

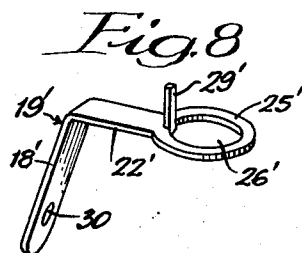
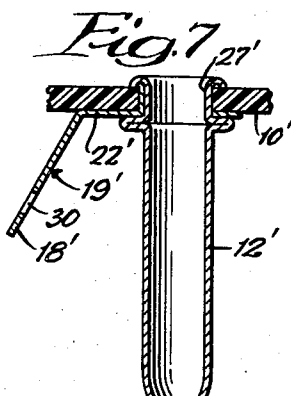
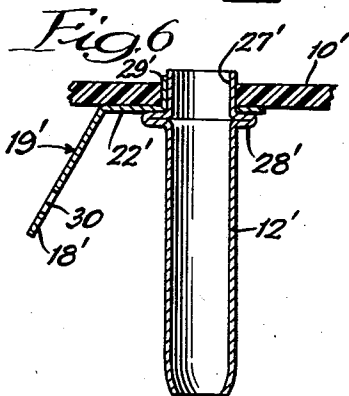
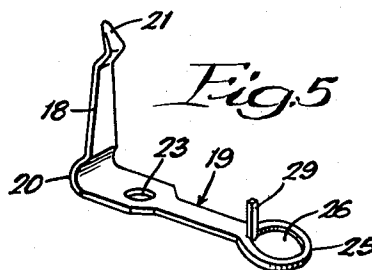
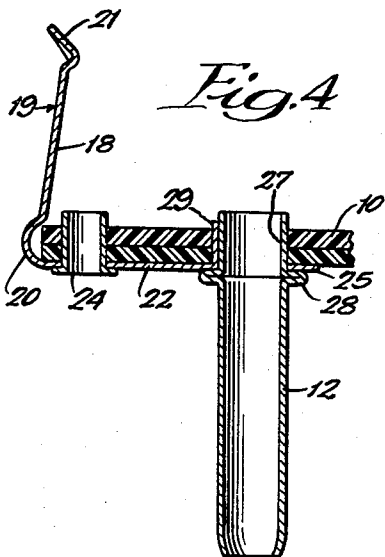
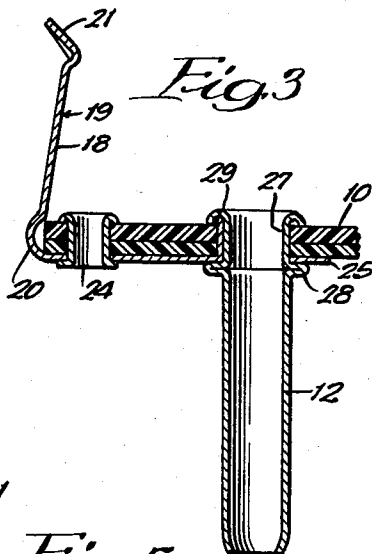
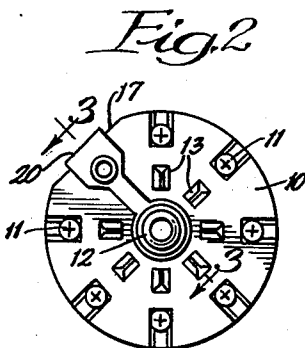
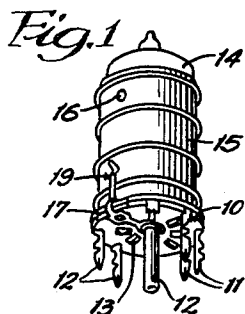
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TERMINAL GROUNDING STRAP

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TERMINAL GROUNDING STRAP

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2 Claims. (Cl. 339—14)

This invention relates to a terminal or connector strap useful in a number of settings as, for example, in the setting of a grounding strap and grounding lug, both of which are shown in the drawing.

In the past, numerous efforts have been made to develop a simple and convenient means for electrically securing a connector strap to a ground post as, for example the tube pin or center post of a laminated tube socket. The means heretofore developed have either been complex in the structure itself or in the means for assembling the components, or the electric connection provided by the attempted mechanical lock is not satisfactory. There has been a need then for an improved connector strap and tube pin structure mechanically united in the forming of an electric connection, and it is accordingly an object of this invention to provide such a structure.

Another object of this invention is to provide in combination with a panel—which, for example, might be the laminates in a laminated tube socket—a tube pin or connector pin and connector strap for assembly with such panel in a simple and expeditious manner, and to provide an arrangement of parts whereby a mechanical interlock occurs between the pin and strap that is effective as a good electrical connection. Yet a further object is in providing a connector member which may be used as a grounding strap in combination with a laminated tube socket, and as a grounding lug with printed wire boards, and of course in other settings as well, and which has a base leg provided at its inner end with an aperture for receiving the shank of a grounding or tube pin, and which has a tab extending upwardly in substantially contiguous relation with the shank of a pin extending through the aperture—the tab being dimensioned so as to project slightly above the panel with which it and the pin are assembled, whereby such projecting end bites into the shank of the pin when the upper end of the shank is rolled over in the uniting of the components with the panel. Additional objects and advantages will appear as the specification develops.

Embodiments of the invention are illustrated in the accompanying drawing, in which—

Figure 1 is a perspective view of a laminated tube socket embodying the invention, and being shown with a tube and tube shield in position with respect thereto; Figure 2 is a bottom plan view of the socket assembly shown in Figure 1; Figure 3 is a broken vertical sectional view taken along the line 3—3 of Figure 2; Figure 4 is a broken vertical sectional view corresponding to that of Figure 3, but showing the condition of the respective parts prior to the swaging operation that completes the assembly and puts it in the condition shown in Figure 3; Figure 5 is a perspective view of the terminal strap shown in each of the preceding figures in position with respect to the other components of the socket assembly; Figure 6 is a broken vertical sectional view corresponding substantially to that of Figure 4, but showing a modified form of terminal strap; Figure 7 is a broken vertical sectional view of the modified terminal strap illus-

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trated in Figure 6, and Figure 7 corresponds to the showing of Figure 3; and Figure 8 is a perspective view of the modified terminal strap illustrated in Figures 6 and 7.

Figure 1 illustrates a laminated tube socket 10 that is for the most part conventional and has, therefore, a plurality of depending connector pins 11 adapted to extend through apertures therefor in a printed wire board and to be connected by solder globules to the printed wire thereon. The socket 10 also has a center grounding post or tube pin 12 and a plurality of pin sockets 13 spaced apart circumferentially thereabout for alignment with and to receive the contact pins of a tube 14 that, in the illustration of Figure 1, is enclosed by metal, electrostatic shield 15. The shield 15 may be provided with a number of indentations 16 that form internal projections for frictionally gripping and centering the tube 14 within the shield. All of the components so far described are well known in the art, and in being conventional require no further description.

As is most apparent from an examination of Figure 2, the laminae of the socket 10 are circular, but at one point therealong are flattened, as shown at 17 to facilitate the extension thereby of the upwardly oriented leg 18 of the terminal strap 19, which has an outwardly bowed portion 20 adjacent the lower end of the leg 18 to further facilitate the extension of the leg upwardly beyond the socket laminates. The upper end of the leg 18 is turned laterally outwardly to form a tip 21, and this outwardly turned end facilitates the insertion of the tube 14 into the socket and the positioning of the shield 15 about the tube. The terminal strap also has a base leg 22 formed integrally with the leg 18, and it is oriented generally at right angles with respect to the leg 18 so as to lie flush along the underside of the socket 10.

The socket 10 has an opening therethrough that is alignable with the aperture 23 in the base leg 22 of the terminal strap, and when the opening and aperture are in alignment, they are adapted to pass a rivet 24 therethrough which in completion has swaged or rolled ends which serve to rigidly anchor the strap to the socket and, of course, which serve additionally to anchor the laminates of the socket together. The base leg 22 at its inner terminus is circular, as is shown at 25, and this circular end portion has an opening or aperture 26 therethrough dimensioned to receive the upper shank portion 27 of the tube pin 12, as is shown most clearly in Figures 3 and 4. The tube pin 12 has an accordion fold adjacent the upper end thereof that forms an annular flange 28 adapted to abut the underside of the end 25 of the terminal strap to prevent the pin from moving therethrough.

The terminal strap is equipped with an upwardly turned tab 29 struck from the material removed in forming the aperture 26 in terminal end 25 thereof. The tab is substantially normal to the base leg 22 of the strap, and extends upwardly adjacent the circumference of the opening 26 whereby it is contiguous with the shank 27 of the tube pin when that shank is inserted through the opening 26. It will be noted that the tab 29 is dimensioned so that it extends slightly above the upper surface of the socket 10 when the strap is in position with respect thereto, having its base leg 22 in abutment with the undersurface of the socket. Thus, when the pin 12 is anchored in place by rolling or swaging the upper end thereof outwardly and into the configuration illustrated in Figure 3, the upper end of the tab 29 digs into the outwardly turned end of the shank so as to become, in effect, integrated therewith whereby an excellent electric connection is provided between these two members.

It will be apparent that the terminal strap 19 may be secured in position as part of the normal assembly operations wherein the connector pins 11, the sockets 13,

laminates and tube pin 12 are united. Whatever the sequence of operations, however, the strap 19 will be positioned with respect to the socket laminates, as shown in Figure 4, and a rivet 24 and tube pin 12 inserted into position. Thereafter, the upper end of the rivet and upper end of the pin shank 27 will be swaged over to unite the strap, as shown in Figure 3. It will be understood that the leg 18 in being inclined inwardly and in resiliently maintaining such position, will tightly engage a shield 15 surrounding a tube 14 mounted in the socket so as to establish a good electrical connection therewith. The shield will be grounded through the strap and through the pin 12 which, when the socket is mounted on a panel such as a printed wire board, will be connected to an appropriate ground wire.

Figures 6 through 8 show a modification of the terminal strap 19, and in this form a panel 10', which may be a printed wire board, is apertured to receive a tube pin or ground post 12' flanged at 28' to abut the underside of the base leg 22' of the modified terminal strap or ground lug 19'. As is most apparent from Figure 8, the base leg of this connector strap has a circular terminal end 25' provided with an aperture or opening 26' there-through which receives the upper shank 27' of the ground post. The connector strap also has an upwardly oriented tab 29' dimensioned so as to extend slightly above the upper surface of the panel, and to bite into the shank of the tube pin at the upper end thereof when it is swaged outwardly, as shown in Figure 7.

The strap 19' has a downwardly turned leg 18' that, if desired, may be formed with an aperture 30 therein for receiving the end of a connector wire which would be then soldered thereto. The terminal strap 19' and tube pin 12' are assembled with the panel or board 10' in precisely the same manner as described with reference to the assembly operation of the terminal strap 19. Therefore, the assembly steps will not again be repeated. For convenience, the components of the modified structure shown in Figures 6, 7 and 8 are designated with the same numerals as those adopted for the components of Figures 1 through 5, and are distinguished therefrom only in that each of the numbers has been primed.

The strap in the forms illustrated serves as a grounding strap for a tube shield or as a grounding lug for a tube pin. It will be apparent, however, that straps or lugs or similar members having different uses may embody the same inventive principles advantageously for it is found that after assembly an excellent electrical connection is made between the strap and tube as well as providing a good mechanical interlock. The assembly

can be accomplished in a simple operation and with convenience.

While in the foregoing specification embodiments of the invention have been described in considerable detail for purposes of illustration, it will be apparent to those skilled in the art that numerous changes may be made in those details without departing from the spirit and principles of the invention.

I claim:

1. In combination with an insulating panel having an opening therein, a connector strap abutting one surface of said panel, said strap having a leg apertured to correspond substantially with the opening in said panel and in general alignment therewith and having a tab extending through said opening, and a post member extending through said opening and aperture and being equipped with a stop abutting said strap, said tab being shorter than the portion of said post member extending through said aperture and opening, but being longer than the thickness of said panel for projecting therebeyond, the end portion of said post member being turned over to lock said panel and strap against said stop, said tab having its outermost end in biting engagement with the turned end of said post member.

2. In an assembly of the character described, a post equipped intermediate the ends thereof with an outwardly extending flange, a strap member provided with an aperture therein receiving said post and being in substantially abutting relation with said flange, a tab provided by said strap and extending along the surface of said post, and an insulating panel having an opening therein passing said post and tab therethrough and being in substantial abutment along one side thereof with said strap, said post and tab projecting beyond the surface of said panel and said post being turned outwardly at its end to constrain said panel and strap against said flange, said tab having its outermost end in biting engagement with said outwardly turned portion of said post.

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