JAMES V. AINSWORTH, OF LOS ANGELES, CALIFORNIA.

TROLLEY CATCHER AND REPLACER.


Application filed January 22, 1903. Serial No. 140,175. (No model.)

To all whom it may concern:

Be it known that I, JAMES V. AINSWORTH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented and discovered a new and useful Improvement in Trolley Catchers and Replacers; and I do hereby 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.

This invention relates to improvements in an attachment for trolley-wheels, which quickly catches the trolley-wire when displaced from the wheel and replaces the wire thereupon; and the objects of my improvement are, first, to provide a movable forked rod for retaining the trolley-wire when displaced from the trolley-wheel until replaced upon the trolley-wheel; second, to construct an automatically-operating replacing device by means of which the trolley-wire is restored upon the trolley-wheel whenever accidentally removed therefrom; third, to improvise an automatic air-compressing device carried upon the car for replacing disengaged trolley-wheels on the trolley-wire; fourth, to devise means whereby delay to passengers on the car is avoided, and, fifth, to produce a device which will avoid the necessity of stopping the car in order to replace upon the trolley-wheel the trolley-wire dislodged therefrom. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Fig. 1 is a view in elevation of my improved attachment for trolley-wheels, showing the trolley wheel and wire in place thereon, the cylinder and its attached arm for the trolley-wheel, and the socket for the trolley-pole, with a portion of the trolley-pole and air-tube broken away. Fig. 2 is a vertical section of the cylinder, showing the piston head, rod, and branching arms connected to the piston-rod in elevation, operating rods and levers also in elevation for actuating the piston head, rod, and arms connected to the rod, and the wire coil for depressing the piston shown partly in section. Fig. 3 is a similar view, in elevation, to that shown upon Fig. 1 of the drawings, with the trolley-wire displaced from the groove in the trolley-wheel.

Fig. 4 is a like view to that shown upon Fig. 2, with the trolley-wire displaced from the trolley-wheel and caught by the branching arms carried by the piston-rod, the said wire shown below the level of the top of the trolley-wheel. Fig. 5 is a sectional view of the cylinder and some of the parts therein, the piston head, rod, and branching arms shown in elevation, with the trolley-wire located within the cylinder and devices connected therewith in elevation, other parts thereof broken away, a portion of the top of the car in elevation and parts thereof broken away, and the trolley-stand shown in section. Fig. 7 is a view in elevation of the top of the car, the air-pipes partly shown in elevation and partly by dotted lines, the trolley-stand, trolley-pole, trolley-wheel and its attachment, and a portion of the trolley-wire also illustrated in elevation, and a portion of the air-pipes shown depending from the two ends of the car broken away; and Fig. 8 is a sectional view, on an enlarged scale, illustrating the connection of the air-pipes secured to the car and the air-pipe connections leading to the air-cylinder and the trolley-pole broken away.

Similar reference-numerals refer to like parts throughout the several views.

The reference-numeral 1 refers to the trolley-wheel; 2, to the trolley-pole; 3, to the air-cylinder; 4, to the arm of the trolley-wheel, preferably cast, otherwise made a part of the air-cylinder 3. The trolley-pole socket 5, like the said arm 4, is in like manner preferably made integral with the air-cylinder 3. The arm 4 is forked at its outer end, and the trolley-wheel is made to revolve within the fork upon the pin 7. 8 is the piston-head, having thereon a packing of leather or other suitable material. 9 is the piston-rod, which is longer than the cylinder 3 and carries upon its upper end, extending above the cover of the cylinder, a body portion 10, having two upwardly-extending radiating arms 11, inclined and converging toward the body portion 10, and upon the upper and inner face of each of the said arms are racks 12 12,
which serve to catch the trolley-wire as soon as the wire becomes dislodged from the groove of the trolley-wheel and securely hold the trolley-wire within the said two arms 11 11 until the piston-head 8 and rod 9, carrying the said arms 11 11, are elevated, carrying with it the trolley-wire, as shown upon Fig. 5 of the drawings. These arms 11 11 are provided upon the upper extremities thereof with beat-like projections 13 13 and racks 12 12, connected to the inner face of said arms, which extend from the beat-like projections to the converging ends of the arms 11 11, between which the roller 61 is located, on which the trolley-wire 31 slides when the piston-rod has ascended, carrying with it the said wire, as shown in Fig. 5 of drawings. A key 60 upon the cover 22 works in the way 51 in the piston-rod 9 and keeps the arms 11 11 at right angles to the wire 31.

In the bottom of the air-cylinder 3 are located two valves 14 and 15. The compressed-air valve 14 permits the compressed air to enter the cylinder 3 from a compressed-air tank or tanks (not shown) located in the two ends of the car to pass upward therethrough upon the top of the car 60 through the ball connection 33, thence upward through the flexible pipe 34 into the pipe 35, which follows the trolley-pole 2, to or near the upper and swinging end thereof.

The stop-cock or valve 15 permits the compressed air to escape from the cylinder 3 under piston-head 8, and when this valve is open the piston-head, rod, and upwardly-slanting arms 11 descend, as shown upon Figs. 2 and 4 of the drawings, thereby permitting the dislodged trolley-wire 31 to descend upon the trolley-wheel within the groove shown therein.

To the free end of the crank 17 the link 19 is pivoted, and to the opposite end thereof the horizontal lever 21, fulcrumed upon a pin 39 in the side of the cylinder 3, is also pivoted. The opposite end of the lever 21 rests between two collars 23, secured upon the vertical rod 18, which passes through a keeper 26, secured to the side of the air-cylinder 3.

The free end of the valve-crank 16 is pivoted to the vertical rod 18, which extends upward from below the bottom of the cylinder 3 a short distance above the cover 22 of said cylinder and is pivoted to the outer end of the cover-lever 20, fulcrumed to a support upon cover of the cylinder 29 by means of a post 37.

The cover-lever 20 extends inwardly and centrally from the support 37 until it is about in contact with the piston-rod 9, which reciprocates within the cylinder 3, carrying upon one end the piston-head and upon its opposite the branching arms 11 11.

The elevation of the piston-head 8 in the cylinder 3 and the piston-rod with its branching arms 11 11 above the top of the trolley-wheel 1 places the trolley-wire 31 within the groove of the trolley-wheel. When the piston-head 8 ascends against the tension of the spring 41 by means of the compressed air entering the bottom of the cylinder 3 through the air-valve 14, its upper surface comes in contact with the lower end of the rod 24, which reciprocates through the cover 22 of the cylinder, forces the said rod 24 against the action of the trolley-wire 31, and also moves the free end of the cover-lever 20 to a horizontal position. (Shown upon Figs. 2 and 3 of the drawings.) This closes the valve 14 by moving the vertical rod 18 down, and thus cuts off the compressed air from the pipe 32. This downward movement of the vertical rod 18 carries with it the free end of the lever 21, retained between the two collars thereon, 23 23, and by means of the link 19 and crank 17 opens the valve 15 and permits the compressed air within the cylinder to escape. The spring 70 acts as a buffer, preventing the entire descent of the piston-head 8.

The operation of this invention will be readily understood from the foregoing description, taken in connection with the drawings appended hereto.

It is obvious that many variations and changes in the details of construction and arrangement of my invention would readily suggest themselves to persons skilled in the art and still be within the spirit and scope of my invention.

I do not desire to confine this invention to the specific construction, combination, and arrangement of parts herein shown and described, and the right is reserved to make all changes in and modifications of the same as come within the spirit of this invention; but I do desire to secure as my invention all features of construction and equivalents thereof that come within the scope of my improvement as herein shown and described, and illustrated upon the drawings appended hereto.

Having described my invention, what I claim, and desire to secure by Letters Patent, is:

1. An attachment for trolley-wheels, a cylinder, a piston-head and piston-rod adapted to reciprocate within the cylinder, said rod extended above the cover of the cylinder, arms extending outwardly secured to the piston-rod, devices for reciprocating the piston-head, rod, arms carried upon the end of the piston-rod and moving therewith, whereby the trolley-wire caught and retained by said arms is held in a plane above or below the normal position of the wire.

2. An attachment for trolley-wheels, a cylinder, a piston-head and rod adapted to work vertically within the cylinder, said rod projecting through and above the cover of the cylinder, upwardly and outwardly slanting arms secured to the free projecting end of the piston-rod, the extremity of each of said arms provided with a hook or hook for catching and retaining the trolley-wire when displaced from the wheel and means for reciprocating. 789,682
said piston head, rod, and arms, and holding the trolley-wire for a limited space of time below the normal plane of elevation of the trolley-wire.

3. An attachment for trolleys, a wheel, a cylinder having an arm carrying said wheel and a pole-socket made integral with said cylinder, a trolley-pole connected within said socket at one end, and with a car at the opposite end, a piston head and rod adapted to reciprocate within said cylinder, said rod provided at the end thereof projecting through and above the cover of the cylinder with upwardly-extended and radiating arms having a rack upon the inner faces thereof for catching and holding the trolley-wire when dislodged from the trolley-wheel, devices for reciprocating the piston head, rod and arms carried thereon, and for holding the trolley-wire above the normal position above the trolley-wheel.

4. An attachment for trolleys, a wheel having a groove upon the periphery thereof, a cylinder provided with a forked arm, said wheel journaled in the outer end thereof, a pole-socket made a part of said cylinder, a trolley-pole fastened at one end within the socket and pivotally connected at the opposite end thereof to the top of a car, a piston head and rod adapted to move vertically and centrally relative to said cylinder, said rod carrying radiating arms and an antifriction device at the junction of said arms and the piston-rod and means for elevating said piston-rod and arms upon the upper end thereof, whereby the trolley-wire when displaced from the groove in the trolley-wheel is carried upon said antifriction device between the converging ends of said arms and elevated above the normal height of the trolley-wire and above the trolley-wheel.

5. A cylinder, a piston head and rod reciprocating therein, a trolley-wheel, means for connecting said parts, upwardly-extending radiating arms secured to the free projecting end of said rod, a roller journaled between the converging ends of said arms, mechanism for elevating said piston head, rod and arms within and above the cylinder, devices upon said arms for conducting the trolley-wire when displaced from the trolley-wheel to and upon said roller and retaining said wire until replaced upon the trolley-wheel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES V. AINSWORTH.

Witnesses:

G. M. GIFFEN,
J. E. CROFT.