(No Model.)

G. G. CAMPBELL.

ELECTRIC CONNECTION WITH CAR TRACKS.

No. 423,468. Patented Mar. 18, 1890.

Fig. 1.

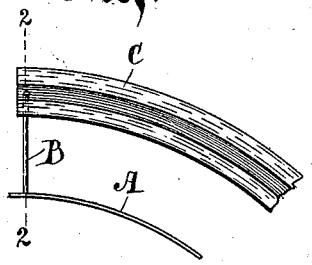


Fig. 2.

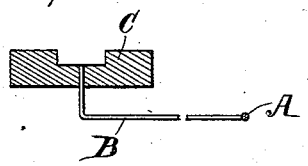


Fig. 3.

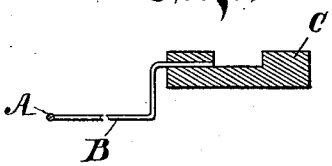


Fig. 4.

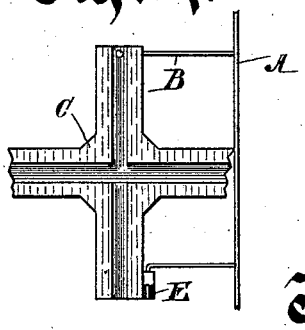


Fig. 5.

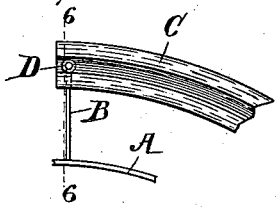
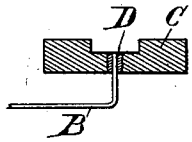


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE GARDINER CAMPBELL, OF MILWAUKEE, WISCONSIN.

ELECTRIC CONNECTION WITH CAR-TRACKS.

SPECIFICATION forming part of Letters Patent No. 423,468, dated March 18, 1890.

Application filed November 16, 1889. Serial No. 330,519. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GARDINER CAMPBELL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Electric Connections with Car-Tracks; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In that system of operating street-cars by means of an electric motor in which an overhead wire and trolley are used for conducting the electric current it is desirable to complete the electric circuit through the car-track and a continuous wire laid in or upon the ground near and along the track, to which the several rails or plates of the track are connected electrically to form a complete metal circuit for the electric current.

Heretofore it has been common to drill a hole into or through the rail, plate, or frog of which the track is formed, and to therein insert and secure tightly a copper wire, which, when the track is laid down, forms a branch, connecting this part of the track with the continuous ground-wire. It is common to construct the curved rails or plates with which the track is constructed at a corner, also the cross-track plates used where two tracks cross each other, and frogs or switch-plates used at the switches of very hard cast-iron or steel, and the drilling of these for the purpose of inserting a branch ground-wire is very slow and expensive work, and the connection thereby made is sometimes faulty by reason of a failure to make the contact of the inserted wire with the wall of the aperture drilled in the plate so thoroughly tight as to form a perfect electric connection, or if made thoroughly tight at first these connections are liable to become loose by reason of the constant movement or vibration of the track caused by the passage of the cars thereon or otherwise. To obviate these difficulties, and to form a perfect and lasting electric connection between the rail or plate and the branch connecting-wire, is the object of my invention.

In the drawings, Figure 1 is a portion of a curved rail or plate with a branch wire connecting it to the continuous ground-wire. Fig. 2 is a vertical transverse section of the device shown in Fig. 1 on line 2 2 thereof. Fig. 3 is a transverse section of a rail like that shown in Figs 1 and 2, but having the branch wire connected to the rail in a different place. Fig. 4 is a rail-crossing plate with a branch electric wire connected thereto at each end. Fig. 5 shows a modified form of connecting the branch wire with the rail-plate. Fig. 6 is a transverse section of the device shown in Fig. 5 on line 6 6 thereof.

A represents a continuous ground-wire laid alongside the car-track, commonly of copper, and intended to form the ground-line of the electric circuit.

B is a branch ground-wire running from the ground-wire A to the rail or car-track plate C. These car-track plates are shown in the drawings in two forms, the curved form shown in Figs. 1 and 5 and the crossing-plate shown in Fig. 4; but my invention is adapted equally well for the curved rails or plates, the cross rails or plates, the frogs and switch-plates, and also the straight rails of which a track is formed.

In Figs. 1, 2, 3, and 4 the branch ground-wire B is shown as inserted in and surrounded immediately by the track or plate C, and in Figs. 5 and 6 a sleeve or plug D is shown, which may be of copper, soft ordinary iron, or any metal that is readily cut under a drill or chisel. The branch ground-wire B is ordinarily constructed of copper.

My method of connecting the branch ground-wire with the rail or plate consists in inserting the copper wire into the matrix in the mold in which the rail or plate is to be cast, and pouring the molten liquid, of which the rail or plate is formed, into the matrix about the copper wire, so that the wire is secured directly and permanently in the rail or plate when it is cast. The result of such construction is to make so close and perfect a union of the rail or plate with the therein-inserted branch ground-wire as to make a perfect electric connection of the one to the other. This construction obviates the labor and expense of drilling a hole in the rail or plate and of inserting and fixing the ground-wire tightly in the aperture provided.

It is sometimes desirable to so connect the ground-wire with the rail or plate that it may

be disconnected temporarily; and to provide for this a soft-metal sleeve or plug D may be inserted in the matrix of the mold and the rail or plate cast onto and around the plug, which may be provided with the therein-inserted branch ground-wire B, or as the plug is formed of soft metal it can be drilled readily, and the wire can be inserted in the plug after the plate has been cast with the soft-metal plug only in it.

Instead of a permanent soft-metal plug, a chill-core having a smooth surface may be inserted in the matrix and the metal cast about it, which core may thereafter be knocked out of the plate or rail, leaving a smooth hardened surface about the aperture, into which the wire or soft-metal plug containing the wire may be forced tightly, forming a more or less perfect electric connection and circuit. Such chill-core may be large enough to form an aperture adapted to receive the soft-metal plug in which to insert the wire, or may be so small as to form an aperture adapted to receive the wire only.

In Fig. 4 one of the branch wires is inserted in a projection E, cast integral with the crossing-plate.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an iron or steel plate, frog, or rail of a car-track with a copper wire or its equivalent, one end of the wire being inserted in the plate, frog, or rail, the abutting surfaces of the wire and the plate, frog, or rail being intermingled to the extent caused by casting the molten metal of the plate, frog, or rail about the wire in the casting of the plate, frog, or rail, substantially as and for the purpose set forth.

2. The combination of a metal plate or rail adapted for a portion of a car-track, in combination with a wire and a sleeve or plug thereabout secured in the plate permanently, substantially as described.

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

GEORGE GARDINER CAMPBELL.

Witnesses:

C. T. BENEDICT,

ANNA FAUST.