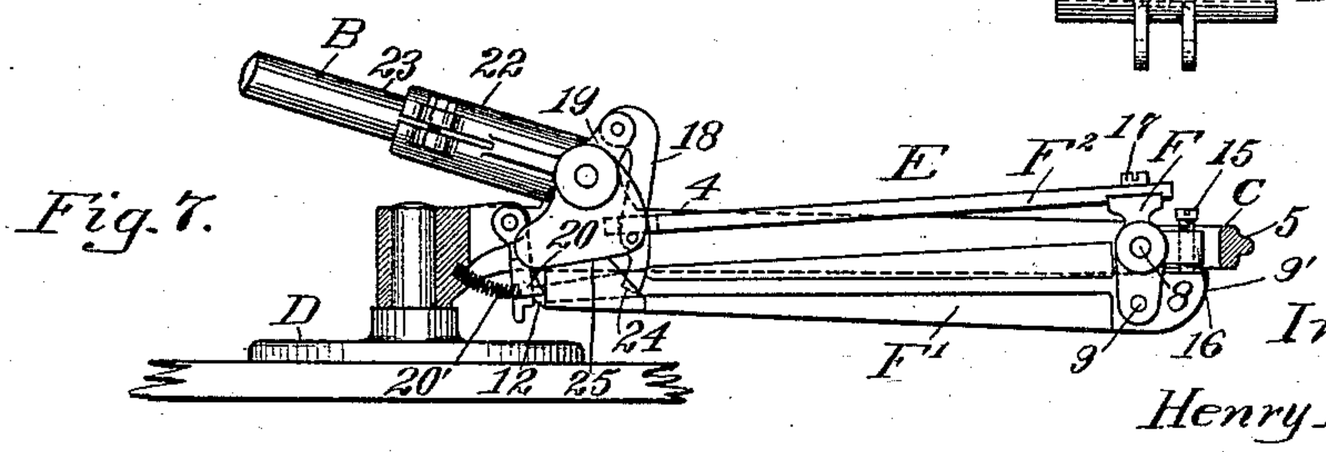


Fig. 7.

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By his Attorney
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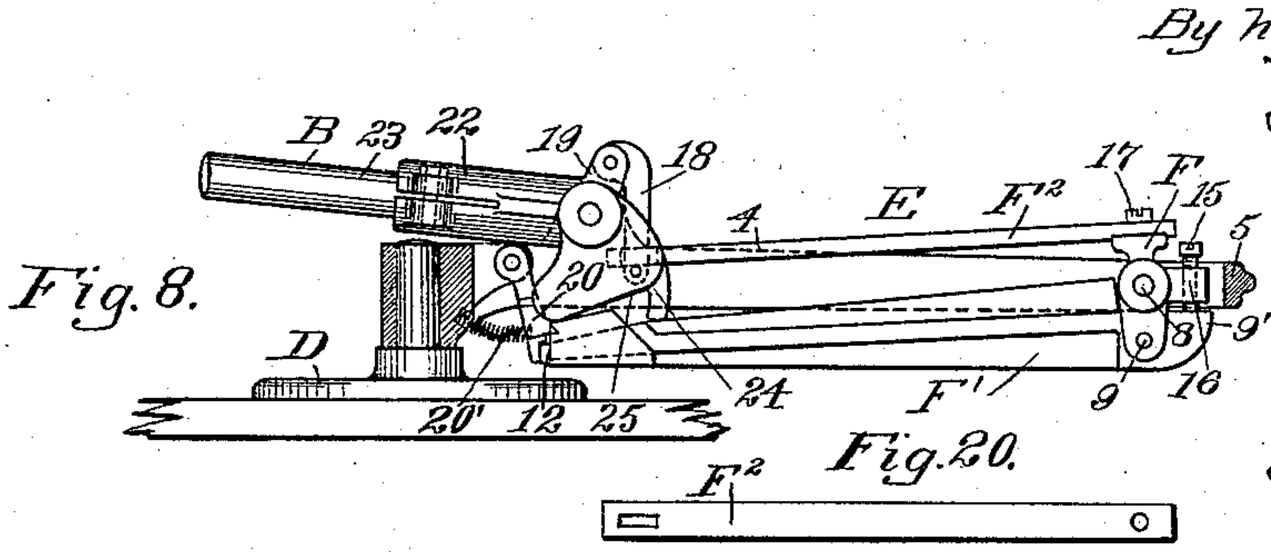

Fig. 8.

Witnesses:
S. W. Potts.
Fred. J. Dole.

Fig. 20.

UNITED STATES PATENT OFFICE.

HENRY D. HINCKLEY, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO HOWARD N. HINCKLEY, OF SAME PLACE.

ELECTRIC-RAILWAY TROLLEY.

SPECIFICATION forming part of Letters Patent No. 571,120, dated November 10, 1896.

Application filed August 12, 1895. Serial No. 558,972. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. HINCKLEY, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Electric-Railway Trolleys, of which the following is a specification.

This invention relates to electric-railway trolleys, and has reference more particularly to an improved mechanism for actuating and controlling a trolley-pole.

One object of my present invention is to provide, in connection with a trolley-pole and its support, improved actuating and controlling means whereby the trolley-pole will be normally maintained in a working position relatively to a trolley-wire and whereby a retractive movement of said trolley-pole will be automatically effective when said pole is thrown out of its working position.

A further object of my invention is to provide, in connection with a trolley-pole and its carrier, an improved trolley-pole actuator embodying springs which normally exert an effective tension upon the trolley-pole and maintain the same in an advanced working position; also to provide improved means controlled by the advancing movement of the trolley-pole for automatically tripping the trolley-pole actuator and releasing the tension of the springs, whereby to throw the actuator out of active or effective relation with the trolley-pole at a predetermined point in the advancing movement of the trolley-pole and whereby to automatically effect a retractive movement of the trolley-pole, and also to provide improved means for reëstablishing an active or effective relation between the trolley-pole and its actuator.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of the trolley apparatus embodying my present invention, said figure showing the trolley-pole held in its normal working position and the trolley-pole actuator locked in effective operative relation with the trolley-pole. Fig. 2 is a plan view of the apparatus seen from above in Fig. 1. Fig. 3 is an end view of the trolley apparatus seen from the left hand in Figs. 1 and 2, a portion of the trolley-pole being broken away. Fig. 4 is a cross-sectional view of the trolley apparatus, taken in dotted line *a a*, Fig. 2, and looking toward the left hand in said figure, a portion of the upper part of the trolley-pole being broken away. Fig. 5 is a sectional side elevation of the trolley apparatus, showing the parts thereof in the same position illustrated in Fig. 1, the dotted radial lines *c*, *d*, and *e* representing, respectively, the actuator-tripping position, the idle retractive position, and the resetting position of the trolley-pole. The trolley-pole actuator in this figure is shown in its active position, or in the position for maintaining the trolley-pole in operative relation with the line-wire, or in its working position. Fig. 6 is a sectional side elevation similar to Fig. 5 and shows the trolley-pole in a position in advance of its working position which corresponds to the position represented by dotted line *c*, Fig. 5. In this position the trolley-pole actuates the tripping mechanism, which throws the trolley-pole actuator out of active or effective relation with the trolley-pole and effects the retractive movement of said trolley-pole. Fig. 7 is a sectional side view, similar to Figs. 5 and 6, showing the trolley-pole in the retractive, idle position represented by dotted line *d*, Fig. 5, and in position for inaugurating the reëstablishment of an active or effective relation between said trolley-pole and its actuator. Fig. 8 is a sectional side elevation, similar to Figs. 5, 6, and 7, showing the trolley-pole in its extreme retracted and actuator-resetting position, said figure showing the actuator reset and locked in the active position illustrated in Figs. 1 and 5. Fig. 9 is a side elevation of the base-piece or socket-piece of the trolley-pole. Fig. 10 is an end view of the same seen from the right hand in Fig. 9. Figs. 11, 12, and 13 are side, edge, and plan views, respectively, of the latch which normally holds the pole-actuator in effective or active relation with the trolley-pole. Figs. 14 and 15 are plan and sectional side views, respectively, of the holdback member or lever-arm of the trolley-pole actuator. Figs. 16 and 17 are side and edge views, respectively, of a link which forms a connecting medium between the trolley-pole and the

actuating-spring. Fig. 18 is an end view, seen from the left hand in Fig. 19, of the carrying member for the actuating-springs and a holdback member of the trolley-pole actuator. Fig. 19 is a side view of said carrying member, and Fig. 20 is a plan view of one of the actuating-springs.

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

In the preferred organization herein shown and described the trolley-pole (designated in a general way by B) is pivotally carried at its lower end for movement in the vertical plane by a suitable frame, (designated in a general way by C,) which is pivotally supported for swinging movement in the horizontal plane upon a stand or pivot-plate, (designated in a general way by D,) and as a means for controlling the movements of the trolley-pole I have provided, in connection with said trolley-pole, a trolley-pole actuator, (designated in a general way by E,) and I have also provided a locking and tripping device for effecting, respectively, an active and an inactive operative relation between the trolley-pole B and the actuator E.

The trolley-pole-carrying frame C, which may be of any suitable construction for carrying the operative parts of the apparatus, is herein shown as an oblong open frame consisting of the two horizontal side bars 2 and 4 and the connecting end bars 3 and 5, between which side bars are pivoted the trolley-pole and the trolley-pole actuator. The trolley-pole is pivotally supported at its lower end in suitable horizontal bearings 6 and 6′, located near the inner end of the frame C, and the trolley-pole actuator is pivotally supported between the side bars 2 and 4 in suitable bearings 7 and 7′ near the outer end of said frame, as will be readily understood by a comparison of Figs. 1, 2, and 4 of the drawings.

The trolley-pole actuator, in the preferred form thereof herein shown and described, comprises three principal members—to wit, a carrying member (designated in a general way by F) pivotally supported near its middle portion, as at 8, between the side bars of the frame C in the bearings 7 and 7′, a lever-arm or resistant member (designated in a general way by F′) fulcrumed near the outer end thereof, as at 9, on one end of the carrier F, and one or more resilient members (herein shown as springs F^2) secured to the opposite end of the carrier F and operatively connected with the trolley-pole B, as hereinafter more fully described. In practice it is preferable that one of the members F′ or F^2 be made rigid, although it will be obvious that if both said members were made resilient and operatively connected together for adjustment, one relatively to the other, in the manner shown and described, such construction would be within the scope of my present invention. The two members F′ and F^2 of the trolley-pole actuator are shown located one above the other, and are connected together at the outer end thereof by means of the carrier F, said carrier constituting a means for tilting said members relatively to each other to bring their inner ends in close proximity to increase the effective tension of the actuator and, as required, to increase or decrease the effective tension of the actuator.

In the present instance I have shown three resilient members F^2 for operatively engaging and actuating the trolley-pole, which members are in the nature of flat springs, are fixed at their outer ends to the upper end of the carrier F by means of screws 17, and are shiftably connected at their inner ends to the lower end of the trolley-pole by means of links 18, having their lower ends in shiftable engagement with the springs F^2 and having their upper ends pivotally carried at the outer ends of relatively short rocking arms or levers 19 at the lower end of the trolley-pole, as will be understood by reference to Figs. 1, 2, and 5 of the drawings.

The springs F^2 are herein shown vertically slotted at their ends, and the links 18 are shown extended through the slots in said springs, where they are held in place by suitable pins or cotters. It will be understood, however, that the form of connection between the springs F^2 and the trolley-pole B may be modified within the scope and limits of my invention, and also that any number and other suitable forms of springs may be employed.

At the inner end of the lever-arm F′ is a catch 12 in position and adapted to be engaged by a latch or pawl 20, pivotally carried on the frame C, and which is adapted for normally holding the member F′ in a fixed position relatively to said frame. This latch 20 is shown normally pressed into engagement with the catch 12 of the member F′ by means of a spring 20′, which is connected with the frame C and bears against the inner face of the latch.

By reference to the drawings it will be seen that the resilient members F^2 exert a downward stress upon the links 18 of the trolley-pole when the member F′ is in the normally-fixed position illustrated in Figs. 1 and 5 and tend to maintain the pole in an elevated working position or in the position shown in Figs. 1 and 5 of the drawings, with the trolley-wheel 21 thereof in working engagement with the line-wire W. In other words, when the resistance member F′ is locked in the fixed position shown in Figs. 1 and 5 the resilient members F^2 are effective for elevating the trolley-pole, and when said member F′ is in the released position shown in Figs. 6 and 7 the tension of the resilient members F^2 is released and said members are ineffective in so far as their control over the movements of the trolley-pole is concerned. Thus it will be seen that when the members of the trolley-pole actuator E are in the positions illustrated in Figs. 1 and 5 said actuator is active for

operating the trolley-pole, and when said members are in the positions shown in Figs. 6 and 7 the actuator is inactive in so far as the control over the movements of the trolley-pole is concerned.

By the employment of relatively stiff springs and adjusting said springs so as to bring their inner ends, when inactive, into close proximity to the inner ends of the resistance member F′ and connecting the inner ends of said springs to the rocking arms 19, as shown, I am enabled to secure a lifting stress of great power and move the upper end of the trolley-pole through a long arc with a relatively short movement of the pole-engaging ends of the springs, as will be readily apparent by a comparison of Figs. 8 and 5 of the drawings.

In the preferred form thereof herein shown the trolley-pole B comprises the base or pole socket-piece 22 and the pole 23, movably clamped in said pole socket-piece, and which carries the trolley-wheel 21 at the upper end thereof.

As a convenient means for tripping the latch 20 to throw the same out of engagement with the catch 12 of the lever-arm or resistance member F′ at a predetermined point in the advancing movement of the trolley-pole or when the trolley-pole is thrown out of its working position relatively to the line-wire and is carried forward beyond its working position or to the position represented by the dotted lines *c*, Fig. 5, I have provided a tripping-arm 24 at the lower end of the trolley-pole below the pivotal point of said trolley-pole and in position to engage the latch 20 when the pole advances beyond its normal working position to throw said latch out of engagement with the catch 12 of the resistance member F′, which allows the two members F′ and F² to swing upward at their inner ends, thus releasing the tension of the member F² and allowing the trolley-pole to drop by its own gravity to the position represented by the dotted line *d*, Fig. 5, which position is more fully illustrated in Fig. 7. This tripping of the latch 20 by the tripping-arm 24 renders the actuator E inactive and allows the pole to swing idly, as will be readily understood by a comparison of the operative views, Figs. 5, 6, and 7.

As a convenient means for resetting the trolley-pole actuator E to effect an active relation between said actuator and trolley-pole, whereby said trolley-pole may again be advanced to its working position, I have provided a resetting-cam 25 at the lower end of the trolley-pole in position to bear against an incline or cam-face 26 (herein shown as a camway) upon the upper side of the inner end of the resistance member or lever-arm F′, when the trolley-pole is further retracted from the position shown in Fig. 7 to that shown in Fig. 8 of the drawings, or from the position represented by the dotted line *d*, Fig. 5, to that represented by the dotted line *e*, said Fig. 5. This further retraction of the trolley-pole may be done by hand through the medium of the rope R or other suitable device secured to the trolley-pole in any suitable manner.

The resetting-cam 25 may preferably have a movement concentric to the axis upon which the trolley-pole rocks, and the working face thereof will be so disposed relatively to the incline or cam-face 26 of the lever-arm F′ as to have an ineffective bearing against said cam-face when the trolley-pole is in the position illustrated in Fig. 7, but will have an effective bearing upon said cam-face and will sufficiently lower the lever-arm, during the retractive movement of the trolley-pole from the position shown in Fig. 7 to the position shown in Fig. 8, to bring the catch 12 of said lever-arm into locked engagement with the latch 20 when the trolley-pole has arrived at the position shown in Fig. 8, thus resetting the actuator and bringing the same into active engagement with the trolley-pole, and in position to advance said trolley-pole to the working position shown in Figs. 1 and 5, said pole being immediately advanced upon the resetting of the actuator E.

In the drawings I have shown the trolley-pole provided with two corresponding resetting-cams 25, located one at each side of the longitudinal axis of said pole, and a lever-arm F′, against which said cams bear, is shown having at its forward end two camways in the upper face thereof in position for engagement by the two cams of the trolley-pole; but it will be obvious that I do not desire to limit myself to the employment of any particular number of cams.

As herein shown, the cams 25 and the rocking arms 19 are formed integral with the base or pole-socket 22, but it will be obvious that said parts may be separate and secured to the base of the trolley-pole in any suitable manner, or the base and trolley-pole may be made in one piece, and said parts be formed upon or secured to said trolley-pole.

In operation, when the trolley-pole is jarred or thrown out of its working position relatively to the line-wire W, it is advanced by the actuator E substantially to the position represented by dotted line *c*, Fig. 5, which corresponds to the position shown in full lines in Fig. 6, which carries the tripping-arm 24 against and disengages the latch 20 from the catch 12 on the lever-arm F′ of the actuator, which lever-arm immediately rises to the position thereof shown in Fig. 6, which nullifies the tension of the springs F², rendering them inactive in so far as sustaining the trolley-pole is concerned, thus allowing the trolley-pole to drop by its own gravity to the position shown in Fig. 7, which corresponds to the position thereof represented by dotted line *d*, Fig. 5.

When the trolley-pole has arrived at the position shown in Fig. 6, which corresponds to the position represented by dotted line *c*,

Fig. 5, and the tripping-arm 24 has disengaged the latch 20 from the catch 12 on the lever-arm to nullify the effective action of the springs F^2 upon the trolley-pole, the free inner end of the lever-arm is brought into engagement with the working face of the resetting-cam 25 and into position to be actuated or lowered by said cam during the retractive or descending movement of the trolley-pole. The working face of the resetting-cam is eccentric to the axis of movement of the trolley-pole, and said working face will preferably be of such form as to have no appreciable effect for changing the position of the lever-arm during the descent of the trolley-pole until the trolley-pole is drawn below the inoperative or idle position shown in Fig. 7. When the trolley-pole is drawn below the idle position illustrated in Fig. 7, the cam will act upon and force the lever-arm F′ downward until it arrives at the position shown in Fig. 8, when the latch 20 will immediately engage the catch, lock the lever-arm in the position shown in Fig. 8, and reset the actuator in its effective working position relatively to the trolley-pole.

Immediately after the inauguration of the retractive movement of the trolley-pole, which inauguration is effected by the temporary nullification of the effective action of the actuator, an effective relation is concurrently reëstablished between the trolley-pole and said actuator—that is to say, a slight resistance is at this time established between the actuating-spring and the trolley-pole, which is sufficient to slightly retard the movement of the trolley-pole, and this resistance gradually increases as the trolley-pole approaches its normal idle position, to thereby cushion the trolley-pole in its retractive movement, as will be understood by a comparison of the several figures of the drawings. This resistance does not attain a magnitude sufficient to effect an advancing movement of the trolley-pole until said pole is drawn below its inoperative or idle position. Thus it will be seen that the springs or resilient members of the actuator, owing to their peculiar organization relatively to the trolley-pole, form a cushioning device or retarding-buffer for easing the retractive movement of the trolley-pole.

The stress of the springs may be readily regulated to secure the best actuating and retarding effect by means of the adjusting device 15, as before described.

As will be seen by reference to Figs. 5 to 9, inclusive, the working face of the resetting-cam 25 is, for a portion of its length, practically concentric with the pivot on which the trolley-pole swings and is shown having a substantially straight portion intermediate of the ends of said working face, also that the resetting or concentric end of the cam 25 is at such an angle relatively to the concentric portion of the working face as to require a power considerably in excess of the normal stress exerted by the trolley-pole to be applied to carry the cam from the position shown in Fig. 7 to the position shown in Fig. 8 for the purpose of resetting the actuator. Thus it will be seen that owing to the peculiar construction of the working face of the resetting-cam 25 and the coöperative relation of the cam-face 26 upon the resistance member or lever-arm F′ of the actuator the resetting-cam also constitutes a limiter for automatically limiting the retractive movement of the trolley-pole, whereby to prevent the accidental retraction of the trolley-pole, through its own gravity, below its normal idle position.

Having thus described my invention, I claim—

1. In a trolley apparatus, the combination with a suitable frame; of a trolley-pole pivotally supported on said frame for movement toward and away from an electric conductor; a shiftable trolley-pole actuator having a spring acting on the lower end of the trolley-pole, to normally maintain said trolley-pole in its working position relatively to the conductor; a latch carried on the frame and normally engaging and locking the actuator in effective relation with the trolley-pole; an independent tripping device carried on the trolley-pole in position and adapted for engaging and throwing the latch out of engagement with the actuator at a predetermined point in the advancing movement of the trolley-pole, to thereby temporarily nullify the effective relation between the actuator and trolley-pole; and a resetting-cam carried by the trolley-pole and controlled by the retractive movement of said trolley-pole for engaging the actuator, and for effecting a reëngagement between the actuator and latch, and to thereby reëstablish an effective relation between said trolley-pole and actuator.

2. In a trolley-pole apparatus, the combination with a trolley-pole; of a shiftable actuating device having a resilient member connected with the trolley-pole and adapted for normally elevating the pole, and also adapted, in one position of said device, for holding the pole in an intermediate, inoperative position; a cam for setting, and a latch for locking, the actuating device in its operative position, when the pole is forcibly lowered below its said inoperative position; and an adjusting device in connection with, and adapted for regulating the effective tension of, the resilient member relatively to the pole, substantially as described.

3. In a trolley apparatus, the combination with a trolley-pole supported for movement toward and from an electric conductor; of a shiftable actuator comprehending two independent, longitudinally-disposed members connected together for adjustment, one relatively to the other, and one of which members is resilient and is connected to the trolley-pole, and is adapted for normally maintaining said trolley-pole in working relation with the conductor; means controlled by the

trolley-pole for automatically and temporarily nullifying the effective action of the resilient member upon the trolley-pole concurrently with a movement of the trolley-pole in advance of its working position, to thereby inaugurate a retractive movement of said trolley-pole; and means controlled by the trolley-pole for engaging one member of the actuator, and for resetting the resilient member in active relation with the trolley-pole, substantially as described.

4. In a trolley apparatus, the combination with a suitable frame; of a trolley-pole pivotally supported upon said frame to swing toward and away from an electric conductor; a trolley-pole actuator pivotally supported at its outer end on the frame, and in shiftable connection at its inner end with the trolley-pole; a latch carried on the frame and normally engaging and locking the actuator in effective relation with the trolley-pole; a tripping device carried by the trolley-pole in position for engaging the latch and releasing the same from the actuator at a predetermined point in the advancing movement of the trolley-pole, to temporarily nullify the effective relation between the actuator and trolley-pole, and inaugurate a retractive movement of said trolley-pole; and a resetting-cam carried upon, and controlled by the retractive movement of, the trolley-pole, for effecting a reëngagement between the latch and actuator upon a movement of the trolley-pole below its normal, idle position, to thereby reëstablish an effective relation between said actuator and trolley-pole.

5. In a trolley apparatus, the combination with a suitable frame, and with a trolley-pole pivotally supported on said frame for movement toward and away from an electric conductor; of a trolley-pole actuator in normal, effective relation with the trolley-pole, and comprehending two independent members adjustably connected together at one end and pivotally carried at this end upon the frame, and having their opposite ends separated and movable toward and from each other, and one of which members is connected with the trolley-pole; and an adjusting device in operative connection with, and adapted for relatively adjusting, said members to increase or decrease the effective tension thereof relatively to the pole.

6. In a trolley apparatus, in combination, a trolley-pole supported for movement toward and from an electric conductor; an actuator in normal, active relation with the trolley-pole, and adapted for normally maintaining said trolley-pole in working position relatively to the conductor; means carried by the trolley-pole for temporarily nullifying the active relation between the actuator and trolley-pole concurrently with a movement of the trolley-pole in advance of its working position; and a combined limiting and resetting cam fixedly carried by the trolley-pole in position for frictionally engaging the actuator at predetermined points in the retractive movement of the trolley-pole, and adapted at one point in the said retractive movement of the trolley-pole for retarding and temporarily holding the same in an intermediate idle position, and upon a further retractive movement of the trolley-pole for resetting the actuator in active relation with the trolley-pole.

7. A trolley apparatus comprising a suitable frame; a trolley-pole supported on said frame for movement toward and from an electric conductor; a trolley-pole actuator embodying two members supported for movement one toward the other, and one of which members is resilient and is operatively connected with the trolley-pole, and the other of which members is substantially rigid and is normally locked against movement relatively to the frame; a latch carried on the frame in normal locked engagement with the substantially rigid member; a tripping device carried by the trolley-pole in position and adapted for engaging and throwing the latch out of engagement with the rigid member at a predetermined point in the advancing movement of the trolley-pole; and a resetting-cam fixedly carried by the trolley-pole in position for engaging and throwing the rigid member into position to be engaged by said latch, to reset the actuator and effect an active relation between said actuator and trolley-pole, substantially as described.

8. A trolley apparatus, comprising in combination a suitable frame; a trolley-pole pivotally supported on said frame for movement toward and from an electric conductor; a trolley-pole actuator having a fixed connection at one end with the frame, and in normal, effective engagement with the trolley-pole at its opposite end, and embodying two independent longitudinally-disposed members connected together for adjustment relatively to each other at the fixed end of the actuator and having their opposite ends relatively separated and movable toward and from each other; a latch carried by the frame, and adapted for locking one of said members in fixed relation with the frame; a connection between the other member and the trolley-pole; means controlled by the trolley-pole for releasing the latch from the actuator member, to temporarily nullify the effective action of said actuator upon the pole, and to inaugurate the retractive movement of said pole; and a resetting-cam fixedly carried by the trolley-pole in position and adapted for frictionally engaging one of the actuating members, and for effecting a locked engagement between said member and the latch, to reëstablish an active relation between the actuator and trolley-pole, substantially as described.

9. A trolley-pole apparatus, comprising in combination a suitable frame; a trolley-pole pivotally supported on said frame for movement toward and from an electric conductor; a trolley-pole actuator in normal, effective

relation with the trolley-pole, and comprehending two independent, longitudinally-disposed members adjustably connected together at one end, and pivotally carried at this end upon the frame, and having their opposite ends separated and movable toward and from each other, and one of which members is shiftably connected with the trolley-pole; means for normally locking one of said members relatively to the frame, to effect an operative relation between the actuator and trolley-pole; means controlled by the trolley-pole for automatically releasing the normally-locked member, to nullify the operative relation between the actuator and the trolley-pole; and means carried by the trolley-pole for automatically resetting the actuator in operative relation with the trolley-pole, substantially as described.

10. The combination with the trolley-pole-carrying frame and the trolley-pole carried thereon; of a trolley-pole actuator in normally effective engagement with the trolley-pole, and embodying two members, one of which is resilient and is operatively connected with the trolley-pole, and the other of which members is substantially rigid and is fixed at one end relatively to the other member, and is adapted for movement at its opposite end toward and from said other member; means carried by the trolley-pole for automatically nullifying the effective operation of the actuator; and a cam carried by the trolley-pole in position for spreading the two members of the actuator relatively to reset the actuator in effective operative relation with the trolley-pole.

11. A trolley apparatus comprising, in combination, a swiveled frame; a trolley-pole pivotally supported on said frame to swing toward and away from an electric conductor; a trolley-pole actuator carried on said frame, and having a spring normally in tension with the trolley-pole, and adapted for normally maintaining the trolley-pole in a working position relatively to the actuator; a spring-actuated latch carried upon the frame and in normal locked engagement with the actuator; means carried by the trolley-pole in position for engaging the latch and disengaging the same from the actuator, to temporarily nullify the tension of the spring upon the trolley-pole, when said trolley-pole is advancing beyond its working position, and to thereby inaugurate the retractive movement of said trolley-pole; and a combined limiting and resetting cam carried and controlled by the trolley-pole, and effective at one stage in the retractive movement of said trolley-pole for engaging the actuator-spring, and for holding said trolley-pole in an intermediate, idle position; and also effective at another stage in the retractive movement of the trolley-pole for resetting the actuator in locked engagement with the latch to reëstablish the effective tension of said spring relatively to the trolley-pole.

12. In a trolley apparatus, the combination with a frame and the trolley-pole pivotally carried on said frame; of a trolley-pole actuator comprising a carrier pivotally supported on said frame; one or more springs fixed at one end to said carrier and operatively connected at their opposite ends by means of links to the trolley-pole; and a lever-arm pivotally supported at one end on the carrier; a latch carried by the frame in position and adapted for engaging and normally holding the free end of the lever-arm against movement to normally maintain the actuator in effective relation with the trolley-pole; a trip carried by the trolley-pole in position and adapted to nullify the effective relation between the actuator and trolley-pole; and a cam carried by the trolley-pole in position for engaging and effecting a relocking movement of the lever-arm to reëstablish an effective relation between the actuator and the trolley-pole, substantially as described.

13. In a trolley apparatus, the combination with a frame, and with a trolley-pole supported on said frame; of an actuating-spring in operative connection with the trolley-pole; a lever operatively connected with the spring; a latch for normally locking the lever in fixed relation with the frame to normally hold the spring in operative tension with the trolley-pole; a trip carried by the trolley-pole for releasing the latch at a predetermined point in the advancing movement of the trolley-pole to nullify the tension of the actuating-spring; and a resetting-cam fixedly carried by the trolley-pole in position for engaging the lever at a predetermined point in the retractive movement of the trolley-pole to spread said lever relatively to the spring, and effect a locked engagement between the latch and lever, and to thereby reëstablish the tension of the spring relatively to the trolley-pole, substantially as described.

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