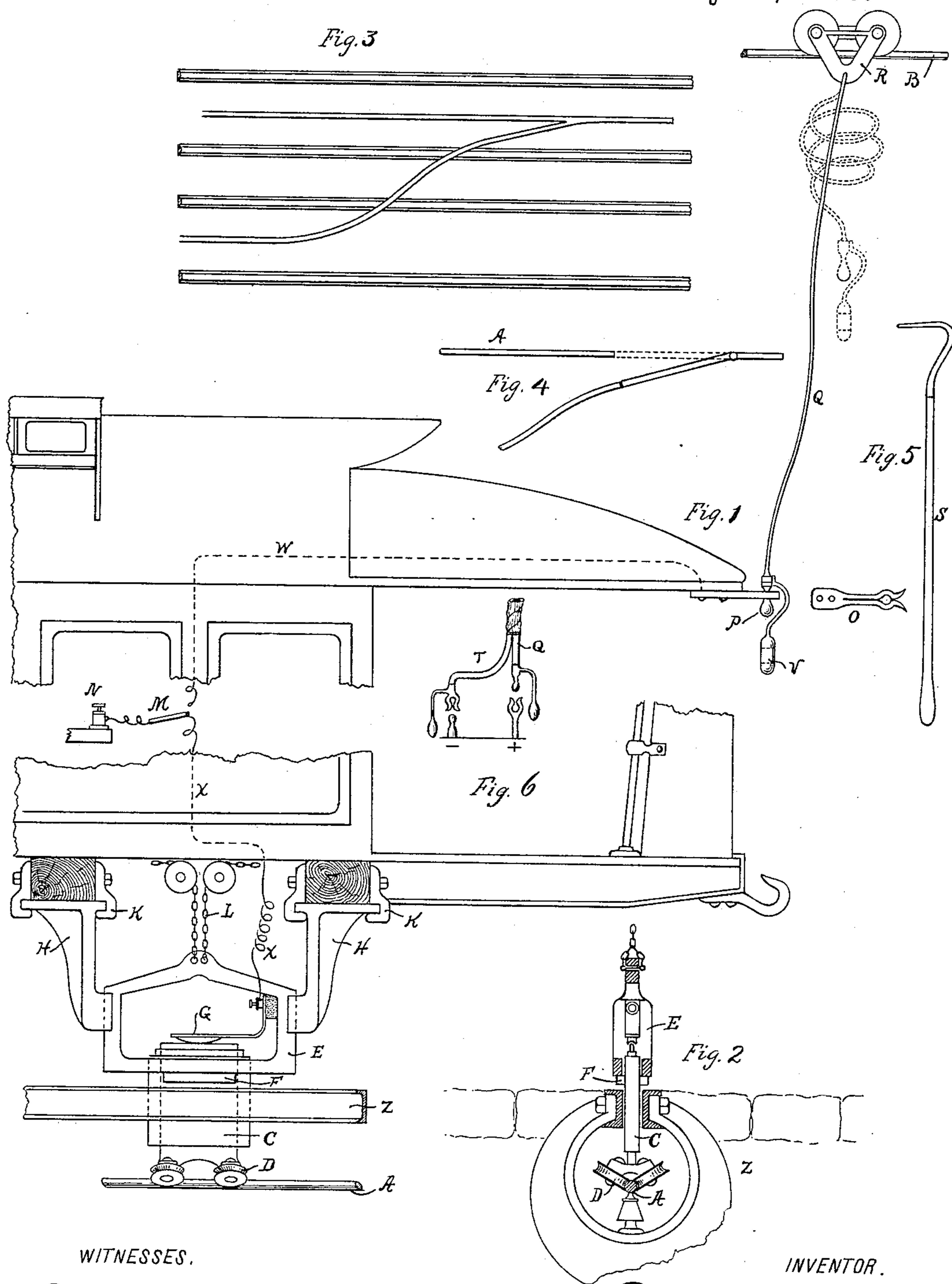


(No Model.)

E. M. BENTLEY.
ELECTRIC RAILWAY.

No. 385,902.

Patented July 10, 1888.



WITNESSES.

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UNITED STATES PATENT OFFICE.

EDWARD M. BENTLEY, OF NEW YORK, N. Y.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 385,902, dated July 10, 1888.

Application filed October 20, 1887. Serial No. 252,865. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. BENTLEY, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

My invention relates to electric railways in which the supply-conductor is inclosed in a slotted conduit along one section of the road, and is elevated above the surface of the roadway along the succeeding section; and it consists in devices whereby an electrically-propelled vehicle is adapted to travel along both sections of conductor.

In the accompanying drawings, Figure 1 is a side elevation of a car equipped according to my invention. Fig. 2 is a transverse section of the conduit, its inclosed conductor, and the contact device therefor. Fig. 3 shows a double-track road with a cross conduit between the respective conduits of the tracks. Fig. 4 shows the conductor at the meeting point of the conduits. Fig. 5 shows a hook used in reaching the overhead contact device. Fig. 6 shows a connection for a contact device when two conductors are used.

In Fig. 1, A is the inclosed section of supply-conductor for the railway, Z being the inclosing-conduit, and B is the elevated conductor, supported at any desired height by posts or transverse wires. Connection is made with the inclosed conductor by an insulated protected shank, C, going down through the slot, and having the wheels D, adapted to ride on the wire or rod A. On the car or any electrically-propelled vehicle is a frame, E, adapted to fit down over C and embrace it, resting finally on stops F. This frame is held in vertical guides H, which in turn move on transverse guides K. The frame can be lifted at will from either end of the car by chain L. An insulated spring, G, attached to the frame, descends with it and bears upon the conducting-core of C. A wire, x, leads from G to the motor-terminal N. When the end of the conduit-section of road is reached, the frame is lifted, and in the case of a double-track road, after the car has passed on C, is transferred by a cross-connection to the conduit of the opposite track, while the car is transferred

from the up to the down track at a farther point along the road where the supply-conductor is elevated. Fig. 4 shows the conductor at the junction of the conduits.

For the overhead connection a trolley or traveler moves along wire B, and a flexible conductor, Q, leads therefrom to the car, with which it has a detachable spring-clip connection. This connection consists of a pair of spring-jaws, O, which embrace the neck of an hour-glass-shaped knob on the end of conductor Q. This can be readily detached manually, when the end of the elevated section is reached, by means of handle V. When released, the conductor is of such resilient nature that it will be automatically withdrawn into a coil, as is shown by dotted lines. It can then be reached by the next car by means of a hook, S, adapted to take into an eye or ring in handle V. The spring-jaws are fastened to the roof of the car-platform, and a wire, W, leads thence to switch M, by which it may be connected to the motor-terminal N. This switch on the car, which is adapted to connect the motor-terminal alternately to the two contact devices, may be used in order to prevent an arc at the contact-connection, and also to keep out of electrical connection the wire X or W, which is not in use. When two conductors independent of the earth or track are used, it is especially necessary that in changing from one set to the other the right connections be invariably made or a short circuit will result. I therefore make it impossible that the wrong connections be made by means of the device shown in Fig. 6. In that arrangement the positive and negative wires have respectively such clip-connections that they can be joined to the car only in the right way. Any other device for accomplishing the same end may be employed, and any form of take-up in the overhead conductor-connection may be used instead of the spring shown.

I do not claim herein any method of operation of street-railways which may be disclosed by description of the above devices, such method being claimed in an application now pending, Serial No. 272,650, filed May 3, 1888.

I do not in this application claim, broadly, a detachable contact device for connecting an electrically-propelled vehicle with a line-con-

ductor, nor any of the broad features pertaining thereto, such being shown and claimed in my pending application, Serial No. 183,543.

I claim—

5 1. In an electric railway, the combination of a section of elevated supply-conductor, a section of inclosed supply-conductor, an electrically-propelled vehicle, a permanent conductor on the vehicle leading to a contact device for the said elevated section, a corresponding conductor leading to a contact device for the said inclosed section, and the contact device for the elevated conductor having a spring-jack or similar detachable connection
10 with the vehicle and with the corresponding permanent conductor.

2. In an electric railway, the combination of a section of elevated supply-conductor, a section of inclosed supply-conductor, an electrically-propelled vehicle, a permanent conductor on the vehicle leading to a contact device for the said elevated section, a corresponding conductor leading to a contact device for the said inclosed section, and the said contact
25 device for the inclosed section having a detachable connection with the vehicle, and having a spring-jack or similar detachable connection with the said corresponding permanent conductor.

30 3. The combination, in an electric railway, with a supply-conductor, one section being inclosed in a slotted conduit and a second section elevated above the surface of the roadway, of a vehicle provided with a permanent conductor
35 leading to a contact device for the elevated section, and also provided with a contact device leading into the conduit detachable from the vehicle at a point outside the conduit, and having a spring-jack or similar detachable connection with a permanent conductor on the
40 vehicle.

4. In an electric railway having a section of inclosed and a section of elevated conductor, the combination, with an electric locomotive,
45 of two conductors leading from the two contact devices, respectively, the said two contact devices, and a switch on the car for connecting the motor-terminals with the two conductors alternately.

5. In an electric railway having both an inclosed and an elevated section of conductor, the combination, with an electric locomotive, of a contact device for the conduit-section, removable so as not to impede the progress of the vehicle along the elevated section, and a
55 holder adapted to receive the conductor of a detachable contact device for the elevated section.

6. In a double-track electric railway, the combination of an electric supply-conductor, a conduit on each track inclosing a section of said conductor, an extension of said railway having a conductor elevated above the surface of the roadway, a cross-conduit joining the
60 conduits of the two tracks at the end, an electrically-propelled vehicle, a removable contact device for connecting said vehicle with the inclosed conductor, with means for connecting it to the elevated conductor when that section is reached.

7. The combination, in an electric railway, with positive and negative supply-conductors, of an electrically-propelled vehicle and two pairs of contact devices, one pair of which is provided with connectors of different form for
75 positive and negative wires, respectively, whereby only the right connection can be made.

8. The combination, with the contact-trolley, of a conductor provided with a take-up device and a ring or eye by which it may be reached from below and brought into an operative position.

9. In an electric railway, the combination, with an electrically-propelled vehicle, of a supply-conductor inclosed in a conduit, a contact device beneath the car connecting with the conductor, but detachable at a point outside the conduit both electrically and mechanically, and a common actuating device for the
85 electrical and mechanical detachment.

EDWARD M. BENTLEY.

Witnesses:

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