(No Model.)

T. J. McTIGHE.

ELECTRIC RAIL BOND.

No. 478,629. Patented July 12, 1892.

Fig. 1

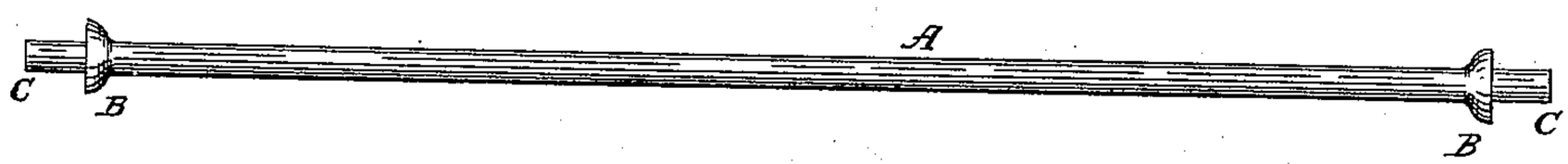


Fig. 2.

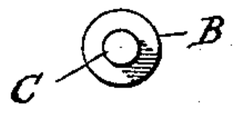


Fig. 3.

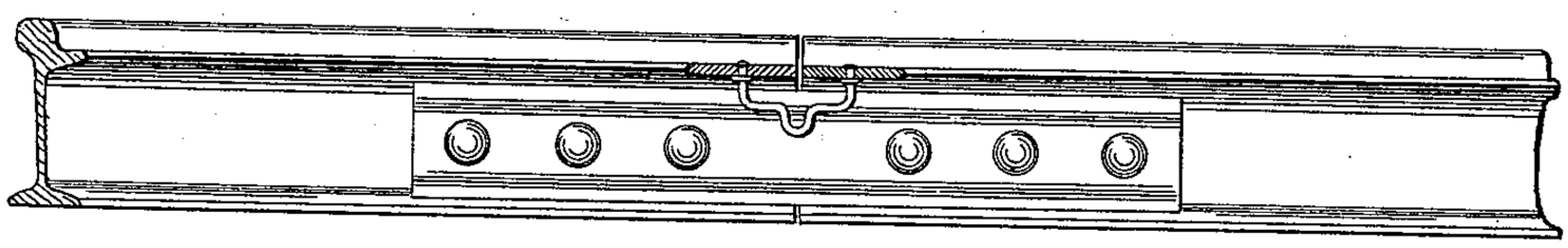
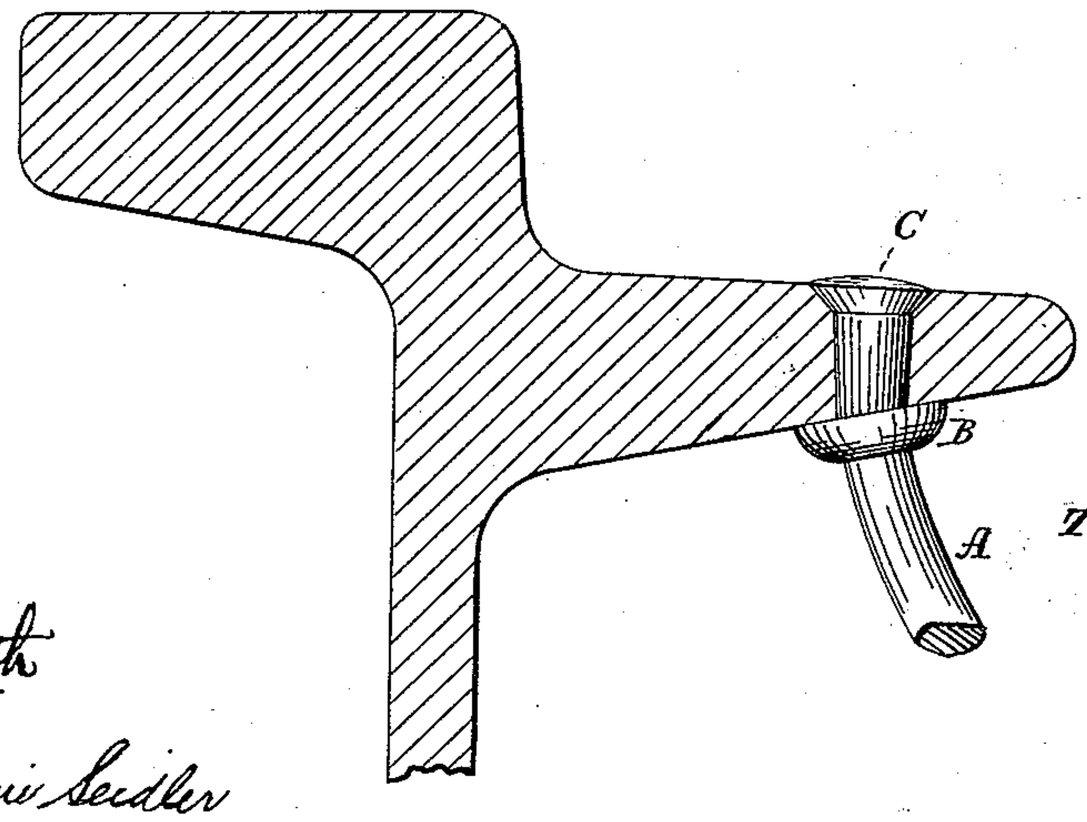


Fig. 4.



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ELECTRIC RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 478,629, dated July 12, 1892.

Application filed April 1, 1892. Serial No. 427,410. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. McTIGHE, 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 Electric-Railway Rail-Bonds and Applying Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of devices now known as electric-railway rail-bonds—namely, a connector to be fastened by riveting or upsetting to the ends of adjoining rails for the purpose of insuring electrical continuity of the rails.

As heretofore applied, the rail-bond has been made generally of wire or a flat band of metal having rivets attached to its ends by soldering, brazing, or riveting, the bond as a whole thus comprising three separate pieces. A modification consists in taking a plain wire, inserting its ends in enlarged holes in the rails, and driving alongside a channeled pin of conical or wedge shape. Here again are three separate pieces of metal. When these devices are applied and the moisture and exposure exert their corrosive influence the adjacent surfaces become oxidized and the continual pounding of the rail-joint by passing cars shakes the rust out, new surfaces are exposed, and finally the rail-bond becomes a source of trouble and renewed expense. If the rail-bond be of copper in any part or be of iron brazed together, galvanic action is liable to proceed to the destruction of the device. My invention aims at the elimination of these troubles; and it consists in a rail-bond in one integral piece, having shoulders or rivet-heads on its curved ends terminating in pins or rivets for insertion in and attachment to the rail, substantially as hereinafter described and claimed.

My invention further consists in the combination, with a girder-rail joint, of a rail-bond having its ends inserted upwardly through the tram of the rail within the length of the fish-plates, thus permitting the use of a very short rail-bond, reducing the electrical resistance due to the bond to the minimum, and permitting direct inspection and tightening at all times.

In the drawings, which form a part of this specification, Figure 1 is a side view of my improved rail-bond as manufactured. Fig. 2 is an end view of same. Fig. 3 is a side elevation, partly sectional, of a girder-rail joint showing my rail-bond in position. Fig. 4 is a full-sized section of the head and tram of a girder-rail, showing my method of insuring the permanent retention of a rail-bond in the tram of the rail.

In describing a girder-rail herein I call the "head" that portion which receives the car-wheels and the "tram" the depressed horizontal portion of the head which affords a track or bearing-surface for the wheels of wagons and other vehicles.

To one skilled in the art of metal-working several methods of manufacture will suggest themselves.

A is the rail-bond, and B B the shoulders formed on its curved ends and which support the rivets C C while heading up the ends and sealing the extremities of the holes drilled in the rails.

The rail-bond A may have the shoulders B B formed by simply upsetting the metal at those points, or the rail-bond may be made from stock, the diameter of the shoulders swaged down to form the rivet-ends, and the body or drop-forged rivet ends, including the shoulders, may be welded to the body-piece; or any other method of manufacture may be adopted which effects the result of a rail-bond having in one integral piece the curved ends with the shoulders B B and rivet ends C C. The act of riveting such a rail-bond in the rails absolutely seals the contacting surfaces against contact with air, and as the bond itself is homogeneous neither rusting nor electrolysis can occur. Obviously, since electric welding can be availed of, the bond proper and the rivet ends may be of different metals, but I prefer the entire bond of iron or soft steel, so that when applied to a steel rail no electrolytic action upon the bond structure at any point will be possible.

In the ordinary use of rail-bonds a hole is punched or drilled in each rail far enough from the ends to clear the fish-plates, which are

from eighteen to twenty-six inches long. This involves necessarily the use of rail-bonds of corresponding length, so that as a general thing the rail-bonds are made thirty inches long, in order to allow them to pass around the fish-plate. On a long line of railway, assuming the condition of defective contact through the fish-plates, the resistance of the rail-bonds would amount to a very serious figure. It therefore becomes most important to primarily reduce the possible resistance of the rail-bonds to the very lowest point. I accomplish this, as shown in the drawings, by drilling through the tram of the rail as close to the ends thereof as practicable, usually about three inches, and I am thus enabled to use a rail-bond as short as nine inches without interfering with a due allowance for expansion and contraction of the rails, thus practically eliminating about three-fourths of the possible resistance due to the rail-bonds. Another very important advantage follows this application of the rivets upwardly through the tram of a girder-rail, in that, as this portion of the rail is always uncovered, the whole rail-bond system may be readily inspected frequently without disturbing the paving or rails in any way. Any suspected loose bond may be tested and tightened, and thus the continuous maintenance of the integrity of the rail return-circuit easily insured, whereas if the bonds are applied to the web or the foot of the rail both are permanently concealed by the paving and inspection is rendered impossible except by taking up the paving—a tedious and costly expedient.

In order to prevent the wheels of wagons and other vehicles which ride on the tram from pressing the rivet ends of the rail-bonds out of their seat in the tram, and also to insure the most positive and permanent contact between the rail and rail-bonds after drilling the holes for the rail-bonds, I ream them in such a way as to make a conical hole with its narrowest end next the shoulder of the rail-bond, so that after the latter is inserted and properly upset by hammering it will be impossible to withdraw it. For additional security I prefer to countersink the hole at its outer extremity, so as to allow of the formation of a head on the rivet.

I claim as my invention—

1. A rail-bond comprising a body A, having curved ends, with shoulders B B and pins or rivets C C, all in one integral piece.

2. The combination, with a girder-rail joint, of a rail-bond having its ends inserted upwardly through holes in the trams of the adjoining rails and within the lengths of the fish-plates and riveted on top.

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

THOMAS J. McTIGHE.

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