H. ETHERIDGE.

RAIL JOINT BOND.

APPLICATION FILED MAR. 24, 1914.

1,166,826.

Patented Jan. 4, 1916.

FIG. 1

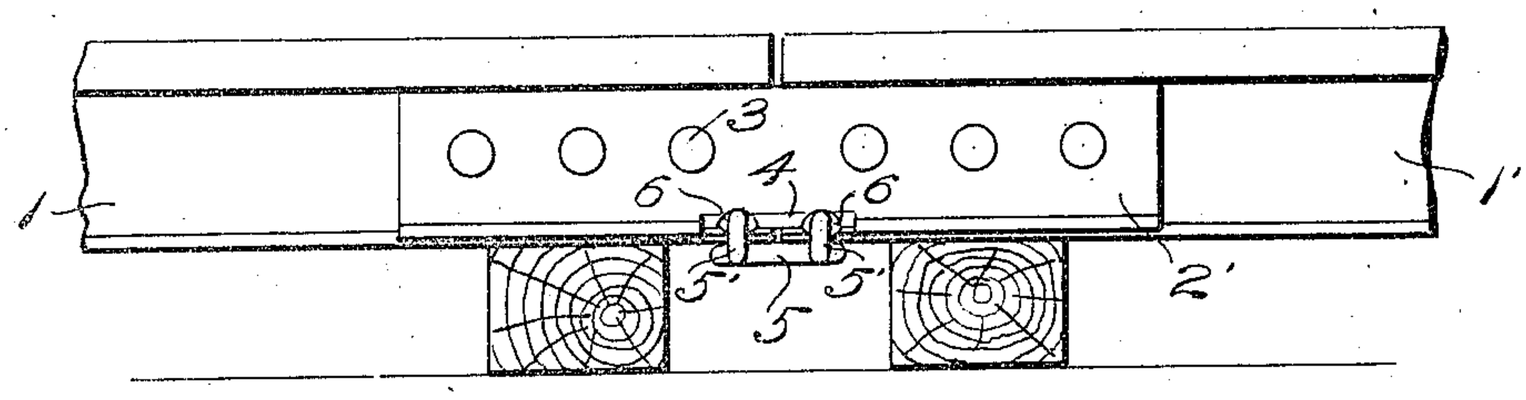


FIG. 2

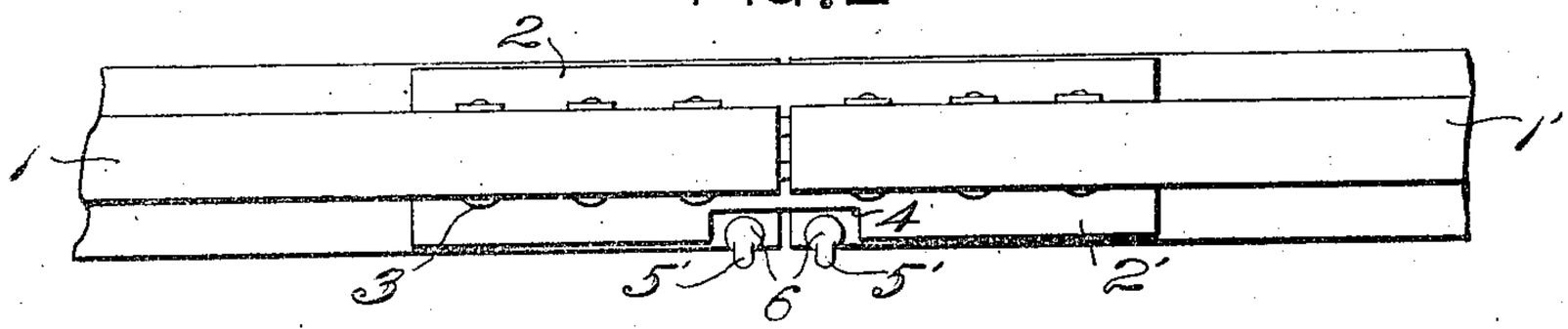


FIG. 3

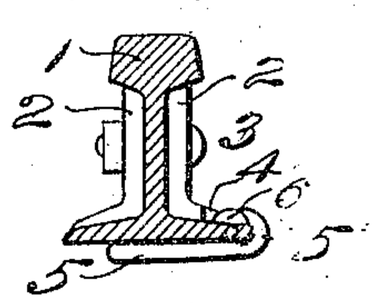


FIG. 6

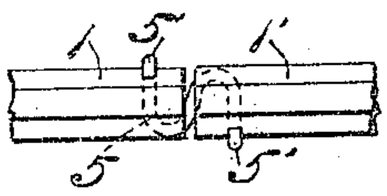


FIG. 7

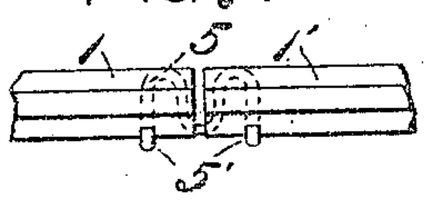


FIG. 4

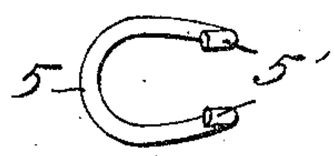


FIG. 5

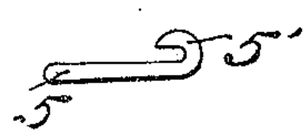
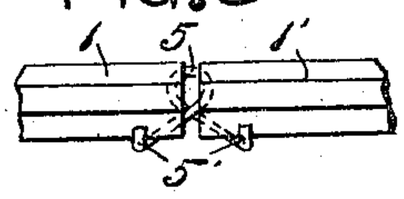


FIG. 8



WITNESSES

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UNITED STATES PATENT OFFICE.

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RAIL-JOINT BOND.

1,166,826. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed March 24, 1914. Serial No. 826,877.

To all whom it may concern:

Be it known that I, HARRY ETHERIDGE, a citizen of the United States, residing at Zelienople, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Joint Bonds; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to electrical connections for the meeting ends of track rails in electrical railway systems, where the rails are employed for conducting electrical current.

My invention has for its objects, to provide a simple and practical form of bond connection, adapted equally as well for the parted ends of rails at curves, and at turnouts, as for straight portions of the track; that may be applied to the rails without the necessity of drilling openings or otherwise removing portions thereof to apply the bond thereto; that will engage by its terminals with the rails and be self supporting when applied thereto, preparatory to and during final uniting therewith, to assist the workman; that will form a strong, durable and electrical joint; that will readily yield or respond to the expansion and contraction of the rails, and that will be so positioned with respect to the rails, when applied thereto, as to permit easy inspection and at the same time be out of the way of possible injury.

Broadly, the invention consists in a bond having each of its terminals, or ends, turned over, or otherwise formed, like that of a hook, engaging over and beyond the edges of and upon the flanged base portions of the rails and united thereto by brazing or welding, the body portion thereof being disposed beneath the base portion of the rails, preferably directly at the parting point, and so bent or formed as to be sufficiently flexible as to readily yield in the direction of and to the expansion and contraction of the rails.

With the above objects in view, the invention consists in certain features of construction, in certain parts, arrangement and combination of parts, as will be hereinafter more specifically set forth and particularly pointed out in the appended claims.

In describing the invention in detail, reference is to be had to the accompanying drawings, forming a part of this specification, wherein like detail parts are designated by like numerals for convenience in referring to said parts, said drawings representing the following views:

Figure 1 is a side elevation of a complete rail joint, having the preferred form of bond applied thereto. Fig. 2 is a plan thereof. Fig. 3 is an end elevation thereof. Fig. 4 is a plan of the bond. Fig. 5 is a side elevation of said bond. Figs. 6, 7 and 8 are plans of rail ends, having modified forms of bonds applied thereto.

Referring to Figs. 1, 2 and 3, where a simple form of rail joint is shown, with the preferred form of bond applied thereto, and to Figs. 4 and 5 where said bond is separately shown, the numerals 1 and 1′ indicate the meeting end portions of two rails, having the usual parting or space therebetween to provide for expansion and contraction, said rail ends being connected by fish-plates 2 and 2′, and by bolts 3, in the usual manner, the fish-plate 2′ in this instance having a suitable cut-away portion, such as that indicated by the numeral 4, so as to provide clearance about the terminals of the bond when united with the upper base portions of the rails. The bond may be formed of a rod or strip, or other equivalent, but in this instance, comprises a member 5, preferably formed of a rod or bar of soft copper and of circular form in cross-section, having its intermediate or body portion proper, bent or otherwise formed somewhat like that of a horseshoe or the letter U, the extreme ends or terminals thereof being each turned backwardly above the body portion to form a curved hook 5′, said bond being of substantially uniform conductivity throughout its entirety.

The bond is applied to the flanged base portion of the meeting rails, preferably at a point about equi-distant from the ends or parting thereof, by forcing or driving the hooked terminals thereof over and beyond the edge of and upon the upper surface of the flanged base portion of the rails, the body portion of the bond straddling the parting of and disposed horizontally beneath and practically flush with the under side or base of the rails, in which position it will be self-supporting until its terminals are united thereto. After thus positioning

the bond the upper portion of the terminals thereof are each united at and to the upper surface portion of the rail flange engaged thereby, by brazing, the brazing material, here indicated by the numeral 6, spreading about and beneath the terminals and thoroughly uniting the same with the rails, forming a substantial and electrically perfect joint.

While the above described bond, with a simple form of bend in its body portion, is the preferred form, yet it is obvious that said body portion may be bent or formed in various ways, among which are the modifications illustrated in Fig. 6 where the body portion is formed somewhat like that of the letter S, the terminals 5′ being each of hook form and engaging over and upon the base portions of the rails 1 and 1′, as heretofore described in the preferred form, but at opposite sides; in Fig. 7 where the body portion of the bond 5 is formed somewhat like that of the letter M, the terminals 5′ thereof being each of hook form and engaging the base portion of the rails 1 and 1′, at the same side, and in Fig. 8 where the body portion of the bond 5 is formed like that of a loop, with its terminals 5′ also of hook form and engaging the base portion of the rails 1 and 1′, at the same side, said modifications being shown positioned ready for brazing to the rails.

The provision of the turned or hooked terminals with a bond having an intermediate bent body portion are such as to enable them to be applied rapidly to a number or all of the rail joints along the track, where they will be self-sustaining until and during brazing to the rails, and the relative position of the body portion of each bond with respect to the rails, is such as to not only be sensitive to and readily yield to and in the direction of expansion and contraction of the rails, but is also such as to not interfere with the ballasting, between ties, as well as be protected from injury.

While I have shown but one form of rails and fish-plates therefor, a preferred form of bond, and several form of bonds in addition thereto, relative to the body portions thereof, it is to be understood the rails and fish-plates may be of other suitable forms than that shown, and that the body portion of the bond may also be of the same or other forms than that shown, and be within the spirit of my invention, as set forth in the appended claims.

What I claim as my invention and desire to secure by Letters Patent, is;

1. An initially self-supporting electric rail bond formed of one piece of metal the extreme end portions thereof, forming the connecting terminals, being each turned backwardly in a plane above the body portion and in the same direction.

2. An electric rail bond formed of one piece of metal having its body portion, from terminal to terminal, of substantially U shape, the ends of the U forming the terminals being each turned over toward and above the body in hook form.

3. An electric rail bond formed of a rod the body portion thereof, from terminal to terminal, being of substantially U shape, the ends thereof forming the terminals being each turned over toward and above the body portion in substantially hook form.

4. The combination with the parted end portions of rails connected to one another by fish-plates, of a bond having connecting terminals of substantially hook form each engaging over the edge of and upon the flanged base portions of the rails, at each side of the parting, and united to said rail base by brazing, the body portion of said bond, between its terminals, being bent and disposed below the rails, the fish plate having a clearance space formed therein for the bond terminal.

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

HARRY ETHERIDGE.

Witnesses:
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D. E. PARSONS.