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RAIL BOND

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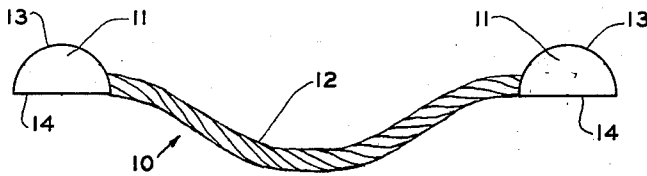


FIG. 1.

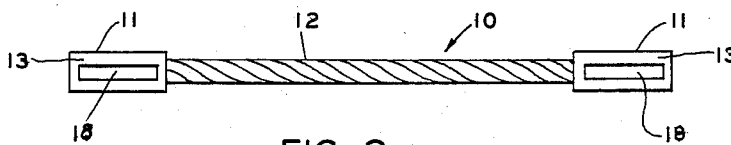


FIG. 2.

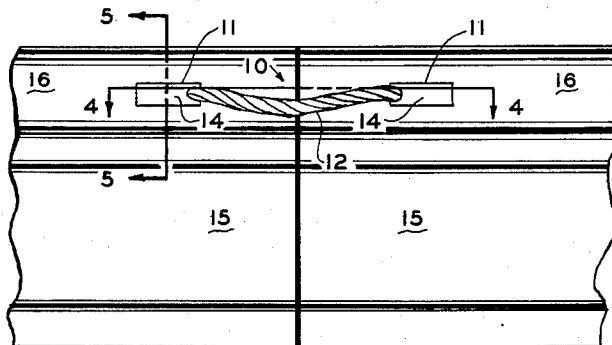


FIG. 3.

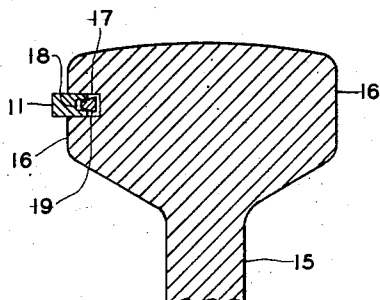


FIG. 5.

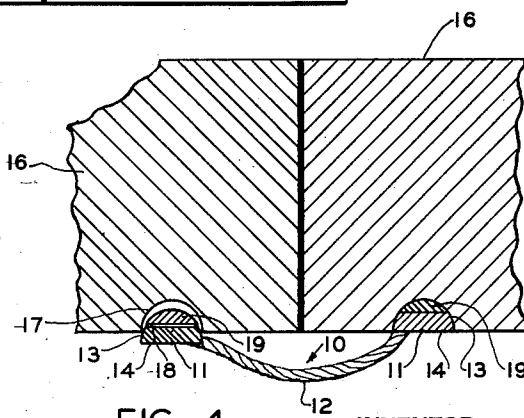


FIG. 4.

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RAIL BOND

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4 Claims. (Cl. 238—14.05)

This invention relates to a rail bond to electrically and mechanically connect the adjacent ends of abutting rails and more particularly to a rail bond which may be easily and inexpensively replaced.

Heretofore, the terminals of rail bonds have been of a type adapted to fit within cylindrical cavities near the ends of abutting rails, and have comprised parts protruding beyond the surface of the rails adapted to be easily sheared off by dragging parts from rolling stock, snow plows, ballast spreaders, and from the carelessness of repairmen. The rail bonds presently being used are so connected to adjacent rails that damaged rail bonds are practically impossible to replace. In the event that a terminal or cable is sheared off, the terminals must remain in their cavities and additional cavities must be drilled in the rails and terminals of a new rail bond inserted. If an excessive number of cavities are drilled near the end of a rail, the rail must be replaced either from structural weakness or lack of space to drill new cavities.

One object of this invention is to provide a rail bond which may be economically manufactured.

Another object of this invention is to provide a rail bond having a minimum of parts protruding beyond the surface of the rail.

Another object of this invention is to provide a rail bond having terminals requiring relatively shallow insert cavities.

A further object of this invention is to provide a rail bond having terminals which may be easily removed from the terminal cavities in the rails in order that the rail bond may be replaced.

Another object of this invention is to provide a rail bond having terminals comprising disc segments, the curved portion of which are adapted to fit in rail cavities of like shape.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the drawings, wherein:

Fig. 1 is a top plan view of the rail bond made in accordance with this invention;

Fig. 2 is an inside elevation of Fig. 1;

Fig. 3 is an outside elevation of the rail bond connecting adjacent ends of abutting rails;

Fig. 4 is a section taken along the lines 4—4 of Fig. 3; and

Fig. 5 is a section taken along the lines 5—5 of Fig. 3.

Referring now to the drawings in more detail, Figs. 1 and 2 disclose a rail bond 10 made in accordance with this invention comprising a pair of like terminals 11 connected by a cable 12. The cable 12 may be of any suitable material which is capable of conducting electricity and at the same time possessing strong mechanical qualities, such as strands of wire made from copper or aluminum, or alloys of copper or aluminum. The cable may be provided with an electrical insulating material for coating the strands of conductor wires.

Each terminal 11 is in shape of the segment of a disc or a half-moon, so that its inside surface 13 is curved and

preferably semi-cylindrical. The outside surface 14 is substantially flat so that it may register flush with the outside surface of the rail when completely inserted. The terminals 11 are also made from material of high electrical conductivity. However, this invention in no way restricts the material used in the rail bond 10, so long as the material is electrically conductive and mechanically strong.

Fig. 3 discloses the rail bond 10 in operating position connecting the adjacent ends of two abutting rails 15. Drilled in the ball 16 of each rail 15, is a cavity 17 (Figs. 4 and 5). Each cavity 17 is formed similar to the disc segment shape of each terminal 11 of the rail bond 10, and is so designed that each terminal must be driven by a hammer or similar tool into the cavity 17 to form a tight fit. Accordingly, the cavity 17 is relatively shallow in comparison with the cylindrical cavities now in use.

To prevent the terminals 11 from becoming loose or removed from the cavities 17 by ordinary usage and wear, each terminal 11 may be provided with a wedging action. As illustrated in Figs. 2, 4 and 5, each terminal has a recess 18 formed in its curved portion and generally parallel with the faces of the terminal. Adapted to fit within recess 17 is a wedge insert 19. As illustrated in Figs. 4 and 5, the wedge insert 19 fits loosely within the recess 18 just before and during the time when the terminal 11 is driven into the cavity 17. When the terminal 11 is completely driven into its cavity 17, as illustrated by the right-hand terminal of Fig. 4, the wedge 19 fits snugly within the recess 18 so that its outer edge forms a smooth continuous surface with the curved inside portion 13 of the terminal 11. As an alternative, it is also possible to eliminate the wedge insert 19 (Fig. 2). By flexing the sides of the recess 18 slightly inward and making the outer portion of the terminal 11 slightly larger than the cavity 17, the terminal itself will act as a wedge when it is driven into the cavity 17.

The operation of the device is as follows:

Rails 15 used for conducting electricity, such as, for example, in signal circuits, are laid end to end and secured to cross-ties to form a railroad track in a manner well known to the art. The cavity 17, having the shape of a disc segment, is cut or drilled into a portion of the rail 15 near each end. Cavities 17, which are relatively shallow, are preferably located in the ball 16 of the rail to avoid weakening of the structure of the rail 15. A rail bond 10 having terminals 11 comprising disc segments or half-moons are driven into the cavities 17 by a suitable hammer. When a terminal 11 is driven into the cavity 17 until its outer portion 14 is substantially flush with the outer surface of the ball 16, the terminals 11 are prevented from being removed by any suitable wedging action, such as the recess 18 and wedge insert 19 previously described. The cable 12 is slightly longer than the distance between cavities 17 in adjacent ends of abutting rails 15, to provide for expansion of the rails 15 without rupture of the cable 12. When the terminals 11 are completely inserted in their respective cavities 17, only the cable 12 is protruding beyond the surface of the rail ball 16, to present a minimum of rail bond parts to the hazards of railroad traffic and maintenance.

However, in the event that the cable 12 is broken or severed from either of the rail terminals 11, then the terminals may be easily removed by virtue of their unique shape. By exercising a lever or crowbar near one end of the outside terminal surface 14, the curved inner terminal surface 13 will slide along the curved surface of the cavity 17 in such a manner that the terminal 11 will rotate or tilt within the cavity 17, loosening the terminal 11 sufficiently that it may be removed completely from the cavity 17. After the terminals 11 are removed, then like termi-

nals 11 of another rail bond 10 may be inserted in the same cavities 17.

The structure of the rail bond 10 in accordance with this invention provides two major advantages. First, the disc segment or half-moon structure of the terminals 11 and the like shape of the cavities 17 permits complete insertion of the terminals 11 so that the only protruding part of the rail bond 10 is the cable 12. Moreover, the disc segment shape of the terminals 11 and the similar shape of the cavities 17 permits the removal of the terminals 11 from the cavities 17 in the event of rupture of the cable 12. Such a rail bond 10 assures that during the life of a rail 15 only one cavity 17 need be drilled in each end of the rail. The expense and time consumed in drilling additional holes every time a rail bond is replaced is eliminated. Moreover, rails 15 do not have to be replaced because of an excessive number of cavities and consequent weakening of the rail structure. Because the number of parts are few and the design and structure of the rail bond elements is simple, the cost of manufacturing rail bonds in accordance with this invention is less than the cost of rail bonds now being used.

It will be apparent to those skilled in the art that various changes may be made in the invention, without departing from the spirit and scope thereof, and therefore the invention is not limited by that which is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. A rail bond comprising a pair of terminals and a cable electrically and mechanically connecting said terminals, each of said terminals comprising a curved end portion having flat parallel sides, said end portion being adapted to snugly fit within an arcuate cavity having parallel sides of like shape in a rail.

2. A rail bond comprising a pair of terminals and a

cable electrically and mechanically connecting said terminals, each of said terminals comprising a cylindrically curved inner end portion and a pair of flat parallel side portions, the end and side portions of said terminal being adapted to fit within a cylindrically curved cavity having parallel sides of like shape in a rail.

3. A rail bond comprising a pair of terminals and a cable electrically and mechanically connecting said terminals, each of said terminals comprising a cylindrically curved inner end portion, a pair of flat parallel side portions and a substantially flat outer end portion, the end and side portions of said terminal being adapted to fit within a cylindrically curved cavity having parallel sides of like shape in a rail, in such a manner that said outer portion is substantially flush with the surface of said rail.

4. A rail bond comprising a pair of terminals and a cable electrically and mechanically connecting said terminals, each of said terminals having a semi-cylindrical shape and comprising a curved inner end portion, flat parallel side portions and a substantially flat outer end portion, said terminal being adapted to fit within an arcuate cavity of like shape having parallel sides in a rail, the outer end portion of said terminal being adapted to fit substantially flush with the outer surface of said rail.

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