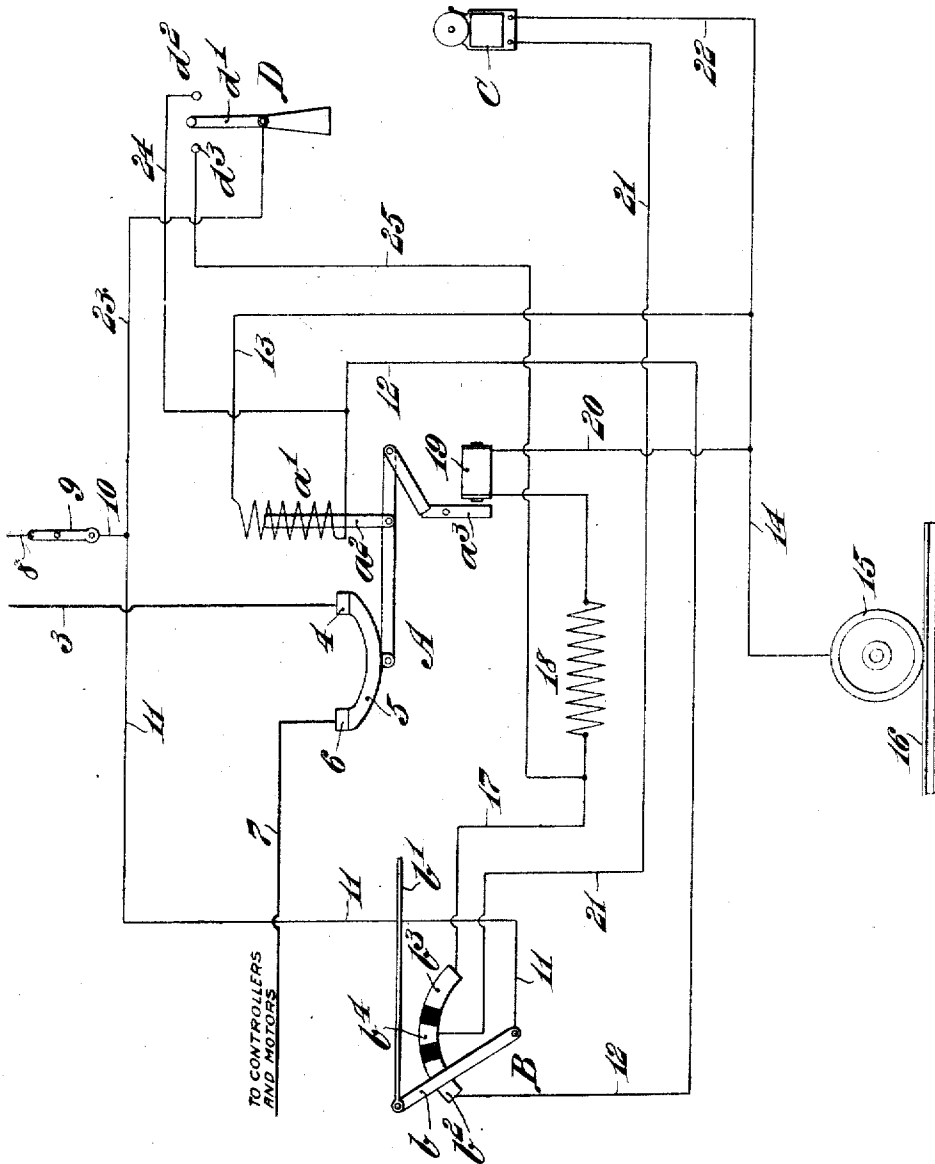


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PASSENGER ELECTRIC RAILWAY CAR.
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945,964.

Patented Jan. 11, 1910.



WITNESSES:

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PASSENGER ELECTRIC-RAILWAY CAR.

945,964.

Specification of Letters Patent. Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, FREDERICK H. LINCOLN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Passenger Electric-Railway Cars, of which the following is a specification.

10 My invention relates to safety apparatus for electric railway cars; and in such connection it has particular relation to means for preventing the starting of a car, while any of the doors remain open or unclosed.

15 The principal objects of my invention are first, to provide a simple and efficient means for preventing the starting of electric railway cars, while any of the doors thereof remain open or unclosed, to thereby prevent
20 accidents caused by the improper starting of the car, while passengers are in the act of entering or leaving the same as well as preventing passengers from jumping from the car while in motion; second, to provide
25 in connection with the aforesaid device, means to automatically signal to the motorman when any of the doors of the car are opened or closed; and third, to provide in such a car, an emergency-switch, whereby
30 the motorman can, under extraordinary circumstances, operate the car notwithstanding some of the doors may be open.

My invention is particularly applicable to electric railway cars of the type known
35 as "pay-within" or "pay-as-you-enter" cars, these cars, as is well known, being usually provided with sliding or swinging doors, which are maintained closed, while the car is running, and my present invention
40 contemplates the employment of means to prevent improper starting or operation of cars of the said types, while any of the doors thereof remain unclosed or opened during the running of the car as well as
45 providing automatic signaling means in connection therewith.

The nature, scope and characteristic features of my present invention will be more readily understood from the following description taken in connection with the accompanying drawing forming part hereof, showing a diagrammatic view of the wiring employed in one embodiment of my invention, in an electric railway car, but with

only so much of the connections shown as is necessary, for a comprehension of the said invention.

Referring to the drawing 3, is one of the lines of a main circuit of a car, preferably that portion thereof running from the usual
50 "hood switch" and "circuit breaker" to the controllers and motors. The line 3, runs to a contact 4, of a circuit-breaker or magnet controlled switch A, the current passing through a contact-bar 5, of the said circuit
55 breaker A, to a contact 6, of the said circuit breaker, and thence through the line 7, to the controllers and motors, where the current is distributed and controlled, in the usual manner. In the present embodiment
70 of my invention, there is employed an auxiliary circuit for controlling the circuit-breaker or magnet controlled switch A, this circuit being connected by the line 8, to the trolley or to any other suitable live part
75 of the car circuit, this auxiliary circuit being controlled by a switch 9, from which the current passes by the line 10 to the line 11, and thence to the arm *b*, of a three-way switch B.

80 The three-way switch B, is controlled and actuated, in unison, with the actuation of a door of the car, the arm *b*, being connected by a rod *b'*, either to the door or to a mechanism for operating the door in any suitable
85 manner, not shown, so that the switch arm *b*, will be actuated at all times, in unison with the said door. When the door is closed and the switch B, is in the condition shown in the drawing, the current passes
90 from the switch arm *b*, through the contact *b'*, thence through the line 12, to the solenoid *a'*, of the circuit-breaker A, energizing the same, and causing the solenoid core *a''*, to permit the contact-bar 5, to bridge the
95 terminals 4 and 6, and thus to maintain the main car-circuit unbroken at this point. After passing through the solenoid *a'*, the current passes by the line 13, to the common return 14, connected with the traction-wheel
100 15, of the car, thence passing to the rail 16, constituting the common return of the electric railway system. When a door is in an open position, the current will pass through the switch arm *b*, to the contact *b''*, thence
105 through the line 17, the resistance 18, and the trip-catch-coil 19, which, in this particular embodiment of my invention as illus-

trated is energized, to cause the trip catch a^3 , of circuit breaker A, to release the contact bar 5, of said circuit-breaker A, to thereby permit the main-circuit of the car to be broken, at this point. After passing through the trip-catch-coil 19, the current passes by the line 20, to the common return 14, of the auxiliary circuit of the car. When the switch B, is actuated by the opening and closing of the door, the arm b , in passing from the contact b^2 , to the contact b^3 , will momentarily pass over a contact b^4 , and permit the current to flow through line 21 to a signal bell C, which is located in proximity to the motorman's position, and will indicate to him the respective, opening and closing of the doors, to guide him in the operation of the car. After passing through the signal bell C, the current returns by the line 22, to the common return 14, and thence to the main circuit of the railway system, as hereinbefore described.

It will be apparent that if the foregoing device be used, in railway systems, where crossings are frequent, there will be occasions when possibly the doors might be open and it would be necessary to quickly move the car, to avoid collisions or other accidents, and this could not be done with any of the doors open at such times, as it will be readily understood that the main car-circuit will be broken and beyond the control of the motorman, whenever the doors are open, and the solenoid coil a^1 , is not energized. To provide for such an emergency, a switch D, located near the motorman is used, the arm d^1 , of which is connected by the line 23, to the main line 10, of the auxiliary circuit. The switch D, is normally maintained open in any suitable manner, but at the proper time can be manually operated by the motorman, to cause the current to flow through contact d^2 , and thence through the line 24, which taps into the line 12, so that the current may pass through the solenoid a^1 , to energize the same, and thus to close the main car-circuit controlled through the switch D. Likewise if the circuit breaker A, be closed, and conditions should arise where it is desirable for the motorman to arbitrarily open the same, by actuating switch D, the current may be permitted to flow through the contact d^3 , thence through the line 25, which taps into the line 17, and thence through the resistance 18, and trip-catch-coil 19, to operate the trip-catch a^3 , and thereby to open the circuit-breaker A.

By the foregoing means is provided a simple and efficient apparatus for preventing the operation of a car, while any of the doors of the same remain open, to the end that accidents may be prevented, as aforesaid, as well as providing automatic means controlled by the opening and closing of the doors, for signaling to a motorman that

such operation has taken place; and also providing a means of arbitrary control for the motorman, in case of emergency. While the said means have only been shown and described in connection with a single door of a car, it will of course be readily understood that the same are applicable to a plurality of doors and such as are usually employed in street railway cars.

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an electric railway car, means to break the main car circuit when a door is opened, said means, comprising a circuit-breaker, an auxiliary circuit for controlling the same and a switch actuated in unison with the door for controlling said auxiliary circuit.

2. In an electric railway car, means for breaking the main car circuit when a door of the car is opened, in combination with means for arbitrarily closing said circuit.

3. In an electric railway car, means for breaking the main car circuit when a door is opened, said means, comprising a circuit-breaker, an auxiliary circuit for controlling the same and a switch actuated in unison with the door for controlling said auxiliary circuit and means controlled by said switch for restoring said circuit breaker.

4. In an electric railway car, means for breaking the main circuit of the car, when a door is opened, said means, comprising a circuit-breaker, an auxiliary circuit for controlling the same and a switch actuated in unison, with the door for controlling said auxiliary circuit, means controlled by said switch for restoring said circuit-breaker when the door is closed and means for arbitrarily restoring said circuit-breaker.

5. In an electric railway car, means for breaking the main car circuit, when a door is opened, said means, comprising a circuit-breaker, an auxiliary circuit for controlling the same, and a switch actuated in unison with the door for controlling said auxiliary circuit means controlled by said switch for restoring said circuit-breaker, when the door is closed, and means for automatically signaling, when the door is being opened or closed.

6. In an electric railway car, means for controlling the main car circuit to prevent improper operation of the car when a door is open, said means, comprising a circuit-breaker, an auxiliary circuit for opening said circuit-breaker, a second auxiliary circuit for restoring said circuit-breaker, and a switch actuated in unison with the door for controlling said auxiliary circuits.

7. In an electric railway car, means for controlling the main car circuit to prevent improper operation of the car, when a door is open, said means, comprising a circuit-

breaker, an auxiliary circuit for opening
said circuit-breaker, a second auxiliary cir-
cuit for restoring said circuit-breaker, a
switch actuated in unison with the door for
5 controlling said auxiliary circuits, and a
manually operated switch to arbitrarily
control said auxiliary circuits.

In witness whereof, I have hereunto set
my signature in the presence of two sub-
scribing witnesses.

FREDERICK H. LINCOLN.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.