

No. 849,703.

PATENTED APR. 9, 1907.

S. B. STEWART, JR.  
ELECTRIC RAILWAY.  
APPLICATION FILED APR. 29, 1901.

Fig. 1.

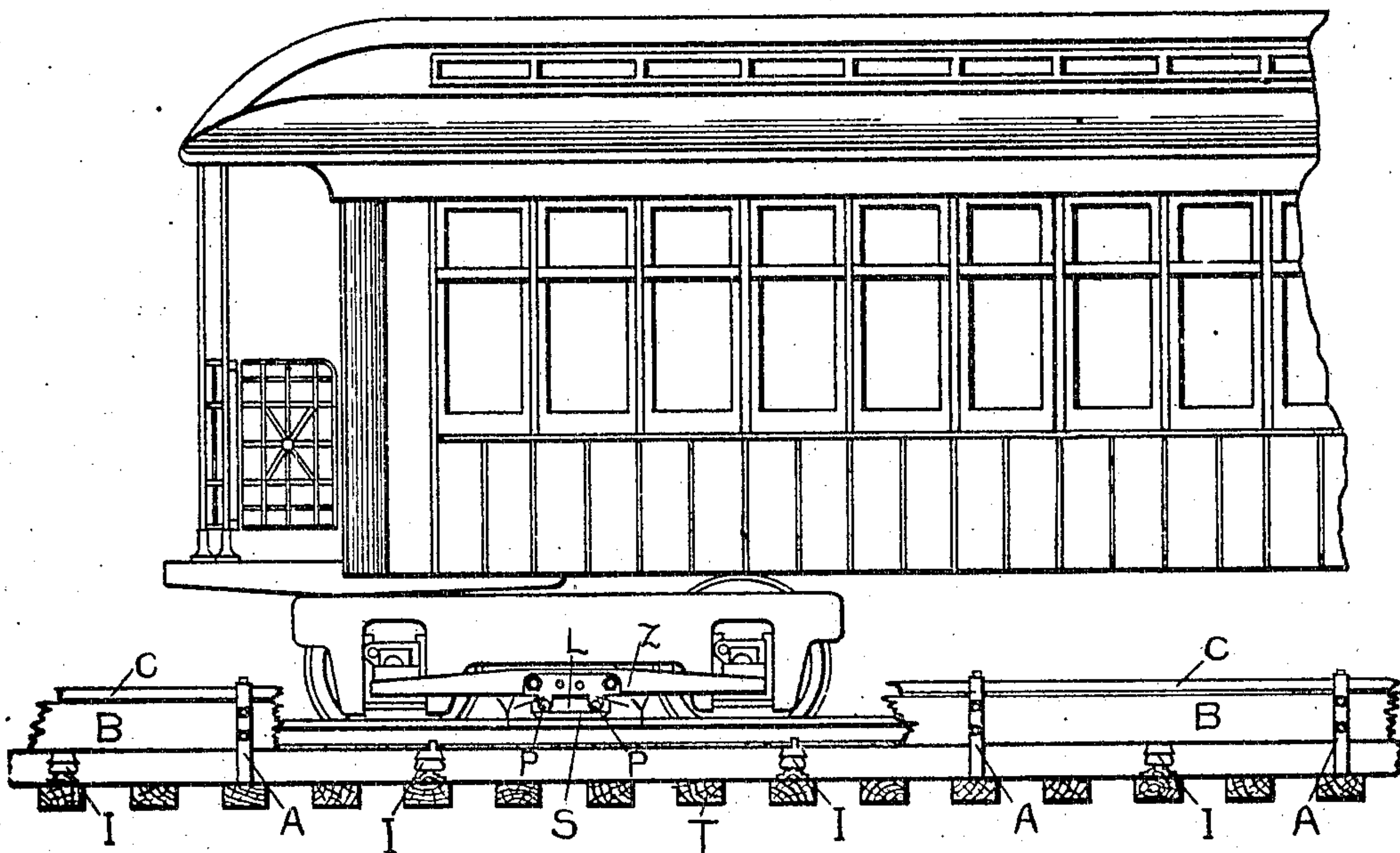


Fig. 2.

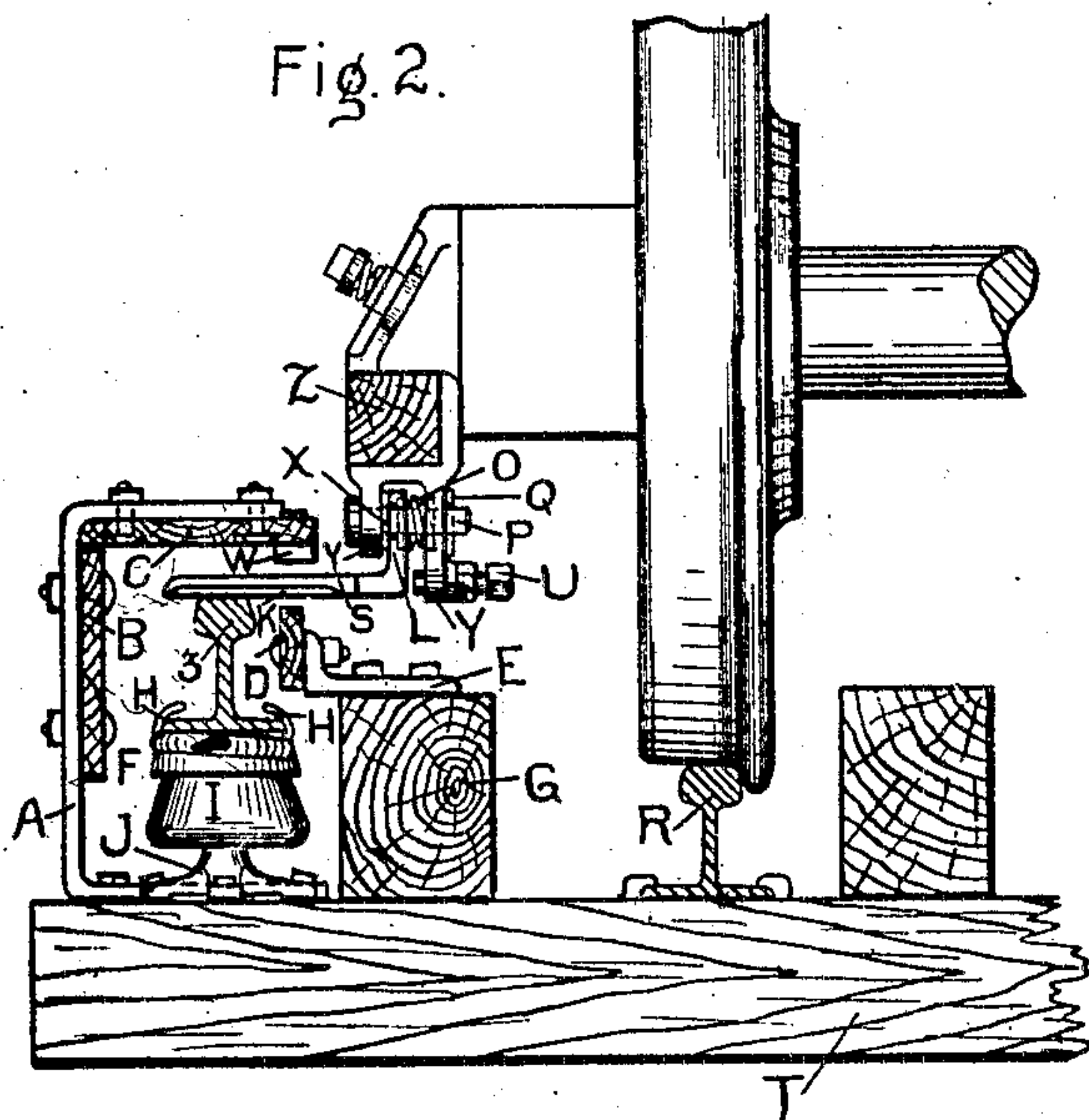


Fig. 3.

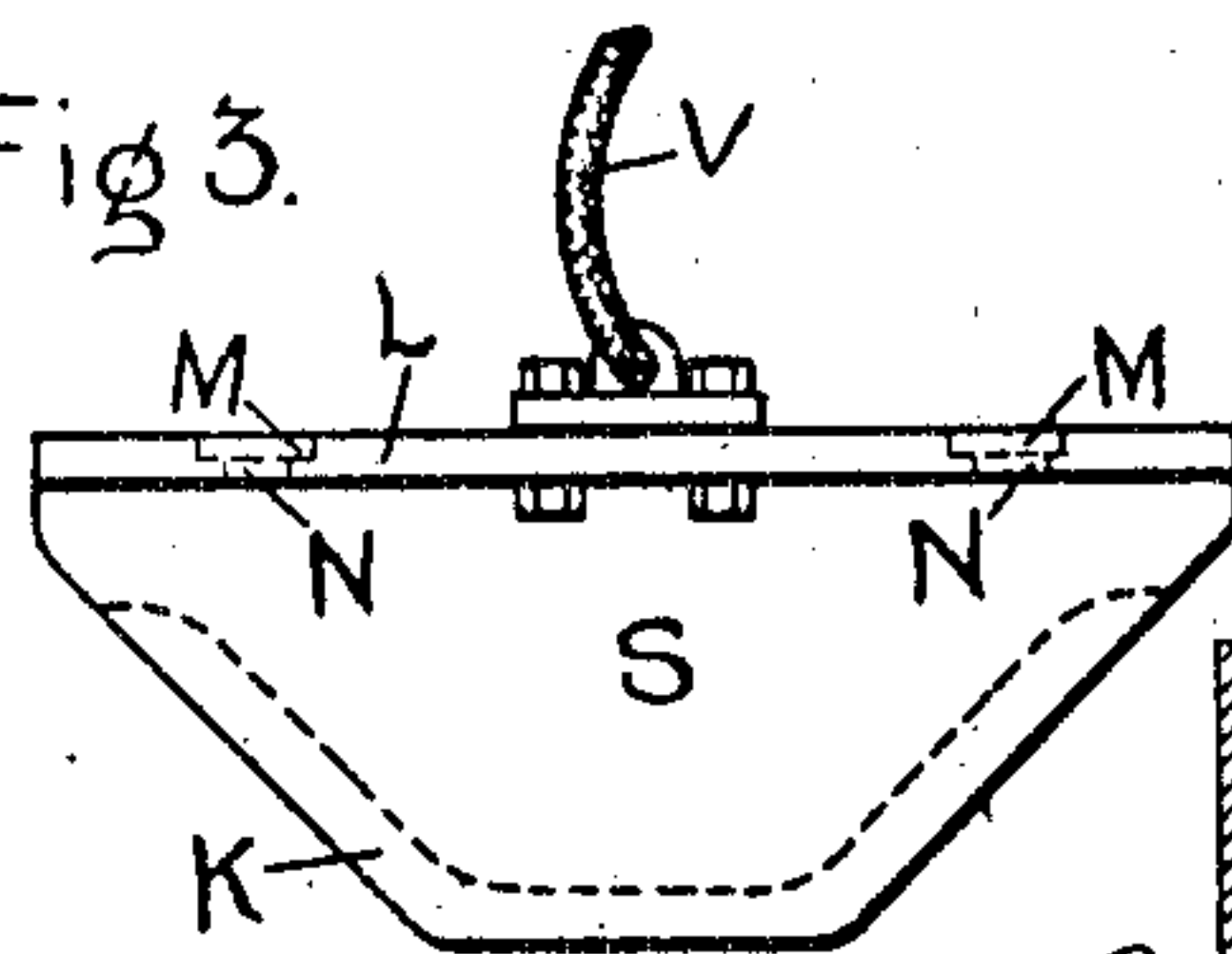


Fig. 5.

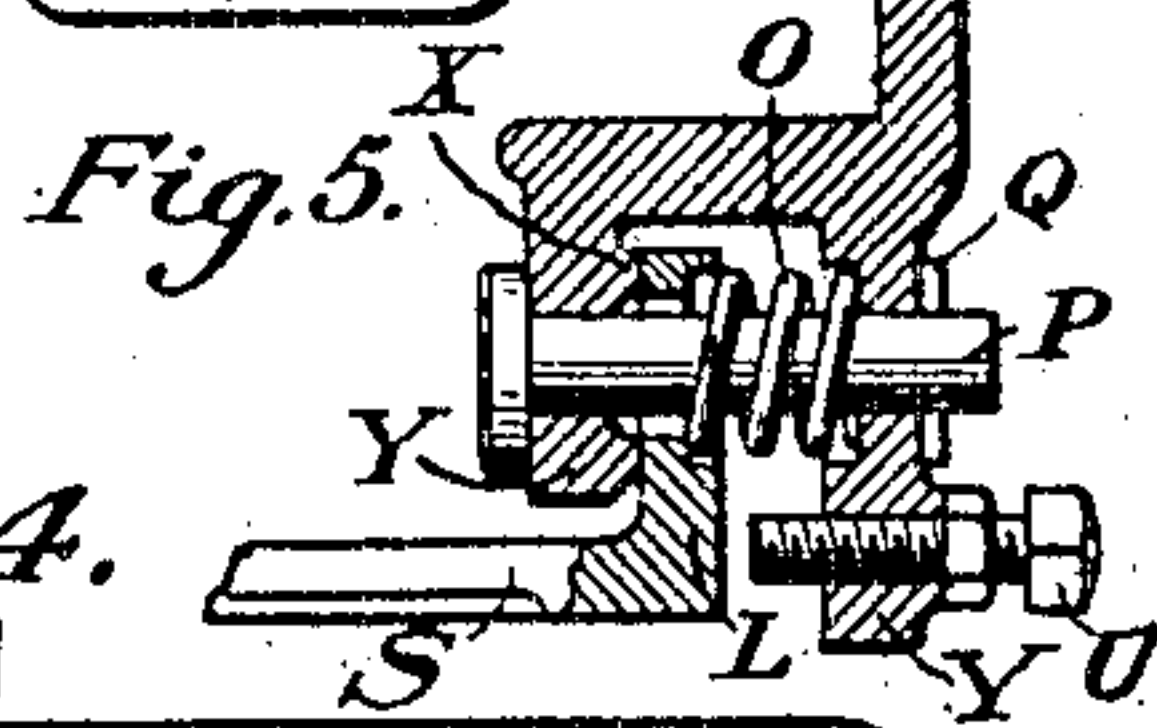
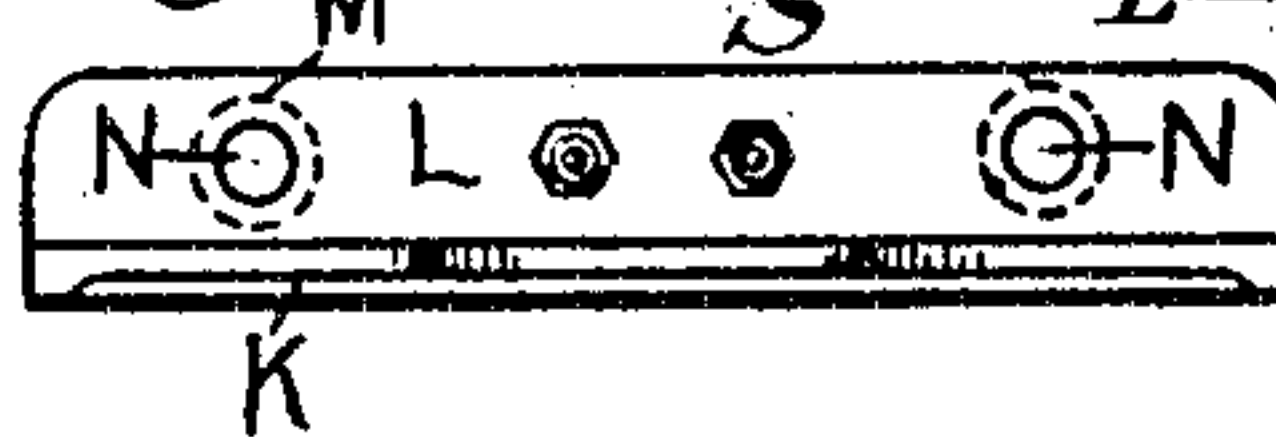


Fig. 4.



Witnesses:

*Art. L. Chapman*

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by

Inventor.  
Samuel B. Stewart, Jr.

*Alfred B. Davis*

Atty.



# UNITED STATES PATENT OFFICE.

SAMUEL B. STEWART, JR., OF SCHENECTADY, NEW YORK, ASSIGNOR TO  
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## ELECTRIC RAILWAY.

No. 849,703.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed April 29, 1901. Serial No. 57,873.

*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 Electric Railways, of which the following is a specification.

The object of my invention is to provide a novel construction of contact-shoe which permits an arrangement of the housing for the third rail adapted effectively to protect the third rail from the weather and from accidental contact and which is designed to be securely and yet yieldingly supported from the car.

Of the drawings, Figure 1 is an elevation of a roadway constructed in accordance with the invention, a portion of the housing being broken away to show the collector-shoe carried by the car. Fig. 2 is a cross-section of a roadway structure embodying the invention. Figs. 3 and 4 are respectively a plan and elevation of the modified contact-shoe, and Fig. 5 is a sectional view through the collector-shoe and one of its supports in order to show on a larger scale the means for supporting the shoe.

The third rail is supported upon third-rail insulators I. These third-rail insulators are now a well-known article of manufacture and generally consist, first, of a metal base J, having legs which are bolted or spiked to the cross-ties T; second, of an insulating portion which is mounted on the base J, and, third, of a petticoated supporting-piece F, of metal, which is provided with lugs H, which retain the flanges of the third rail. In order to prevent these lugs from being broken off by the movements of the third rail, there is a space intervening between the lugs and the top of the support which is wider than the thickness of the rail-flange, as disclosed in my application for patent, Serial No. 31,511.

The housing preferably consists of boards B and C, which are supported by metal straps A, bolted or spiked to the cross-ties T in any suitable manner. The inner wall of the housing, between the third-rail insulators and the traction-rail R, extends up nearly to the top of the third rail, and while it may be of any suitable construction it is shown as comprising a timber G, utilized as a wheel-guard, and boards D, secured to the timber G by angle-

irons E. The clearance between the roof of the housing and the top of a shoe engaging the top of the third rail is only sufficient to allow for the vertical oscillation of the contact-shoe. To this end the roof of the housing, which comprises a board C and the bent portions of the straps A, extends substantially at right angles to the upright wall of the housing, so that between the inner end of the roof and the upper portion of the inner side wall, which does not reach quite to the top of the third rail, there is only a very narrow slot, through which the ordinary form of third-rail shoe could not possibly pass.

The contact-shoe itself, as shown in Figs. 3 and 4, consists of a thin metal plate S, of steel or wrought-iron, which is adapted to enter freely the narrow slot in the housing and has the edges of its surface which engages with the third rail beveled, as shown at K, in order to cause it to rise over irregularities in the rail. The shoe is so supported from the car that when irregularities in the third rail occur or when the shoe passes from rail to rail or when the rail is interrupted the shoe can readily yield, so that it will not be subjected to strains and consequent breakage.

The flat horizontal portion of the shoe is provided at one side with a vertical projection L, which is perforated at N, the perforation being countersunk, as shown at M. The shoe is supported by means of these perforations N in the following manner: Brackets Y depend from the wooden support Z, suitably mounted on the car. These brackets are perforated for the reception of supporting-pins P, which pass through the perforations M in the vertical portion L of the shoe S. The supports P are held in place by dowel-pins Q. It should be particularly noted that the holes N are of considerably greater diameter than that of the pins P, so that the shoe is permitted to swing freely on the supports or pins P, and the horizontal portion S can have sufficient vertical movement to compensate for irregularities in the third rail. The right-hand or inner brackets are countersunk face to face with the countersunk portions M of the shoe portion L, and helical springs O, mounted on the pin P, are held in these countersunk portions. The right-hand or inner brackets are also further extended downwardly, and adjustable stops U in the



extended portions are adapted to serve as means for positively limiting the downward vertical movement of the shoe S. A wearing-plate W is secured to the lower portion of the right-hand end of the roof of the housing and serves to positively limit the upper vertical movement of the shoe and to prevent injury to the roof of the housing. If the shoe S strikes a slight obstruction or irregularity in the third rail, its beveled edge K will tend to lift it over the obstruction, and the loose connection of the shoe with its support will permit it to be raised against the action of the spring O, which serves as a cushion. In this case the upper projection L of the shoe is pivoted against the lower lug X, formed on the right-hand side of the outside brackets Y. When the third rail is interrupted for some reason, as at a crossing, and the shoe tends to drop by its own weight, it is permitted by its loose mounting to drop until it comes in contact with the limiting device U, which is so arranged that the shoe cannot drop to such extent that it will not be permitted to ride up on the advance portion of the rail by means of its beveled edges K. The shoe is, however, not permitted to impinge violently against the device U, because the spring O in this case acts as a cushion, the extended portion L of the shoe being pivoted against the upper lug X, formed on the right hand of the outer or left-hand brackets Y. The spring O should be sufficiently powerful so that the shoe is normally held at all times freely on the pin P.

It is evident from the above description that the third rail is adequately protected and at the same time free access to the rail is provided for the improved form of contact-shoe.

The metal straps A should be constructed of wrought-iron of about three quarters of an inch thickness and two inches wide, so that the housing is sufficiently strong to support the weight of persons who might be walking along the track. The slot in the side of the housing is so narrow that access to it can be had only with great difficulty, and it is practically impossible for sleet to be driven therethrough to coat the third rail with ice. The electrical connection to the car-motors from the contact-shoe may be made in any suitable manner, as by the flexible lead V, shown in Fig. 3 as attached to the shoe in a suitable manner to provide a good electrical connection.

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

1. A contact-shoe, which comprises a flat metal plate adapted to enter a narrow lateral slot in a third-rail housing, said plate being

provided with a perforated angular portion serving as a support.

2. The combination with a contact-shoe support, of a shoe having a vertical portion which has a perforation larger than the support, to permit vertical play of the shoe, said shoe having a thin horizontal portion adapted to enter a narrow lateral slot of a third-rail housing.

3. The combination with a contact-shoe support, of a flat shoe carried horizontally on said support and having a vertical portion which has a perforation larger than the support, to permit vertical play of the shoe, of a spring which presses against said vertical portion to serve as a cushion during the vertical movements of the shoe.

4. The combination with a support, of a thin flat shoe having a vertical portion on which the shoe is so swung from said support, that the thin portion of the shoe has a vertical play, and means for positively limiting such swinging play.

5. A thin metal shoe having a perforated angular portion, in combination with a support for said angular portion which is smaller than the perforation therethrough, whereby the main portion of the shoe is supported horizontally to have a slight vertical play.

6. A thin metal shoe having a vertical portion provided with a countersunk perforation, in combination with a support which is smaller than the perforation therethrough, and a spring fitting in the countersunk portion to serve as a cushion for the shoe during its vertical movements.

7. The combination with brackets depending from a car, of bars or supporting-pins between said brackets, the vertical part of a collector structure freely mounted on said bars, whereby the horizontal portion of the shoe has a vertical swinging play, and a spring between said vertical portion and the inner bracket, whereby when the horizontal portion of the shoe is raised by an irregularity of the third rail the vertical shoe portion will be pivoted against the lower part of the outer bracket, and the spring will serve as a cushion, and when the horizontal portion of the shoe is depressed by its own weight the vertical portion of the shoe will be pivoted against the upper part of the outer bracket and the spring will again serve as a cushion.

In witness whereof I have hereunto set my hand this 27th day of April, 1901.

SAMUEL B. STEWART, JR.

Witnesses:

BENJAMIN B. HULL,  
MARGARET E. WOOLLEY.