Aug. 14, 1928. 1,680,347

C. C. SUNDERLAND

SOCKET FOR WIRE CABLES OR STRANDS

Filed Nov. 17, 1926

Fig. 1.

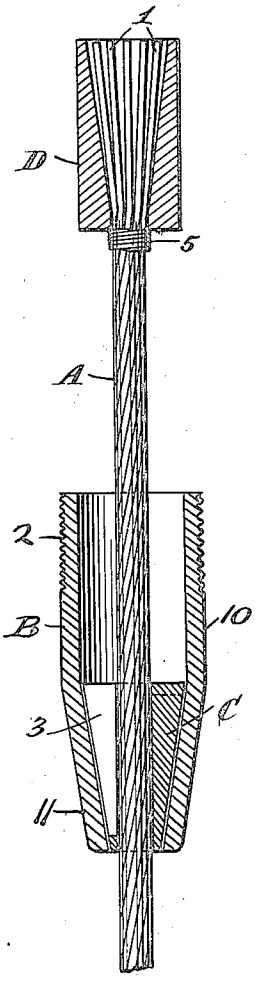


Fig. 2.

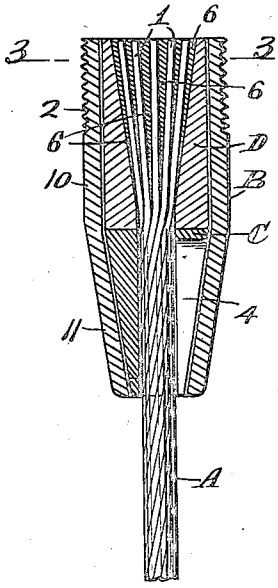


Fig. 5.

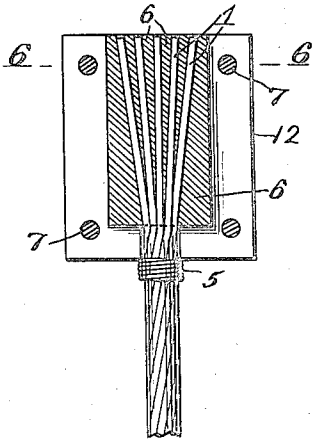


Fig. 6.

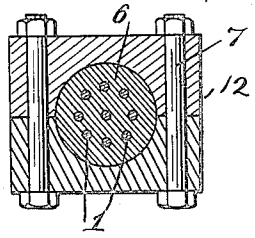


Fig. 3.

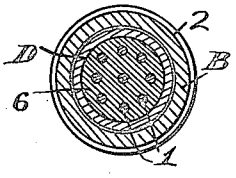


Fig. 4.

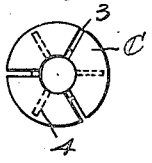
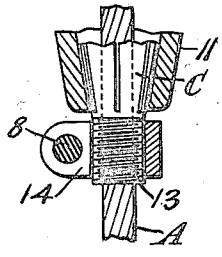


Fig. 7.



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UNITED STATES PATENT OFFICE.

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SOCKET FOR WIRE CABLES OR STRANDS.

Application filed November 17, 1926. Serial No. 148,807.

This invention relates to an improved socket for socketing wire strands or cables, and is intended especially for use with electric cables such as now used largely for power transmission purposes and electrification work, the especial object of the invention being to provide a socket connection that will develop a high strength of the cable and assure an efficient electrical connection. The invention, however, is applicable to wire strands and cables of any character and for other than electrical use, including all steel wire strands and cables.

Such electrical wire strands or cables are commonly made with wires of aluminum, bronze, hard drawn copper or copper weld material, that is, steel with a copper covering, either with or without some wires of steel for strength. In such strands, it is difficult to make a socket connection in the regular manner that will develop a high percentage of the ultimate strength of the strand, as the zinc or tin used as the filling material in socketing the wires acts on the copper, aluminum or bronze so as to anneal and weaken the wires embedded in the filling material.

The present invention provides a socket connection in which any weakening of the wires by action of the filling material used in socketing, or any weakness in the filled connection resulting from defects in the filling or otherwise, shall be compensated for and the full strength of the strand be secured, while at the same time the construction shall provide a simple and convenient method of socketing which can be readily applied in the field without highly skilled labor.

For a full understanding of the invention, a detailed description of sockets embodying the invention in preferred forms, and their application to the strand, will now be given in connection with the accompanying drawings forming a part of this specification, and the features forming the invention will then be specifically pointed out in the claims.

In the drawings—

Figure 1 is a view showing the parts of the socket in place on the strand prior to making the socket connection;

Figure 2 is a similar view showing the completed socket connection;

Figure 3 is a cross-section on the line 3—3 of Fig. 2;

Figure 4 is a top plan view of the wedge of Figs. 1 and 2;

Figure 5 is a view similar to Fig. 1, showing a modification;

Figure 6 is a cross-section on the line 6—6 of Fig. 5; and

Figure 7 is a detail of the lower part of the socket showing a modification.

Referring now to the drawings, A is the cable or strand to be socketed made up of a number of wires 1, some or all of which, in an electrical cable, will be of aluminum, bronze, copper or copper-weld material, either with or without some wires of steel. B is the main basket of the socket connection having the usual screw threads 2 for a coupling piece connecting the basket to a terminal or a connecting strand, this basket B having an upper portion 10, the inner surface of which is preferably straight and an extended portion 11 tapering inside to receive a split wedge C, which in an electrical strand may be of copper or other good electrical conducting material. This wedge C is split so as to be compressed upon the strand A as it is drawn down in the tapering portion 11 of the basket B under tension on the strand, but preferably is made as a single piece, as shown, having slots 3, 4, these slots 3, 4 extending alternately from opposite ends of the wedge nearly to the other end, so that the desired compression is secured without a parted wedge. On the end of the strand A is a secondary basket D fitted to slide easily within the straight portion 10 of the main basket B, and in this secondary basket the wires 1 are separated and socketed by zinc, tin or other suitable filling material. A winding of wire 5 is shown in Fig. 1 on the strand A at the inner edge of the basket D and described hereafter.

The method of making the socket connection is as follows: The main basket B, with its wedge C therein, is slipped over the end of the strand A, the wire 5 then wound on the strand A to prevent spreading of the wires below it, the secondary basket D then slipped over the end of the strand A down to the wire winding 5, and the wires 1 separated for socketing in basket D, all as shown in Fig. 1.

The wires 1 are then socketed in the basket D by the zinc, tin or other suitable filling material 6, as usual in socketing, the wire

winding 5 removed, and the basket B then moved up to the end of the strand and onto and over the secondary basket D, so that the basket D then rests upon the wedge C and, under tension on the strand A, forces it downward in the basket B and thus compresses it upon the strand. The complete construction with the strand socketed is then as shown in Fig. 2, and the basket B may now be connected by any suitable coupling as desired.

The socket construction and method of applying the same illustrated in Figs. 5 and 6 is the same as shown in Figs. 1–4, except that the secondary basket D is not used, but the wires 1 are socketed in a body of filling material, 6, which is filled into a mold 12 applied about the separated wires 1 of the strand outside the wire wrapping 5. This mold 12 is preferably made as shown in two parts connected by bolts 7 so as to be readily applied to and removed from the strand end. After the wires 1 have been socketed in the filling material 6 in mold 12, as shown in Fig. 5, the parts of the mold 12 are separated and the mold removed, the wire wrapping taken off, and the main basket B moved over the filling block 6 to complete the socketing, the block 6 then bearing upon the wedge C in the same way as the secondary basket D in the construction shown in Figs. 1–4.

It will be seen that the invention provides a very simple, cheap and convenient means for socketing a strand or cable, by which the full strength of the rope may be secured, although the percentage of such strength secured by the filling material may be much less than the full strength, the clamping of the wedge C upon the strand A by the pressure of the secondary basket D or filling block 6 acting to utilize a considerable portion of the strength of the rope, and thus compensate for any weakness in the wires or connection of the wires in the secondary basket D or filling block 6. This is especially important in electrical strands or cables, with wires of aluminum, bronze, copper or copper-weld material, in which the zinc or tin usually employed as a filling material acts on the copper or aluminum to weaken the wires therein. This feature is important, also, with strands of any other material and used for any other purposes, such as ordinary steel strands or ropes, any weakness in the filled connection, due to defects in the filling or other causes, being compensated for by the clamping of the wedge C upon the strand. In the case of electrical cables or strands, also, the clamping of the wedge upon the metal strand A aids in assuring an efficient electrical connection through the strand.

In some cases it is desirable to provide an electrical connection for a jumper cable to electrically connect two cables that may be mechanically connected together by a basket B on each cable with the usual sleeve coupling screwed thereon, in case the baskets by themselves are not of suitable material for the electrical conductivity required. An efficient and convenient provision for such connection is made by extending the split wedge C below the inner end of basket B and securing a connecting piece on such extension. Such a construction is shown in Figure 7 with the extension 13 on the wedge and a connecting piece 14 secured thereto. The extension 13 is shown as screw threaded and the connection piece 14 as a split screw threaded nut screwed on the extension 13 and clamped by bolt 8, but it will be understood that the connection piece may be of any suitable form and connected to the extension 13 in any other suitable manner. Such connection pieces on wedge C may be used for other electrical connections than jumper cables and for mechanical instead of electrical connections.

It will be understood that the invention is not limited to the specific form of the strand or socket shown, but that the invention is applicable in connection with strands or cables of different forms and arrangement of wires, and that the specific construction of the socket may be changed while retaining the invention defined by the claims.

What is claimed is:

1. A cable or strand connection, comprising a body of filling material in which the separated ends of the strand are embedded, a basket on the strand enclosing said body and in which said body is free to move along the strand, said basket having a portion decreasing in interior diameter in the direction of rope tension, and a compressible wedge in said basket portion free to move on the strand and compressed on the strand by the filled strand end under tension on the strand.

2. A cable or strand connection, comprising a basket receiving the separated ends of the strand, a body of filling material socketing the separated ends of the strand in said basket, a second basket enclosing said first mentioned basket and in which said first mentioned basket is free to move with the strand, said second basket having a portion decreasing in interior diameter in the direction of rope tension, and a compressible wedge in said portion free to move on the strand and compressed on the strand by the filled and socketed strand end under tension on the strand.

3. A cable or strand socket, comprising a basket adapted to receive and socket the separated ends of the strand, a second basket adapted to receive the first mentioned basket and in which said first mentioned basket is free to move with the strand, said second basket having at its inner end an interior

tapering surface, and a compressible wedge in said portion forming a seat for the first mentioned basket and co-acting with said tapering surface to compress the wedge on the strand as the wedge is forced into said tapering portion of the basket under tension on the rope.

4. A cable or strand connection, comprising a body of filling material in which the separated ends of the strand are embedded, a basket on the strand enclosing said body and in which said body is free to move along the strand, said basket having a portion decreasing in interior diameter in the direction of rope tension, and a compressible wedge in said basket portion free to move on the strand and compressed on the strand by the filled strand end under tension on the strand, said wedge having an extension outside the basket adapted to receive a connecting piece.

In testimony whereof, I have hereunto set my hand.

CHARLES C. SUNDERLAND.