

Nov. 11, 1969

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3,478,295

MULTIPLEX GROUNDING OUTLET

Filed Aug. 3, 1967

2 Sheets-Sheet 1

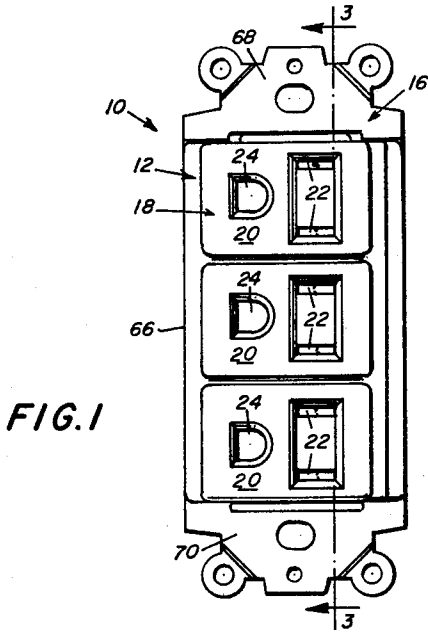


FIG. 1

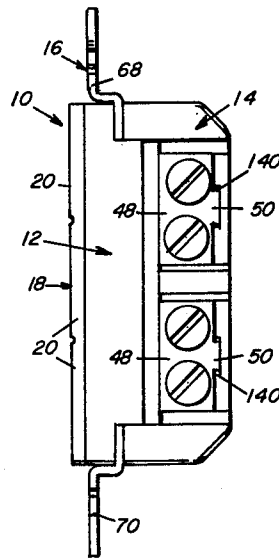


FIG. 2

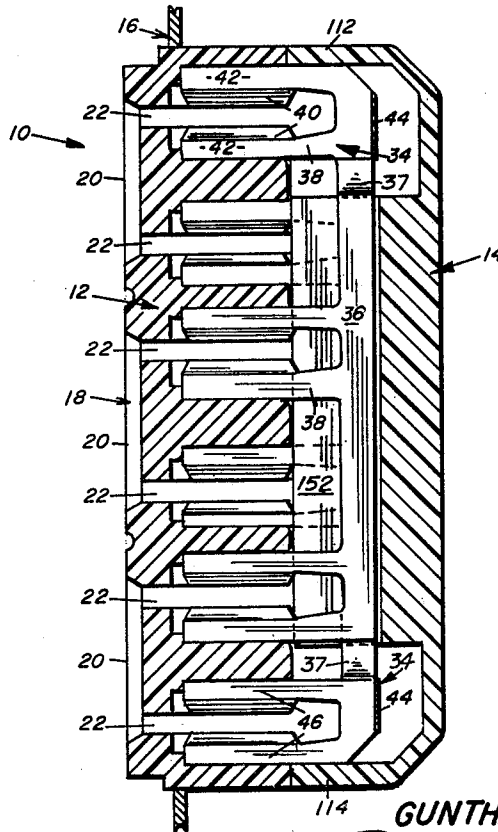


FIG. 3

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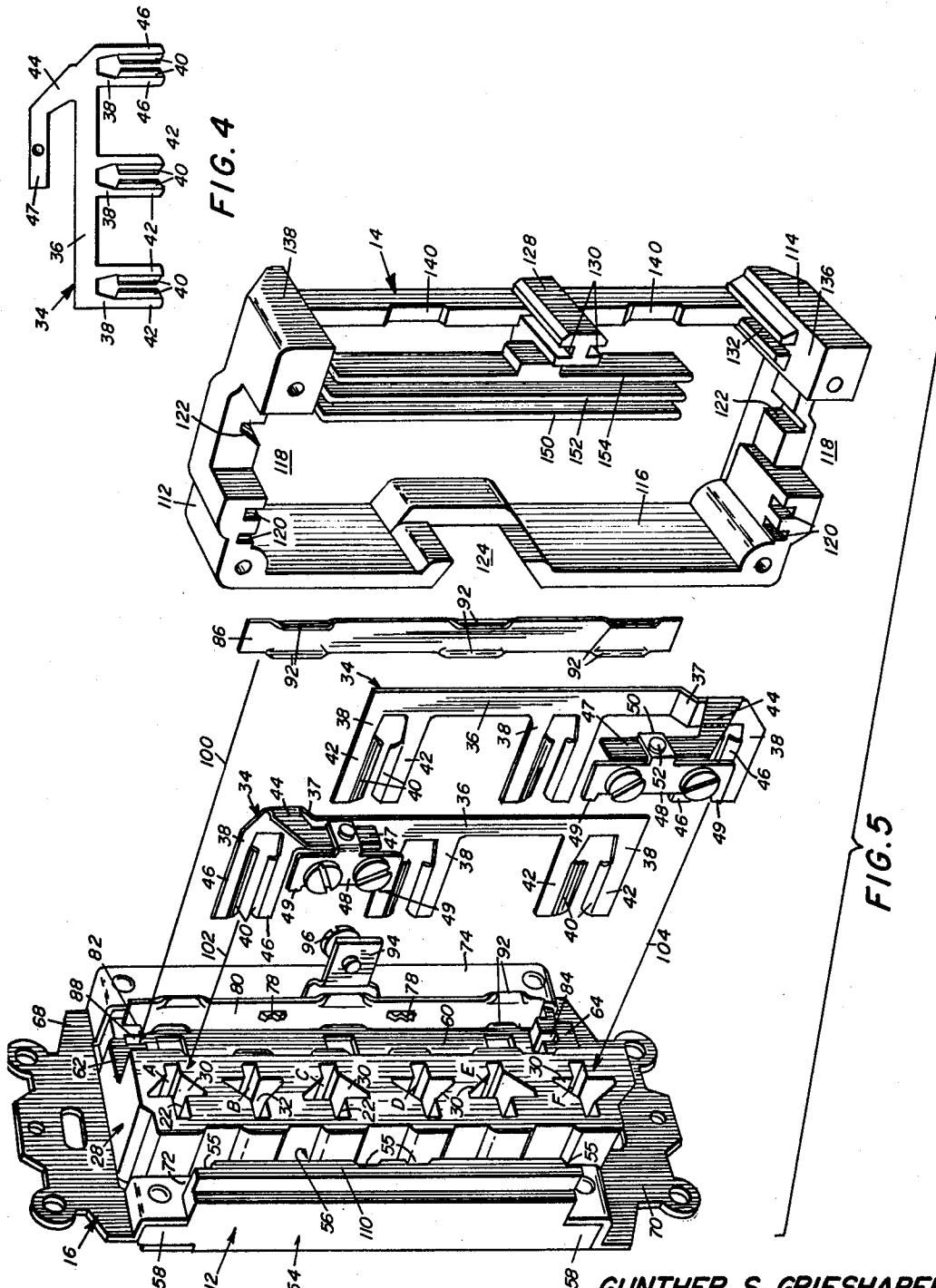
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2 Sheets-Sheet 2



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3,478,295  
**MULTIPLEX GROUNDING OUTLET**  
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U.S. Cl. 339—14 **6 Claims**

## ABSTRACT OF THE DISCLOSURE

This invention relates to electrical outlets and more particularly to multiplex grounding outlets comprising a housing having an upper and lower body with a mounting strap carried therebetween. The front face of the upper body is provided with multiple grounding plug accommodating units, each unit including a pair of spaced slots adapted to receive the plug prongs and an opening laterally spaced from the two slots adapted to accept the grounding prong.

### Background of the invention

Due to shock hazards, many localities have electrical codes which require that some means be provided in an outlet for grounding whatever is plugged into it. Some difficulties have been encountered in making a multi-unit outlet having a suitable grounding means without extensive modification to existing insulated outlet housings. In order to ultimately have all outlets of the grounding type, it is obviously necessary that a relatively inexpensive yet substantial multi-unit grounding outlet be developed. It is with this need in mind that the multiplex grounding outlet of this invention has been devised.

### Summary of the invention

It is an object of this invention to provide a multi-unit grounding outlet which is compact and yet complies with all required standards for such outlets.

It is another object to provide a multiplex grounding outlet having a two-piece housing with a conventional mounting strap carried therebetween and to which the grounding contact is connected.

It is a further object to provide a multiplex grounding outlet which will fit into a conventional outlet box without modifications to either the box or outlet.

It is yet another object to provide a multiplex grounding outlet wherein the grounding prong openings are laterally offset from the plug prong openings so that a plurality of right angle grounding plug units may be inserted in the multiplex outlet for use at the same time.

It is a still further object to provide a multiplex grounding outlet comprising an insulated housing having an upper and a lower body, said upper body having a front face provided with a plurality of grounding plug receiving units, each unit having a pair of spaced slots adapted to accommodate spaced plug prongs and an opening laterally spaced from said slots adapted to receive a grounding prong, said slots and openings being aligned in kind on said front face, the upper body having contact holding cavities in the back portion thereof aligned with and communicating with each slot, a pair of contact assemblies mounted on the back portion of the upper body, each contact assembly including a plurality of spaced and interconnected contacts, said contact holding cavities being configured such that alternate cavities will only accommodate contacts of a given contact assembly, said contact assemblies fitting into the upper body with their respective contacts fitting in alternate contact holding cavities, whereby a space is provided between the contacts of the pair of contact assemblies, grounding contact means mounted in the back portion of the upper body in alignment with respective open-

ings in the front face, grounding terminal means connected to said grounding contact means, the lower body being configured to interfit with the exposed back portion of the upper body to provide a closed assembly, said lower body having dividing means to maintain the spaced contact assemblies in required spaced relation.

Other objects and advantages will become more apparent when considered in conjunction with the following detailed description and drawings showing by way of example a preferred embodiment of this invention.

### Brief description of the drawings

FIGURE 1 is a front plan view of the multiplex grounding outlet of this invention;

FIG. 2 is a side elevational view of the outlet;

FIGURE 3 is a cross sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is a plan view of a contact assembly as it is initially formed; and

FIGURE 5 is an exploded view of the outlet.

The multiplex grounding outlet comprises an insulated housing 10 having an upper body 12 and a lower body 14 with a conventional mounting strap 16 carried therebetween. As best illustrated in FIGURE 1, the upper body 12 has a front face 18 provided with three grounding plug receiving units 20. Each plug receiving unit includes a pair of spaced parallel slots 22—22 adapted to accommodate the plug prongs and a D-shaped opening 24 laterally and equidistantly spaced from the prong slots 22 adapted to receive a grounding prong. The prong slots 22 extend crosswise with respect to the length of the upper body and are in longitudinal alignment. Likewise the D-shaped grounding prong openings are also in longitudinal alignment.

Referring to FIGURE 5, the back side of the upper body 12 has a contact housing portion 28 formed as a rectangularly shaped block generally coextensive with the length of the upper body 12 and in alignment with the prong slots 22 in the front face of the body. The width of the housing 28 is slightly greater than that of slots 22 which extend from the front face 18 completely through the contact housing. Contact housing cavities 30 are formed in the contact housing 28 in register with the prong slots 22. These cavities 30 are triangular in cross section with the apex 32 of each triangle being alternately directed toward one side and then the other to provide an arrangement wherein three cavities each have an apex directed toward one side and the other three cavities have their apexes directed in the opposite direction.

Two contact assemblies are carried in the cavities 30 and as illustrated in FIGURES 4 and 5 each contact assembly 34 includes an elongated strip 36 having three downwardly extending parallel spaced bifurcated tongues 38. The confronting edge portions 40 of each pair of bifurcations 42 are directed outwardly from the plane of the tongues 38. A connecting strap portion 44 is bent at a right angle to the strip 36 and has a tab strip 47 extending therefrom in spaced relation to the strip 36. It should be noted that each contact strip 36 has an offset portion 37 at the end from which the connecting strap 44 extends. This offset portion 37 carries one pair of contact members illustrated as bifurcations 46—46 having the same construction as bifurcations 42—42. The need for this offset will become more apparent when the assembly of the outlet is described. A terminal 48 is connected to each tab strip 47 by means of lug 50 and rivet 52 so that the terminal will be spaced from and parallel to the contact members illustrated as bifurcations 42—42 and 46—46.

A terminal support 54 extends from the back side of the upper body 12 and is spaced outwardly from the con-

tact housing portion 28 to form a channel 56. The terminal support 54 has one face 110 generally flush with the corresponding face of contact housing portion 28 and is somewhat shorter than upper body 12, as seen at 58—58. The faces of portions 58, the bottom of channel 56 and the face of upper body side wall 66 lie in the same plane.

A cavity 60 is provided in the back portion of the upper body 12 in general alignment with the grounding prong receiving openings 24 which extend through the upper body into said cavity. As shown in FIGURE 5, the cavity 60 is bounded at its end by shoulders 62 and 64 and on one side by the contact housing 28 and on the other side by upper body side wall 66.

As previously described, the mounting strap 16 is positioned between the upper and lower bodies 12 and 14. More particularly, the mounting strap 16 comprises end mounting portions 68 and 70 of the conventional type and connecting side strips 72 and 74. Side strip 72 is slightly offset inwardly and so sized that it will fit down into channel 56 while strip 74 is sized so that it will rest smoothly on the upper face of side wall 66. Strip 74 has a pair of spaced projections 78 which pass through openings in ground contact strip 80 and are upset to retain the ground contact strip 80 thereto. The end portions of the contact strip 80 fit down into positioning slots 82 and 84 in shoulders 62 and 64 respectively. Likewise ground strip 86 fits down into cavity 60 parallel to ground contact 80 with its end portions fitting in retaining slots 88 and 90 in shoulders 62 and 64 respectively as indicated by arrow 100. It should be noted that the two ground contact strips 80 and 86 are spaced apart a sufficient amount to provide substantial engagement with grounding plug prongs which pass through D-shaped openings 24 in the upper body 12. Additionally, the ground contact strips are provided with outwardly flared portions 92 which register with openings 24 to facilitate prong contact. Suitable bosses are formed in cavity 60 to provide adequate support for the two ground contact strips 80 and 86.

The mounting strap 16 is provided with a ground terminal 94 which extends perpendicularly downward, with respect to front face 18, from the central portion of side strip 74 and is spaced slightly inward from the vertical face of side wall 66 of the upper body 12. A terminal screw 96 is threadedly carried by terminal 94.

In describing the assembly of the outlet reference can most advantageously be made to FIGURES 3 and 5. In assembling the outlet, the mounting strap 16 with ground contact strip 80 secured thereto is positioned on the back side of the upper body 12 with the side strip 72 fitting down into channel 56 and side strip 74 resting flush on the upper face of side wall 66. Thus the mounting strap 16 will be in the position shown in FIGURE 5 with the end portions of ground contact strip 80 resting in positioning slots 82 and 84 of shoulders 62 and 64 respectively. After this, ground contact strip 86 is positioned in cavity 60 with its end portions fitting into retaining slots 88 and 90 in shoulders 62 and 64. This is indicated by the arrow numbered 100.

As shown in FIGURE 5, the arrow 102 shows the direction and positioning of the uppermost contact and terminal assembly wherein the offset upper contacts 46—46 fit into the triangular cavity designated A, the next lower set of contact fitting into cavity C and the last in cavity E. At the same time, the terminal 48 comes to rest on surface 110 of terminal support 54 with the terminal lugs 49 fitted down into offsets 55. The lower contact and terminal assembly fits into the upper body 12 in a similar manner (see arrow 104) with the offset contacts 46—46 fitting into contact cavity F, the next above contacts fitting into cavity D and the uppermost in cavity B. The terminal fits in the same manner as set forth above with terminal lugs 49—49 fitting into offsets 55—55. The offsetting of the uppermost and lowermost contacts provides a space between the contact strips 36 thereby preventing any short-circuiting between contact strips.

With the triplex outlet so assembled, the lower body 14 is united with the upper body 12. As illustrated in FIGS. 3, 4 and 5, the lower body 14 is sized in outline to generally correspond to the upper body and includes a flat bottom surface 110, end walls 112 and 114 and a side wall 116. These end walls 112 and 114 and side wall 116 form a cavity of such size as to allow the lower body to fit down over the back portion of the upper body. More particularly, the end walls 112 and 114 have flat corner portions that fit down on corresponding corner portions of the upper body. Further these end walls 112 and 114 have recesses 118 sized to fit over the contact housing 28 and slots 120—120 spaced to receive the exposed end portions of ground contacts 80 and 86. These end walls are also provided with positioning slots 122—122 to fit over the outermost contact of each offset pair of contacts. The side wall 116 is provided with a central cut-out 124 formed to fit over and expose ground terminal 94 and associated terminal screw 96.

The lower body side opposite side wall 116 is substantially open to provide access to the terminals 48. A partition 128 is provided in the middle of the open side and has vertical grooves 130—130 in opposite sides in alignment with groove 132 in the corner portion 136 of the lower body. The other corner portion 138 has a similar groove which is not shown due to the angle of the perspective view. These grooves receive the end portions of terminals 48 to firmly position same in the housing in the manner shown in FIGURE 2. Slots 140 are provided to accommodate the lugs 50 of the terminal 48.

The lower body 14 is provided with three spaced parallel longitudinally extending dividers 150, 152 and 154 which fit on either side and between the contact strips 36 to assure required spacing. In addition, conventional means are used to secure the upper and lower body together with the mounting strap to form a completed triplex outlet.

It is of interest to note that the contact assemblies are punched out in flat form as illustrated in FIGURE 4 after which the connecting strap 44 and tab strip 47 are bent either to the left or to the right depending on the position the contact assembly is to assume in the upper body. Even the offsetting of strip portion 37 is in the same direction for both contact assemblies. The advantages of such construction are readily apparent. In addition, the shape and position of the contact cavities 30 make it possible to accurately station the contacts to provide the necessary spacing for safety reasons.

The specific and efficient arrangement of contacts and housing thereof makes it possible to provide a triple unit of the grounding plug type which will conveniently fit into a conventional outlet housing.

As indicated by the objects of this invention it is contemplated that the novel combination of this invention could be realized in outlets other than a triplex unit. For example, if it is desired to produce a duplex unit the only changes required would be the elimination of the end pairs of contacts of each contact assembly opposite the offset pairs. Secondly, the corresponding contact receiving cavities would be eliminated. These changes when combined with appropriate changes in the size of the housing and mounting strap to reflect such deletions would result in a duplex outlet rather than a triplex outlet. Modifications such as this are well within the skill of the art and, therefore, will not be described further.

What is claimed is:

1. A multiplex grounding outlet adapted to accommodate a plurality of conventional grounding plugs, said outlet comprising an insulated housing having an upper and a lower body, said upper body having a front face provided with a plurality of grounding plug receiving units, each unit having a pair of spaced slots adapted to accommodate spaced plug prongs and an opening spaced laterally from said slots adapted to receive a grounding

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prong, said slots and openings being aligned in kind on said front face, the upper body having contact holding cavities in the back portion thereof aligned with and communicating with each slot, a pair of contact assemblies mounted in the back portion of the upper body, each contact assembly including spaced and interconnected contacts, said contact holding cavities being configured such that alternate cavities will only accommodate contacts of a given contact assembly, said contact assemblies fitting into the upper body with their respective contacts fitting in alternate contact holding cavities, whereby a space is provided between the contacts of the pair of contact assemblies, grounding contact means mounted in the back portion of the upper body in alignment with respective openings in the front face, grounding terminal means connected to said grounding contact means, the lower body being configured to interfit with the exposed back portion of the upper body to provide a closed assembly, said lower body having dividing means to maintain the spaced contact assemblies in required spaced relation.

2. The invention as described in claim 1 and wherein one end contact of each contact assembly is offset with respect to the other contacts of that assembly whereby a space is provided between the contacts of the pairs of contact assemblies.

3. The invention as described in claim 2 and wherein a mounting strap is provided between the upper and lower bodies.

4. The invention as described in claim 1 and wherein the dividing means comprises three downwardly extending dividers fitting on either side of and between the contact assemblies.

5. A multiplex grounding outlet adapted to accommodate a plurality of conventional grounding plugs, said outlet comprising an insulated housing having an upper and a lower body with a mounting strap therebetween, said upper body having a front face provided with a plurality of grounding plug receiving units, each unit having a pair of spaced slots adapted to accommodate spaced plug prongs and an opening laterally spaced from said slots adapted to receive a grounding prong, said slots and openings being aligned in kind on said front face, the upper body having a back portion with cavities aligned and communicating with each slot, a pair of contact assemblies mounted in the back portion of the upper body, each contact assembly comprising a contact strip with a plurality of pairs of contacts extending therefrom, a contact pair at one end of each contact strip being offset with respect to the others, aforesaid cavities being configured such that alternate cavities will only accommodate the contact pairs of a given contact assembly, the contact assemblies being assembled in the back portion of the body with their contact pairs in alternate cavities, the offset end contact pair of each assembly being disposed in opposite end cavities whereby a longitudinal space is provided between the contact strips and associated contacts, terminal means connected to the pair of contact assemblies, grounding contact

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means mounted in the back portion of the upper body in alignment with the openings in the front face, said grounding contact means being affixed to the mounting strap, grounding terminal means connected to said grounding contact, aforesaid lower body being configured to interfit with the exposed back portion of the upper body to provide a closed assembly, said lower body having three spaced parallel dividers fitting on either side of and between the two contact strips to maintain same in required spaced relation.

6. A triplex grounding outlet adapted to accommodate three conventional grounding plugs, said outlet comprising an insulated housing having an upper and a lower body with a mounting strap therebetween, said upper body having a front face provided with three grounding plug receiving units, each unit having a pair of spaced slots adapted to accommodate spaced plug prongs and an opening laterally spaced from said slots adapted to receive a grounding prong, said slots and openings being aligned in kind on said front face, the upper body having a back portion with cavities aligned and communicating with each slot, a pair of contact assemblies mounted in the back portion of the upper body, each contact assembly comprising a contact strip with three pairs of contacts extending therefrom, a contact pair at one end of each contact strip being offset with respect to the other two, aforesaid cavities being configured such that alternate cavities will only accommodate the contact pairs of a given contact assembly, the contact assemblies being assembled in the back portion of the body with their contact pairs in alternate cavities, the offset end contact pair of each assembly being disposed in opposite end cavities whereby a longitudinal space is provided between the contact strips and associated contacts, terminal means connected to the pair of contact assemblies, grounding contact means mounted in the back portion of the upper body in alignment with the openings in the front face, said grounding contact means being affixed to the mounting strap, grounding terminal means connected to said grounding contact, aforesaid lower body being configured to interfit with the exposed back portion of the upper body to provide a closed assembly, said lower body having three spaced parallel dividers fitting on either side of and between the two contact strips to maintain same in required spaced relation.

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U.S. Cl. X.R.

339—157