

[54] **ELECTRICAL GROUND TERMINAL**

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[51] Int. Cl.² **H01R 3/06**

[58] Field of Search **339/14, 95 R; 85/5 R**

[56] **References Cited**

UNITED STATES PATENTS

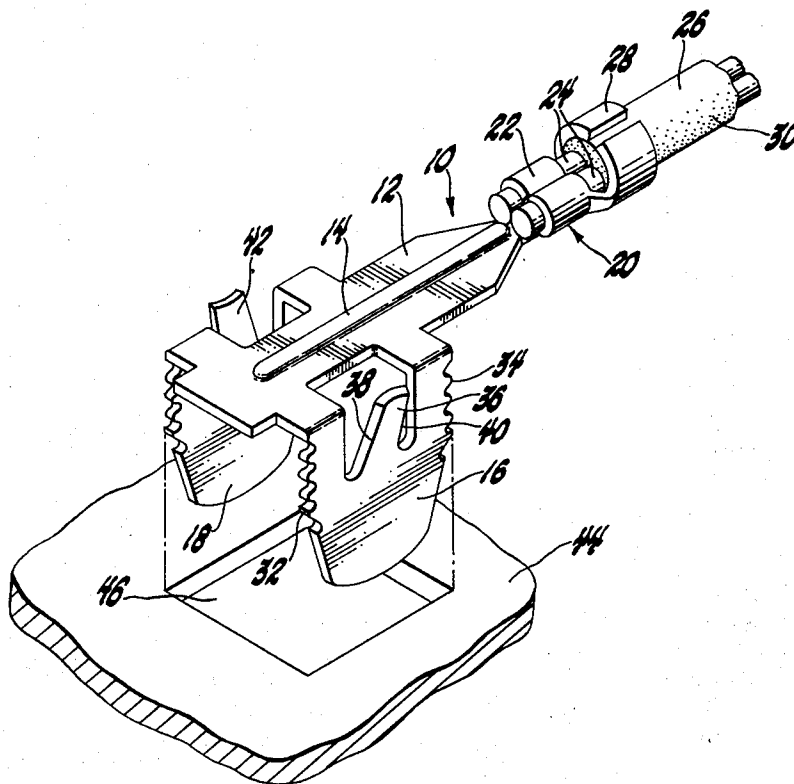
2,560,530	7/1951	Burdick.....	85/5 R
3,535,673	10/1970	Maltais et al.	339/95 R

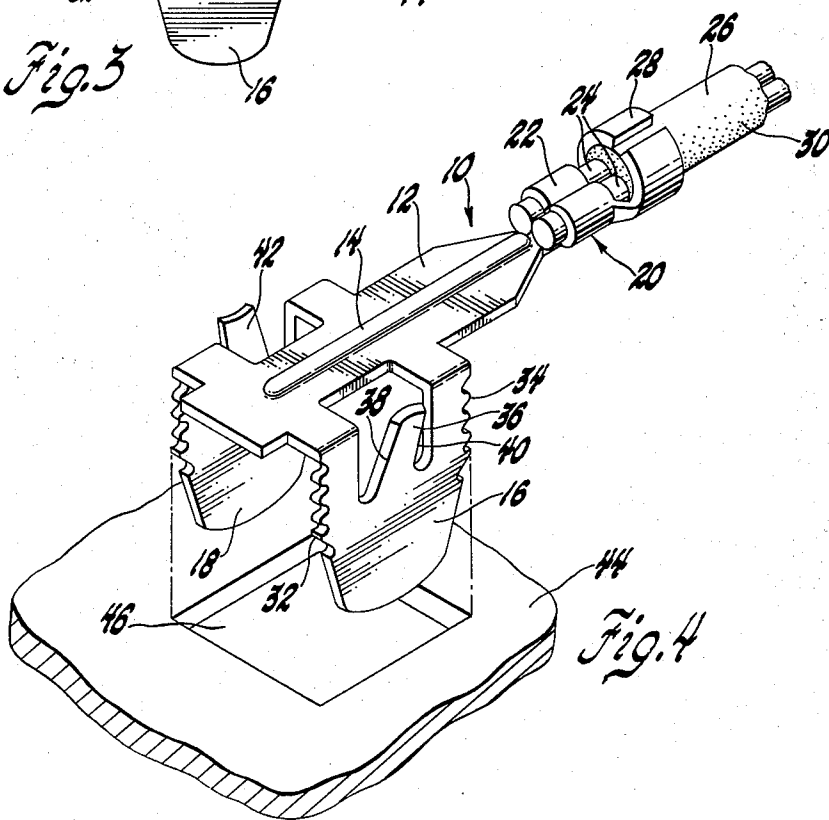
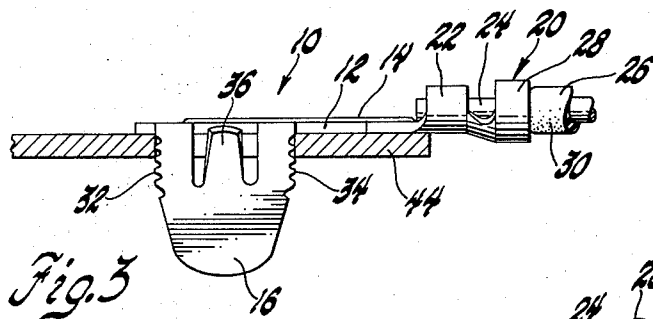
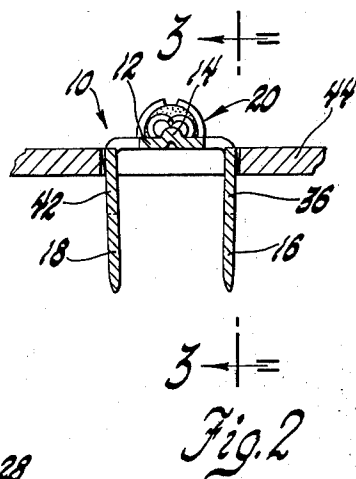
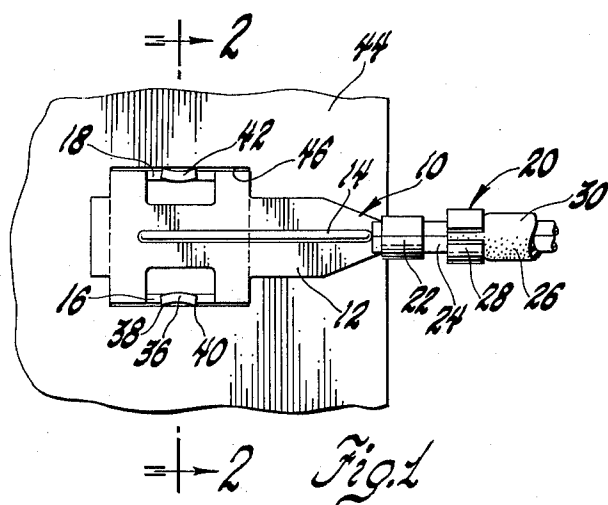
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[57] **ABSTRACT**

An electrical ground terminal has a pair of spaced blade members which have sawtooth edges which scrape and cut the surface of an undersized hole extending through an electrically conductive support panel when the terminal is forcefully driven thereinto for a mechanical and electrical connection therebetween. The blades have cantilevered resilient tangs which are self-biased into engagement with the edge of the hole to improve the electrical connection between the support panel and the terminal.

2 Claims, 4 Drawing Figures





ELECTRICAL GROUND TERMINAL

This invention relates generally to electrical ground terminals and more specifically to those types of electrical ground terminals which are adapted to be forcefully driven into a hole in an electrically conductive support panel.

In the past electrical ground terminals have included portions with sawtooth edges which grippingly engage surfaces of a hole in an electrically conductive metal support panel so that when the terminal is forcefully driven into the hole the sawtooth edges scrape dirt, metal oxides or any other matter which inhibits the passage of electric current from a portion of the hole surface so that the terminal is not only securely fastened to the support panel but also makes an adequate electrical connection with it.

It is generally an object of this invention to improve upon this general type of terminal, examples of which are disclosed in the U.S. Pat. No. 3,535,673 issued to Frederick J. Maltais on Oct. 20, 1970 for an "Electrical Grounding Terminal" and the U.S. Pat. No. 3,686,609 issued to Hansen on Aug. 22, 1972 for a "Ground Terminal".

More specifically, it is an object of this invention to improve upon the terminals disclosed in the aforementioned patents by improving the electrical connection between the terminal and the electrically conductive metal support panel by increasing the contact points therebetween. In the improved terminal in accordance with this invention, the contact between the terminal and the surface of the hole is increased by additional sharp edges of the terminal which are self-biased into engagement with the surface defining the hole thereby insuring a more adequate electrical connection between the terminal and the support panel.

The exact nature of this invention as well as other objects and advantages thereof will be readily apparent from consideration of the following specification relating to the annexed drawing in which:

FIG. 1 is a plan view of an electrical ground terminal in accordance with this invention, said ground terminal being illustrated as forcefully driven into a square hole in an electrically conductive metal support panel.

FIG. 2 is a section taken substantially along the line 2—2 of FIG. 1 looking in the direction of the arrows.

FIG. 3 is a section taken along the line 3—3 of FIG. 2 looking in the direction of the arrows.

FIG. 4 is a perspective view of the ground terminal in accordance with this invention showing the terminal prior to being forcefully driven into the square hole of an electrically conductive metal support panel.

Referring now to the drawings, there is shown an electrical ground terminal 10 which is preferably stamped in one integral piece from a suitable conductive material such as sheet metal. More specifically, the electrical ground terminal 10 comprises a base 12 having a longitudinally disposed stiffening rib 14 to increase the rigidity of the base 12 so that it is adapted to receive the blow of a suitable impact tool. A pair of spaced blades 16 and 18 depend downwardly from one end portion of the base 12 and at the opposite end of the base 12 is an integral ferrule 20 of conventional design. More particularly the ferrule 20 comprises a first set of wings 22 crimped onto the stripped conductor core end 24 and a second set of wings 28 crimped onto the insulator sheath 30 of a cable 26.

The blades 16 and 18 are identical so that the description of the blade 16 will suffice. The blade 16 has sawtooth portions 32 and 34 on its longitudinal facing ends which sawtooth portions extend for approximately half the length of the blade from the juncture of the blade 16 with the base 12 or about twice the thickness of the panel through which the blade is inserted. The lower portion of the blade is tapered and has a rounded bottom. See FIG. 3.

The blade 16 also has a cutout tang 36 which extends upwardly and outwardly from the middle of the blade 16 up to a location about even with the juncture between the blade 16 and the base 12. The tang 36 is flat at its juncture with the blade 16 and gradually transforms into a curvilinear cross section of outward concavity toward its free end thereby providing two sharp spaced edges 38 and 40 at its outboard extremity for almost all of its entire length. The blade 18 being identical to the blade 16 has a tang 42 which is identical to the tang 36.

Referring now to FIG. 4, the terminal 10 is adapted to be connected to an electrically conductive metal support panel 44 by forcefully driving the blades 16 and 18 having the tangs 36 and 42 into a hole extending through the support panel with a force applied to the upper surface of the base 12. As illustrated in FIG. 4, the support panel 44 has a square hole 46 which orients the terminal 10 with respect to the panel 44. Other shapes for the hole may be used, however, it is preferable that the hole be slightly undersized with respect to the width of the blades 16 and 18 so that when the blades 16 and 18 are driven into the hole by a blow on the base 12 the sawtooth portions of the blades scrape and cut portions of the surface defining the hole to make a good mechanical and electrical connection therebetween. The hole whether square or otherwise however must be undersized with respect to the diverging tangs 36 and 42 so that when the terminal 10 is forcefully driven into the hole 46, the tangs 42 and 36 are deflected inwardly toward the center of the terminal body and thus each biasingly engages the surface defining the hole. Since the portions of the tangs which engage the surface of the hole are curvilinear, each of the tangs has two sharp spaced edges which dig into the surface defining the hole and thus insure a good electrical connection between the terminal and the panel.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What is claimed is:

1. An electrical ground terminal adapted to be forcefully driven into an undersized hole extending through an electrically conductive support panel comprising:

a base,

a pair of spaced blades integral with said base and extending downwardly therefrom, each of said blades having sawtooth portions on at least a portion of one longitudinal facing end which sawtooth portions are adapted to scrape and cut the surface of an undersized hole extending through an electrically conductive support panel when said terminal is forcefully driven into said undersized hole so as to make an electrical and mechanical connection between the terminal and the support panel, and at least one of said blades further having a resilient integral tang extending laterally outwardly from

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said blades and upwardly toward said base in a cantilevered fashion, said tang having a generally concave outer surface and a pair of sharp spaced edges for digging into a surface defining said undersized hole under the self biasing forces of said tang when said terminal is forcefully driven therein to provide additional points of contact between the terminal and the support panel and thereby improve the electrical connection therebetween.

2. An electrical ground terminal adapted to be forcefully driven into an undersized hole of an electrically conductive support panel comprising:

- a base,
- a pair of spaced generally flat blades integral with said base and extending downwardly therefrom, each of said blades having sawtooth portions on their longitudinally facing ends extending from the juncture of said blades with said base downwardly for approximately half the depth of the blades, said sawtooth portions being adapted to scrape and cut the surface of an undersized hole of a support

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panel when said terminal is forcefully driven into said undersized hole so as to make an electrical and mechanical connection between the terminal and the support panel,

each of said blades further having a resilient integral tang extending angularly in cantilevered fashion from a mid portion thereof, said tangs diverging toward said base and terminating in a free end which is approximately coplanar with said base, each of said tangs being flat at the juncture with their respective blades and transforming into a curvilinear cross section at their free ends which is concave in the outward direction, and each of said tangs having a pair of sharp spaced edges for digging into the surface of said undersized hole under the bias of said tangs when said terminal is forcefully driven therein to improve the electrical connection between the terminal and the support panel.

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