(No Model.) 4 Sheets—Sheet 1.

B. I. POTTER.

ELECTRICALLY CONTROLLED CAR SWITCH.

No. 467,050. Patented Jan. 12, 1892.

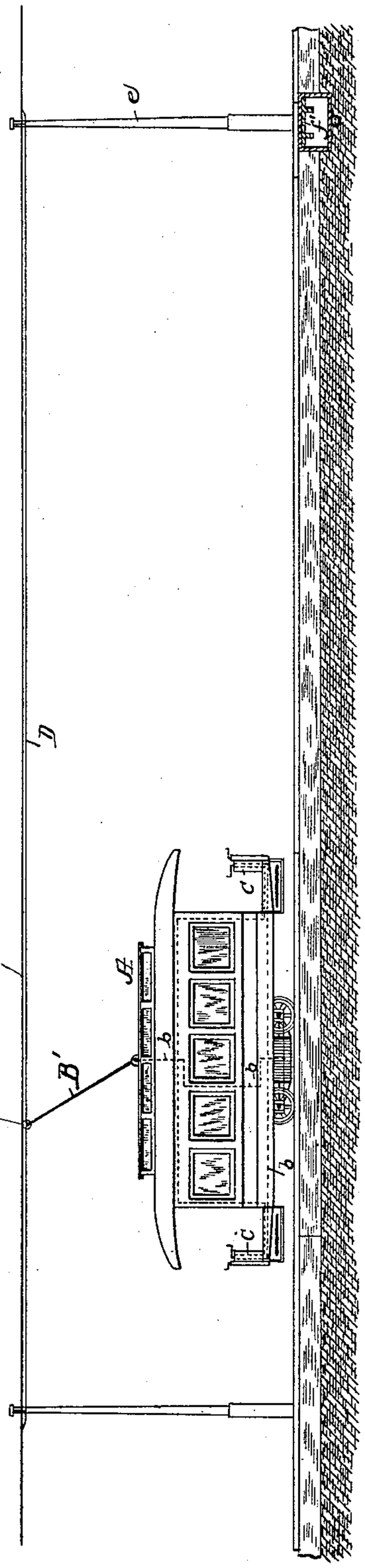

FIG. 1.

WITNESSES.
J. McDolan
F. Faulkner

INVENTOR.
Burt I. Potter
by his attys
Clarke & Raymond

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 2.

B. I. POTTER.

ELECTRICALLY CONTROLLED CAR SWITCH.

No. 467,050. Patented Jan. 12, 1892.

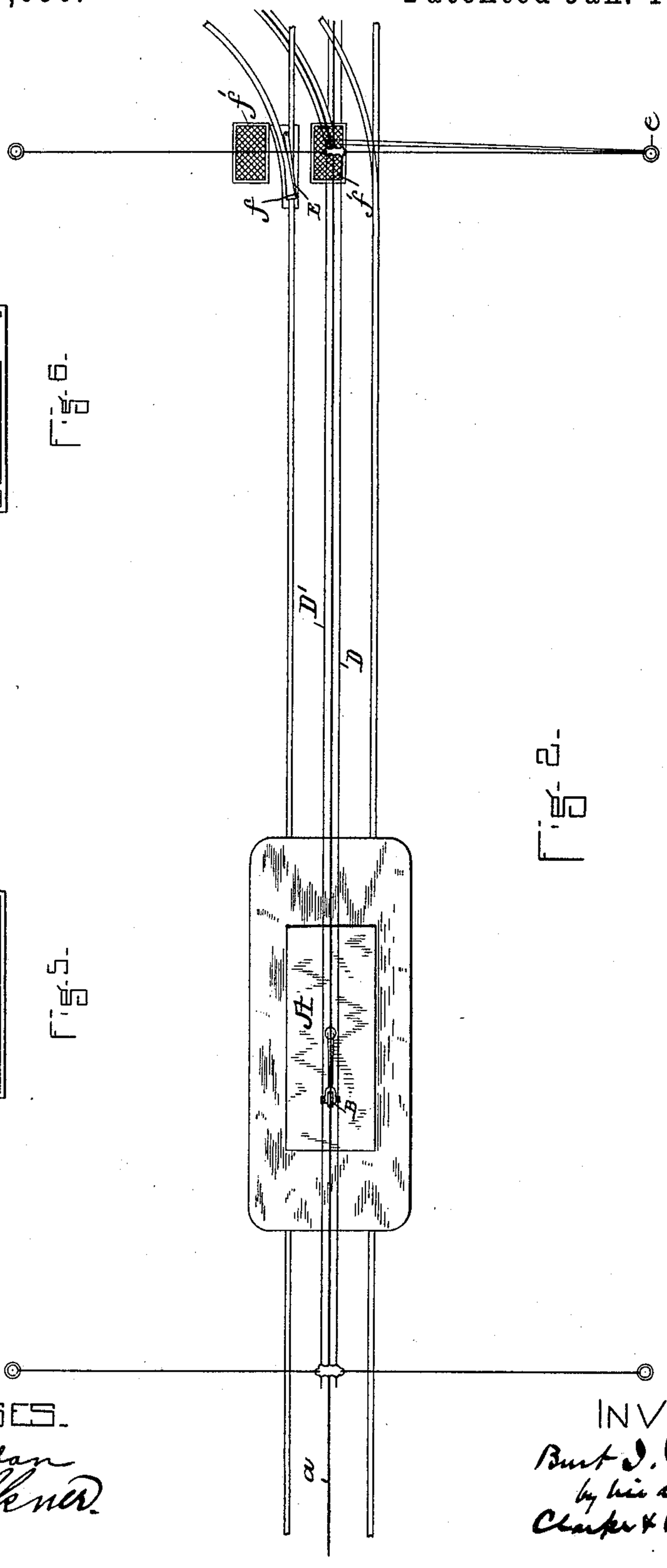

FIG. 6.

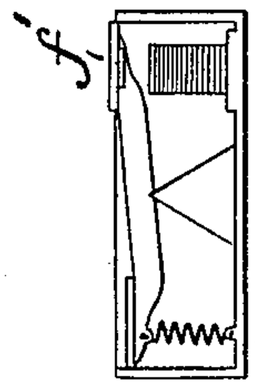

FIG. 5.

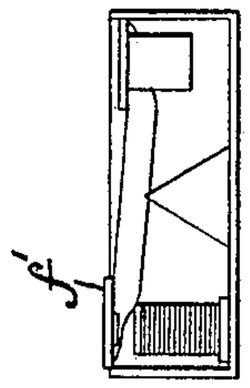

FIG. 4.

FIG. 2.

WITNESSES.

J. M. Dolan

F. Faulkner.

INVENTOR.

Burt I. Potter

by his attys

Clarke & Raymond

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

B. I. POTTER.

ELECTRICALLY CONTROLLED CAR SWITCH.

No. 467,050. Patented Jan. 12, 1892.

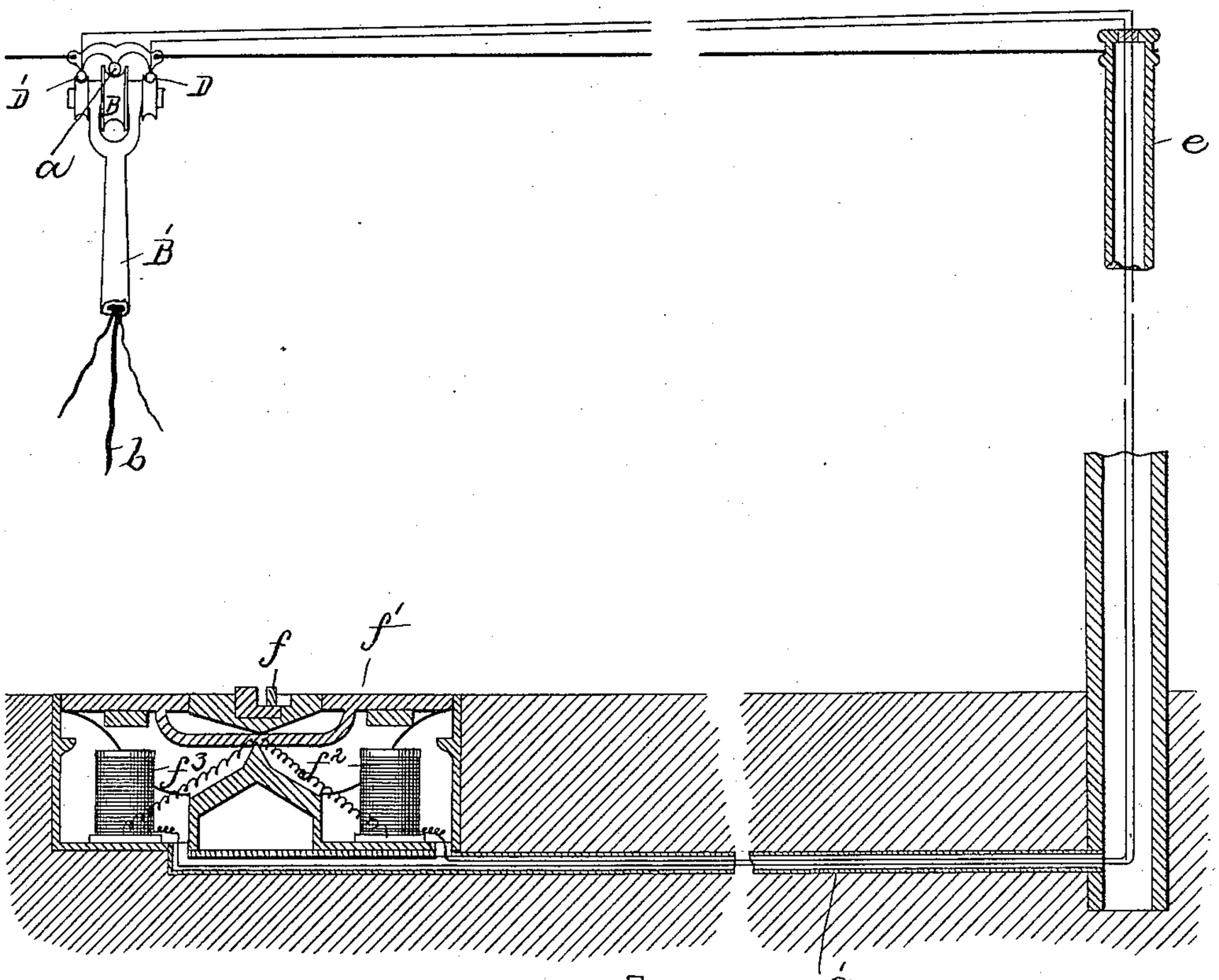

Fig. 3.

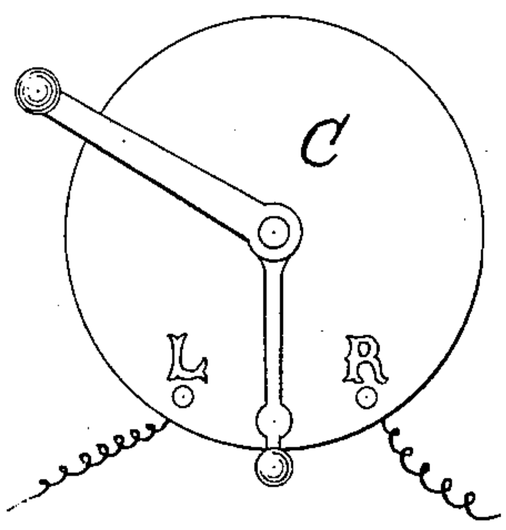

Fig. 4.

WITNESSES.

L. M. Dolan.

F. Faulhaber.

INVENTOR.

Burt I. Potter

by his attys

Charles Raymond

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 4.

B. I. POTTER.

ELECTRICALLY CONTROLLED CAR SWITCH.

No. 467,050. Patented Jan. 12, 1892.

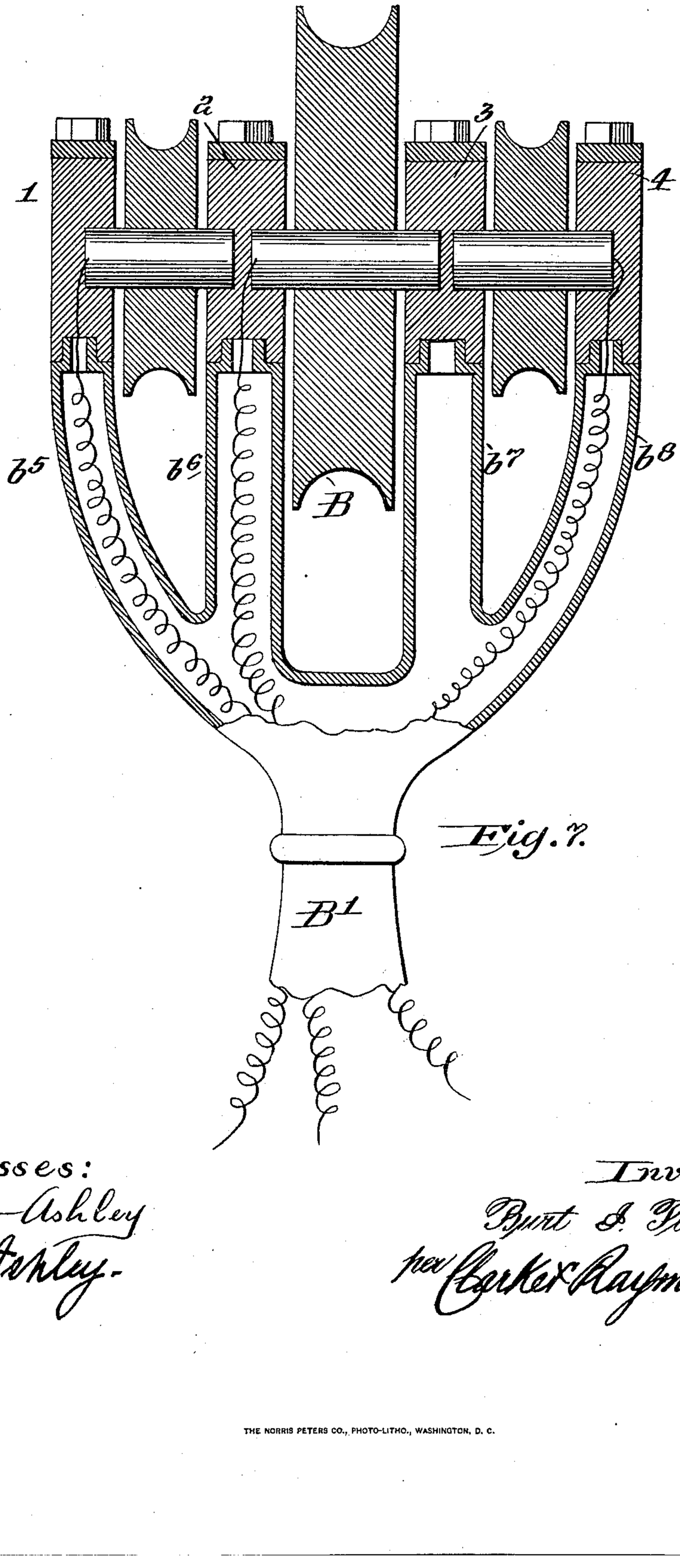

Fig. 7.

Witnesses:
Arthur Ashley
B. Ashley.

Inventor:
Burt I. Potter
per Clarke & Raymond
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BURT I. POTTER, OF BOSTON, MASSACHUSETTS.

ELECTRICALLY-CONTROLLED CAR-SWITCH.

SPECIFICATION forming part of Letters Patent No. 467,050, dated January 12, 1892.

Application filed January 13, 1890. Serial No. 336,766. (No model.)

To all whom it may concern:

Be it known that I, BURT IRVING POTTER, a citizen of the United States, and a resident of Boston, in the county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Electrically-Controlled Car-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The object of the invention relates to means for electrically controlling the movement of a switch-point from an electrically-operated car; and it comprises, in connection with the trolley-wire by which the electric current is distributed over the track-circuit, the usual trolley connections and additional or auxiliary wires, one on each side of the trolley, running from the vicinity of the switch any desired distance, ordinarily dead, connected at one end with mechanism for actuating the switch-point and with the other end adapted to be connected with the source of electric energy or supply by means of wires running upon or through the trolley-support to a convenient point of operation on the car, usually at each dasher, and a switch for connecting the wire receiving the current from the trolley-wire with either one of the two auxiliary wires desired, whereby the operator or engineer of the car upon approaching a switch may, by making the connection between the source of electric energy in the car and either one or the other of the switch-operating wires, cause a sufficient portion of the electric current to pass through the auxiliary wire to operate the switch-point-actuating mechanism.

Referring to the drawings, Figure 1 is a view in side elevation representing the car, a track-section, and the electric-circuit switch. Fig. 2 is a view in plan of the parts of the system above noted. Fig. 3 is a detail view enlarged, showing especially the distributing-conductor, the switch-circuits, the trolley-support, and the switch. Fig. 4 is a view in elevation of the operator's switch for shunting the current from the main conductor to the switch-circuit. Figs. 5 and 6 are detail views, each of which represents the switch as operated by one magnet, the switch-platform in one instance having an overbalance to move it when the magnet is not energized and in the other instance a spring for the same purpose. Fig. 7 represents an enlarged detail, in part in elevation and in part in vertical section, of the trolley-support.

A represents a car having a motor actuated by an electric current, preferably but not necessarily obtained from a distributing trolley-wire *a*.

B is the trolley, B′ the trolley-support, and *b* the conductor, which extends from the trolley B to the switch-box C at each end of the car.

D is a wire upon one side of the trolley-wire *a* and parallel with it, and D′ is a wire upon the other side of the same and parallel with it. Both the wires D D′ are of any desired length, extending any required distance from a switch-point, and in the drawings E represents the switch-point or movable rail-section. The wires D D′ extend by suitable courses to the mechanism for electrically controlling the movement of the switch-point. In the drawings (see Fig. 3) these wires are represented as running to one of the posts *e*, used for suspending the trolley-wire, entering the cavity of the post preferably at the top and extending downward to the base, and thence running through a gas-pipe or conduit *e′* to the switch or controlling mechanism.

As will be seen in the enlarged view, Fig. 7, each of the three trolleys has bearing in insulating-blocks, as 1 2 3 4, which are mounted upon corresponding arms b^5 b^6 b^7 b^8 of the trolley-support and from each other, and each trolley or trolley-pivot is connected by an insulated wire with the respective contact-points of the circuit-closer. I do not of course confine myself to this particular manner of running the wires, as any form of switch and switch-controlling apparatus adapted to be electrically operated may be used. I have represented as one form the switch which has the controlling or directing point *f*, carried upon the tilting platform *f′*, of metal, and I have represented as a mechanism for moving this platform the electro-magnets f^2 f^3, one of which is connected with the wire D and the other with the wire D′. The magnets are placed into operative relation to the platform and are independently energized according as it is desired to move the switch-point and at the will of the engineer or operator upon the

car. For instance, a car approaching a switch is brought into electric connection with the switch by means of the wires or conductors running from each of the electro-magnets to points within connecting distance of the car, and connection with these wires is represented as obtained by means of the trolley-arm and auxiliary trolleys, and connections are further made between the auxiliary trolleys and a conductor of the electric energy used for actuating the motor upon the car, which are in the control of the operator and by which the electric current may be established through the wire D and the magnet f^2 energized or a current established through the wire D′ and the magnet f^3 energized; or the connection may not be made with either wire, in which case of course both wires remain dead, and the switch will not be operated.

In many cases it will be desirable to use the two electro-magnets and the two wire connections in order that the switch may be positively controlled and held in one place or the other—that is, into position to shunt the car or in a position not to shunt it, as may be desired. I would not, however, be understood as confining myself to the use of the two electro-magnets for governing the switch, as one only may be employed, and in Figs. 5 and 6 I have represented the use of one magnet only with a tilting-switch platform. In this construction the switch-point is always held in a given position either by overbalancing the platform or by means of a light spring, and is moved into another position only upon the energizing of the magnet, the magnet operating to move or tilt the platform in opposition to the overbalance or spring. I would further say that the connections herein specified for connecting the electrically-impelled car with a switch may be employed with any system for supplying the car with electro-motive force, the only requirement necessary being to establish a switch between the conductor of such force and one or more distributing-wires with which the car is connected by a trolley and trolley-arm or equivalent connecting device. Of course the wires D D′ or either of them may be run in both directions from the switch, so that the switch may be operated in whichever direction the car moves. It will be understood that the wires D D′ or either of them extend only such distance from the switch as may be desirable; that the circuit between the car and the track-switch is established automatically upon the entering of the car within the circuit by the riding of the auxiliary trolley or trolleys upon the wires D D′; that at all other times the wires D D′ are dead-wires, and that no electric circuit is established until the operator or engineer of the car makes a connection with an energized conductor on the car.

It will be observed that under my construction it is practicable for the operator or car-attendant to set his electric switch before arriving at the point of commencement of the supplemental wires D D′ and to permit the car to proceed without further regard to the track switch or point, because the moment a circuit is completed through one or the other of the supplemental wires the track-switch will be properly set and will be positively held, or if displaced by a passing vehicle will be at once restored to its proper position by the continuing action of the active magnet. In consequence of this fact it is practicable to make the supplemental wires as long as may be desired, and thus to enable the operator not only to set his electric switch, but also to actuate the track-switch considerably in advance of reaching the same, and this with the certainty that it will be properly set when the car reaches it. At the same time, in the event of oversight or neglect and failure to properly set the electric switch at the time of or before reaching the supplemental wires, the operator may still effect the proper setting of the track-switch, provided only that the car-wheels have not actually entered upon it. In this important particular my apparatus differs from previous constructions in which short contact blocks or plates have been arranged on or in the ground and the switch-actuating circuit completed through brushes carried by the car.

Manifestly the danger of injury or death to pedestrians and to animals that would result from the employment of extended contact-plates in the roadway precludes their use and necessitates short plates, which cause the current to act only momentarily upon the track-switch and leave said switch liable to displacement before the car reaches it; or if the operator should fail to set his electric switch before reaching the contact-plates it would be impossible for him to set the track-switch from the car, even though considerable space intervened between the car and the switch. Moreover, by reason of the accumulation of dirt, snow, frost, or moisture upon the plates when placed in the roadway there is liability of passing over them without effecting completion of an operative circuit through the switch-magnets. In view of these facts the employment of overhead wires is important, and the apparatus becomes readily and clearly distinguishable from such prior plans as above noted. My plan affords such extended contact-surface as will insure perfect contact at some point in its length, if not continuous contact throughout, despite snow, frost, or rain, and such extended surface not only has not been but could not practically or safely be provided under prior plans of construction.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a track system, the combination of the following elements: a track-rail, a switch point or rail adapted to be electrically controlled and operated, an electrically-impelled car, an electric conductor or conductors extending along the track in the direction of travel of

the car and electrically connected with the switch-actuating mechanism, a contact or contacts for said conductor or conductors carried by the car, and an electric switch carried upon the car and serving to connect one or another of said conductors with the source of electricity which supplies the car-motor.

2. In a track system, the combination, with a track-rail, a switch rail or point, and an electrical actuating mechanism for said switch rail or point, of one or more conductors in electrical connection with the switch-actuating mechanism, said conductors being placed above and off the ground, an electrically-propelled car, an electric connecting device carried by the car and serving to connect said conductor or conductors with the source of electricity which supplies the car-motor, and an electric switch carried upon the car and serving to complete or break at will the circuit of the conductor or conductors.

3. In combination with a track-rail, a switch point or rail, electric mechanism for shifting said point, an electrically-impelled car, a conductor extending from the electric switch-actuating mechanism to a suitable distance therefrom and exposed throughout its length, and an electric connecting device carried or supported by the car and serving to connect the conductor with the source of electricity which supplies the car-motor, whereby contact may be made and maintained with said conductor throughout its length and the proper position of the track-switch be thereby preserved until the car passes the switch.

4. In a track system, the combination of an electrically-controlled switch, an overhead electric conductor, a supplemental conductor or conductors extending from the switch parallel with the track, an electrically-impelled car, a trolley or support having a trolley and main conductor for establishing a circuit with the overhead conductor, an additional conductor and trolley for each supplemental conductor carried by said trolley-support, said additional conductors extending to a convenient point or points on the car, and an electric switch or switches located at said point or points on the car and serving to connect the supplemental conductor or conductors at will with the main conductor, and thereby to supply them, and through them the switch-actuating mechanism, with the necessary current for actuating the track-switch.

BURT I. POTTER.

In presence of—
F. F. RAYMOND, 2d,
THOMAS O. POTTER.