Aug. 4, 1936. H. H. FEBREY 2,050,047

RAIL BOND INSTALLATION

Filed Dec. 29, 1933

Fig. 1.

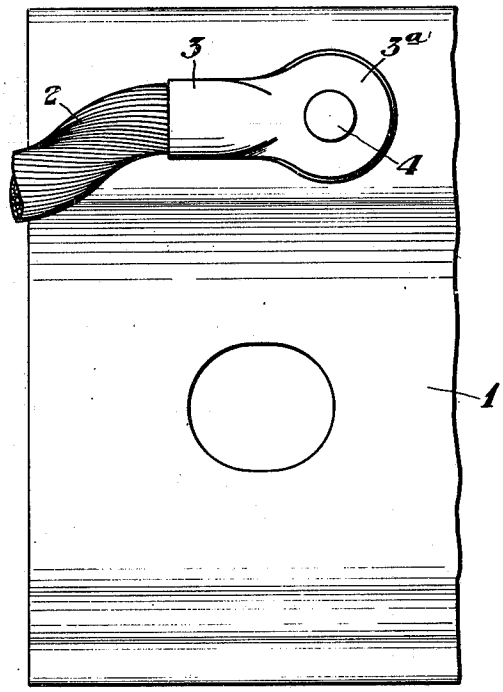


Fig. 2.

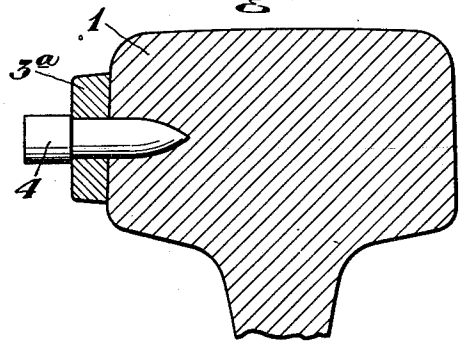
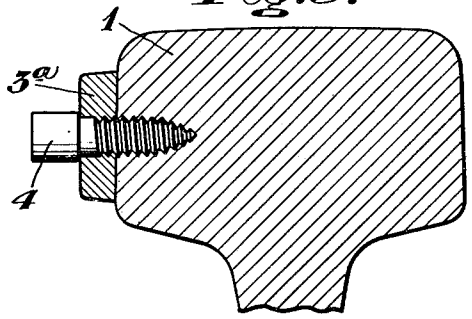


Fig. 3.



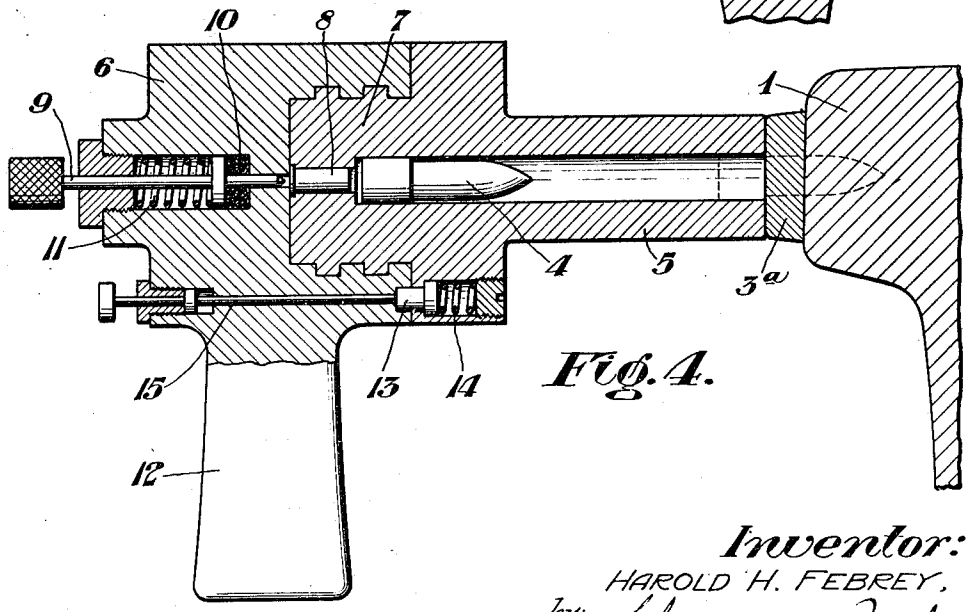


Fig. 4.

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RAIL BOND INSTALLATION

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4 Claims. (Cl. 29—169)

This invention relates to rail bonds, one of the objects being to provide a bond installation which is permanent yet may be made cheaply and easily. Another object is to provide a method of installing a plurality of bonds so that all the installations have the same characteristics. Other objects may be inferred.

According to the present invention, the rail bond installation includes a conductor strand, a terminal connecting with this strand, and a pointed pin which is driven through this terminal and into the solid metal of a railroad rail. The installation will, ordinarily, include a second terminal similarly fixed to another rail and connecting with the other end of the conductor strand, the two rails being those which are to be electrically bonded. It should be noted that the described installation is entirely different from one wherein a terminal pin is driven through a hole previously formed in a rail, the pointed pin in the present instance being solidly embedded in the metal, the latter and the pointed portion of the pin being in intimate contact throughout. The pin may in some instances be screw-threaded.

The above described installation is effected by shooting the pointed pin through the terminal with sufficient velocity respecting its weight to effect penetration into the solid metal of the rail. Preferably, the terminal should provide a flattened portion which may be positioned against the side of the rail so as to conveniently receive the pin. This flattened portion may be apertured to receive the pin, it may have a relatively deep depression into which the pin is shot and which aids its penetration through the remainder of the terminal, or the flattened portion may be completely solid and the pin shot through it into the rail.

Now it is obvious that the size of the pin is limited, and it follows that its velocity must be correspondingly high. Velocities of around three thousand feet per second are sufficient in most instances, although the shape of the pin as well as its weight may greatly vary this factor.

A particular feature of the invention is that a plurality of rail bonds having terminals of the type mentioned may be installed so that identical characteristics are obtained as to each individual installation. This result is effected by properly positioning the terminals with their flattened portions at appropriate points against the sides of the rails to be bonded, and shooting pointed pins of substantially equal weights through these portions and into the solid metal of these rails at substantially equal velocities. This results in identical installations, assuming that the proportions of the terminals' flattened portions are kept equal.

The high velocities required in connection with the present invention indicate the use of explosive charges as a means for propelling the pins. Also, explosive charges may be quite easily proportioned to provide equal forces in each instance of a number of installations.

The invention will now be more specifically described with the aid of the accompanying drawing, in which:

Figure 1 is a side view of the bond installation.

Figure 2 is a cross-section of Figure 1.

Figure 3 is also a cross-section, but showing the use of a screw-threaded pin.

Figure 4 is a cross-section of a gun suitable for propelling a pin to the required velocity by means of an explosive.

More particularly, Figures 1 and 2 show the end portion of a railroad rail 1, the installation being made to the head of this rail in view of the greater mass of metal present there, and also since it permits the use of a shorter conductor strand than would otherwise be possible if the splice bar had to be spanned. Continuing, there is shown a conductor strand 2 with which a terminal 3 connects, the pointed pin 4 being driven through this terminal and into the solid metal of the rail, this being shown particularly well by Figure 2. The terminal is preferably constructed to provide a flattened portion 3^a through which the pin is driven, as previously described.

The use of a screw-threaded pin is shown by Figure 3. Contrary to what might be expected, the solid metal of the rail completely fills the grooves in the surface of this pin, just as though the latter had been screwed into place. This installation results simply from shooting the pin into place at sufficient velocity, this being also the method followed in connection with the use of the smooth-surfaced pointed pin shown by the second figure.

A gun suitable for use in effecting the installations described, is illustrated by Figure 4. It includes a barrel 5 which is fastened in a breech 6 by means of a rather heavy bayonet connection 7. This barrel is chambered to receive the pin 4 and a cartridge 8, the latter being constructed along the lines of the ordinary blank cartridge. This cartridge is one of many which must be supplied, it being remembered that the present invention provides particular advantages when a plurality of rail bonds must be installed.

Of course, the pin 4, shown in the barrel 5, is also one of the many required.

As previously explained, all of the pins used should have equal weights, and the explosive charges should be proportioned to produce equal forces in each instance. Hence, the cartridges used should be carefully loaded with equal amounts of explosives. This indicates that commercial blank cartridges are not desirable, since they are not charged with any great accuracy.

The breech 6 carries a combination hammer and firing pin 9 which is urged forwardly, against a resilient washer 10, by a spring 11. Also, a handle 12 is fixed to the breech 6 and a suitable lock, such as the lug 13 urged forwardly by a spring 14 and depressible by a thumb operated member 15, should be provided to prevent inadvertent separation of the barrel 5 from the breech 6.

In use, the barrel 5 is loaded with the cartridge 8 and pin 4. The barrel is then fastened to the breech 6 and the gun as a whole is centered on the terminal 3. The operator holds the handle 12 with one hand, and with his other hand draws back the combination hammer and firing pin 9, sudden releasal of the latter effecting firing.

The illustrative gun just described is simplified so that it may be easily constructed by those not familiar with firearm manufacture. In addition, it prevents the carrying of the gun in a cocked position, which is naturally dangerous, and requires the use of two hands in its operation, the last assuring that the operator will not have one hand free to put in a dangerous position.

I claim:

1. A rail bond installation including, in combination with a railroad rail, a conductor strand, a terminal connecting with said strand, and a pointed pin driven through said terminal and into the solid metal of said rail, said pin being solidly embedded in said rail, the latter and the pointed portion of said pin being in intimate contact throughout.

2. A rail bond installation including, in combination with a railroad rail, a conductor strand, a terminal connecting with said strand, and a screw-threaded, pointed pin driven through said terminal and into the solid metal of said rail, said pin being solidly embedded in said rail, the latter and the pointed portion of said pin being in intimate contact throughout.

3. A method of installing a plurality of rail bonds having terminals, including positioning said terminals against the sides of the rails to be bonded, and shooting pointed pins of equal weights through said terminals and into the solid metal of said rails by means of explosive charges which are proportioned in each instance to provide equal forces.

4. A method of installing a plurality of rail bonds having terminals, including positioning said terminals against the sides of the rails to be bonded, and shooting pointed pins of equal weights through said terminals and into the solid metal of said rails by means of explosive charges which are proportioned in each instance to provide equal forces, said pins being sufficiently short to prevent their pointed ends passing through the opposite sides of said rails.

HAROLD H. FEBREY.