Oct. 7, 1930. A. B. DIBNER 1,777,295

CABLE TERMINAL

Filed Sept. 14, 1927

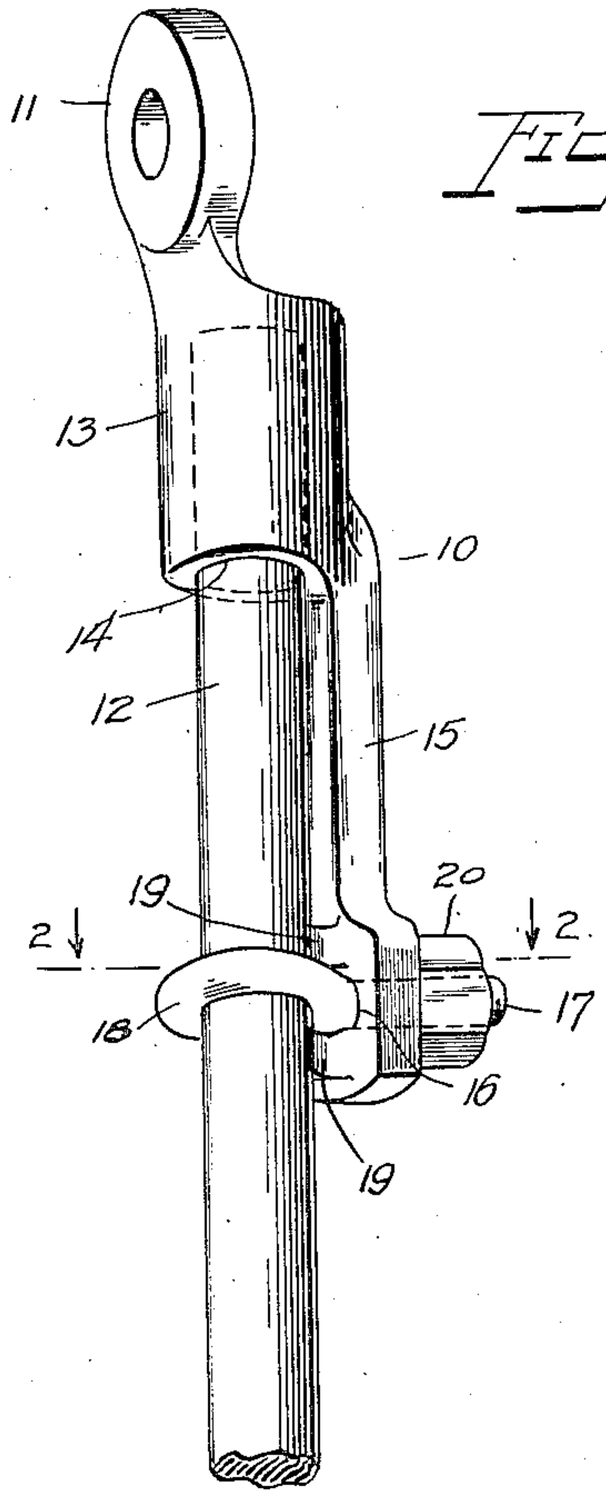


Fig. 1.

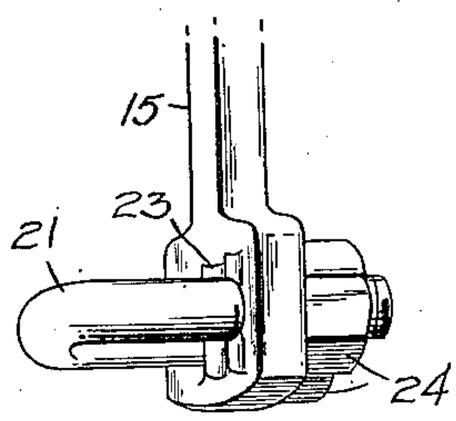


Fig. 3.

Fig. 4.

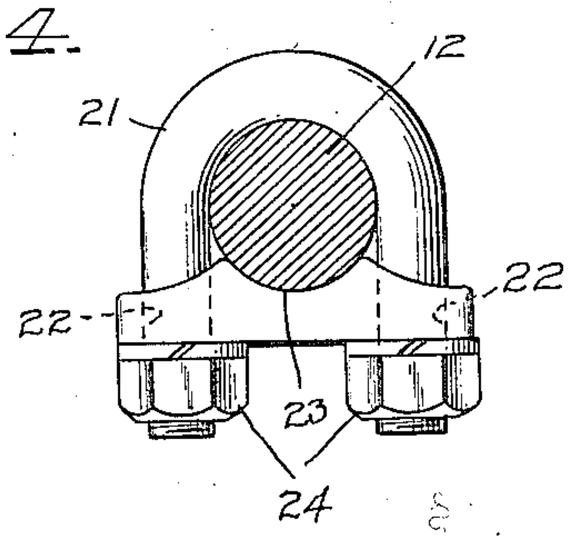
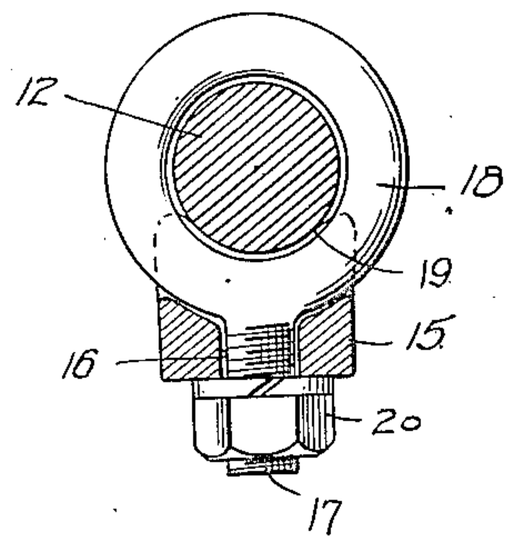


Fig. 2.



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1,777,295

UNITED STATES PATENT OFFICE

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CABLE TERMINAL

Application filed September 14, 1927. Serial No. 219,480.

My invention relates to improvements in cable terminals adapted especially for high tension electrical currents conducted over copper cables, and has for its principal object to provide a cable terminal of this character which will prevent failures of the cable through disconnection at the place where the cable is soldered in the terminal.

Another object of the invention is to afford a cable terminal which will prevent mechanical breakage of the copper cable as a result of the process of crystallization at the point where the cable is soldered in the terminal, the crystallization being caused by mechanical vibration of apparatus located out of doors where it is subject to wind and the inherent electro-mechanical vibration of an alternating current apparatus.

I have accomplished the objects referred to in the foregoing paragraphs by means of a terminal connection illustratively exemplified in the accompanying drawings, in which, Figure 1 is a perspective elevational view of a terminal embodying the preferred form of clamping arrangement; Figure 2 is a transverse sectional view taken on lines 2—2 of Figure 1; Figure 3 is a view of a portion of the terminal illustrating a modified form of clamp; and Figure 4 is an end view of the arm showing the U bolt clamp of Figure 3.

Referring to the drawings, 10 denotes a cast fixture having a contact face 11 at its upper end in the form of a disc which is the medium of current flow from a flat source through the terminal to a cable 12. The contact disc 11 projects from one end of a cylindrical shell 13 in which the cable 12 is soldered to the wall of the bore or socket 14. Integral with the shell 13 and projecting axially of the fixture 10 from the end opposite the contact disc 11, is an arm 15 which is offset from the axis of the bore 14 and which is calculated to have a cross sectional area equal to that of the cable 12. The free end of the arm, which may be of any desired length, is flattened in the direction of the contact disc 11 and provided with a bore 16 to accommodate the threaded shank 17 of an eye bolt 18. The diameter of the eye conforms to that of the cable 12 and disposed above and below the eye bolt 18 when in position are raised seats 19 having their surfaces slightly convex to closely embrace the surface of the cable 12. A nut 20 is adjustable over the threaded shank 17 of the eye bolt 18 to draw the cable against the seats 19. This construction forms a connection, which makes possible the prevention of failure of the cable when the solder in the socket 14 has become melted through overload. Heretofore, when the solder failed, the cable would slip from the socket 14 and result in a broken connection.

Thus far I have described only the mechanical features by means of which the cable is held in place, permitting a sufficient degree of contact through the eye bolt 18 and thence through the arm 15. It has been found in practice, however, that where one end of a cable is rigidly held by such means as utilized in the older types of terminal connections, the copper of the cable being readily crystallized, would tend to harden and crystallize at the point of greatest stress, such point corresponding to the portion of the cable at the rim of the socket 14. The causes of swaying the cable may be meteorologic in the form of wind, unusual loading of sleet and the general vibration caused by storm, or vibration in the connection may also be due to magnetic stress of high current densities, changes of temperature, or a combination of any or all of the above causes.

According to the present invention the damage resulting from the above causes are reduced to a minimum, since by means of the arm 15 and eye bolt 18, there is provided a point of connection distantly removed from the critical point of contact at the socket 14. Taking into account the principle of the beam having three points of support, flexure of the cable makes it possible to avoid severe strain and crystallization of the metal by affording a large measure of flexibility between the eye bolt 18 and the socket 14.

Referring now to Figures 3 and 4, the modification comprises a U-bolt 21 used in place of the eye bolt 18, which, of course, necessitates a pair of openings 22 in the free end portion of the arm to accommodate the

parallel threaded portions of the U-bolt. In this embodiment, a single seat 23 is cast in the arm between the openings 22 so that when the U-bolt is tightened by the nuts 24 the surface of the cable will make close contact with the terminal.

Installation of the present invention is exceedingly simple and failures due to breakage are avoided. The eye bolt is first placed over the end of the cable to be attached and the said end is then soldered in the usual manner in the socket 14. The stem of the bolt is placed in the bore at the free end of the arm 15 and the nut 20 tightened until the surface of the cable is seated in the seats 19.

The inconvenience and expense involved in the breakage of high current or high tension electrical joints particularly in an outdoor substation installation, warrants the use of equipment capable of preventing the failures common to an installation in which such preventative measures are not employed.

Having now described the nature of my invention and manner in which the same is utilized, what I claim and desire to secure by Letters Patent is:

1. An electrical cable terminal, comprising an integral fixture having a contacting surface, a socket for the end of the cable, and an arm projecting parallel with the cable to a point removed from the socket, and clamping means carried by the free end of the arm to simultaneously provide auxiliary current carrying means and adapted to contact with the cable so as to support the same at a point distant from the socket.

2. In a cable terminal fixture, an integral member having a contacting surface, a socket in which the end of the cable is soldered and an arm projecting parallel with the cable, the said arm being provided at its free end with an opening disposed transversely of the axis of the cable and having seats for the cable arranged on opposite sides of the opening, an eye bolt having its threaded shank in said opening and the eye portion adapted to embrace the cable at a point distant from the socket, and a nut adjustable over the shank of the eye bolt and against the arm to draw the cable against its seat.

3. In an electrical cable terminal, an integral fixture having a contacting surface, a socket in which the cable end is supported and an arm projecting parallel with the cable, the said arm being provided at its free end with an opening disposed transversely of the axis of the cable and having seats for the cable arranged on opposite sides of the opening, an eye bolt having its threaded shank in said opening and the eye portion adapted to embrace the cable at a point distant from the socket and simultaneously provide an auxiliary current carrying means, and a nut adjustable over the shank of the eye bolt and against the arm to draw the cable against its seat.

In testimony whereof he has affixed his signature.

ABRAHAM BERNARD DIBNER.