(No Model.)

W. B. CLEVELAND

ELECTRIC RAIL BOND.

No. 588,791. Patented Aug. 24, 1897.

FIG. I

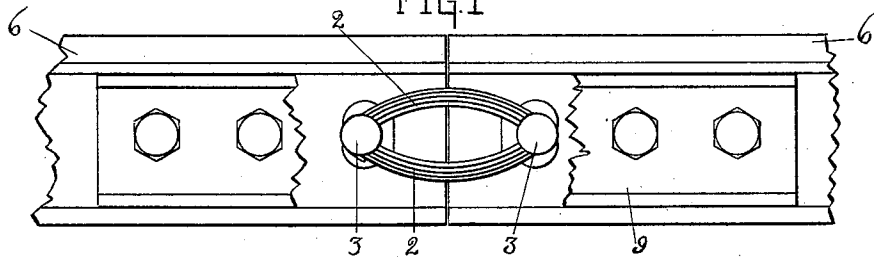


FIG. II

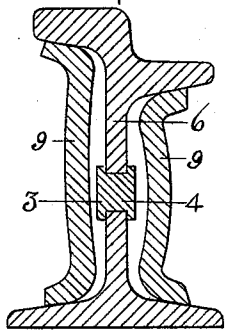


FIG. III

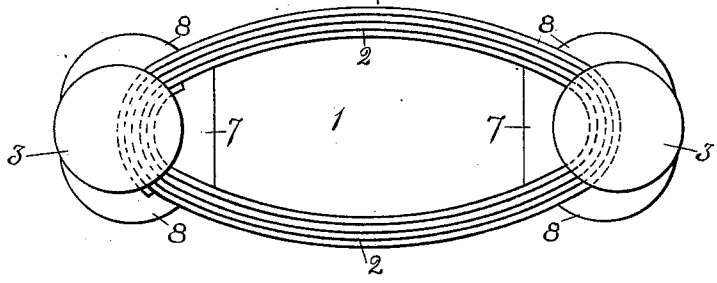
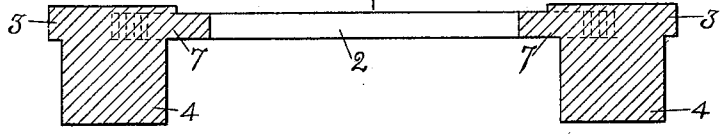


FIG. IV



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM B. CLEVELAND, OF CLEVELAND, OHIO.

ELECTRIC RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 588,791, dated August 24, 1897.

Application filed April 15, 1897. Serial No. 632,224. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. CLEVELAND, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Electric Rail-Bonds, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side elevation of a rail-joint provided with my improved rail-bond, showing the fish-plate broken away to disclose the bond; Fig. II, a cross-section of the rail and bond, taken through one lug of the latter; Fig. III, a plan view of the bond, and Fig. IV a longitudinal section of the same.

The bond consists of an oblong coil 1 of flattened wire, usually of copper or copper alloy, and laterally flattened to form two more or less arched connecting side members 2. Two heads 3, forming riveting-lugs 4, which project to one side of the bond, are cast upon the doubled ends of the coil, said heads being of substantially the same metal or alloy as the wire and being cast upon the ends of the coil so as to form a welded joint, the wire melting and becoming homogeneous with the metal of the heads. The oblong expansible and contractible wire frame connects the two heads in such manner that when the lugs are inserted in the holes 5 in the webs of the rail ends 6 and have been expanded and headed in said holes, as illustrated in Figs. I and II, the rail ends may approach and separate by the expansion and contraction of the rails without affecting the electrical connection between the rails and without loosening the lugs in their holes. The hammering of the car-wheels in passing over the meeting ends of the rails will not affect the electrical connection by the bond, inasmuch as the elasticity of the connecting wire frame will cause the same to yield to any movement of the rail ends whether longitudinal or vertical. As both side members of the frame bulge or flatten at the same time from compression or expansion of the frame the lugs will remain solidly fixed in their holes without any turning movement, whereby a perfect metallic contact by the lugs is maintained and wear of the lugs is prevented. This latter feature will insure long life to the bond with a minimum of inspection and readjustment. The bond is flat and is covered by the fish-plates 9 of the joint after being secured in position. The metal of the heads extends along the portions of the side members nearest the heads, thereby forming reinforces 7 between the side members and reinforces 8 at the outsides of the same.

The bonds are preferably manufactured by coiling flattened copper wire with the flat sides of the wire bearing against each other until a sufficient number of wires are provided in the side members of the frame to provide the required current-carrying capacity. The coil is now stretched or flattened edgewise until an oblong frame is produced having slightly-arched sides or nearly straight sides. This frame is then placed in a mold having cavities for the formation of the heads and lugs and into which cavities the doubled ends of the frame project. The heads and lugs are now cast upon said doubled ends, the metal of the heads forming a weld with the wires, whereupon the heads and lugs are preferably finished by drop-forging.

The reinforces at the portions of the wires at the joints with the heads prevent motion of the wires at such joints, and thus prevent the wires from breaking at those points. The reinforces will distribute the motion of the wires during expansion and contraction of the bond over the entire side members of the frame.

The doubled ends of the wires are indicated by dotted lines in Figs. III and IV of the drawings. The wires will not show in the heads in the actual bond when a section is made through the head, having become completely and homogeneously united with the metal of the heads; but they are indicated in the drawing to illustrate the shape of the wire frame and the position of the ends of the frame in the heads.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed provided the principles of construction set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. An electric rail-bond, consisting of an oblong frame formed from a laterally-compressed coil of flat wire coiled to have its flat sides bearing against each other, and of terminal heads and lugs cast upon the doubled ends of said frame, substantially as set forth.

2. An electric rail-bond, consisting of an oblong frame having its side members composed of flattened wires placed with their flat sides bearing against one another, and of terminal heads and lugs cast upon the ends of said frame and having reinforces projecting between and on the outsides of the side members of the frame at their points of joining said heads, substantially as set forth.

3. An electric rail-bond, consisting of an oblong frame formed from a laterally-compressed coil of flat wire coiled to have its flat sides bearing against each other, and of terminal heads and lugs cast upon the doubled ends of said frame, and having reinforces projecting between and on the outsides of the side members of the frame at their points of joining said heads, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 10th day of April, A. D. 1897.

WILLIAM B. CLEVELAND.

Witnesses:
WM. SECHER,
PHILIP E. KNOWLTON.