J. F. HEALY.

TROLLEY CONSTRUCTION.

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1,409,173. Patented Mar. 14, 1922.

Fig. 1.

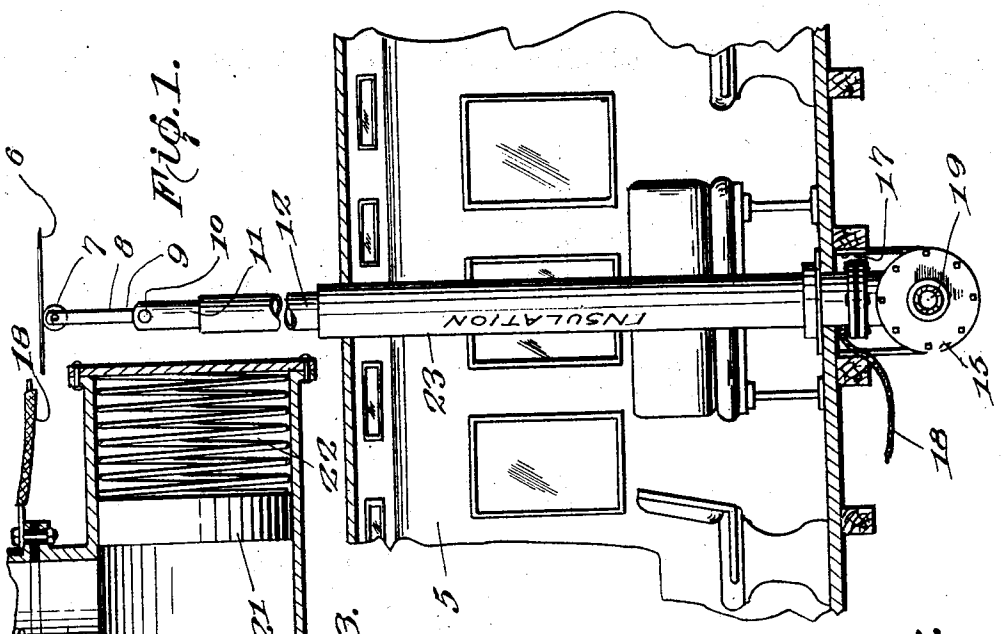


Fig. 3.

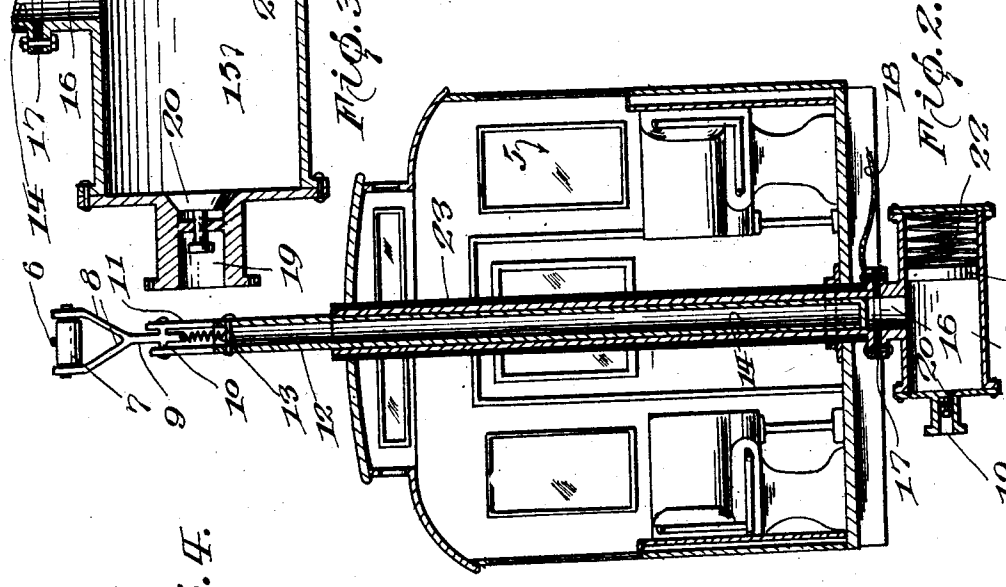
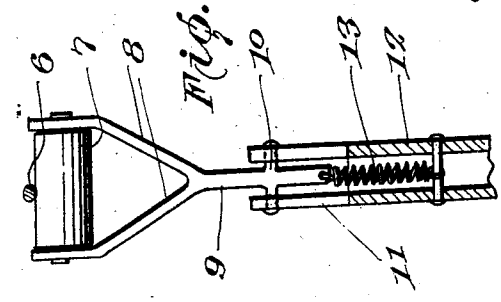


Fig. 2.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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TROLLEY CONSTRUCTION.

1,409,173. Specification of Letters Patent. Patented Mar. 14, 1922.

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To all whom it may concern:

Be it known that I, JAMES F. HEALY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Trolley Constructions, of which the following is a specification.

This invention relates to current collectors for electrically propelled railway cars, and more particularly to collectors of that type consisting of a trolley wheel running on an overhead conductor wire.

The invention has for its object to provide a novel and improved support for the trolley wheel, and fluid-pressure controlled means cooperating therewith for maintaining the proper contact between the trolley wheel and the overhead wire.

The object stated is attained by means of a combination and arrangement of parts to be hereinafter described and claimed, and in order that the same may be better understood, reference is had to the accompanying drawing forming a part of this specification.

In the drawing,

Figure 1 is an elevation of the apparatus, a fragment of the car being shown in section;

Fig. 2 is a cross-section thereof;

Fig. 3 is an enlarged longitudinal section of a fluid pressure cylinder, and Fig. 4 is an enlarged elevation of a trolley wheel support.

Referring specifically to the drawing, 5 denotes a fragment of an electrically propelled railway vehicle obtaining current from an overhead conductor wire 6 which runs parallel to the track on which the vehicle travels. The current collector is a wheel or roller 7 supported to travel beneath the wire 6 in contact therewith.

The roller 7 is journaled between the two branches 8 of a fork having a depending stem 9, which latter is provided with trunnions 10, whereby the fork is pivotally supported, the trunnions being journaled in bearings 11 at the top of a vertically positioned tube 12, said tube being open at the top to accommodate a spring 13 anchored at its lower end to a cross pin 14 carried by the tube, and connected at its upper end to the bottom of the fork stem 9. The fork carrying the roller 7 is pivoted to rock in the direction the wire 6 runs, and it is held normally in erect position by the spring 13. It will therefore be evident that the fork is free to yield to allow the roller 7 to pass crossings and other obstructions which it may encounter. The roller 7 is wide enough to remain in contact with the wire 6 at places where the latter is deflected sidewise from its normal position midway between the ends of the roller.

In order to maintain a proper contact between the roller 7 and the wire 6, the tube 12 is slidably supported, and it is constantly urged in an upward direction by a fluid pressure means which will now be described.

The tube 12 is housed in an upright tube 14 suitably supported in the car 5 at the center thereof, and passing through the floor and the roof thereof, as shown in Fig. 2. Beneath the car floor is mounted a fluid-pressure chamber or cylinder 15 which is horizontally positioned and has a side outlet 16 opening upwardly into the lower end of the tube 14. The lower end of the tube 12 is closed and is exposed to the fluid pressure in the cylinder 15 passing from the latter through the outlet 16 into the lower end of the tube 14. The tube 12 is to all intents and purposes a vertically slidable plunger, and the tube 14 is a cylinder in which said plunger works. It will therefore be evident that the pressure against the lower end of the plunger forces it upwardly to maintain a constant contact of the roller 7 with the wire 6.

The outlet 16 and the lower end of the tube 14 are flanged so that they may be conveniently bolted together, with a gasket 17 of insulating material between the flanges so as to electrically isolate the cylinder 15. This is necessary for the reason that the current collected by the roller 7 passes through the tube 14. The conductor 18 carrying the current to the controller or other apparatus on the car, is connected to the lower end of the tube 14. The insulation 17 therefore permits the cylinder 15 and the parts immediately associated therewith to be handled without danger of shocks.

The fluid-pressure employed in the operation of the apparatus may be compressed air obtained from the air-brake system of the car. The cylinder 15 is shown with an air inlet 19 provided with a check valve 20.

Off to one side of the outlet 16, the cylinder 15 contains a plunger 21 which is backed by a spring 22. This plunger is in that end of the cylinder opposite the end where the air enters and hence it is exposed on one side

to the air pressure and on the other side it is pressed by the spring 22.

The tension of the spring 22 will be such that it equals the normal air pressure required to hold the tube 12 properly elevated, and hence the plunger 21 is stationary in the cylinder 15. However, when the roller 7 reaches a low portion of the wire 6, the tube 12 is forced downwardly, whereupon the plunger 21, by the increasing air pressure in the cylinder due to the compressing action of the descending tube 12, forces the plunger 21 rearwardly against the tension of its spring 22, and this relieves the augmented pressure.

When the roller 7 is to be lowered clear of the wire 6, it is necessary only to vent the cylinder 15, whereupon the tube 12 slides downwardly by its own weight. Any suitable arrangement of release valve may be provided for this purpose.

In order to prevent the occupants of the car from being shocked by coming in contact with the electrically charged tube 14, the latter is completely housed in with some suitable non-conducting material, as shown at 23.

Due to the central position of the tube 14, one or more of the regular cross seats of the car may be removed and replaced with side seats, as shown in Figs. 1 and 2.

I claim:

1. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a collector element carried by the top of the plunger, a cylinder in which the plunger works, and means for admitting fluid pressure to the cylinder beneath the lower end of the plunger.

2. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a fork carried by the upper end of the plunger and pivotally mounted to rock in the direction of the length of the trolley, a collector element carried by the fork, a cylinder in which the plunger works, and means for admitting fluid pressure to the cylinder beneath the lower end of the plunger.

3. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a fork carried by the upper end of the plunger and pivotally mounted to rock in the direction of the length of the trolley a collector element carried by the fork, resilient means for yieldingly holding the fork in erect position, and means for admitting fluid pressure to the cylinder beneath the lower end of the plunger.

4. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a collector element carried by the top of the plunger, a cylinder in which the plunger works, a fluid pressure chamber having an outlet into the cylinder, and means for admitting fluid pressure into the chamber.

5. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a collector element carried by the top of the plunger, a cylinder in which the plunger works, a fluid pressure chamber having an outlet into the cylinder, means for admitting fluid pressure into the chamber, and means associated with the chamber for relieving excess pressure therein.

6. A current collector of the overhead trolley type, comprising a vertically positioned slidable plunger, a collector element carried by the top of the plunger, a cylinder in which the plunger works, a fluid pressure chamber having an outlet into the cylinder, means for admitting fluid pressure into the chamber, a pressure relieving plunger in the chamber exposed on one side to the pressure therein, and a spring bearing against the other side of said plunger and balancing the normal pressure in the chamber.

In testimony whereof I affix my signature.

JAMES F. HEALY.