No. 673,368. Patented Apr. 30, 1901.

F. PFENT.

TROLLEY STAND.

(Application filed June 27, 1900.)

(No Model.)

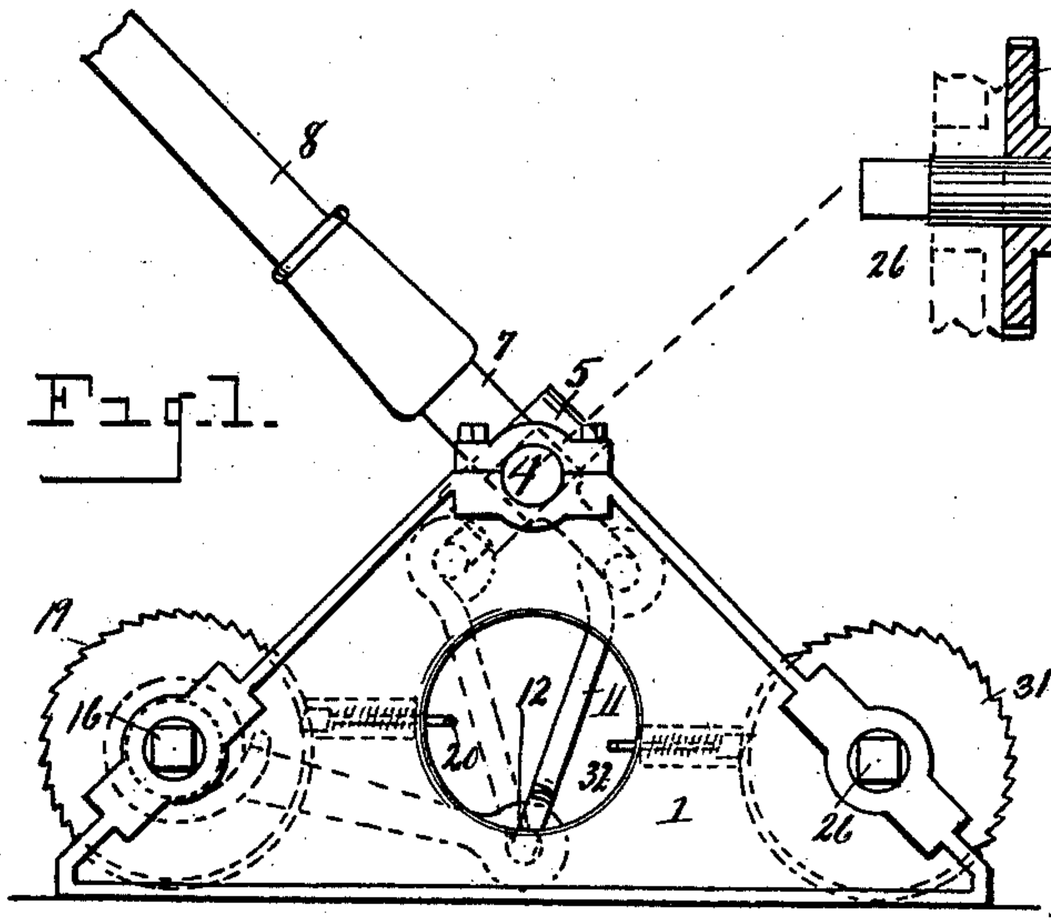

Fig. 1.

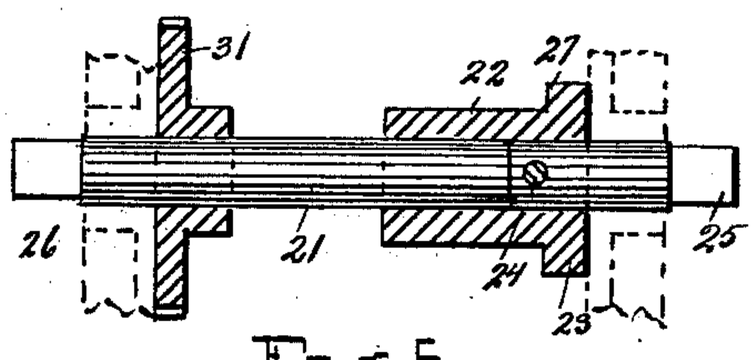

Fig. 6.

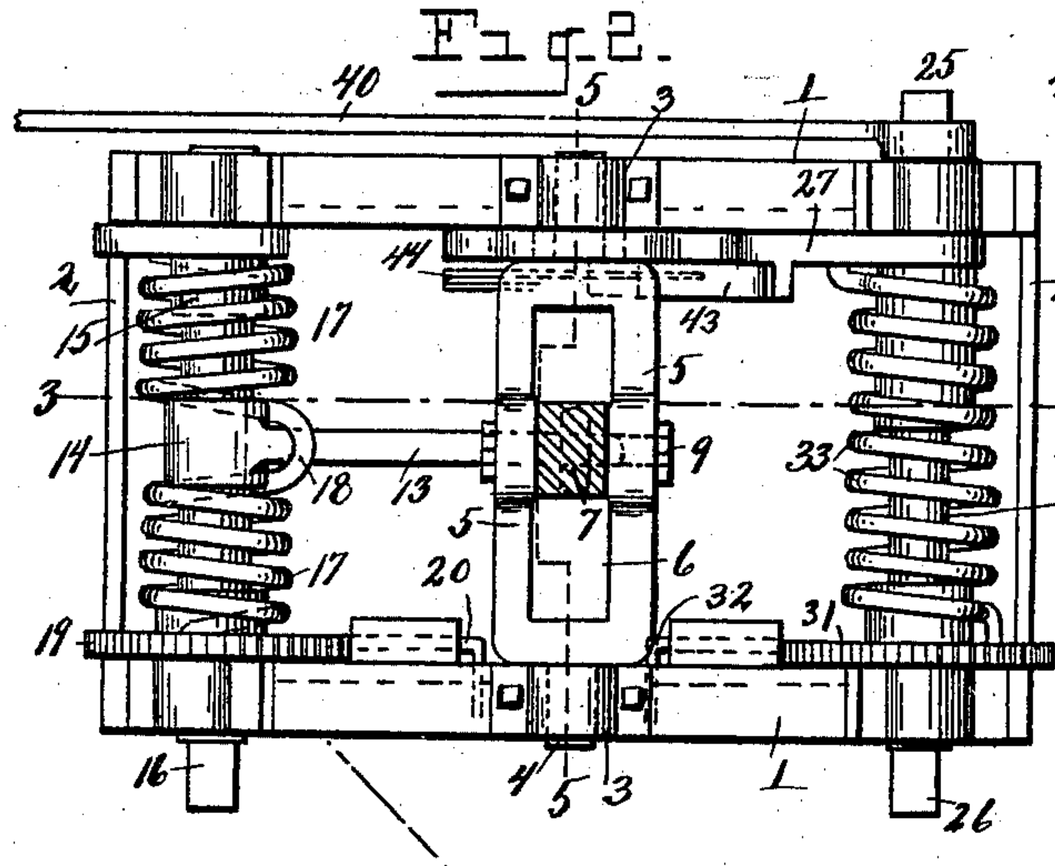

Fig. 2.

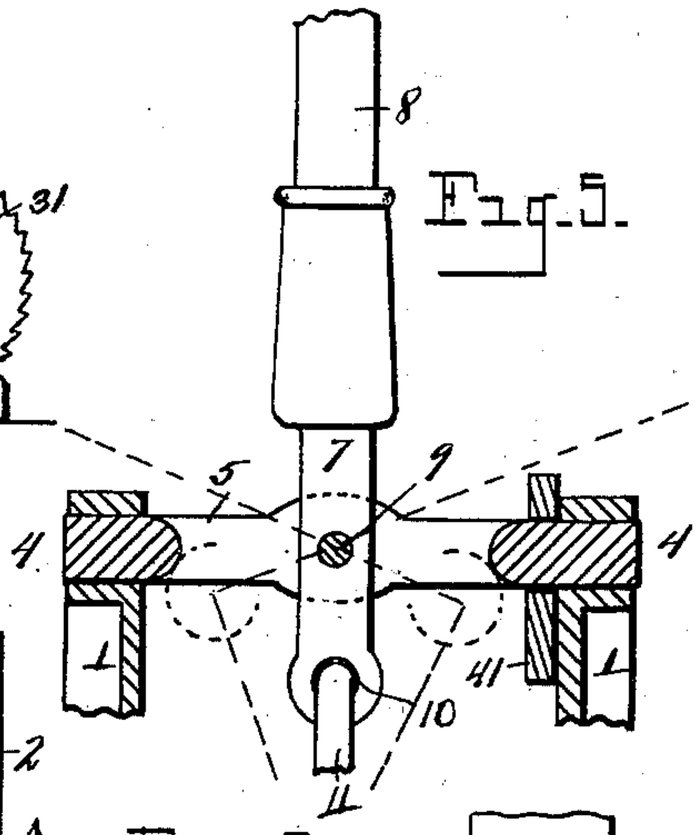

Fig. 5.

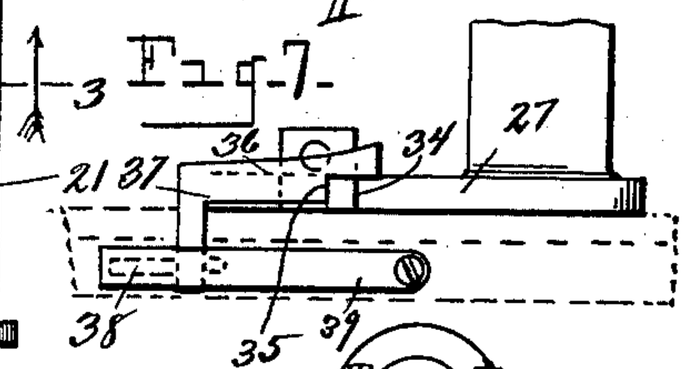

Fig. 7.

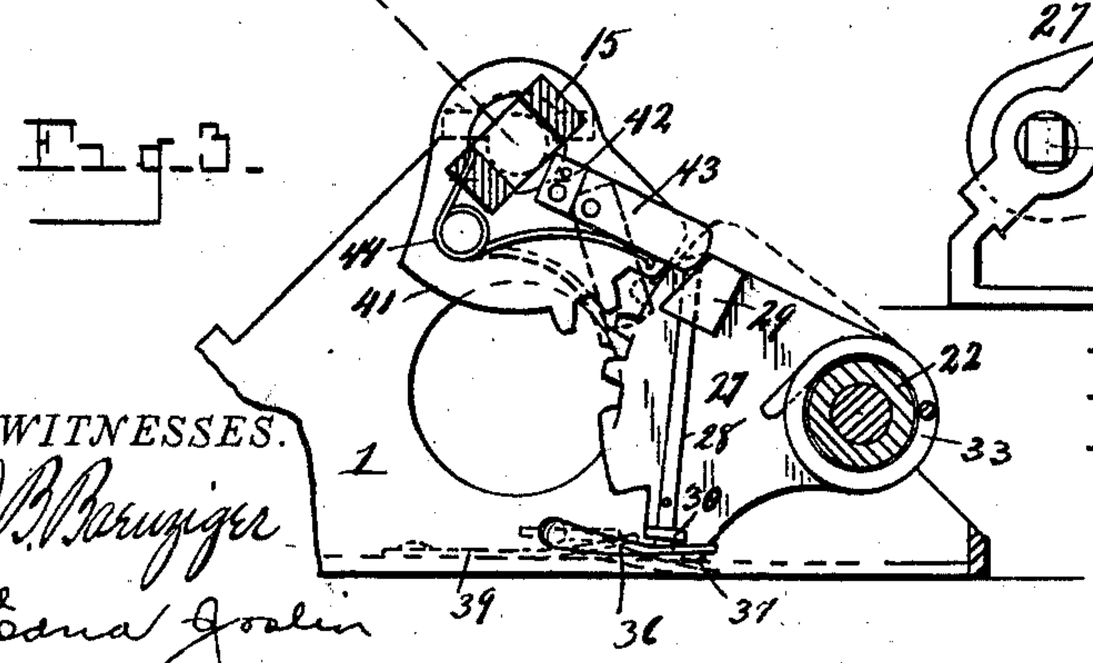

Fig. 3.

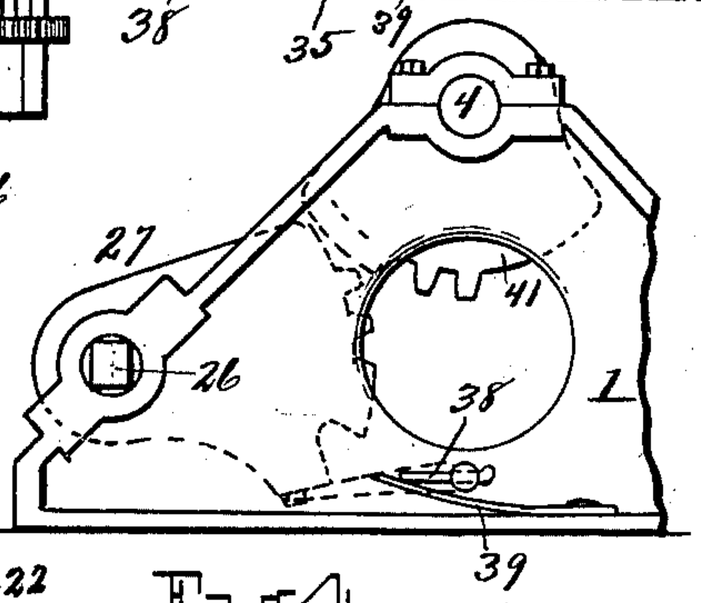

Fig. 4.

WITNESSES.

O. B. Berninger

b. Edna Goolin

INVENTOR.

Frank Pfent

By R. B. Wheeler & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

FRANK PFENT, OF CONNERS CREEK, MICHIGAN, ASSIGNOR OF ONE-HALF TO GILBERT M. MORAN, OF DETROIT, AND LOUIS A. MORAN, OF GROSSEPOINTE, MICHIGAN.

TROLLEY-STAND.

SPECIFICATION forming part of Letters Patent No. 673,368, dated April 30, 1901.

Application filed June 27, 1900. Serial No. 21,735. (No model.)

To all whom it may concern:

Be it known that I, FRANK PFENT, a citizen of the United States, residing at Conners Creek, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Trolley-Stands; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to trolley-stands; and it consists in the construction and arrangement of parts hereinafter more fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide a trolley-stand in which the arrangement is such as to place a spring tension upon the trolley-pole sufficient to hold the trolley-wheel in contact with the overhead conductor and at the same time allow of a longitudinal and transverse movement of the pole, and by a further arrangement provide for automatically drawing the trolley-pole down to a horizontal position should the trolley inadvertently leave the conductor.

The above object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a trolley-stand embodying my invention. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section on line 3 3 of Fig. 2. Fig. 4 is a side elevation of the stand opposite from that shown in Fig. 1, parts being broken away. Fig. 5 is a transverse section on line 5 5 of Fig. 2. Fig. 6 is a detail, partly in section, showing the jointed spring-actuated shaft forming part of the mechanism for drawing downward the trolley-pole. Fig. 7 is an inverted plan in detail of the locking parts employed in the automatically-actuated pole-depressing mechanism.

Referring to the characters of reference, 1 designates the parallel side pieces forming the frame of the trolley-stand, connected at their ends by suitable transverse bars 2. The sides of the trolley-stand are triangular in formation and are provided at their apices with the bearing-boxes 3. Mounted in said boxes are the journals 4 of the yoke 5, which crosses between the inner faces of the sides of the stand and which is adapted to rock upon said bearings. Pivoted within the central openings 6 of said yoke is the socket 7 of the trolley-pole 8, adapted to carry at its upper end the ordinary rotary contact-wheel, which engages the overhead conductor, said wheel and conductor not being shown. The bolt 9, passing through the sides of the yoke and the interposed socket of the trolley-pole, forms the fulcrum upon which said pole is permitted to oscillate transversely of the car, as shown by dotted lines in Fig. 5, while the journals 4 of said yoke form the fulcrum upon which the trolley-pole oscillates longitudinally of the car, as shown by dotted lines in Fig. 1.

The lower end of the trolley-pole or trolley-pole socket extends a suitable distance below the pivot-bolt 9 and is provided with an eye 10 therein, to which is loosely coupled the upper end of a link 11, the lower end of said link being in like manner coupled at 12 to the inwardly-extending end of the arm 13. The opposite end of the arm 13 is attached to a sleeve 14, loosely mounted upon the center of a transverse shaft 15, crossing between the sides of the frame at one end, near the bottom thereof, and journaled therein, one end of said shaft having a squared projecting end 16 for the application of a wrench thereto. Carried upon said shaft is a double coiled spring 17, having a central loop 18, which engages over the projecting arm 13, the ends of said spring being made fast to the opposite ends of said shaft, respectively. Mounted upon said shaft and adapted to turn therewith is a ratchet-wheel 19. Attached to the side of the frame adjacent said ratchet-wheel is a spring-actuated detent 20, adapted to engage said wheel and hold it against backward movement. It will now be understood that by turning said shaft in the direction of the arm 13 tension will be applied to the doubled coiled spring 17, owing to the fact that the center of said spring is held by said arm, while the ends are permitted to turn with

said shaft, whereby any desired tension may be applied to said spring, which is retained by the detent engaging the ratchet-wheel 19.

The downward force exerted by the spring 17 upon the arm 13 is transmitted through the link 11 to the lower end of the pole-socket, whereby the trolley-wheel at the upper end of the pole is held forcibly but yieldingly in contact with the overhead conductor. Not only is the tension of said spring exerted to raise the upper end of the trolley-pole when standing on either side of a vertical position, but the tension of said spring is also exerted to carry the pole to a vertical position when its upper end is swung laterally, as a lateral movement of said pole in either direction draws upon the link 11, as shown by dotted lines in Fig. 5, which movement is resisted by the tension of said spring, so that with the upper end of the trolley-pole free the force of the spring 17 exerted thereon through the link 11 will cause said pole to assume a vertical position, but at the same time allow of a reciprocation of said pole longitudinally and transversely of the car or permit the upper ends of the pole to describe a circle, so that the connection between the pole and stand is, in effect, a universal-joint connection permitting of a movement of the pole from a vertical line in any direction and again restoring the pole to a vertical position when released. The universal movement of the trolley-pole enables it to readily follow the line of the conductor at all turnouts or in rounding curves and enables the pole to be reversed should it be desired to change the direction of the car. When the trolley accidentally leaves the overhead conductor, the pole rises to a vertical position and violently encounters the cross-wires, if the car be in motion, doing damage to said wire and the pole. This objection is overcome by providing an automatic device for drawing the trolley-pole down to a horizontal position whenever it inadvertently leaves the trolley-wire. The means employed for accomplishing said result consists of a spring-actuated shaft 21, journaled between the sides of the trolley-stand and comprising two independently-rotatable sections whose inner ends are supported in an embracing-sleeve 22, (see Fig. 6,) to which the minor portion 23 of said shaft is made fast by means of a pin 24. The opposite ends of said sectional shaft project through the sides of the stand and are provided with squared portions 25 and 26, respectively adapted to receive a wrench, through the medium of which said shaft-sections may be independently turned. Formed integral with the sleeve 22 and projecting laterally therefrom is a toothed segment 27. Mounted upon said toothed segment and movable therewith is a reciprocatory plunger 28, whose upper end passes through and is supported in the block 29, carried by said segment, and whose lower end passes through a guide 30. Made fast to the major portion of the shaft 21 is a ratchet-wheel 31, adapted to be held against backward movement by a detent 32. Mounted upon said sectional shaft and extending from end to end thereof is a coiled spring 33, one end of which is attached to the segment 27 and the other end to the ratchet-wheel 31. By applying a wrench to the end of the major portion of the shaft and turning it tension may be applied to the spring 33, which is exerted upon said segment and minor portion of the shaft to rock said minor portion and raise said segment. To lock said segment down against the action of said spring, a lug 34 is formed upon the lower edge of said segment, which is adapted to engage the shoulder 35, (see Fig. 7,) formed on the foot 36, which projects laterally from a small rock-shaft 37, which passes through and is journaled in the side of the trolley-stand and carries in its outer end a transverse pin 38, which is engaged by a spring 39, whose tension is exerted to normally hold said foot raised. In locking the segment down a downward pressure is exerted upon the lever 40, which is mounted on the squared end 25 of the minor portion of said shaft, whereby the segment 27 is rocked downward and carries with it the free end of the foot 36 until the shoulder 35 thereof slips past the lug 34 on said segment, when said parts become interlocked and said segment is held from rotating or swinging upwardly. When said parts are in their locked position, the lower end of the plunger 28 rests directly upon said foot, as will be seen upon referring to Fig. 3.

Loosely mounted upon one of the journals of the oscillatory yoke 5 is a toothed segment 41, having teeth adapted to mesh with the teeth of the segment 27. Mounted upon the inner face of the segment 41 is a block 42, which is adapted to engage the opposite edges of the yoke 5 as said yoke is tilted from side to side, whereby said segment is permitted a limited independent movement, but is also caused to move in unison with said yoke. Pivoted to the face of the segment 41 and positioned to cause its pivoted end to abut against the block 42 when extended parallel therewith is an arm 43, which is normally held against movement upon its pivot by means of the spring 44, mounted on the yoke 5. The outer end of the arm 43 projects into the path of the upper end of the plunger 28, extending through the block 49, carried by the segment 27. While the trolley is in engagement with the overhead conductor the position of the parts is so that the free end of the arm 43 stands above the end of the plunger 28 and out of contact therewith. Should the trolley leave the conductor, however, the force exerted on the trolley-pole through the spring 17 will immediately carry the free end of the pole upward and cause the yoke to engage the block 42 on the segment 41 and swing said segment downward, so as to carry the free end of the arm 43 forcibly against the upper end of the plunger

28, thereby moving said plunger downward and causing its lower end to engage and carry the foot 36 from contact with the lug 34, thereby releasing the segment 27 and allowing the spring 33 to swing said segment upwardly in the arc of a circle, whereby its teeth are caused to engage with the teeth of the segment 41 and impart a movement thereto which will rock the yoke and swing the trolley-pole downwardly to a horizontal position free from contact with the cross-wires or any of the overhead structure. To restore the parts to their normal position, the lever 41 is depressed, thereby rotating or swinging the segment 27 against the action of the spring 33 until it is again locked by the foot 36. This operation permits the trolley-pole to rise, when the trolley thereon may be placed in contact with the conductor. Should the trolley-pole in assuming its vertical position miss the trolley-wire and stand erect, it may be drawn downward after the segment 27 is locked, as the pivoted spring-actuated arm 43 will yield to permit its free end to pass the block 29 as the trolley-pole is drawn down to an inclined position for engagement with the conductor.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a trolley-stand, the combination with a suitable frame, a trolley-pole pivoted in said frame, a spring-actuated arm hinged in the frame and adapted to have movement against the action of its actuating-spring and a jointed inflexible connection between said arm and said trolley-pole.

2. In a trolley-stand, the combination with a suitable frame of a trolley-pole pivoted therein, the lower end of said pole extending beyond the point of pivot, a spring-actuated arm hinged in the frame and a link jointedly connected with the free end of said arm and with the lower end of said pole.

3. In a trolley-stand, the combination with a suitable frame, a trolley-pole pivoted in said frame, its lower end extending below said point of pivot and adapted to describe the arc of a circle as the pole is swung upon its fulcrum, a spring-actuated arm hinged in the frame in axillar alinement with said trolley-pole and an inflexible link jointedly connecting the free end of said arm with the lower end of said pole.

4. In a trolley-stand, the combination with a suitable frame, a trolley-pole pivoted in said frame, the lower end of said pole extending beyond said pivot and adapted to move in the arc of a circle as the pole swings upon its fulcrum, a spring-actuated arm mounted in the frame and projecting in axillar alinement with said pole, the tension of the spring exerting a downward pressure upon said arm, an inflexible link hinged at one end to said arm and at the opposite end to the lower end of said pole.

5. In a trolley-stand, the combination with a suitable frame of a trolley-pole pivoted in said frame, a transverse shaft carrying a coiled spring and means establishing a jointed but inflexible connection between said spring and the lower end of said pole.

6. In a trolley-stand, the combination with a suitable frame, a yoke journaled in said frame to rock or oscillate, a trolley-pole pivoted in said yoke so as to swing laterally upon said pivot as well as longitudinally of the car with the tilting of said yoke, a coiled spring mounted in said frame and means establishing a jointed but inflexible connection between the lower end of said pole and said spring.

7. In a trolley-stand, the combination with a suitable frame, of a yoke journaled in said frame, a trolley-pole pivoted centrally within said yoke whose lower end projects below said point of pivot, a pivoted arm carrying the tension of a spring projecting in axillar alinement with said pole and an inflexible link jointedly attached to said pole and to said arm.

8. In a trolley-stand, the combination with a suitable frame, of a yoke journaled in said frame, a trolley-pole pivoted centrally in said yoke, the lower end of said pole depending below said point of pivot, a shaft crossing said frame and carrying a spring, a rigid arm journaled on said shaft and engaging said spring and a link connecting said arm with the lower end of said trolley-pole.

9. In a trolley-stand, the combination with a suitable frame, a trolley-pole pivoted in said frame, a shaft journaled in said frame, a coiled spring upon said shaft attached thereto, a ratchet-wheel also attached to said shaft, an arm journaled on said shaft and engaging said spring and a link connecting said arm with said trolley-pole.

10. In a trolley-stand, the combination with a suitable frame, a yoke journaled in said frame, a trolley-pole pivoted centrally within said yoke having its lower end depending below said point of pivot, a shaft mounted in said frame, a coiled spring upon said shaft, means for applying tension to said spring, a rigid arm journaled on said shaft and engaging said spring and a link connecting the free end of said arm with the lower end of the trolley-pole.

11. In a trolley-stand, the combination of a suitable frame, a trolley-pole pivotally mounted in said frame, means for applying spring tension to said pole, a loose segment on the fulcrum of said pole having a limited movement independent thereof, a tripping-arm carried by said segment, a spring-actuated shaft carrying a segment adapted to mesh with said first-mentioned segment, a foot adapted to engage and lock the segment on said shaft against the action of said spring, a movable plunger carried by the segment of said shaft adapted to engage said foot and having its upper end extending into the path of said tripping-arm.

12. In a trolley-stand, the combination with a suitable frame, a yoke journaled in said frame, a trolley-pole pivoted in said yoke, means for applying spring tension to said pole, a segment loosely mounted on the journal of said yoke, a stop on said segment adapted to be engaged by said yoke, a pivoted arm on said segment adjacent to said stop, a spring-actuated shaft carrying a segment adapted to mesh with the segment on the journal of the yoke, means for locking the segment of the shaft against the action of its spring, means actuated by the pivoted arm on the segment carried by the journal of the yoke for releasing said locking means and causing the engagement of said segments to lower the trolley-pole.

13. In a trolley-stand, the combination with a suitable frame, of a trolley-pole pivoted therein, means for applying spring tension to said pole, a segment carried on the fulcrum of said pole, a rotatable shaft formed of independently-rotatable sections, a ratchet-wheel on one of said sections, a segment fixed on the other of said sections, a spring mounted on said shaft attached at one end to said ratchet and at the other end to said segment, means for locking the segment on said shaft and means for releasing said segment to cause it to engage the segment on the fulcrum of the trolley-pole.

In testimony whereof I sign this specification in the presence of two witnesses.

FRANK PFENT.

Witnesses:
E. S. WHEELER,
C. EDNA JOSLIN.