Sept. 20, 1955 T. R. SWENSON 2,718,627

SOLDER TERMINAL AND CONNECTION LUG

Filed Aug. 23, 1950

Fig. 7.

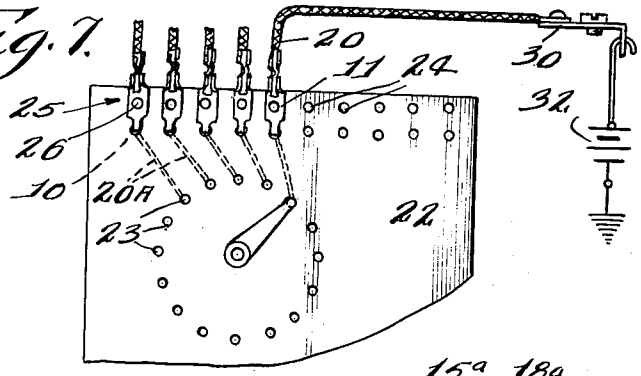


Fig. 8.

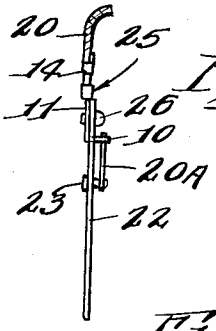


Fig. 6.

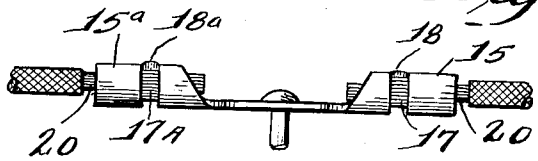


Fig. 1.

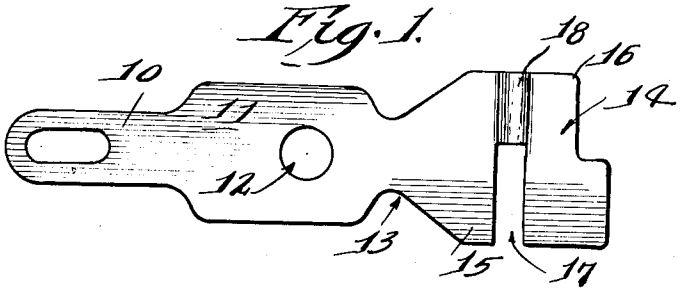


Fig. 4.

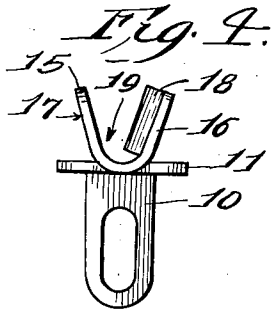


Fig. 2.

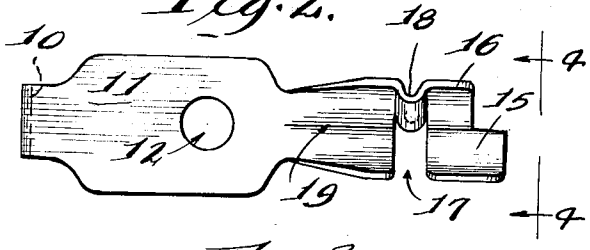


Fig. 5.

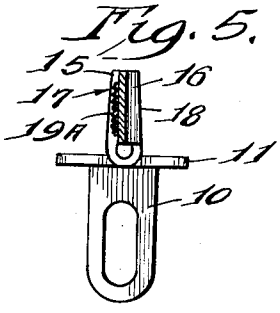
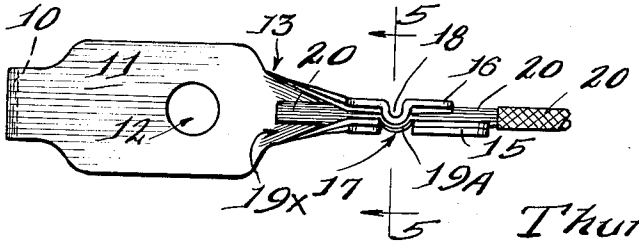


Fig. 3.



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SOLDER TERMINAL AND CONNECTION LUG

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8 Claims. (Cl. 339—276)

This invention has as its principal object the provision of a combination solder terminal and connection lug characterized chiefly in that it is a simple, one-piece, single-operation die stamping formed by an inexpensive die with a terminal lug having an embossed part and a complementary cut-away part cooperable to seize a conductor to lock the same in good electrical and mechanical association with said lug.

Additional objects and advantages of the improved structure pertain to manufacturing and assembly economies resulting from the conductor-seizing features, and to details of the construction and operation of the device hereinafter set forth in view of the annexed drawing, in which:

Fig. 1 is an enlarged plan of the punching before upsetting;

Fig. 2 shows the punching of Fig. 1 upset;

Fig. 3 is a view similar to Fig. 2 but crimped to seize a conductor;

Fig. 4 is an endwise elevation looking in the direction of lines 4—4 of Fig. 2;

Fig. 5 is a section taken at lines 5—5 of Fig. 3;

Fig. 6 is a side elevation of a modified terminal-lug of the double-ended variety;

Fig. 7 is an elevational fragment of a switch panel showing the terminal lugs in use;

Fig. 8 is a side elevation of the panel of Fig. 7.

The die punching for the terminal lug is shown in Fig. 1, in its condition before the final forming or upsetting operation is performed, and it will be observed that this punching includes an elongated piece of thin metal having a narrow terminal piece or tail **10** projecting axially (of the length of the punching) from a wider mounting face or plate portion **11** having a rivet hole **12** punched therethrough. Joined to said plate portion **12** by a narrow piece of the stock, as at **13**, is the lug portion generally indicated at **14**.

The lug portion is also elongated and has on one side-wing **15** a locking slot or cut-out **17** dimensioned to be somewhat larger than a complementary projection or boss **18** stamped into the companion wing portion **16**.

When the stampings come from the die, the two side wings are upset to form a channel, as indicated at **19** in Fig. 2.

In use, the terminal lugs are prepared by inserting the stripped ends **20** of a conductor in the channel of the lug, as in Fig. 3, whereupon an operator actuates a small press to squeeze the two side wings **15** and **16** together upon the conductor **20** therebetween, and in this operation a portion **19A** of the conductor is forced by the boss **18** into the slot or cut-out **17** whereby the conductor is caught and locked in the channel.

The prepared lugs are then usually mounted upon some type of electrical apparatus, such as a rotary switch panel **22**, Fig. 7, having contact buttons **23** thereon and a plurality of lug-mounting holes **24** preferably situated close to a marginal edge of the panel.

The desired number of lugs are secured to said panel

as at **25**, Fig. 7 or 8, by means of rivets **26** engaged in lug holes **12** and panel holes **24**; and the conductors **20A** are soldered to desired contacts **23**.

In addition, cable conductors **20** are soldered to other terminals, as at **30**, for connection of the various control buttons **23** in some desired circuit, e. g. to power supply **32**.

In prior devices of this class, it has long been the accepted practice to mount some kind of a soldering terminal on the apparatus panel, as by crimping or riveting operations, and thereafter to solder the necessary conductors thereto in wiring up the apparatus. Frequently, too, the connection conductors, such as **20A**, were previously soldered to the old style terminals before the latter were riveted or crimped onto the panels **22**.

The improved terminal lug contemplates mass production of prepared terminal lugs by locking-in the conductor parts **20** before attachment of the lugs to the apparatus, thereby eliminating at least one soldering operation for the wiring crews.

The locking-in connection of the lug part, as when wings **15** and **16** are pressed together to seize the conductor, may be performed at any time by use of a pair of pliers.

In cases where all soldering on the terminal-lug is to be omitted, the modification of Fig. 6 is used, wherein the lug structure **15—16—17—18** is duplicated on the plate **11**, as at **15A—16A—17A—18A**.

Electrical connections can be quickly and effectively made without soldering, using either the single-ended form of Fig. 3, or the double-ended form of Fig. 6. No soldering equipment, special tools or skilled talent is required in making such connections, and the device is useful to the same purposes whether the lugs are to be prepared in advance with certain conductors attached (e. g. **20**), or whether such connections are to be made after the terminal lugs are attached to the apparatus, e. g. panel **22**.

There is little wasted stock in the forming operation, and the manufacturing costs are low and only simple dies are required.

It should be observed in Fig. 3 that the converged wings **15—16**, by reason of joinder to the flat or plate portion **11** by the tapered and narrowed part **13**, form a solder-receiving cavity as at **19X**, which is somewhat scoop-shaped and open-ended to lead and flow solder freely into the channel and seized conductor. For such purposes the narrowed neck **13** tapers at some suitable angle, say about 45°, into conjunction with the wings **15**, **16**, so that the narrowed part will be wider than the formed-up channel to form the scoop-like solder entrance at **19X**.

I claim:

1. A combination lug and terminal comprising a mounting plate portion, a terminal projecting from said plate portion on one side thereof, and a lug consisting of two opposite wings projecting from another side of said plate, said wings being upset to define an elongated conductor-receiving channel, and one said wing having a boss opposite a slot in the other wing, said wings being pressed together along lines extending in the direction of the length of said plate to seize a conductor in said channel, said slot being of a width to admit a substantial portion of said conductor crimped into said slot by said boss, whereby to lock said conductor in said lug.

2. A soldering terminal and conductor lug comprising a centrol body portion from one side of which projects a tail to which a soldered connection may be made, and from the opposite side of which projects a lug portion consisting of opposite wings upset to form a channel in one side-forming wing of which is a slot and in the other side wing of which is a protrusion opposite said slot and dimensioned to fit into the slot, said wings being forced together

in assembled relation with a conductor in said channel and said protrusion forcing conductor portions into said slot to lock the conductor in the channel.

3. In a connector lug, an elongated lug body having conductor-seizing means in the form of a pair of oppositely situated laterally-projecting wings on the lug bent toward each other to define a longitudinally-extensive conductor-receiving channel, one wing having an extruded projection directed into the channel, and the other wing having an opening opposite said projection and larger than the latter, said wings being forcibly converged by lateral displacement upon a conductor in said channel to seize the same, said projection forcing portions of the conductor into said opening.

4. A terminal lug in the form of an elongated piece of metal having a central mounting portion pierced to receive an attaching pin, and a wide wing section joined thereto by a narrowed connecting section, which tapers outwardly to said wide wing section, said wing section having a lateral slot cut into an edge thereof, with a laterally-extensive boss struck up from the opposite edge in lateral alignment with said slot, said wing section having said edge portions turned up to form a longitudinally-extensive conductor-receiving channel having said slot in one side thereof and said boss in the opposite side thereof, said opposite sides being pressed toward each other upon a conductor therebetween to seize the conductor said boss deforming the conductor to force a portion of the same into said slot.

5. A terminal lug according to claim 4 and in which a second wing section identical to said first-mentioned wing section is provided on the opposite side of said central mounting portion to seize a second conductor.

6. A terminal lug according to claim 4 in which there is additionally provided a pierced soldering tail formed integrally with said central mounting portion.

7. A terminal lug comprising an elongated piece of metal having at one end and respectively disposed on opposide sides of the long axis thereof, a lateral slot opening into the adjoining edge and a lateral rib aligned with the slot, said opposite sides being turned up toward each other as opposite wings to form a lug with a wire channel extending in the direction of said axis, said wings being closable upon a wire in said channel to seize the wire, said rib forcing portions of the wire into said slot to lock the wire, portions of said metal piece adjoining said wings affording a soldering terminal.

8. A terminal lug in the form of a narrow strip of metal having near one end thereof a transverse notch extending from one edge portion of the strip crosswise and substantially to the central part thereof, said strip also having a transverse embossment running from the opposite edge portion toward said slot and defining a raised rounded rib of approximately the same width and length as said slot and in transverse alignment with the latter, said edges of the strip being bent up to define a wire-receiving channel with opposite side walls respectively containing said slot and rib in juxtaposition to seize a wire in said channel when said sides are forced together, said rib deforming said wire to force and lock portions of same in said slot.

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