Oct. 13, 1931. M. SCHWARTZ 1,827,337

ELECTRIC CURRENT CONDUCTING BOND

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Fig. 1.

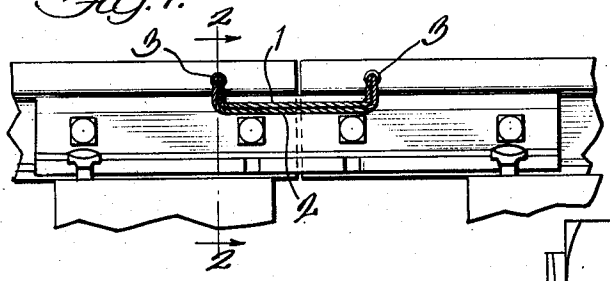


Fig. 2.

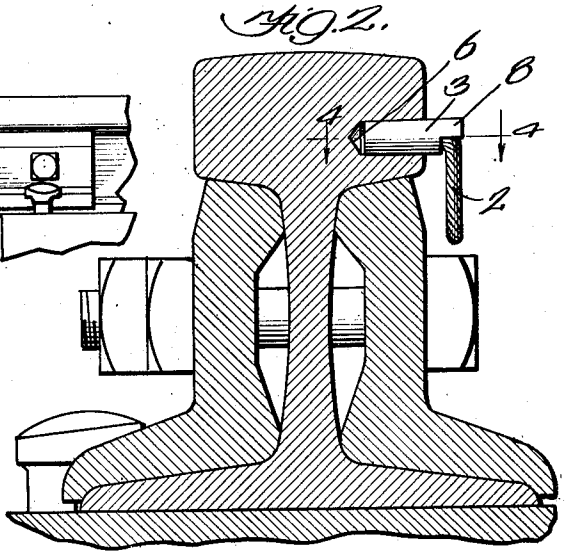


Fig. 3.

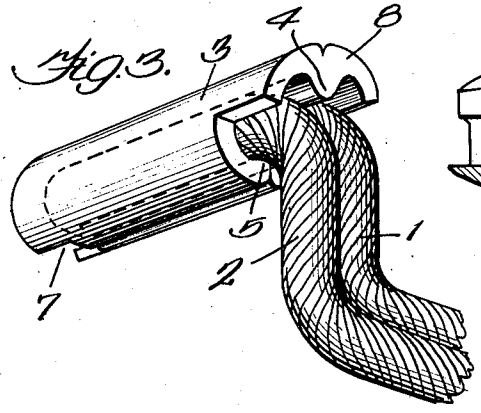


Fig. 6.

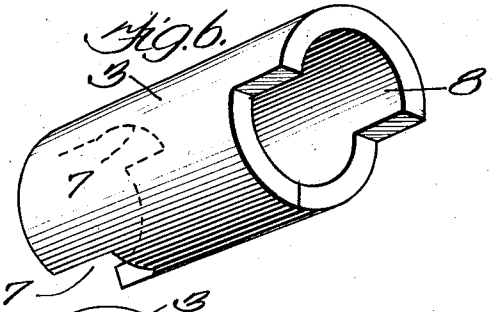
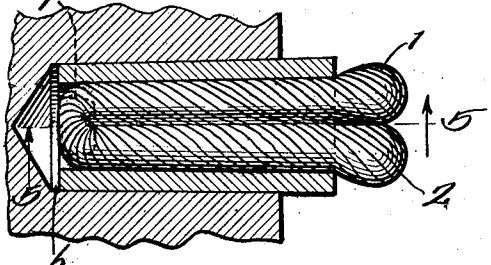


Fig. 4.



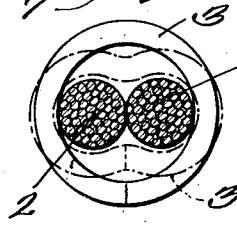
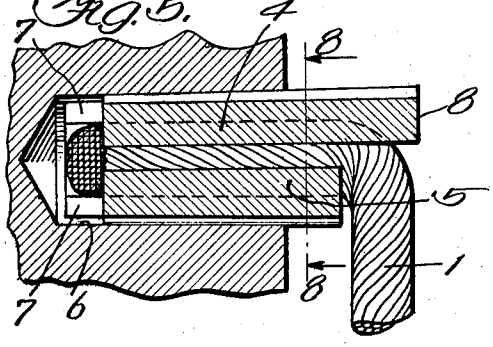


Fig. 7.

Fig. 5.



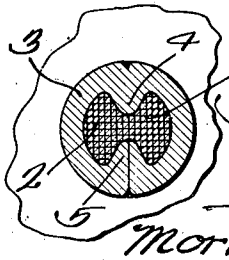


Fig. 8.

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Fig. 9.

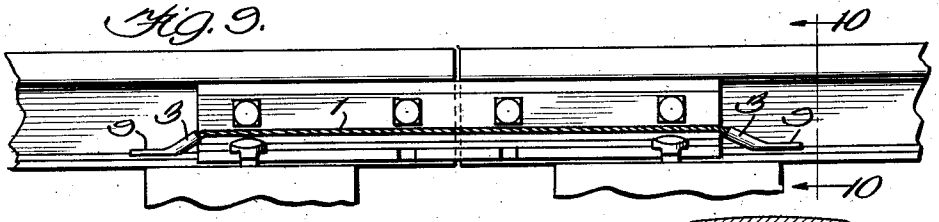


Fig. 10.

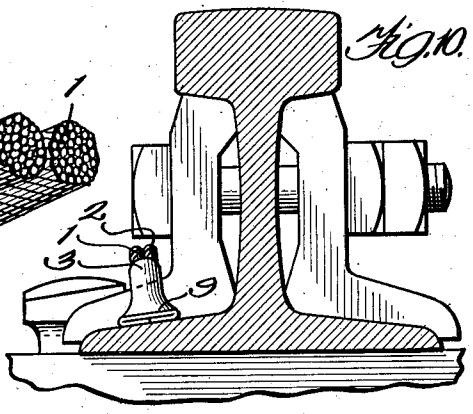


Fig. 11.

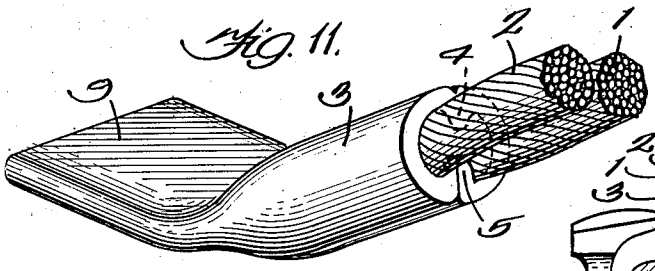


Fig. 12.

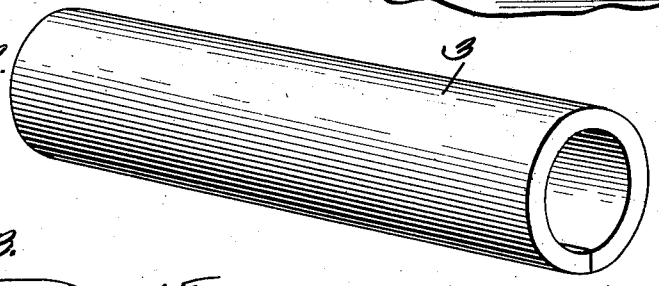


Fig. 13.

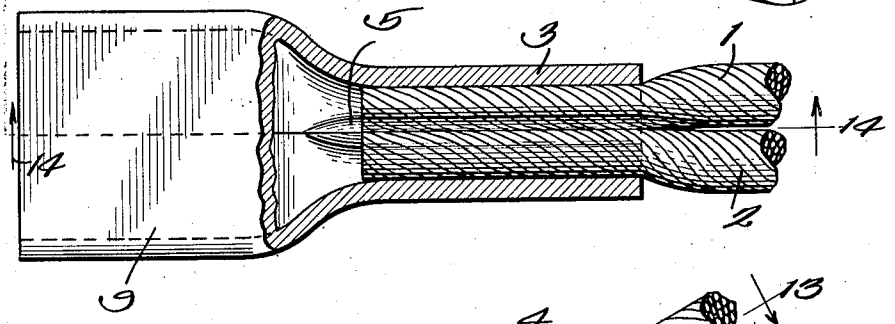
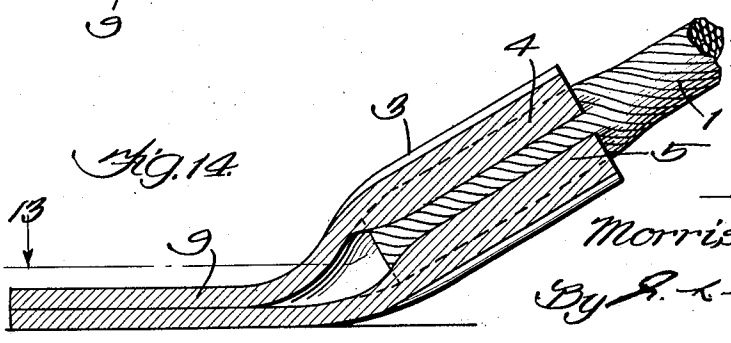


Fig. 14.



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Atty

Patented Oct. 13, 1931 1,827,337

UNITED STATES PATENT OFFICE

MORRIS SCHWARTZ, OF CHICAGO, ILLINOIS

ELECTRIC CURRENT CONDUCTING BOND

Application filed March 17, 1926. Serial No. 95,303.

My invention relates to electric current conducting bonds, such as are used in electrically connecting railway rails.

The invention has for its object the provision of a construction whereby very firm mechanical and electrical union is effected between the current conducting metallic rod portions of such bonds and the metallic current conducting terminals provided upon the ends of the rods. These terminals may be formed to constitute plugs that may be driven into socket openings provided in the rails or may be so shaped as to enable them to be welded upon the rails.

The electric current conducting bond of my invention is inclusive of an elongated metallic shell which substantially surrounds a portion of the current conducting metallic rod of the bond, this shell being desirably of uniform thickness when initially applied to the rod and being contracted along its length in a manner to form at least one rib and preferably two opposite ribs upon the interior and extending longitudinally of the shell, the contracting pressure being sufficiently great to force the ribs into firm engagement with the rod throughout a portion of its length.

The invention will be more fully explained in connection with the accompanying drawings in which Fig. 1 is a side view illustrating the adjacent ends of two railway rails mechanically coupled in any usual or preferred manner and electrically connected by a bond formed in accordance with my invention, the bond illustrated in this figure being inclusive of two rod portions placed abreast and equipped with terminal plugs; Fig. 2 is a sectional view on line 2—2 of Fig. 1, on a larger scale; Fig. 3 is a perspective view illustrating one end of the bond that is shown in Fig. 1; Fig. 4 is a sectional view on line 4—4 of Fig. 2, on a larger scale; Fig. 5 is a sectional view on line 5—5 of Fig. 4; Fig. 6 is a perspective view of the shell as it appears before it is placed about the rod of the bond; Fig. 7 is a perspective view showing two rod portions placed abreast within the shell, the shell being shown in full lines before it is contracted and in dotted lines after it has been partially contracted; Fig. 8 shows the structure of Fig. 7 after the shell has been fully contracted; Fig. 9 is a view somewhat similar to Fig. 1 with the exception that the current conducting rod there shown is equipped with terminals that are welded into mechanical and electrical engagement with the flanges of the two adjacent railway rails; Fig. 10 is a sectional view on line 10—10 of Fig. 9, on a larger scale; Fig. 11 is a perspective view of one end of the bond that is shown in Fig. 9; Fig. 12 is a perspective view of the shell before it is assembled with the current conducting rod portions of the bond; Fig. 13 is a plan view of the parts shown in Fig. 11 with a portion shown in section on line 13—13 of Fig. 14; and Fig. 14 is a sectional view on line 14—14 of Fig. 13.

The invention will be first described more particularly in connection with the construction shown in Figs. 1 to 8 inclusive. The current conducting rod element of the bond is illustrated, in these figures, as being inclusive of two rod portions 1 and 2 placed abreast. These rod portions may be discontinuous or they may be formed in one piece folded at its mid portion to constitute the two parts that are located abreast, as illustrated in Figs. 4 and 5. The rod element may be flexible in which case it is formed of strands, this formation being preferred where the rod element is equipped with plugs at its ends. Metallic connecting plugs 3 are assembled with the rod element of the bond. These connecting plugs are desirably formed of sheet metal of substantially uniform thickness, the metal sheets being curled to form shells, as illustrated in Fig. 6. The invention, however, is not to be limited to shells thus formed. Each shell is contracted along its length in a manner to form two opposite ribs 4 and 5 upon the interior and extending longitudinally of the shell, each rib being desirably of wedge shape and tapering inwardly. The pressure employed in contracting each shell is not only sufficient to thicken the shell at places to form the ribs as illustrated but is also sufficient to have tight wedging engagement with and between the two rod portions between which the ribs are

forced, the two rod portions consequently merging to form an 8-shaped figure, as illustrated in Fig. 8. The wedging rib 4 of each shell is disposed between the longitudinal meeting edges of the strip that forms the shell and the rib 5 is jointly composed of the longitudinal meeting edge portions of said sheet, each edge portion being, of itself, a rib. When the rod element and the shells have been assembled, as illustrated and described, the shells, which now constitute terminal plugs, are driven into the socket openings 6 formed in the heads of the rails. Each shell is desirably initially cut away at 7 and in line with the location of the ribs 4 and 5 whereby such shell extends inwardly beyond the ribs to serve as a guard for the rail entering end of the rod element of the bond. The shell is outwardly extended, as indicated at 8, on one side of the rod element of the bond to enable the shell to receive hammer blows without injuring the rod element of the bond. If desired, the plug shell may be slightly tapered toward the rail entering end thereof.

The structure shown in Figs. 9 to 14 inclusive has many characteristics in common with the construction shown in Figs. 1 to 8 inclusive, similar parts being given similar characters of reference. The terminals in the structure of Figs. 9 to 14 inclusive are not in the form of plugs, as in the other construction, but are flattened, as indicated at 9 to enable them to be welded upon the flanges of the rails, the shells being made longer for this purpose than when they are formed to serve as plugs.

Having thus described my invention, I claim:

1. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, a longitudinal meeting edge portion of said shell being thickened into a rib portion that is upon the interior of the shell and extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

2. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, each longitudinal meeting edge portion of said shell being thickened into a rib portion that closely approaches the other rib portion and is upon the interior of the shell and extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

3. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, a longitudinal meeting edge portion of said shell being thickened into a rib portion that is upon the interior of the shell and extends longitudinally of the shell and into said rod element, said shell being also thickened between its edges to form a rib that is also upon the interior of the shell and also extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

4. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, each longitudinal meeting edge portion of said shell being thickened into a rib portion that closely approaches the other rib portion and is upon the interior of the shell and extends longitudinally of the shell and into said rod element, said shell being also thickened between its edges to form a rib that is also upon the interior of the shell and also extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

5. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, said shell being thickened between its meeting edges to form a rib that is upon the interior of the shell and extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

6. An electric current conducting bond including a current conducting rod element and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, a longitudinal meeting edge portion of said shell being thickened into a rib portion that is upon the interior of the shell and extends longitudinally of the shell and into said rod element, said shell being also formed with a rib between its meeting edges that is also upon the interior of the shell and also extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

7. An electric current conducting bond including a current conducting rod element

and a shell formed of sheet metal substantially surrounding and tightly engaging the rod element and having two longitudinal meeting edges, each longitudinal meeting edge portion of said shell being thickened into a rib portion that closely approaches the other rib portion and is upon the interior of the shell and extends longitudinally of the shell and into said rod element, said shell being also formed with a rib between its meeting edges that is also upon the interior of the shell and also extends longitudinally of the shell and into said rod element whereby the distortion of the rod element provides a fixed relation between said shell and said rod element.

8. An electric current conducting bond including a shell having a circular outer periphery and an inner irregular periphery, said inner periphery surrounding a pair of rod elements disposed side by side, and forming thickened portions constituting ribs extending longitudinally thereof for distorting and for gripping said rod elements.

9. An electric current conducting bond including a shell having a circular outer periphery and an inner irregular periphery, said inner periphery surrounding a pair of rod elements disposed side by side, and foming thickened portions constituting ribs extending longitudinally thereof for distorting and for gripping said rod elements, said shell being cut away at one end thereof in line with the location of said ribs.

10. An electric current conducting bond including a shell having a circular outer periphery and an inner irregular periphery, said inner periphery surrounding a pair of rod elements disposed side by side, and forming thickened portions constituting ribs extending longitudinally thereof and partially between said rod elements to form a wedging engagement therebetween whereby said rod members are merged to form a substantially 8-shaped figure.

11. An electric current conducting bond including a shell having a circular outer periphery and an inner irregular periphery, said inner periphery surrounding a pair of rod elements disposed side by side, and forming thickened portions constituting ribs extending longitudinally thereof and partially between said rod elements substantially the full length thereof to form a wedging engagement therebetween whereby said rod members are merged to form a substantially 8-shaped figure.

12. An electric current conducting bond including a shell having a circular outer periphery and an inner irregular periphery, said inner periphery surrounding a pair of rod elements disposed side by side, and forming thickened portions constituting ribs extending longitudinally thereof and partially between said rod elements substantially the full length thereof to form a wedging engagement therebetween whereby said rod members are merged to form a substantially 8-shaped figure, said shell being cut away at one end thereof to substantially the thickness of said rod elements in line with the location of said ribs whereby the latter extend to said cut-away portion.

In witness whereof, I hereunto subscribe my name.

MORRIS SCHWARTZ.