April 14, 1936. J. B. COOK ET AL 2,037,066

CONNECTER

Filed July 10, 1933

Fig. 1.

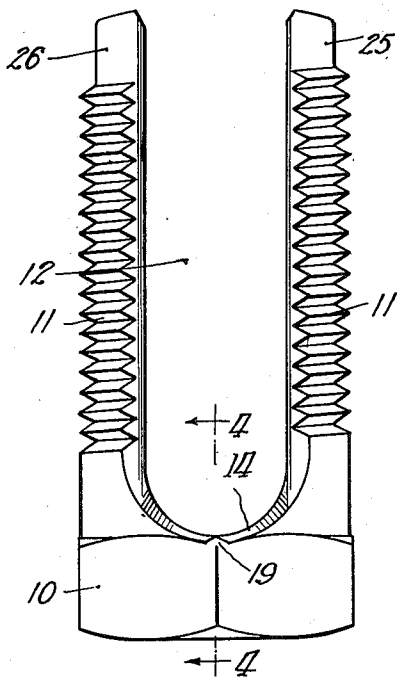


Fig. 3.

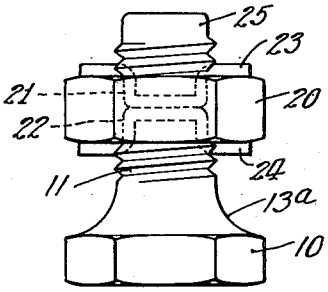


Fig. 4.

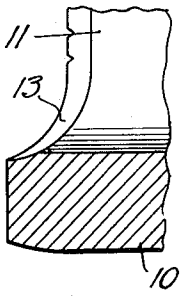


Fig. 5.

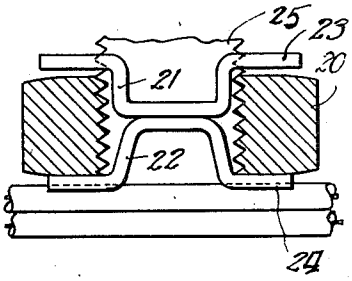
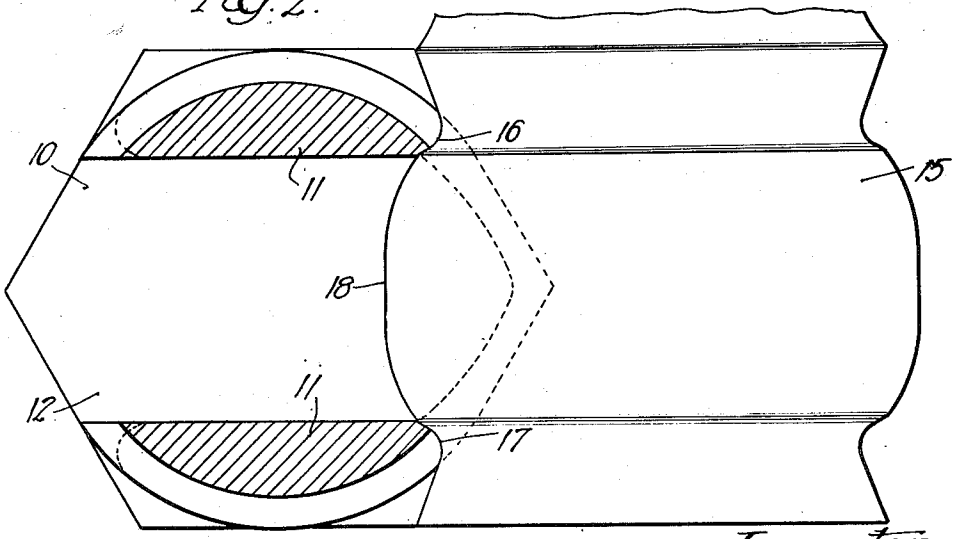


Fig. 2.



Inventors:
John B. Cook
William G. Fotsch
By Gabel Banning & Wells Attys.

Patented Apr. 14, 1936

2,037,066

UNITED STATES PATENT OFFICE

2,037,066

CONNECTER

John B. Cook and William G. Fotsch, Chicago, Ill., assignors to Reliable Electric Company, Chicago, Ill., a corporation of Illinois

Application July 10, 1933, Serial No. 679,598

3 Claims. (Cl. 173—263)

Our invention relates to electrical connecters and more particularly to connecters in which a yoke portion, which we may call a head, having a slotted or bifurcated shank is provided with a nut having a suitable clamping element or elements between which and the head a conductor or conductors may be clamped.

In our present device we have eliminated features of prior art devices which are seriously objectionable, and to that end our device is so made that it presents no rough surfaces at its edges. This is of importance for two reasons: primarily, it is of importance because sharp edges have a tendency to injure the conductor which is to be clamped; and, secondarily, the sharp edges have a tendency to injure the rubber gloves of the lineman or other operator who uses the connecter and thus expose him to high voltage hazards.

Our improved connecter, therefore, contemplates bevelled or rounded edges at the extremities of the screw-thread, and in its preferred form also bevelled edges at the unscrew-threaded portion of the slot. In order to bring this about, we have provided a novel construction of the connecter so that one operation of the milling cutter may smooth not only the edges of the screw-threads at the edges of the slot, but also bevels or smooths the flaring portion of the slot beyond the screw-thread.

Our invention further contemplates the provision of a nut in connection with such a connecter in which clamping elements are provided on opposite sides thereof so that the nut is reversible.

Our invention further contemplates means to prevent cross threading of the nut which is liable to occur because of the bifurcated nature of the shank, said means in the embodiment disclosed herein consisting of guides.

We will explain one form which our invention may take more in detail by referring to the accompanying drawing in which—

Fig. 1 is a side view of one of the connecter elements, the nut being omitted;

Fig. 2 is a top view thereof showing the milling cutter by virtue of which the edges are bevelled or smoothed;

Fig. 3 is a side view of Fig. 1, but of a slightly different form of the invention in which the base of the element is of a more flaring nature;

Fig. 4 is a sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a sectional view of the nut illustrating how the contact element lengthens under stress.

Like characters of reference refer to like parts throughout the figures.

Referring more particularly to Figs. 1, 2, and 4, we show a yoke 10 which in this instance also serves as a head, which has a shank consisting of the two elements 11, 11, forming thus a bifurcated shank having a slot 12 between them. The shank is screw-threaded, as shown, very nearly down to the head. It will be noted that by reason of the slot, the lower portions of the elements 11, 11 flare as shown at 13.

The slot 12 is made by means of a milling operation, and, as the material used for the manufacture of the device generally consists of copper or brass or the like, the edges at the slot are more or less seriously torn and in a roughened condition. To remove the projecting parts, it has heretofore been the practice to brush these off. This, however, does not smooth the edges nor does it leave the edges in a condition which prevents injury to the gloves. Such brushing likewise does not relieve the sharpness of the edge at the bottom of the slot for instance along the edge 14.

After considerable experimentation, we have developed a milling cutter 15 which performs the operation of smoothing the edges of the screw-thread and also the edge 14 in one operation. An examination of this milling cutter will reveal that it has rounded cutting edges at 16, 17 of a rather small diameter and has a more or less elliptical cutting edge 18 which, as the milling cutter reaches the bottom of the slot, is of such a character that it bevels the lower edge of the slot. It will be noted by an inspection of Fig. 1 that the bevel along the edge 14 which is made by the portion 18 of the milling cutter bevels the entire lower edge of the slot with the exception of the small triangular portion 19 which remains in that condition because of the rounded characteristics of the two faces of the head portion.

We have thus developed a very simple and efficient way of rounding or smoothing the edges of the screw-thread and also the edges of the slot so that the device may be utilized without injury to either the gloves or the wire itself.

In Fig. 3 we have shown a similar device with the exception that the lower portion of the shank is provided with a more emphasized flaring portion 13a. The milling cutter which we have developed smooths the edges of this connecter element similarly to the manner explained in connection with the device of Fig. 1.

The nut 20 which cooperates with the clamp-

ing element heretofore described is provided with what we may call a duplex saddle contact element consisting of the two similar more or less U-shaped elements **21**, **22** which at the center point of their meeting area may be suitably fastened together as by riveting or spot welding or the like. It will be noted that the exposed projecting portions of these saddle parts are flat as shown more clearly at **23**, **24** so that they will not bite into the nut surface or thread so readily. By arranging these saddle portions in the manner which we have disclosed, it will be seen that the nut is reversible so that the extremities of the saddle portions may act as clamping portions whichever way the nut happens to be placed in position on the screw-thread.

We have found that a novel result is obtained by having the contact member **21** and **22** so constructed that the one which contacts the conductors is capable of lengthening under stress between the points such as **24** where it engages the conductor and the central portion which is gripped in the slot. Upon tightening the nut down upon the conductors, the pressure between the threads on the nut and those on the shanks **11** rises and causes the shanks to yield toward each other gripping the central part of the contact element. Since any increase in force applied to the nut tends to collapse the slot **12** further, it has heretofore been very difficult to get enough compression of the conductors. With our construction of the members **21—22**, they stretch or straighten and allow the nut to press their contact surfaces down on the conductor without moving the central portion any further down slot **12**.

By reference to Figs. 3 and 5, it is believed that the action of the members **21** and **22** will be best understood. Please note that in Fig. 3 where no pressure is being applied on a wire, the members **21** and **22** are practically of the same shape. Now, when the pressure of the nut threads on the bolt threads causes the shanks to move toward each other, this movement is most pronounced toward the free ends of the shanks because they are solidly anchored at their bases. The main result, however, is that the shanks grip the central portions of the members **21** and **22** and further movement of this nut **20** downward results in distorting the shape of the member **22** to that shown in Fig. 5, while the portion **23** of the member **21** rises slightly above the nut.

Another result obtained by this structure is the ability of the contact to adapt itself to the inner nut wall shape without deforming the threads of the nut. It will be noted that the contact element has a substantially flat surface for engaging the conductor and also for engaging the nut. Our tests have shown that with this structure the contact will be deformed on the conductor side as the nut is tightened before it cuts into the threads of the nut and damages them.

As the shank is bifurcated, trouble has been experienced owing to cross threading, that is, owing to the fact that it has been difficult properly to align the nut so that it engages the proper screw-threaded sections.

In order properly to align the nut to prevent cross threading, we provide guides **25** and **26** which are extensions of the shank portions **11**, **11**. The outer diameter of the guide portions **25** and **26** is a trifle less than the inner diameter of the nut so that the nut is properly aligned before it reaches the screw-threaded portions.

From what has been thus described, the nature of our invention will be clear to those skilled in the art, and it will also be clear that modifications may be made within the scope of the appended claims without departing from its spirit.

We claim the following:

1. A device of the character described comprising a head, a slotted screw-threaded shank projecting from said head, and a nut for said shank having a reversibly functioning saddle slidable in said slot, said saddle consisting of a pair of strips having their end portions projecting over the opposite sides of the nut, and having their central portions united between the two end faces of the nut.

2. A device of the character described comprising a head, a slotted screw-threaded shank projecting from said head, and a nut for said shank having a reversibly functioning saddle slidable in said slot, said saddle comprising a pair of duplicate strips having their central portions united within the opening through the nut and having their end portions overlying the opposite sides of the nut.

3. A connecter comprising a head, a slotted screw threaded shank projecting from said head, the side edges of the shank and the base of the slot therein being rounded and bevelled down to the base of the slot from the tip of the shank, the bevel extending inwardly beyond the depth of the thread, a nut for said shank having a reversibly functioning saddle slidable in said slot, said saddle consisting of a pair of strips having end portions projecting over the opposite sides of the nut, central portions united within the nut, and intermediate portions running inwardly adjacent the threads of the nut from the end portions to the central portions.

JOHN B. COOK.
WILLIAM G. FOTSCH.