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J. F. MACKIN.

TROLLEY POLE CONTROLLER.

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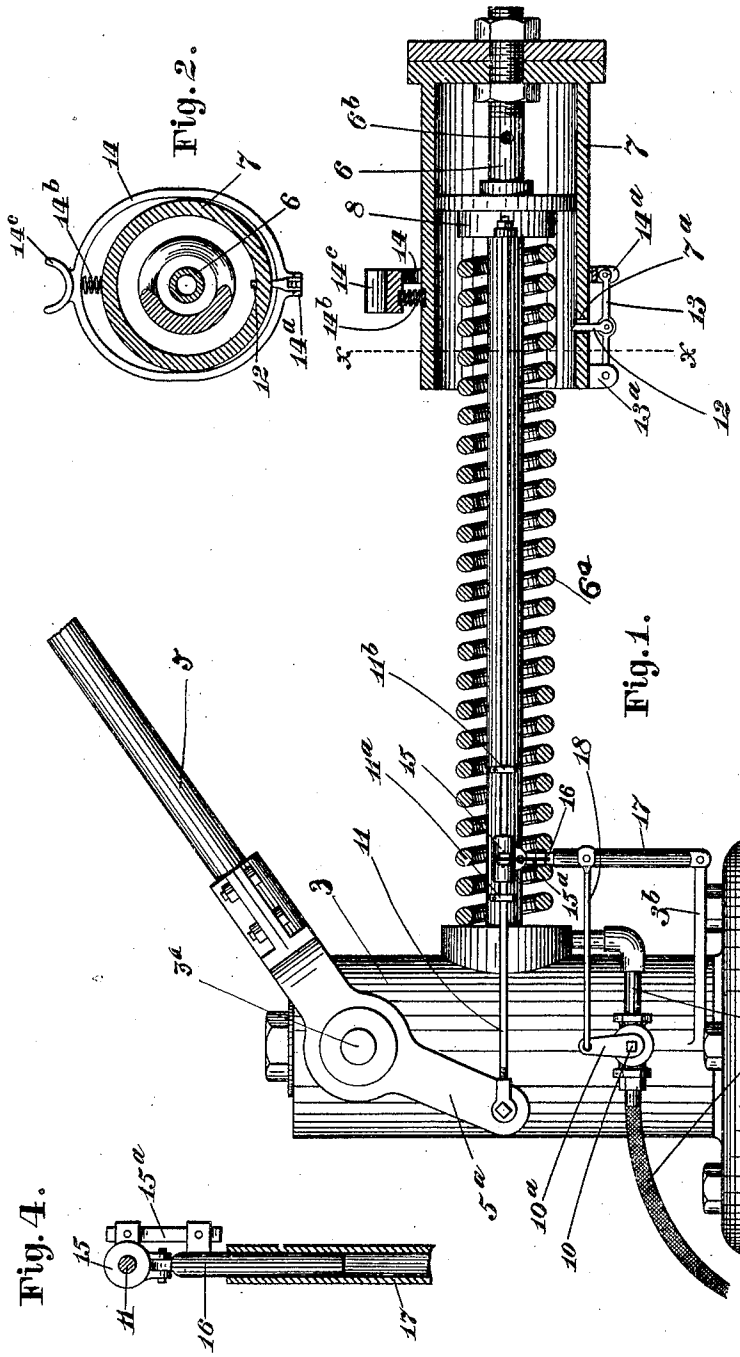


Fig. 1.



Fig. 2.

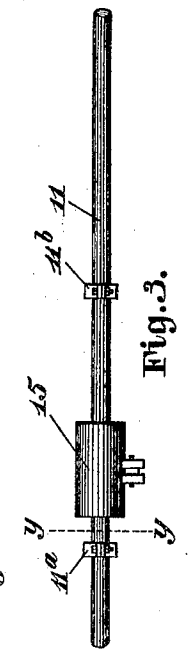


Fig. 3.



Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH F. MACKIN, OF COLUMBUS, OHIO.

## TROLLEY-POLE CONTROLLER.

No. 820,584. Specification of Letters Patent. Patented May 15, 1906.

Application filed August 21, 1905. Serial No. 275,110.

*To all whom it may concern:*

Be it known that I, JOSEPH F. MACKIN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Trolley-Pole Controllers; 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.

The object of this invention is to provide means for automatically and pneumatically depressing or "retrieving" the trolley, after it has run off the conducting-wire, to a point below the plane of the conducting-wire, so that by subsequent manipulation it may be restored to the wire.

Pneumatically-operated trolley-retrievers have been proposed before.

My invention therefore consists in the improved construction hereinafter described and claimed, one embodiment of the invention being shown in the accompanying drawings.

In said drawings, Figure 1 is a side elevation with parts in section. Fig. 2 is a cross-sectional view on the plane *x x*, Fig. 1. Fig. 3 is a side view, on a larger scale, illustrating in detail the friction device or grip for operating the valve for controlling the admission of compressed air to the cylinder for depressing the pole. Fig. 4 is a sectional detail of the same looking principally from the plane *y y*, Fig. 3.

In the views, 2 designates a platform that is to be suitably secured to the roof of the car.

3 is a turn-post secured on the platform to turn thereon. The turn-post has a stud $3^a$ projecting from each of the opposite sides thereof and on which is mounted the trolley-pole 5, to swing in a vertical plane. The trolley-wheel (which it is deemed unnecessary to show) is to be journaled at the upper end of the pole, as usual. Secured horizontally to the turn-post is a tube 6, having mounted on its outer end a cylinder 7, which contains a piston 8. On the tube 6, between the piston 8 and the turn-post, is a coiled spring $6^a$, abutting at one end against the turn-post and at the other end against the piston. Connecting the piston 8 and short arms $5^a$, constituting downward extensions of the pole 5, are rods 11. Normally the spring $6^a$ tends to throw the upper end of the pole upward by pressure on the exposed side of the piston, which is movable on the tube 6, and thus to keep the trolley in contact with the overhead conducting-wire. Compressed air is supplied to the outer end of the cylinder from a suitable reservoir (not shown, but to be carried with the car) through a pipe 9, connected with the tube 6, which latter is provided with a port $6^b$ to admit air into the cylinder. A portion of the pipe 9 is made flexible, so that the trolley can be reversed when the car is to travel in the opposite direction. The pipe 9 is furnished with a valve at 10 having an arm $10^a$. When the valve 10 stands in the position seen in Fig. 1, communication between the compressed-air reservoir and the cylinder is cut off, and when the valve is turned out of this position, as hereinafter described, by the running of the trolley off the conducting-wire, the valve is opened and compressed air admitted to the cylinder beyond the piston. The under side of the wall of the cylinder is furnished with a port $7^a$, located at a point to which the piston will be moved by compressed air, preferably slightly before the pole is completely depressed.

12 designates a latch that works in the port $7^a$, said latch having a beveled upper end to permit the piston to pass thereover when moved to depress the pole. The latch 12 is supported on a lever 13, hung at one end in ears $13^a$ and at its other end in ears $14^a$ at the lower side of an elongated ring 14, that encircles the cylinder. Between the cylinder and the under side of the upper portion of the elongated ring 14 is a spring $14^b$, adapted to press said ring upward and hold the latch 12 with its upper beveled end projecting into the cylinder. By pressing the ring 14 downward the upper end of the latch can be withdrawn from the cylinder. The elongated ring 14 is provided at its upper side with a crotch $14^c$, into which the trolley-pole 5 can be drawn to depress the ring 14.

On the rod 11 slides a sleeve 15. This sleeve 15 is hinged to the upper end of a pin 16, that slides in a tubular post 17, hinged at its lower end to a projection $3^b$ on the turn-

post 3. The sleeve 15 is held yieldingly in a horizontal position by means of a spring $15^a$, fastened to ears on the pin 16 and on the sleeve 15. The rod 11 is furnished with stops $11^a$ and $11^b$ on opposite sides of the sleeve 15 and in position to strike the sleeve 15 at the proper predetermined times. The tubular post 17 and the arm $10^a$ of the valve 10 are connected by means of a rod 18.

Because the short arm $5^a$ swings through an arc and because the rod 11 is rigidly secured to the piston 8 said rod is slightly flexed, and when suddenly flexed, as when the trolley runs off the conducting-wire, the sleeve 15 will be bound or clutched to the rod and the valve's arm $10^a$ thrown to open the pipe 9, thus admitting pressure through the port $6^b$ into the cylinder 7. This pressure forces the piston 8 against this spring and depresses the trolley-pole, through the rods 11, until the piston passes over the latch 12, which latch catches the piston and holds it. In this pole-depressing movement the stop $11^b$ on the rod 11 strikes the sleeve 15 and cuts off the compressed air at the proper time. The pressure in the cylinder 7 is exhausted through the port $7^a$ when the piston 8 passes over the latch 12. As before indicated, I prefer to arrange the parts so that the trolley-pole will be depressed to within a short distance of the crotch $14^c$, so that by a slight pulling down with the usual rope that is attached to the trolley-pole that member may be drawn into the crotch $14^c$ for the purpose of depressing the ring 14 and withdrawing the latch 12, thereby permitting the pole to be restored by the action of the spring $6^a$ to the conducting-wire. When the motion of the pole, and therefore of the rod 11, is slow, as in depressing the pole and in restoring the pole to the wire after the release of the piston, the rod 11 does not bind in the sleeve 15, and hence the rod 11 moves without engaging said sleeve.

What I claim, and desire to secure by Letters Patent, is—

1. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder surrounding the outer end of said tube, a piston in the cylinder on the tube, means connecting the piston and pole, a spring acting on the piston tending to raise the pole and means for admitting fluid-pressure to the cylinder through the tube to depress the pole.

2. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole and means for admitting fluid-pressure to the cylinder operative by the means connecting the piston and pole.

3. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole, means for admitting fluid-pressure to the cylinder through the tube operative by the means for connecting the piston and pole to depress the pole and an exhaust for limiting the pole-depressing action of the piston.

4. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole, means for admitting fluid-pressure through the tube to the cylinder to depress the pole, an exhaust for limiting the pole-depressing action of the piston and a latch for holding the piston when it reaches the limit of its pole-depressing action.

5. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole, means for admitting fluid-pressure through the tube to the cylinder to depress the pole, an exhaust for limiting the pole-depressing action of the piston, a latch for holding the piston when it reaches the limit of its pole-depressing action adapted to be operated by manipulating the pole.

6. In a trolley-retriever, the combination of the trolley-pole, a turn-post on which the same is mounted, a stand for the turn-post, a tube extending from the turn-post, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole and means for admitting fluid-pressure to the cylinder through the tube to depress the pole.

7. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, a flexible rod connecting the piston and pole, a spring acting on the piston tending to raise the pole, means for admitting fluid-pressure to the cylinder through the tube to depress the pole, a

valve for controlling the fluid-pressure, a friction-sleeve on said flexible rod, and means connecting said valve and friction-sleeve.

8. In a trolley-retriever, the combination with the trolley-pole and stand therefor, of a tube supported near the base of the pole, a cylinder supported near the outer end of said tube, a piston in the cylinder, means connecting the piston and pole, a spring acting on the piston tending to raise the pole, means for admitting fluid-pressure through the tube to the cylinder to depress the pole, and a port in the cylinder for releasing the pole-depressing pressure.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH F. MACKIN.

Witnesses:
ULYSSES R. PETERS,
BENJ. FINCKEL.