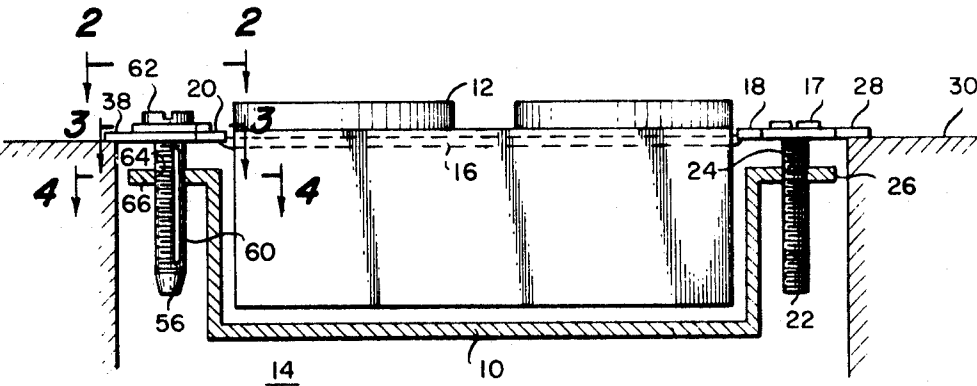


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[54] **AUTOMATIC GROUNDING FOR RECEPTACLE**
6 Claims, 8 Drawing Figs.
[52] U.S. Cl..... **174/51,**
174/53, 339/14 R
[51] Int. Cl..... **H05k 5/02**
[50] Field of Search..... **174/53, 51,**
78; 339/14

ABSTRACT: A slotted grounding strap is mounted across the spaced parallel legs of the end portion of a receptacle mounting strap and a screw is snugly and resistently carried in the slot. The screw is threadedly mounted in the mounting ear of a flush-type box to secure the receptacle in the box and provide an automatic low resistance electrical path between the mounting strap and the box.



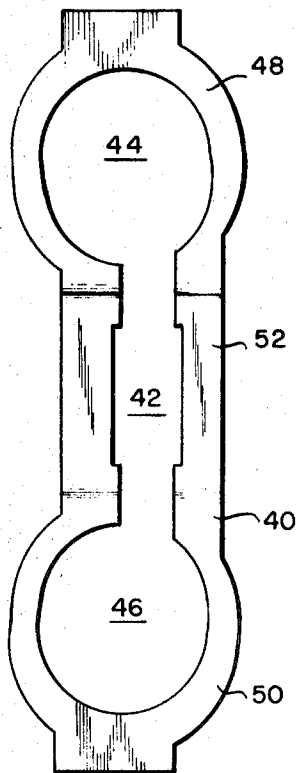


Fig. 5

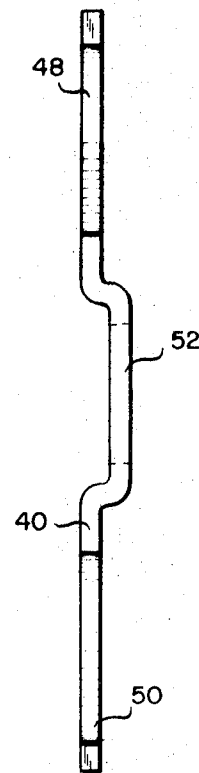


Fig. 6

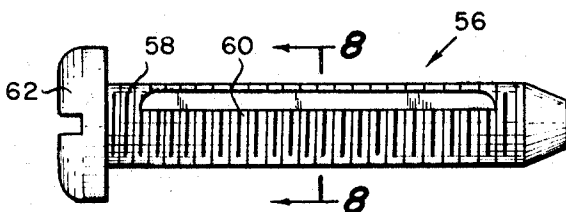


Fig. 7

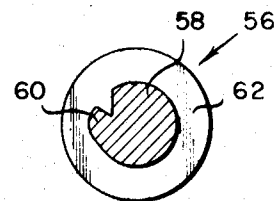


Fig. 8

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AUTOMATIC GROUNDING FOR RECEPTACLE

SUMMARY OF THE INVENTION

This invention relates generally to the field of grounded electrical units and more particularly to the automatic grounding of a receptacle to the flush box in which it is mounted.

The National Electric Code requires that a metallic box be permanently grounded and at the same time that a receptacle therein may be removed therefrom without interrupting the continuity of the grounding conductor. The conventional wiring method is to run the permanent continuous grounded conductor to the metal box and then run a second separate wire from the box to the grounding terminal of the receptacle. The automatic grounding feature of this invention will eliminate the need for the second wire and further ensure that a proper ground connection is made as soon as the receptacle is assembled in the box.

In view of the foregoing it is an object of this invention to provide automatic grounding means for a receptacle when it is mounted in a metallic flush-type box.

It is another object of this invention to provide a receptacle mounting strap with grounding means for automatically connecting the mounting strap and the box to provide a low resistance electrical path therebetween.

It is still further object to provide an automatic grounding means on a receptacle mounting strap which will retain the mounting screws assembled with the mounting strap.

It is yet another object to provide the spaced parallel legs of the end portion of a receptacle mounting strap with a slotted grounding strap mounted thereacross, said slot snugly and resiliently a screw which is threadably inserted in the mounting ear of a flush-type box to secure to the receptacle in the box and provide an automatic low resistance electrical path between the mounting strap and the box.

DESCRIPTION OF THE DRAWINGS

The above and additional objects and advantages will become more apparent when taken in conjunction with the following detailed description and drawings, disclosing by way of example a preferred embodiment of this invention.

In the drawings:

FIG. 1 is an elevational view partly in section illustrating the receptacle mounted in a flush-type box with the automatic grounding means on the left-hand side of the assembly,

FIG. 2 is a plan view taken along line 2—2 of FIG. 1 illustrating the automatic grounding means,

FIG. 3 is an horizontal sectional view taken along line 3—3 of FIG. 1 showing the manner in which the screw threads engage the grounding strap,

FIG. 4 is an horizontal sectional view taken along line 4—4 of FIG. 1 depicting the manner in which the mounting screw engages the threaded hole in the mounting ear,

FIG. 5 is a plan view of the grounding strap,

FIG. 6 is an elevational view of the grounding strap of FIG.

5, FIG. 7 is a plan view of the mounting screw used in the grounding means,

FIG. 8 is a sectional view taken along line 8—8 of FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

One application of the automatic grounding means of this invention is illustrated in FIG. 1 wherein a flush-type metallic box 10 receives a conventional electrical receptacle 12 in a wall opening 14 or the like. The receptacle 12 is provided with the usual mounting strap 16 which has tab portions 18 and 20 extending from the ends thereof. The tab portion 18 is of the conventional type having an opening to receive a mounting screw 22 which is threadably inserted in the threaded hole 24 of box mounting ear 26. The mounting screw 22 has a bevelled head 27 as usually found in this environment. The tab portion 18 is further equipped with mounting ears 28 which are adapted to rest on the wall surface 30.

It is the tab portion 20 which is provided with the automatic grounding feature of this invention. As best illustrated in FIGS. 1 and 2, tab portion 20 is notched to form a U-shaped section comprising parallel outwardly extending tab legs 32 and 34 from which project tab ears 36 and 38 respectively. A grounding strap 40 made of material having good electrical conductivity is mounted across the tab legs 32 and 34 and secured thereto in a low resistance manner by welding as indicated at points 42.

As best shown in FIGS. 5 and 6, the grounding strap 40 has a centrally disposed longitudinal slot 42 connecting with large oval cutouts 44 and 46 in the end portions 48 and 50 respectively. The middle portion 52 of grounding strap 40 is offset a slight amount as shown in FIG. 6. The offset is sized so that it will fit down into the notch 54 between tab legs 32 and 34.

The mounting screw 56 used in the automatic grounding means is shown in FIGS. 7 and 8. This screw is made of a suitable material having reasonably good electrical conductivity for example, brass. As illustrated the shank 58 is threaded throughout its length and is provided with a longitudinal offset 60. It should be noted that offset 60 does not extend up to the screw head 62 but rather, starts a distance downwardly on the shank 56. This is done in order that the threaded portion of the shank which is in engagement with the grounding strap will not have the offset and such that the portion of the shank threaded into the mounting ear will be distorted to provide additional interference and thus assure good electrical conduction.

The relationship of the width of the slot 42 in grounding strap 40 and the diameter of the threaded portion of screw shank 58 which is not provided with the offset 60 is such that the screw shank will be snugly and resiliently gripped by the strap sides forming the slot 42 to provide a good electrical path and further retain the screw assembled with the grounding strap. In this connection, see FIG. 3 wherein the aforesaid threaded shank 58 engages the strap sides forming the slot 42.

The threaded hole 64 in box mounting ear 66 is sized to receive the threaded portion of shank 58 which has the offset 60 to assure that there is sufficient interference and contact to produce a reliable electrical path between the two. This is illustrated in FIG. 4 wherein the shank offset 60 is shown cutting into the threaded hole 64 in box mounting ear 66.

Although the functioning of the various elements to provide the automatic grounding of this invention should now be readily apparent, a brief description follows.

Referring particularly to FIGS. 1 and 2, the receptacle 12 is mounted in flush box 10 by means of a mounting strap having end tab portions 18 and 20. A mounting screw 22 fits through an opening in the tab 18 and is threadably introduced with the threaded hole 24 in ear 26. The other tab portion 20 mounts grounding strap 40 which is welded to said tab. A mounting screw 56 is fitted down between the strap sides turning slot 42 so that the threads interengage with said sides in a snug and resilient manner to provide good electrical conductivity therebetween. The screw 56 is then threadably introduced into the threaded hole 64 in ear 66 with the offset portion 60 biting into the hole threads to provide a good electrical connection therebetween. Thus as soon as the screw 56 is inserted into the ear 66 an automatic ground connection is made between the mounting strap and the flush box. Additionally in the usual installation the underside of the head 62 of screw 56 will firmly engage the grounding strap 40 to provide further positive grounding.

It should be noted that the sole contact between the mounting strap 16 and the screw 56 is the grounding strap 40 which is the support and retainer for the screw. In other words, the problem of the alignment of a grounding member with the hole in the mounting strap of the conventional type is eliminated. Additionally, the end oval cutouts 44 and 46 which connect with slot 42 aid in providing the desired resilience of the strap side portions which define the slot. Since the strap is of substantial proportions an excellent grounding is achieved. Further there is no opportunity for an

"open" to occur because as soon as the screw is inserted in the grounding strap, the mounting strap is electrically connected to the grounding strap. This obviously would not necessarily be the case when a grounding contact is added to the conventional mounting strap since it could be bent, broken or otherwise displaced so as to not contact the mounting screw inserted in the mounting strap. It is considered that the automatic grounding means of this invention results in complete reliability.

What is claimed is:

1. In an electrical assembly comprising a metallic flush-type box having a mounting ear extending outwardly from each end thereof and a receptacle mounted therein, said receptacle including a metallic mounting strap secured to the mounting ears by suitable screws inserted in threaded holes in said ears, the improvement comprising an outwardly extended tab portion on each end of the mounting strap, at least one tab portion having a centrally notched section forming said tab portion into a U-shaped element wherein the free ends of the legs of the U-shaped element project outwardly in a parallel manner, a grounding strap of low electrical resistance material mounted across the tab legs and secured thereto in a low resistance manner, said grounding strap having a longitudinally disposed slot whose central portion is aligned with the threaded hole in the mounting ear therebeneath, said mounting screw snugly and resiliently engaged by the strap sides defining the central slot portion providing a low resistance

electrical path between the screw and the grounding strap, and further providing a low resistance path between the grounding strap and the box, thus automatically establishing a low resistance electrical path between the flush box and the mounting strap.

2. The invention as set forth in claim 1 and wherein the screw has its threads distorted providing increased contact between the distorted screw threads and the mounting ear into which it is threaded.

3. The invention as set forth in claim 2 and wherein the mid portion of the grounding strap is offset with the offset disposed between the tab legs.

4. The invention as set forth in claim 3 and wherein the screw has a flat head and fits flush down against the offset portion of the grounding strap to provide additional electrical contact therebetween.

5. The invention as set forth in claim 1 and wherein the end portions of the grounding strap have enlarged openings therein communicating with the slot to provide additional resilience to the slot side portions which engage the screw extending therethrough.

6. The invention as set forth in claim 1 and wherein the mounting screw is held in the grounding strap by the sides of the strap defining the slot when it is not threaded into the mounting ear.

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