July 12, 1938. F. FRANKEL, JR 2,123,506

SOLDERLESS LUG

Filed Sept. 15, 1936

Fig. 1.

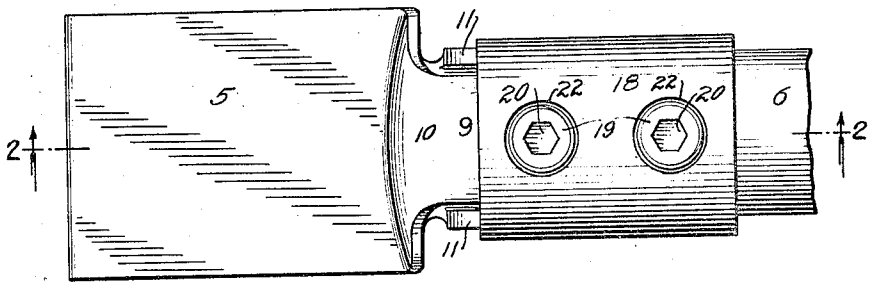


Fig. 2.

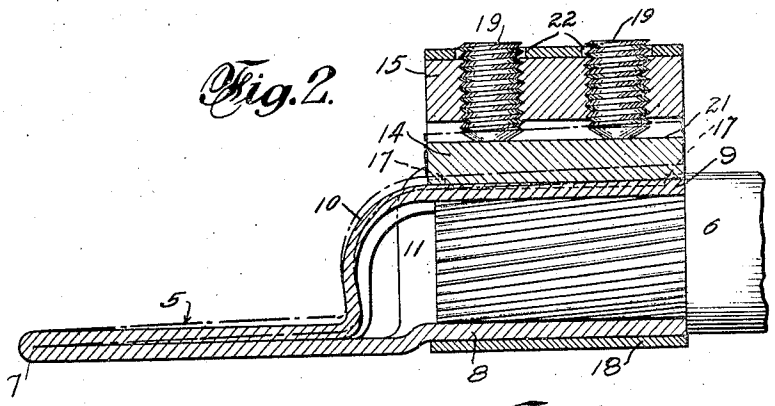


Fig. 3.

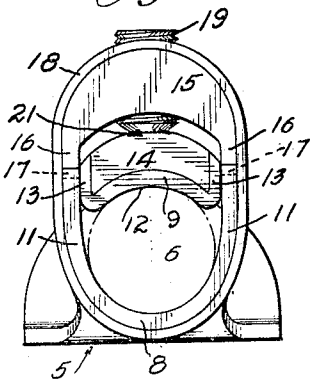
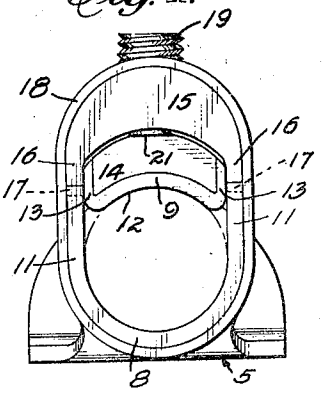


Fig. 4.



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SOLDERLESS LUG

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3 Claims. (Cl. 173—269)

My invention relates to a cable connecting device and more particularly to a solderless lug.

It is the principal and general object of the invention to provide an improved, efficient device of the character indicated which will effectively perform its function.

It is a more specific object of the invention to provide a device of the character indicated which is adaptable for use with cables of different sizes.

Another object is to provide a simple form of device in which there will be a substantially maximum area of contact between the cable and the conducting portions to be connected thereto.

Another object is to provide a device of the character indicated, formed of metal, and in which the objection of season cracking is reduced to a minimum.

Other objects and various features of invention will be hereinafter pointed out or will become apparent to those skilled in the art.

In the drawing which shows, for illustrative purposes only, a preferred form of the invention—

Fig. 1 is a top plan view of a solderless lug, illustrating features of the invention;

Fig. 2 is a sectional view taken substantially in the plane of the line 2—2 of Fig. 1;

Fig. 3 is an end view of the lug shown in Fig. 1 and indicating a small cable therein; and

Fig. 4 is a similar view of the same lug but indicating a larger cable therein.

In said drawing, 5 indicates generally a contact member in the form of a blade which is to be connected to a second contact member or cable 6. In the preferred form, the blade 5 is formed of flat copper, folded upon itself at 7, and provided with complementary channeled contact portions 8—9 which are separated from each other to embrace a cable. Such separation may be effected by forming up one rear blade portion, as indicated at 10, so as to provide an offset and thus space apart the contact portions or members 8—9. The contact member 8 is formed up so as to embrace a cable and is of generally U form as clearly appears in Figs. 3 and 4. The legs 11—11 of the U extend up a considerable distance and the contact member 9 preferably fits snugly between and is guided by the legs 11 as shown in said figures. The upper contact member 9 is preferably formed, as indicated at 12, to embrace a cable and the outer edges may be flanged up, as indicated at 13—13, which flanges may pass down between the legs 11—11, and thus the two contact members are guided relatively to each other so that there can be little or no twisting or misalignment of the same. The contact member 9 is provided with a stiff backing shoe 14, preferably formed of suitable metal not readily corrodible nor subject to season cracking. The shoe 14 may be quite snugly embraced between the flanges 13—13 and fits the curved portion of the contact member 9 so that the shoe will be securely held to and back up the contact member. In fact I prefer to taper or dovetail the shoe 14 so as to assure a tight interlock between the shoe and the contact 9 and flanges 13.

I provide means for urging the contact members 8—9 into tight clamping engagement with the cable 6 and in the form shown I prefer to employ what may be termed a yoke 15, formed to extend over the shoe 14 and the coacting member 9. The yoke 15 may have legs 16—16 straddling said shoe and extending downward into contact with the legs 11—11 of the contact member 8, and in fact I prefer to hold the yoke 15 and contact member 8 against longitudinal relative displacement by forming interfitting portions thereon as by rabbeting one and forming end tongues on the other as indicated at 17, whereby the yoke 15 and contact member 8 will be held against longitudinal displacement from each other. Lateral disengagement is prevented by the flanges 13—13. The yoke and contact member 8, and in fact all of the parts, are held against displacement by means preferably in the form of an endless strap or sheath 18. The sheath 18 fits snugly around the contact member 8 and the yoke 15. In order to clamp the cable rigidly between the contact members 8—9, I provide means preferably in the form of one or more screws 19, of a well known headless variety, provided with a central wrench socket 20. The screws 19 in the form illustrated are screwed into threaded holes through the yoke 15 and engage the flat upper surface 21 of the shoe 14, as will be clear. The sheath 18 is provided with apertures 22 to render the clamping screws 19 accessible.

My improved lug lends itself to use in connection with cables of different sizes, that is to say, the lug may be designed to take cables, for example from 1,000,000 circular mils to 750,000 circular mils with substantially equal conducting and other efficiency. I prefer to make the cross-sectional form of the lower arcuate part of the contact member 8 such that it will just fit the smallest cable for which the lug is designed (see Fig. 3), thereby at once securing about 180° contact with the small cable. The contact member 9 is preferably of a curvature to fit a cable intermediate the largest and smallest cables for which the particular lug is designed. Therefore, for the en-

tire range of cable sizes for which the lug is designed, the curvature of the contact member approximates the cable curvature and good contact is obtained. When a larger cable is inserted in the lug (see Fig. 4), the cable will not fit the arcuate portion of the contact member 8 exactly, but when the screws 19 are screwed home the contact member 9, backed up by the stiff shoe 14, will force the cable down and cause the side walls of the contact member 8 to be spread or opened up to an extent sufficient to make a good contact with the larger cable. It will be seen that in effect the U-shaped contact member 8 and sheath 18 form a sling for carrying a cable and the latter is held in tight clamped engagement and in good electrical contact with both the contact members.

It will be noted that by reason of the reforming of the contact member to fit the cable, the original lay of the strands of the cable will be distorted as little as possible and the best possible contact between the various strands obtained.

Preferably, the screws 19, if of the headless kind, are of such length that when the cable of largest size is rigidly clamped the screws will be substantially flush with the outer surface of the sheath 18 and when a smaller cable is employed, the tops of the screws will be below such sheath. Thus, a sightly lug is produced and one in which there are no projecting screws.

The proportioning of the parts is preferably such that when the largest cable is in place and tightly clamped in the lug, the folded portions of the blade 5 will just contact with each other. When a smaller cable is gripped there may be some buckling of the blade 5 but the blade will give at 10 and when the blade is clamped flat on a bus bar all buckling will be removed. Furthermore, it will be noted that, with the stiff shoe 14, a very full and good contact between the contact member 9 and the cable will be secured, due to the fact that the contact member 9 while being forced into engagement with the cable will not buckle and flare up at the ends or edges as would be the case if the screws engaged the contact member 9 directly rather than through the stiff shoe which serves to rigidly back up the contact member 9 and cause it to maintain contact substantially throughout the length of the cable inserted in the lug. My improved lug having the blade portion 5 and the contact members 8—9 all integral provides the best possible conductivity between the cable and the blade. The sheath or sleeve which surrounds all parts of the lug and serves to ultimately take the strain incident to clamping of the cable between the contact members is preferably made of metal, is not subject to corrosion nor is it subject to season cracking. The same thing may be said of the shoe 14 and the yoke block 15, as well as the screws 19, when they are also made of like metal.

The mechanical or holding effect of the lug on a cable may be greatly improved by using a spatter spray of tin, Silfos, or other hard metal on the contact members so as to provide a rough surface to better grip the cable.

It will be seen that I have provided a solderless lug providing very extensive and excellent contact with a cable. The parts are all quite simple and cheap to manufacture and the entire device is handled and applied as a unit. There are no parts which are likely to become disengaged and lost.

While the invention has been described in considerable detail and a preferred form illustrated, it is to be understood that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In a device of the character described, a blade formed of flat metal folded intermediate its length, the ends of said blade being spaced apart and oppositely channeled to form jaws providing a substantially circular pocket for a cable end, one jaw being slidable between the side walls of the other jaw, a stiff shoe resting on the outer surface of one of said blade ends, a yoke overstanding and straddling said shoe and engaging the edges of the other blade end, means for interlocking said engaging edges to prevent independent longitudinal movement of said yoke and blade end, a strap surrounding all of said parts, and a screw passing through said strap and threaded through said yoke and engaging said shoe to force the latter forwardly, for the purpose described.

2. In a device of the character described, a blade formed of flat metal folded intermediate its length, the ends of said blade being spaced apart and oppositely channeled to form a substantially circular pocket for a cable end, a stiff shoe resting on the outer surface of one of said blade ends, a yoke overstanding and straddling said shoe and engaging the edges of the other blade end, a strap surrounding all of said parts, a screw passing through said strap and threaded through said yoke and engaging said shoe to force the latter forwardly, for the purpose described, the side edges of the blade end supporting said shoe being bent upwardly between said shoe and the adjacent portions of the yoke and bridging the lines of engagement between said yoke and the other blade end.

3. In a device of the character described, a contact member formed of flat metal folded intermediate its length, the ends being spaced apart, one end being channeled longitudinally to form a jaw for receiving one side of a cable end, the other end being oppositely channeled longitudinally to form a second jaw for engaging the opposite side of said cable end, the sides of said second jaw extending between and guided by the side walls of the first mentioned jaw as the jaws are caused to approach each other, a stiff shoe at the outer side of and also extending between the side walls of the first jaw, a yoke overstanding said shoe and having a threaded passage, a clamping screw adjustable in said passage toward and from said shoe, and a strap surrounding all of said parts excepting the outer end of said screw.

FERDINAND FRANKEL, JR.