

(No Model.)

J. H. BICKFORD.

RETURN WIRE CONNECTION FOR ELECTRIC RAILWAYS.

No. 593,369.

Patented Nov. 9, 1897.

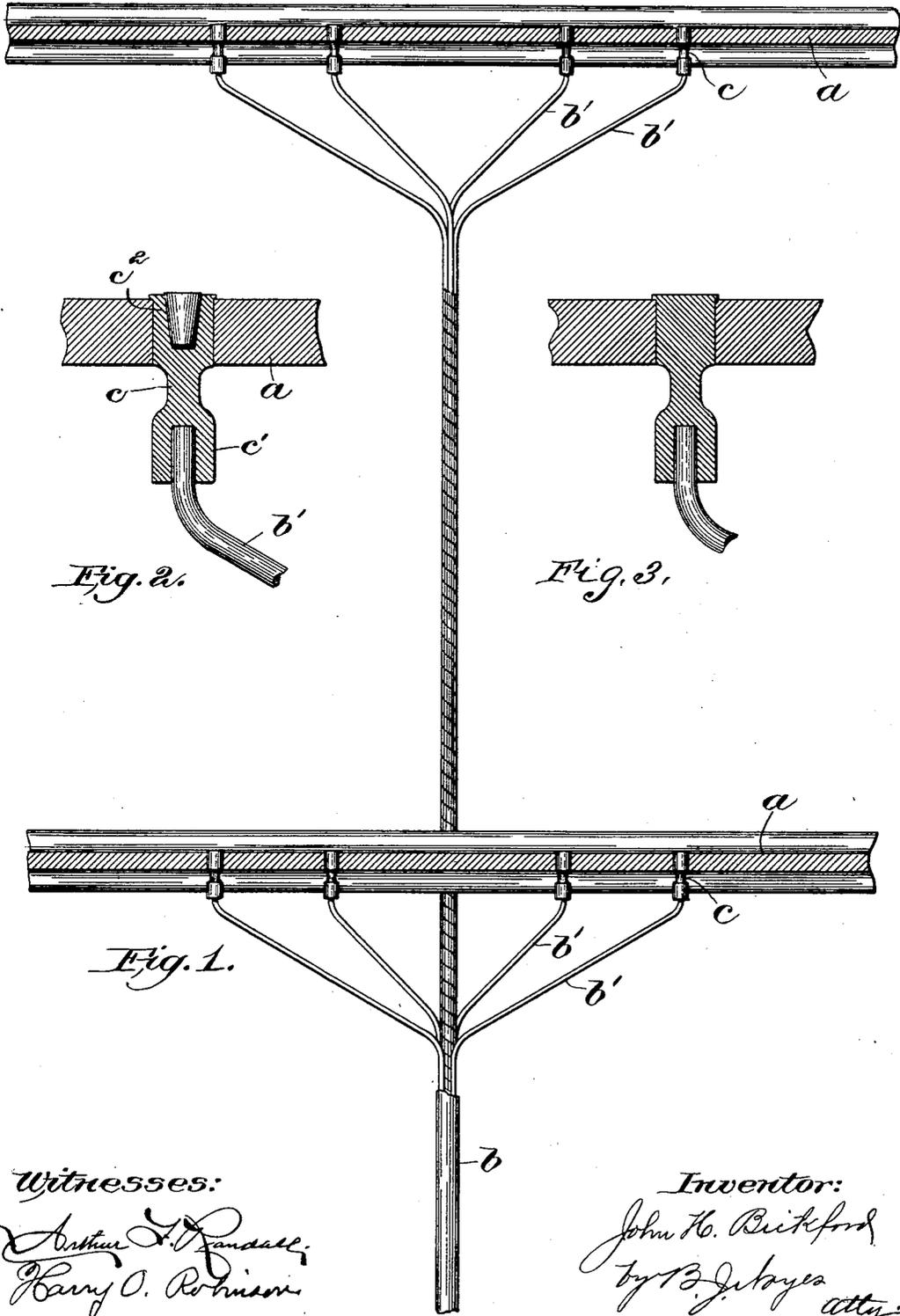


Fig. 2.

Fig. 3.

Fig. 1.

Witnesses:

Arthur D. Randall,
Harry O. Robinson

Inventor:

John H. Bickford
by B. J. Hayes atty.

UNITED STATES PATENT OFFICE.

JOHN H. BICKFORD, OF SALEM, MASSACHUSETTS.

RETURN-WIRE CONNECTION FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 593,369, dated November 9, 1897.

Application filed March 15, 1897. Serial No. 627,488. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BICKFORD, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Return-Wire Connections for Electric Railways, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In the construction of electric railways it has heretofore been customary, so far as I am aware, to connect the return-wires leading from the track to the switch at the power-house by means of suitable connecting-wires, the terminals of which are soldered to bonds which are employed to connect the rails of the track. Such means of connecting the ends of these return-wires with the track is very insecure and more or less temporary, and the solder-joint by means of which such connection is made adds a material resistance to the circuit which has to be overcome. It is desirable to use large flexible cables as return-wires or connecting-wires between the track and switch at the power-house for the reason that they are more economical, permanent, and effective, and said cables may comprise as many strands as may be desired; and this invention has for its object to improve the construction of electric railways to the end that a stranded cable may be connected directly with the rails of the track in such a manner that little or no resistance is offered or added to the circuit and that the connection when made is very secure and effective and is also permanent.

In carrying out this invention the stranded cable leads from the usual switch at the power-house to the track, and instead of connecting the ends of the wires of said stranded cable to bonds which connect the rails of the track, as above referred to, they are connected directly to the rails by means of solid ends or solid connectors which are secured to the ends of said wires.

The solid ends or connectors which form the subject-matter of this invention each consist of a short piece or strip of wire or it may be a short rod or bar, having formed at one end a head which is provided with a socket into which the end of the wire is inserted and brazed, or it may be formed with a clamp to

engage the wire, thereby securing said solid end or connector to the end of the wire, and having its opposite end formed with a head which is to be connected directly with the rail—as, for instance, said head may be fitted into a hole provided for it in the web of the rail, and then expanded—as, for instance, it may be formed with a socket into which a wedge of suitable construction may be driven to expand it, and thereby cause it to snugly fit the hole in the rail, and the outer end of said expanded head is or may be then upset for additional security, or the whole outer surface of the head may be upset and no wedge used. In other words, the head may be riveted into the hole in the web of the rail being thereby expanded.

Figure 1 shows in plan view the return connecting-wires which connect the track with the switch at the power-house, together with means embodying my present invention for connecting them directly to the rail; Fig. 2, a sectional view of one of the solid ends or connectors for the wires, and Fig. 3 a similar view of a modification to be referred to.

The rail *a*, of any usual or suitable construction, is formed or provided with one or more holes arranged at suitable or convenient distances apart, four being herein shown.

A stranded cable *b* is employed, which also may be of any suitable construction and herein shown as having four strands or terminal wires for each rail, as shown at *b'*, although it may have more or less; but I desire to include within the scope of this invention a single wire. The solid ends or connectors by means of which the ends of these strands or wires *b'* are connected with the rails each consist of a short piece or strip of wire, or it may be a rod or bar *c*, formed or provided at one end with a head *c'*, having a socket into which the end of the strand or wire *b'* is inserted and brazed, thus permanently securing said end or connector to the wire, or the head may be made in the form of or as a clamp to engage the end of the wire. The opposite end of the wire, rod, or bar *c* is herein shown as likewise formed or provided with a head *c''*, which is designed to be introduced into one of the holes in the web of the rail *a*, and said head *c''* is formed with a socket into which a wedge is driven to

expand said head c^2 and cause it to snugly fit the hole, and the outer end of said socketed head c^2 is or may be then upset or clenched, as shown in Fig. 2, or the head c^2 may be upset or riveted without using the wedge or plug, as shown in Fig. 3, and thereby expanded in the hole in the web of the rail.

The manner herein shown of connecting the ends of the strands or wires with the solid ends or connectors is very simple, and so also is the manner herein shown of connecting said solid ends or connectors with the rails, and the connection thus made by means of these solid ends or connectors is very secure and of a permanent character, and no soft solder is used to add to the resistance of the circuit.

The stranded cable is herein shown as separated and several strands carried to each rail, and such construction is I deem important.

I claim—

1. The stranded cable b , connectors for connecting the ends of the strands b' of said cable directly to a rail, consisting of short pieces of wire, rods or bars c , connected at one end with the strands b' of said cable, and connected at the other end to the rail, substantially as described.

2. The stranded cable b , separated and having several strands b' , leading to each rail a and solid ends or connectors substantially as described, by which the ends of said strands are connected to said rails, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. BICKFORD.

Witnesses:

WILLIAM H. GOVE,
JOHN T. QUINN.