H. P. BROWN.

ELECTRIC BOND FOR RAILWAYS.

APPLICATION FILED APR. 2, 1907.

945,374.

Patented Jan. 4, 1910.

Fig. 1.

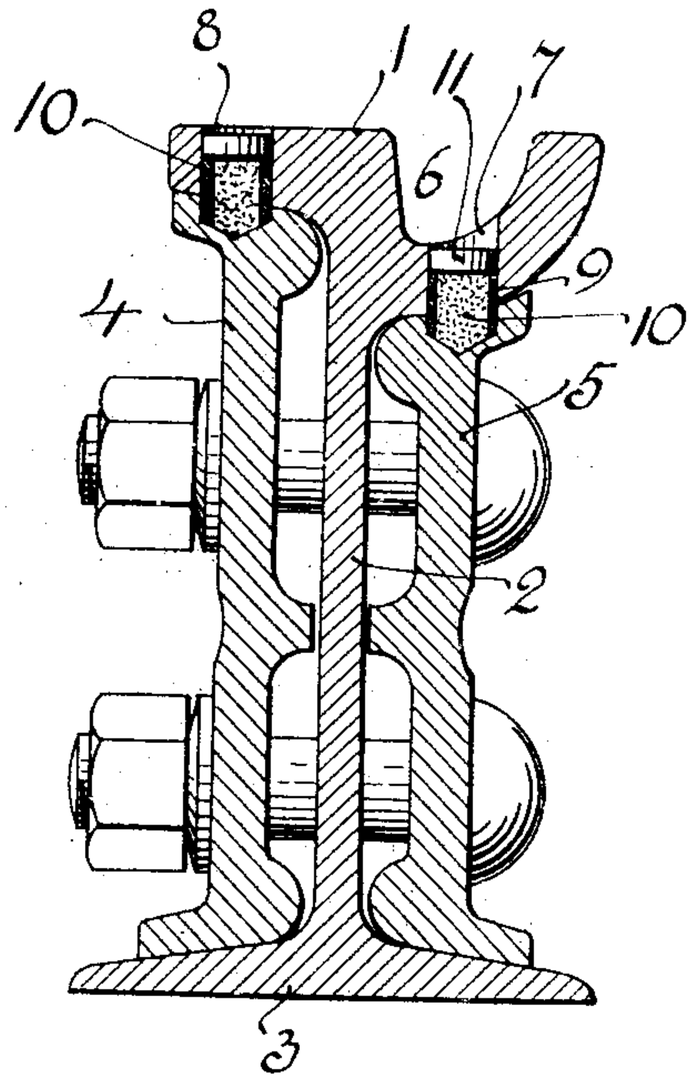


Fig. 2.

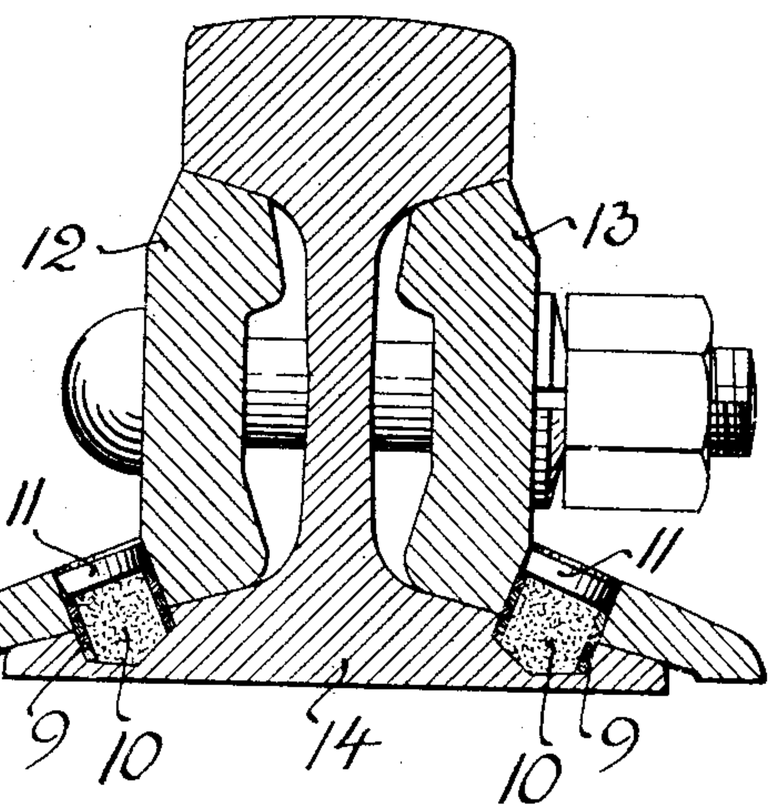
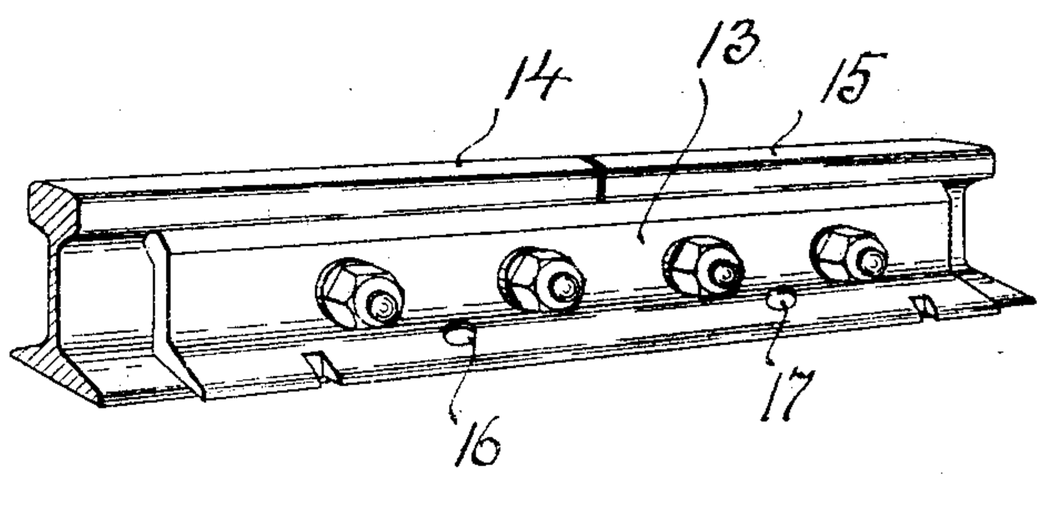


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC BOND FOR RAILWAYS.

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Application filed April 2, 1907. Serial No. 365,972.

To all whom it may concern:

Be it known that I, HAROLD P. BROWN, a citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Electric Bonds for Railways, of which the following is a specification.

My invention relates to an electric bond for railways and more particularly to a bond comprising a plug of readily yielding metal of high electric conductivity which may be applied from the exposed surface of the rail where the street is paved, without disturbing the pavement and without removing the rail joints. Copper bonds, as ordinarily used, have their contacts on the rails gradually destroyed by corrosion and electrolytic action and are liable to breakage on account of the motion of the rails and the bonds are liable to be partially or wholly sheared off by the expansion and contraction of the rails under heat and cold.

My present invention is directed to a bond which shall withstand these and all other tendencies to deterioration and destruction and one which may be applied in a simple and inexpensive manner.

With these ends in view, my invention consists in a plug of readily yielding metal of high electric conductivity, for example a plug of plastic alloy extending through an exposed surface of rail or angle or splice bar into the angle or splice bar or rail adjacent thereto.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a vertical transverse section through a grooved girder rail, such as is commonly used in paved streets, showing the angle or splice bars and the bonds in position, Fig. 2 is a similar view through a T-rail, and Fig. 3 is a view in perspective showing the position of the bonds with respect to the meeting ends of two railway rails.

Referring to the form shown in Fig. 1, the head of the rail is denoted by 1, its web by 2 and its base by 3. The outer angle or splice bar is denoted by 4 and the inner angle or splice bar is denoted by 5.

The groove along which the flange of the car wheel travels is denoted by 6. Through the portion of the rail at the bottom of the groove 6, there is drilled a hole 7 which extends through the head of the rail and into but not through the top of the splice or angle bar 5. To make the electric conductivity doubly effective, a similar hole may be tapped through the tread of the rail 1 as shown at 8 and into but not through the top of the splice or angle bar 4. Into these holes 7 and 8, plastic alloy is placed, the crack of the hole having first been protected by a flat spiral copper coil 9. To be more explicit, after the hole is bored through each rail into the splice or angle bar, the drill chips are removed conveniently by means of a permanent magnet and the proper depth of the hole determined conveniently by means of a collar fastened to the drill stock. The wall of the hole is then amalgamated or otherwise protected from corrosion by a non-rusting conducting coating. This amalgamation coats the steel with a layer of bright amalgam which will not rust nor will it permit the steel covered by it to rust. A spiral 9 of flat copper wire, in the form of a coil, is then preferably inserted into the hole to seal the crack between the rail and the angle or splice bar. The hole is then partly filled with what is known in the art as plastic alloy, 10, which is extremely viscous and adheres to the amalgamated surfaces of the steel and the spirals. The top of the hole is then sealed, for instance by means of a metal disk 11. This disk presses downwardly on the coil 9, keeping it tightly closed and hence the crack between the rail and the splice or angle bar tightly closed and as the dirt and foreign matter accumulates above the disk 11, either in the hole 7 or 8, the tendency will be for the flange, in the one instance, and the tread of the car wheel in the other instance, to exert a downward pressure upon the disks 11 as the car passes along the track thus squeezing the coil and the plastic alloy into a compact mass, holding the joint tightly sealed and the bond in its most effective condition.

With this bond, the lateral shifting of the

holes in the rail and angle or splice bar out of register under the effects of heat and cold or from other cause, will not affect the integrity of the bond, the material of which it is composed being at all times in close electric contact with the walls of the hole through the rail and in the splice or angle bar and ready to accommodate itself to any slight variances which may ordinarily be liable to take place under traffic.

Instead of the plastic alloy in a flowing state, a semi-plastic metal plug consisting of a more solidified form of the plastic alloy or other non-rusting conducting metal, may be used and it, under the constant hammering action of the passing train, will be forced to accommodate itself to any slight variations which may take place in the positions of the rail and splice or angle bar relative to each other. And, even though the bond be sheared entirely, the hammering will force the portions into intimate contact with each other and the rail and angle bar while the amalgamation will prevent corrosion. This form of bond does not require the tearing up of the pavement in paved streets and does not in any event, even when applied to a T-rail, require any dismemberment of the joint in order to apply it, nor any interruption of traffic as it can be applied during intervals between passing trains or cars.

The form shown in Fig. 2, is that in use in connection with T-rails where the holes are made through the base flanges of the splice or angle bars 12 and 13, into the base flanges of the rail 14.

In Fig. 3, the two rails, denoted by 14, 15, show the splice or angle bar 13 in its position relative thereto and the holes for the reception of the bonds, located at 16, 17, it being understood that there may be two holes correspondingly placed on the splice or angle bar 12 on the opposite sides of these meeting ends of the rails.

The spiral coil of copper wire has been found to be an exceedingly efficient guard against the tendency of the plug of plastic alloy creeping away out of position between the rail and angle or splice bar.

While I have shown a groove faced rail in illustrating my invention, I do not wish to limit myself to such a form as my invention is also well adapted to use where the face of the rail is flat instead of grooved.

What I claim is:—

1. The combination with a railway rail and an angle or splice bar, the rail being provided with a hole extending through it and the splice bar with a hole extending into but not through it, of a spiral metallic guard located around the margin of the hole and a plug of readily yielding metal of high electric conductivity seated within said guard within the hole and having an electric engagement with the said guard.

2. The combination with a railway rail and a splice or angle bar, the rail being provided with a hole through its head in the path of a wheel traveling along the rail, and the angle or splice bar being provided with a hole partially therethrough, of a plug of readily yielding metal of high electric conductivity seated in said hole in position to be compressed by the said wheel in passing along the rail.

3. The combination with a railway rail and a splice or angle bar, the railway rail being provided with a groove in its head along which the flange of a wheel is adapted to travel and with a hole extending through the tram of the rail and the angle bar being provided with a corresponding hole extending partially therethrough, of a plug of readily yielding metal of high electric conductivity seated in said hole and a cover in the upper part of said hole for shielding the said yielding metal from exposure.

4. The combination with a railway rail and a splice or angle bar, the railway rail being provided with a groove in its head along which the flange of a wheel is adapted to travel and with a hole extending through the tram of the rail and the angle bar being provided with a corresponding hole extending partially therethrough, of a plug of semi-plastic non-rusting metal seated in said hole.

5. The combination with a rail along which a wheel is adapted to travel and a splice or angle bar for connecting the rail with an adjacent rail, the portion of the rail along which the wheel travels being provided with a hole extending through it and the angle bar being provided with a corresponding hole extending partially through it, of a plug of readily yielding metal of high electric conductivity seated in said hole and a cover in the upper part of said hole for shielding the said yielding metal from exposure.

6. The combination with a railway rail and an angle or splice bar, the rail and the bar being provided with a hole extending through the rail and partially through the bar and the hole being provided with a non-rusting conducting coating or amalgam, of a spiral metallic guard located around the margin of the hole and a plug of readily yielding metal of high electric conductivity seated in said hole and in intimate electric engagement with both the rail and angle or splice bar.

7. The combination with a railway rail and an angle or splice bar, the rail being provided with a hole extending through it and the splice bar with a hole extending into but not through it, of a close spiral of

flat amalgamated wire located around the margin of the hole and a plug of readily yielding metal of high electric conductivity seated within said guard within the hole and having an electric engagement with the said guard.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 22nd day of March 1907.

HAROLD P. BROWN.

Witnesses:

ROBT. N. HARDY,

THOS. H. HASKINS.