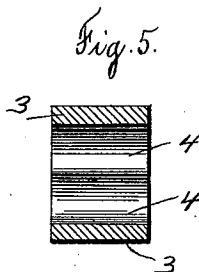
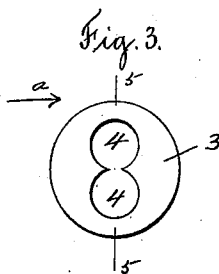
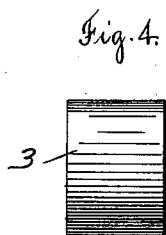
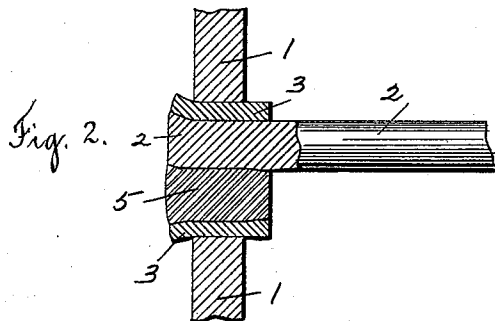
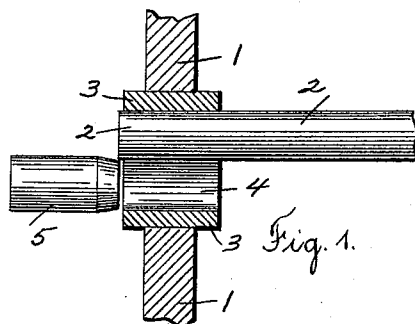


(No Model.)

F. H. UNDERWOOD & F. H. DANIELS.
RAIL BOND.

No. 568,385.

Patented Sept. 29, 1896.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK H. UNDERWOOD, OF AUBURNDALE, AND FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 568,385, dated September 29, 1896.

Application filed April 7, 1896. Serial No. 586,531. (No model.)

To all whom it may concern:

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

Our invention relates to rail-bonds or metallic conductors for connecting the ends of rails of electric railways; and the object of our invention is to provide a rail-bond or conductor of very simple construction and one which will be inexpensive to manufacture.

Our invention consists in certain novel features of construction of our rail-bond, and more particularly of the terminals or ends of the rail-bond and the manner of attaching the same to the rails and to the bond-wire or conductor, as will be hereinafter fully described.

Referring to the drawings, Figure 1 is a sectional view of a portion of a rail and one terminal or end of our rail-bond combined therewith before the terminal is secured to the rail. Fig. 2 corresponds to Fig. 1, but shows the end of the bond wire or rod secured in the terminal and the terminal secured to the rail. Fig. 3 is a face view of the terminal or end detached. Fig. 4 is an edge view; and Fig. 5 is a vertical section on line 5 5, Fig. 3, looking in the direction of arrow *a*, same figure.

In the accompanying drawings, 1 is a portion of a rail, and 2 is the end of a rail bond-wire or metallic conductor, which is of suitable length and preferably of the same diameter throughout its length. The terminal or end 3 is preferably made of copper and separate from the bond-wire 2, and it will be understood that there are two terminals or ends for each bond-wire, one at each end of the wire, where it is to be connected to the rail.

The terminal 3 is preferably of cylindrical shape, and in length or width is about twice the thickness of the web of the rail, and is provided with two holes or openings 4 there-through, which are preferably of cylindrical

shape and contiguous to each other, and preferably open into each other, as shown in Fig. 3. One of said holes 4 is for the end of the bond-wire or conductor 2, and the other for the drift-pin 5.

In attaching the terminal or end 3 to the rail it is inserted in an opening through the rail, either before or after the end of the bond-wire 2 is inserted in one of the holes 4, as shown in Fig. 1. The drift-pin 5 is then driven into the other hole 4, preferably from the opposite side of the rail from which the bond-wire extends. The diameter of the drift-pin 5 is a little greater than the diameter of the hole 4, into which it is driven, so that the driving in of said pin 5 expands the metal in the terminal around the pin and forces it in contact with the rail. It also forces the end of the bond-wire against the metal surrounding it and secures it in the terminal, and also forces the metal in the terminal around the bond-wire into contact with the rail to secure the terminal thereto and bring the surfaces of metal into close contact. After the drift-pin 5 is driven in it may be slightly headed, and also the end of the bond-wire, as shown in Fig. 2, to prevent the withdrawal of the bond-wire.

The advantages of our improved terminal for rail-bonds will be readily appreciated by those skilled in the art. It is of simple construction and inexpensive to manufacture, and can be very quickly and easily attached to the rail and to the end of the bond-wire.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a rail-bond, the combination with the end of the bond-wire or conductor, of the terminal, adapted to extend through an opening in the rail, and provided with two openings or holes therein, contiguous to each other, one hole for the end of the bond-wire or conductor, and the other for a drift-pin, substantially as set forth.

2. The combination with the end of a metallic conductor, of a terminal or end, made separate therefrom, and provided with two adjoining holes, one for the end of the con-

ductor, and the other for a drift-pin, substantially as set forth.

3. An improved terminal or end, for attaching metallic conductors to rails, of cylindrical
5 shape, and adapted to extend through an opening or hole in the rail, and provided with two holes or openings therein, contiguous to each other, one for the end of the conductor,

and the other for a drift-pin, substantially as set forth.

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