

(No Model.)

J. J. DAINTON.
RAIL BOND.

No. 601,707.

Patented Apr. 5, 1898.

Fig. 1.



Fig. 2.

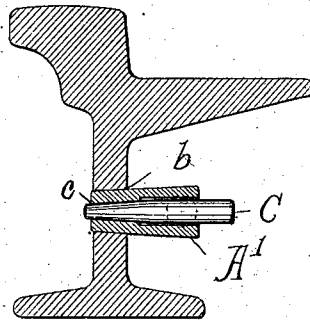
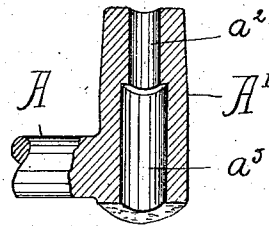


Fig. 3.



Fig. 4.



WITNESSES
Howard Carter
Geo. E. Kreidler

INVENTOR
John J. Dainton.
By Carter & Graves
His Attys.

UNITED STATES PATENT OFFICE.

JOHN J. DANTON, OF CHICAGO, ILLINOIS.

RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 601,707, dated April 5, 1898.

Application filed February 15, 1897. Renewed March 9, 1898. Serial No. 673,275. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. DANTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rail-Bonds, of which the following is a specification.

This invention relates to improvements in electrical connectors commonly designated "rail-bonds," and refers more particularly to improvements in rail-bonds of that class provided with tubular terminals which are inserted and secured within suitable apertures formed in the web or body of the rails.

The particular object of the present invention is to provide a bond which is so constructed as to insure a very perfect electrical contact of large area between the rails and terminals, so as to reduce resistance to a minimum, and is at the same time capable of being readily removed from the rails without injury to the bond, thereby enabling the same bond to be used over and over again as the rails are renewed.

Subordinate advantages achieved by the present invention are a saving of time and labor in applying and removing the bonds and the dispensing of all special tools for performing these operations.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and the same will be more readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a general plan view of an approved embodiment of my invention. Fig. 2 is a transverse vertical sectional view of an ordinary street-railway rail and the bond applied thereto, the section being taken axially through one of the terminals of the bond. Fig. 3 is a perspective view of one of the drift-pins used for expanding and securing the terminal within the rail. Fig. 4 is a perspective view of one of the terminals and the connected end of the body of the bond, the terminal being shown in axial section.

Referring to the drawings, the bond shown therein is one of the type commonly known as "long bonds"—i. e., a bond provided with a body long enough to extend over the connecting fish-plates of the rails and enable the

terminals to be secured within the webs of the rails at each end of said fish-plate.

A designates the conductor or body of the bond. Preferably and as herein shown said body is made of drawn copper wire or rod, so as to insure the maximum conductivity with a given cross-section of metal; but it is to be understood that the form of the body is not essential, and it may be made of cast metal, if desired. In order to provide for endwise movement of the rails with relation to each other under contraction and expansion and vertical movement under the weight of traversing cars without bringing an undue strain upon the terminals, the body of the bond is shown as provided with a bend or loop of any suitable form, as indicated at *a*, in the usual manner.

At each end the body of the bond is provided with a tubular terminal *A'*, said terminals being arranged to stand with their axes at right angles to the main body of the bond and parallel with each other. The terminals are of approximately cylindric form and of somewhat greater length than the thickness of the part of the rail within which they are designed to be inserted, so that when the bond is in place a space will be left between the body of the latter and the side of the rail sufficient to accommodate the fish-plate. The end portions of the terminals which extend through the rails are made slightly tapering throughout a portion of their length somewhat greater than the thickness of the web of the rail engaged, so that said terminals may be driven into the rail to form a drift-fit therein, notwithstanding slight variations in the diameter of the receiving-apertures which are likely to exist in different rails, especially where the bond is transferred from one rail to another at different times.

The terminals are made hollow or provided with axial bores which extend entirely through the same from end to end, as indicated at *a² a³*. When applied to the rails, the terminals are inserted in apertures *b*, made tapering to correspond to the external form of the terminals, it being understood that the terminals are inserted from the larger side of the apertures in the rails.

In order to expand the terminals into more

perfect electrical contact with the rail, drift-pins C are provided, each having a tapering end portion c of proper size to fit within the bore of the terminal and expand or swage the terminal into forcible contact with the rail. The drift-pins will be driven into the terminals from the same side that the terminals are inserted in the rails, and the firmness with which the terminals are expanded within the webs of the rail and thus held by the drift-pins will be relied upon solely for retaining the bond within the rail. The drift-pins are of greater length than the length of the terminals and are so proportioned that when driven home they will project at each end beyond the ends of the terminal, which latter will preferably be left approximately flush with the surface of the rail at their smaller ends.

In order that the full expansive force of the drift-pin may be exerted upon that part of the terminal which extends within the body of the rail, the terminals are counter-bored or enlarged, throughout the portion which protrudes from the rail, sufficiently to permit the drift-pin to fit loosely therein, as indicated clearly in the drawings.

With the bond constructed as above described it is applied by first driving the terminals firmly within the tapered apertures of the rails and thereafter driving the drift-pins within the terminals from the same side or in the same direction in which the terminals are driven into the rail. Should it become necessary at any time to remove the bond from the rail, the drift-pin will first be driven out, after which one or more light taps of the hammer upon the end of the terminal will start the latter back from the tapered aperture of the rail and without injury to or disfiguring the bond. Owing to the contraction and expansion of the rail and the con-

tinued vibration imparted thereto by the traversing cars, there is more or less tendency of the terminals to become loosened in their seats within the rail after a long period of use. With my improved construction, however, it is only necessary to go over the road occasionally and by driving the drift-pins in slightly thus overcome any possible looseness in the terminals and corresponding increased resistance.

I claim as my invention—

1. A rail-bond provided with terminal sleeves entering tapered holes in the rail web or flange from the larger end of the hole and removably expanded therein by tapered drift-pins inserted from the same side as the rail-bond, said drift-pins being longer than the terminal and arranged to project at each end thereof and the end of the terminal being left substantially flush with the face of the rail so as to prevent the expansion of the metal under the action of the drift-pin from forming a head or head to interfere with the removal of the bond.

2. A rail-bond provided with tapered terminal sleeves entering tapered holes in the rail web or flange from the larger side of the hole and removably expanded therein by tapered drift-pins inserted from the same side as the rail-bond, said terminals being counter-bored throughout the portions thereof external to the rail, and the drift-pins being of greater length than the terminals and arranged to project at each end of the latter.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two subscribing witnesses, this 13th day of February, A. D. 1897.

JOHN J. DANTON.

Witnesses:

GEO. E. FINK,
ALBERT H. GRAVES.