

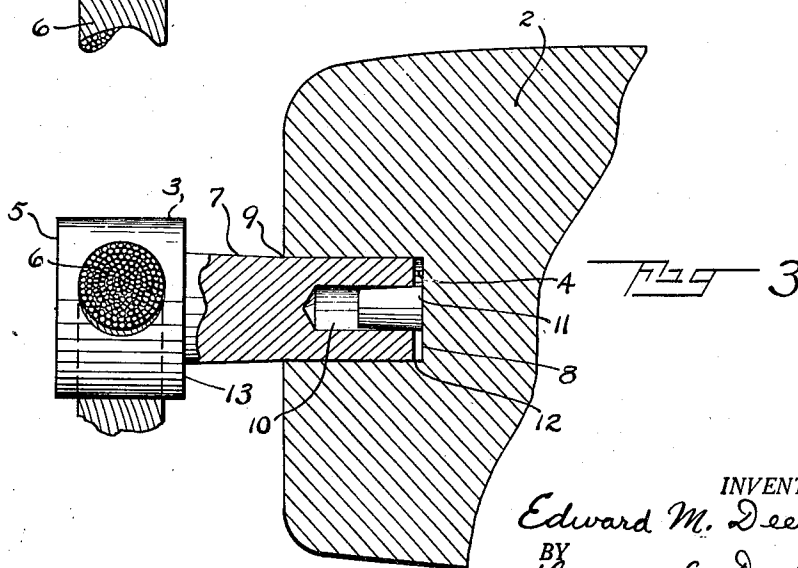
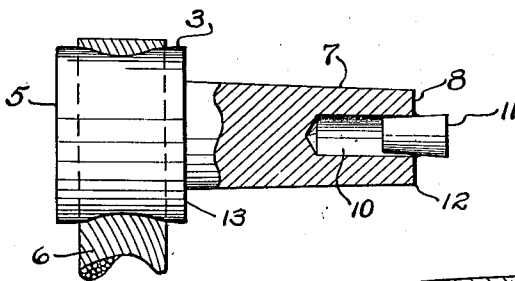
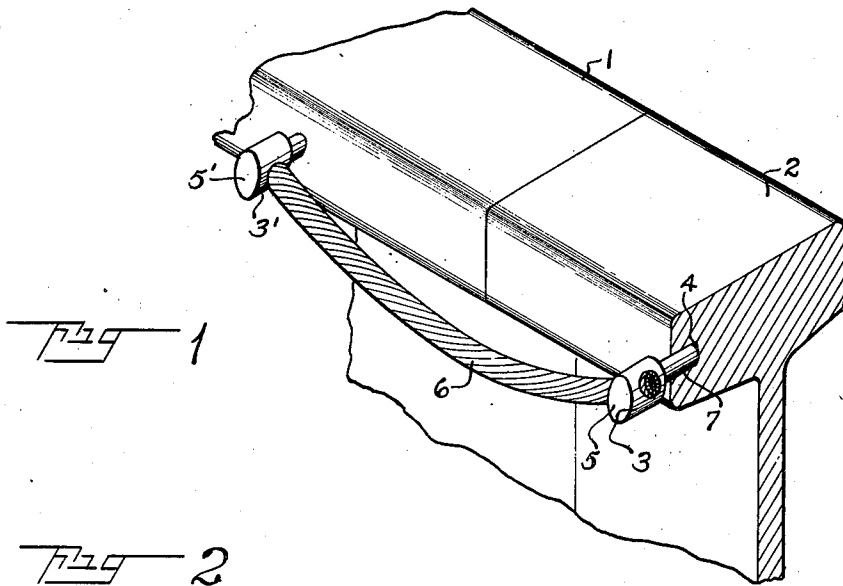
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RAIL BOND

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## UNITED STATES PATENT OFFICE.

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## RAIL BOND.

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This invention relates to electrical conductors, more especially those used to connect rail sections and particularly to such conductors as used in track circuit signalling.

It is well understood by those skilled in the railway track circuit signalling art that the ordinary bond wires now commonly used introduce a very considerable resistance in the rail circuit. Since the common use of copper oxide-soda batteries for railway track circuits this resistance has been especially objectionable. Various expedients have been resorted to to overcome the objectionable features of the ordinary bond wires which extend from the web of one rail to the web of the adjacent rail either outside of or inside of the joint plates. One method has been to weld either electrically or by torch one end of a bond to the ball of one rail and the other end to the ball of an adjacent rail. There are many objections to such a bond, although it does very considerably lower the resistance of the track circuit. One of the greatest objections to the welded bond is that in case a bond becomes broken the maintainer of the section where the bond is located has no means to weld another bond in place, as the apparatus for so doing is so cumbersome and expensive that individual maintainers are not provided therewith.

It has been proposed to drill a shallow hole in the ball of each adjacent rail and drive a plug therein, connecting the plug with a conductor. This form of bond gives the desired result in so far as lowered resistance is concerned, but enough ingenuity has not been expended upon them to render them practical. The best known form of this type of bond is shown by the patent to Brennan, No. 856,127, dated June 4, 1907.

The principal object of this invention is to provide an improved bond of the Brennan type.

A further object of the invention is to provide a bond of the type specified of such form that it may be easily removed from the orifice in the head of the rail so that a new bond may be put in place in the same orifice.

A further object of the invention is to provide a bond of the type specified of such form that it will not reach the bottom of the orifice in the railhead.

A further object of the invention is to

provide a bond of the type specified of such form and so arranged that the expanding member will act to keep the orifice in the pin free from foreign matter.

Other objects and advantages will appear as the description of the particular physical embodiment selected to illustrate the invention progresses, and the novel features of the invention will be particularly pointed out in the appended claims.

In describing the invention in detail, and the particular preferred physical embodiment selected to illustrate the invention, reference is had to the accompanying drawing, wherein I have illustrated a particular preferred physical embodiment of my invention, and wherein like characters of reference designate corresponding parts throughout the several views, and in which:

Figure 1 is a perspective view of the meeting ends of two rails with my improved bonds in place thereon; Fig. 2 is a part sectional part elevational view showing the details of one of my improved plugs; Fig. 3 is a part sectional part elevational view of one end of my bond showing its application to a rail head.

In Fig. 1, numeral 1 designates one rail and 2 an abutting rail. A plug 3 is inserted in an orifice 4 of one rail and a like plug 3' is inserted in a like orifice in rail 1. The heads 5 and 5' of the plugs are electrically connected by a metallic conductor 6. This conductor may be flexible, as shown, or it may be made of solid wire. The conductor 6 is in the form shown connected to a plug, as 3, by passing through an orifice in the head 5 thereof and by being preferably electrically welded thereto, although tinning or soldering is quite practical.

The plug 3 is formed with a cylindrical head 5 adapted to receive the blows from a hammer or similar instrument. The portion 7 of the pin or shank is very slightly tapered. The small end 8 is of such size that it will enter into orifice 4, perhaps one quarter the depth of said orifice without driving and the taper is such that when the plug is fully driven the portion at 9 will make a fit so snug as to exclude moisture.

In one end of the shank an orifice 10 is formed. Within this orifice is seated a body shaped like the frustum of a cone, designated 11. When the plug is driven into orifice 4, the member 11, which I will call a rift-pin, contacts the bottom or end wall of the orifice,

so that further driving of the plug causes the walls of the shank 7 to be expanded so that the edge 12, practically digs into the walls of the orifice 4 so making a bright metal contact between the rail and the shank.

The dimensions of the orifice 10, the rift-pin 11, the tapered shank 7 and the orifice 4 are such that when fully driven the parts take up the positions as shown by Fig. 3, in which the end 8 of the shank has not reached the end wall of the orifice 4 and the end of the rift-pin 11 has not reached the end wall of the orifice 10. By such construction the plug is most efficiently held.

The plug 3 is provided with a shoulder at 13, which shoulder when the plug is driven into place is some little distance from the face of the ball of the rail, as well shown by Fig. 3. This space allows the insertion of an instrument such as the ordinary railroad claw bar for removing the plug from the rail, in case of defect, in order to again use the same orifice 4 for a new plug.

In practice rift-pin 11 is inserted as shown in Fig. 2, in the orifice 10 and then preferably the whole plug is tinned as by insertion in molten metal. This practice results in keeping the member 11 in place while the plugs are in transit as that a plug always has associated with it, the corresponding rift-pin. This practice also prevents orifice 10 from practically filling with the tinning metal and so preventing proper driving of the pin, because if the plug is tinned without 11 in place, as shown in Fig. 2, then the orifice 10 is likely to practically fill with the tinning metal and when the rift-pin is entered into orifice 10 and the plug driven in orifice 4, the plug cannot be driven properly home

due to the obstruction to member 11. By this practice I also obviate the presence of foreign matter in orifice 10 which also would prevent proper driving of the pin. In addition to the foregoing advantages it would also be pointed out that the tinning metal acts as a lubricant and facilitates the proper driving of the pin. The first blow on the plug after the end of member 11 seats on the end wall of orifice 4 being sufficient to break the bond between 11 and 7 formed by the tinning, and then the tinning metal acts as a lubricant between 11 and 7 and between 7 and the walls of the orifice 4.

Although I have particularly described the construction of one physical embodiment of my invention, and explained the operation and principle thereof, nevertheless, I desire to have it understood that the form selected is merely illustrative, but does not exhaust the possible physical embodiment of the idea of means underlying my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a plug for a railbond for railway rails, in combination; a shank formed with an orifice in one end; a rift-pin entered in the orifice and tinning metal holding the rift-pin in place and preventing entrance of foreign matter in the orifice when the plug is in transit and also serving as a lubricant as the pin is driven into the rail.

2. The method of making a plug for a rail bond which consists in forming a shank with an orifice therein partially entering a tapered rift pin in the orifice and then tinning with molten metal.

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