

(No Model.)

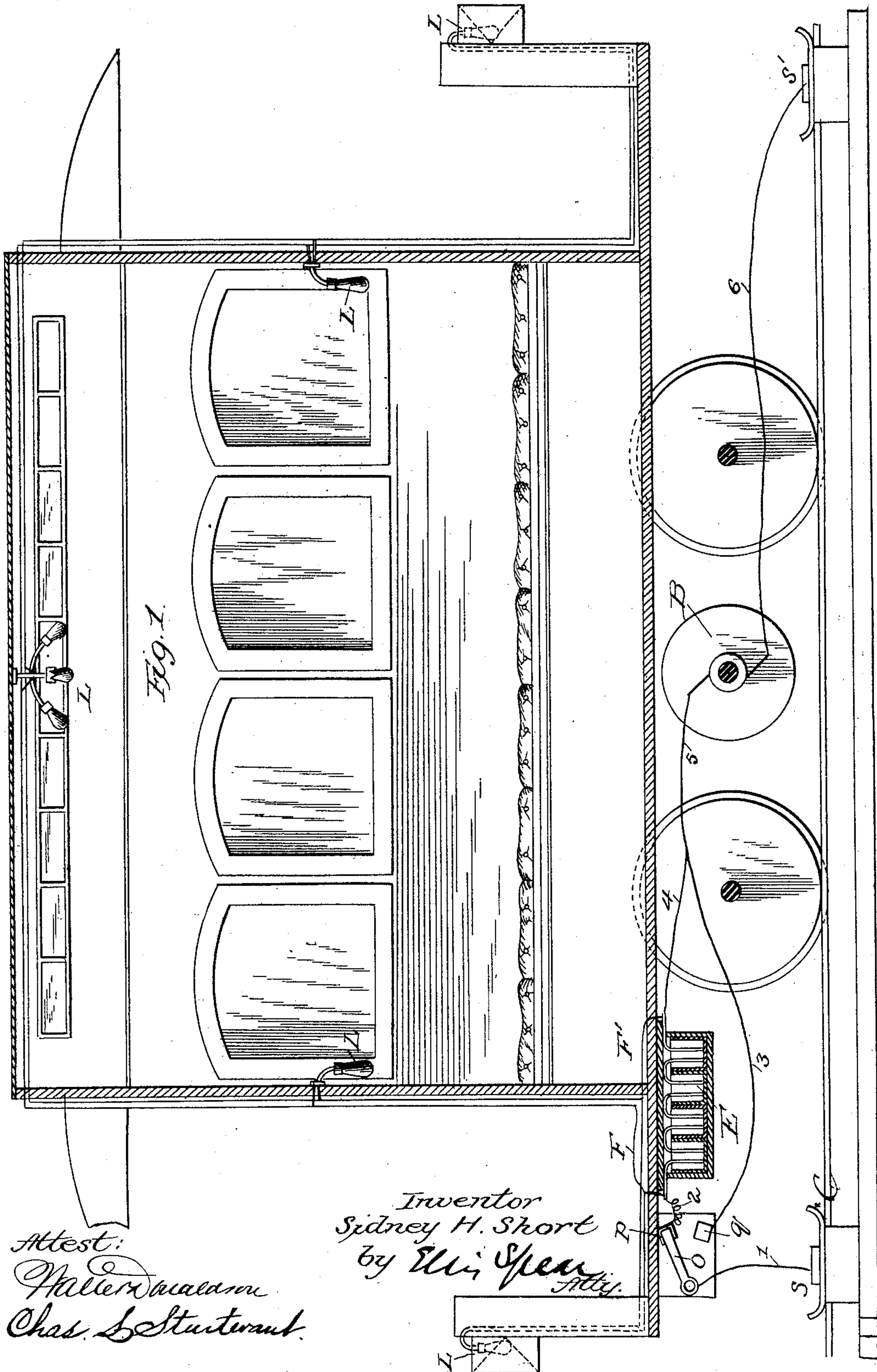
2 Sheets—Sheet 1.

S. H. SHORT.

APPARATUS FOR LIGHTING CARS BY ELECTRICITY.

No. 369,561.

Patented Sept. 6, 1887.



(No Model.)

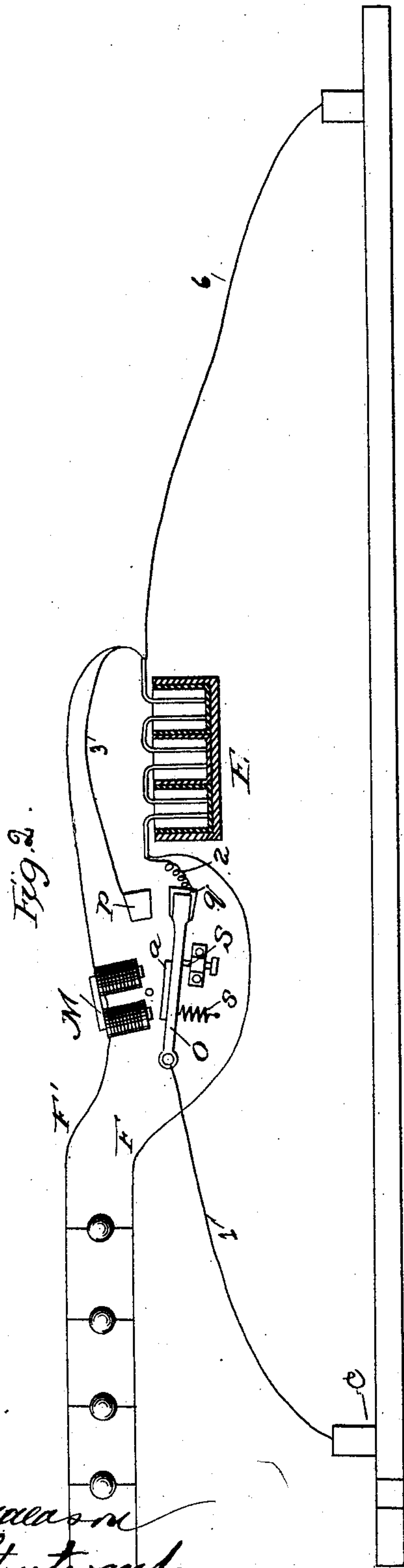
2 Sheets—Sheet 2.

S. H. SHORT.

APPARATUS FOR LIGHTING CARS BY ELECTRICITY.

No. 369,561.

Patented Sept. 6, 1887.



Attest:

Mellera mason
Chas. L. Sturtevant.

Inventor.
Sidney H. Short
by Ellis Spear
Atty.

UNITED STATES PATENT OFFICE.

SIDNEY HOWE SHORT, OF DENVER, COLORADO, ASSIGNOR TO THE UNITED STATES ELECTRIC COMPANY, OF SAME PLACE.

APPARATUS FOR LIGHTING CARS BY ELECTRICITY.

SPECIFICATION forming part of Letters Patent No. 369,561, dated September 6, 1887.

Application filed October 12, 1886. Serial No. 216,055. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY HOWE SHORT, of Denver, in the county of Arapahoe and State of Colorado, have invented a new and
5 useful Improvement in Apparatus for Lighting Cars by Electricity; and I do hereby declare that the following is a full, clear, and exact description of the same.

In an electrical railway system where the
10 electricity is supplied to a motor for moving the cars or trains of cars from a stationary supply-conductor along the roadway it is sometimes desirable to use some of the electric current for lighting the cars or coaches at night.

15 The object of this invention is to enable me to light the cars by means of incandescent lamps of any size or tension from a system in which all the electric locomotives are in series and the current quantity remains nearly constant but the electro-motive force varies.

In the accompanying drawings, Figure 1 represents an ordinary car in longitudinal section with a motor, and wires connecting it with a current-collector, and with my electric-light
25 apparatus. Fig. 2 represents a diagrammatic view of the wires in relation to the current-collector and the electric-light apparatus with some modification.

In the drawings, B represents the electro-
30 motor by which the car is impelled. It is arranged to receive the current from a conductor below the track through a current-collector, C, and the wires 1, 3, 5, and 6. A switch, O, is interposed between the wires 1 and 3, leading from the collector at one end of the car to the electromotor. The switch is arranged to swing from the block *q* to the block
35 *p*, the block *q* being connected to the wire 3. The block *p* is connected by a wire, 2, to a suitable secondary electro-motive-force-producing device, E. The other pole of this device is connected by the wires 4 and 5 with the brush of the electromotor B. The switch at O is, however, arranged to divert the current,
40 when desired, from the wire 3, which is connected with the block *q* of this switch, and send it through a secondary electro-motive-force-producing device at E. When the switch is connected with the block *p*, the current will
45 flow from S (connected with one side of the collector) through the switch O to the block

p, the wire 2, the device E, and the wires 4 and 5, the motor B, wire 6, and out at S' (connected to the other side of the collector) to the right.

55 The device at E is so arranged that a large or small current may pass through it, and in so doing produce a constant electro-motive force at its terminals F F'. Such a device may be several cells of lead battery connected in series, the number depending upon the tension required; or, better, the cells may contain a sulphate-of-copper solution with copper plates or simple carbon plates. The details of this electro-motive-force-producing
60 device will, however, form the subject-matter of another application. The wires leading to the lamps L L L L, &c., distributed in the car, are connected with the terminals F F', as shown in the drawings. The lamps are placed
65 in multiple arc on these wires. So long as the switch at O is in contact with the block *p* the lamps will burn, and any slight variation in the main current passing through E will not show in the lamps, as the electro-motive force
70 is constant at F and F'. When the lamps are not needed, the switch O may be moved to *q*, and the current will pass around E through the wire 3 direct to the motor B. After the secondary battery is thus cut out it will soon discharge its force, and the lamps will then no longer burn.

Fig. 2 represents the system in a clearer manner, showing its connections. It also shows an automatic safety device for operating the
75 switch O in case the current becomes too strong for the lamp-circuit L L L L. An electro-magnet, M, is placed in circuit with one of the lamp-wires F'. This magnet is made to attract the armature *a*, which is attached to
80 the switch-lever O. The spring 8 pulls the lever O to the stop S when the current passes through *q*, 2, and E; but if the current passing through the electro-magnet M should from any cause become too great the armature *a*
85 will be pulled up and the switch-lever O will move to the block *p*, and the supply of current will be for the time sent through the wire 3 around the device E. When the overcharge of E has worked off through F and F', the
90 spring 8 will restore the lever O to the block *q* and again supply E with the main current.

I claim as my invention—

1. In combination with an electrically-moved car or locomotive, and with the wire leading from one pole of the electromotor to the collector, a switch in said wire and connecting therewith, and with a branch of said wire, a secondary electro-motive-force-producing device in said branch, and electric lamps in a circuit connected with the terminals of the secondary electro-motive-force-producing device, said electric-lamp circuit having an electro-magnet therein with its armature attached to the switch, and means for retracting the switch from the magnet, all substantially as described.

2. In an electrically-moved car arranged to use a constant current, or nearly so, an electro-motive-force-producing device, E, ar-

ranged to take the main current, an interposed switch and contact-points adapted to shunt the device E, or divert the main charging-current through the same, a lamp-circuit connected to the poles of the device E, and devices operated by the force of the current in the latter circuit for automatically shunting the main current from the device E when the electro-motive force becomes too great in the lamp-circuit, all combined substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIDNEY HOWE SHORT.

Witnesses:

D. C. REUSCH,
W. B. STEWART.