

(No Model.)

W. H. KNIGHT.

CONTROLLER FOR ELECTRIC RAILWAY CARS.

No. 518,254.

Patented Apr. 17, 1894.

FIG. 1.

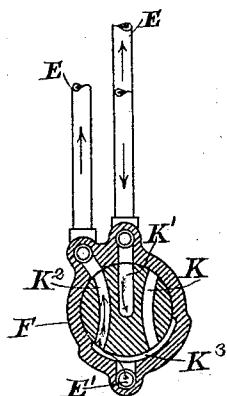
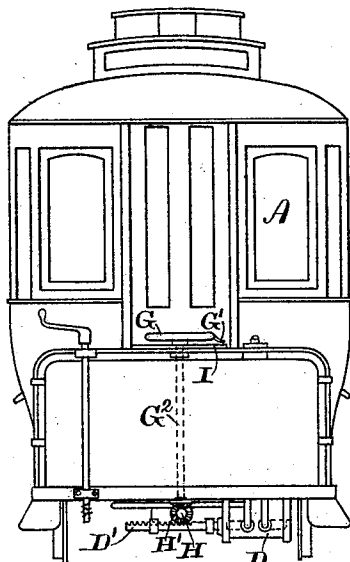
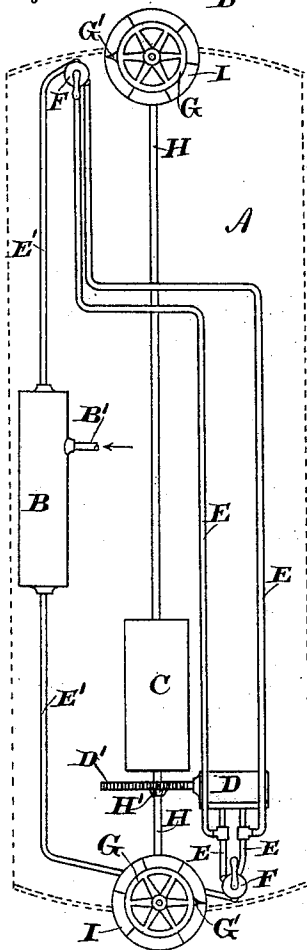


FIG. 3.

FIG. 2.



WITNESSES.

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CONTROLLER FOR ELECTRIC-RAILWAY CARS.

SPECIFICATION forming part of Letters Patent No. 518,254, dated April 17, 1894.

Application filed December 21, 1893. Serial No. 494,288. (No model.)

To all whom it may concern:

Be it known that I, WALTER H. KNIGHT, a citizen of the United States, and a resident of Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Controllers for Electric-Railway Cars, of which the following is a specification.

My invention relates to controllers for electric railway cars, and has for its object to provide a controller which may be operated by fluid pressure, as from the air-brake reservoirs now often employed upon such cars, and to combine therewith an indicator which may also be an operating handle for the controlling device; thus serving not only as an index of the position of the controller, but in case the fluid pressure mechanism be deranged by accident, being also used to operate the controller and run the car.

The accompanying drawings show an embodiment of my invention, wherein—

Figure 1 is an end elevation of a car equipped with my improved controller. Fig. 2 is a diagrammatic plan view showing the arrangement of the circulating system and the index to which I have referred. Fig. 3 is a sectional plan of a suitable controlling valve for the fluid pressure mechanism.

Referring by letter, A is the car.

B is a reservoir of fluid pressure supplied from a suitable air pump operated preferably by an electric motor, as now commonly practiced, through the pipe B'.

E, E', are pipes for fluid pressure communicating with the valves F, F', one at each end of the car, by which the action of a piston in the cylinder D is controlled.

C is a controller, preferably of cylindrical form; it is rotated by means of a rack and pinion, D', H', the rack D' being an extension of the piston rod of the cylinder D, and the pinion H' being secured upon the rod H extending from one platform to the other and fast to the controller cylinder. At each end of this rod H I provide a dial plate or index plate I, which has divisions upon it for every position of the controller, which, as is well known in the art, should work by steps and not by continuous motion. Above each dial

plate is a wheel G, like the brake wheel of an ordinary railway car, and upon the rim of the wheel an index or pointer G'. The wheel G is fast to a vertical shaft G² rotated by bevel-gears from the rod H.

Referring now to Fig. 3, a suitable valve is illustrated, comprising a casing F within which rotates a drum-valve provided with ports K, K', K². A small clearance chamber K³ is provided on the supply side of the valve; the port K' serves, as will be readily understood, as an exhaust port; in the position shown the supply of air comes from the reservoir B through the pipe E' and the clearance chamber K³, then through the port K², and the left hand pipe E to the controller, returning to the valve by the right hand pipe E and out by the exhaust port K'. Should the valve be turned to the left from its illustrated position, the abutment of the valve case between the ports K' and K² serves to close the exhaust port K' and the other ports are also closed by the valve case; a little further motion to the left reverses the action of the air, which is then supplied from the clearance chamber through the port K, the right hand pipe E, down the left hand pipe E to the exhaust port K'. This is a well known form of valve for air-brake mechanism, being similar to the so-called three-way cock of the railway locomotive engine.

The operation of the device thus described is as follows: When the handle of the air-valve is turned to one side of its normal position, the air is admitted to one side of the cylinder D, the piston in which then reciprocates and the piston-rod rack D' rotates the controller cylinder C, by which rotation both of the index wheels G are also revolved; by a movement of the valve handle in the opposite direction the action of the cylinder D is reversed, and the controller is rotated from an opposite direction, its connections being such as to change the speed of the motors either through resistance boxes or through the so-called "series-parallel" system of control. Should any accident occur, crippling the air mechanism, it is manifest that the motorman will be able to use the wheel G as a means of rotating the controller cylinder.

I have illustrated the controller cylinder at one end of the car, but it is manifest that its location as well as the location of the various parts of the apparatus herein described, is immaterial, and this may be changed and other formal changes may be made without departing from the spirit of my invention. I may also employ other forms of controller than the cylindrical one shown, although that is well adapted to the purposes of my invention.

I am aware that fluid pressure has been applied to the operation of controllers in many different ways, and I do not claim broadly such an application; I am also aware that appliances for the control of electric cars particularly by such fluid pressure have been devised and put into successful use, and I do not claim such appliances broadly, as it is understood that my invention is limited to the improvements specifically set out herein in the statement of invention and claims annexed. Therefore

What I claim, and wish to secure by Letters Patent of the United States, is—

1. An electrically propelled vehicle, a controller therefor, means adapted to actuate the controller from a source of fluid pressure carried on the car, and an indicator upon the car platform adapted to show the position of the controller, substantially as described and set out herein.

2. An electrically propelled vehicle, a source of fluid pressure thereon, a controller actuated by such fluid pressure and having a step by step movement, valves located upon the car platforms adapted to control the action of

the fluid pressure mechanism and indicators also upon the car platforms arranged and adapted as herein described, to show the position of the controller and to actuate it by hand.

3. An electrically propelled vehicle, a source of fluid pressure carried thereon, a controller actuated by such fluid pressure, a cylinder actuating a rack, a pinion meshing therewith and operating the controller, valves upon the car platforms arranged to admit and release the fluid pressure in the cylinder in either direction at will, indicators also located upon the car platforms, connected with the controller and operated thereby, such indicators being arranged to act as manual controlling devices for the controller, substantially as described.

4. An electrically propelled vehicle, a source of fluid pressure carried thereon, valves upon the car platforms communicating with such source of fluid pressure, a piston actuated by the fluid pressure and controlled by such valves, a rack and pinion operating the controller cylinder, a rod extending from the controller cylinder to both of the car platforms, and indicators actuated by such rod and upon the car platforms, such indicators adapted to serve as manual controlling devices for the controller cylinder.

In witness whereof I have hereunto set my hand this 16th day of December, 1893.

WALTER H. KNIGHT.

Witnesses:

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BENJAMIN B. HULL.