(No Model)

# G. H. SCOTT.

## ELECTRIC RAIL BOND.

No. 582,698. Patented May 18, 1897.

Fig. 1.

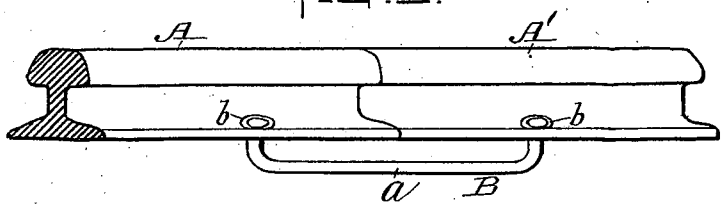



Fig. 2.

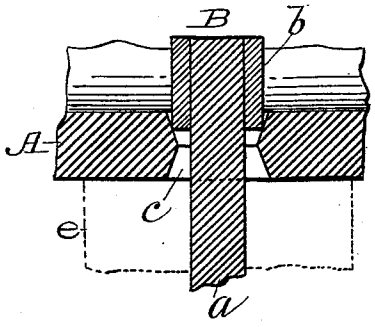



Fig. 4.

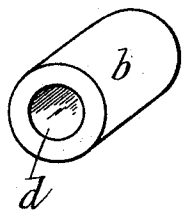



Fig. 3.

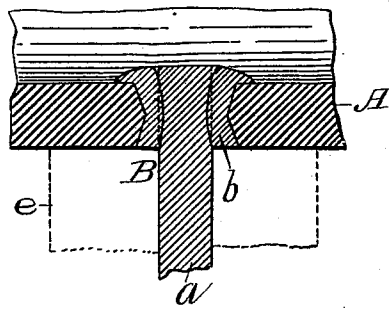



Fig. 5.

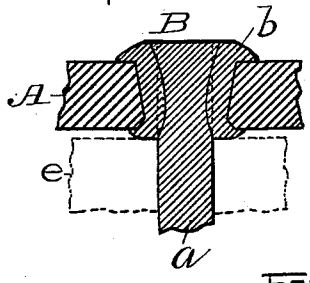



Fig. 6.

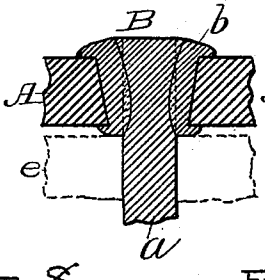



Fig. 7.

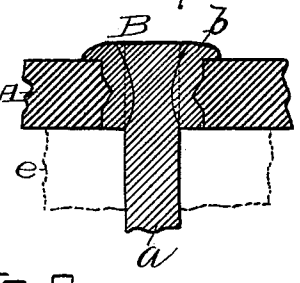



Fig. 8.

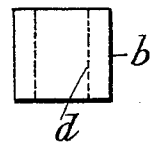
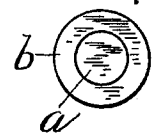



Fig. 9.




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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

GEORGE HASKELL SCOTT, OF WORCESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALBERT A. BARKER, OF SAME PLACE.

## ELECTRIC RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 582,698, dated May 18, 1897.

Application filed July 17, 1896. Serial No. 599,574. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE HASKELL SCOTT, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Electric Rail-Bonds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents two abutting sections of railroad-rails with my improved rail-bond applied thereto. Fig. 2 represents part of a rail-flange with one end of the rail-bond fitted in the opening thereof preparatory to fastening the same by hammering upon the end against a suitable block placed against the under side of the rail, as will be hereinafter more fully described. Fig. 3 is a similar view to Fig. 2, showing the end of the rail-bond after it has been hammered into place and fastened in said rail-flange opening. Fig. 4 is an isometric perspective view of one of the collars or bushings used on the ends of the connecting-rod of the bond. Figs. 5, 6, and 7 are similar sectional views to Figs. 2 and 3, showing slight modifications in the shape of the rail-flange openings, which will be hereinafter more fully described; and Figs. 8 and 9 are side and end views, respectively, of the collar or bushing shown in Fig. 4, in Fig. 9 one end of the connecting-rod being shown fitted in said collar or bushing.

The object of my invention is to produce a rail-bond for electric railroads of as simple and inexpensive construction as possible and also which may be applied to the rails in an easy and expeditious manner.

Said invention consists in combining a connecting-rod having parallel longitudinal sides and two collars or bushings fitted one over each end of said connecting-rod, whose outer surfaces are parallel to their inner surfaces or openings, with the rails formed so that one portion thereof will project farther than another into the openings made therein for the reception of the ends of the bond device, or, in other words, so that the diameter of said openings shall be smaller at one point than another, as and for the purpose hereinafter more fully set forth.

As is well known by those skilled in the art to which my invention appertains, much time and study have been expended in efforts to produce a rail-bond of the class herein named embodying simplicity and ease of application and which, after having been applied, will retain its original firm and rigid tight-contact connection in the rail without lateral or longitudinal movement therein after long and continual use. This result has in a measure been accomplished by means of other similar bond devices, and I therefore make no claim, broadly, to these features, but limit my invention to the special construction and combination of elements set forth, and pointed out in the claim.

In order that others may better understand the nature and purpose of my said invention, I will now proceed to describe it more in detail.

Referring to the drawings, A A′ represent the two abutting rail-sections previously alluded to, and B my improved bond for effecting an electrical connection between said rail-sections.

The bond device consists of the connecting-rod *a* and the two collars or bushings *b b*, which fit over the ends of said connecting-rod and are adapted to be driven into the openings *c* in the rails.

The connecting-rod *a* is of equal transverse diameter where the collars or bushings fit thereon and preferably cylindrical in shape, as is shown in the drawings. Between said collars the rod may be the same or any other desired shape in cross-section so long as that portion over which the collars or bushings fit has parallel longitudinal sides or is of equal transverse diameter. The longitudinal openings *d* in said collars or bushings are of the proper size and shape to fit the straight parallel surfaces of the ends of the rods, and their outer surfaces are of cylindrical shape in cross-section to enter the round openings in the rails. Being thus shaped, it is obvious that they may be produced very cheaply from ordinary copper tubing of the proper size and thickness required for the purpose, it being simply necessary to cut sections from said tubing of the proper length to produce the required length of collars or bushings. The connect-

ing-rods may also be produced in like manner by simply cutting the same in proper lengths from a continuous copper rod. Therefore it will at once be apparent that the separate parts which compose my improved bond device not only embody the greatest simplicity in construction, but also the minimum of cost in their production.

The openings in the rails made for the reception of said collars or bushings are formed of unequal transverse diameter—that is, certain portions of said openings are made of smaller transverse diameter than other portions thereof. This is done by beveling the stock of the rail around said openings in various ways—as, for instance, in Figs. 2 and 3 the diameter of the opening is shown the smallest at the center and beveled or flared out at each side thereof. In Fig. 5 said smallest diameter is formed near one end of the opening with a long flaring bevel at one side and a short flaring bevel at the other side thereof. In Fig. 6 only a single bevel is shown with the smallest diameter of the opening at one end thereof, while in Fig. 7 the smallest diameter comes at the center, as in Figs. 2 and 3, but instead of beveling straight out therefrom to the ends of the opening, as in said Figs. 2 and 3, a short flaring bevel is made and the sides of the opening then extended in parallel lines to the ends of said opening.

The formation of the rail-opening with one portion of smaller transverse diameter than another, in combination with the straight connecting-rod and collars or bushings, constitutes the essential feature of my invention, the purpose of which will be understood from the following description of the operation of applying my rail-bond device to the rails.

The ends of the connecting-rod *a* are first passed through the openings in the rail-flange and the collars or bushings *b b* fitted thereon with the ends of said collars or bushings resting in the edge of the openings, as shown in Fig. 2. A suitable metal block (shown by dotted lines *c*) is then placed and held by one hand under the rail, and with an ordinary hammer in the other hand the ends of the rod and collar or bushing are hammered, first lightly to produce a close frictional contact of the parts, so that they will not slip longitudinally, and then more vigorously continuing said hammering until the collar or bushing is forced down to the metal block and to completely fill the space in the opening around the end of the rod, and also to head over the end of both said collar or bushing and the rod, as is shown in Figs, 3, 5, 6, and 7, which completes the bond connection at one end of the rod, after which the other end is fastened in like manner.

I find in practice that by a bond thus made with a cylindrical collar driven into a beveled opening the operation is not only considerably easier to perform than with a beveled collar fitting into a beveled opening, but also, owing to the reduction in diameter of the opening below the entering-point of the collar or bushing in driving it in, the stock of the connecting-rod at the point opposite the smallest diameter of the opening is considerably reduced in size by the swaging operation, the soft copper metal being forced out longitudinally, substantially as is indicated by full and dotted lines in Figs. 3, 5, 6, and 7, the metal of which the rails are made being much harder than that of said rod and collars or bushings. The rod being thus reduced in diameter at some distance in from the outer end of the collar or bushing causes it to be held rigidly from longitudinal movement therein, while said collar or bushing is likewise held in the opening of the rail, owing to the shape thereof and to its being headed over, as previously specified. The above facts I have fully demonstrated in practice. A bond thus made and subsequently cut through longitudinally showed the rod depressed fully as much as indicated in the drawings, and the contact between the parts was so perfect as to be scarcely perceptible—in fact, the whole forming, practicably, one homogeneous mass of metal.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the rail-sections having openings of unequal diameters at different points in their lengths, with an electric bond device comprising a connecting-rod of cylindrical shape at the ends where it fits into said rail-section openings, and two cylindrical-shaped tubes or collars adapted to fit over said cylindrical ends of the connecting-rod and to be driven into the openings in the rails against the beveled surfaces thereof, and thus, by said driving operation, causing a longitudinal compression and lateral expansion of the metal so as to completely fill the openings and form a tight fit therein, said driving operation also causing the connecting-rod to be compressed laterally and its metal forced out longitudinally and expanded, substantially as and for the purpose set forth.

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