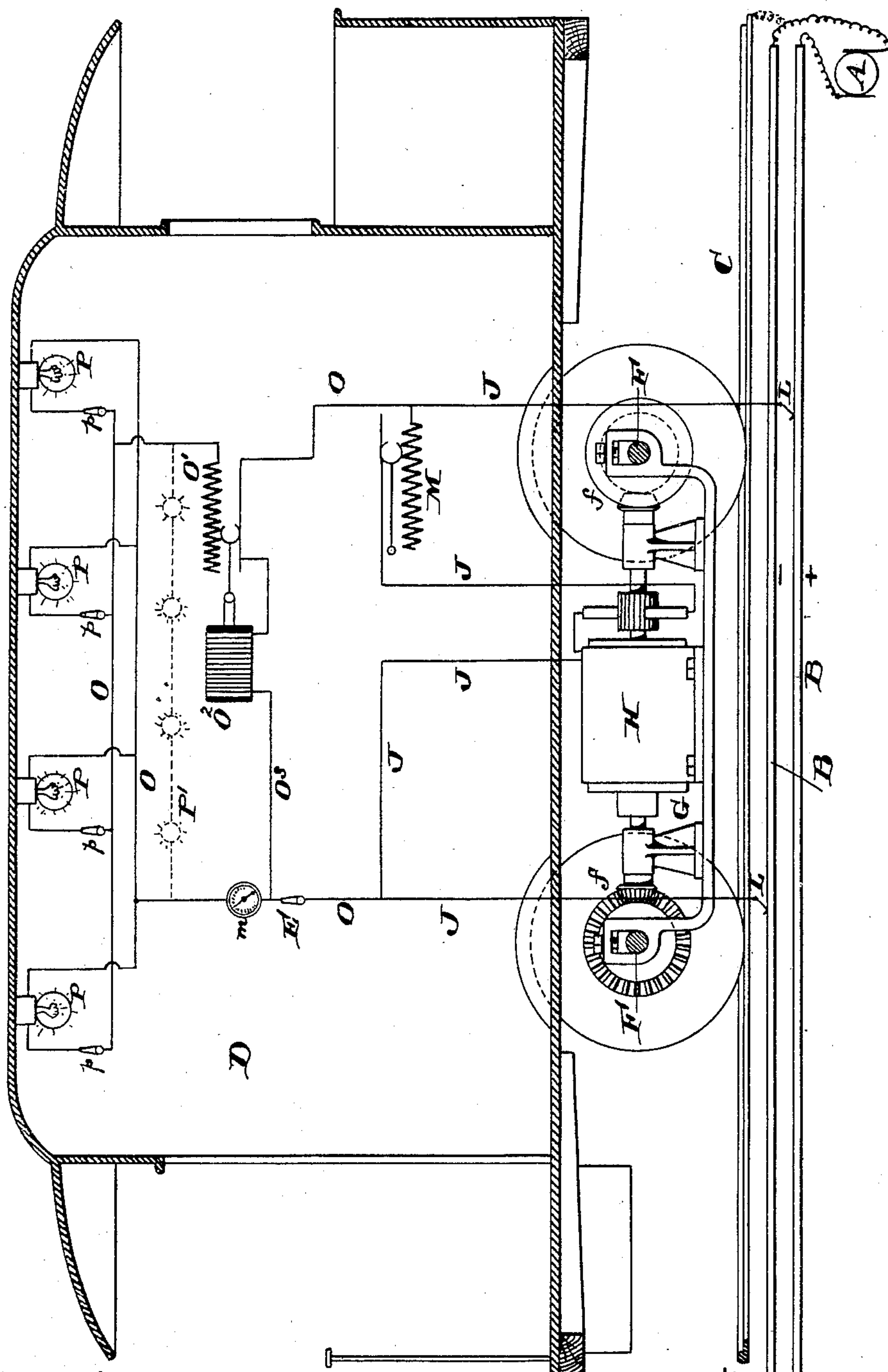


(No Model.)

R. M. HUNTER.
ELECTRIC RAILWAY.

No. 432,753.

Patented July 22, 1890.



Witnesses:
Henry Dwyer
Walter Famariss.

Inventor:

Am. Am. Am.

UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 432,753, dated July 22, 1890.

Original application filed June 9, 1886, Serial No. 204,583. Divided and application filed March 27, 1890, Serial No. 345,501.
Again divided and this application filed May 28, 1890. Serial No. 353,483. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electric Railways, of which the following is a specification.

My invention has reference to electric railways; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawing, which form a part thereof.

This application (Case 145) is a division of my application, (Case 132,) Serial No. 345,501, filed March 27, 1890, which in turn was a division of my application, Serial No. 204,583, filed June 9, 1886.

My invention comprehends means for propelling and lighting a vehicle from the same source of electric power, which electric power is supplied to the traveling vehicle by line-conductors arranged along the railway and leading from a stationary generator of electricity. The electric lamps are connected in multiple with respect to the motor, and are provided with independent regulating mechanism from that employed for controlling the speed of the motor.

In the drawing is shown a sectional elevation of an electrically-propelled vehicle embodying my invention.

A is the source of power, and B B are the positive and negative conductors extending along the railway, and may be arranged in a conduit, or suspended above the car or on the surface of the ground, as desired.

C are the rails, and, if desired, said rails may be used as the return-conductor.

D is the car-body, and is supported upon wheels in the usual manner.

Carried by the axles F is a frame G, upon which the electric motor H is secured, and which motor gears with the axles by gearing f, or in any suitable manner.

J is the motor-circuit, and connects with the conductors B by collectors L.

M is a regulator for controlling the current passing to the motor.

P represents electric lamps arranged in multiple in circuits O, which connect with the motor-circuit J upon opposite sides of the

motor H, and so as to be arranged in multiple with the motor. Each of the lamps is provided with a switch *p* for cutting out either lamp independently of the others.

O' is a resistance-changer in the lamp-circuit O, and is operated by a helix and core O², the helix being arranged in a shunt O³ in parallel with the lamps.

m is an indicator to indicate the current flowing in the lamp-circuit. E is a switch for cutting the lamp-circuit in and out of operation.

P' represents a series of lamps, which may be employed in the place of the multiple arrangement above referred to.

The automatic resistance-changer is designed to work automatically to increase the resistance in the lamp-circuit upon the resistance in the motor-circuit being increased so far as the current passing through the motor is concerned, so that when but little current is passing through the motor a greater resistance is thrown into the lamp-circuit, and vice versa, to maintain the lamps burning at a constant candle-power.

I do not limit myself to any particular arrangement of resistance-changer, as the same may be automatic or otherwise. I do not confine myself to any particular arrangement of lamps, nor to any special type of regulator for the motor, as all of these may be modified in various ways without departing from my invention.

The construction and arrangement of the motor on the car is not claimed in this application, but forms subject-matter of my application, Serial No. 204,583, of which this is a division.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a railway, line-conductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby, a motor-circuit carried by the vehicle making a traveling connection with the line-conductors and supplying current to the motors, a shunt-circuit upon said vehicle receiving electricity from the same

source as the motor, electric lamps in said shunt-circuit, and an indicator to indicate the current flowing through said shunt circuit.

2. The combination of a railway, line-con-
5 ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby and arranged to rotate the vehicle-axle, a motor-circuit carried by
10 the vehicle making a traveling connection with the line-conductors and supplying current to the motor, a shunt-circuit upon said vehicle receiving electricity from the same source as the motor, electric lamps in said
15 shunt-circuit, a resistance-changer to control the current flowing through the lamps, and an indicator to indicate the current flowing through said shunt-circuit.

3. The combination of a railway, line-con-
20 ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby and arranged to rotate the vehicle-axle, a motor-circuit carried by
25 the vehicle making a traveling connection with the line-conductors and supplying current to the motor, a shunt-circuit upon said vehicle receiving electricity from the same source as the motor, electric lamps in said
30 shunt-circuit, an automatic resistance-changer to control the current flowing through the lamps, and an indicator to indicate the current flowing through said shunt-circuit.

4. The combination of a railway, line-con-
35 ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby and arranged to rotate the vehicle-axle, a motor-circuit carried by
40 the vehicle making a traveling connection with the line-conductors and supplying current to the motor, a shunt-circuit upon said vehicle receiving electricity from the same source as the motor, electric lamps in said
45 shunt-circuit, and a resistance-changer to control the current flowing through the lamps.

5. The combination of a railway, line-con-
ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric
50 motor carried thereby and arranged to rotate the vehicle-axle, a motor-circuit carried by the vehicle making a traveling connection with the line-conductors and supplying current to the motor, a shunt-circuit upon said
55 vehicle receiving electricity from the same

source as the motor, electric lamps in said shunt-circuit, and an automatic resistance-changer to control the current flowing through the lamps. 60

6. The combination of a railway, line-con-
ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric
65 motor carried thereby and arranged to rotate the vehicle-axle, a motor-circuit carried by the vehicle making a traveling connection with the line-conductors and supplying current to the motor, a shunt-circuit upon said
70 vehicle receiving electricity from the same source as the motor, electric lamps in said shunt-circuit, a resistance-changer to control the current flowing through the lamps, and separate switches to cut out each lamp.

7. The combination of a railway, line-con-
75 ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby, a motor-circuit carried by the vehicle making a traveling con-
80 nection with the line-conductors and supplying current to the motor, a shunt-circuit upon said vehicle and receiving electricity from the same source as the motor, electric lamps in said shunt-circuit, an automatic resistance-
85 changer to control the current flowing through the lamps, separate switches to cut out each lamp, and a single switch to cut out all of the lamps.

8. The combination of a railway, line-con-
90 ductors arranged along the railway for supplying electric current to an electrically-propelled vehicle, a traveling vehicle, an electric motor carried thereby, a motor-circuit carried by the vehicle making a traveling con-
95 nection with the line-conductors and supplying current to the motor, a shunt-circuit upon said vehicle receiving electricity from the same source as the motor, electric lamps in said shunt-circuit, a variable resistance in said
100 lamp shunt-circuit, a second circuit forming a shunt around the lamps, and an electric device, substantially as set out, in said second circuit to actuate or regulate the resistance in the first or lamp shunt-circuit. 105

In testimony of which invention I have hereunto set my hand.

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,
A. J. DUNN.