

Dec. 12, 1967

J. H. GAINES ET AL

3,358,261

ELECTRICAL RECEPTACLE DEVICE

Filed July 6, 1965

4 Sheets-Sheet 1

FIG. 1.

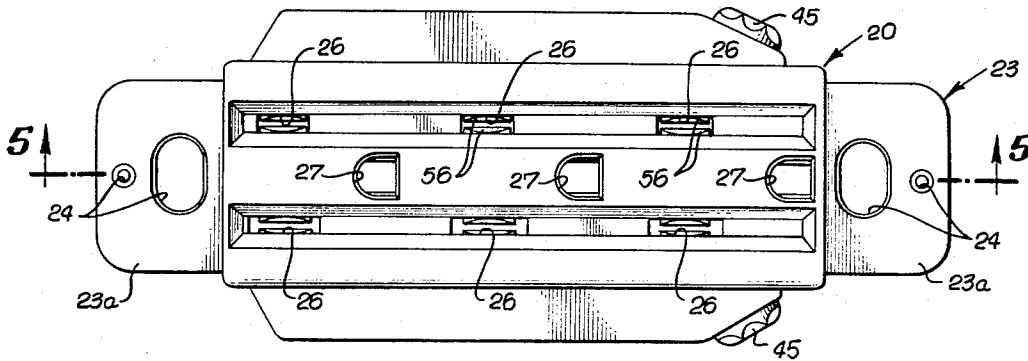


FIG. 2.

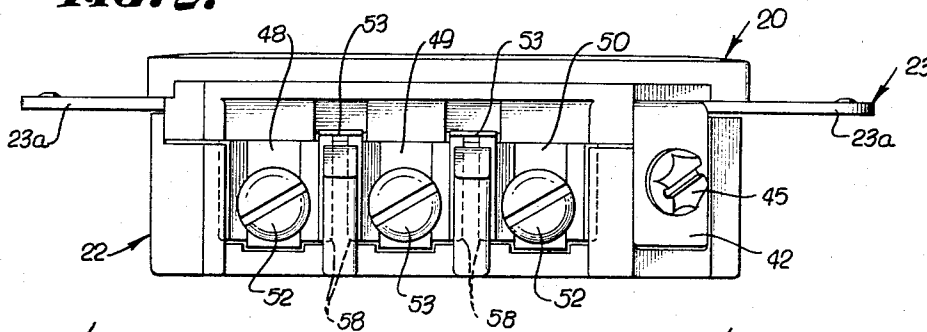


FIG. 3.

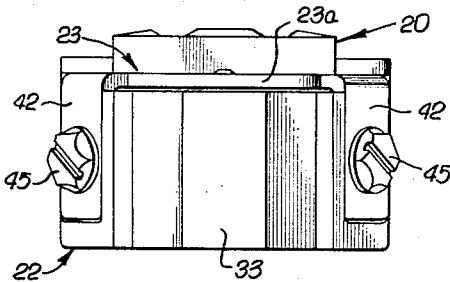


FIG. 4.

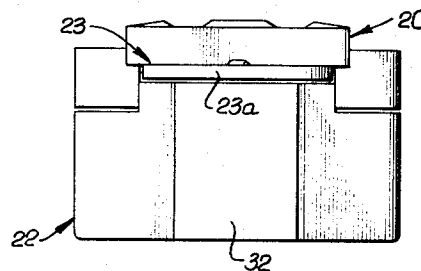
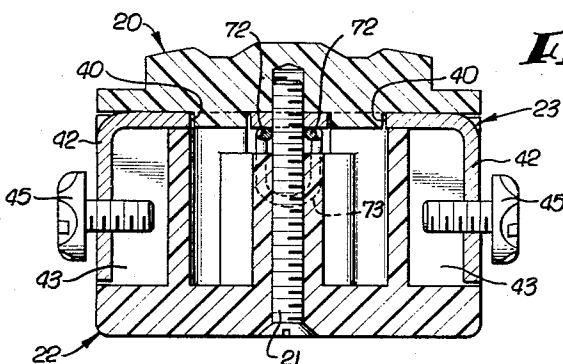


FIG. 11.



INVENTORS.
JACK H. GAINES
FRANCIS K. BOURHENNE
RUSSELL C. EDMISSON
By *White & Haefliger*
ATTORNEYS.

Dec. 12, 1967

J. H. GAINES ET AL

3,358,261

ELECTRICAL RECEPTACLE DEVICE

Filed July 6, 1965

4 Sheets-Sheet 2

FIG. 5.

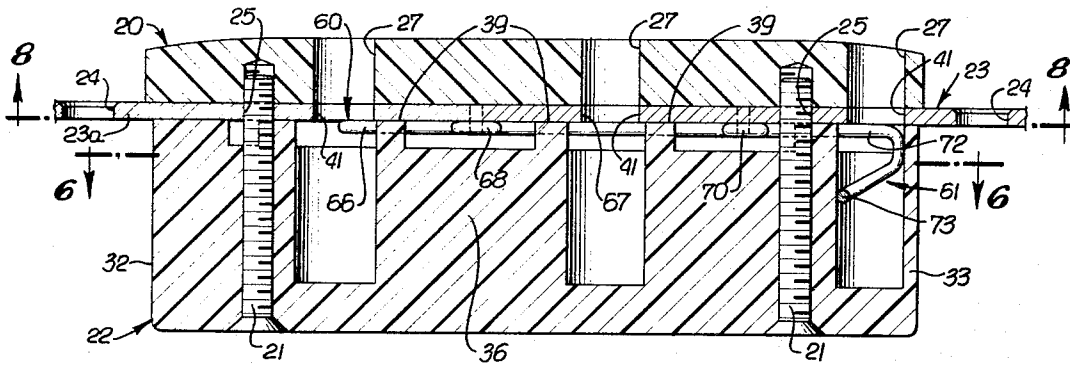


FIG. 6.

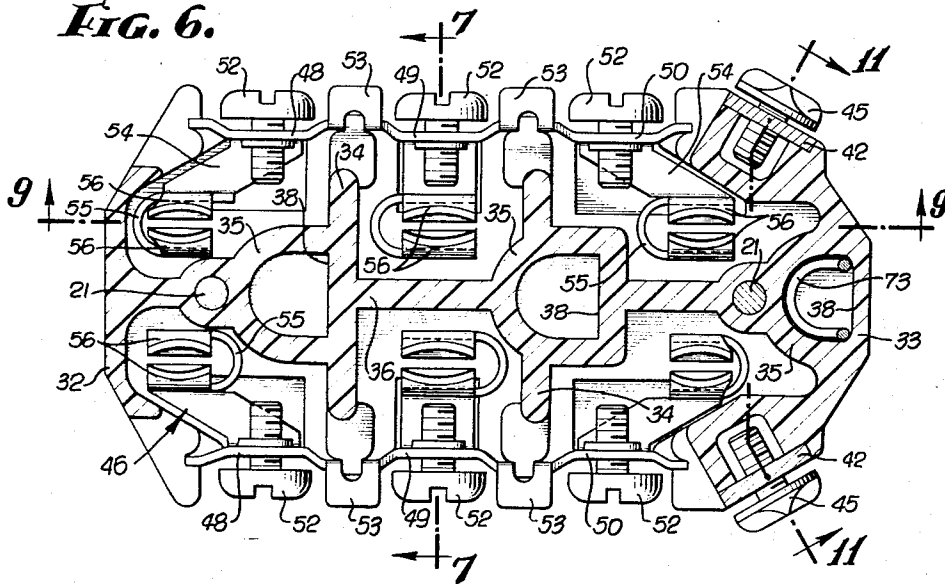
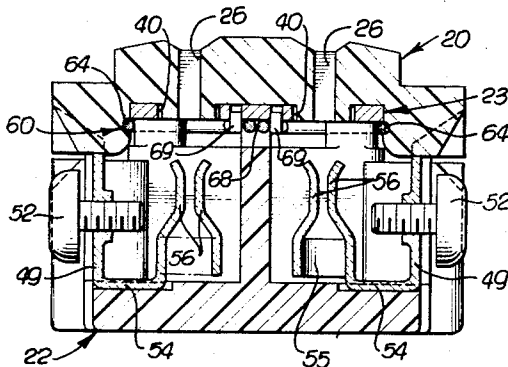


FIG. 7.



INVENTORS.
JACK H. GAINES
FRANCIS K. BOURHENNE
RUSSEL C. EDMISSON
 By *White & Haefliger*
 ATTORNEYS.

Dec. 12, 1967

J. H. GAINES ET AL

3,358,261

ELECTRICAL RECEPTACLE DEVICE

Filed July 6, 1965

4 Sheets-Sheet 3

FIG. 8.

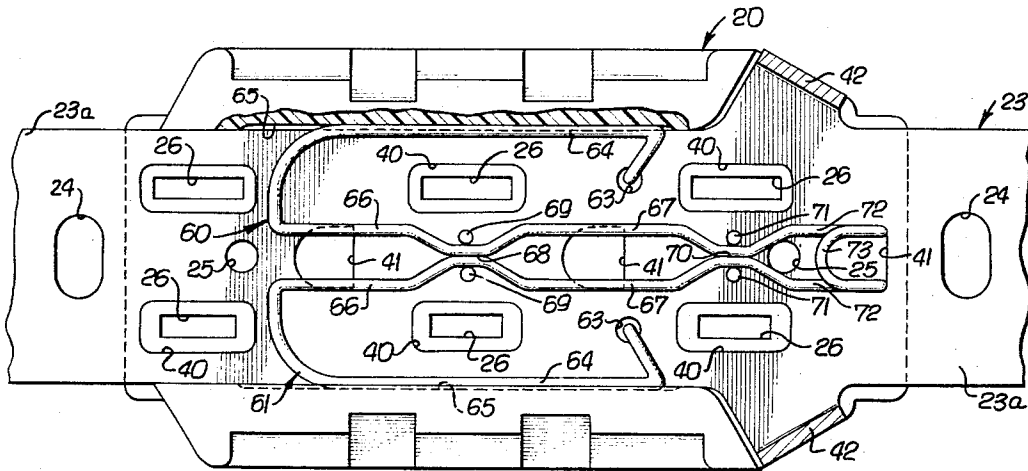


FIG. 9.

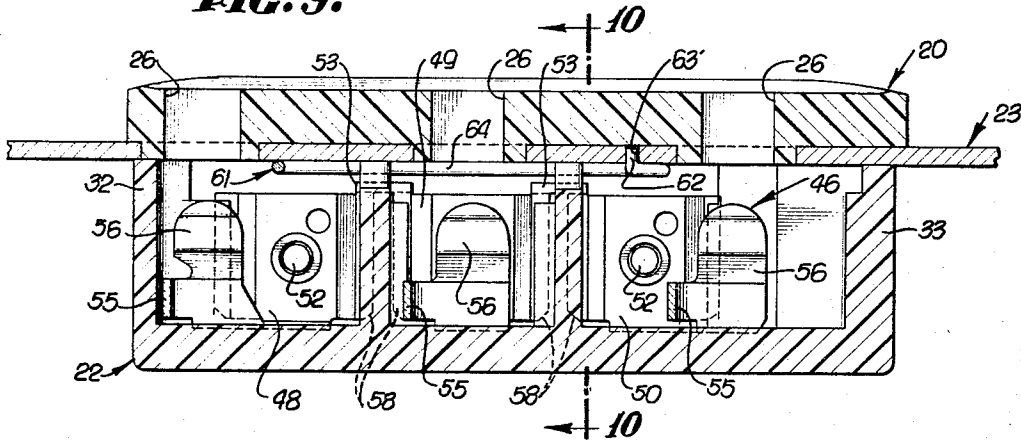
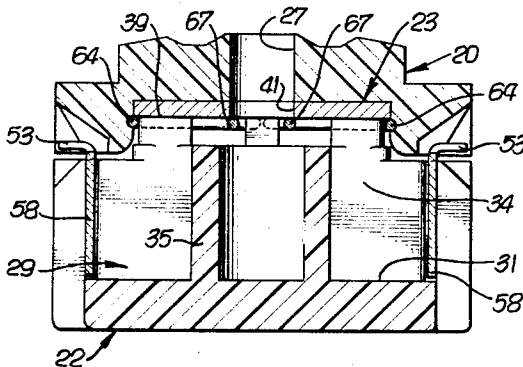


FIG. 10.



INVENTORS.
JACK H. GAINES
FRANCIS K. BOURHENNE
RUSSEL C. EDMISSON
By *White & Haefliger*
ATTORNEYS.

Dec. 12, 1967

J. H. GAINES ET AL

3,358,261

ELECTRICAL RECEPTACLE DEVICE

Filed July 6, 1965

4 Sheets-Sheet 4

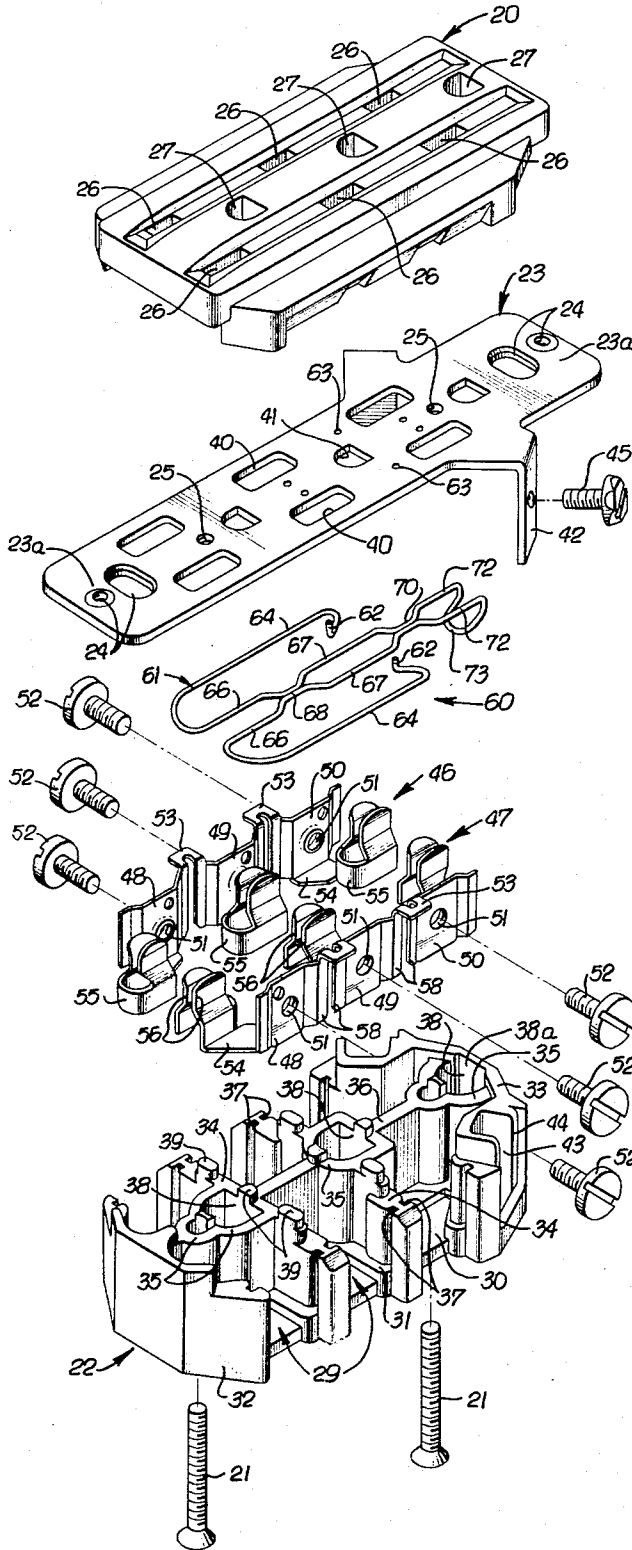


Fig. 12.

INVENTORS.
JACK H. GAINES
FRANCIS K. BOURHENNE
RUSSELL C. EDMISSON
By *White & Haefliger*
ATTORNEYS.

1

3,358,261

ELECTRICAL RECEPTACLE DEVICE

Jack H. Gaines, Long Beach, Francis K. Bourhenne, Lawndale, and Russell C. Edmisson, Bellflower, Calif., assignors to Sierra Electric Corporation, Gardena, Calif., a corporation of California

Filed July 6, 1965, Ser. No. 469,638

7 Claims. (Cl. 339-14)

ABSTRACT OF THE DISCLOSURE

The invention is directed primarily to grounding contact means in a multiplex type of electrical receptacle wherein a mounting strap is contained between body and cover sections of the receptacle and the cover section and strap are apertured to form aligned pairs of blade passing slots and aligned grounding pin openings between the slot alignments.

The grounding contact means is in the form of a resilient conductive wire contacting the mounting strap and having spaced portions aligned with the grounding pin openings to receive and be contacted by grounding pins, the grounding wire having oppositely deflected extents bearing against opposite side surfaces of the body and terminating in the strap.

This invention has to do with improvements in electrical receptacles of the multiplex type, i.e. adapted to receive conventional two-blade, single grounding pin plug-in caps at a succession of locations. Being so adapted, the receptacle comprises insulative body and cover or face plate sections, the latter having successive pairs of blade passing apertures and a corresponding number of aligned grounding pin apertures, all of which are engageable with respective contacts or conductors within the body.

More particularly, the invention applies to such receptacles employing a conductive mounting strap held between the cover and body sections, and apertured in accordance with the face plate openings to pass the cap blades and grounding pins.

The invention has for its principal object to provide within the body an improved type and form of contact means receptive of the grounding pins and in conductive relation with the mounting strap.

As to this feature, the invention contemplates preferably a grounding conductor in the form of a single wire element applied to the body side of the mounting strap and having spaced extents in such alignment with the plug-in apertures as to receive between them the pins in assured grounding contact. As will appear, such accommodation of the pins may effectively be provided by forming the wire with successive substantially parallel extents corresponding in number to the grounding pins to be received. Otherwise, and for retained accommodation to the strap, the wire may have terminals held to the strap by reception therein, and in its continuity, a return bend beyond the contact extents, all as will later appear.

The invention has for its further object to provide such grounding wire contact in operative relation to a pair of positive and neutral contact series, the latter preferably being so related by initially interconnecting break-out portions as to permit isolation electrically of successive pairs of blade contacts.

The invention has various additional particular features and details, all of which will appear from the following description of an illustrative embodiment of the invention shown by the accompanying drawings in which:

FIG. 1 is an elevation showing the face plate surface of the receptacle;

FIG. 2 is a side elevation of FIG. 1;

2

FIGS. 3 and 4 are right end and left end elevations, respectively, of FIG. 2;

FIG. 5 is a longitudinal cross section on line 5-5 of FIG. 1;

FIG. 6 is a section in the plane of line 6-6 of FIG. 5; FIG. 7 is a cross section on line 7-7 of FIG. 6;

FIG. 8 is a view looking upwardly at the underside of the mounting plate as indicated by line 8-8 of FIG. 5; FIG. 9 is a cross section on line 9-9 of FIG. 6;

FIG. 10 is a cross section on line 10-10 of FIG. 9; FIG. 11 is a section taken on broken line 11-11 of FIG. 6; and

FIG. 12 is an exploded view showing in perspective the various components of the receptacle.

The receptacle may be described generally as comprising a cover section or face plate 20 attached by screws 21 to a body 22, both the cover and body being non-conductive and molded of suitable thermo setting plastic. Retained between the sections 20 and 22 is a mounting and grounding metallic strap 23 having terminals 23a appropriately apertured as at 24 for mounting purposes. As illustrated, screws 21 pass through apertures 25 in strap 23 to securely clamp and retain the strap between the cover and body sections of the receptacle.

In particular reference to FIGS. 1 and 12, the cover or face plate section 20 is shown to contain opposed pairs of slotted openings 26 adapted to pass the positive and neutral blades of conventional grounded caps which plug in through the openings 26 to establish blade engagement with later described positive and neutral contacts, the cap grounding pins being insertable through openings 27 into engagement with a common ground contact to be later described. Merely as illustrative, the invention will be described as embodied in a so-called triplex receptacle, having three sets of cap blade and grounding pin apertures 26 and 27 adapted selectively to receive any or all of three plug-in caps.

Referring next to the receptacle body section 22, its structure and configuration appear to particular advantage in FIGS. 6 and 12 wherein the body is shown to be molded with laterally opening cavities generally indicated at 29, defined by bottom surfaces 30 between shoulders 31, end walls 32 and 33, transverse intermediate walls 34, and curved walls 35, the cavities being centrally separated by walls 35 and longitudinal central partitions 36. Toward the outsides, the walls defining the cavities 29 are vertically grooved at 37 to receive the later described positive and neutral contact assemblies which are inserted downwardly to rest on the surfaces 30. Walls 35 also contain and define recesses 38 which accommodate the cap grounding pins inserted through the later described grounding wire. The top surfaces of the various dividing walls of the body to which reference has been made, are molded to have upward equal height projections 39 upon which the strap 23 rests.

Again in reference to FIG. 12, as well as FIG. 8, the body of the strap 23 is flat and contains openings 40 registerable with the cover plate slots 26, and also openings 41 which register with the grounding pin-passing openings 27 in the cover. At opposite sides and toward one end, the strap has a pair of opposed, down-turned ears 42 receivable within the body recesses 43 to bear against shoulders 44, the ears carrying ground wire screws 45.

The body 22 contains two sets or series of positive and neutral contacts generally indicated at 46 and 47 in FIG. 12, and having identical formation. Each of the metallic conductor series includes sections 48, 49 and 50 threaded at 51 to receive line connector screws 52 and interconnected by outwardly turned flanges 53, which may be broken off to electrically isolate any of the three receptacle units composed of a pair of the blade receiving and

single grounding contacts. Each of the sections 48 to 50 has an inwardly projecting base portion 54 and an integral curved end extension 55 which in turn is formed integrally with a pair of upwardly projecting blades 56 adapted to receive between them the plugged-in cap blades inserted through the face plate slots 26. The contact blade pairs 56 are received within the body cavities 29, and the series 46 and 47 are insertable downwardly therein by registering the edge portions 58 of the sections 48 to 50 within the vertical grooves 37.

Provision is made for a common ground conductor, generally indicated at 60, interposed between the body 22 and the undersurface of the strap 23, the conductor being engageable by any or all of the cap grounding pins insertable through the openings 27. The conductor 60 has the form of a wire 61 terminally bent to form ends 62 projecting into and retained within openings 63 in the strap 23. From these terminals the wire has parallel extents 64 which are resiliently received within the face plate grooves 65, see FIGS. 8 and 10, these parallel extents of the wire thence converging to parallel portions 66 and 67 which centrally underlie one pair of the grounding pin openings 27 and between which the wires converge at 68 and are so retained by the confining strap projections 69. The wires similarly converge and are releasably retained together at 70 by the strap projections 71, beyond which the wires again diverge to parallel extents 72 having a common loop terminal 73 received within the body and recess 38a.

In assemblage, the contact series 46 and 47 are insertable downwardly into the body cavities as previously explained, and with the grounding conductor 60 applied to an undersurface of the strap 23 as illustrated in FIG. 8, the strap is then applied to overlie the body cavities, followed by application of the cover face plate 20 and its attachment to the body by screws 21. The cover slots 26 thus are aligned with the respective contact blades 56, and openings 27 are aligned as illustrated in FIG. 8 with the spacing between the grounding conductor extents 66, 67 and 72 so that upon insertion, the plug-in cap grounding pins will engage between and resiliently deflect the corresponding parallel wire extents to afford secure contact in conductive association with the strap 23.

We claim:

1. An electrical receptacle comprising insulative body and cover sections, a conductive mounting strap held between the sections, said cover section and strap having a succession of aligned pairs of opposed positive and neutral cap blade passing apertures and having also a corresponding number of grounding pin apertures in spaced aligned relation between the blade aperture alignments, parallel series of contacts in the body section adapted to receive said blades, and a grounding wire conductor contacting said strap and having spaced portions corresponding in number and aligned with said grounding pin apertures to receive cap grounding pins between them, said conductor having oppositely deflected extents bearing against opposite side surfaces of the body,

2. An electrical receptacle according to claim 1, in which said wire conductor extents are received within recesses in the body.

3. An electrical receptacle according to claim 2, in which said wire conductor extents have ends terminating in said strap.

4. An electrical receptacle comprising insulative body and cover sections, a conductive mounting strap held between the sections, said cover section and strap having a succession of pairs of opposed positive and neutral cap blade passing apertures and having also a corresponding number of grounding pin apertures in spaced aligned relation, parallel series of contacts in the body section adapted to receive said blades, and a grounding wire conductor contacting said strap and having spaced portions corresponding in number and aligned with said grounding pin apertures to receive cap grounding pins between them, said wire conductor extending continuously between ends terminating in said strap and having three spaced parallel extents receptive of grounding pins, said wire conductor having also beyond said parallel extents a return bend deflected from the plane of the wire into a recess in the body.

5. An electrical receptacle comprising insulative body and cover sections, a conductive mounting strap held between the sections, said cover section and strap having a succession of pairs of opposed positive and neutral cap blade passing apertures and having also a corresponding number of grounding pin apertures in spaced aligned relation, parallel series of contacts in the body section adapted to receive said blades, and a grounding wire conductor contacting said strap and having spaced portions corresponding in number and aligned with said grounding pin apertures to receive cap grounding pins between them, said wire conductor extending continuously between ends terminating in said strap and having three spaced parallel extents receptive of grounding pins, said strap carrying projections engaging and confining convergent portions of the wire conductor between its said parallel extents.

6. An electrical receptacle according to claim 5, in which said wire conductor has beyond said parallel extents a return bend deflected away from the body side of the wire into a recess in the body.

7. An electrical receptacle according to claim 6, in which said cover section contains three successive pairs of opposed positive and neutral cap blade passing apertures and a corresponding number of said grounding pin apertures.

References Cited

UNITED STATES PATENTS

2,268,090	12/1941	Windsor	339—157 X
3,036,285	5/1962	Smith	339—14
3,126,239	3/1964	Winter et al.	339—14
3,151,923	10/1964	Bell et al.	339—18

MARVIN A. CHAMPION, *Primary Examiner*.

PATRICK A. CLIFFORD, *Examiner*.