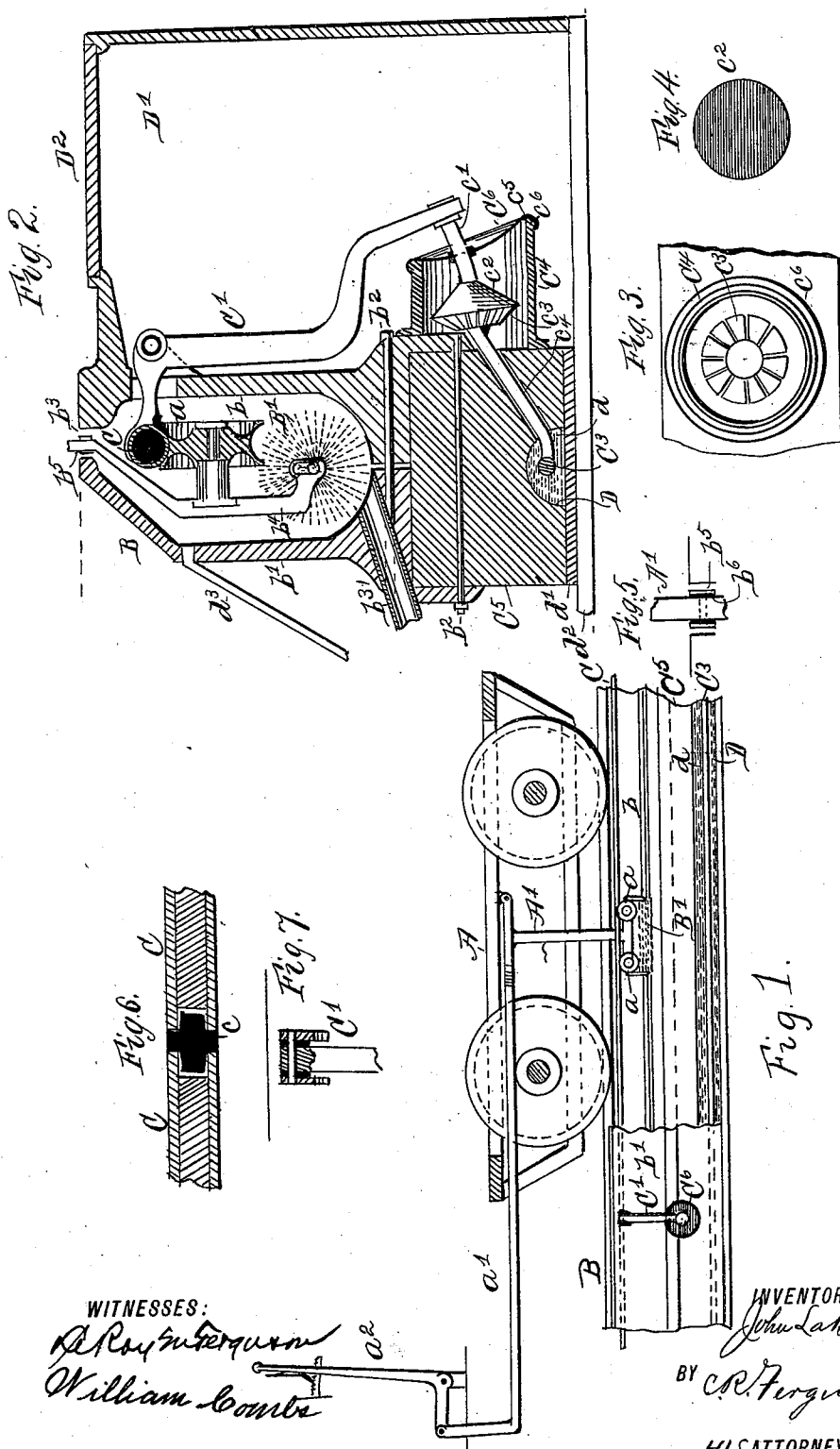


(No Model.)

J. LA BURT.
ELECTRIC RAILWAY SYSTEM.

No. 548,070.

Patented Oct. 15, 1895.



WITNESSES:
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ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 548,070, dated October 15, 1895.

Application filed June 26, 1894. Serial No. 515,748. (No model.)

To all whom it may concern:

Be it known that I, JOHN LA BURT, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric-Railway Systems, of which the following is a specification.

This invention relates to electric trolley-car systems of the kind having an underground conduit for the main-current wire.

In all underground systems that are known to me the conduit is arranged between the tracks or at one side thereof, and are thus an independent construction.

A main feature of my improvement is to so construct one of the tracks that it provides a conduit to receive a contact-line and also to receive the trolley connection between said contact-line and the motor of the car. Another feature is the means of isolating the main-current or live wire, so that it cannot be accidentally touched or tampered with or reached by snow and water.

Another feature resides in certain mechanism for making an electric connection between the main-current wire and contact-line; and the invention further consists in the construction and novel arrangement of parts, as hereinafter specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a system embodying my improvement, with certain parts broken away to better illustrate other parts and showing a portion of a truck. Fig. 2 is a cross-section, on an enlarged scale, of the track forming the conduit and showing the several parts for making the electrical connections. Fig. 3 is a face view of a certain contact-piece employed. Fig. 4 is a face view of a contact-piece which coacts with the contact-piece shown in Fig. 3. Fig. 5 is a detail showing a means of insulating the trolley-hanger from the track. Fig. 6 is a longitudinal section showing a means for connecting the ends of the sections forming the contact-line, and Fig. 7 is a detail showing a certain part as insulated from another part.

Referring by letter to the drawings, A designates a portion of a car-truck to which an

electric motor is to be attached; but it is not deemed necessary to show the motor in the drawings.

A' shows the trolley-rod or hanger, to the lower end of which is attached a trolley or trolleys *a*. At its upper end the rod or hanger A' is attached to, but insulated from, an operating-rod *a'*, having at one end a pivotal connection with the truck-frame and extended at the other end up through the car-platform, and to this end is attached a hand-lever *a''*.

B designates the conduit-track, consisting of two sections *b b'*, secured together by means of tie-bolts *b''*. There is a space or channel *b'''* between the upper or tread portions of the track-sections to admit the passage of the trolley-hanger. The lower inner surfaces of the track-sections are transversely inclined or rounded, as shown in Fig. 2, so that water and dirt will fall to the center. At suitable intervals along the track conduits *b'''* may be placed, leading from the conduit to a sewer or other discharge-place, so that water and dirt may be discharged from the conduit.

To facilitate the removal of water, dirt, and other matter, brushes may be attached to the trolley-hangers. I have here shown cylindric rotary brushes B', having trunnion-bearings in arms *b''*, depending from the trolley-hanger. The bearings in the arms *b''* are vertically elongated, so that the brush will not interfere with the movement of the trolley-hanger. The trolley-hanger at its portion coming directly within the slot *b'''* is provided with steel bearing-plates *b''*. Plates *b'''*, of insulating material, are placed between the trolley-hanger and the plates *b''*, so as to prevent conduction from the trolley-hanger to the track-sections.

C designates the contact-line, consisting, preferably, of tubular metal sections. If desired for stiffening, a core of wood or similar material may be placed in the tubular sections. The sections C are connected one to another at the ends by a joint of insulating material. I prefer to construct this joint so that there may be a vertical movement of one section C relatively to another, for a purpose hereinafter mentioned. In Fig. 6 I show a good form of joint. It consists of a plug *c* of insulating material, such as hard rubber, hav-

ing its ends tapered and inserted in the ends of the sections. In its central portion the plug has an annular shoulder portion against which the ends of the adjacent sections C
5 about.

The sections C may be of any desired length. It is preferable, however, to make them the length of a rail. Each section of the contact-line is supported by two or more rock-
10 levers C', which have their upper ends extended through openings in the webs of the track portions b. The rock-levers are pivoted in brackets extended from the rail-sections b. The rock-levers are insulated from
15 the track, as shown plainly in Fig. 7, by bushings of insulating material around the pivots and insulating-disks between the sides of the levers and the supporting-brackets.

At the lower end the rock-levers C' have
20 contact-plates C² attached to them. The plates C² are mounted on arms c', extended from the levers C', and are designed to engage with contact-fingers c³, which have electrical connection by means of stems c⁴ with
25 the main-current or live wire C³. The contact-fingers consist of an annular series of outwardly-turned strips of metal—copper, for instance—and both the parts c² c³ are located in a substantially water and moisture proof
30 boxing C⁴, secured to the wooden string-piece C⁵, upon which the track-sections are mounted. The arm c' of the lever C' has a spring-yielding longitudinal movement. As a means for providing this spring-yielding movement, I
35 make the front wall of the boxing of vulcanized but yielding rubber C⁶, having its edge secured to the end of the boxing. By referring to Fig. 2 it will be seen that the end wall C⁶ has an inwardly turned or flanged edge c⁵
40 to engage over an annular flange c⁶ on the boxing C⁴.

The main-current or live wire C³ is located within a longitudinal opening or groove D in the string-pieces C⁵, and to prevent water or dampness from contacting with the wire C³
45 I surround it within the opening D with a packing of waterproof and electric insulating material d. Rosin will answer for this material d. Underneath the string-piece C⁵ is a
50 planking d', and this planking may rest on cross-ties d². If desired, at suitable intervals brace-rods d³ may extend from the track-section to the ties. It is desirable to locate the connections between the line-wire and the
55 contact-line within manholes D', which have covers D² at the street-surface.

The operation is as follows: It is to be understood that the trolley-hanger is to have electric connection with the motor and that
60 the track opposite the conduit-track or a wire connected therewith will serve for the return current. By bringing the trolley against a section of the contact-line C the said section will be elevated so that the levers C' will be
65 rocked to place the contact-plates c² of the section in electrical engagement with their

contact-fingers c³, thus closing the circuit from the main-current wire to the motor. The construction of the joints between the sections C will allow the elevation of the section being acted upon above the adjacent
70 sections, both front and rear, so that said adjacent sections will not be electrically charged, excepting when the trolley is in connection with them, as before described.

It will be seen in my invention that the main-line wire is wholly out of the reach of personal contact, so that no harm can result therefrom, and no shock or current can be received from the contact-line, excepting from
80 the section in engagement with the motor.

Having described my invention, what I claim is—

1. In an electric railway system, the combination of a track section and a section at one
85 side thereof forming the walls of a conduit, a contact line in said conduit, rock-levers supporting said contact line and having insulated pivotal connection with the track section, contact plates carried by the lower portion of said rock levers, a main conductor
90 located outside the conduit, and the contact pieces having connection with the conductor, substantially as specified.

2. In an electric railway system, the combination with a track forming a wall of a conduit, and means for supplying an electric current, of a trolley hanger extended into said conduit, arms depending from the trolley hanger and having vertically elongated bearings, and a cylindric rotary brush having
100 trunnion bearings therein, substantially as specified.

3. For an electric railway system, a track section, and a section at one side thereof forming the walls of a conduit for an electric contact line, a string piece to which said conduit sections are secured, a main wire located in said string piece and connections comprising
110 rock levers pivoted to the track sections, and contact plates between said main wire and contact line, substantially as specified.

4. In an electric railway system, the combination with a track and a section adjacent thereto forming a conduit and a main conductor located outside of said conduit, of contact pieces having connection with said conductor, a contact line in the conduit, rock levers having pivotal connection with said track and supporting said contact line, at
120 their upper ends and contact plates supported by the lower ends of said levers, and adapted to engage with the contact pieces which have connection with the main conductor, substantially as specified.

5. In an electric railway system, the combination with a track and a section adjacent thereto forming a conduit of a contact line in said conduit, a main conductor isolated from and below the conduit, the rock levers having
130 pivotal connection with the track and supporting the contact line, the contact plates

carried by the levers and the contact fingers having connection with the main conductor, substantially as specified.

6. The combination with the track, the contact line and the main conductor, of the rock levers, the contact plates on arms extended from the levers, the boxings, the outer walls thereof of spring or yielding material and the annular series of contact fingers, substantially as specified.

7. In an electric railway system, the combination of a contact line consisting of sections, rock-levers for supporting said contact-line, a main conductor isolated from said contact-line, contact pieces extended from the main conductor and consisting, each, of an annular row of resilient fingers and contact

plates carried by the rock-levers for engaging with the first named contact pieces, substantially as specified.

8. In an electric railway system, a contact line consisting of sections and joints for said sections consisting of plugs of insulating material having tapered portions extended into the sections whereby there may be a swinging movement of one section relatively to another, substantially as specified.

Signed at New York, in the county of New York and State of New York, this 25th day of June, A. D. 1894.

JOHN LA BURT.

Witnesses:

CLARENCE R. FERGUSON,
WM. F. Z. DESANT.