

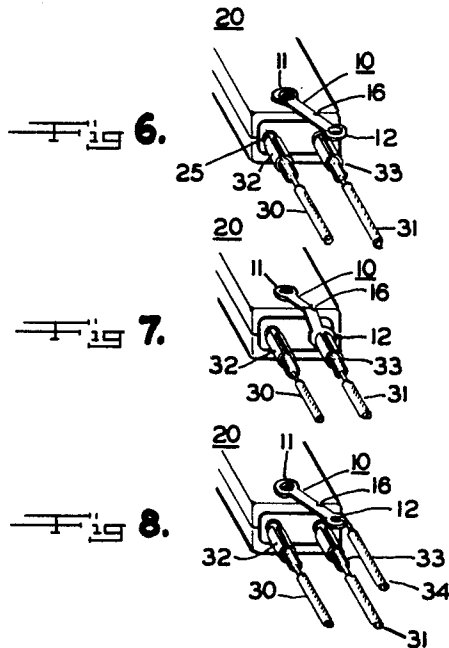
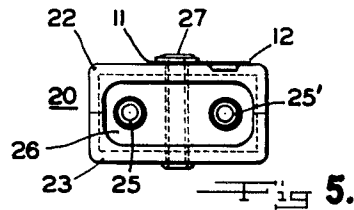
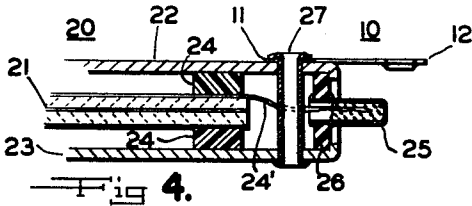
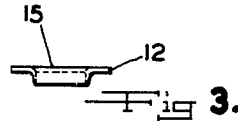
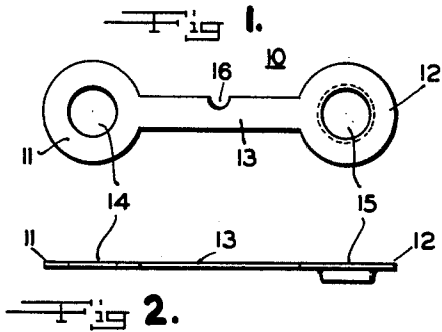
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2,513,147

GROUND LUG

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This invention relates to electrical connectors in general and more particularly to an improved conducting lug for use with electrical apparatus having conventional terminal pins. The lug is so constructed as to be selectively connected or disconnected with respect to one of such pins and when disconnected may readily be soldered to a wire lead, if desired. Such selective connectors have utility in connecting electrical apparatus components in different specific circuits. By permanently mounting lugs of this nature on the components, standardization and simplification is made possible.

While the principles of the present invention may be useful in conjunction with various types of electrical or electronic apparatus I have chosen to illustrate its use in the installation of piezo-electric transducer units. Sensitive electro-mechanical devices are necessarily of a delicate nature, both mechanically and electrically, and it is therefore necessary to replace them as failures occur. It is also advantageous from a commercial viewpoint, to be able to readily install a transducer cartridge of given type in any one of several different types of supporting tone-arms. Some tone-arms are fabricated of die cast metal which will serve as an electrical conductor or ground connection for the contained transducer while others are molded of resinous or plastic material possessing high dielectric properties and thus may not be relied upon to afford electric conductance. Also it will be understood that various tone arms may or may not be electrically insulated from their supporting panels and/or from their associated electrical apparatus either by rubber bushings or by interposed rubber shock-absorbing pads. In some existing apparatus provision for suitably connecting the casing of an included transducer to ground has been provided in the form of an additional or "third" wire lead.

The primary object of the present invention is to provide improved and simplified means for selectively grounding the containing case of an electrical device.

Another object of the invention is the provision of means to render an electrical component adaptable to existing circuit requirements as the number of connectors required.

A further object of the present invention is the provision of simplified means to selectively connect one of a series of contacts on an electrical device into a coacting circuit, which means is integrally incorporated in the device.

These and other objects and advantages of the

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invention will become apparent upon consideration of the following detailed specification and of the accompanying drawing wherein there is disclosed a preferred embodiment of the invention.

In the drawing:

Figure 1 is a plan view of a ground connector lug constructed in accordance with the principle of the present invention;

Figure 2 is a side elevation of the connector of Figure 1;

Figure 3 is an end elevation of the connector of Figure 1;

Figure 4 is a longitudinal section taken at the center line of a piezo-electric transducer cartridge to which is attached the connector of the invention;

Figure 5 is an end elevation of the cartridge of Figure 4; and

Figures 6, 7 and 8 are perspective views of the end of the cartridge of Figure 4 showing respectively three distinct modes of utilizing the connector of the invention.

Referring now to the drawing more in detail, the reference character 10 designates in general the metal connector of the invention. Connector 10 is formed from sheet metal by a combined stamping and drawing operation and comprises an enlarged end portion 11, an opposite end portion 12 and a strip-like interconnecting portion 13. An aperture 14 is provided in enlarged portion 11 for attaching connector 10 to an associated piece of electrical apparatus and a flanged hole 15 is formed in portion 12 to serve as a separable connection terminal of the device as will be herein further described. Located at a suitable point along the length of intermediate portion 13 is a notch 16 which serves to define the point of bending of portion 13 when required.

Figures 4 and 5 show a preferred method of attaching the connector thus far described to an electrical device which is indicated generally by reference character 20. Device 20 is, in the present instance, a piezo-electric transducer unit which comprises an actuating crystal element 21 housed within a casing having upper and lower sections 22 and 23, respectively. A pair of resilient clamping pads 24 are normally provided to resiliently position crystal 21 between and within the casing sections 22 and 23 and to afford both electrical and mechanical insulation between the crystal and casing. Electrical contact is established by means of a pair of metal foil leads 24', only one of which is shown, extending between crystal 21 and terminal tips 25 and

25'. Leads 24 are securely soldered within tips 25 and 25' as shown. Terminal tips 25 and 25' are secured in a rubber insulation strip 26 which in turn is clamped between the casing sections 22 and 23. Clamping tension is provided by a plurality of tubular metal rivets 27, but one being shown, which pass through opposite faces of the casing sections 22 and 23 to accomplish the holding of crystal 21 between pads 24, and the securing of strip 26. The rivet 27 also serves to anchor the end portion 11 of connector 10 described above. Thus, electrical contact is established between terminal tips 25 and 25' and the crystal 21 through the leads 24' while conduction is established between the casing and the lug 10.

Figures 6, 7 and 8 show how the connector of the invention is employed to accomplish the objects set forth above.

Normal contact is made, between the device 20 and its associated circuit, through leads 30 and 31. Leads 30 and 31 are soldered to "quick-disconnect" terminal clamps 32 and 33 respectively, and said clamps are free to be manually forced over the terminal tips 25 and 25', respectively, of the unit 20 to initiate contact therewith at assembly or to facilitate removal or replacement of the device 20.

Figure 6 illustrates the connector of the invention, 10, as standing free of both lead clamps 32 and 33, in which case no contact exists between the casing sections 22 and 23 and either of the leads 30 or 31. Such would be the mode of application where the casing 22-23 itself makes contact with a metallic supporting arm and through it to an associated circuit, or where, for operational reasons, it is neither desirable nor necessary to have casing 22-23 connected or grounded with respect to its associated circuit.

Figure 7 illustrates the connector 10 having its outer free end bent downwardly so that aperture 15 encircles terminal tip 25' and establishes contact therewith. Terminal clamp 33 is then placed upon tip 25' where it makes contact with both tip 25' and connector 10 and thereby brings the casing 20 into the associated circuit via lead 31. Notch 16 on connector 10 enables the body 13 thereof to be bent at the correct place to facilitate easy contact between aperture 15 and tip 25'. This connection may be broken at any time it may become desirable to do so simply by removing clamp 33 and bending connector 10 to its normal straight position.

In Figure 8 the lug 10 of the invention is utilized to ground the outer casing of the device 20 through a separate conductor 34. The use of a separate grounding lead is, of course, desirable in certain installations of electrical apparatus and it should be apparent that the present invention facilitates such installation particularly when it is observed that the flanged aperture 15 in the outer end portion 12 of the lug 10 provides a convenient anchoring recess in which the end of the wire lead 34 may be soldered.

It should now be apparent that I have provided an improved ground lug or connector for electrical apparatus which accomplishes the objects initially set out. The connector is exceed-

ingly simple in design and most economical to produce and when assembled on electrical apparatus in the general manner herein taught is at once both available and readily amenable for use in connecting the apparatus in any one of a number of different circuits.

The above specifically described embodiment of the invention should be considered as illustrative only as obviously many changes may be made therein without departing from the spirit or scope of the invention. Reference should therefore be had to the appended claims in determining the scope of the invention.

What I claim is:

1. In combination with electrical apparatus having a casing with separable top and bottom sections held together by a vertically disposed rivet and having a terminal tip carried by and extending outwardly from an insulating plate clamped between said sections, a ground lug comprised of a strip of compliant current conductive material having an enlarged apertured end portion received under a head of said rivet and extending outwardly in the same general direction as said tip, said lug having an enlarged apertured outer end portion and being of sufficient length that upon flexing in its mid portion said outer apertured end portion may be positioned over said tip.

2. Apparatus according to claim 1 further characterized in that the aperture in said outer end portion is integrally flanged to increase the contacting area of said lug with said tip when said lug is fixed to position said outer apertured portion over said tip.

3. In combination with electrical apparatus having an outer casing to be grounded and a terminal tip insulated from said casing and extending outwardly therefrom, a ground lug comprising a strip of compliant current-conductive material mechanically and electrically secured to said casing and projecting outwardly from said casing in general parallel relation with said terminal tip, said strip having an aperture in its outer end portion of a diameter to closely receive said terminal tip and said strip being of sufficient length that upon flexing of its mid-portion its apertured outer end portion may be positioned over the outer end portion of said terminal tip.

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