

Sept. 25, 1956

A. E. BRICKMAN

2,764,436

RAIL BOND

Filed Nov. 20, 1953

2 Sheets-Sheet 1

FIG. 1.

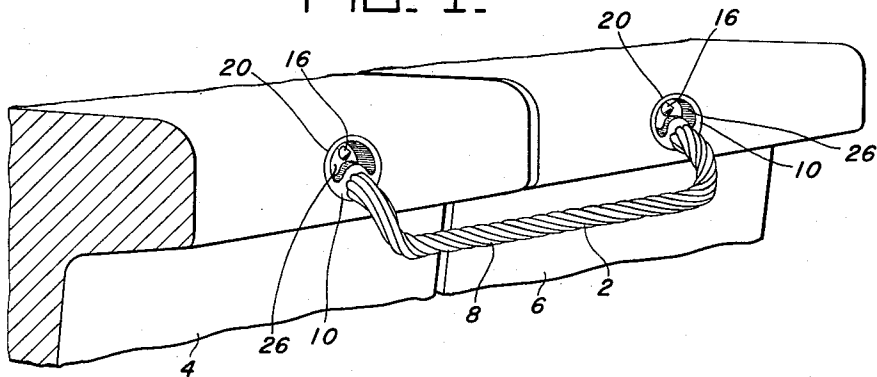


FIG. 2.

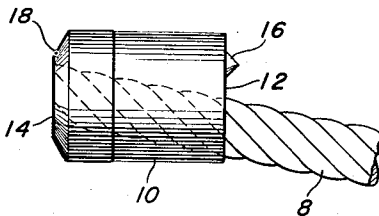


FIG. 3.

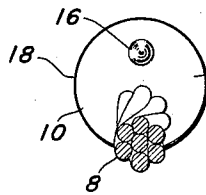


FIG. 4.

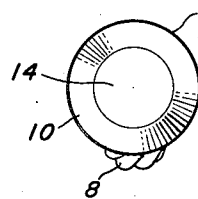


FIG. 5

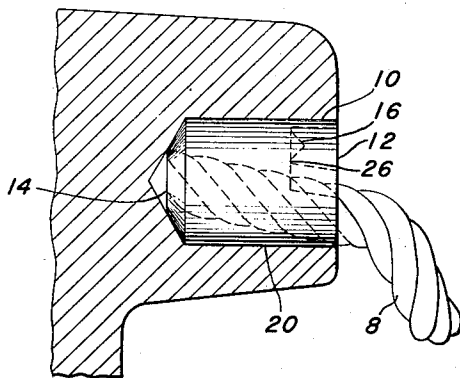


FIG. 6.

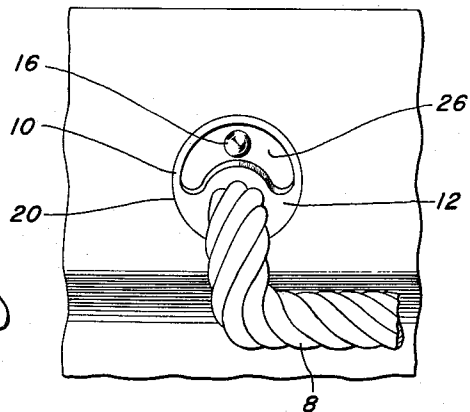
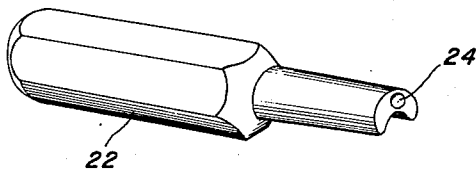


FIG. 7.



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FIG. 8.

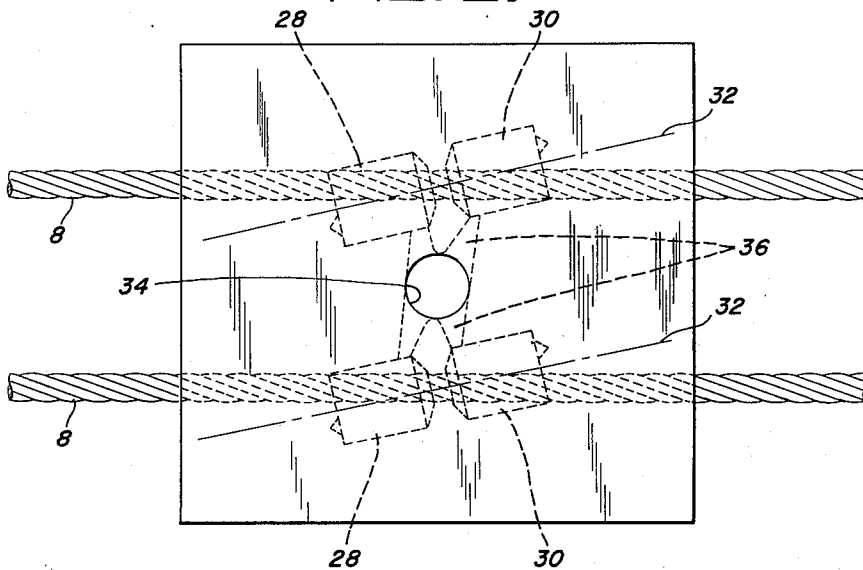


FIG. 9.

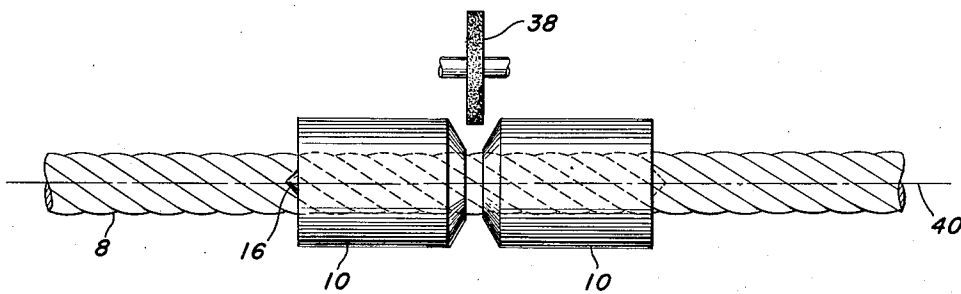
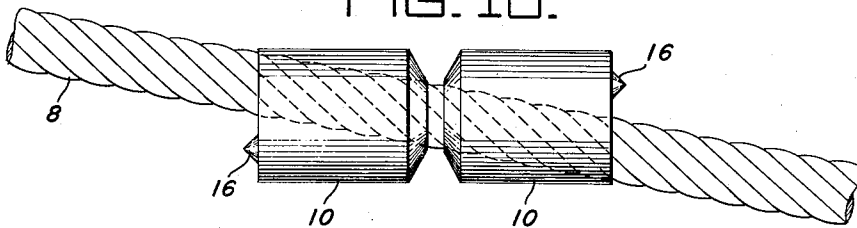


FIG. 10.



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2,764,436

RAIL BOND

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Application November 20, 1953, Serial No. 393,430

2 Claims. (Cl. 287—20.2)

This invention relates to rail bonds and more particularly to mechanically applied rail head bonds. A similar type of bond is shown in the patent to Lavarack No. 2,622,903. The bond shown therein is made by forming a plug of the desired shape, drilling a hole therein, inserting the cable in the hole, swaging the plug to the cable, then placing the plug in the hole in the rail and swaging it therein by means of a tool which is held against the top of the plug and driven thereagainst by means of a hammer. This plug is rather expensive to make and unless the plug is made large in diameter it is difficult to hold the tool against it when driving it into position.

It is therefore an object of my invention to provide a rail bond which is inexpensive to make and which is easily installed in the head of a rail.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a perspective view showing the rail bond of my invention electrically connecting two rails;

Figure 2 is an enlarged view of a single terminal of the rail bond;

Figure 3 is a view of the outer end of the bond of Figure 2;

Figure 4 is a view of the bottom end of the bond of Figure 2;

Figure 5 is a cross section of the rail head showing the rail bond terminal in assembled position;

Figure 6 is a side view of the assembled rail bond;

Figure 7 is a perspective view of the tool used in installing the rail bond;

Figure 8 is a schematic view showing one step in the method of making the rail bond of my invention;

Figure 9 is a side elevation view of a further step in the method of making the rail bond; and

Figure 10 is a plan view of Figure 9.

Referring more particularly to the drawings, the reference numeral 2 indicates the rail bond of my invention which extends between adjacent rails 4 and 6. The rail bond consists of a cable 8, which is made of electrically conducting metal such as bronze, and plugs 10 at each end thereof. The plugs 10 are made of malleable metal having a melting point less than the metal of the conductor 8 and may be a zinc alloy containing between 3.9% and 4.3% aluminum, .75% to 1.25% copper and .03% to .06% magnesium. This alloy has a melting point of approximately 780° F. The plug 10 has a substantially greater diameter than the cable 8 and is tapered slightly inwardly from its outer end 12 to its inner end 14. The axis of the cable 8 is preferably arranged at an oblique angle to the axis of the plug 10 with the cable being substantially tangent to the plug at its outer end 12 and substantially centered with respect to the plug 10 at the end 14. However, some of the advantages of my invention

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may be obtained by having the axis of the cable 8 displaced from the axis of the plug 10 and parallel thereto. A conical portion 16 extends upwardly from the face 12 for a purpose which will appear later. The end of the cable 8 extending through the plug 10 to the surface 14 is preferably coated or plated with an electrically conductor material such as cadmium or aluminum. The purpose of the coating is to prevent electrolysis reaction under conditions of actual use. The coating 18 may be applied to the entire plug or any part thereof as long as it covers the end of the cable or strand.

In assembly, the plug 10 is placed in a hole 20 in the head of the rail and the end of a tool 22 having a conical recess 24 therein is placed on the end 12 of the plug with the cone 16 being received in the recess 24, this functioning to hold the tool in position. The plug is then driven into engagement with the sides of the opening 20 by applying a hammer blow to the end of the tool 22. This provides a recess 26 in the plug 10. Other means may be provided for centering the tool 22 and holding it in position while the hammer blow is being applied. The angle arrangement of the cable in the plug presents the maximum area for contact by the tool and eliminates danger of exposure of the strands along the sides of the plug. It also provides a rail bond in which the cable slopes downwardly away from the rail as shown in Figures 1 and 5 so that it is removed from the zone of maximum danger which is at the top of the rail.

The plug 10 may be cast around the cable 8 in any suitable manner with the metal of the plug 10 extending into and filling the interstices of the cable. One method of making the rail bond is to cast a plurality of spaced apart pairs of plugs 10 about long lengths of cable. While a single cable may be used it is desirable to use two cables such as shown in Figure 8. The die blocks of the casting machine are provided with apertures for receiving the cables or strand members. The cavities 28 and 30 for each of the cables have their axes 32 arranged at an angle with the axes of the cables and are spaced a short distance apart. As in standard die casting procedures the dies are supplied with a sprue hole 34 and gates 36 through which the molten die metal is forced to fill the cavities 28 and 30. The plugs are separated from each other by means of an abrasive wheel 38 as shown in Figure 9 to provide a number of rail bonds. The center line 40 of Figure 9 is at the parting line of the die casting dies. The cut ends of the cable are then coated or plated with conductor material such as cadmium or aluminum.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A rail bond comprising a cable of copper containing metal, a plug of malleable metal of lower melting point than said cable cast about one end of said cable and extending into the interstices thereof, the diameter of said cable being substantially less than the diameter of said plug, said cable being slightly spaced from the periphery of said plug at its outer face and extending obliquely therethrough toward the center of the inner face of said plug.

2. A rail bond comprising a cable of copper containing metal, a plug of malleable metal of lower melting point than said cable cast about one end of said cable and extending into the interstices thereof, the diameter of said cable being substantially less than the diameter of said plug, said cable being slightly spaced from the periphery

of said plug at its outer face and extending obliquely there-
through toward the center of the inner face of said plug,
the cable extending entirely through said plug and termi-
nating at the bottom face thereof, and a coating of elec-
trically conductor material over the said end of the cable. 5

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