No. 668,710. Patented Feb. 26, 1901.

G. H. DAVIS.

ELECTRIC RAILWAY.

(Application filed Sept. 15, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

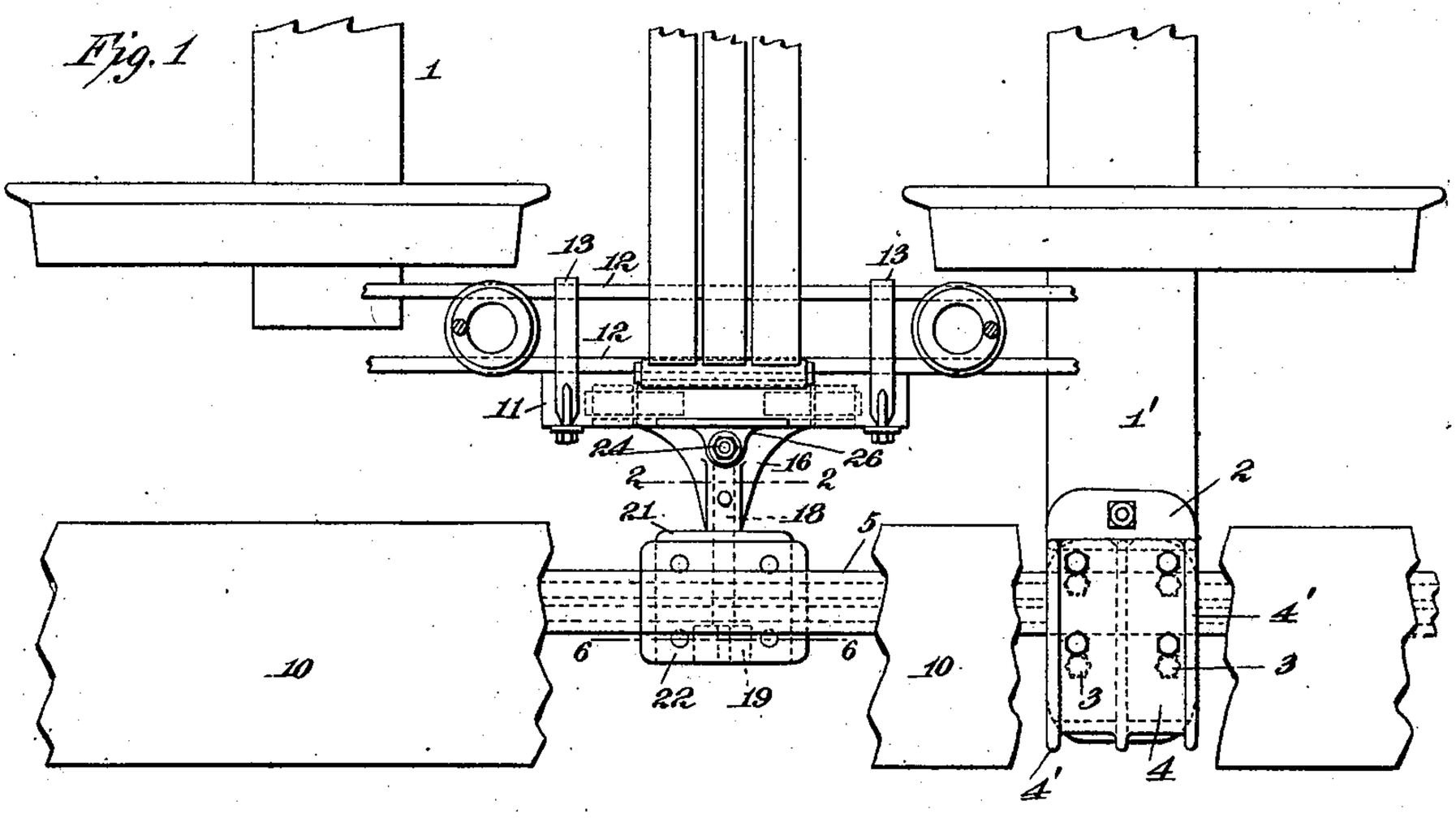
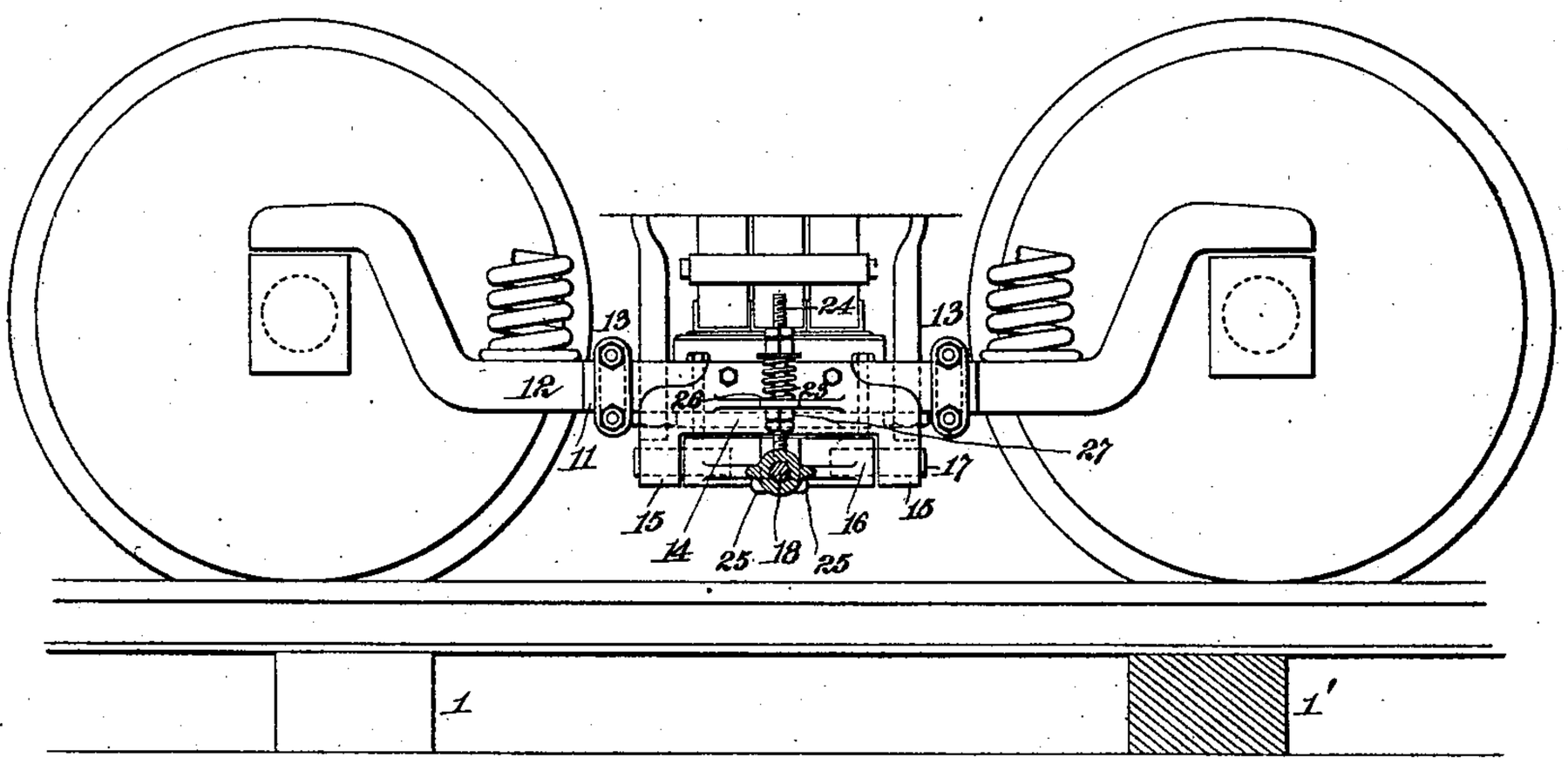


Fig. 2



Witnesses:

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Fig. 3

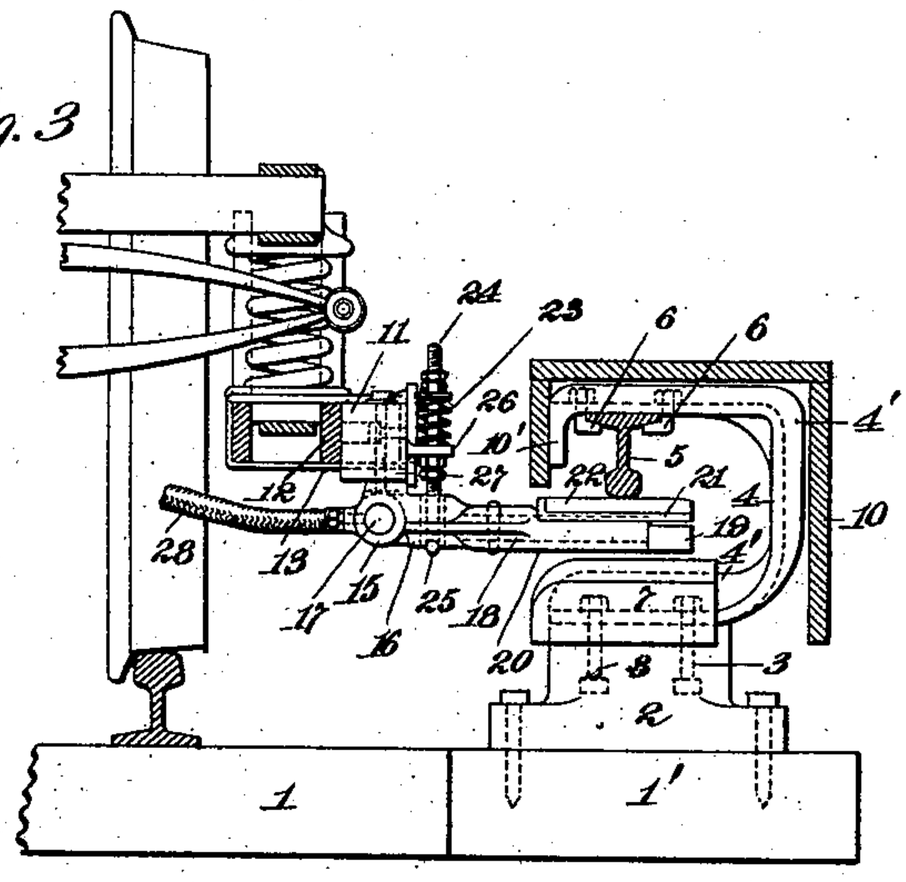


Fig. 4

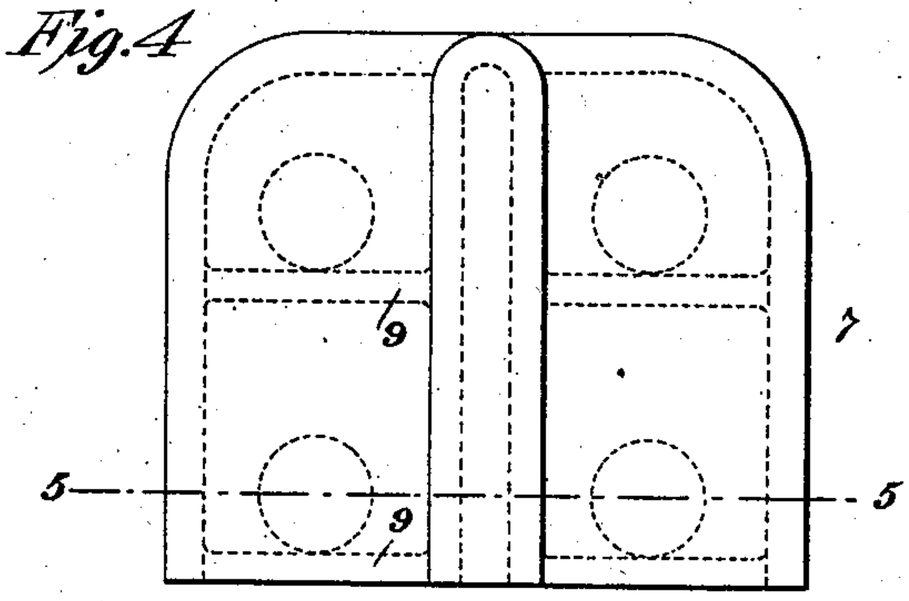


Fig. 5

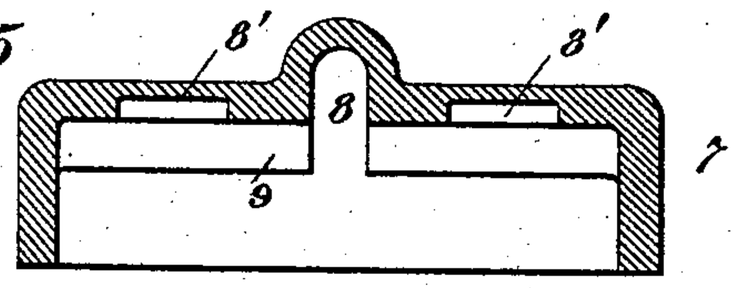
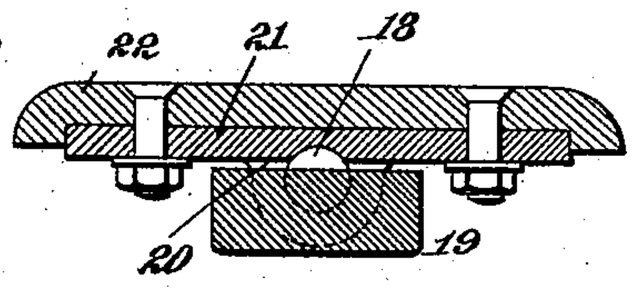


Fig. 6



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UNITED STATES PATENT OFFICE.

GEORGE H. DAVIS, OF NEW YORK, N. Y., ASSIGNOR TO FRANK R. FORD, GEORGE W. BACON, AND GEORGE H. DAVIS, OF SAME PLACE.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 668,710, dated February 26, 1901.

Application filed September 15, 1900. Serial No. 30,196. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. DAVIS, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented a certain new and useful Improvement in Electric Railways, (Case A,) of which the following is a description.

My invention relates to improvements in electric railways which are operated on exclusive rights of way—as, for instance, in underground tunnels and elevated structures; and the invention relates more particularly to an improved manner of mounting the working conductor adjacent to the way and to features of novelty in the construction and operation of the current-collecting devices carried by the car or truck and coöperating with the working conductor.

My object generally is to provide an electric railway of the third-rail type possessing all the advantages of systems of that character so far as concerns economy of construction, solidity, and durability in operation and ease of repair, while at the same time with my system I conceal the working conductor to practically the same extent as in those systems employing slotted conduits, and hence overcome the danger now inherent in third-rail systems of persons accidentally engaging the working conductor to receive a charge therefrom.

A further object of the invention is to provide and produce an improved support for the current-collecting shoe which will permit the latter to coöperate with the working conductor with the greatest possible degree of efficiency.

In order that my invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan, partly broken away, of a part of a car-truck equipped with my improvements and coöperating with the working conductor. Fig. 2 is a section on the line 2 2 of Fig. 1, showing the truck in elevation. Fig. 3 is a cross-sectional view. Fig. 4 is a top view of one of the caps for protecting and insulating the feet of the brackets which carry the working conductor. Fig. 5 is a section on the line 5 5 of Fig. 4, and Fig. 6 is a section on the line 6 6 of Fig. 1.

In all of the above views corresponding parts are represented by the same numerals of reference.

1 represents the ties, some of which are extended, as shown at 1′ in Fig. 3. Assuming the ties to be spaced about two feet between centers, every fifth tie may be conveniently extended, as shown, to form a support for the insulated pedestals which carry the brackets for the working conductor. These pedestals 2 may be of the form shown and are bolted or otherwise secured in place to the extended portions 1′ of the ties. Any suitable insulating material may be used in the manufacture of these pedestals; but they are preferably made of "reconstructed granite," technically so called. Molded into the pedestals are bolts 3, by means of which brackets or hangers 4 can be rigidly secured to the top of each pedestal, as shown. Each of these brackets or hangers is made essentially U-shaped, and in order to be properly stiffened it may be formed with ribs 4′, as is common in metal rolling and casting. Secured to the under side of the several hangers or brackets is a working conductor 5, made, preferably, of mild steel. In order to secure maximum insulation and economy of construction, the brackets or hangers, as stated, are preferably spaced as far apart as practicable, and hence it is desirable to employ a working conductor possessing considerable vertical rigidity. To this end I preferably employ a working conductor of the form shown—namely, that of an ordinary T-rail supported in an inverted position, the tread of such rail offering a wide surface for engagement with the contact-shoe and being sufficiently thick to withstand great wear. The working conductor 5 is secured to the brackets or hangers in any suitable way, as by means of clips 6 of a common form. There being preferably no insulation between the working conductor and the hangers or brackets, the latter will be necessarily charged, and hence if exposed might be a source of dan-

ger. I prefer, therefore, to cover the foot or lower limb of each bracket with a cap 7, cast with a channel 8, which fits over the rib 4′, and with recesses 8′, into which the nuts of the bolts 3 are received. Said cap may also be cast with parallel ribs 9, adjacent to the recesses 8′, in order that the cap may not work loose even if by reason of vibration it were dislodged from the bolts. The caps are made of any suitable insulating material, but preferably, also, of reconstructed granite, owing to the cheapness, tensile strength, insulating properties, and durability of that material. In order to effectively cover, conceal, and protect the working conductor, I employ a continuous housing 10, which is made generally trough-shaped, as shown, and which is inserted in place over the brackets and retained in position by its weight. The short side of this housing may bear against the projection 10′, formed integrally with the upper leg of each bracket or hanger, as shown. The housing 10 is made of some suitable insulating material, preferably of creosoted wood. It will be seen that the construction and mounting of the working conductor provide for great economy of material, great strength and rigidity in use, and substantially complete protection for the conductor.

Referring now to the construction and manner of mounting the contact-shoe, I illustrate in the accompanying drawings the carrying of these elements from the equalizing-bar of a car-truck of common form, as is desirable, since the relation between the equalizing-bar and the working conductor remains practically unchanged in use. It will be understood, however, that the contact-shoe may be supported from other parts of the car or truck without departing from the spirit of the invention.

11 represents a block, preferably of wood, secured to the side of the equalizing-bar 12 by means of brackets 13. Bolted to the bottom of the insulating-block 11 is a plate 14, formed with ears 15, as shown. A cast arm 16 is mounted in gimbals 17 within said ears, so as to be capable of tilting vertically. The arm 16 is bored out horizontally for the reception of a bearing-pin 18, bent or otherwise secured in place, said bearing-pin being formed with a rectangular head 19, arranged below the center of the bearing-pin, as shown. Mounted upon the bearing-pin, between the head 19 and the end of the arm 16, is a sleeve 20, which is cast with a plate 21, to which the contact-shoe 22 is bolted or otherwise secured, said shoe being made, preferably, of soft cast-iron, so as to minimize the wear on the working conductor. The under surface of the plate 21 is in a plane slightly above the top of the head 19 of the bearing-pin, so that the sleeve 20 may tilt slightly on the bearing-pin to permit the contact-shoe 22 to accommodate itself to any small irregularities in the inclination of the working conductor with respect to the way. At the same time the contact-shoe will not be permitted to depart materially from its normal horizontal position, so as not to interfere with the proper engagement with the working conductor in case of a break in the latter, as in crossings, turnouts, &c. In order to maintain the contact-shoe 22 in its proper engagement with the working conductor, I employ a spring for normally impelling the same upward. This spring 23 is coiled around a threaded rod 24, which passes through the arm 16 and is formed on its lower end with horizontal lugs 25, engaging the bottom of said arm. The lower end of the spring 23 is supported by an ear 26, which is secured to the front of the block 11. A pair of lock-nuts 27 are threaded on the rod 24 below the ear 26, so as to limit the upward movement of the shoe, as will be obvious. In this way the shoe will be prevented from being forced too far above the plane of the working conductor in case of a break in the latter.

The construction described permits a very satisfactory and flexible support for the contact-shoe, as will be obvious. The pivoting of the shoe with respect to the gimbals 17 permits it to accommodate itself to slight differences in the vertical height of the working conductor with respect to the ties. The mounting of the contact-shoe on the bearing-pin allows the former to adjust itself to irregularities in the inclination of the working conductor. Finally, by employing a shoe having a considerable lateral width provision is made for the accommodation of any variations in the distance between the way and the working conductor.

In the drawings I illustrate a conductor 28, which connects the arm 16 with the usual motor or motors.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In an electric railway, the combination with the way, of a plurality of insulating supports or pedestals extending along the line of the way, a metallic hanger or bracket having horizontal bottom and top members and a vertical side member carried by each pedestal, a working conductor supported directly in an inverted position from the horizontal top members of said brackets, and a housing or casing removably carried by said brackets for substantially inclosing the working conductor, as and for the purposes set forth.

2. In an electric railway, the combination with the way, of a plurality of hangers or brackets carried on insulated supports and arranged parallel with the way, each bracket having a lower and an upper member, a working conductor secured to the upper members of said hangers or brackets and maintained in an inverted position whereby a contact-shoe will make underneath contact therewith, and an insulating-cap covering the bottom member of each bracket, substantially as set forth.

3. In an electric railway, the combination

with the way, of a plurality of hangers or brackets carried on insulated supports and arranged parallel with the way, each bracket having a lower and an upper member, a working conductor secured to the upper members of said hangers or brackets and maintained in an inverted position whereby a contact-shoe will make underneath contact therewith, and an insulating-cap covering the bottom member of each bracket, said cap being held in position by its weight and being formed with ribs which engage behind the bolts for securing the hanger or bracket in position, substantially as set forth.

4. In an electric railway, the combination with the way, a car movable thereon and a working conductor extending parallel with the way, of an arm carried by the car on horizontal pivots, so as to be movable toward and away from the working conductor, a contact-shoe carried by said arm on horizontal pivots extending at right angles to the pivots of said arm, whereby said contact-shoe automatically adjusts itself to variations in the longitudinal plane of said working conductor, and means for maintaining the contact-shoe in engagement with the working conductor, substantially as set forth.

5. In an electric railway, the combination with the way, a car movable thereon and a working conductor extending parallel with the way, of an arm carried by the car on horizontal pivots, so as to be movable toward and away from the working conductor, a contact-shoe carried by said arm on horizontal pivots extending at right angles to the pivots of said arm, whereby said contact-shoe automatically adjusts itself to variations in the longitudinal plane of said working conductor, and a spring for normally impelling the arm upward to maintain the shoe in engagement with the conductor, substantially as set forth.

6. In an electric railway, the combination with the way, a car movable thereon, and a working conductor extending substantially parallel with the way, of an arm carried by the car on horizontal pivots, a contact-shoe pivoted to said arm and engaging the under side of the working conductor, a spring for normally impelling the arm upward to maintain the shoe in engagement with the conductor, and means for limiting the oscillating movement of the contact-shoe with respect to said arm, substantially as set forth.

7. In an electric railway, the combination with the way, a car movable thereon, and a working conductor arranged parallel with the way, of an arm carried by the car on horizontal pivots, a spring for impelling said arm normally upward, a bearing-pin carried by said arm and having a rectangular head, and a contact-shoe mounted on said bearing-pin and adapted to be limited in its oscillating movements thereon by said head, the contact-shoe being maintained in engagement with the working conductor by the tension of said spring, substantially as set forth.

This specification signed and witnessed this 6th day of September, 1900.

GEORGE H. DAVIS.

Witnesses:
FRANK L. DYER,
JNO. R. TAYLOR.