

No. 610,909.

Patented Sept. 20, 1898.

J. E. LLOYD.
RAIL BOND.

(Application filed Nov. 12, 1896.)

(No Model.)

Fig. 1.

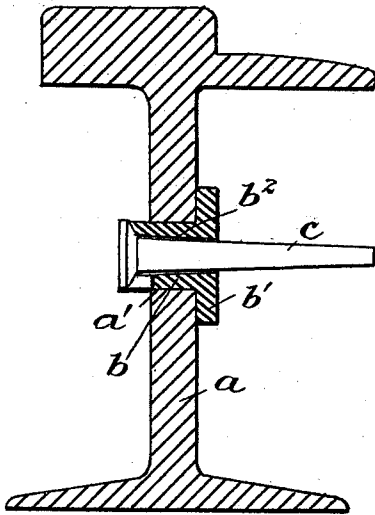


Fig. 2.

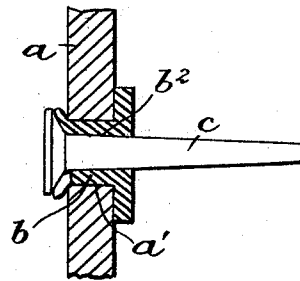


Fig. 3.

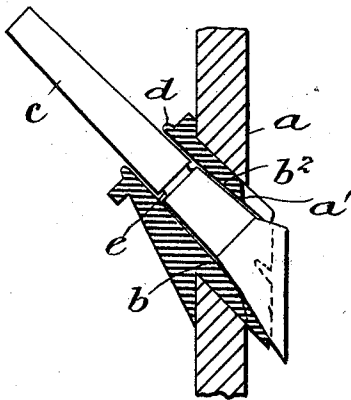


Fig. 4.

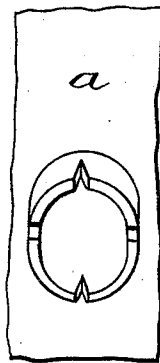


Fig. 6.

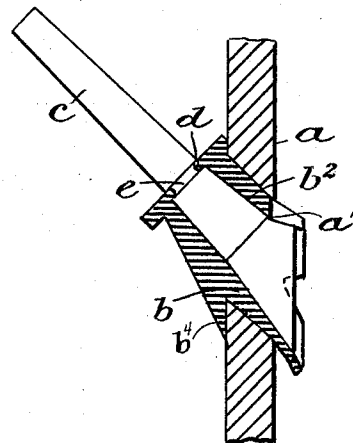
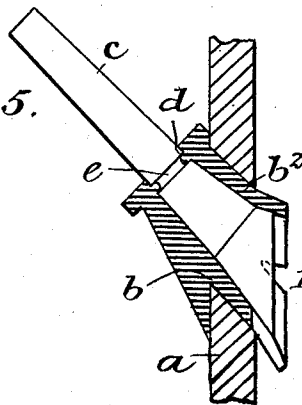


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN E. LLOYD, OF NEW YORK, N. Y.

RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 610,909, dated September 20, 1898.

Application filed November 12, 1896. Serial No. 611,816. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. LLOYD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rail-Bonds, of which the following is a full, clear, and exact specification.

This invention pertains to rail-bonds, and has particular reference to the means for fastening the bond-wire to the rail.

The object of the invention is to provide a simple and efficient fastening which may be easily applied.

Heretofore in fastening the wire to the rail after the rail has once been put in place it was necessary to dig up the earth on each side of the rail, so as to expose both sides thereof. The wire could then be fastened by a screw and nut or by any other well-known means. The central idea of my invention is to remedy this difficulty and to construct a bond-wire which may be firmly attached to the rail without exposing more than one side of the rail while the wire is being attached and which when inserted cannot be withdrawn without destroying the bond.

The invention also comprehends other novel features, which will be more fully hereinafter described, and pointed out in the claims.

Notwithstanding numerous ways may be devised for attaining the desired result in substantially the same manner as herein set forth, I have illustrated in the accompanying drawings what I deem to be the preferred forms of my invention, it being understood, however, that I do not limit myself to the forms herein shown.

In the drawings, Figure 1 is a sectional view of a rail, showing a wire attached thereto in accordance with my invention, the wire being substantially at a right angle to the rail and not in fixed position. Fig. 2 is similar to Fig. 1 and shows the wire drawn to its fixed position. Fig. 3 is a sectional view of a wire attached at an oblique angle to the rail, the wire being loose. Fig. 4 is a side view of the same. Fig. 5 is similar to Fig. 3, but shows the wire in fixed position. Fig. 6 illustrates a modified location of the groove.

Referring more particularly to the drawings, *a* represents the rail to which the wire

is to be attached. A straight-bored hole *a'* is drilled through the rail at any desired point and at any desired angle. Although it may commonly be deemed best to drill the hole at a right angle to the rail, nevertheless I have found it advantageous to drill the hole at any oblique angle, inasmuch as a greater contact-surface is thereby secured. This, however, is not a material feature with my invention, for I deem it to be within the spirit and scope of my invention to drill the hole, and thus place the wire, at any angle. A washer *b*, having an annular shoulder or plate *b'*, is adapted to be inserted in the hole *a'*, the annular shoulder or plate resting against the side of the rail. This annular shoulder, it is obvious, may be dispensed with without departing from my invention and any other suitable means for preventing the washer from being drawn or pushed through the hole in the direction opposite the wire be substituted therefor. Through washer *b* is a tapered passage *b²*, broadening toward the end of the washer opposite that having the annular shoulder. Preferably this passage has two or more tapers or bevels, as illustrated in the drawings—that is, the sides of the passage taper outward from different points in the axis of the passage. The end of the bond-wire *c* is enlarged and swells outwardly to form a head, the latter having bevels or tapers or being formed to correspond with the tapering passage *b²* and the enlargement being preferably of slightly-larger diameter than the passage. Preferably the tapering of the end of the wire is so arranged that the outer taper (represented by *c* in the drawings) of the wire will fit the outer taper of the passage (represented by *b²* in the drawings) just before the inner tapers of the wire and passage correspond. This, however, is a matter of adjustment and may be varied to suit special construction.

In operation the washer surrounding the wire is inserted in the hole *a'* and pushed or driven in until the shoulder *b'* rests against the side of the rail. Sufficient pressure is exerted against the washer to hold it in place, and at the same time the wire is drawn in. When this is done, the outer enlargement or taper of the wire spreads apart the end of the washer, and the inner tapers of the wire and

passage fit tightly against each other, as illustrated in Figs. 2, 5, and 6. This causes a swelling of the washer against the rail and in consequence a tight fastening between the rail and wire. It will be found that the wire will not work loose by jarring or vibration, nor, in fact, from any cause short of actual violence; but in order to positively insure the wire against working loose the metal of the washer and wire may be upset or hammered together at the points of contact. A more convenient and effective way, however, is shown in Figs. 3, 5, and 6, where an annular teat or rim *d* is formed on washer *b* and an annular groove *e* is cut in wire *c*. When the wire is in fixed position, as shown in Fig. 5, the metal of the washer may be pushed or pressed down to fill in the groove *e*, thereby effectually fixing the wire in the washer. The groove may, if desired, be so located as to be very near the end of the washer when the wire is in final position. This facilitates the filling of it with the metal of the washer, but of course is not as strong as the former construction. In order to strengthen the fastening when the wire is to be placed at an angle to the rail, it will be found desirable to reinforce the washer by forming thereon a shoulder *b*⁴ to rest against the rail, as illustrated in the drawings.

The material of which the washer and wire are made is immaterial so long as a good conductor of electricity is used; but I prefer to use some soft metal, such as copper, in order to facilitate the upsetting of the same, as before described. Likewise the angles of the tapering sides of the passage in the washer and on the wire may be varied at will.

It is to be understood that I do not limit myself to the precise construction herein shown and described, as it is obvious that the various parts may be reversed or some parts omitted or well-known equivalents substituted therefor without departing from the spirit and what I consider to be the terms of my invention.

Having thus described my invention, I claim—

1. In a rail-bond, the combination with the rail and wire, of a flanged washer adapted to surround the wire and be inserted in the rail from one side, and means for forming a flange on said washer on the opposite side of the rail by drawing the wire into the washer, substantially as described.

2. In a rail-bond, the combination with the

rail and wire, of a flanged washer adapted to be inserted in the rail and provided with a passage tapering toward the flanged end thereof, said wire having a tapering or enlarged end to fit said passage, for the purpose set forth.

3. In a rail-bond, the combination with the rail and wire, of a washer adapted to be inserted in the rail and provided with a tapered passage having a plurality of tapers, said wire having a tapered or enlarged end to fit said passage, substantially as described.

4. In a rail-bond, the combination with the rail and wire, of a flanged washer adapted to be inserted in the rail and provided with a tapered passage having a plurality of tapers, said wire having a tapered end of slightly-larger diameter than said passage, substantially as described.

5. In a rail-bond, the combination with the rail and wire, of a flanged washer adapted to be inserted in the rail and provided with a tapered passage having inner and outer tapers, said wire having a tapered or enlarged end to correspond with said passage in such manner that the outer tapers of said washer and wire will fit each other before the inner tapers fit, substantially as described.

6. In a rail-bond, the combination with the rail, of a flanged washer provided with a passage tapering outward from the flange, said washer being adapted to be inserted in the rail, a wire having a tapering end to fit said passage, and means for preventing said wire from being drawn backward when once drawn into said passage, substantially as described.

7. In a rail-bond, the combination with the rail, of a washer provided with a tapering passage and adapted to be inserted in the rail, a wire having a tapering end to fit said passage, an annular rim upon said washer, and an annular groove in said wire, substantially as described.

8. In a rail-bond, the combination with the rail and wire, of a washer adapted to surround the wire and be inserted in the rail at an oblique angle thereto, and a shoulder upon said washer opposite to said angle adapted to rest against the rail, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN E. LLOYD.

Witnesses:

C. V. EDWARDS,
M. A. RYAN.