Nov. 26, 1935. W. E. HUBER 2,022,544

RAIL BOND

Filed April 8, 1931

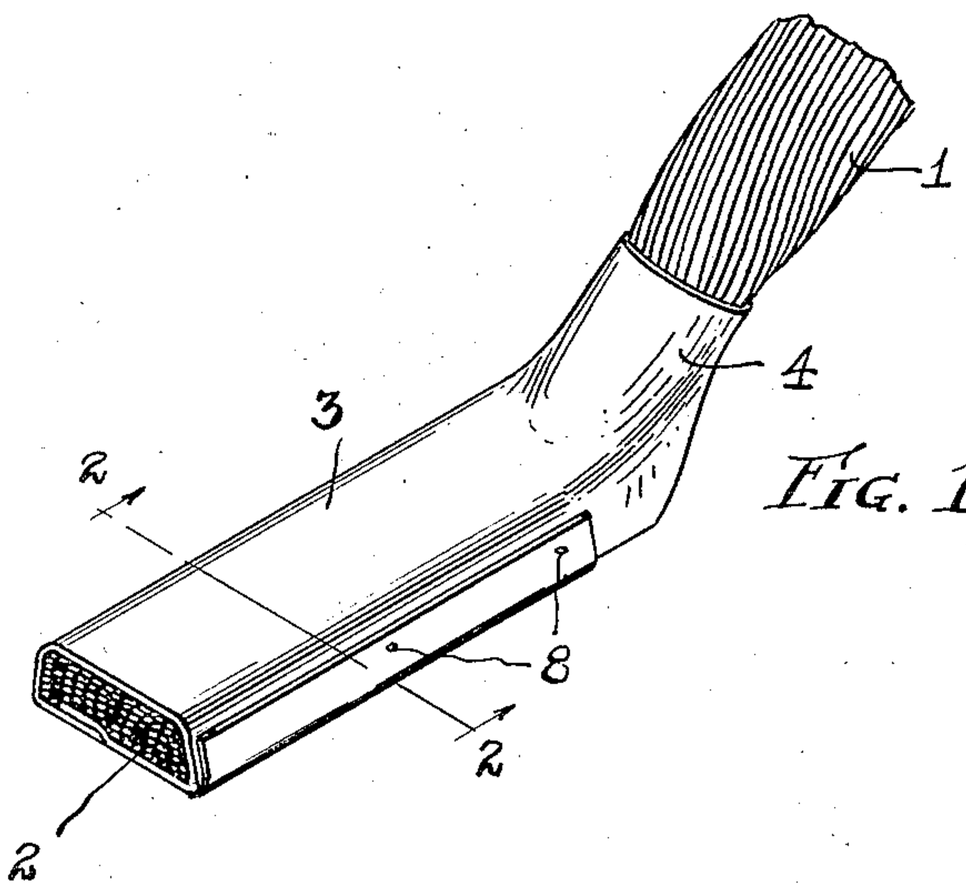

FIG. 1

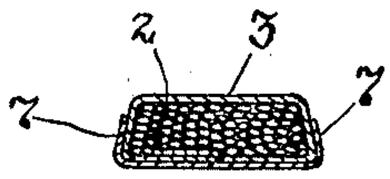

FIG. 2

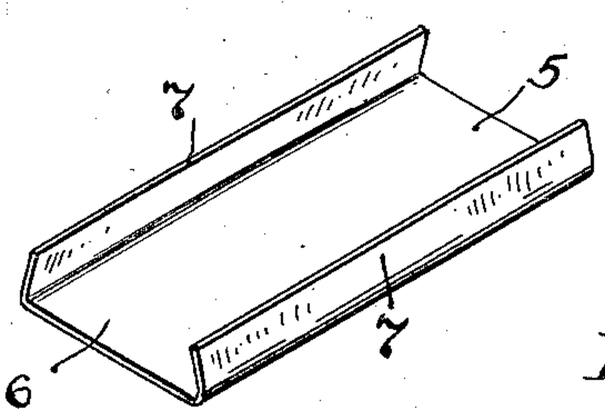

FIG. 3

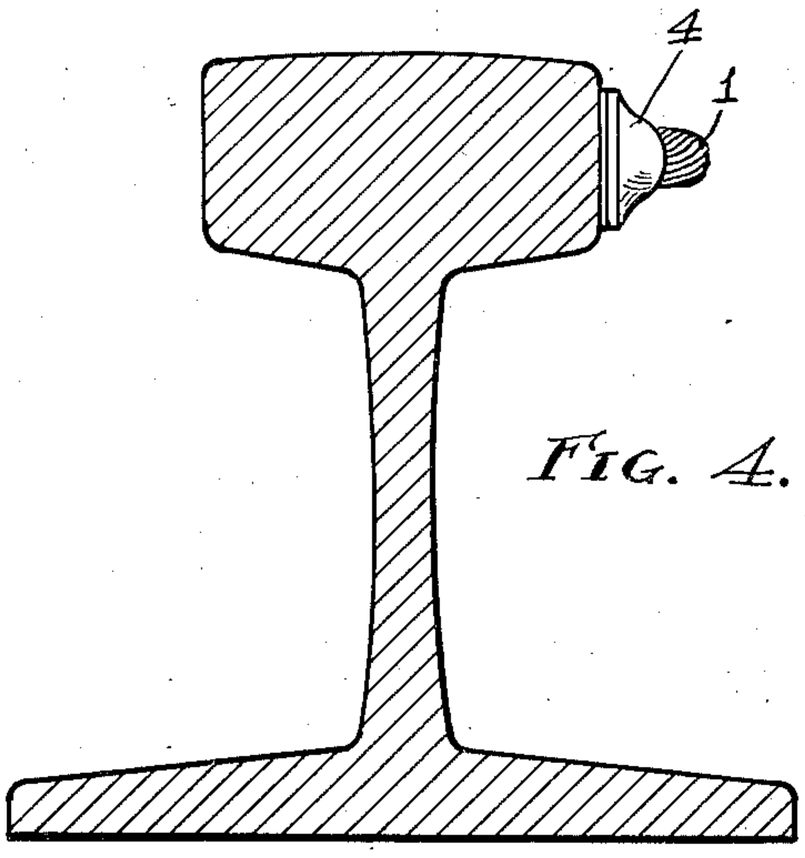

FIG. 4.

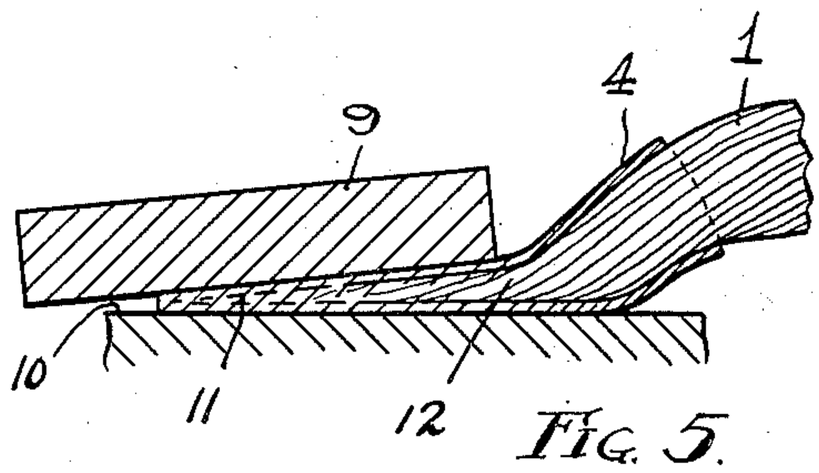

FIG. 5.

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RAIL BOND

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Application April 8, 1931, Serial No. 528,632

4 Claims. (Cl. 173—278)

This invention, relating as indicated to rail bonds, has a specific reference to a form of construction of the terminal of such bonds and the manner in which such terminals may be secured to a selected portion of the rail.

As is well known to those familiar with the art, one of the chief sources of failure of rail bonds is the vibration to which such bonds are subjected during use. Such vibration causes fatigue in the copper strands or wires which in turn leads to a breakage of such wires which usually occurs where the wires attach to the terminal.

It is among the objects of my invention to provide a rail bond construction, specifically the terminals thereof and a method of securing such terminals to the rails which shall not fail in the above described manner as readily as constructions heretofore employed. Other objects of my invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a fragmentary perspective view of a stranded rail bond showing the terminal thereof constructed in accordance with the principles comprising my invention.

Fig. 2 is a transverse sectional view of the terminal illustrated in Fig. 1 taken on a plane substantially indicated by the line **2—2**.

Fig. 3 is a perspective view of the cap of brazing material forming a part of the terminal construction illustrated in the previous figures.

Fig. 4 is a transverse sectional view of a rail showing the bond secured to a portion thereof; and

Fig. 5 is a fragmentary sectional view of a bond terminal and rail illustrating the method of securing the terminal to the rail comprising my invention.

Referring now more specifically to the drawing and more especially to Fig. 1, the body **1** of the bond with which the terminal comprising my invention is associated is preferably flexible and formed of a plurality of strands which are compressed as most clearly illustrated at **2** into a flat terminal which is completely laterally enclosed by a sheath **3** which is preferably of copper or like material. The sheath **3** completely encompasses the flattened terminal of strands for the purpose hereinafter more fully explained and is provided with a substantially cylindrical projection **4** which laterally supports the strands emerging from the flattened portion so as to further insure against breakage of the strands in this area.

The rail contacting portion or face of the sheathed terminal has a cap **5** of brazing material secured thereto, which cap is most clearly illustrated in Fig. 3. It will be noted from an examination of this last named figure that the cap **5** consists of a body portion **6** and side portions **7** so that the body portion **6** may completely overlie the rail engaging face of the sheath **3** and the side portion **7** being bent upwardly around the sides of such sheath as most clearly illustrated in Fig. 2 to insure rigid assembly between the parts preliminary to the attachment of such terminal to the rail in the manner presently to be described. In order to further insure the proper connection between the cap **5** and the sheath **3**, the sides **7** may be indented as at **8** so that there will be no possibility of the cap being moved axially of the sheath. The cap **5** will preferably be of brass or like material for the reasons hereinafter more fully explained.

The manner in which the terminal of the bond is attached to the rail is most clearly illustrated in Figs. 4 and 5. While the terminal has been illustrated as attached to the head of the rail in Fig. 4, nevertheless, it is to be understood that any suitable portion of the rail may be employed as a security means for the terminal of the bond. After the terminal has been assembled in the manner most clearly illustrated in Fig. 1, the same is placed in contact with the selected portion of the rail to which it is to be attached and then pressed against the rail by means of a heated block **9** which may be of suitable refractory material and heated in the manner well known to those familiar with the art. The block **9** will be pressed against the terminal of the bond in such a manner so that the area **11** under the forward end of such block will be heated to a greater extent than the rear portion **12** so that the strands in the portion **11** will be melted to form a solid mass and the strands in the portion **12** will be welded together without losing their identity. As the portion **11** melts, the block, under the influence of the pressure exerted thereon, will assume a position inclined to the face of the

rail so that the terminal in cross-section will be in the form illustrated in Fig. 5. The heat transferred to the terminal from the block 9 will cause the brazing cap 5 to be fused throughout due to the fact that its melting point is lower than the copper from which the sheath 3 and the strands of the bond are formed and will, therefore, when cooled, rigidly secure the bond terminal to the rail.

Due to the fact that the entire rail engaging face of the terminal is covered by a copper sheath which is disposed intermediately of the strands and the brass cap 5, when the terminal is heated, the sheath will prevent the brass from flowing up into the strands and it is this restraint of the brass by the copper sheath which produces a connection between the stranded body member of the conductor and the copper sheath capable of withstanding excessive vibrations. The particular manner in which the terminal is heated to produce the results most clearly illustrated in Fig. 5, also materially asists in producing a connection between the stranded body portion of the bond and the rail which has advantages which will be so apparent to those familiar with the art that an enumeration thereof is believed unnecessary.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A rail bond, comprising a multiple conductor body portion having a terminal with a rail-engaging face, the conductors in the terminal being fused together in the forward portion and thence being progressively separated rearwardly, a surface of lower melting point material on the rail-engaging face of said terminal, and means guarding such separated portion of the conductors from intrusion of low melting-point material from without.

2. The method of forming a multiple conductor rail bond, which comprises melting the conductors of the terminal thereof together in the forward portion only of the terminal, and attaching the terminal to a rail by fusing lower-melting metal between the terminal and rail, while excluding infiltration of the lower-melting metal into the multiple conductor body by an interposed sheath wall.

3. The method of forming a multiple conductor rail bond, which comprises melting and compacting together the conductors of the forward portion of the terminal thereof, and pressing but not melting the conductors in the rear portion of the terminal, and attaching the terminal to a rail by fusing lower-melting metal between the terminal and rail, while excluding infiltration of the lower-melting metal into the multiple conductor body by an interposed sheath wall.

4. The method of forming a multiple conductor rail bond, which comprises applying heat and pressure to the terminal portion thereof with greater flattening and fusion of the conductors in the forward portion of the terminal and progressively less flattening and no fusion at the rear portion of the terminal, and attaching the terminal to a rail by fusing braze material between the terminal and rail, while excluding infiltration of the braze material into the multiple conductor body by an interposed sheath wall.

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