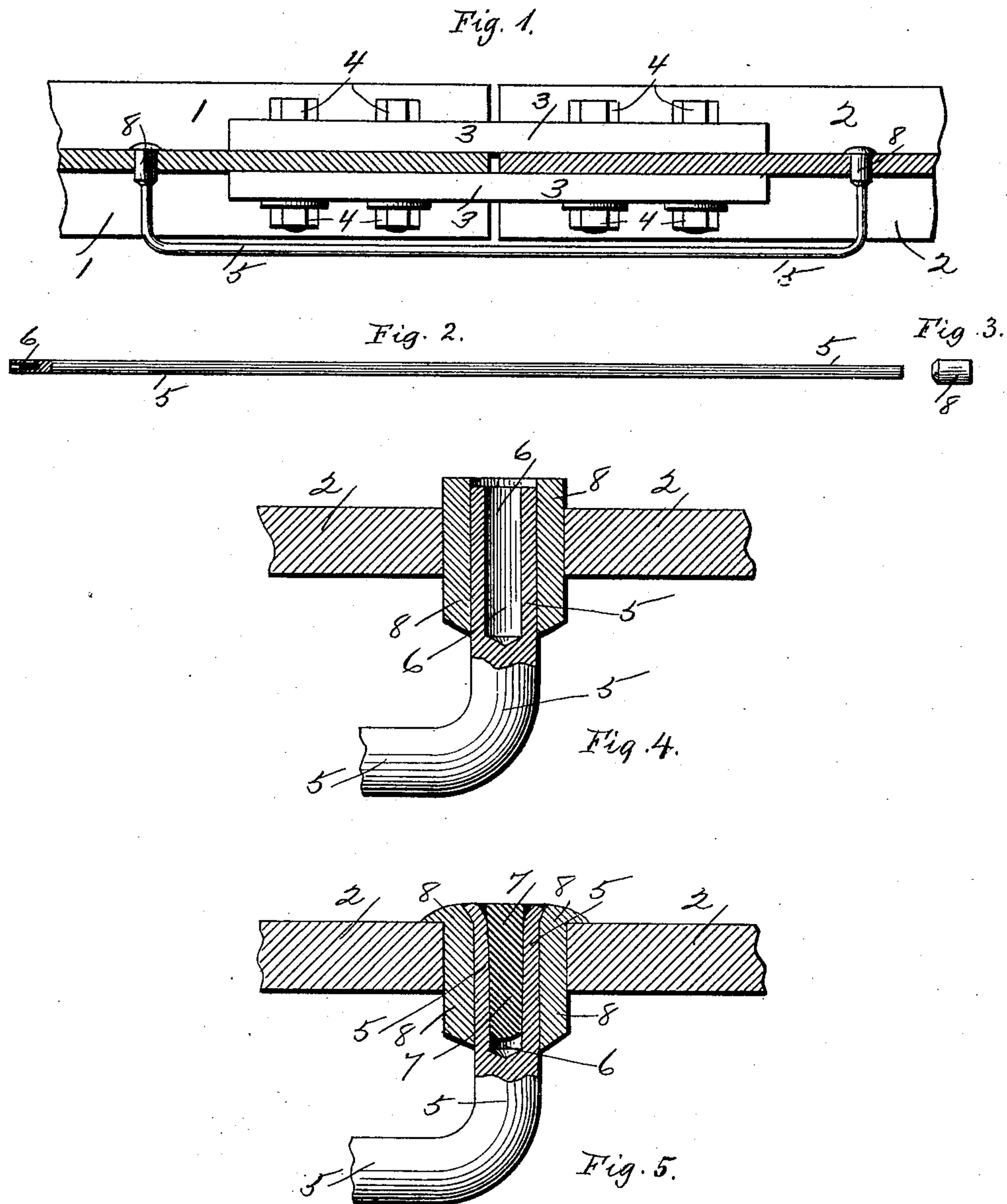


(No Model.)

F. H. DANIELS.
RAIL BOND FOR ELECTRIC RAILWAYS.

No. 564,243.

Patented July 21, 1896.



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RAIL-BOND FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 564,243, dated July 21, 1896.

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To all whom it may concern:

Be it known that I, FRED H. DANIELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Rail-Bonds, of which the following is a specification.

My invention relates to rail-bonds for electric railways, and particularly to that style of rail-bond in which the ends of the bond-wire, rod, or bar are secured in the hole in the rail by means of a drift-pin, which is driven into a hole in the end of the bond-wire, and acts to expand the end and wedge it in the hole in the rail to rigidly secure it therein.

Heretofore in the class of rail-bonds above referred to the ends of the bond-wire have been of enlarged diameter to make the area of copper surface which is in contact with the iron or steel large enough to overcome any resistance to the passage of the electric current through the joint or point of connection between the end of the bond-wire and the rail.

In order to make the ends of the bond-wire of larger diameter than the body of the bond, it has been customary to forge or weld the ends of the desired size, and this increases materially the cost of the rail-bonds.

The object of my invention is to improve upon the construction of rail-bonds of the class above referred to, and to reduce the cost thereof, and to provide a rail-bond in which the bond-wire, rod, or bar is of the same diameter throughout its length, the ends being of the same diameter as the body of the bond and provided with a hole therein, extending in the direction of the length of the wire, to receive the drift-pin, which expands the end and brings the exterior surface thereof into contact with a bushing, which extends through a hole in the rail and extends over the end of the bond-wire. The drift-pin wedges the end of the bond-wire in the bushing, and the bushing in the hole in the rail, and brings the surface of the bushing into solid contact with the surface of the hole in the rail, and the heading or upsetting of the end of the bushing and bond-wire and

drift-pin prevents the same from working loose.

My invention consists in certain novel features of construction of my rail-bond, as will be hereinafter fully described, and the nature thereof indicated by the claim.

Referring to the drawings, Figure 1 is a sectional plan view of the adjacent ends of two rails with my rail-bond applied thereto. Fig. 2 shows the bond-wire or rod detached with one end shown in section. Fig. 3 shows the bushing which is inserted in the hole in the rail. Fig. 4 is a sectional detail of the rail, bushing, and end of the bond-wire or rod before the drift-pin is inserted, and Fig. 5 corresponds to Fig. 4, but shows the drift-pin inserted and the several parts secured together. Figs. 4 and 5 are on an enlarged scale.

In the accompanying drawings, 1 and 2 are the adjacent ends of two rails, fastened together by fish-plates 3, secured thereto by bolts 4 in the ordinary way.

5 is the rail-bond wire or rod, made of copper, and of the same diameter throughout its length, the ends being of the same diameter in cross-section as the body or central portion of the wire or rod. Each end is bored out longitudinally or provided with a central cylindrical opening or hole 6 therein, which is adapted to receive the drift-pin 7, which is of a little larger diameter than the hole 6, and is driven into said hole, as shown in Fig. 5, to expand the end of the wire or rod 5.

A bushing or tube 8, made of copper, is used in connection with each end of the bond-wire or rod 5. The external diameter of said bushing 8 corresponds to the diameter of the hole in the rail into which it is inserted, and the diameter of the central hole in the bushing 8 is a little greater than the external diameter of the end of the bond-wire or rod 5, so that said end may be freely inserted in said bushing.

After the bushing 8 has been placed on the end of the bond-wire or rod 5 and inserted through the hole in the rail, as shown in Fig. 4, the drift-pin 7 is inserted in the hole 6 in the end of the bond-wire or rod 5 and driven in, and the end of the bond-wire and of the

bushing 8 headed or upset as shown in Fig. 5, to prevent their moving in the rail.

5 The driving in of the drift-pin 7 expands the end of the bond-wire and causes it to come in solid contact with the internal surface of the bushing 8, and the expansion of the end of the bond-wire causes said bushing to expand and come in solid contact with the surface of the hole in the rail to make a tight
10 joint.

The size of the bushing 8 is such as to give a large area of copper surface in contact with the iron or steel, so that there will be no resistance to the passage of the electric current, and said bushing is made solid or intact, without any longitudinal slit or cut therein, to receive any foreign material or moisture, and effect the proper insulation of the wire.

20 The advantages of my rail-bond will be

readily appreciated by those skilled in the art. It is inexpensive to manufacture, and can be quickly and easily secured to the rail.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— 25

An improved rail-bond for electric railways, comprising a bond-wire of the same diameter throughout its length, and having a cylindrical hole leading in from each end for 30 the drift-pin, and a separate tube or bushing open at both ends, and not split longitudinally, to fit over each end of the bond-wire, and be secured thereon and in the hole in the rail, by the driving in of a drift-pin, substantially as shown and described. 35

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