

(No Model.)

3 Sheets—Sheet 1.

C. D. JENNEY.
CONDUIT ELECTRIC RAILWAY.

No. 523,146.

Patented July 17, 1894.

Fig. 1.

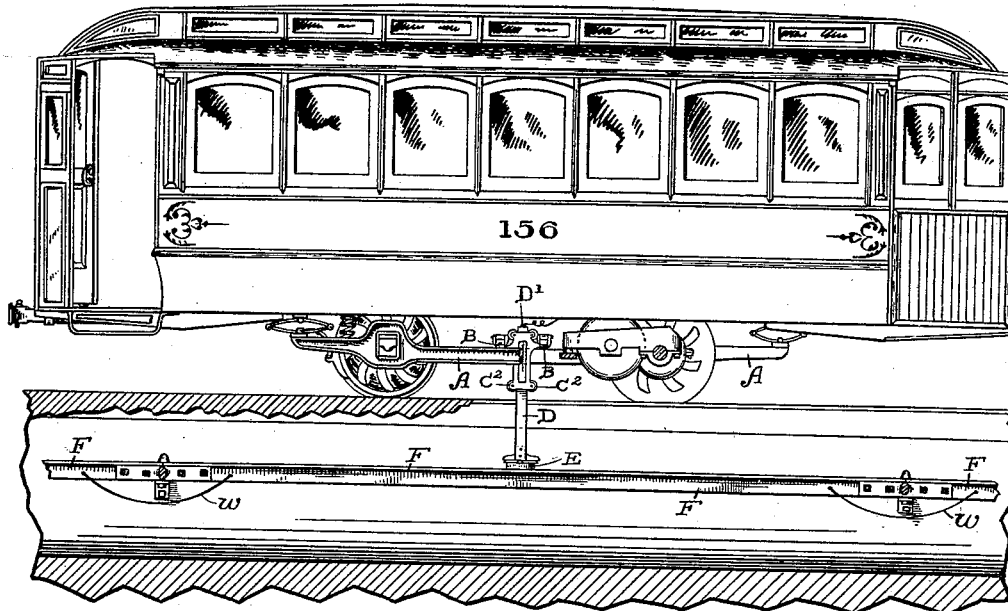
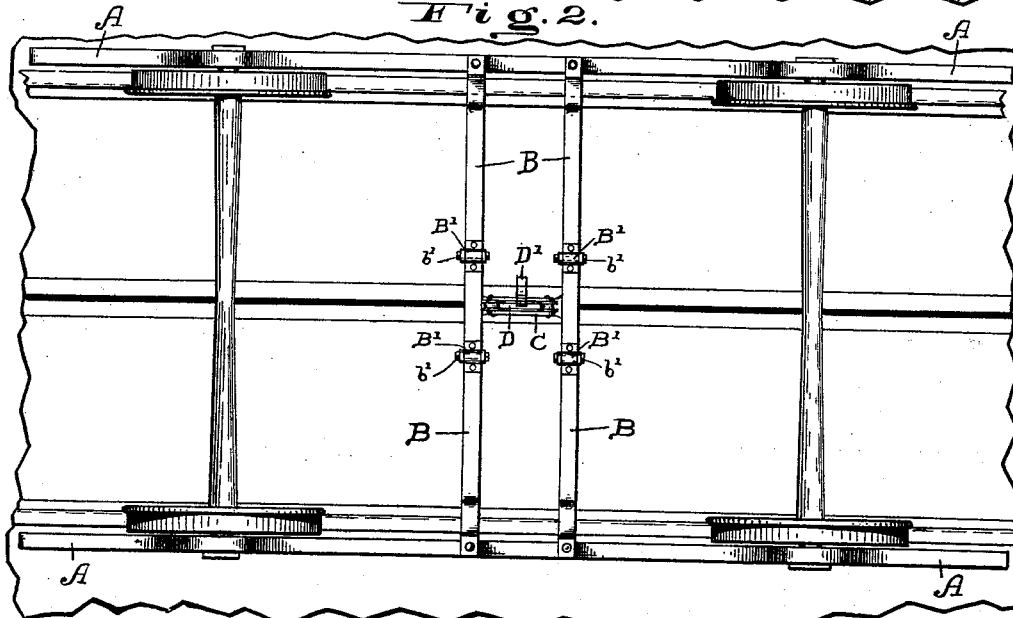


Fig. 2.



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(No Model.)

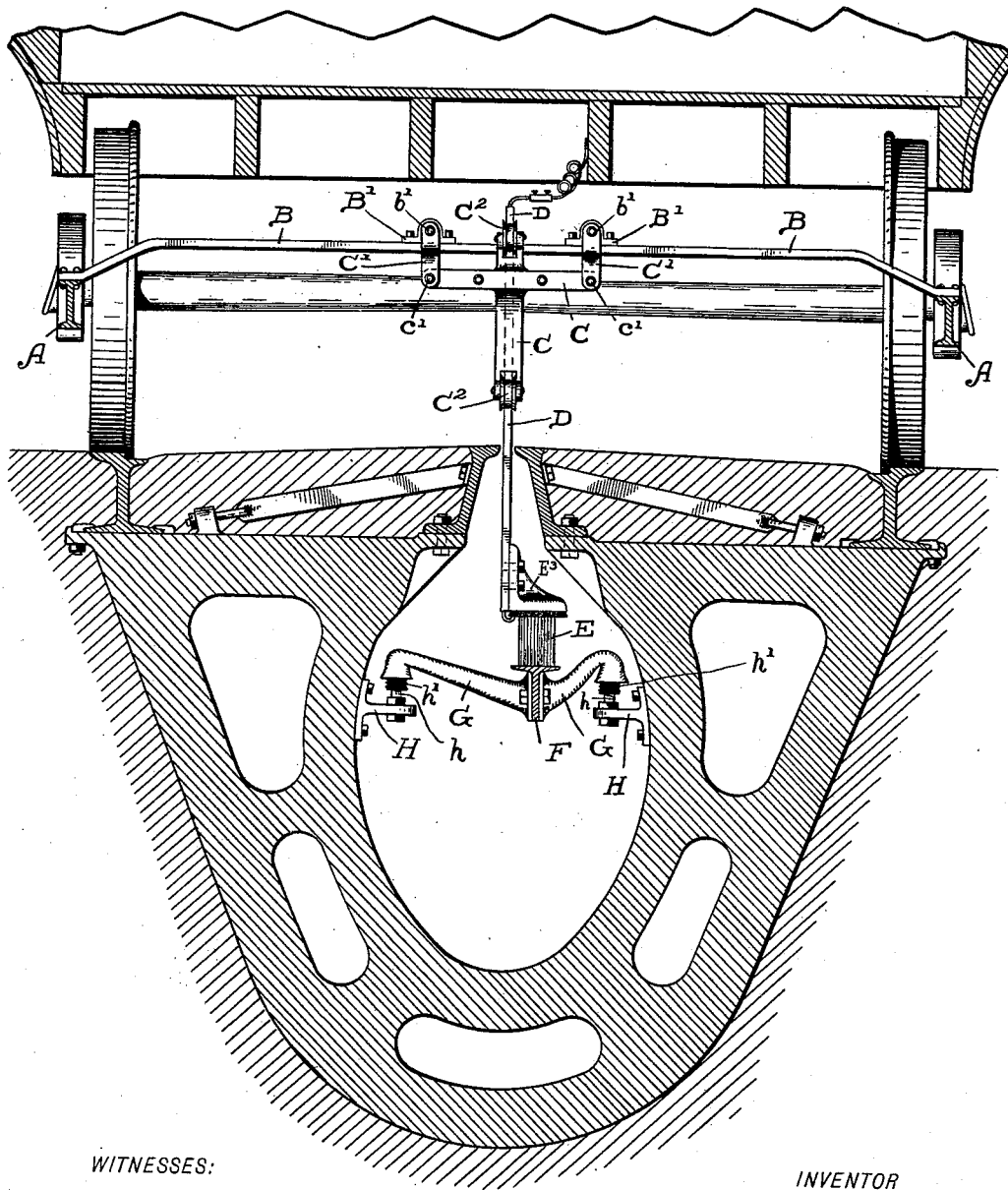
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Fig. 3.



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Fig. 4.

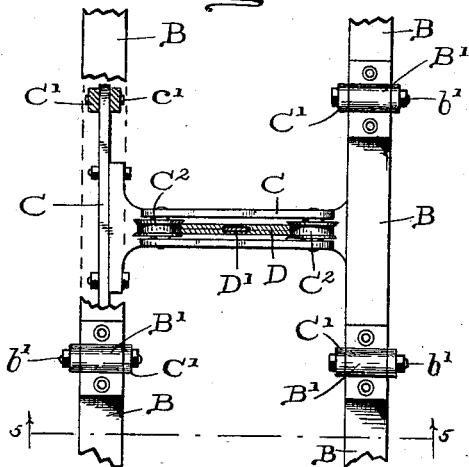


Fig. 5.

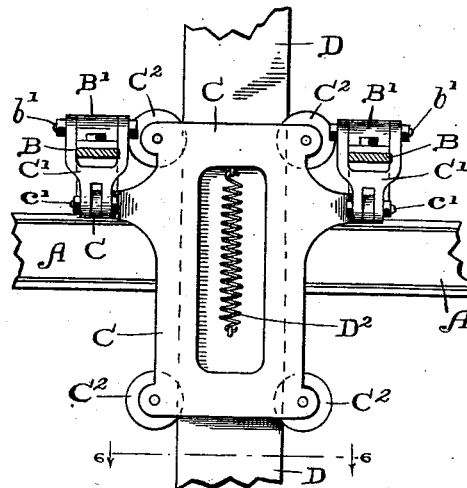


Fig. 6.

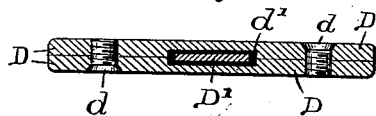


Fig. 7.

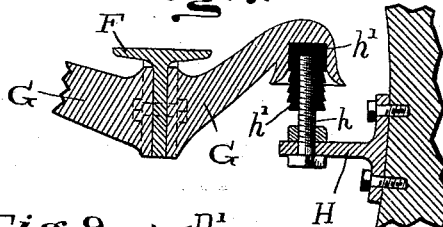


Fig. 8.

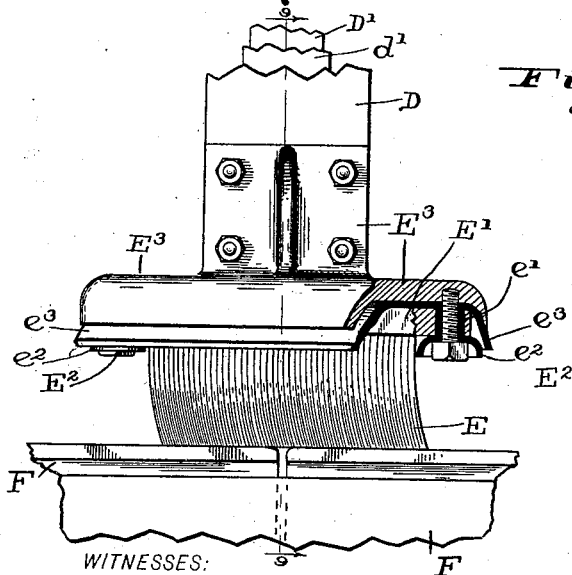
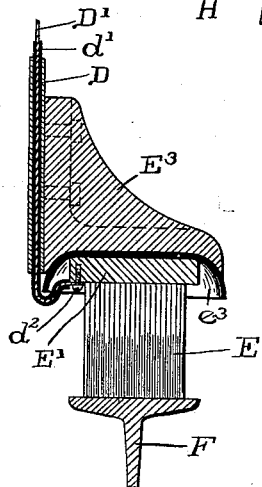


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES D. JENNEY, OF INDIANAPOLIS, INDIANA.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 523,146, dated July 17, 1894.

Application filed March 5, 1894. Serial No. 502,342. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. JENNEY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Conduit Systems for Electric Railways, of which the following is a specification.

My said invention relates to that class of electric railways in which a conduit is provided similar to such as are provided for cable railways; and it consists in certain novel constructions whereby such a railway is produced having a high degree of efficiency combined with durability and economy of operation. Said invention will be first fully described, and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of an electric car having my improved apparatus attached thereto, and showing also the conduit construction in central longitudinal section, a portion of one side of the running gear of the car being broken away; Fig. 2 a top or plan view of the running gear, on an enlarged scale; Fig. 3 a transverse sectional view, on a still further enlarged scale, of the running gear and the conduit; Fig. 4 a top or plan view of the central portion of the apparatus, said view being similar to a portion of Fig. 2, on an enlarged scale; Fig. 5 a side elevation of the apparatus shown in Fig. 4, as seen from the dotted line 5 5; Fig. 6 a transverse sectional view of the rod or bar which extends down into the conduit, on a still further enlarged scale; Fig. 7 a sectional view of one of the insulated rail supports used for supporting the rail in the conduit; Fig. 8 a side elevation of the brush resting upon the conductor rail, on an enlarged scale, and Fig. 9 a transverse sectional view of the same.

In said drawings the portions marked A represent the frame of the ordinary running gear of an electric car; B transverse bars secured thereon; C a frame supported upon said bars by means which will be presently described; D the conductor bar, supported upon said frame and extending down into the conduit; E the brush on the lower end of

said bar; F the rail or conductor in the conduit; G arms supporting the rail, and H brackets supporting the arms.

The frame A is in itself of an ordinary construction, and carries the car body, the motor, and other appliances, in a usual and well known manner, and therefore need not be further described herein, except incidentally in describing the other parts.

The transverse bars B are bolted firmly to the side rails of the frame A, and extend across the car and support the frame and mechanism by which the bar D is carried and guided in its movements.

The frame C is of a peculiar construction, and is carried by hangers C' from pivot bolts b' resting in bearings B' upon the bars B, being secured to the lower ends of said links by pivot bolts c'. By means of these links and pivots this frame is permitted to swing sideways, and thus accommodate the bar D, which is carried thereby, to the oscillation of the car. There being four of the bearings B', however, which are secured rigidly to the bars B, the frame is prevented from yielding appreciably in the other direction. The bearings of the pivot bolts b', being comparatively long, are of service in securing this last mentioned result. Said frame is provided with four anti-friction trucks C² which form the bearing for the bar D. While there is little if any strain on more than two of these trucks at any one time, I prefer to provide four of them, both for steadiness, and for the reason that the car sometimes runs in the reverse direction, which would bring the two not commonly of great service into active operation.

The conductor bar D I prefer to make of a peculiar construction, consisting of two smaller bars having channels in the middle portions of their flat surfaces on one side, and which may be secured together by machine screws d, or rivets, or otherwise. In the opening thus formed I place the conductor strip or wire D', and surround the same with insulating material d', as shown most plainly in Fig. 6. The conductor is thus not only well insulated, but provided with a strong armor or shield, and is situated at the point in the main bar D where it is least likely to be injured by the wear on the bar, or by blows or rough usage of any kind. As this bar and the

conductor and the brush carried thereby are of greater weight than it is desirable shall rest upon the brush points, I support said bar by springs D^2 attached at one end to the bar, and at the other end to the frame C, as shown in Fig. 5. The conductor D' in the bar D is connected at its upper end to the motor, and at the lower end to the brush E by means of binding screws d^2 .

10 The brush E, properly speaking, consists of metal bristles secured in an appropriate head-piece E' and resting upon the track F. This head-piece is secured by means of insulated bolts E^2 to a bracket E^3 , which in turn is bolted to the bar D, a sheet of insulating material e^3 being interposed between the parts E' and E^3 , with an insulating washer e^2 between the bolt E^2 and the head-piece E' , and an insulating sleeve e' within the perforation through the head-piece E' and surrounding the bolt E^2 . The insulating parts e^3 and e^2 are each of an inverted cup-shaped formation, so as to more efficiently shed the water which may fall on the structure from above.

25 The conductor rail F is formed of sections of T-iron suitably supported, and the various sections are electrically connected by flexible conductor strips or "bond wires," w , as shown in Fig. 1, said sections being separated slightly at their ends to provide for expansion and contraction;—this being permitted by the flexibility of the conductor strips which unite them. The upper surface of these conductor rails is broad, and substantially flat, so as to afford an ample surface for the brushes to bear upon during all the various movements and swayings of the car, at switches and curves, as well as where the road is uninterrupted and straight, and the brush themselves are of considerable length, so as to pass the joints between the sections of conductor rail without appreciable jar or interruption, being intended to bridge said joints easily, as indicated most plainly in Fig. 8. Said rails being of ample size, ordinary iron or steel may be used, instead of the more expensive copper wire commonly used for electrical conductors in street railway construction. These rails are placed in any suitable underground conduit; and I have illustrated in Fig. 3 a conduit similar to that used in cable railway construction, although, of course, any other suitable construction may be employed in carrying out my invention.

55 The arms G extend from suitable supports at the sides of the conduit inwardly to the point where the rail F is positioned, which is usually nearer one side of the conduit than the other, both for convenience in construction and to remove the rail from directly under the slot, and thus out of the way of drippings from the street. These arms incline upwardly from the rail toward each side, in order that no moisture may run along them toward the insulation upon which they are mounted. At the ends they have cavities in the under side, with flaring or bell-shaped

mouths, the better to shed moisture and protect the insulation therefrom, as shown in Figs. 3 and 7.

70 The brackets H are secured to the sides of the conduit in any desired manner which is sufficiently firm and rigid to support the rail structure, by means of bolts or otherwise, as may be desired. Upon the projecting ends of these arms are upwardly projecting points h , which are provided with insulating caps h' , which fit directly into the cavities in the under sides of the arms G. These insulating caps, upon the outside, are surrounded with a series of corrugations, preferably level upon the under side and inclined upon the upper side, which is a form well adapted to shed moisture, and also increases the surface on the outside, over which a current would have to travel in passing from one metal part to another, and thus the insulating capacity is increased, in proportion to the size of the caps, over that of plain caps.

85 As will be seen, my construction is all very strong, simple and durable, and not liable to get out of order, while leakage of electric current is guarded against at every point, and at the same time the necessary oscillation of the conductor running from the car to the conductor rail is amply provided for during all the various movements of the car.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an electric railway system, of the frame C supported on swinging links, whereby it is enabled to swing freely in one direction, and provided with the flanged trucks between which the conductor bar is placed, and said conductor bar, substantially as set forth.

2. The combination, in a conduit electric railway system, of a conductor bar mounted to permit a vertical movement, a frame-work carrying said conductor-bar and capable of a lateral movement, and springs attached to said bar and to said frame and operating to support or carry a portion of the weight of said bar, substantially as shown and described.

3. The combination, in an electric railway system, with the conductor bar leading from the car structure, of the conductor rail within the conduit, arms leading from said conductor rail toward the sides of the conduit, brackets upon the sides of the conduit, and an insulated connection between said brackets and said arms.

4. The combination, in an electric railway system, of the conductor bar leading from the car structure into the conduit, the conductor rail in said conduit, and insulating arms supporting said rail, and leading at an upward inclination from said rail toward the sides of the conduit, where they are supported, substantially as set forth.

5. The combination, in a conduit electric railway system, of the conduit, the conductor rail located therein to one side of the center

of said conduit, and insulated arms supporting said rail from the sides of the conduit, substantially as set forth.

6. The combination, in a conduit electric railway system, of the conduit, the conductor rail located therein, the arms G leading from said conductor rail toward the sides of the conduit at a proper inclination, and having bell-shaped sockets in the under side of their ends, brackets secured to the sides of the conduit, upwardly extending points on said brackets, and insulating material surrounding said points and fitting into the sockets on the under sides of the ends of the arms, substantially as set forth.

7. The combination, in a conduit electric railway system, of a conductor rail situated in a conduit and having a broad substantially flat top, metallic supports extending

from said conductor rail, said supports being insulated from the conduit structure, a car structure including the motor, a conductor bar leading from the car structure to the rail and provided with a contact device on its lower end, and a swinging or yielding support for said conductor bar carried by the car structure, whereby contact between the contact device on the lower end of the conductor bar and the upper flat surface of the conductor rail may be maintained notwithstanding the vibrations or oscillations of the car in use.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 28th day of February, A. D. 1894.

CHARLES D. JENNEY. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.