June 6, 1939. 2,161,249

A. B. DIBNER, NOW BY JUDICIAL CHANGE OF NAME B. DIBNER

TERMINAL SCREW LUG

Filed July 9, 1935

Fig. 1.

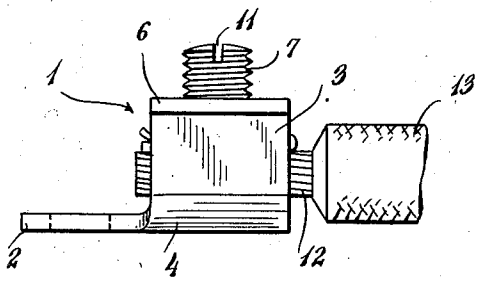


Fig. 3.

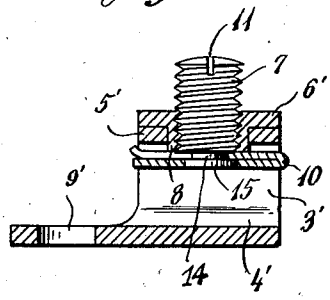


Fig. 2.

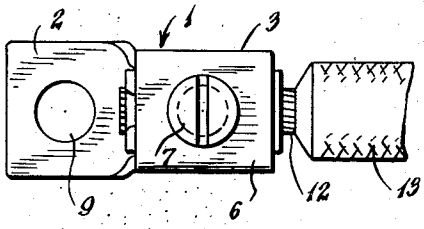


Fig. 4.

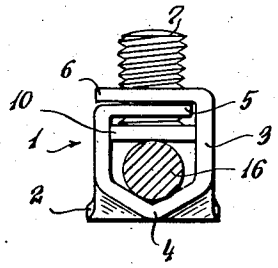


Fig. 6.

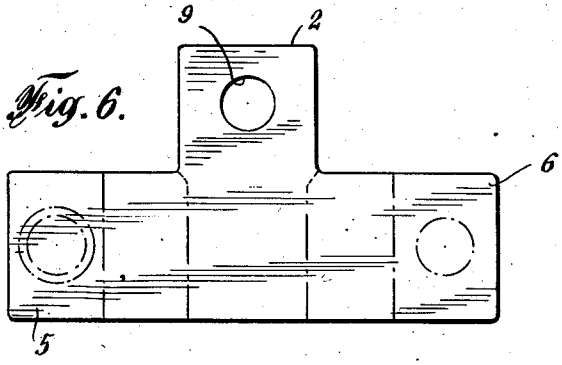


Fig. 5.

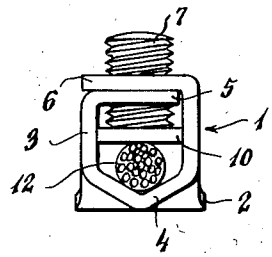


Fig. 7.

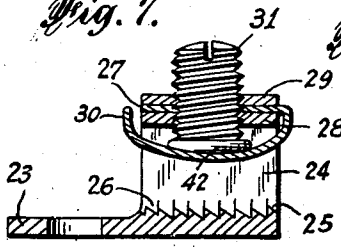


Fig. 8.

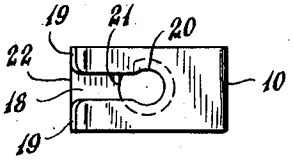
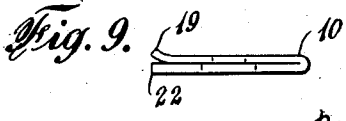


Fig. 9.



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TERMINAL SCREW LUG

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Application July 9, 1935, Serial No. 30,429

9 Claims. (Cl. 173—269)

This invention relates to terminal lugs for electric wires, cables and the like, and refers particularly to the type in which the end of a wire or cable is gripped in a screw operated clamp.

The main object of my invention is to provide a simple and efficient terminal lug of the solderless type which is time saving in use and very easy to apply.

Another object is to provide a terminal lug of the character indicated which is very easy and economical to manufacture and therefore readily placed upon the market.

It is a very important object to have a terminal lug of this character provided with a clamping screw or bolt which is capable of exerting considerable clamping pressure upon the end of an electric wire or cable, even of the multiple strand type, so that the end of the wire or cable is securely held and the lug thereby fixed upon the same.

A further object is to provide such a terminal lug with a protective pressure bar which is automatically retained in assemblage with the lug when once placed in position therein and serves to protect the end of the wire or cable from mutilation by the clamping screw of the lug.

It is also an object to produce a lug of this type which is adapted for use with a whole range of sizes of wires or cables, without requiring a different size of lug for each size of wire or particular thought or precaution but merely relegating the matter of cable size to be fitted to a simple question of adjustment.

It is even an object herein to have a lug which, by virtue of its structural form automatically centers the end of a wire in a position wherein the clamping pressure applied thereon is equally exerted in a balanced manner so as to avoid injury to the wire during the application of the lug thereto.

Another additional object is to so construct a terminal lug of this type that when the clamping screw or bolt is screwed down upon a wire end, its pressure tends to increase the friction between the threads in the lug proper and those of the screw in order to cause the screw to be very firmly gripped in the lug so as to remain securely in any attained position of adjustment.

It may be mentioned as one of the objects of this invention that the lug proper embodying the main features thereof may be made from stamped blanks of sheet metal bent into final form and properly threaded to receive the clamping bolt or screw.

Further objects and the several advantages of my invention will be described in detail in the specification as it proceeds.

In the accompanying drawing forming part hereof:

Fig. 1 is a side elevation of a terminal lug made according to the invention and embodying the main principles thereof, an end of a cable being shown in position in the lug.

Fig. 2 is a top plan view of the same terminal lug.

Fig. 3 is a section of a modification of the terminal lug.

Fig. 4 is another view of the device of Fig. 1 as seen from the right, the end of a large solid cable being shown in position and in section.

Fig. 5 is a similar view as in Fig. 4, except that the overlapping top portion is attached together as by welding or soldering and wherein the end of a multiple strand cable of relatively smaller size is shown than that in Fig. 4 and generally corresponding with the cable end of Figs. 1 and 2.

Fig. 6 is a plan view of a blank of sheet metal from which the main body of either of the lugs of the preceding views may be made.

Fig. 7 is a section similar to Fig. 3, illustrating modification of the terminal lug as well as of the pressure bar and set screw.

Fig. 8 is a top plan view of the pressure bar used in conjunction with the set screw or bolt of Fig. 3.

Fig. 9 is a side elevation of the same pressure bar.

Throughout the views the same reference numerals indicate the same or like parts. Heretofore the great majority of cable lugs were installed on the ends of wires and cables by soldering the same on said wires and cables, necessarily involving the use of cumbersome and numerous tools, as well as hazardous equipment, not to mention that often considerable time would also be consumed in making such soldered installation. Naturally the necessity has been felt for a more convenient type of terminal lug installation and as a result certain cable lugs have appeared upon the market which avoid the use of solder but they usually introduce new problems and are also not simple in construction and also sacrifice some desirable feature which was actually present in the old type of soldered lug installation such as direct and rigid connections and security thereof.

In order to avoid all the disadvantages and inconveniences involved in the operation of soldering terminal lug installations according to the old methods and also the use and even construction of the solderless types and particularly with

the foregoing objects in view the present invention is designed, and primarily consists of a one piece or unitary terminal lug body which may be attached directly to a panel board and to which the end of a cable or wire may be directly secured by means which will presently be described in detail.

Hence, in the practice of my invention a terminal lug body generally indicated at 1, of metal such as copper or a suitable alloy, has a flat lug portion 2 having an aperture 9 for a screw or bolt by which to secure the same to a connection on a switchboard or panel, etc., a tubular body portion 3 which is V shaped at the bottom as shown at 4 and has the two upper ends 5 and 6 overlapping each other. Through the overlapping members 5 and 6 a threaded hole extends into which a set screw or bolt 7 is fitted so that turning of the screw will cause the lower end thereof to approach or recede from the lower V shaped bottom 4 of the tubular portion 3 of said lug. If the end 12 of a cable 13 is thrust into the tubular portion of the lug and the screw 7 turned by fitting a screwdriver into its upper slot 11 the screw will descend upon the cable end and clamp the same between said screw and said V shaped bottom 4 in a vise like grip. As will presently be described, another means may be used to secure the overlapping ends 5 and 6 together.

However, in order to prevent the lower end of the screw from grating or grinding directly upon the wire or the cable, it is preferred to introduce a pressure bar, one form of which is shown at 10 as shown in Figs. 8 and 9, so that said pressure bar is interposed between the end of the screw and the bare end of the cable. The pressure bar in this form is bent double so that the lower portion 22 has the upper bifurcated portions 19—19 overlying the same with a slot 18 between the bifurcations enlarged at 20 to fit the neck 14 of the set screw. When the set screw 7 has been screwed part of the way into the lug and the pressure bar placed with the bifurcations 19—19 straddling the neck 14 of the screw 7, it is but necessary to force the pressure bar home and the bifurcations will ride past the neck of the screw and finally seat in the enlarged portion 20, after which the pressure bar will be retained by flange or flat head 15 upon said set screw, with the result that the pressure bar will follow the screw whether the latter is screwed upwardly or downwardly, while the pressure bar in turn will prevent loss or removal of the screw from the terminal lug.

An alternative device with integrally connecting overlapping ends, as shown in Fig. 3, consists in drifting metal downwardly as at 8 from the upper member 6' through member 5' and then forming the screw thread in said drifted metal 8, the latter metal extending even past the lower surface of overlapped member 5' so that the screw thread is longer than if it merely passed through the two thicknesses of the overlapping members A double gain is thus attained, namely, that the length of the screw thread is increased and both overlapped members are as rigidly united as though riveted together. The parts 3', 4', 5', 6' and 9' correspond to parts 3, 4, 5, 6 and 9, respectively of the other views.

It is nevertheless possible to omit drifting of the metal from one of the overlapped members through the other and instead leaving the overlapping members free with the screw passing simply through the threaded thicknesses of each, as shown in Figs. 4 and 5, for a reason which will presently appear.

In Fig. 4 a relatively large cable 16 is shown as gripped between the pressure bar 10 and the lower V shaped bottom 4 of the lug, while in Fig. 5 the multiple strand cable 12 of relatively smaller diameter is similarly gripped, the screw and pressure bar in this case being necessarily in lower positions. However, it is sometimes desirable to provide a clearance in the pressure bar for the head or flange 15 upon the lower end of set screw 7 and in order to afford such clearance, an aperture 21 as shown in Fig. 8 is punched in the bottom portion 22 of the pressure bar so that even this clearance serves as an additional retaining means for the pressure bar upon the set screw, because the head or flange upon the screw shown in Fig. 3, will tend to seat or spring into place in said aperture when assembling the pressure bar upon the screw. Naturally the thickness of the lower portion 22 of the pressure bar is at least equal to the thickness of flange 15 of the screw and the latter may even be less than the gauge of said lower portion 22. Manifestly, when a cable or wire is placed in position in the tubular portion 3 of the terminal lug and the pressure bar lowered upon the same by means of the set screw, the V shaped bottom will positively center the end of the cable exactly below said set screw so that all side strains and unequal pressures with resulting injury to the cable are avoided, but the pressure exerted will nevertheless theoretically tend to resiliently open the V shaped bottom 4 and spread the sides of the tubular portion 3 and simultaneously tend to pull apart overlapping members 5 and 6 of the device illustrated in Figs. 4 and 7, so as to exert a shearing strain upon the set screw. This will, of course, not shear the screw but will instead cause the threaded portions of members 5 and 6 to almost lock upon the screw by a very great resulting friction so that the screw is held fast without any danger of unscrewing or releasing the pressure bar from the cable. This very great resulting friction is caused by the substantially rigid body, which is but slightly deflected even when the mechanical means used to apply pressure to the conductor is tightened, in the modification where the overlapping portions of sheet metal are not interlocked.

The blank from which the body of the connector of Figs. 3 and 4 is made is shown in Fig. 6. The lug 2 is integrally formed with the bottom section 4, the side walls, and the overlapping ends 5 and 6. The bottom 4 is shaped to form a V and the sides and overlapping ends form the tubular body 3.

When forming the body portion for the device shown in Fig. 4, a hole shown in circular broken lines in member 6 of Fig. 6 is punched in the ends 5 and 6, which holes are subsequently tapped for the screw 7.

When the blank is used for the modification shown in Fig. 3, a hole shown in circular broken lines in member 6, of Fig. 6, is punched in end 6 only and a larger hole, shown in circular broken lines in member 7 is punched so that the metal of the smaller sized hole may be drifted downward, as shown in Fig. 3 to lock the overlapping edges together and provide a longer length of metal, as indicated at 8, which is subsequently threaded for the screw 7, as previously explained.

It is obviously quite possible to grip more than one cable or wire in the lug because two or three

or even more ends of cables, wires or similar conductors can be connected to the lug simultaneously, as this sometimes may conceivably avoid necessity for other connections.

A modification of the pressure bar primarily is shown in Fig. 7, wherein a horizontal strip portion 27 is disposed intermediate overlapping end portions 28 and 29 of the tubular portion 24 of the lug, while the remaining portion 30 of the pressure bar is bent downwardly in arcuate form beneath the set screw 31 and is intended to be constructed of resilient material so that the arcuate portion 30 will follow the screw upwardly when the latter is unscrewed in an upward direction and will, of course, be pushed down by the screw into any downwardly projected position when the screw is screwed down toward the V shaped bottom 26 of the same lug. The flat lug portion 23 corresponds to the previously described lug portion 2, while the V shaped bottom 26 is serrated or provided with teeth as indicated at 25 so as to more firmly grip an end of a cable when the latter is to be secured in the lug. Of course, the serrations may be omitted if desired as they do not form the main feature of the invention. It is evident that the pressure bar remains in position due to the fact that set screw 31 passes through portion 27 of the same, although in this form of the lug the set screw is mushroomed at its lower end 42 to prevent it from being removed from the lug by unscrewing the same. The mushroomed lower end 42 thus serves as a means for retaining the set screw in assembled condition with the lug in this form, nevertheless a set screw 7 of the form shown in Fig. 3 can also be used with a clip or split washer (not shown) forced into position about the neck 14 in known manner so as to permanently retain the set screw in the lug if so desired.

In connection with the set screw it is obvious that any kind of screw already known may be used and instead of having a rounded upper end merely provided with a slot 11 for receiving the screw driver, the screw may be surmounted by a square or hexagonal head, the size of such head being of no great importance and the shape thereof naturally forming no actual part of the invention.

In view of the foregoing description and the accompanying figures of the drawing which have now been disclosed, it is obvious that further variations may be resorted to and parts may be used without others within the spirit and scope of the invention.

Having now fully described my invention, I claim:

1. An electrical terminal for electric cables comprising a substantially rigid body made from a T-shaped blank of sheet metal, the side wings bent into a tubular shaped body having a bottom and side walls, and overlapping apertured ends forming the top portion, the leg of the T forming a flat terminal place, and a clamping screw threadedly engaging at least one of the apertures in the ends and passing through the other aperture for compressing a cable longitudinally into the connector body.

2. An electrical terminal for electric cables comprising a substantially rigid body made from a T-shaped blank of sheet metal, the side wings bent into a tubular shaped body having a bottom and side walls, and overlapping, attached, apertured ends forming the top portion, the leg of the T forming a flat terminal plate, and a clamping screw threadedly engaging at least one of the apertures in the attached ends and passing through the other aperture for compressing a cable longitudinally into the connector body.

3. An electrical terminal for electric cables comprising a substantially rigid body made from a T-shaped blank of sheet metal, the side wings bent into a tubular shaped body having a bottom and side walls, and overlapping, interlocked, apertured ends forming the top portion, the leg of the T forming a flat terminal plate, and a clamping screw threadedly engaging at least one of the apertures in the interlocked ends and passing through the other aperture for compressing a cable longitudinally into the connector body, said interlock consisting of metal drifted from one overlapping end into the aperture of the other.

4. A terminal lug for electric wires, cables and the like, forming an inseparable assembled unit and comprising in combination, a U shaped member of metal having a flat lug portion integrally connected to the bottom portion thereof in parallelism with the axis of said U shaped member and having the upper ends of the same bent over each other so as to mutually overlap, and an adjustable clamping screw extending through both of said overlapping upper ends of said U shaped member toward the bottom of the latter in order to cause said bottom to spread or open and said overlapping ends to tend to separate and exert a transverse shearing strain upon said screw when the latter is brought down under pressure upon the end of a cable within said U shaped member and thereby tend to automatically retain the screw by friction in any attained position upon said cable.

5. A terminal lug for electric wires, cables and the like, forming an inseparable assembled unit and comprising in combination, a U shaped member of metal having a flat lug portion integrally connected to the lower portion of the U-shaped member with said lower portion formed into a V shaped bottom merging with said flat lug portion and the sides of said U shaped member terminating at their upper ends in a pair of bent mutually overlapping portions, and an adjustable clamping screw extending through both of said overlapping portions of said U shaped member toward said V shaped bottom in order to cause said bottom to spread or open and said overlapping portions to tend to separate and exert a transverse shearing strain upon said screw when the latter is brought down under pressure upon the end of a cable within said U shaped member and thereby tend to automatically retain the screw by friction in any attained position upon said cable.

6. A terminal lug according to claim 4, wherein the lower end of the clamping screw is rotatably connected to a removable pressure bar disposed and guided between the sides of the U shaped member and is movable upwardly and downwardly with the screw when the latter is rotated, one portion of said pressure bar being bifurcated and said bifurcated portion straddling said clamping screw.

7. A terminal lug according to claim 5, wherein the lower end of the clamping screw is rotatably connected to a pressure bar disposed and guided between the sides of the U shaped member and is movable upwardly and downwardly with the screw when the latter is rotated so as to recede

from or approach the V shaped bottom of said U shaped member.

8. A terminal lug according to claim 4, wherein the clamping screw has a flange upon the lower end thereof and a removable pressure bar is mounted upon and retained by said flange and is disposed and guided between the sides of the U shaped member so as to be upwardly or downwardly movable between said sides upon rotation of said screw one portion of said pressure bar being bifurcated and said bifurcated portion straddling said clamping screw above said flange.

9. A terminal lug according to claim 5, wherein the clamping screw has a flange upon the lower end thereof and a removable pressure bar is mounted upon and retained by said flange and is disposed and guided between the sides of the U shaped member so as to be upwardly or downwardly movable between said sides upon rotation of said screw one portion of said pressure bar being bifurcated and said bifurcated portion straddling said clamping screw above said flange.

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