No. 827,681. PATENTED JULY 31, 1906.

G. W. BROWNE.

ELECTRIC RAILROAD.

APPLICATION FILED FEB. 23, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

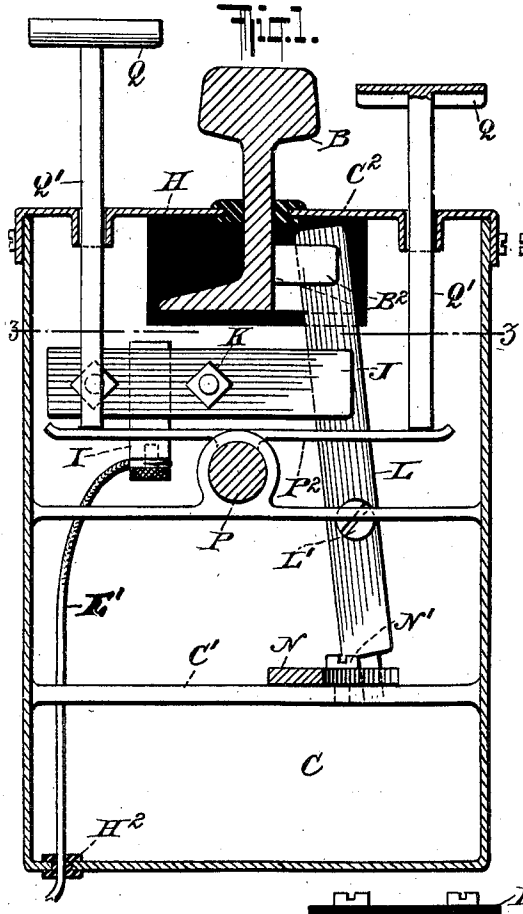


Fig. 2.

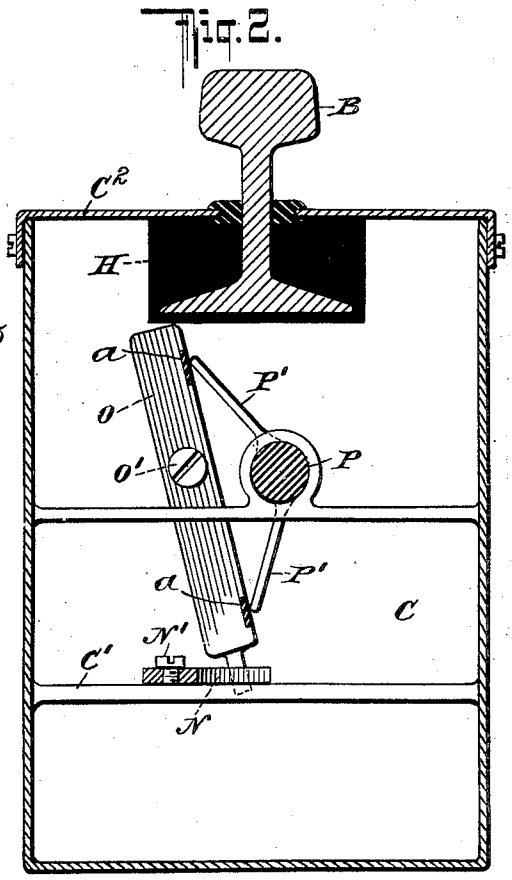
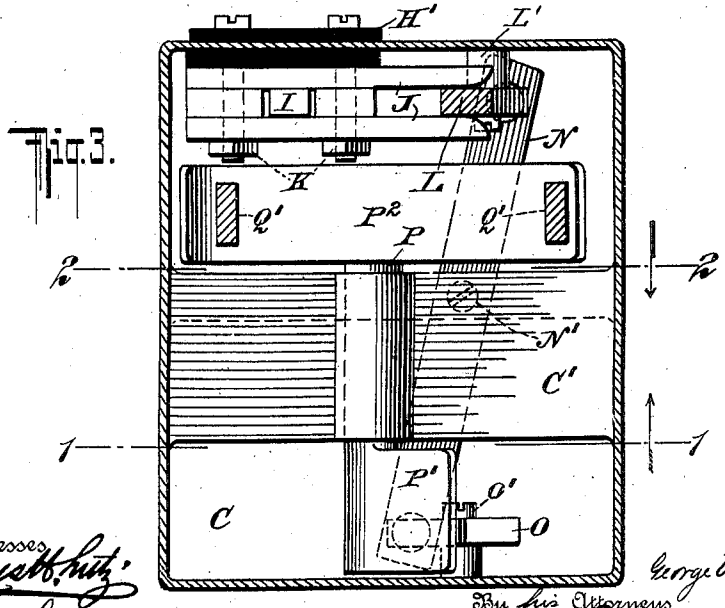


Fig. 3.



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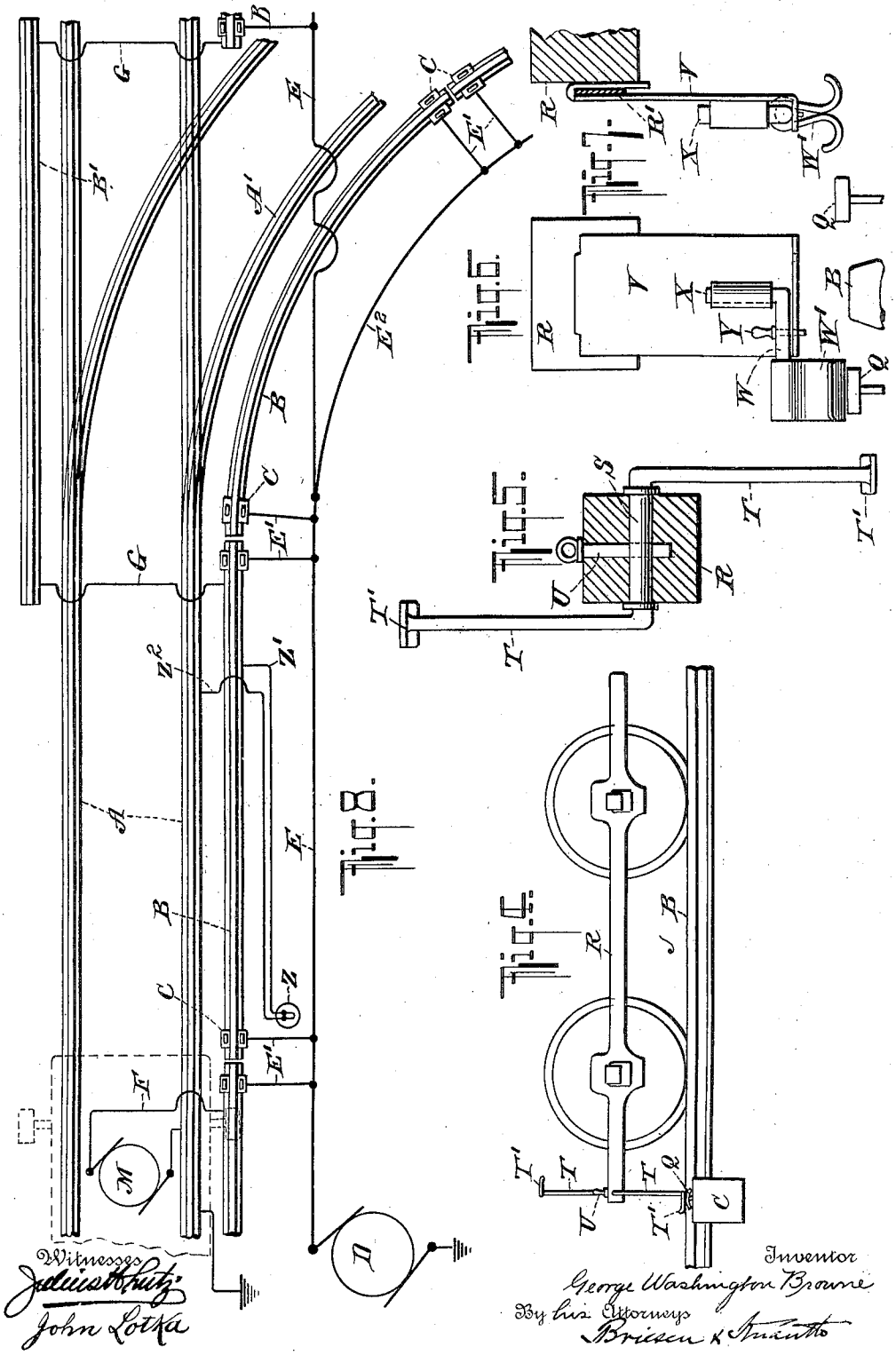
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON BROWNE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO GEORGE WASHINGTON ADAMS, OF BROOKLYN, NEW YORK, AND ONE-HALF TO MILTON MENDEL, OF NEW YORK, N. Y.

ELECTRIC RAILROAD.

No. 827,681. Specification of Letters Patent. Patented July 31, 1906.

Application filed February 23, 1905. Serial No. 246,851.

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON BROWNE, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Electric Railroads, of which the following is a specification.

My invention relates to electric railroads of the sectional-conductor type, and, particularly to those in which a so-called "third-rail" conductor is employed.

The third-rail system has so far been capable of a limited application only, for the reason that the highly-charged conductor-rail is extremely dangerous and, moreover, requires a considerable supply of electricity on account of the inevitable loss through leakage.

In the third-rail system embodying my invention the third rail is constructed in sections which are insulated from each other and which are connected with the live conductor or feed-wire only as long as a car or train is to derive current from each section. The connecting and disconnecting of the third-rail sections relatively to the feed-wire is controlled by circuit closing and opening devices which are operated by suitable appliances on the cars. The principle of operation is this, that the car upon entering a section will automatically enliven that section, and a car or the last car of the train leaving a section will disconnect that section from the feed-wire.

An electrical block or signal system may be readily combined with my improved type of electrical railway.

I will now proceed to describe my invention in detail, with reference to the accompanying drawings, and will then point out its novel features in the appended claims.

Figure 1 is a cross-sectional elevation of the third rail and adjacent parts embodying my invention, taken on line 1 1 of Fig. 3. Fig. 2 is a sectional elevation on line 2 2 of Fig. 3. Fig. 3 is a horizontal section on line 3 3 of Fig. 1. Fig. 4 is a side view of a truck with the operating device thereon. Fig. 5 is a sectional elevation of said operating device. Fig. 6 is a front elevation of another form of switch-operating device. Fig. 7 is a vertical section of Fig. 6, and Fig. 8 is a plan showing the arrangement of the rails and circuits.

Referring to Fig. 8, A indicates the main rails on which the cars travel, and B the sections of the third rail, which sections are insulated, as shown best in Figs. 1 and 2. At each end of section B is located a box C, containing a circuit-closing and circuit-opening device of the character described in detail hereinafter. D indicates the dynamo from which the electric current is supplied to the feed-wire or live conductor E, from which branches E′ run to the boxes C. In Fig. 8 the second terminal of the dynamo is shown grounded, and one of the track-rails A is also grounded, thus forming the return-circuit for the motor M of the car, which is diagrammatically indicated in that figure, and which motor has one terminal connected with the track-rail and the other with the third rail by means of a wire F, any suitable current-taking device or collector being employed. Where the track branches off for a siding or switch, as shown at the right of Fig. 8, the feed-wire is of course continued along both track-sections, as indicated at E^2, and the two alining third-conductor sections at the ends of the gap left for the rails A′ of the siding are permanently connected with each other by means of wires G and an intermediate third-rail section B′, located on the other side of the track. It will be understood that I do not limit myself to the particular way of making the return-circuit shown in Fig. 8.

Referring now to Figs. 1, 2, and 3, it will be seen that each box C, which is made with suitable braces C′ and a removable top C^2, carries the third-rail section B in such a manner that the section projects partly above the box and partly within the same, being insulated by means of suitable material H. The branch E′, connected with the live wire E, leads to a bar I, which is set between two conducting-bars J, held together and clamped by screws and nuts K. The bars J together form a contact member in the shape of a fork and are insulated from the box by rubber or other material H′, it being understood that the branch wire E′ is similarly insulated from the box, as shown at H^2. Into the fork formed by the bars J is adapted to project a switch-arm L, fulcrumed at L′,

which arm is also adapted to project against a suitable contact member B^2 on the third-rail section B. This contact member B^2 may be forked and similar in construction to the contact member formed by the bars J. The lower end of the switch-arm L is connected with a horizontally-swinging lever N, fulcrumed at N'. The other end of this lever N is connected with a vertically-swinging lever O, fulcrumed at O'. This lever O is engaged by two projections P' on a horizontal shaft P, which shaft is also provided with a cross piece or beam P^2, extending about horizontally. This beam is adapted to be depressed at either end by means of shifting members, each of which comprises a head Q and a stem Q', suitably guided in the top of the box, so as to slide up and down therein. It will be seen that there is a head Q at each side of the third-rail section B. Depressing one of these heads will connect the corresponding third-rail section B with the live wire E, and depressing the head Q on the other side of the section B will disconnect the rail-section B from the live wire. This will be obvious, since the depression of either one of the shifting devices will rock the shaft P one way or the other, and thus through the medium of the levers O and N the switch-arm L will be thrown in contact with the contact-bars J and with the third-rail section B or away from these parts. The box C is preferably water-tight, so that rain or snow may not have any detrimental effect on the operation. By interposing any suitable insulation in the connection between the switch-arm L and the shifting devices Q Q', as at *a a*, Fig. 2, I can easily prevent the said shifting devices from ever becoming charged with high-tension electricity.

Various appliances may be mounted on the cars in order to operate the switch-shifting devices hereinbefore described. In Figs. 4 and 5 the frame R of the car-truck is provided with a horizontal shaft S, extending transversely and provided with oppositely-extending arms T at each end. The shaft S is normally locked, as by means of a pin U, which can be withdrawn to release the shaft. The shaft can be so locked that one or the other of the arms T is in a lowered position. These arms carry shoes T' at their free ends, said shoes being so located as to engage with the respective heads Q when the arms T are lowered. It will be readily understood that only one of the arms T is in operating position at a time.

By reference to Fig. 1 it will be seen that depressing the head Q, located at the right of the rail B, will close the circuit, as shown in said figure, while the depression of the head Q at the left of the rail will open the circuit. An operating device, such as T T', is located at each end of a train or car, and the two operating devices of a train or car are set differently—that is, the one at the front end of car is set so as to depress the circuit-closing head Q and the one at the rear end of the car or train is set to depress the circuit-opening head Q. Thus as a train or car enters a section of the third-rail conductor the parts will be brought into the position shown in Fig. 1, and as the train leaves such section the head Q at the left-hand side of the rail B will be depressed and the circuit opened. Of course every time that one of the heads Q is depressed the other head Q is raised through the medium of the beam P^2. The cars are provided with any suitable brushes or other current-collectors which engage the third rail B. In order that electricity may be supplied to the cars at points where the branching of tracks compels an interruption of the third rail, I provide the intermediate third-rail section B' on the opposite side of the track at any such point and connect such intermediate section with the adjacent section B at the other side of the track by the wires G. Inasmuch as a car always has current-collecting devices on both sides, this arrangement insures a supply of electricity to the car when passing a point where a track branches off.

The duplication of boxes C at each end of the third-rail section B is for the purpose of allowing cars to travel in either direction. When the cars are to travel backward, the position of the two operating devices at the ends of the car is reversed, so that the device which previously operated to open the circuit will now close it, and vice versa.

In Figs. 6 and 7 I have shown another means for operating the shifting heads Q. The truck-frame R is provided with a bar R', on which is hooked a bracket V, having pivoted thereto an arm W, swinging about a vertical axis X and held either to the left or to the right by means of a movable locking-pin Y. The arm W carries a shoe W', which is adapted to engage either one of the heads Q, according as said arm is swung to one side or the other. The operation of this form of my invention will be practically the same as described with reference to Figs. 4 and 5.

My improved system may be readily combined with a signaling device. Thus in Fig. 8 I have indicated an incandescent lamp Z, from which a wire Z' leads to one of the third-rail sections B, while another wire Z^2 leads to one of the main rails A. This device will indicate whether the respective third-rail section B is alive or dead and may be used as a block-signal, if desired. Of course instead of an incandescent lamp I may employ any other electrically-actuated or electrically-released device.

I claim as my invention—

1. In an electric railroad a sectional third rail, a live conductor having branches adapted for connection with the respective third-rail sections, a circuit-opener and a circuit-closer at each end of each third-rail section

and operating devices consisting of rock-shafts carrying reversed arms T, T carried by the cars for actuating the said circuit-closers and circuit-openers, said operating devices being capable of assuming two different positions, as described.

2. In an electric railroad a sectional third rail, a live conductor having branches adapted for connection with the respective third-rail sections, a combined circuit closer and opener located at each end of the third-rail section and having vertically-movable heads Q, Q at opposite sides of said rail, and operating devices located upon the cars and adapted to actuate said combined circuit closer and opener.

3. In an electric railroad a reversible switch-operating device carried by the car, the said device comprising a rock-shaft S having reversed arms T, T capable of assuming two different positions, and a switch-operating device proper mounted to swing with said rock-shaft.

4. In a third-rail electric railroad a switch-operating device carried by the car, said device comprising a carrier movable to different positions, in either of which it is above the level of the third rail, a switch-operating member on said carrier, and means for locking the carrier in either of the positions.

5. In an electric railroad, a sectional conductor, a live wire having branches adapted for connection with the sections of said conductor, a circuit-closer and a circuit-opener for each section of the conductor, the actuated members of said circuit-closer and circuit-opener being movable up and down on opposite sides of the sectional conductor, and operating devices mounted on the cars and arranged to depress said circuit-closers and circuit-openers respectively.

6. In an electric railroad, a sectional conductor, a live wire, a circuit-closer and a circuit-opener for each section of the conductor and controlling the connection thereof with the live wire, the actuated members of said circuit-closer and circuit-opener being movable up and down on opposite sides of the sectional conductor, a connection between the circuit-closer and circuit-opener to cause one of them to rise when the other is depressed, and vice versa, and operating devices mounted on the cars and arranged to depress said circuit-openers and circuit-closers respectively.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE WASHINGTON BROWNE.

Witnesses:
JOHN LOTKA,
JOHN A. KEHLENBECK.