

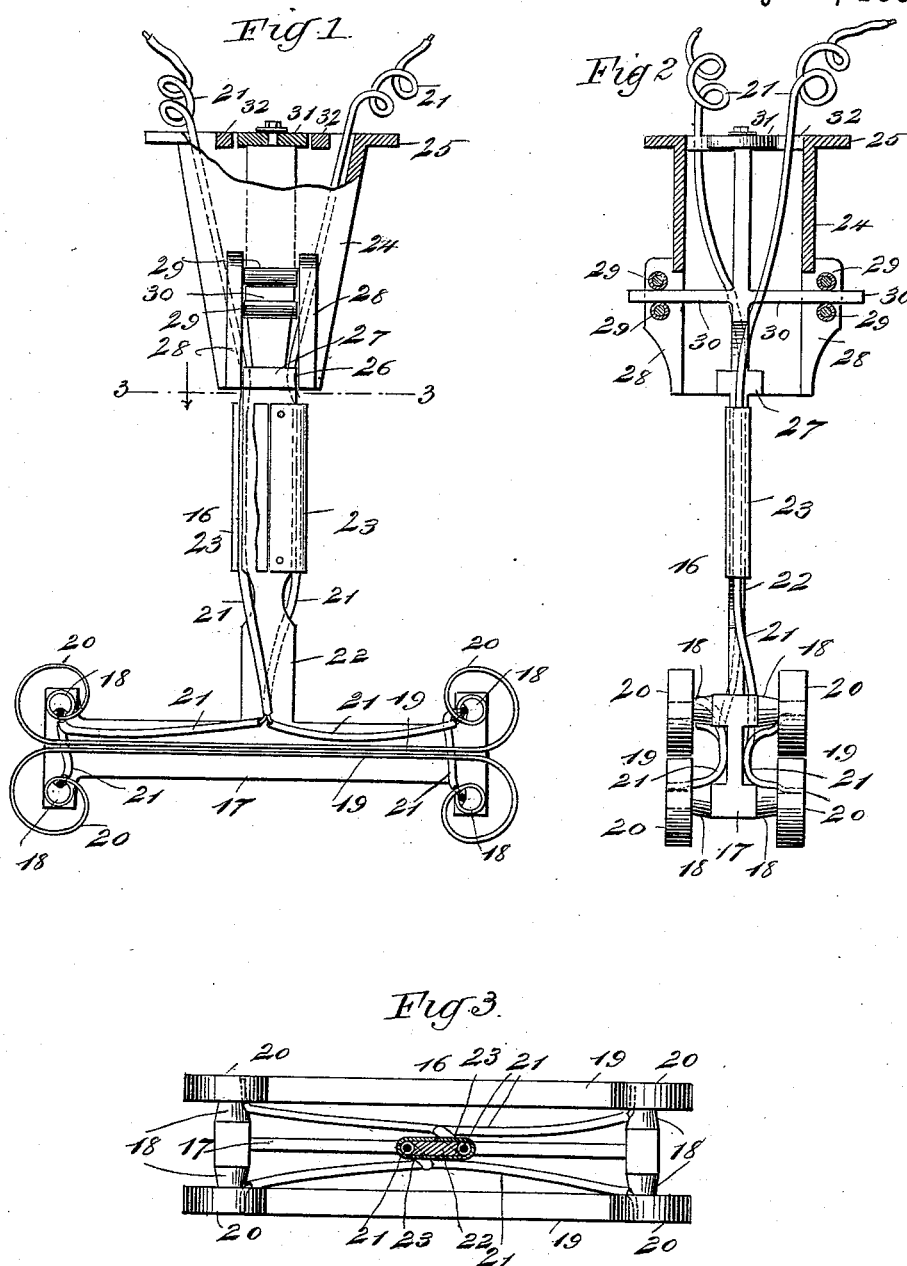
(No Model.)

2 Sheets—Sheet 1.

H. A. DOTY.  
ELECTRIC RAILWAY.

No. 523,306.

Patented July 17, 1894



WITNESSES:  
*Paul J. ...*  
*W. Sedgwick*

INVENTOR  
*H. A. Doty*  
BY *Munn & Co*  
ATTORNEYS.

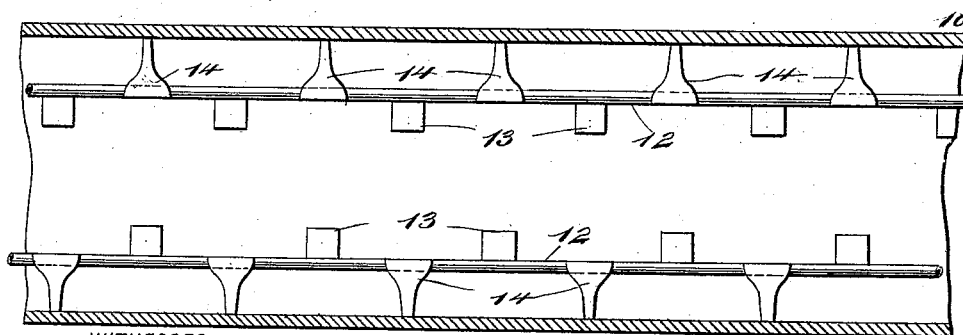
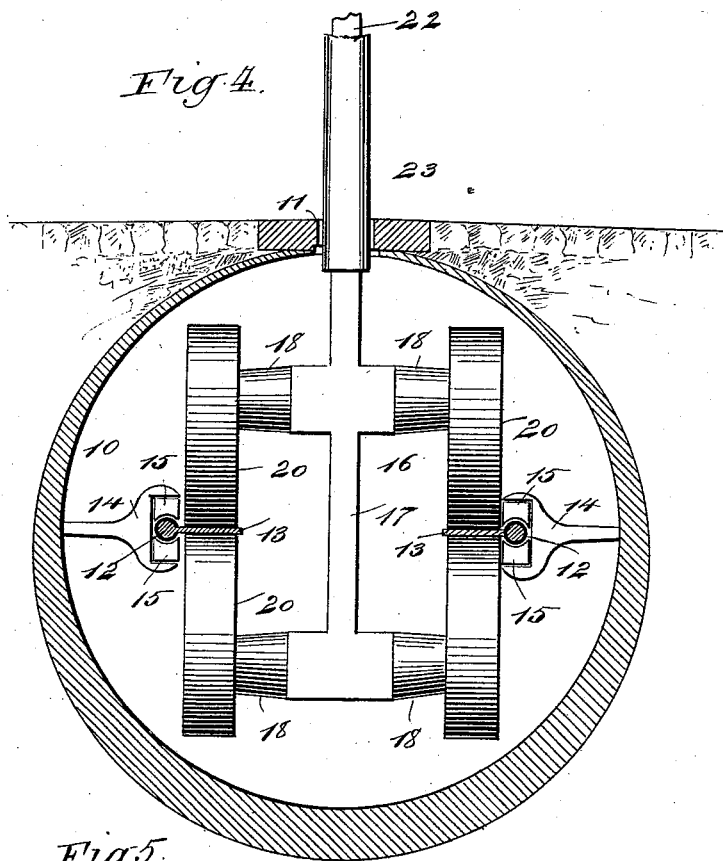
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*Paul J. Schat*  
*C. Sedgwick*

*Fig 6*

INVENTOR  
*H. A. Doty*  
BY  
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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

HENRY A. DOTY, OF JANESVILLE, WISCONSIN, ASSIGNOR TO MARY E. DOTY,  
OF SAME PLACE.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 523,306, dated July 17, 1894.

Application filed March 27, 1894. Serial No. 505,285. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. DOTY, of Janesville, in the county of Rock and State of Wisconsin, have invented a new and Improved Electric Railway, of which the following is a full, clear, and exact description.

My invention relates to improvements in electric railways and particularly to conduit electric railways.

10 The object of my invention is primarily to provide a conductor which may be, for the most part, insulated and which has at intervals thereon projecting lugs which are uninsulated, also to provide flexible contact shoes  
15 arranged to make a sliding contact with both sides of the lugs, to the end that perfect contact may be made, sparking avoided and the current used with but little leakage.

20 A further object of my invention is to construct a trolley which is adapted to be used with the conductor referred to, which may be applied to any kind of a car, which is adapted to run smoothly in the slot of a conduit, and which has such freedom of lateral movement  
25 that it always retains its correct position without regard to the rocking of the car or the rounding of curves.

30 To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate  
35 corresponding parts in all the views.

40 Figure 1 is a broken side elevation, partly in section, of the trolley and its support which form part of my invention. Fig. 2 is an end view, partly in section, of the trolley and its support. Fig. 3 is a sectional plan on the line 3-3 of Fig. 1. Fig. 4 is a cross section through a conduit provided with my improved conductors and trolley. Fig. 5 is a sectional plan of the conduit and the conductors therein;  
45 and Fig. 6 is a diagrammatic view, showing in elevation the relative positions of the contact shoes and the bare lugs of the conductor.

50 The conduit 10 may be of any approved construction and is provided with the customary surface slot 11 through which the trol-

ley arm runs, while extending longitudinally through it on opposite sides are the line wires 12, which are covered with insulating material and which, at frequent intervals, have thereon laterally projecting lugs 13 which are  
55 in connection with the wire, as stated, and are left bare so that the current may be readily taken from them.

The conductors 12 are supported in suitable hangers 14, which are fastened in any  
60 convenient way to the sides of the conduit, and the hangers are preferably provided with clamping blocks 15 which are arranged above and below the wires 12, but any suitable hangers and clamps may be substituted for those  
65 shown. In connection with the conductors, a trolley 16 is used, which has a body portion 17, and at the ends of this laterally projecting arms 18, these being arranged in pairs one  
70 above the other, as shown clearly in the drawings, and the arms 18 carry the flexible contact shoes 19 which are of conducting material and of spring metal, these shoes being  
75 arranged in pairs on opposite sides of the trolley so as to contact with the lugs 13 of both conductors 12, and each shoe 19 is flat for a greater portion of its length which lies parallel with the conductors 12 and the ends of the upper shoes terminate in upwardly  
80 curved coils 20, which are secured to the upper arms 18 of the trolley, while the lower shoes terminate in downwardly curved coils which are fastened to the lower arms of the  
85 trolley and thus the two shoes on each side of the trolley meet for a greater portion of their length and they are adapted to slide  
over the lugs 13 and to clasp them above and below, thus making a contact on both sides of the lugs and insuring a perfect connection.

The lugs 13 are preferably arranged so that  
90 the lugs on opposite sides of the conduit alternate, as shown in Fig. 5, and thus a shoe 19 will always engage three lugs on one side while it engages two on the other and a perfect contact is thus assured. The shoes are so  
95 flexible that they slip, without noticeable friction, over the lugs 13, and this flexibility or elasticity of the shoes also provides for and permits any usual up and down movement of  
100 the trolley under the varying load and posi-

tion of the car. By having the upper and lower shoes terminate in oppositely curved coils, as specified, the shoes are rendered substantially as flexible near the ends of their flat surfaces as in the center, and they are accurately guided on the lugs 13 when the trolley is run in either direction.

The shoes 19 on opposite sides of the trolley, are connected at both ends with wires 21, which extend upward along the arm 22 of the trolley and through the hanger thereof, these wires being adapted to connect with the motor on the car in the usual way. The trolley arm 22 is secured rigidly to the body of the trolley and on it are keeper plates 23 which hold the wires 21 in place and prevent them from touching the sides of the slot 11, these plates serving also as wear plates. The trolley arm 22 extends upward into a hopper-like hanger 24 which has a top flange 25 to facilitate its attachment to some portion of a car, and near the bottom the hanger is transversely slotted, as shown at 26, in which slot runs a guide flange 27 on the trolley arm 22, so that when the hanger moves laterally, the arm is not displaced.

The hanger 24 has, on its opposite sides and on opposite sides of the slot 26, flanges 28, which carry anti friction rollers 29 arranged in pairs one above the other, and between these rollers extend arms 30 on opposite sides, and this arrangement serves to further guide the trolley arm and hanger in relation to each other so that the hanger may move laterally without seriously affecting the trolley.

The arm 22 extends upward through the hanger and, at its upper end, it is provided with a roller 31 which runs between guide bars 32 on the hanger, and thus still further means is provided to steady the arm and hanger in relation to each other and permit the lateral movement of the hanger without serious disturbance of the arm.

It will be seen from the above description that means is provided for making a perfect sliding contact with the main conductors, and that all necessary freedom of movement is permitted in the trolley. I am aware that heretofore covered conducting wires have been used having projecting pins or lugs with which contact might be made, but these pins or lugs have usually been arranged in such a manner that contact was made with the ends or one side of them, and in such cases the contact is more or less imperfect.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. As a new article of manufacture, a conductor for electric railways provided with thin, laterally projecting, spaced, and aligning lugs, said lugs being rigidly secured to the conductor, as set forth.

2. As a new article of manufacture, a conductor for electric railways, comprising a covered wire, and thin, flat, bare, projecting lugs rigidly secured to the wire and in longitudinal alignment, as specified.

3. In an electric railway, the trolley comprising a suitable frame or body, and shoes on opposite sides of the body, the shoes being of flexible material arranged in pairs with meeting faces adapted to receive a conductor between them, substantially as described.

4. In an electric railway, the trolley comprising a frame or body, and conducting shoes on opposite sides thereof, the shoes being arranged in pairs, each pair having meeting faces and diverging ends terminating in coils which are fastened to supports on the trolley, substantially as described.

5. The combination, with a trolley having an upwardly projecting arm, of a hollow hanger into which the upper end of the trolley arm projects and has guided movement, guide rollers arranged in pairs on opposite sides of the hanger, and arms projecting laterally from the trolley arm, and working between the said rollers, substantially as described.

6. The combination with a trolley having an upwardly projecting arm, said arm being provided with a guide flange, of a hollow hanger into which the trolley arm projects, said hanger being transversely slotted at its lower end to receive the said flange, guide rollers journaled in pairs on opposite sides of the hanger, and laterally projecting arms on the upper end of the trolley arm, said arms working between the guide rollers, substantially as described.

7. The combination, with the trolley having a supporting arm, of the hollow hanger having guide bars at the top, a slot at the bottom and guide rollers at opposite ends of the slot, a guide block on the trolley arm to run in the slot, guide arms projecting from the trolley arm between the guide rollers, and a roller at the top of the trolley arm to run between the guide bars, substantially as described.

HENRY A. DOTY.

Witnesses:

EDWIN F. CARPENTER,  
ANNA M. CURTESS.