No. 676,378. Patented June 11, 1901.

A. C. WOLFE.

SAFETY TROLLEY BASE.

(No Model.) (Application filed Jan. 22, 1901.) 2 Sheets—Sheet 1.

FIG. 1.

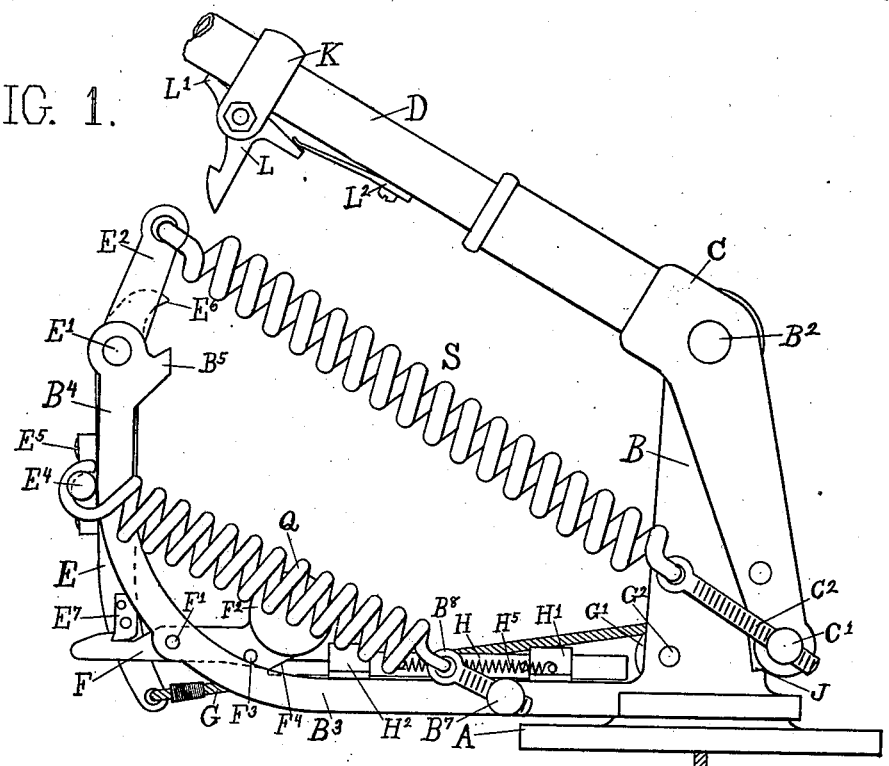

FIG. 2.

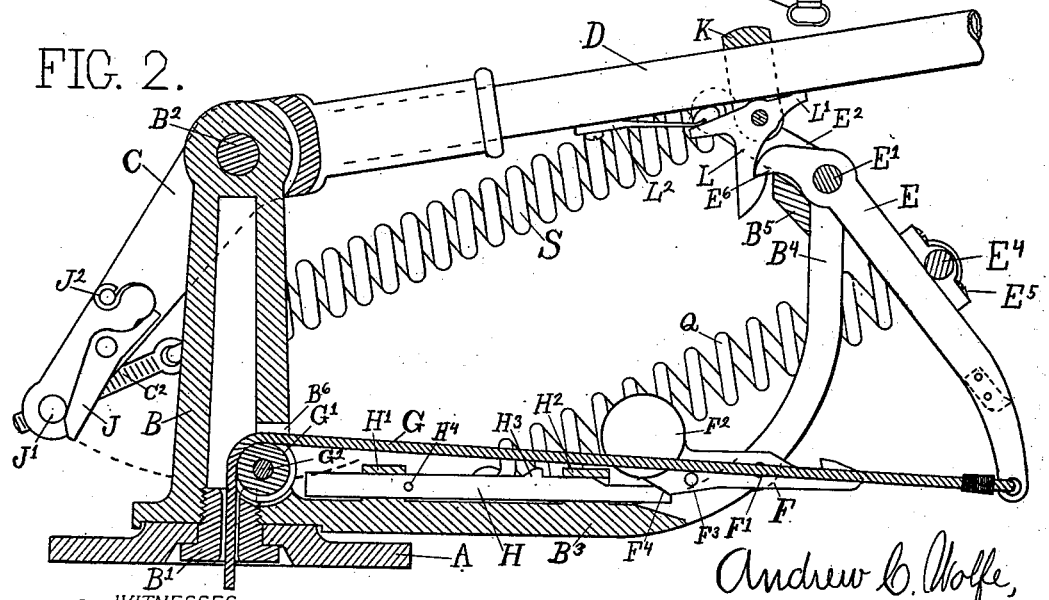

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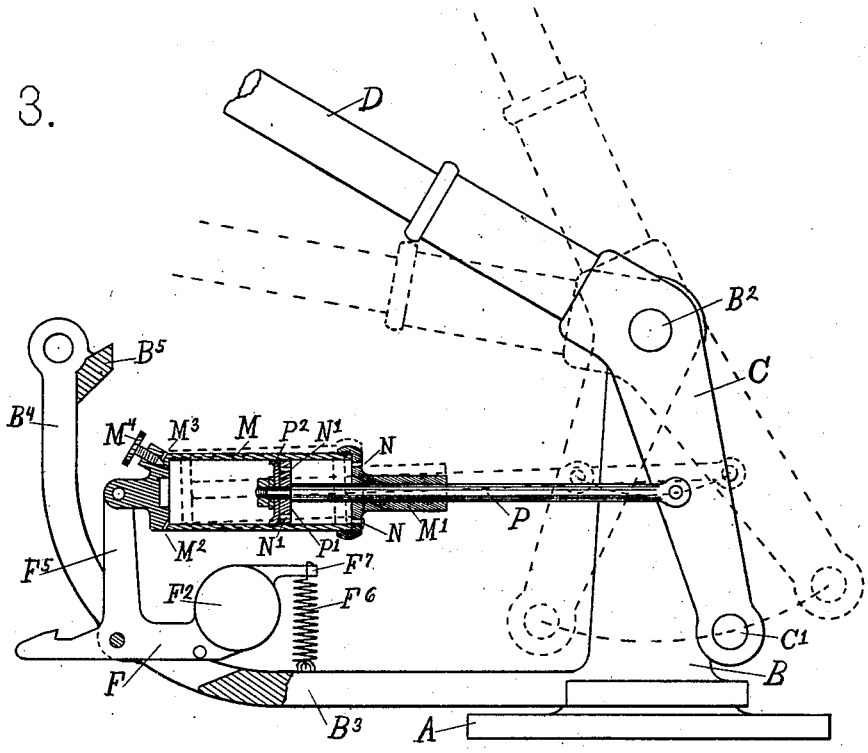
FIG. 3.



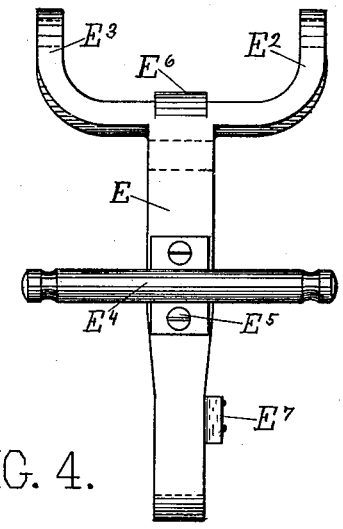


FIG. 4.

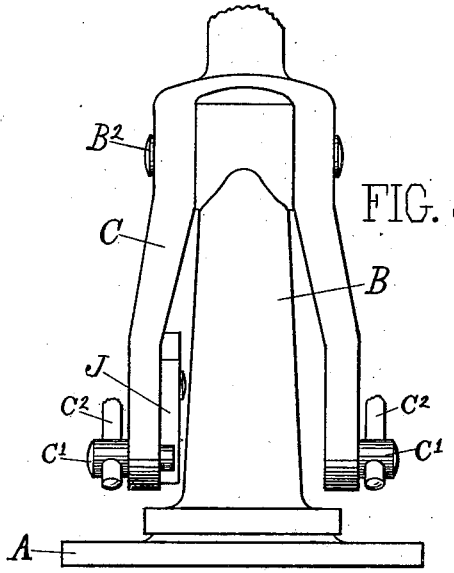


FIG. 5.

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UNITED STATES PATENT OFFICE.

ANDREW C. WOLFE, OF DENVER, COLORADO, ASSIGNOR OF TWO-THIRDS TO CHARLES K. WOLFE AND FRANK DILLINGHAM, OF SAME PLACE, AND JOSEPH F. HEWITT, OF ALLEGHENY, PENNSYLVANIA.

SAFETY TROLLEY-BASE.

SPECIFICATION forming part of Letters Patent No. 676,378, dated June 11, 1901.

Application filed January 22, 1901. Serial No. 44,328. (No model.)

To all whom it may concern:

Be it known that I, ANDREW C. WOLFE, a citizen of the United States, residing at No. 1415 Sixteenth avenue, in the city of Denver, county of Arapahoe, and State of Colorado, have invented a new and useful Safety Trolley-Base, of which the following is a specification.

This invention relates to safety trolley-bases of that class in which the accidental leaving of the wire by the trolley-pole causes the lowering of the pole to avoid injury to the cross-wires and to the trolley-pole.

The principal objects of the invention are, first, to provide a trolley-base in which the sustaining-springs are counterbalanced by opposing springs when released to aid in replacing the sustaining-springs and to cushion the descent of the pole; second, to provide a releasing trolley-base having a latch to retain the pole in a lowered position; third, to provide a releasing trolley-base having an automatically-adjustable connection from the pole to the releasing-catch, which shall be operative to release the sustaining-springs while the pole is in a high, low, or intermediate position, and, fourth, to provide a trolley-base having a releasing means embodying an air-cylinder, whereby the quick upward movement of the pole will cause the release of the sustaining-springs, while the slow upward movement of the pole will not cause such release.

The above objects are attained by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the trolley-base with the upper part of the trolley-pole broken away. Fig. 2 is an opposite side elevation, partly in section, and showing the trolley-base in a released position. Fig. 3 is a side elevation, partly in section, showing a modified form of the releasing means from that shown in Figs. 1 and 2. Fig. 4 is a rear elevation of the equalizing-lever as seen from the left in Fig. 1, and Fig. 5 is a front elevation of the swivel and fork as seen from the right in Fig. 1. In Fig. 3 only such parts are shown as are necessary to illustrate the releasing means.

In this improved trolley-base, A represents a base-plate which is to be secured to the top of the car in any desirable manner, as by bolts passing through the same, and upon this base-plate is pivoted the swivel-post B by means of the stud B′. Pivoted to the top of the swivel-post B is the fork C, which oscillates freely upon the pivot B^2, and secured in the upper portion of the fork C is the trolley-pole D, which is secured in the fork in any desirable manner. The swivel-post B has a rearward extension B^3, bent upward and terminating in the bifurcated portion B^4, the two side portions of which are connected together near the top by the cross-rib B^5, formed, preferably, integral therewith. In the vertical slot of this bifurcated part B^4 is placed an equalizing-lever E, which is pivoted upon the pin E′, which is preferably tight in the equalizing-lever E. The top end of lever E is forked, terminating in the arms E^2 and E^3, which have holes through them for the reception of the sustaining-springs, to be later described. Fixedly secured to the back side of the lever E is a cross-piece E^4, secured in any desirable manner, as by the screws E^5, and near the ends of this cross-piece are formed annular recesses for the reception of equalizing-springs, which will be further described later. Between the forks E^2 and E^3 is a projection terminating in the hook E^6 for engagement with a latch upon the trolley-pole to prevent the same from rebounding after release. Riveted or otherwise secured to the side of the lever E is a catch-block E^7 for engagement with a retaining-pawl F, which is pivoted upon the pin F′, inserted in the extension B^4. Through the lower extremity of lever E is a transverse hole in which is secured a rope or cord G, which passes through the vertical slot in extension B^4 at the side of the pawl F and over a pulley G′, revolubly mounted upon a pin G^2 in a slot B^6, and thence through a central hole through the stud B′, and has secured to it a suitable handle G^3 to be grasped by the attendant to return the lever E to its operative position to sustain the pole D.

The rear end of the pawl F is formed into a hook adapted to engage with the catch-block E^7, the front end of the pawl F being formed into a weight F^2, and a pin F^3, passing through the pawl, acts as a stop for the

weighted end of the pawl. Beneath the weighted part the pawl is formed with an inclined surface F^4, and engaging with the same is the inclined end of a slide H, mounted in caps H′ and H^2 for free reciprocatory movement, with a stop H^3 for its rearward movement, a stop H^4 for its forward movement, and spring H^5, which tends to retain it in its forward position. The movement to the rear of this slide H raises the weighted end of pawl F and depresses the rear end of same sufficiently to cause the hook of the pawl to disengage from the catch-block E^7, allowing the lever to swing out to the position shown in Fig. 2, its normal or operative position being as in Fig. 1, being held in such position by engagement with the pawl F.

Pivoted to the interior of one arm of the fork C is a pendant J, which is normally sustained against a stop J′ in any desirable manner, as by the spring J^2, and the position of this pendant is such that as the fork swings toward the rear when the pole D rises to a sufficient height the pendant will engage with the front end of the slide H and move the same toward the rear sufficiently to disengage the pawl F, and thereby release the lever E. As the pole continues to rise the pawl as it follows the curved dotted line shown in Fig. 2 disengages from the slide H, which is immediately retracted by the spring H^5 to its forward position, allowing the pawl to assume a position for again engaging the lever E. As the pole descends and the fork returns toward its forward position the pendant drags over the front end of the slide, the spring J^2 permitting the pendant J to recede sufficiently from the stop J′ to pass over the slide.

Pivotally secured in the lower portions of the fork C are outwardly-projecting studs C′, into which are screwed the adjustable eyebolts C^2, and into these eyebolts are hooked the sustaining-springs S, the opposite end of the said springs being hooked into the forks E^2 and E^3 of the lever E. These sustaining-springs S have sufficient tension when the lever E is in the latched position, as shown in Fig. 1, to elastically support the pole D with approximately even pressure up against the trolley-wire at any height the wire may be within the limits of movement of the pole, or from about ten degrees above the horizontal to about sixty-five degrees above the horizontal, the increased tension of the springs as the pole lowers being compensated for by the decrease in the angle at which the springs and the fork stand.

Secured in the opposite sides of the extension B^3 are studs B^7, into which are screwed the eyebolts B^8, and into these eyebolts are hooked the equalizing-springs Q, and the opposite ends of the same are hooked upon the cross-piece E^4, as before mentioned. These equalizing-springs Q are somewhat weaker than the sustaining-springs S, and consequently are overcome by the latter upon the pawl F being disengaged from the lever E, causing the lever to then assume the position shown in Fig. 2.

Pivotally secured in a clamp K, secured upon the trolley-pole D, is a latch L, which is limited in its rearward movement by a projection L′, resting against the pole, and a spring L^2 tends to sustain the latch in such position as to engage with the hook E^6 of the lever E when the lever is in the unlatched position (shown in Fig. 2) and the pole D is in its lowered position, as shown in the same view. Fig. 2 therefore represents the position of the respective parts of the trolley-base after the pole has left the wire and has raised above its working position sufficiently to force back the slide H, tipping the pawl F, releasing the lever E, which is thrown outward or to the rear by the excess of force of springs S over springs Q, in consequence of which the pole D descends and the latch L retains it in its lowered position. As the pole is allowed to descend by the force of gravity after the unlatching of lever E and is detained in its lowered position by latch L, the tension of springs S is but slightly in excess of the tension of springs Q, and therefore the lever E may easily be returned to its vertical or operative position by the attendant pulling the handle G^3 and cord G until the lever is engaged by the pawl F. At the first part of the return movement of lever E the pole D is unlatched by the tipping and rearward movement of hook E^6, thus allowing the ascent of the pole while the lever E is being returned, and this feature of unlatching the pole at the first of the said return movement allows of the easing up of the tension of springs S and causes the resistance to the return movement to be materially reduced. The cord G may be carried about suitable pulleys to the front or rear platform of the car (not shown) to be convenient for the motorman or conductor.

A substitute for or modification of the connections from the fork C to the pawl F is shown in Fig. 3, in which an air-cylinder, piston, and piston-rod are substituted for the slide H and pendant J. To suit this modification, the pawl F is provided with a vertical extension or arm F^5, and the action of the weight F^2 is preferably augmented by a spring F^6, attached to a projection F^7 and secured to a suitable hook or eye in the extension B^3. To the upper extremity of the arm F^5 is pivotally secured one end of an air-cylinder M, having a combined cap and guide M′, through which freely slides a piston-rod P, the front end of which is pivotally secured to the fork C. The piston P′ is preferably provided with a leather or other flexible washer P^2, having the edge turned toward the rear and being adapted to compress the air in the rear portion of the cylinder M and to suck in air at the front end of the cylinder M through suitable openings N through cap M′ and openings N′ through piston P′, the leather washer acting as a valve against the face of the pis-

ton. The cylinder M is provided with one or more small openings M^2 and an adjustable opening M^3, regulated by the needle-point screw M^4, and through these openings M^2 and M^3 the air may be slowly expelled as the trolley-pole slowly rises, as when it follows up an inclined wire from beneath a bridge or other overhead structure; but in case the pole D rises suddenly, as when the pole leaves the trolley-wire, the openings M^2 and M^3 do not allow the exit of the air as rapidly as corresponds to the advance of the piston P′, and the pressure resulting from this limitation of air-exit and rapid advance of piston causes the cylinder M to overcome the weight F^2 and spring F^6 and the friction of pawl F, where it engages the lever E, and the pawl is therefore tipped and the lever E released. I do not wish to confine myself to the exact construction of air-cylinder, piston, air-inlets, &c. shown, as it is evident that the desirable feature is to have an air-cylinder in which the piston may advance at a moderate rate of speed without operating the pawl F; but a rapid advance of the piston will cause the cylinder to operate the pawl, because of the limited exit of the air contained in the cylinder.

The possibility of providing a construction wherein the release of the sustaining-springs is effective from low running positions of the trolley is very desirable, as the injury is often severe where the pole leaves the wire beneath solid overhead structures, as bridges, elevated railways, &c., and yet the construction must be such as to have the release equally effective when the car passes from beneath the structure and the pole is running high.

The adjustment of the air-outlet of the cylinder M is for the purpose of adapting the device to the combined slant of trolley-wire and customary speed of the car while passing under such slant. The cross-rib B^5 acts as a stop for lever E.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining-springs; an equalizing-lever; equalizing-springs; and a retaining-pawl, for said equalizing-lever.

2. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining-springs; equalizing-springs; an equalizing-lever connecting the said equalizing and sustaining springs; a retaining-pawl, engaging with said lever; and disengaging means from said pole to said pawl.

3. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining-springs; an equalizing-lever; equalizing-springs; and a latch, in position and adapted to retain the said pole in its lowered position.

4. In a trolley-base, the combination, with a trolley-pole pivoted upon a swivel-support, of sustaining-springs; equalizing-springs; an equalizing-lever to which the said springs are attached; a pawl adapted to retain the said lever in its operative position; and connections from said pole to said pawl, embodying an air-cylinder with limited openings for the exit of air.

5. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining-springs; equalizing-springs; an equalizing-lever; a pawl engaging with said lever; air-compression disengaging means connecting said pole with said pawl; and an air-outlet in the said disengaging means, regulated by an adjusting-screw.

6. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining-springs; equalizing-springs opposing the said sustaining-springs; an equalizing-lever connecting the said sustaining and equalizing springs; a pawl engaging said lever; means for disengaging said pawl from said lever; and a cord for returning the said lever to its operative position.

7. In a trolley-base, the combination, with a pivoted trolley-pole, of sustaining and equalizing springs; an equalizing-lever; a retaining-pawl engaging with said lever; a slide in position and adapted to disengage said pawl; and a pendant upon the fork of said pole, for the operation of said slide.

8. In a trolley-base, the combination, with a pivoted trolley-pole, of an equalizing-lever; means for latching and disengaging said lever; and a latch upon the said pole, for engagement with the said lever, and released by the return of the lever.

In testimony whereof I have hereunto set my hand and affixed my seal, before two subscribing witnesses, at Denver, Colorado, this 18th day of January, A. D. 1901.

ANDREW C. WOLFE. [L. S.]

Witnesses:
ROBERT JAMES,
OLGA JACOBSON.