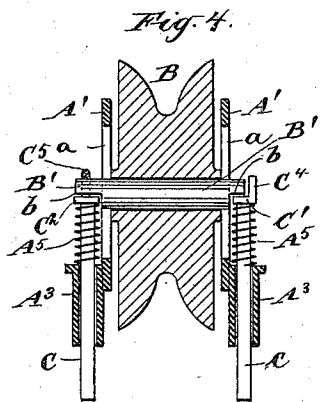
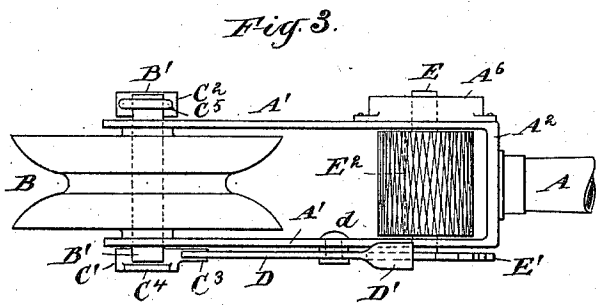
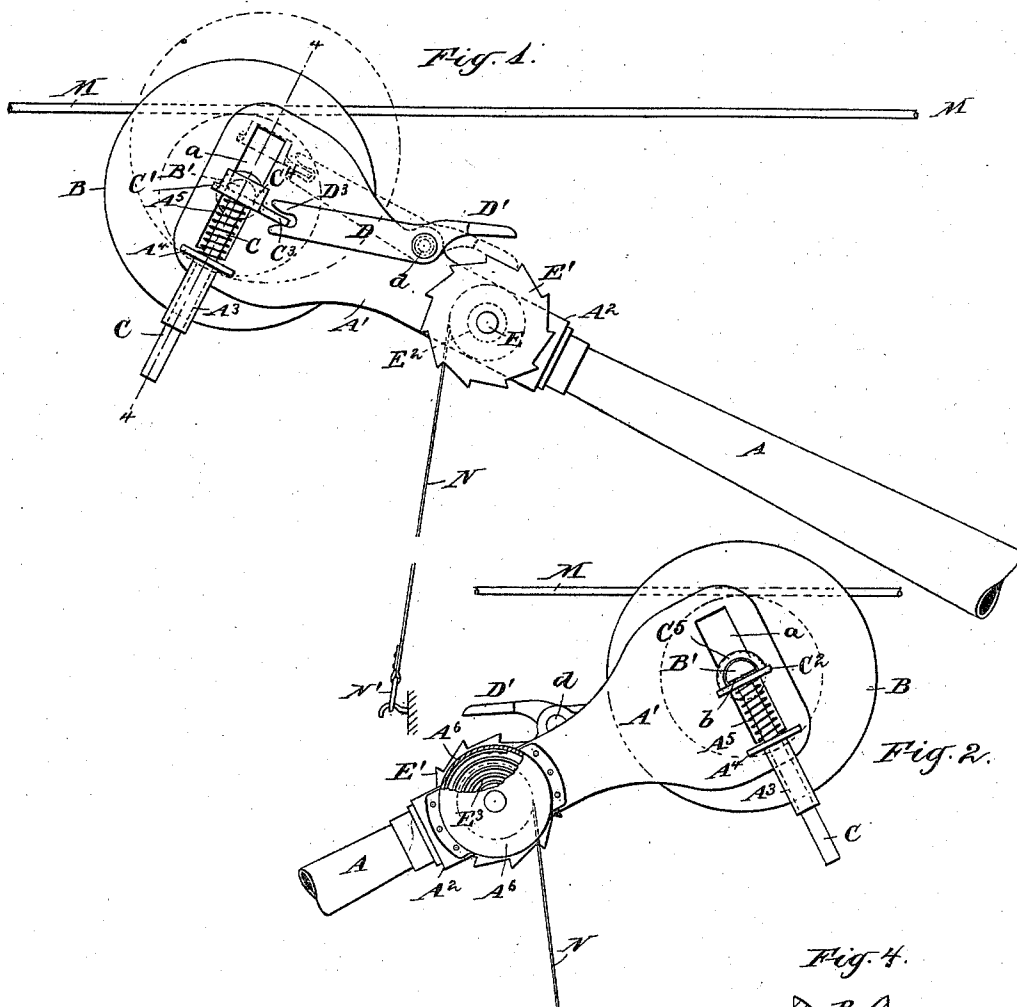


(No Model.)

L. M. HALSEY.
TROLLEY POLE CONTROLLER.

No. 577,853.

Patented Mar. 2, 1897.



Witnesses:
Wm. Connor
P. C. Collins

Inventor:
Louis M. Halsey,
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Charles R. Searle.

UNITED STATES PATENT OFFICE.

LOUIS M. HALSEY, OF BROOKLYN, NEW YORK.

TROLLEY-POLE CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 577,853, dated March 2, 1897.

Application filed July 20, 1896. Serial No. 599,852. (No model.)

To all whom it may concern:

Be it known that I, LOUIS M. HALSEY, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Trolley-Pole Controllers, of which the following is a specification.

The invention relates to means for controlling the trolley-pole so that when the wheel accidentally leaves the wire the free end of the pole shall be held down by the rope below the level of the cross-wires and other portions of the overhead structure until again released and replaced. As ordinarily equipped the free end of the pole is allowed to whip through the air, striking and tearing the overhead wires and other portions, and inflicting more or less damage until the car is stopped. Several attempts have been made in the direction to reduce this evil, but all the devices known to me have been unmechanical, unreliable, and complicated.

The object of my invention is to provide a construction which shall afford the desired protection, and which shall be simple, efficient, and easily handled and managed.

The invention consists of a trolley-wheel mounted in a yoke secured to the free end of the trolley-pole, with liberty to sink therein by compressing slight springs when pressed upward against the wire and to again rise when the pressure is reduced. The axle on which the wheel turns projects through and beyond the jaws of the yoke and is connected to a pawl pivoted on the side of the latter and adapted to engage the teeth of a ratchet-wheel fixed on one end of a shaft extending across the yoke from side to side and attached at its opposite end to one extremity of a strong volute spring, the other being secured to the fixed casing. The portion of this shaft lying within the jaws of the yoke serves as a reel upon which to wind the slack of the trolley-rope. The spring exerts merely a gentle tension upon the rope while the wheel is in contact with the wire and allows the reel to wind and pay out as the pole sinks and rises, because when thus conditioned the pawl is lifted clear of the ratchet-teeth, but so soon as the pressure holding the wheel downward is relieved, as by its accidentally leaving the wire, the wheel rises relatively to

the yoke and turns the pawl into engagement with the ratchet-teeth, immediately preventing any further rise of the trolley-pole by checking the reel and stopping any further unwinding of the rope.

The mechanism is simple, light, inexpensive, and not liable to disarrangement, and is self-contained. It is all carried at the end of the trolley-pole near the wheel, thus avoiding long connections and the attending friction in transmitting the motion.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side view of a trolley-wheel, yoke, and a portion of the pole constructed in accordance with my invention. Fig. 2 is a corresponding view of the opposite side. Fig. 3 is a plan view, and Fig. 4 is a cross-section on the line 4 4 in Fig. 1.

Similar letters of reference indicate the same parts in all the figures.

A is the trolley-pole, of any ordinary or approved construction, swiveled, as usual, to the top of the car (not shown) and equipped with one or more stiff springs arranged at the junction with the car to hold the free end of the pole strongly upward, as usual.

A' A' are long jaws or cheeks of a yoke connected together and to the end of the pole A by a cross-piece A² and having a nearly perpendicularly-arranged transverse slot *a* formed in each, in which travels the shaft B' of the trolley-wheel B. The latter is loose on the shaft and may be patterned in all respects like the wheels commonly used. The mid-length of the shaft B' is cylindrical to afford a bearing for the wheel, and the ends are cut away nearly to the center to form shoulders *b*, having plane under faces matching to and lying upon the platforms or flanges C' C², each secured to the upper end of a rod C, lying outside each jaw A', parallel with the face of the latter and in line with the slot therein. The rods C are guided in tubular extensions A³ A³, projecting downward from brackets A⁴, riveted or otherwise secured to the jaws below the slots *a*, and are supported each by a light helical thrusting-spring A⁵, interposed between the bracket A⁴ and the flange C' C². Each is independent of the other, so that either

may sink and rise to accommodate the angular displacement of the shaft when required, as in following sharp curves or other conditions.

5 The springs A^5 are so set relatively to the stiff springs at the lower end of the trolley-pole as to normally carry the shaft B' at about the mid-height of the slots a when the wheel is held in contact upon the under face of the
10 wire M and allow a considerable range of up-and-down motion without contacting with the slot ends in either direction.

The head or flange C' shown in Fig. 1 differs from its mate C^2 in that it has a projecting lip or tongue C^3 , extending in the same
15 plane toward the lower end of the yoke and engaged by a fork D^3 on the long end of a vertically-swinging pawl or lever D , pivoted to the jaw A' at the point d . The opposite
20 end D' is partly bent or folded over at a right angle, as shown, to present its edge in position to engage the teeth on a ratchet-wheel E' .

The rising and sinking motions of the wheel B and its shaft B' are thus enabled to act directly upon the pawl D to engage or release
25 the ratchet-wheel and dispense with all intermediate mechanism, more or less complicated, in transferring the motion.

E is a transverse shaft parallel with the
30 shaft B' , turning in bearings in the jaws A' near their junction with the cross-piece A^2 . On one overhung end is secured the ratchet-wheel E' , already described. The middle portion between the jaws serves as a drum or
35 reel E^2 for the trolley-rope N .

Although I have referred to this connection as a "rope," I have shown and prefer to use a ribbon of flat webbing having the requisite
40 strength, for the reason that it will pack closer and run freer on and off the reel and is therefore less liable to kink and become entangled.

The opposite end of the shaft E extends through the jaw A' on that side into the casing A^6 , containing a volute spring E^3 , attached
45 at one end to the shaft and at the other to the casing and conditioned to exert its force to turn the shaft E in the direction to wind the rope upon the reel, and thus take up all slack
50 between the latter and the ring N' on the rope normally attached to a hook upon the dashboard or other convenient point on the car. (Not shown.)

The shaft E is held against displacement
55 endwise by inserting one end, when assembling the parts, within the loop or staple C^5 on the head C^2 and then forcing the opposite end down within the upturned lip C^4 on the outer edge of the head C' . This securing
60 means allows considerable play between the several parts in accommodating themselves to the varying conditions, while holding them reliably.

The operation of the device will be readily
65 understood, but may be briefly described. Assuming that the trolley-wheel is engaged under the wire M and is depressed by the ac-

tion of the strong springs upon the roof of the car into the position shown by the strong lines in Figs. 1 and 2, the pawl D is lifted and
70 the shaft E and its reel E^2 are free to revolve in either direction to pay out more rope in opposition to the volute spring E^3 or to take in the slack by winding it upon the reel when the pull ceases, and under all conditions to
75 keep the rope taut. The yielding of the springs A^5 softens the effect of the usual up-and-down or "seesaw" motions of the car and prevents the trolley-wheel leaving the wire by reason of such. If on account of an unusual
80 rising or sinking motion or other cause the trolley-wheel is unable to continue its hold on the wire, the springs A^5 immediately assert themselves and raise the shaft B' in the slots a , depressing the free end of the pawl D
85 into engagement with the teeth on the ratchet-wheel, checking the revolution of the reel, and thereby preventing the unwinding of the rope, and consequently any further rise of the pole. As soon as the forward motion of
90 the car is checked the conductor finds the rope N taut, and, grasping it, again applies the wheel to the wire in the usual manner. If the trolley-pole has been caught by the quick action of the mechanism with its wheel
95 below the level of the wire, it will become necessary to release the fastening N' from its engagement with the car-platform in order to get sufficient length of rope to reach to the wire. He then replaces the wheel as before,
100 and thus releases the wheel and unwinds as much rope as is required to enable him to again attach the fastening to the car.

By mounting the reel and its controlling mechanism in close proximity to the trolley-
105 wheel I am able to make the connection between the shaft of the latter and the ratchet very direct and positive in its action. The mechanism itself is light and adds but little to the weight at the end of the pole. It is
110 simple in construction and performs the service required efficiently.

Modifications may be made in the forms and proportions within wide limits.

The connection of the pawl to the head C'
115 may be varied and other means of holding the shaft B' against displacement may be employed.

I claim—

1. The trolley-pole and jaws thereon, and
120 a trolley-wheel mounted between the jaws with liberty to rise and sink therein, in combination with a spring-actuated reel carried by said jaws and near said wheel, a ratchet-wheel on the reel-shaft, a pawl pivoted on
125 one of said jaws with one end connected to the wheel-support and the other adapted to engage or release said ratchet-wheel as the trolley-wheel sinks or rises, and a trolley-rope attached at one end to the car and at the
130 other to said reel, all arranged to serve substantially as herein specified.

2. The trolley-pole A having the jaws A' and slots a therein, the trolley-wheel B and

its shaft B' mounted between said jaws with its shaft extending through the slots, in combination with the rods C and heads C', C², the supporting-spring A⁵ for each, the shaft E, spring E³ and ratchet-wheel E', the pawl D mounted on one of said jaws and connected to the head C' to be moved by the rising and sinking of the latter to release and engage said ratchet-wheel, and the rope attached at one end to the car and at the other to said reel-shaft, all substantially as herein specified.

3. The trolley-pole A having jaws A' and slots *a* therein, the trolley-wheel B and its shaft B' mounted between said jaws with its shaft extending through said slots, in combination with the rods C and heads C', C², guides A³, and a supporting-spring for each head, the reel-shaft E mounted in said jaws, the actuating-spring E³ and ratchet-wheel E', the pawl D pivoted on one of said jaws, the fork D³

and lip C³ engaged thereby and operated by the rising and sinking movements of the head to engage and release the said ratchet-wheel, and the trolley-rope N attached at one end to the car and at the other to said reel-shaft, all substantially as herein specified.

4. The trolley-pole A, jaws A' and trolley-wheel B therein, in combination with the shaft B' having the shoulders *b*, the rods C and heads C', and C² matching to the said shoulders the loop C⁵ on one of said heads and the lip C⁴ on the other, and a supporting-spring A⁵ for each, all arranged to serve substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

LOUIS M. HALSEY.

Witnesses:

ROBT. CONNOR,

ALEXANDER C. CONNOR.