

May 12, 1942.

W. L. DUNN

2,283,136

TERMINAL STRIP

Filed Sept. 2, 1941

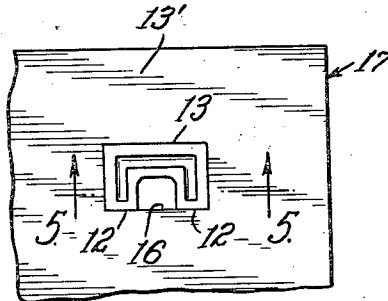
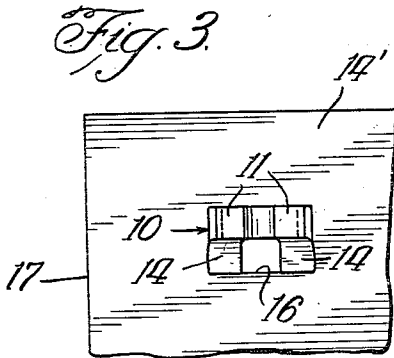
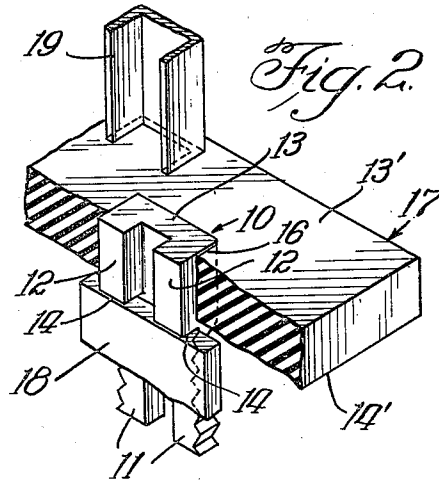
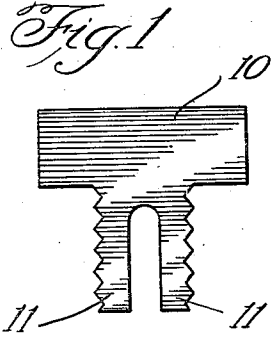
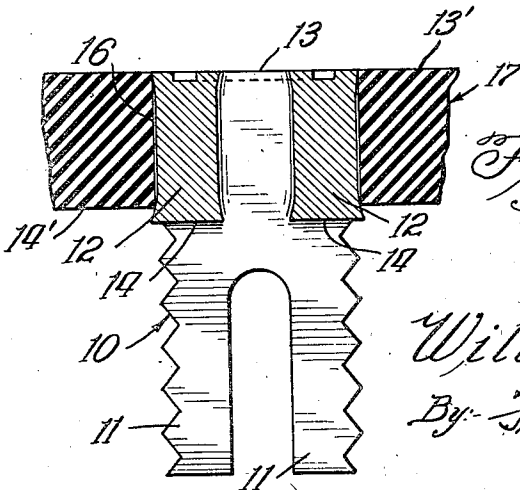


Fig. 4



Inventor:

William L. Dunn

By: Thomas L. Mueller

Att'y.

UNITED STATES PATENT OFFICE

2,283,136

TERMINAL STRIP

William L. Dunn, Chicago, Ill., assignor to Belmont Radio Corporation, Chicago, Ill., a corporation of Illinois

Application September 2, 1941, Serial No. 409,217

3 Claims. (Cl. 173-324)

My invention relates, in general, to terminal strips and more particularly to an assembly of a soldering or terminal lug rigidly secured to an insulating member.

Soldering or terminal lugs and the corresponding insulating member or strip therewith have been provided in many different shapes and assemblies to form what is generally designated in the electrical art as terminal strips. In some of the assemblies the elements are of such construction as to prevent relative rotation between a lug and its mounting or insulating member, but tipping may occur with consequent loosening of the lug in such member. In other devices there may be relative rotation between the elements of the assembly, and yet no tipping of the lug in the insulating member. However, the art has had difficulty in providing a lug and insulating member of such construction and so secured together that the lug will remain rigidly secured in the insulating member against relative rotation and tipping after heat has been applied to the lug to solder a wire or bus bar thereto, and such heat is transmitted to the insulating member at the mounting aperture. If some success is obtained in overcoming this difficulty it has only been with a structure so expensive as not to be commercially practical for most installations.

It is an object of my invention to provide an improved, simple, rugged structure including an insulating member and a soldering or terminal lug thereon.

A further object of my invention is to provide a structure of this nature which will remain in fixed assembled condition even with the application of heat to the lug and a transmission therefrom to the insulating member in an area adjacent the mounting portion of the lug in such member.

A still further object of my invention is to provide a stamped-out member for assembly into a terminal strip.

Other objects and advantages of my invention will be apparent from the following description taken with the drawing in which:

Fig. 1 is an illustration of the blank from which the soldering or terminal lug is formed;

Fig. 2 is a perspective view of the formed lug mounted in an insulating member with a portion of the latter broken away, and tools or dies in a position to simultaneously swedge opposite edges of the mounting portion of the lug for a fixed mounting in the insulating member;

Fig. 3 is a plan view looking upwardly in Fig. 55

2 after the lug has been swedged for the final mounting;

Fig. 4 is a corresponding top plan view after swedging; and

Fig. 5 is an enlarged cross-sectional view along the line 5-5 of Fig. 4 showing the final assembled condition of the insulating member and lug.

In practicing my invention I provide a metal lug formed in a stamping operation to a configuration with a U-shaped mounting portion at one end and a soldering or fastening portion at the other end. The mounting portion has a U-shaped free edge at one end and a pair of shoulders at the other end extending outwardly from the single plane of the fastening portion and from the body or connecting wall in the U-shaped mounting portion which is likewise in the same single plane. The lug is assembled in a substantially square or rectangular aperture in an insulating member with the mounting portion substantially covered on all sides by the sides of the aperture but having the shoulders and the U-shaped free end edge originally projecting very slightly beyond the corresponding faces of the insulating member. Tools or dies, with one of the tools or dies being U-shaped, are simultaneously pressed from opposite directions against the corresponding shoulders and the end edge of the mounting portion to swedge said shoulders and edge sufficiently to secure the lug to the insulating member at both faces. The configuration of the mounting portion of the lug and the insulating-member-aperture, with the swedging fastening, prevent both relative rotation between the insulating member and terminal member, and relative tipping between the two.

Referring now to the drawing, the blank of the terminal lug is shown in Fig. 1 and includes a mounting portion 10 with a soldering or fastening portion including a pair of legs 11 extending therefrom. The blank is formed to the shape shown in Fig. 2 with the mounting portion in U-shape, including a pair of projections or legs 12 with a U-shaped edge or face 13 at one end and shoulders 14 at the other end. The body or connecting portion of the mounting portion and the fastening portion of the lug are both in the same plane. The lug is inserted into a substantially square or rectangular aperture 16 in an insulating strip or member 17, with the legs 12 of the mounting portion 10 being of such length relative to the thickness of the insulating member 17 that they extend slightly beyond the faces 13' and 14' of the insulating member 17. It is thus seen that the projections 12 each have a

shoulder at each end, the ends 14 constituting free shoulders in that they are entirely exposed, and the other shoulders with the connecting portion forming a U-shaped free edge 13.

Although the assembly is illustrated in the present drawing by merely a single lug in an insulating member, it is understood that there may be one or a plurality of lugs similarly assembled in a single insulating member or strip. With one or with more lugs assembled as described, the assembly is secured in a jig or fixture. A single die or tool 18 rising upwardly against the shoulders 14 on the mounting portion, and a die or tool 19 of U-shape for each lug descending downwardly onto the corresponding lug, simultaneously engage the shoulders 14 and the U-shaped end edge 13 respectively to swedge the edges outwardly in frictional fastening engagement with the insulating member 17 at the edge of the aperture 16, as shown in Fig. 5. The U-shaped configuration of the tool or die 19 impresses a corresponding mark in the face 13 of the mounting portion and spreads the top thereof accordingly.

Although a wire, bus bar, or the like may be secured to the legs 11 of the lug in a cold fastening, normally it is soldered to the legs 11 with heat which is applied in sufficient quantity so as to be transmitted throughout the entire lug and to the insulating member adjacent the aperture 16. Because of the characteristics of many standard varieties of insulating material for the member or strip 17, such heat melts or softens the material adjacent the mounting portion 10 of the lugs. With the lugs of the prior art heretofore used commercially this has caused loosening between the lug and insulating member sufficient to permit relative tipping between such lug and member. This may eventually permit withdrawal of the lug or loosening such as to constitute a hazard when the wires and terminal strip are subjected to very rough and severe use. This difficulty alone has been overcome in some cases by a lug member manufactured on a screw machine with an annular mounting portion. This results in a very expensive unit, and although the tipping may be eliminated the screw machine part is round and relative rotation occurs between the lug and the terminal strip unless expensive means are employed to prevent it.

As is evident from the above description, however, the structure of the present invention affords an inexpensive stamped construction assembled quickly and inexpensively. Although some melting or restriction of the insulating material adjacent the aperture 16 may occur the double fastening with the swedging at the top and bottom of the mounting portion of the lug, and the substantially rectangular configuration of the mounting portion in a correspondingly shaped aperture minimize or completely eliminate the tipping, and prevent relative rotation between the insulating member and lug. The lug will remain rigidly secured in the insulating member under the most severe conditions of use for the entire structure thus insuring successful operation, not only of the elements at the terminal strip alone, but also of the entire apparatus in which the terminal strip is mounted. Where a

terminal strip is employed the apparatus is normally operated through the electrical connections by bus bars, wires, and the like in circuits extending through the lugs.

Although the invention has been illustrated and described only in its preferred embodiment, it is understood that the invention is not limited thereby, but is limited only by the scope of the appended claims.

I claim:

1. In combination with an insulating member having a pair of parallel faces and an aperture therein extending between said faces, a lug having a portion extending in a single plane entirely longitudinally of such lug with a soldering part at one end and a free edge at the other end, said lug having a pair of projections at such other end extending longitudinally on said portion substantially at right angles to said portion and each projection having a free shoulder at each end thereof with one pair of said shoulders lying in a plane with said free edge to form a continuous U-shaped edge for said lug at that end, with said projections positioned substantially entirely within said insulating member aperture, and with said U-shaped edge and the other pair of free shoulders spread outwardly in frictional fastening engagement with corresponding edges of the aperture at the two faces of the insulating member to rigidly secure said lug thereto.

2. In combination with an insulating member with a pair of faces and having an aperture therein, a lug having a mounting portion substantially entirely within said aperture and a soldering portion extending therefrom and positioned outside the insulating member, with said mounting portion provided in U-shape and having a pair of legs extending therefrom with each leg having a shoulder at one end thereof at a corresponding face of said insulating member and said mounting portion having a U-shaped end edge at the other end of said legs at the other face of the insulating member, with said U-shaped edge and said shoulders being spread outwardly in frictional fastening engagement with the corresponding edges of the aperture at the two faces of said insulating member to rigidly secure said lug to said insulating member.

3. In combination with an insulating member having a pair of parallel faces and an aperture therein extending between said faces, a lug having a fastening portion at one end thereof in a single plane and a mounting portion in a U-shaped configuration and a mounting portion at the other end with a U-shaped configuration including a wall in the plane of the fastening portion and a pair of legs extending at right angles to said wall, the ends of said legs and the wall end forming the U-shaped edge at one end of the mounting portion and the other ends of said legs comprising shoulders, with said mounting portion positioned substantially entirely within said aperture with said U-shaped edge and said shoulders all being spread at corresponding faces of said insulating member in frictional fastening engagement with such insulating member at the aperture edges to rigidly secure said lug thereto.

WILLIAM L. DUNN.