

E. H. FAILE.  
ELECTRIC CABLE CONNECTOR.  
APPLICATION FILED MAR. 31, 1911.

1,056,651.

Patented Mar. 18, 1913.

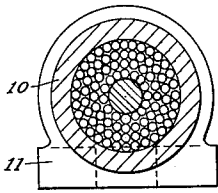


Fig. 2

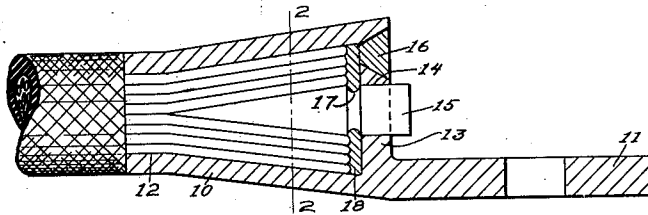


Fig. 1

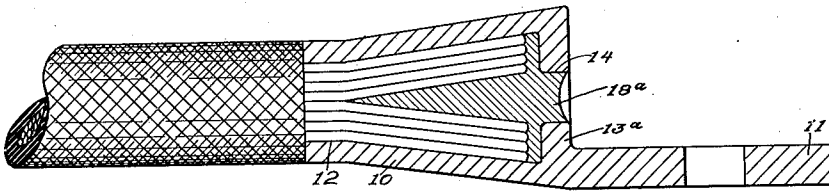


Fig. 3

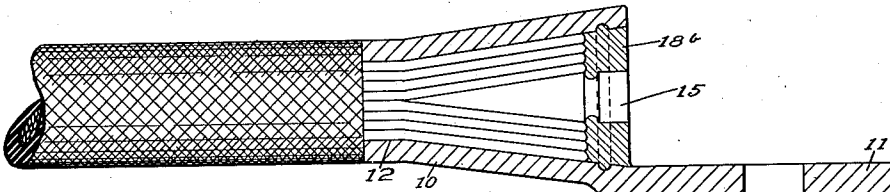


Fig. 4

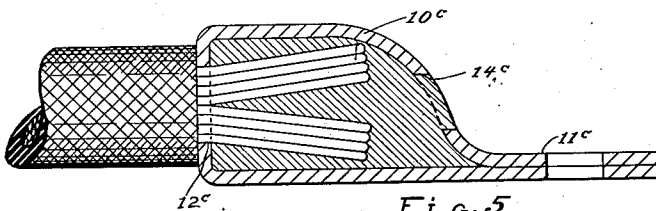


Fig. 5

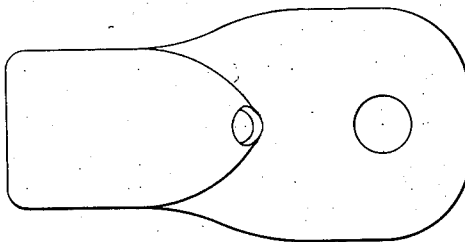


Fig. 6

WITNESSES:

*H. E. Kaabe*

*C. M. Fairbank*

INVENTOR

*Edward Hall Faile*

# UNITED STATES PATENT OFFICE.

EDWARD HALL FAILE, OF NEW YORK, N. Y.

ELECTRIC-CABLE CONNECTOR.

1,056,651.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed March 31, 1911. Serial No. 618,156.

*To all whom it may concern:*

Be it known that I, EDWARD HALL FAILE, of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Electric-Cable Connectors, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in connectors for securing in place the ends of multiple strand electric cables, the object of the invention being to provide a connector which forms as nearly as possible a perfect electrical contact with the cable, and at the same time a firm and rigid mechanical bond, which will positively prevent the separation of the connection and cable. My improved connection is equally adapted for securing together two cable ends or for securing a cable end to a dynamo or other electrical machine or to a switchboard.

Reference is to be had to the accompanying drawings, which form a part of this specification, and in which similar reference characters indicate the same parts in the different views.

Figure 1 is a longitudinal section through a connector and a cable end and illustrating one embodiment of my invention, in which a wedge is used with or without solder; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is a view similar to Fig. 1, showing the use of solder alone after the removal of the wedge; Fig. 4 is a similar view showing the solder acting as the end wall of the socket; Fig. 5 is a longitudinal section through the form shown in Fig. 6; and Fig. 6 is a top view of a connection formed from a piece of tubing.

My improved connection in its essential features includes a body of suitable metal constituting a good electrical conductor, for instance, copper, the body being so formed as to facilitate its attachment to the end of a multiple strand electric cable, and also its attachment to a binding post of a switchboard or dynamo electric machine. For attachment to the cable the body is provided with a socket having at least two openings, into one of which the end of the cable may be extended and into the other of which may be admitted means for preventing the

withdrawal of the cable. The means for facilitating the attachment of the connection to a binding post or other point of support is a lug preferably perforated, to facilitate its being bolted in place.

In the specific form illustrated in Fig. 1, I form the connection of a simple casting having a substantially conical body 10 and a lug 11 extending in the same general direction as the axis of the body, and substantially tangential to the body at one side. The lug connects to the larger end of the body, and the outer surface of this lug is the only part of the entire device which it is advisable to machine or otherwise finish. This outer surface may be smoothed up on an emery wheel, so that when it is clamped in place it will form a good electrical contact. The conical body 10 is hollow, and at the end opposite the lug 11 has an opening 12 of an interior diameter approximating that of the exterior diameter of the bundle of wires or strands going to make up the cable. The space or chamber within the body gradually increases in diameter from the opening 12 toward the lug, and at the larger end of the body there is an end wall 13. The chamber is thus substantially conical in form, with a truncated apex opposite to the lug and of a size to receive the cable. The end wall 13 has an opening 14 therethrough in axial alinement with the opening 12, and into this opening I drive a wedge 15 of suitable electrically-conducting metal. Adjacent to the opening 14, there is preferably a second opening 16 in the wall, through which solder may be admitted to the interior of the body 10.

In securing a connection to the end of the cable, the insulation is cut away from the latter for a distance substantially equal to the length of the chamber within the body, and the end of the cable is extended through an opening 12 toward or into contact with the end wall 13. The wedge 15 is then driven through the opening 14 into the end of the cable, so as to spread apart the strands and force them into firm mechanical contact and good electrical contact with the inner walls of the body. The spreading apart of the strands prevents the cable from being

pulled out, and so long as the wedge remains in place, the strands cannot come together again. For positively insuring the retention of the wedge, the latter may be provided with an annular groove 17 at a point which normally comes just inside the wall 13, and upon pouring molten solder through the opening 16, the solder will enter the end of the cable and flow around the wedge 16 so as to form a perfect electrical contact between the strands of the cable and the connection. Furthermore, the wedge itself forms a good electrical contact with the strands and also with the walls of the opening 14. No jarring or even heating of the connection can loosen the cable or break the good electrical contact. The inner surface of the body may, if desired, be tinned, so as to facilitate the union of the solder therewith.

I do not wish to be limited to the specific construction illustrated in Fig. 1, as various other forms may be devised to carry out my invention. In Fig. 3, I have illustrated substantially the same connection except that the end wall 13<sup>a</sup> has only one opening 14 therein, and instead of leaving the wedge in place, I withdraw it after it has been driven in to spread the strands apart. - After withdrawing the wedge, solder 18<sup>a</sup> is admitted through the opening 14, to fill the conical recess formed by the wedge and to fill the space between the ends of the strands and the wall 13<sup>a</sup>.

It is not essential that the wall 13 or 13<sup>a</sup> be employed, as I may entirely omit this end wall. As shown in Fig. 4, I insert the cable end in the same manner as before, and drive the wedge 15 centrally into the end of the cable, to spread apart the strands. Solder 18<sup>b</sup> is then poured into the end of the body, so as to connect the body, the strands and the wedge, and to positively prevent the removal of the wedge. In addition to the groove in the wedge, I may form a groove in the inner surface of the wall of the socket as shown in dotted lines in Fig. 4.

The forms shown in Figs. 1, 3 and 4 are castings, but it is not essential that the connection be in the form of a casting. In Figs. 5 and 6, I have shown a connection formed from a piece of tubing. One end of the tubing is pressed flat to form the lug 11<sup>a</sup>, and the remainder of the lug is left substantially cylindrical to form the body 10<sup>a</sup>. At the end opposite the lug, the body is flanged inwardly to leave an opening 12<sup>a</sup>, through which the end of the cable may be inserted, and in the inclined end wall opposite the opening 12<sup>a</sup> is the opening 14<sup>a</sup>, through which a wedge may be driven to spread apart the strands. As illustrated, the wedge is removed and replaced by solder, as in Fig. 3, although the wedge may be left in and solder admitted through an

additional opening, as shown in Fig. 1, or the opening 14<sup>a</sup> may be made larger and the end of the body formed of solder. The body in this case is substantially cylindrical rather than conical, as in the forms first described, but it will, of course, be evident that the specific form is not important. It is evident that other forms might be devised within the scope of the appended claims without departing from the spirit of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A connector for securing the end of a multiple strand electric cable, comprising an attaching lug, a socket integral therewith and having an entrance opening for the cable in one end and a second opening in the opposite end, a portion of the space within the socket being of greater diameter than the first-mentioned opening, and solder admitted through the second-mentioned opening into engagement with the ends of the strands for closing said second-mentioned opening and retaining the cable within said socket.

2. The combination with a multiple strand electric cable of a connector for securing the end thereof, comprising an attaching lug and socket having an entrance opening in one end for the cable and an opening in the opposite end adjacent to the end of the cable, a wedge admitted through the second-mentioned opening and extending into the end of the cable to spread apart the strands of the latter, and solder encircling said wedge and in engagement with the end of the cable.

3. The combination with an electric cable of a connector for securing the end thereof, comprising an attaching lug and a socket having an entrance opening in one end for the cable and an opening in the opposite end adjacent to the end of the cable, a wedge admitted through the second-mentioned opening and extending into the end of the cable to spread apart the strands of the latter, said wedge having an annular groove adjacent to the end of the cable, and solder encircling said wedge adjacent to said groove and engaging with the end of said cable.

4. The combination with a multiple strand cable of a connector for securing the end thereof comprising an attaching lug, and a socket integral therewith, and having an entrance opening in one end for the cable, a portion of the space within the socket being of greater diameter than the cable, to permit the spreading apart of the ends of the strands of the cable, said socket having a second opening adjacent to the end of the cable, said second-mentioned opening serving for the admission of a

wedge to spread apart the ends of the strands and hold them in engagement with the walls of said socket, and being of such a size as to fit said wedge, and said socket  
5 having a third opening for the admission of solder into the space not occupied by the strands of the cable and wedge.

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

EDWARD HALL FAILE.

Witnesses:

CLAIR W. FAIRBANKS,  
MARTIN BOURKE.