July 3, 1951 E. GREGORY 2,559,423

CONNECTOR LUG

Filed March 18, 1947

Fig. 1.

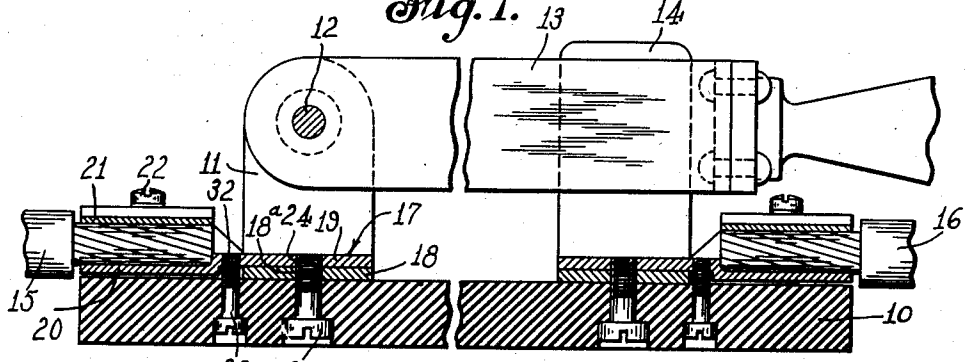


Fig. 2.

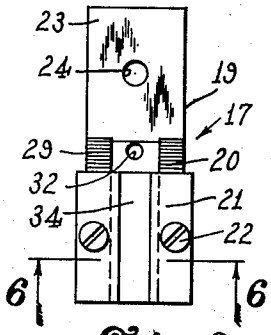


Fig. 3.

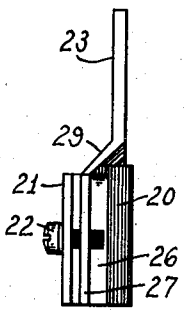


Fig. 4.

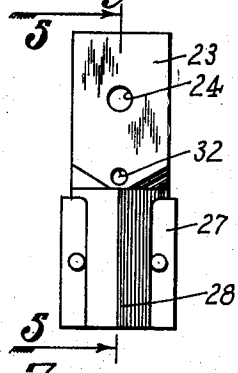


Fig. 5.

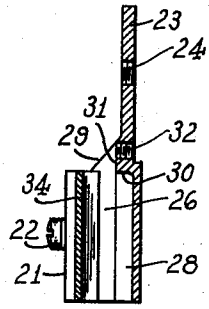


Fig. 6.

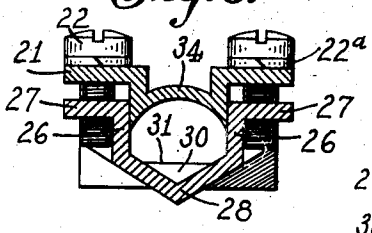


Fig. 7.

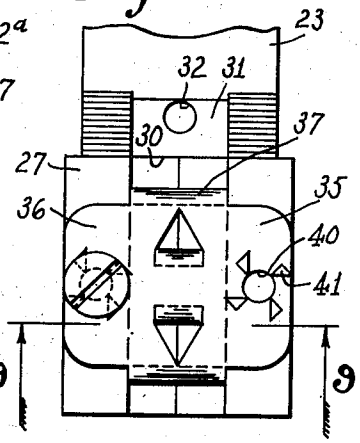


Fig. 8.

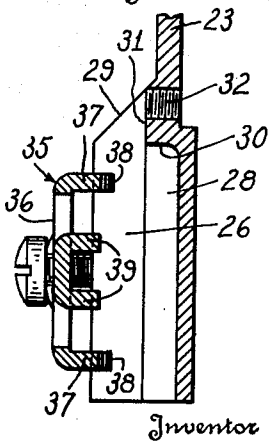


Fig. 9.

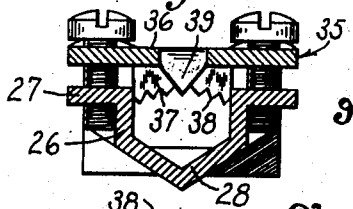
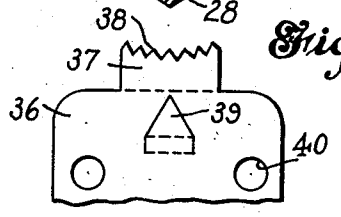


Fig. 9A



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CONNECTOR LUG

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1 Claim. (Cl. 173—259)

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This invention relates to connector lugs, and, while not limited thereto, it has special reference to a connector lug by means of which a cable or wire can have its end connected, without the use of solder, to a knife switch or electric fuse or like element.

The invention has for one of its objects the provision of a connector constructed, at least in large part, from conducting metal that is pressed or stamped to give it the required shape, the connector being so constructed that the cable or wire can be easily positioned therein and clamped securely in a manner to establish and maintain a good electrical connection between the cable or wire and its associated appliance.

Another object is to provide a device of this kind which is not only effective in use, but can be readily manufactured and supplied to the trade at a low price.

In the accompanying drawings:

Fig. 1 is a longitudinal sectional view of a knife switch embodying in its structure two connector lugs constructed in accordance with the invention;

Fig. 2 is a top plan view of one of the connector lugs removed from the base;

Fig. 3 is a side or edge view of the lug;

Fig. 4 is a bottom plan view;

Fig. 5 is a section on line 5—5 of Fig. 4;

Fig. 6 is a section on line 6—6 of Fig. 2;

Fig. 7 is a top plan view showing a modified form of connector lug;

Fig. 8 is a longitudinal section of the lug shown in Fig. 7;

Fig. 9 is a section on line 9—9 of Fig. 7; and

Fig. 9A is a fragmentary view of the blank used in making the clamping plate shown in Fig. 7.

In the knife switch shown in Fig. 1, the structure of the switch is to a large extent of standard construction. The switch includes a base plate 10 of molded insulating material, to which is applied a generally U-shaped post 11 having a pivot 12 for a knife blade 13, which blade is adapted to make contact with a generally U-shaped contact clip 14 fastened to the base. The post 11 is connected to an electric cable or wire 15, and the clip 14 connected to a cable or wire 16. The cables are connected respectively to the members 11 and 14 by connector lugs embodying the present invention, and, as the connections are identical, a description of one will suffice.

In Fig. 1, the cable 15 is connected to post 11 through a connector lug, indicated generally at 17, which in this instance has two members clamped upon the stripped end of the cable, one of said members having an extension by means of which it is fastened to the base portion 18 of the post 11. This base portion 18 is a metal member connecting the two legs of the post 11 and having its lower face in contact with the upper face of the base 10, as shown in Fig. 1.

The structure of the connector 17 is shown in detail in Figs. 2 to 6, inclusive. It comprises a

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body 19 of metal such as copper, pressed or stamped into the shape shown, said body presenting a channeled cable-receiving portion 20 cooperating with an upper cable-clamping plate 21 adapted to be held in clamping position by clamping screws 22. At one end the body 19 is provided with a rectangular flat extension 23 having at the middle portion thereof a threaded hole 24 adapted to receive the threaded end of a screw 25 screwed into position from the lower face of the base 10. The screw 25 passes with clearance through a hole 18a in the member 18, previously described, and its extremity enters the threaded hole 24, the arrangement being such that, as the screw is screwed in hole 24, the post 11 will be firmly held to the base by means of the overlying portion 23 of the connector with which the screw is engaged.

The channeled cable-receiving portion 20 has the cross-sectional shape shown in Fig. 6, the channel being provided with side walls 26 having integral lateral flanges 27 at their upper ends, the walls 26 being integrally joined at their lower ends with a V-shaped channel bottom 28. As will be seen from Fig. 3, the extension 23 is in a plane offset from the plane of the flanges 27 and from the plane in which the lowermost or outermost portion of the channel bottom is located, and the extension 23 is connected with the flanges 27 by sloping portions 29. As shown in Fig. 5, the V-shaped bottom portion of the connector body leads to a transverse shoulder 30 that provides a stop engaging the extremity of the cable in the manner shown in Fig. 1, so as to provide a seat in which the end of the cable can be placed, said seat being of V-shaped cross section. Immediately upwardly (Fig. 5) from the shoulder 30 a flattened portion 31 is provided between the sloping portions 29, and in this flattened portion is a threaded perforation 32, somewhat smaller than the perforation 24 and adapted to be engaged by the threaded end of a small screw 33 inserted from the lower face of the base 10, as shown in Fig. 1. This screw 33 prevents any sidewise movement or twisting of the connector when it is assembled in the manner shown in Fig. 1. The clamping plate 21 in this form is coextensive in length with the flanges 27, and its screws 22 pass through holes in the plate and engage threaded perforations in the flanges. The cross-sectional shape of plate 21 is such that it engages the end portion of the cable for the purpose of clamping the cable tightly in its seat, and in the form shown this plate has an arched cable-engaging portion 34, the arch being depressed with respect to the general plane of the plate (Fig. 6), and having flat side portions that engage the side walls of the channel. It will be evident that by screwing down the screws 22 (Fig. 6), the longitudinal arched wall portion of the clamping plate can be forced downwardly to bring its arcu-

ate lower surface into firm engagement with the cable end, the action being such as to somewhat flatten the cable end and thereby conform it closely to the upright side walls and the slanting bottom of the cable-positioning seat above described.

It is important to note that in clamping the cable the clamping plate is moved downwardly and positioned by the upper headed or enlarged ends of the screws **22**, the head of the screw always being active in holding the plate. It is preferable to have lock washers **22a** interposed between the heads of the screws and the upper surface of the clamping plate, as by this arrangement the loosening of the cable end under the effects of vibration or the like is prevented. It is not necessary to make frequent inspections with a view to tightening up loose screws. A tight and effective electrical connection can be obtained without regard to the diameter of the cable or wire within certain limits.

The connector lug, as above described, can have the cable end securely clamped therein in the manner described, and can then be associated with a post such as **11** by having the extension **23** placed over the base of the post and then engaged by a screw inserted from the lower face of the base **10**, as above described. The small screw **33** can then be readily placed in position. It will be noted from Fig. 1 that the bottom portion of the channel receiving the cable end is, in the assembled position, spaced upwardly to a slight extent from the upper face of the base **10**.

In the form shown in Figs. 7, 8, 9 and 9A of the drawing, the body of the connector is constructed as previously described, but the clamping plate used in association therewith is of modified form. Here the clamping plate **35** has a rectangular body **36** lying substantially in a single plane and resting upon the flanges of the connector body. The plate is provided with integral down-turned end extensions **37** that engage with their lower edges the upper or outer part of the cable end. In the form shown these extensions **37** have inner or lower edges that are generally arcuate in shape, as shown in Fig. 9, and these arcuate edges are serrated to provide pointed members or teeth **38** that are adapted to bite into the cable end to a certain extent so as to insure good electrical contact. The end extensions **37** thus provide arch-shaped transverse wall portions upon the clamping plate that engage the cable end, and they also engage and are guided by the side walls of the channel. In addition to the end extensions **37**, the plate **35** also has down-turned members associated with its body that are adapted to engage the cable end for clamping purposes. In the form shown the latter members are in the form of prongs **39** that are created by cutting the plate and displacing the metal from the plane of the plate so as to provide down-turned pointed prongs respectively at opposite sides of the center of the plate. The perforations in the plate **35** through which the clamping screws pass are shown at **40**, and the upper surface of the plate is preferably roughened by providing small projections **41** on the plate adjacent the perforations for the purpose of engaging the heads of the clamping screws to hold them firmly in place.

The improved connector has the advantage that an effective electrical connection can be obtained between the end of the cable or wire and the terminal of the switch or other appliance without the use of solder, there being a seat in which the cable end is received and positioned, and then effectively clamped in a manner to create and maintain a good electrical connection. In the particular forms shown also the connector has as a part thereof an integral extension in the form of a clamping member or nut that can serve in attaching the connector to a switch post or the like, and can also serve as a means for clamping the switch post or like member to a base member. Furthermore, the connector can be produced at relatively low cost.

While two forms of the article are shown herein, it is to be understood that various other forms and modifications may be provided without departing from the principles of the invention or the scope of the claim.

What I claim is:

A connector lug of generally plate-like form adapted for use with knife-blade switches having at one end a longitudinally channeled cable-receiving body and at the other end a planar extension integral with said body, said planar extension being provided with a hole for a screw whereby it can be secured flatwise to a suitable bed, said channeled body having a cable-engaging bottom of V-shaped cross section extending below the plane of said extension and having extending upwardly from said bottom, side walls with flanges at their upper portions, which flanges are extended in a lateral and outward direction, said flanges being provided intermediate of their ends with threaded holes, a clamping plate extended over the cable-receiving channel and over said flanges and having holes adapted to register with those in said flanges, and headed screws having shanks engaging said threaded holes and extending through the holes in said clamping plate and having their heads adapted to force the plate toward the channel in said body to seat the cable in said V-shaped bottom portion, said clamping plate having a downwardly offset cable-clamping portion extending between the side walls of the channel and having its side margins engaging and guided by said side walls in moving to clamping position, the clamping plate being of sheet metal and said offset portion being constituted by downwardly bent plate portions directed transversely of the channel and having arcuate serrated lower edges which engage the cable.

ERNEST GREGORY.

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