Oct. 9, 1928.

D. K. TEMPLETON

1,686,583

METHOD OF MAKING CABLE CONNECTIONS

Filed July 27, 1927

Fig. 1.

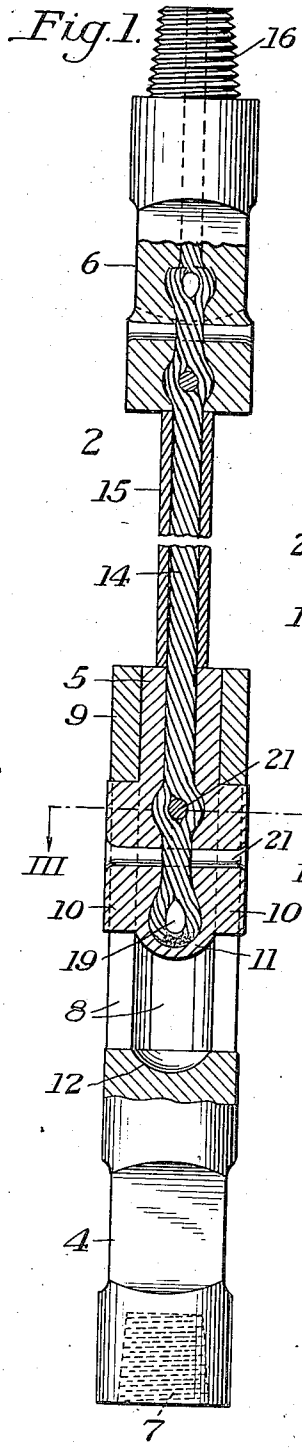


Fig. 3.

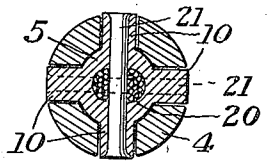


Fig. 2.

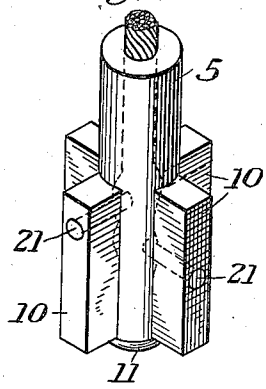


Fig. 4.

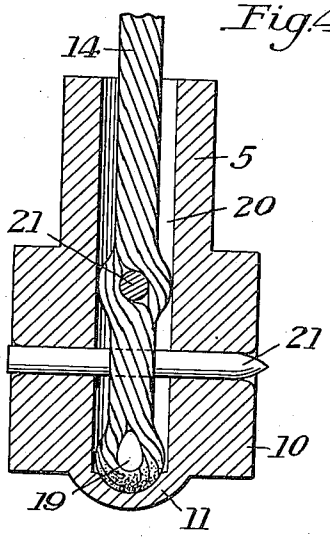


Fig. 5.

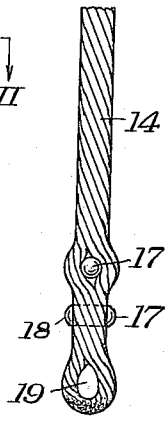


Fig. 6.

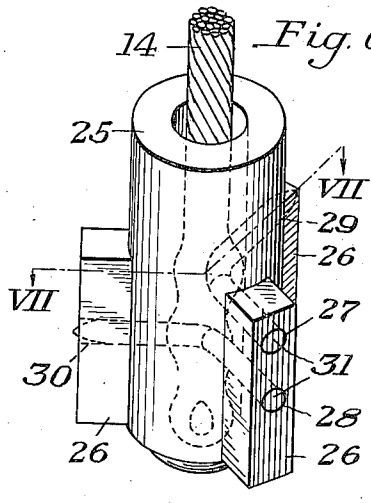
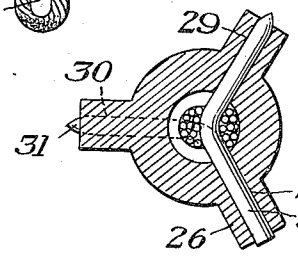


Fig. 7.



INVENTOR

David K. Templeton,

by his Attys,

Byrnes, Stallman & Daniels

Patented Oct. 9, 1928. 1,686,583

UNITED STATES PATENT OFFICE.

DAVID K. TEMPLETON, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO CHARLES R. BRYSON, OF PITTSBURGH, PENNSYLVANIA.

METHOD OF MAKING CABLE CONNECTIONS.

Application filed July 27, 1927. Serial No. 208,768.

My invention relates to cable connections and particularly to a method for securing stranded cables to sockets, clamps, sleeves and the like.

In securing stranded cables to sockets, clamps, sleeves and the like, it has heretofore been common practice to pass pins through a cable. The pins extend into the walls of the sockets, clamps or sleeves which is connected to the cable, and serve to transmit a considerable portion of the longitudinal strain. Provision has also been made for pressing the walls of the socket, clamp or sleeve into irregular engagement with the outer surface of the cable.

I have found that by bulging the strands of the cable, providing means for maintaining the bulge, and causing the walls of the connector to engage the bulges in the cable, that a very effective cable connection is obtained.

One application of the invention is securing drilling tools to cables, although it is to be understood that the invention is not necessarily limited to drilling machinery, but may be practiced wherever it is desired to clamp or connect a cable to a cooperating socket, clamp, sleeve or the like.

In operating drilling machinery it is common practice to provide a drill jar mechanism for supporting a drilling tool and for permitting a hammer to descend and strike the drill a sharp blow. In raising the drill the hammer is raised to engage a shoulder on a socket member for the attachment of the drilling tool. Accordingly, the hammer engages the socket member both in the upward and downward stroke. Since drill tools are of large size and are relatively heavy, and since the stroke of the hammer is at least several inches long, the amount of force applied to the socket member at each end of the stroke is considerable.

Heretofore the hammer has been secured to its support by a cable enclosed in a sleeve. The material of the support and hammer is initially forced into tight engagement with the cable. However, during the operation of the drill, the blows given to the support and the hammer have tended to loosen them from engagement with the cable.

For strengthening the engagement between the cable and the hammer and support, I spread or bulge the cable at one or more points by driving a spreader, having a rounded point, between the strands of the cable without injury to the strands. The cable may be heated during the spreading operation. After the cable is spread, it, together with the spreading inserts, which are preferably of soft material, is inserted in openings in the support and hammer. Pins are then driven through the walls of the hammer for replacing the spreaders. Thereafter the material of the hammer is forced, as by swedging or hammering, into engagement with the spread or bulged portions of the cable and the pin. For certain types of drills the material of the hammer may be forced into engagement with the cable and spreaders without the use of pins. In either case the material of the cable is spread or bulged sufficiently to form irregular surfaces of considerable areas. The materials of the hammer and support, however, shape themselves around the spread portions of the cable, thereby ensuring firm engagement for preventing relative movement under longitudinal strains. The length of the prepared portion of the cable and the number of bulges are made such that the pounding against the faces of the hammer and support will not dislodge sufficient material from the cable to permit slippage.

The presence of the pins also prevents the loosening of the material adjacent the cable.

The accompanying drawings illustrate the preferred embodiment of the invention in which: Fig. 1 is a view partially in elevation and partially in section of a drill jar embodying my invention; Fig. 2 is a perspective view of the hammer; Fig. 3 is a cross-sectional view of the drill jar taken along the section line III—III of Fig. 1; Fig. 4 is a sectional view of the hammer; Fig. 5 is a view of a cable after the spreading operation; Fig. 6 is a perspective view of a modified form of the invention; and Fig. 7 is a sectional view thereof, taken along the section line VII—VII of Fig. 6.

Referring to Fig. 1, a drill jar 2 comprises a socket 4 for the reception of a drill tool, a hammer 5 and a support 6.

The socket 4 is provided with a threaded opening 7 at the bottom thereof, for the reception of the drill tool (not shown). The upper portion of the socket is provided with a plurality of slots 8 and a header 9. The hammer 5 is provided with a plurality of flanges 10, which are illustrated as four, al-

though the number may be varied as desired. The lower face of the hammer is provided with a rounded surface 11 for engaging a corresponding seat 12 in the socket 4 when delivering a hammer blow. A cable 14 extends from the interior of the hammer 5 upwardly and engages the socket 6. A sleeve 15 surrounds the exposed portion of the cable 14. The support 6 is provided with threads 16 for securing the drill jar to the end of a hoisting cable, drill bar, or the like.

Referring to Figs. 1 and 5, for securing the cable between the hammer 5 and the support 6, an improved method of fastening is provided. Since the manner of securing the cable to hammer 5 and support 6 may be identical, a description of the method of securing it to the hammer 5 only is given.

Plugs 17 of soft material having rounded ends 18 are initially driven between the strands of the cable for spreading or bulging it without injury to the strands. The wedge 19 is driven into the lower end of the cable. Although the cable strands may terminate in a substantial V-shape around the wedge 19, I prefer to bring the strand ends together around the wedge and fasten them together, as by welding. This construction more securely holds the wedge in place and makes for a structurally strong joint.

The cable when thus prepared, is inserted into an opening 20 in the hammer 5. The opening 20 is initially of sufficient diameter to permit the passage of the bulged portion of the cable and the spreaders 17. After the cable is in place in the hammer 5, pins 21 are driven through the aligned openings in the walls of the hammer. The pins 21 engage and replace the spreaders 17. Thereafter the material of the hammer is swedged or hammered into close engagement with the bulges on the cable, the pins 21 and the wedge 19. The presence of the pins 21 and the wedge 19 prevents the cable from being returned to its normal shape during the swedging or hammering operation, thereby causing the inner walls of the opening 20 to assume an irregular shape for preventing longitudinal movement relative to the cable 14 thereafter. The bulged portions of the cable relieve the pins 21 of the major portion of the longitudinal strains as the primary function of the pins is to insure spreading of the cable strands. The presence of the pins 21 also prevents the loosening of the hammer 5 relative to the cable 14.

For other types of drill jars the pins 21 may be omitted and the material of the hammer swedged around the inserts 17.

Referring to Figs. 6 and 7, I have shown a modified form of the invention in which the hammer 25 is provided with three flanges 26, one of which is provided with a pair of openings 27 and 28. The other flanges 26 are provided with openings 29 and 30, respectively, in horizontal alignment with the openings 27 and 28. Tapered pins 31 are driven into the openings 27 and 28. These pins penetrate the cable without injury to the strands and engage the inner wall of the hammer 25. Since the path of least resistance offered to the pins is through the openings 29 and 30, they bend slightly and move outwardly from the cable 14. The material of the hammer 25 is thereafter forced into close engagement with the cable 14 and the pins 31, in the same manner as described in connection with the form of the invention shown in Fig. 1.

While I have illustrated and described the preferred form of my invention, it will be understood that it may be otherwise practiced within the scope of the following claim.

I claim:—

In the method of attaching a member to a cable, the steps consisting in inserting a spreader between the strands of a cable for spreading the cable, inserting the spread portion of the cable and the spreader into an opening in the member, passing a fastening device from the member into the spread portion of the cable for replacing the spreader, and then forcing the member into close engagement with the fastening device and spread portion of the cable.

In testimony whereof I have hereunto set my hand.

DAVID K. TEMPLETON.