W. P. BOVARD.

METHOD OF APPLYING RAIL BONDS TO RAILS.

APPLICATION FILED JULY 14, 1917.

1,277,370. Patented Sept. 3, 1918.

Fig. 1.

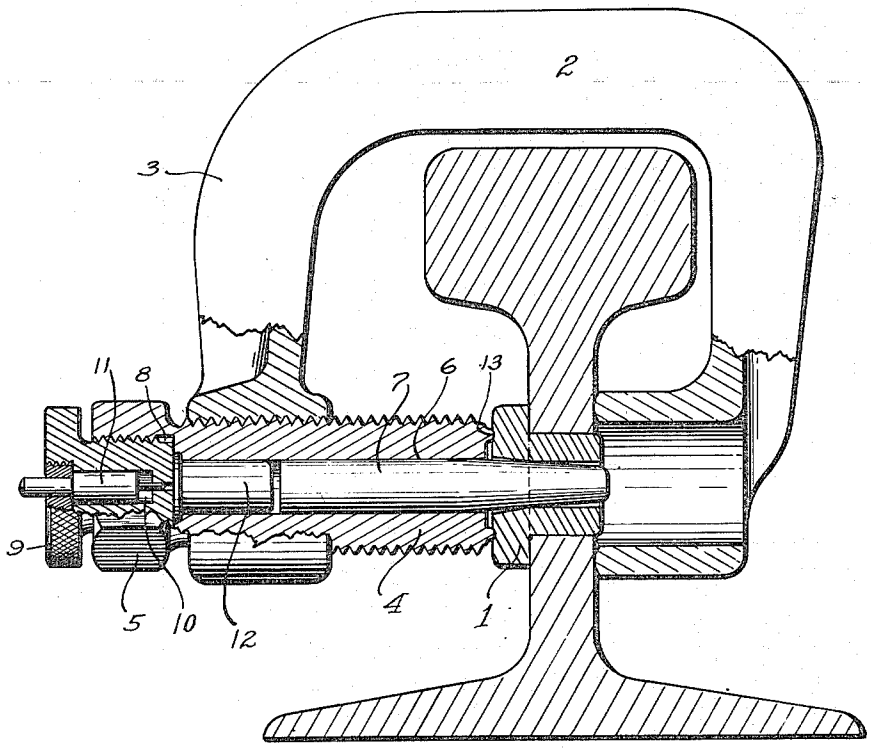


Fig. 3.

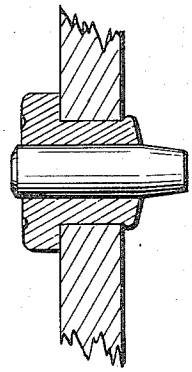
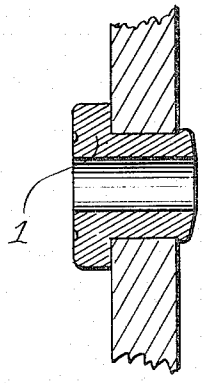


Fig. 2.



Witness

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METHOD OF APPLYING RAIL-BONDS TO RAILS.

1,277,370. Specification of Letters Patent. Patented Sept. 3, 1918.

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To all whom it may concern:

Be it known that I, WILLIAM P. BOVARD, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Methods of Applying Rail-Bonds to Rails, of which the following is a specification.

My invention relates to the method of applying rail bonds to rails for electrically uniting the adjacent ends of rails used as return circuits for electric railroads, but it is not necessarily limited to the application of rail bonds.

My method of installing bonds has for its object an improvement over the present method of installing rail bonds and especially those known as pin expanded or pin driven terminal rail bonds.

It is found with the pin driven bonds on the market in which the pin for expanding the terminal is forced into the terminal by means of a hammer, that carelessness upon the part of the workman will cause the pin to be driven in at an angle thereby tending to cut away the metal in front of the end of the pin in place of the pin being forced into the terminal in such a manner as to uniformly expand the terminal against the sides of the rail.

Figure 1 is a cross-sectional view of a rail and also showing one form of a clamping device partly in section, which can be used in the application of my method.

Fig. 2 is a sectional view taken through a terminal showing the condition after the application of my method.

Fig. 3 is a sectional view of a terminal showing a pin positioned therein.

The bond which I use in connection with my method is not different from that now found on the market and known as a pin expanded terminal rail bond. The method I employ and which I claim is novel, consists in forming an aperture in the web of the rail near the end thereof, and inserting therein the terminal of any of the well-known pin expanded rail bonds now found on the market, the terminal being indicated by numeral 1 in Fig. 1. I then position upon the rail a clamp or other suitable tool, one form of which is shown in Fig. 1, and indicated by numeral 2.

This clamping tool consists of a frame member 3, having a screw member 4, in the end of one arm. The screw 4 has a polygonal sided end 5 for the application of a wrench, and has an aperture 6 part way through of such a size as to fit snugly a drift pin 7 of proper size for expanding the terminal when the pin is forced therethrough. The aperture 6 opens into an enlarged aperture 8 which is screw threaded and receives a screw plug 9. The screw plug 9 is provided with an aperture 10, and located therein is the firing pin 11. Within the aperture 6 is located a cartridge 12, containing an explosive material. On the face of the screw 4 which contacts with the bond terminal, is a concentric projection 13, surrounding the opening to the aperture 6, and which embeds itself into the bond terminal, thereby acting as a seal and preventing the escape of the expanding gases from within the aperture 6.

In the application of my method to that of bonding rails the various steps consist in drilling the hole in the adjacent ends of the rails, inserting therein the terminal of the rail bond, positioning the clamp in place and forcing the screw 4 tightly against the bond, thereby forcing the terminal tightly in position and causing the sealing ring 13 to embed itself into the terminal, then inserting the drift pin 6 in position as shown and inserting a cartridge 12 in place; then screwing the screw plug 9 into position as shown in Fig. 1. The outer end of the firing pin is now struck a light blow with a hammer which causes the opposite end to contact with a priming cap thereby causing the explosive in the cartridge to detonate and the expanding gases confined in the tight aperture 6 forces the drift pin through the aperture in the bond terminal, causing the bond terminal to be forcibly expanded into proper contact with the rail as indicated in Fig. 2.

The force of the charge can be regulated by the size of the cartridge so that the drift pin may be either forced entirely through the terminal or forced only part way through with the idea of allowing it to remain permanently in the terminal of the bond as indicated in Fig. 3.

Having fully disclosed in the above specifications and the drawing my new and novel method of installing rail bonds, I claim:

1. The method of expanding an apertured terminal within an opening provided in a

rail by employing a pin which when forced into engagement with the wall of the aperture expands the terminal, consisting in positioning the terminal within the opening in the rail, then forcing the pin through the aperture of the terminal by explosive means.

2. The method of expanding an apertured terminal into engagement with the wall of an opening provided in a rail by employing a pin which when forced within the aperture expands the terminal, consisting in positioning the terminal into intimate engagement with the wall of the opening in the rail, then forcing the pin within the aperture of the terminal by explosive means.

3. The method of expanding an apertured terminal within an opening provided in a rail, consisting in forcing a pin to enter the aperture in the terminal by employing the expansive forces created by an explosion.

4. The method of attaching an apertured terminal to a rail consisting in preparing an opening in the rail, inserting the terminal in the opening, positioning a clamp on the rail and the terminal in a manner as to tightly maintain the terminal in proper relation with the rail, then expanding the terminal by forcing a pin into engagement with the wall of the aperture thereof, the pin being forced through the aperture by utilizing the expansive forces created by an explosion caused within a cavity provided in the clamp.

5. The method of expanding an apertured terminal within an opening provided in a rail consisting in inserting one end of a drift pin within the aperture, then causing an explosion to occur within a cavity formed in a clamp wherein the opposite end of the drift pin is mounted, the explosion creating expansive forces by means of which the drift pin is forced to enter the aperture of the terminal, being adapted to remain permanently therein or pass entirely through the aperture.

6. The herein described method of uniting parts consisting in forcing a pin through an aperture in one part by utilizing the expansive forces created by means of an explosive, the pin being of such a size as will expand the one part through which it is forced.

In testimony whereof I affix my signature.

WILLIAM P. BOVARD.