

No. 798,368.

PATENTED AUG. 29, 1905.

S. B. STEWART, JR.  
THIRD RAIL CONTACT SHOE.  
APPLICATION FILED MAY 5, 1904.

Fig. 1.

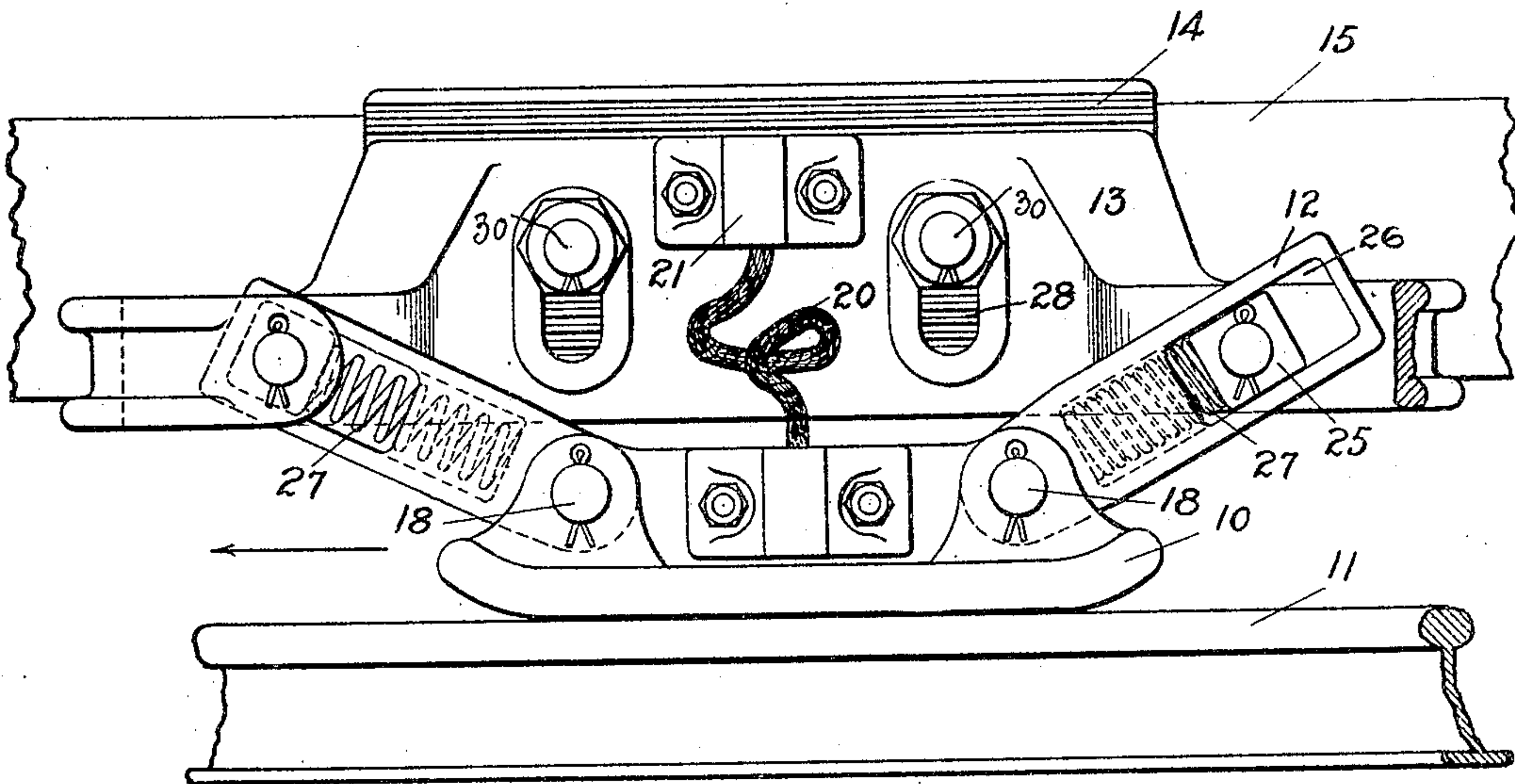
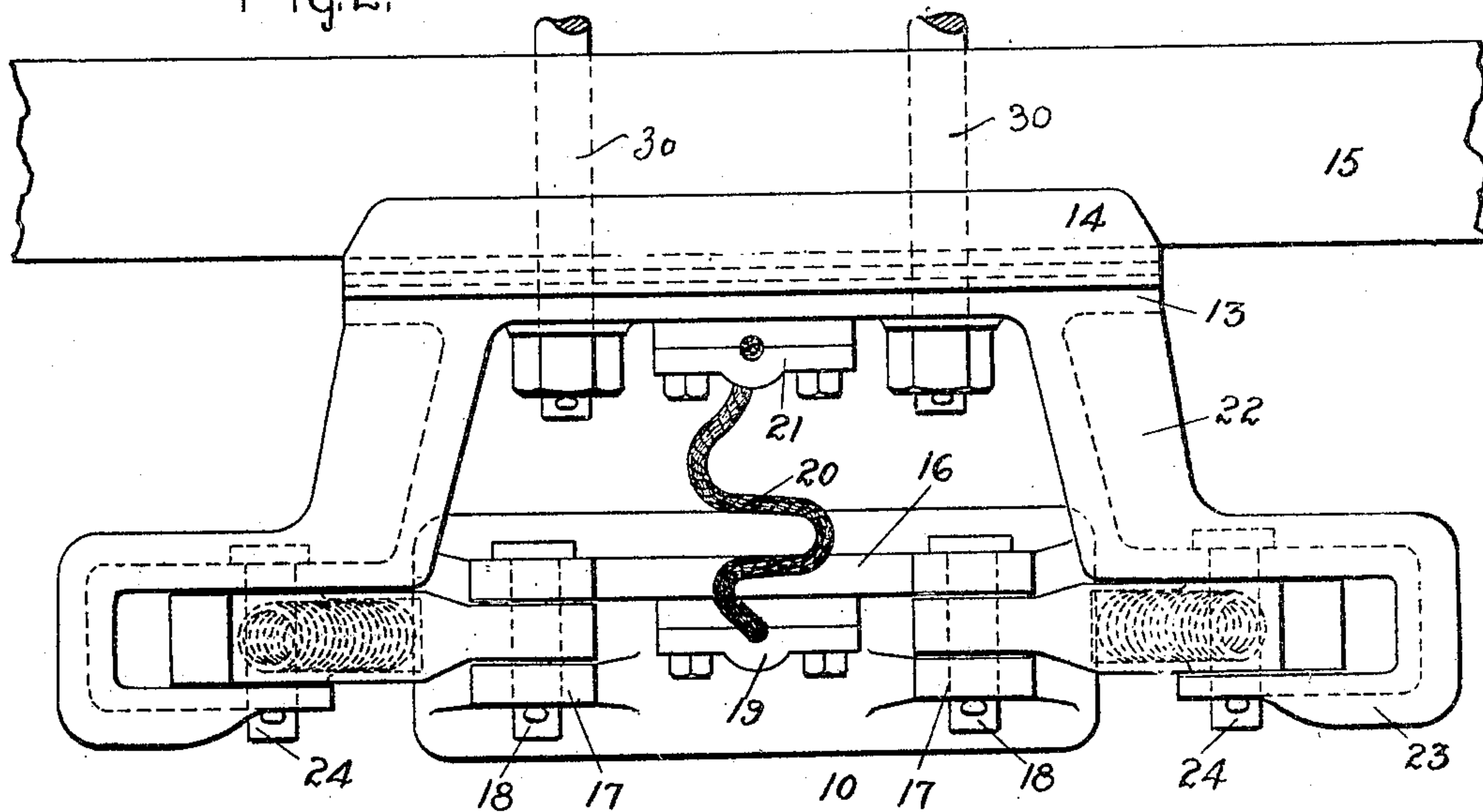


Fig. 2.



WITNESSES:

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Att'y.



# UNITED STATES PATENT OFFICE.

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## THIRD-RAIL CONTACT-SHOE.

No. 798,368.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed May 5, 1904. Serial No. 206,475.

*To all whom it may concern:*

Be it known that I, SAMUEL B. STEWART, Jr., a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Third-Rail Contact-Shoes, of which the following is a specification.

My invention relates to collectors or contact-shoes of the type employed in electric railways having a third-rail conductor arranged parallel to the track-rails with which the shoe is adapted to contact to collect current for the operation of the motors on the car.

The object of my invention is to provide an efficient and structurally simple contact-shoe which will not be affected by slight irregularities in the third rail or by obstructions thereon and which will operate satisfactorily under varying conditions of service. This object is obtained by mounting the contact-shoe so that it will have a vertical movement and a horizontal movement relative to the frame and then combining therewith a novel spring mechanism by which the contact-shoe is pressed downward into engagement with the rail and by which any longitudinal thrust on the shoe is transmitted to and taken up by the springs. This mechanism in the present embodiment of the invention comprises obliquely-arranged spring-links which constitute connecting means between the shoe and its supporting-frame.

The character of the invention will more fully appear upon reference to the following description, taken in connection with the accompanying drawings, in which I have shown one embodiment of my invention, and the scope of the invention will be specifically set forth in the appended claims.

In said drawings, Figure 1 is a side elevation of the collector-shoe shown in operative position upon the third rail, and Fig. 2 is a plan view of the same.

Referring in detail to the drawings, 10 designates the collector-shoe, which is adapted to run on the upper side of the rail 11. The ends of the shoe are connected by slotted links 12 to the supporting-frame 13, which in turn is adjustably mounted upon a plate 14, fixed to the shoe-beam 15, adapted to be mounted on a car-truck. For this purpose the collector-shoe is provided on its upper

side with a rib 16 and lugs 17, to which the lower ends of the links 12 are secured by pins 18. The web also carries a clamp-connector 19 for the lower end of the flexible conductor 20. The upper end of the conductor is secured by a similar connector 21 to the outer face of the supporting-frame 13. Thus good electrical connection is established between the shoe 10 and the supporting-frame 13. The circuit, including the flexible conductor, is completed through the plate 14 and therefrom to the motors by any suitable conducting means.

The frame 13 is provided at its opposite ends with outwardly-projecting arms 22, which terminate in U-shaped projections 23. The upper ends of the links 12 extend between the arms of the projections 23, and pins 24 extend between said arms through blocks 25, which are free to move longitudinally of the slots 26 in said links. The portions of the links 12 adjacent to the pins 18 are socketed for the reception of coiled compression-springs 27, which bear at their upper and outer ends against the blocks 25. In order to adjust the collector-shoe with reference to the rail 11, so as to accommodate it to service with third rails of different heights from the road-bed, the frame 13 is made adjustable upon the plate 14. For this purpose the contacting faces of the plate 14 and frame 13 are roughened, and clamping-bolts 30, which extend through the slots 28 in the frame 13, are provided.

In the construction which I have disclosed herein the shoe is positively held against the rail with considerable pressure by the springs 27, so that I am enabled to employ a relatively light contact-shoe. In addition to forcing the contact-shoe into intimate engagement with the rail the springs also permit a slight longitudinal movement of the shoe and act as buffer-springs to take up the shock incident upon striking irregularities in the rail. It will also be noted that if the shoe is moving in the direction indicated by the arrow in Fig. 1 the rear spring acts to take up this longitudinal movement and to force downward with great pressure the rear portion of the contact-shoe, while the forward spring performs no function except to force the shoe still more strongly rearward and by a very slight component to force the forward part of the shoe into contact with



the rail. Thus the forward part of the shoe, which is that which would first meet any irregularity in the rail, is permitted to ride readily over such irregularity and is prevented from biting into the rail, while the rear portion is forced downward against the rail, so as to give a good electrical contact.

It will be apparent that variations may be made in the structure illustrated without departing from the spirit and scope of my invention. I therefore do not wish to be limited to the specific matter disclosed, but aim to cover by the terms of the appended claims all such variations.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A collector-shoe for a third-rail electric railway, a supporting-frame in which said shoe is mounted so as to have a vertical movement and a horizontal movement relative to the frame, and springs acting under compression to maintain the shoe in contact with the rail and also acting under compression to take up the longitudinal thrust of the shoe due to encountering irregularities in the rail.

2. A collector-shoe for a third-rail electric railway, a supporting-frame in which said shoe is mounted so as to have vertical movement and horizontal movement relative to the frame, and compression-springs located at the ends of said shoe for maintaining said shoe in contact with the rail and for permitting a slight movement in a longitudinal direction.

3. A collector-shoe for a third-rail electric railway, a rigidly-supported frame to which said shoe is secured so as to have a vertical movement and a horizontal movement relative to the frame, and obliquely-arranged springs for maintaining said shoe in contact with said rail.

4. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, links connecting the opposite ends of the shoe to said frame and having a loose connection therewith, and obliquely-arranged springs for maintaining said shoe in contact with said rail.

5. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, slotted links connecting the ends of said shoe to said frame, and obliquely-arranged springs for maintaining said shoe in contact with said rail.

6. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, slotted links connecting the ends of said shoe to said frame, and springs located adjacent thereto

for maintaining said shoe in contact with said rail.

7. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, said collector-shoe having a loose connection with said frame, and springs located at the ends of said shoe for maintaining said shoe in contact with said rail.

8. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, connecting-links extending from the ends of said shoe to said frame and having a pin-and-slot connection therewith, and coiled springs carried by said links and tending to force said shoe into contact with the rail.

9. A collector-shoe for a third-rail electric railway, a rigidly-supported frame, slotted connecting-links at opposite ends of said shoe extending between said shoe and said frame, connecting-pins extending through said slots, and coiled compression-springs lying in said links and bearing against said pins.

10. A collector-shoe for a third-rail electric railway, a supporting-frame, spring-links connecting said shoe and frame, and means for adjusting said frame relative to the car.

11. A collector-shoe for a third-rail electric railway, a supporting-frame in which said shoe is mounted to have vertical movement relative to the frame, and spring-actuated means for compressing said shoe into contact with the rail with a variably-distributed pressure.

12. A collector-shoe for a third-rail electric railway, a supporting-frame in which said shoe is mounted to have vertical movement and horizontal movement relative to the frame, and spring-actuated means for compressing said shoe into contact with the rail with a variably-distributed pressure, depending upon the longitudinal position of the shoe.

13. A collector-shoe for a third-rail electric railway, a supporting-frame therefor, and connecting means between said shoe and frame whereby the pressure between the shoe and rail is increased at the rear portion of the shoe and decreased at the forward portion of the shoe by the rearward movement of the shoe.

In witness whereof I have hereunto set my hand this 4th day of May, 1904.

SAMUEL B. STEWART, JR.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.