

(No Model.)

W. H. GARLAND.
ELECTRIC CONNECTOR.

No. 442,370.

Patented Dec. 9, 1890.

Fig. 1.

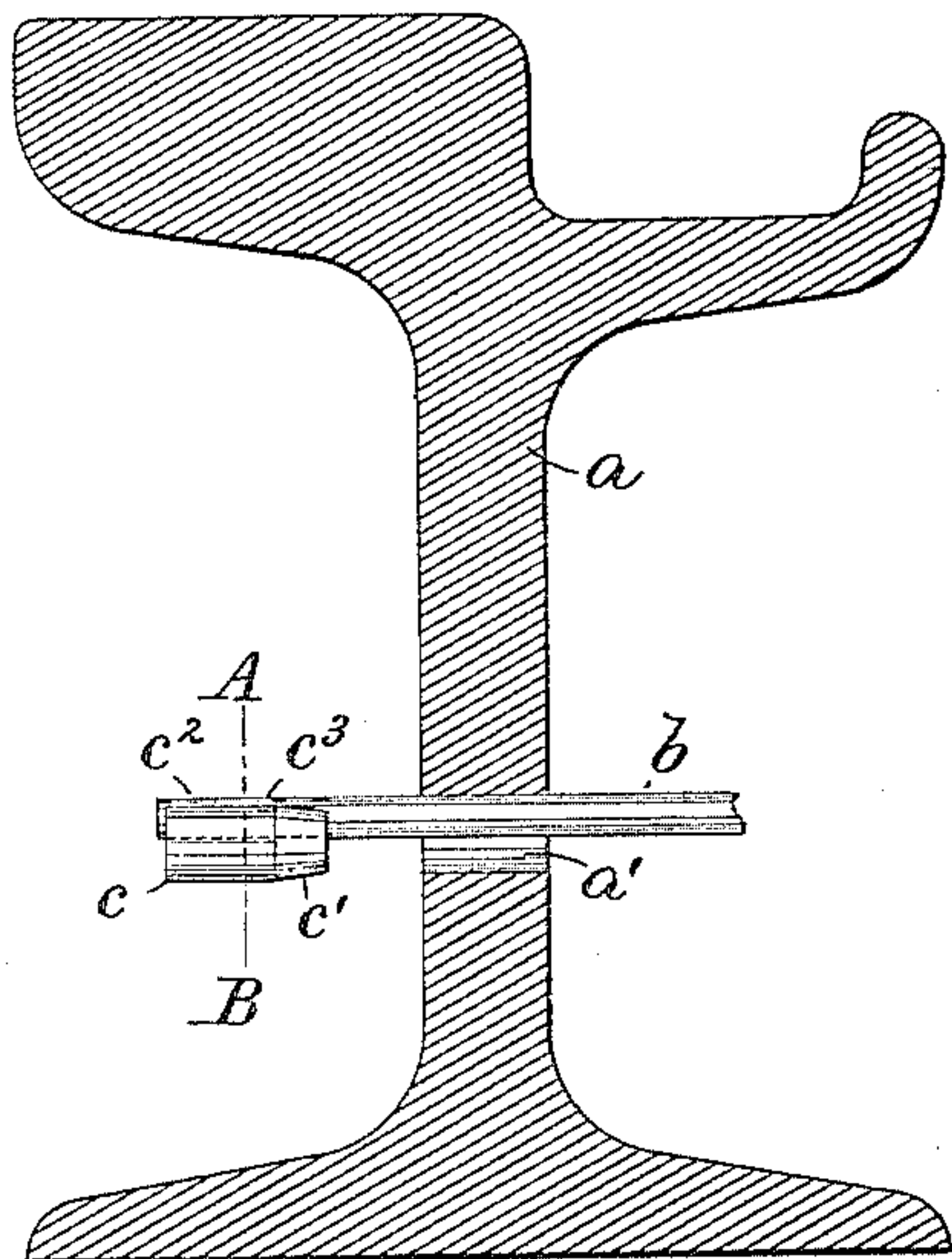


Fig. 2.

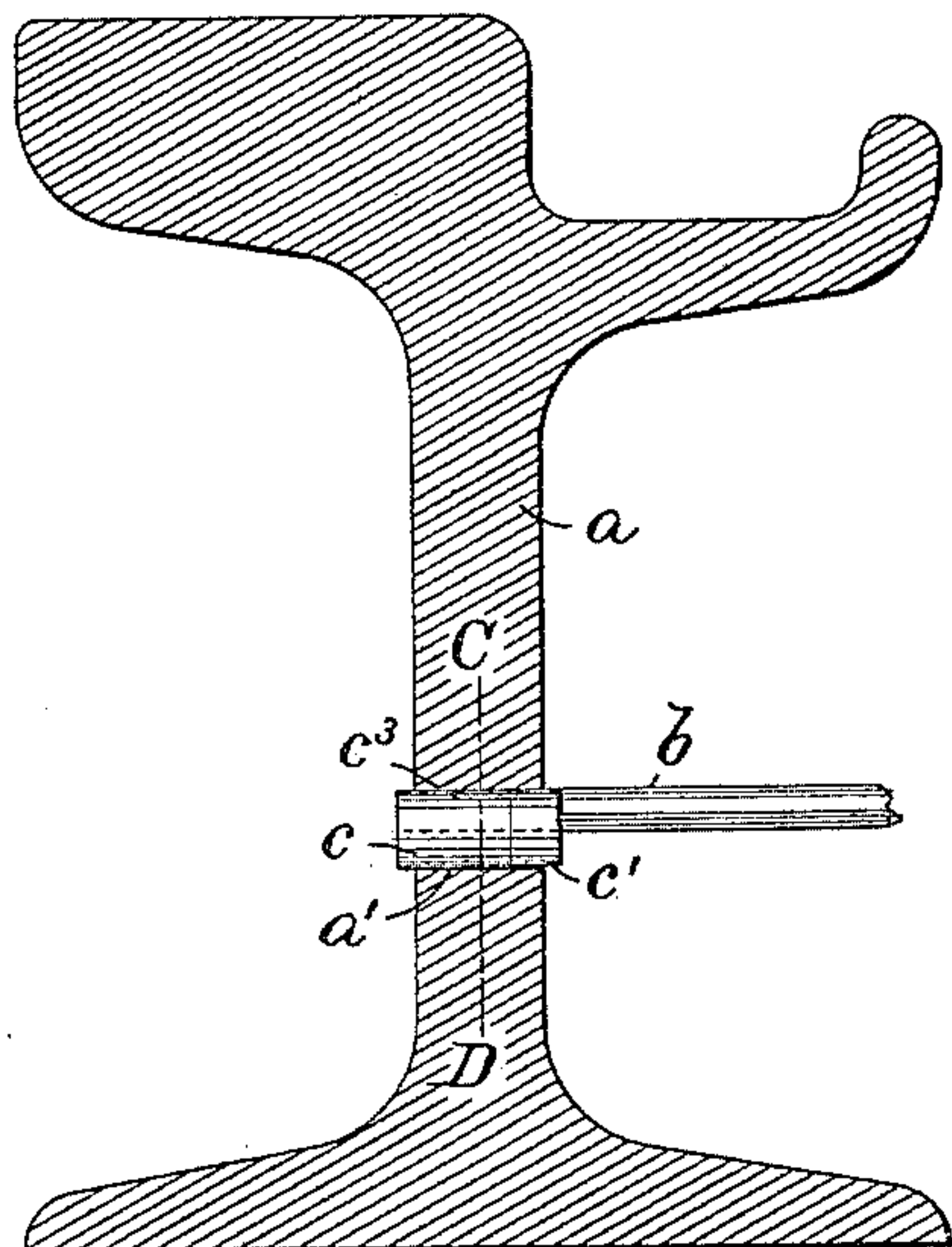


Fig. 4.

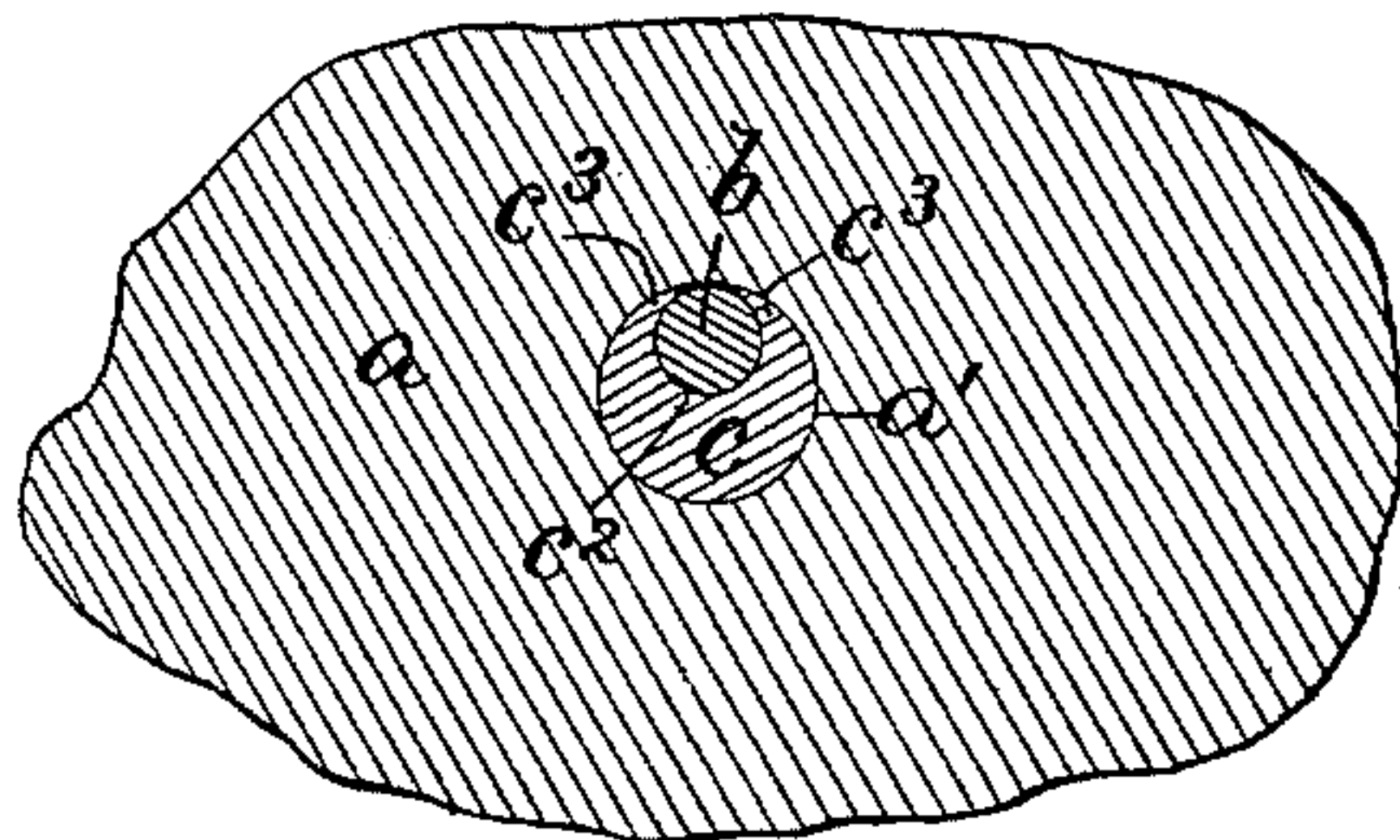


Fig. 3.

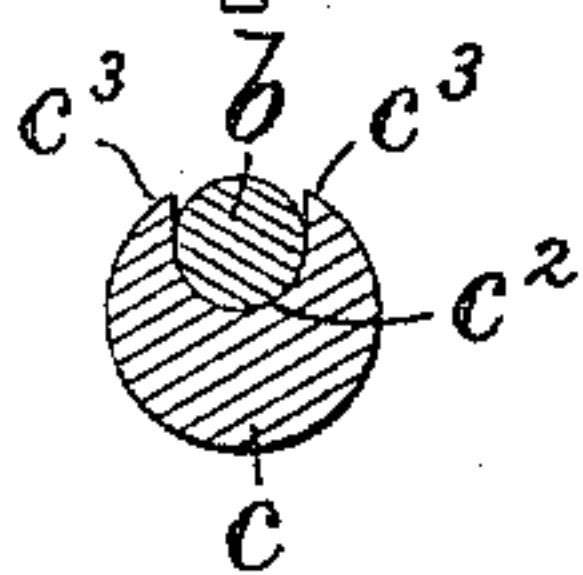


Fig. 8.

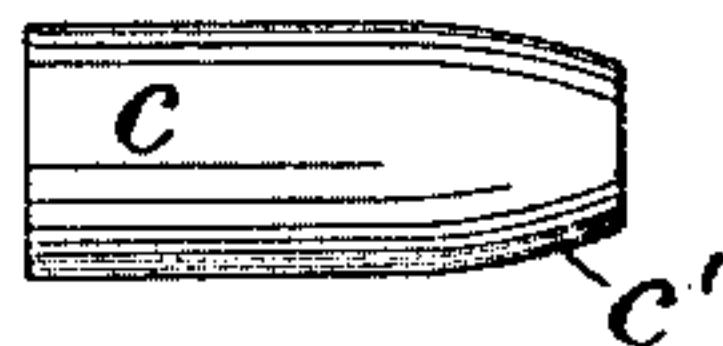


Fig. 6.

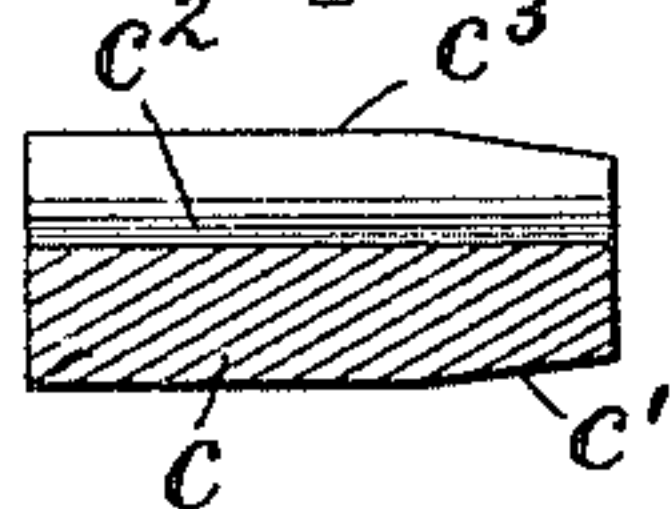


Fig. 5.

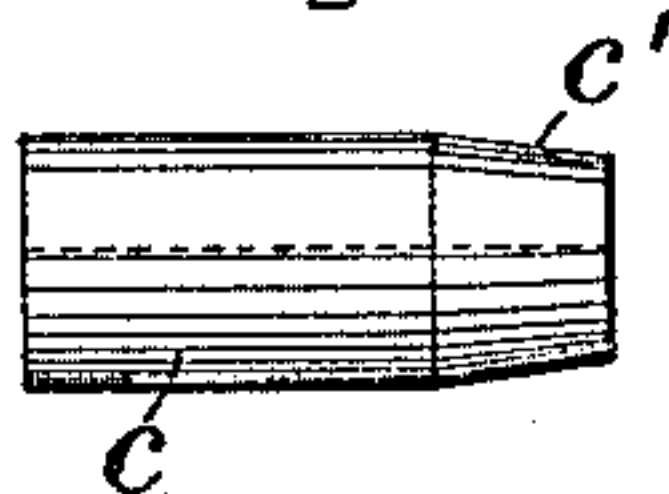
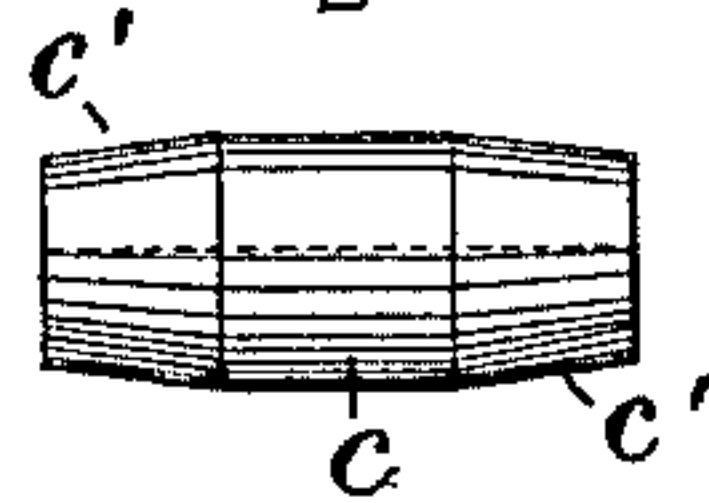


Fig. 7.



Witnesses

Garrie H. Garland
John Aldridge.

William H. Garland. Inventor

UNITED STATES PATENT OFFICE.

WILLIAM H. GARLAND, OF WEYMOUTH, MASSACHUSETTS.

ELECTRIC CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 442,370, dated December 9, 1890.

Application filed September 19, 1890. Serial No. 365,480. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. GARLAND, a citizen of the United States, residing at Weymouth, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Connectors; and I do hereby 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.

This invention relates to improvements in electric connectors for connecting a wire or other small electric conductor to a larger conductor; and it relates to that class of connectors in which the contact between the conductors is produced by driving the connector into a hole or perforation in the larger conductor, and thereby clamping the two conductors together.

It relates more especially to connectors for connecting the branch wires from the supplemental wire of an electric-railway system to the rails of the track.

It consists in providing means whereby a more complete and sure contact is made between the rail and said branch wires than is produced by the devices now in common use; also, producing a less expensive connector than is now used, and one which can be driven into the perforation in the rail on the side from which the branch wire leads or on the opposite side without the liability of injury to said branch wire or of reducing its conveying capacity.

The invention is carried out as follows, reference being had to the accompanying drawings, whereon—

Figure 1 represents a cross-section of a railway-rail with my connector and a branch wire in position to be attached to said rail. Fig. 2 represents a similar view of a rail, showing the branch wire connected to said rail by one of my connectors. Fig. 3 represents a cross-section of the connector and branch wire on the line A B in Fig. 1. Fig. 4 represents a cross-section of the connector and branch wire on the line C D in Fig. 2, showing a portion of the rail surrounding the connector in section. Fig. 5 represents a side elevation of one of my improved connectors. Fig. 6 rep-

resents a longitudinal section of the same. Figs. 7 and 8 represent modified forms of the connectors.

Similar letters refer to similar parts on the different parts of the drawings.

Hitherto connectors have been made in the form of tubes having their inside diameters a trifle larger than the diameters of the branch wires to be connected to the rails and their outside diameters a trifle larger than the holes in the rails within which said connectors are to be driven, and said tubular connectors have been split longitudinally so as to allow them to contract in their outside diameters sufficient to enter the holes in the rails and in their inside diameters sufficient to allow them to firmly grasp the branch wires; but said connectors are costly in their manufacture on account of the number of times they need to be handled in making the tube and then splitting the same. Furthermore, they do not operate satisfactorily to the persons using them, there being many places where it is impossible to use such connectors. Connectors have also been made in the form of pins or plugs having a longitudinal groove on their side, the bottom of said groove being inclined or tapering in relation to the outer surface of said pins, and said connectors are adapted to be applied to the rails by first introducing the end of the branch wires through the perforations in the rails, then placing said connectors upon the projecting ends of the branch wires with the deepest part of their grooves nearest to the rails. The connectors and branch wire are then both driven back into the holes in the rails, which cause the branch wires to be forced and held against the rails by the wedge or tapering form of the connectors. These latter connectors are also costly in their manufacture, inasmuch as each connector has to be handled separately in order to form the tapering grooves on the side of said connectors. Furthermore, said connectors are not adapted for connecting a wire to a hole in a conductor, which hole does not pass entirely through the conductor, as by driving a connector made in this manner at the side of the wire it is liable to reduce the diameter of the branch wire, thus reducing its conveying capacity, on account of the ta-

pering form of the connectors cutting up into the wire, also causing the wire to be weak and liable to break on account of its reduction.

To obviate the above-named difficulties, I construct my improved connector in the following manner.

a represents a railway-rail or other large conductor. a' represents a perforation or hole in or through said conductor, for the purpose of connecting the branch wire b thereto by means of my improved connector c . The connector c is made in the form of a cylindrical pin, preferably having a taper c' at one or both ends of said pin, to enable it to easily enter the hole in the rail when it is driven into said hole, as described hereinafter, and it also has a groove c^2 on its side, which groove extends longitudinally on the side of the pin, the bottom of said groove being straight and parallel with the outside surface of the cylindrical pin, as shown in Figs. 5 and 6.

The greatest outside diameter of the connector c is preferably made a trifle larger than the diameter of the perforation a' into which it is to be driven, and the width of the groove is made a trifle larger than the diameter of the branch wire to be connected to the rail, its depth being about equal to the diameter of said branch wire. The lower part of the groove in the pin is made semicircular in cross-section, so as to conform to the surface of the branch wire introduced therein.

It will be seen that by grooving the pin c , as shown in Fig. 3, two longitudinal ridges c^3 are formed on the pin—one on either side of said groove—and as said groove is made of a depth equal, or nearly so, to the diameter of the branch wire b said ridges will project a little above the center of the branch wire when it is placed within the groove on the connector, as shown in Fig. 3. If a branch wire b is placed within the groove on the connector c and it is driven into a hole or perforation in the rail a or other large conductor, the pin, being a little larger than the hole, will cause the ridges c^3 on the pin to be forced inward against and around the wire, so as to nearly encircle said wire, as shown in Fig. 4, at the same time causing the pin to press firmly against the side of the hole in the rail, and thus forming a close electrical contact between the branch wire and the pin, also between the pin and the interior of the hole in the rail.

These my improved connectors can be made very cheap by simply rolling rods or wire of any length with a groove extending their entire length, after which the connectors can be cut off in any required lengths and provided afterward with the desired taper or tapers in any suitable manner.

By the use of this my improved connector the branch wire is not reduced in size nor changed in the form of its cross-section, but is simply clamped within the groove in the pin by the contraction of said pin when it is

driven into the hole in the rail or other conductor.

On the drawings I have shown the branch wire as passing through the hole in the rail and the connector placed upon the projecting end of the wire ready to be driven into said hole, and the wire forced back until it is clamped firmly within the groove in the connector; but it is not essential to connect the wire in this manner, as the connector might be driven into the hole in the rail on the same side of the rail as that from which the branch wire is intended to lead without injury to or reduction of the size of the wire. This is a great advantage, as it allows the wire to be attached to a conductor in which it is impossible to have the hole pass entire through it—as, for instance, in the frog or other heavy casting of a railway.

In Figs. 7 and 8 are shown two ways of constructing the tapers on the ends of the connectors.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. An electric connector for connecting a small electric conductor to a larger conductor, the same consisting of a cylindrical pin or plug having a straight longitudinal groove on its side of sufficient width to allow the connector to be placed upon the small conductor from the side of said conductor and said conductor to enter said groove, the bottom of said groove being parallel with the outside surface of the cylindrical plug, substantially as set forth and described.

2. An electrical connector for connecting a small electric conductor to a larger conductor, the same consisting of a cylindrical pin or plug tapered at its end and having a straight longitudinal groove on its side of sufficient width to allow the connector to be placed upon the small conductor from the side of said conductor and said conductor to enter said groove, the bottom of said groove being parallel with the outside surface of the cylindrical portion of the plug, substantially as set forth and described.

3. The combination, with a railway-rail or other large electric conductor provided with a hole or perforation therein, of a wire or other small electric conductor to be attached thereto, and a connector to be driven into said hole with said small conductor to connect both of said conductors, and consisting of a cylindrical pin or plug having a straight longitudinal groove on its side of sufficient width to allow the connector to be placed upon the small conductor from the side of said conductor and said conductor to enter said groove, the bottom of said groove being parallel with the outside surface of the cylindrical pin, for the purpose set forth and described.

4. The combination, with a railway-rail or

other large electric conductor provided with a hole or perforation therein, of a wire or other small electric conductor to be attached thereto, and a connector to be driven into said hole with
5 said small conductor to connect both of said conductors, consisting of a cylindrical pin or plug tapered at its end and having a straight longitudinal groove on its side of sufficient width to allow the connector to be placed
10 upon the small conductor from the side of said conductor and said conductor to enter said groove, the bottom of said groove being par-

allel with the outside surface of the cylindrical portion of said pin, the largest diameter of the pin being a little larger than the hole 15 in the rail or other conductor, for the purpose set forth and described.

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

WILLIAM H. GARLAND.

Witnesses:

CARRIE H. GARLAND,
JOHN J. LOUD.