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PATENT REQUEST: STANDARD PATENT/PATENT OF ADDITION

We, being the persons identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow.

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[70] Nominated Person: LEGRAND and LEGRAND SNC

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[54] Invention Title: MULTISOCKET MODULE FOR SOCKET OUTLETS

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BASIC CONVENTION APPLICATION(S) DETAILS

[31] Application Number	[33] Country	Country Code	[32] Date of Application
93 15545	FRANCE	FR	23 DECEMBER 1993

Basic Applicant(s): LEGRAND

Drawing number recommended to accompany the abstract .....

By our Patent Attorneys,
WATERMARK PATENT & TRADEMARK ATTORNEYS

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Stephen K. Plymin
Registered Patent Attorney

DATED this 21st day of December 1994

MU63449 211294

Section 29 (1)
Regulation 3.1 (2)

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NOTICE OF ENTITLEMENT

We, LEGRAND and LEGRAND SNC, both of 128 Avenue Du Marechal De Lattre De Tassigny 87045, Limoges, France, being the applicant in respect of Application No. 81644/94 state the following:-

The Persons nominated for the grant of the patent have entitlement from the actual inventor by assignment.

The persons nominated for the grant of the patent have entitlement from the applicant of the basic application listed on the patent request form by assignment.

The basic application listed on the request form is the first application made in a Convention country in respect of the invention.

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By our Patent Attorneys,
WATERMARK PATENT & TRADEMARK ATTORNEYS

17th January, 1997

Stephen K. Plymin

Registered Patent Attorney

AU9481644

(12) PATENT ABRIDGMENT (11) Document No. AU-B-81644/94
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 677737

(54) Title
MULTISOCKET MODULE FOR SOCKET OUTLETS

International Patent Classification(s)
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(21) Application No. : 81644/94 (22) Application Date : 21.12.94

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(31) Number	(32) Date	(33) Country
93 15545	23.12.93	FR FRANCE

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LEGRAND; LEGRAND SNC

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(56) Prior Art Documents
UK 2262398
EP 294568
FR 2285731

(57) Claim

1. A multisocket module including an insulative material elongate casing having a group (G) of connecting terminals at opposed ends thereof, at least two separate plug-receiving sockets mounted in and spaced lengthwise of said casing, all conductive members of the module including at least two bus conductors interconnecting one of the groups (G) of connecting terminals with the other of the groups of terminals being housed in said casing, exteriorly accessible contact members in vertical alignment with each of said sockets adapted to cooperate with contacts of a plug, said contact members forcibly engaging the bus conductors, said casing having two parts, including an upper part or body defining a body and housing said contact members and a lower part or back defining a back member of said casing, each of said sockets comprising a separate faceplate also separate from said casing and attached to the upper part of said casing, said faceplates having holes for plug contact access to said contact members.

P/00/011 28/5/91
Regulation 3.2(2)

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ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT

Application Number:

Lodged:

Invention Title: MULTISOCKET MODULE FOR SOCKET OUTLETS

The following statement is a full description of this invention, including the best method of performing it known to us :-

MULTISOCKET MODULE FOR SOCKET OUTLETS.

The present invention is generally concerned with multisocket modules for socket outlets of the kind including an elongate insulative material casing equipped with a group of connecting terminals at each end and enclosing all the necessary conductive members and at least two separate sockets spaced lengthwise of said casing, each adapted to receive a plug, the conductive members including at least two continuous bus conductors extending from one group of connecting terminals to the other and, in vertical alignment with each of the sockets, socket contact members accessible from the exterior and adapted to cooperate with the contact members of a plug.

Unlike a multisocket outlet extension, which is normally designed to be used on its own and without being fixed in position, and which for safety reasons is therefore fitted with a power cord at one end only, a multisocket module has connecting terminals at both ends because, although this is not essential, it is usually adapted to be used within an enclosure, such as trunking, for example, which protects the connecting terminals.

The present invention is more particularly directed to the situation in which, to obtain further benefit from the presence of the bus conductors, the contact members of the sockets are merely forcibly engaged on the latter.

This arrangement has long been known in itself, for example from French patent application No 74 31657 filed 19 September 1974, publication number 2 285 731.

In French patent No 74 31657 the sockets are merely sockets spaced lengthwise of the bus conductors which are merely insulated conductors, without the combination being enclosed in any kind of casing.

This arrangement has the merit of simplicity.

However, as the contact members of the sockets are not enclosed, safety is compromised.

In European patent application No 90201615 filed 19 June 1990, publication number 462 329, a casing is provided for reasons of safety.

In this European patent application the casing is in two parts.

It has a bottom part or body which encloses all the contact members,

which in practise fits over the bus conductors from below, and a one-piece top part or cover which constitutes all the sockets, the latter in practise comprising holes providing access to their contact members.

This arrangement has the advantage of enabling assembly of the device merely by stacking its component parts.

However, it has the drawback of not admit of easy modification of the number of sockets.

A general object of the present invention is a multisocket module which admits of easy modification of the number of sockets and has other advantages.

This multisocket module is of the kind comprising an insulative material elongate casing provided with a group of connecting terminals at both ends and enclosing all conductive members of the module and, spaced lengthwise of said casing, at least two separate sockets each adapted to receive a plug, said conductive members including at least two continuous bus conductors which extend from one group of connecting terminals to the other and, in vertical alignment with each socket, socket contact members accessible from the exterior, adapted to cooperate with the contact members of a plug and forcibly engaged on the bus conductors, characterized in that the casing being formed in two parts, an upper part or body enclosing the contact members, a lower part or back, the sockets each include a faceplate separate from the casing and attached to the upper part thereof, with holes providing access to their contact members.

Accordingly, all that is needed to change from a multisocket module having a given number of sockets to a multisocket module having a different number of sockets is to change both parts of the casing.

However, the sockets being formed by separate faceplates, and the latter being advantageously of standardized manufacture suitable for all multisocket modules, regardless of the number of sockets, the change to be effected advantageously and economically relates to only a moderate part of the assembly.

The conductive members, on the one hand, whether these are bus conductors or contact members of the sockets, and the connecting terminals, on

the other hand, are advantageously identical, only the length of the bus conductors varying according to the number of sockets; in practise it is a very simple matter to cut the bus conductors to the required length, as and when necessary.

Furthermore, it is likewise advantageously simple to modify the distance between sockets from one multisocket module to another, should this be required.

European patent application No 87104780 filed 1 April 1987, publication No. 240 916, discloses a multisocket module whose casing is also in two parts, a top part or body enclosing the contact members of the various sockets and a bottom part or back.

However, in this European patent application the contact members of the sockets are not forcibly engaged on the bus conductors.

To the contrary, they are in one piece with them.

Also the one-piece top part or body of the casing itself constitutes the faceplates or the sockets.

Apart from the fact that the back contains a fixing device operated through the top part of the casing, which makes the implementation of the assembly particularly complex, a result of these two features is that it is not possible to modify the number of sockets.

The multisocket module of the invention has the advantage that this is no longer the case.

The features and advantages of the invention will emerge from the following description given by way of example with reference to the appended diagrammatic drawings in which:

figure 1 is a locally cut away perspective view of a multisocket module of the invention;

figure 2 is an exploded perspective view of it;

figure 3 is a view of the lower part of the casing of this multisocket module in longitudinal section on the line III-III in figure 2;

figure 4 is a view of this lower part of the casing in transverse section on the line IV-IV in figure 2;

figure 5 is a view of the upper part of the casing in longitudinal section on the line V-V in figure 2;

figure 6 is a view of this upper part of the casing in transverse section on the line VI-VI in figure 2;

figure 7 shows to a larger scale the part of figure 5 identified by a frame VII in figure 5;

figures 8, 9 and 10 are perspective views to a larger scale of the components identified by the frames VIII, IX and X in figure 2.

As shown in the figures, and in a manner that is known in itself, the multisocket module 10 of the invention includes an elongate casing 11 made from an insulative material and equipped with a group G of connecting terminals 12 at each end. As will be described in more detail below, it encloses all the necessary conductive members and has, disposed side by side lengthwise of the upper surface of the casing 11, at least two separate sockets 14 each adapted to have a plug (not shown) plugged into it.

In the embodiment shown there are only two sockets 14.

The conductive members enclosed in the casing 11 include at least two continuous parallel bus conductors 15 extending from one group G of connecting terminals 12 to the other and, vertically aligned with each socket 14, socket contact members 16, 16' accessible from the outside, on the upper surface of the casing 11, adapted to cooperate with complementary contact members of a plug and forcibly engaged on the bus conductors 15, as will also be described in more detail below.

In the embodiment shown each socket 14 includes two phase contact members 16 in a reverse parallel arrangement and each forming in the median longitudinal plane of the casing 11 a receptacle 18 into which pins of a plug are inserted and a ground contact 16' which in this embodiment carries a projecting pin 19 defining a triangle with the receptacles 18 of the phase contact members 16, this pin cooperating with a corresponding receptacle in the plug.

In the embodiment shown there are therefore three spaced bus conductors 15.

In practise the casing 11 is in two parts 11A, 11B, respectively an upper

part or body which encloses the contact members 16, 16' and a bottom part or back. In accordance with the invention, each socket 14 includes an embellisher 20 separate from the casing 11 and attached to the upper part 11A of the latter, having holes 21, 21' in it for access to the contact members 16, 16'.

In the embodiment shown, the faceplate 20 of a socket 14 has a front skirt 23 which is generally rectangular, in practise square, substantially parallel to the lower part 11B or back of the casing 11 and, set back from this skirt 23, in the central area of the latter, a well 24 which has a generally circular transverse section and the bottom 25 of which has the necessary holes 21, 21' in it.

In practise two holes 21 are provided, one for each phase contact member 16, in line with the corresponding receptacles 18 and substantially on the diameter of the bottom 25 of the well in the median longitudinal plane of the casing 11.

Only one of these holes 21 can be seen in the figures.

Conjointly, the faceplate 20 of a socket 14 includes only one hole 21' for the pin 19 of the ground contact member 16'.

The bottom 25 of the well 24 of a faceplate 20 also has a hole 26 for a screw 27 for fixing the faceplate 20 to the casing 11, this screw being screwed into a screwthreaded hole 28 provided for this purpose at a corresponding location in the upper part 11A of the casing.

In the embodiment shown the hole 26 is at the center of the bottom 25 of the well, between the two holes 21.

This leaves room for a further hole (not shown) diametrally opposite the hole 21' to receive a polarizer on the plug, if required.

As this provision is not relevant to the present invention it is not described here.

As an alternative, and in particular if there is no polarizer, the hole 26 can be diametrally opposite the hole 21'.

The faceplate 20 of a socket 14 can be equipped with a known safety device or "shutter" which normally covers the holes 21 and which is retracted by the pins of a plug when the plug is inserted.

These provisions are not relevant to the present invention either and are

not described here.

In the embodiment shown the faceplate 20 of a socket 14 has a rim 29 all around its perimeter.

In practise the faceplates 20 of the sockets 14 are contiguous along one side of their skirt 23.

In the embodiment shown the bus conductors 15 are substantially at the interface between the upper and lower parts 11A, 11B of the casing 11.

They are therefore substantially coplanar.

In practise they are equally spaced and comprise, for example, bare round copper or brass rods.

The contact members 16, 16' of a socket 14 include at least one flange 30 incorporating a slot 31 by means of which they are forced onto a bus conductor 15.

In accordance with the invention, this slot 31 is open at the end towards the lower part 11B of the casing 11.

In practise the contact members 16, 16' have two parallel flanges 30 linked by a median part 32 and each including a slot 31.

For the phase contact members 16 the flanges 30 are extended laterally and, in a manner that is known in itself, they are shaped so that together they define the respective receptacle 18.

For the ground contact member 16' the median part 32 is extended laterally and at a distance from the flanges 30 carries the projecting pin 19, which is riveted to it, for example.

In the embodiment shown this median part 32 is vertically aligned in the casing 11 with a screwthreaded hole 28 and has a hole 67 in it for the corresponding screw 27.

In accordance with the invention, the connecting terminals 12 are also forcibly engaged on the bus conductors 15.

In practise they are conventional screw terminals 33. Their body 34 has a slot 35 at the bottom for forcible engagement on a bus conductor 15. The slot 35 is open at the end towards the lower part 11B of the casing 11, as described for the contact members 16, 16'.

The upper and lower parts 11A, 11B of the casing 11 are not described in complete detail here.

Only their parts needed to understand the invention are described.

The upper part 11A has a floor member 36 which is generally rectangular in plan view and has, projecting upwards from its longitudinal sides, two flanges 37 each forming two uprights 38 at each end. A projection 39 in their central area has a height slightly less than that of the uprights 38.

For each socket 14 the floor member 36 has two cells 40 disposed in a reverse parallel arrangement on either side of the screwthreaded hole 28. Adapted to receive the phase contact members 16, they have an opening 41 in their base over at least part of their length for the flanges 30 of the latter contact members.

In the embodiment shown the phase contact members 16 have at least one lateral lip 42 adapted to cooperate with a retaining shoulder 43 in corresponding relationship to it on one flank of the corresponding cell 40 of the floor member 36 on the upper part 11A of the casing 11, facing towards the lower part 11B of the latter.

In practise two lips 42 are provided on each phase contact member 16, one for each flange 30, and the lips 42 on respective sides of the corresponding receptacle 18 diverge in the direction away from the slots 31 in the flanges 30.

Conjointly, the flanks of a cell 40 of the floor member 36 each have a shoulder 43 preceded by a bevel 44.

Conjointly, for each socket 14, the floor member 36 has a hole 46 for the pin 19 of the corresponding ground contact member 16'.

In the embodiment shown the connecting terminals 12 are accommodated in cells 47 which are in one piece with the upper part 11A of the casing 11.

To this end, the cellular floor 36 of the casing has an extension 48 at each end including three aligned cells 47.

Each of these cells 47 is open laterally to the exterior through a notch 49 at its base, providing access to the corresponding connecting terminal 12.

In the embodiment shown each of the uprights 38 formed on the upper

part 11A of the casing 11 has on its outside a groove 50 preceded by a bevel 51 for clipping it onto a support frame (not shown).

The flanges 37 are slightly curved between an upright 38 and the corresponding projection 39, for an optimum match to the shape of the well 24 of the sockets 14.

The lower part or back 11B of the casing 11 is a generally rectangular plate with a rim 52 around all of its perimeter.

It has three projections 53 spaced along its transverse sides and in one piece with the rim 52. They nest in the corresponding notches 49 on the upper part 11A.

In the embodiment shown clipping means are operative between the upper and lower parts 11A, 11B of the casing 11.

These clipping means include at least two lugs 54, 55 on the lower part 11B and forming hooks which cooperate with tabs 56, 57 provided for this purpose on the upper part 11A.

In the embodiment shown there are two lugs 54 at each end of the casing 11 and at least two lugs 55 in its median area.

In the embodiment shown only two lugs 55 are provided in the median area of the casing 11.

There could be more than two lugs for a number of sockets 14 greater than two, however.

All the lugs 54, 55 extend in a generally longitudinal direction.

The hook part of the lugs 54 is in the same plane as the remainder of the lug.

That of the snap-fastener lugs 55 is in a plane perpendicular to the plane of the remainder of the lug.

The hook part of all the snap-fastener lugs 54, 55 faces outwards.

The corresponding tabs 56, 57 on the upper part 11 project inside the well 58, 59 through the floor member 36 thereof.

They are preceded by bevels 60, 61.

In addition to the rim 52 and the lug 54, 55, the lower part 11B of the casing 11 carries an array of projecting stiffener ribs which also provide all the

necessary insulation between the bus conductors 15.

They can also locate these conductors, if required.

The lugs 54 are set back relative to the transverse sides of the lower part 11B and the lugs 55 are set back relative to its longitudinal sides with a recessed notch in front of them.

The upper part 11A or lower part 11B of the casing 11 preferably includes, as shown here, nesting means 62 at one end at least for optionally coupling an auxiliary compartment (not shown), for example a compartment containing a cable clamp.

In the embodiment shown there are nesting means 62 at both ends of the casing 11 and they include, projecting from respective opposite sides of the part 11A, 11B concerned, two tongues 63 inclined to each other and together forming dovetail type nesting means.

In practise the part of the casing 11 incorporating the nesting means 62 is the upper part 11A.

To be more precise, the tongues 63 forming the nesting means 62 project from the longitudinal sides of the extensions 48 of the floor member 36 of the upper part 11A.

The device can be assembled in the following manner.

The bus conductors 15 are first fitted to the lower part 11B or back.

The connecting terminals 12 and the ground contact members 16' are then forcibly engaged on the bus conductors 15.

The body part 11 is then clipped to the part 11B.

As a result, the bus conductors 15 are gripped between the lower part 11B and the upper part 11A.

Finally, the phase contact members 16 are forcibly engaged on the bus conductors 15 through the cells 40 in the upper part 11A of the casing 11, with their lips 42 clipping into the latter.

Note that the device is advantageously assembled simply by stacking its components.

They can be stacked in the reverse order, if necessary.

The faceplates 20 for the sockets 14 are then fitted.

Preferably, they are not fastened to the casing 11, or at least are not completely fastened to the latter, by the screws 27 provided for this purpose.

This is because, at installation time, the installer may need to remove the faceplates 20 to clip the casing 11 onto its support.

The faceplates 20 are therefore fitted finally only after this clipping is done.

They then bear on the end of the uprights 38 of the upper part 11A of the casing 11, with their lip 29 capping the latter, and on the projections 39.

By bracing the uprights 38 they reinforce the clipping of the casing 11 onto its support.

Note that to change the number of sockets 14 of the multisocket module 10 in accordance with the invention it is merely necessary to manufacture the upper and lower parts 11A, 11B of its casing 11 accordingly.

All the other component parts are the same, which standardization is advantageous.

Of course, the present invention is not limited to the embodiment described and shown, but encompasses any variant execution thereof, in particular with reference to the ground contact member of the sockets.

Depending on the standards in force in some countries, the ground contact member may be in some form other than a simple pin.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A multisocket module including an insulative material elongate casing having a group (G) of connecting terminals at opposed ends thereof, at least two separate plug-receiving sockets mounted in and spaced lengthwise of said casing, all conductive members of the module including at least two bus conductors interconnecting one of the groups (G) of connecting terminals with the other of the groups of terminals being housed in said casing, exteriorly accessible contact members in vertical alignment with each of said sockets adapted to cooperate with contacts of a plug, said contact members forcibly engaging the bus conductors, said casing having two parts, including an upper part or body defining a body and housing said contact members and a lower part or back defining a back member of said casing, each of said sockets comprising a separate faceplate also separate from said casing and attached to the upper part of said casing, said faceplates having holes for plug contact access to said contact members.

2. A multisocket module as claimed in to 1 wherein said bus conductors are disposed substantially at an interface between the two parts of said casing and said contact members for at least one of said sockets include at least one flange having a slot for forcible engagement with one of said bus conductors, said slot being open towards the lower part of said casing.

3. A multisocket module as claimed in claim 1 or claim 2 wherein said contact members of each of said sockets define a cell and also include at least one lateral lip cooparable with a corresponding retaining shoulder on the upper part of said casing and facing towards the lower part of said casing.

4. A multisocket module as claimed in any one of claims 1, 2 or 3 wherein said connecting terminals are also in forcible engagement with said bus conductors.

5. A multisocket module as claimed in claim 4 wherein each of said connecting terminals has a slot for forcible engagement with one of said bus conductors, and said slot opens towards the lower part of said casing.

6. A multisocket module as claimed in any one of claims 1 to 5 wherein said connecting terminals are housed in recesses in one piece construction with the upper part of said casing.

7. A multisocket module as claimed in any one of the preceding claims wherein one of the parts of said casing has nesting means for coupling an auxiliary compartment.

8. A multisocket module as claimed in claim 7 wherein said nesting means include two tongues projecting from opposite sides of said one part and inclined relative to each other whereby said coupling means are of dovetail configuration.

9. A multisocket module as claimed in claim 7 or 8 wherein said one part of said casing is said upper part.

10. A multisocket module as claimed in any one of the preceding claims wherein said casing has clipping means for clipping the parts thereof together.

11. A multisocket module as claimed in claim 10 wherein said clipping means include at least two hook-shaped lugs carried by the lower part of said casing cooparable with tabs carried by the upper part of said casing.

12. A multisocket module as claimed in claim 11 wherein said clipping means include two lugs at each end of said casing and at least two lugs in a median area of said casing.

13. A multisocket module as claimed in any one of the preceding claims wherein each of said faceplates comprises a front skirt and a central well for receiving a plug, said holes being defined in an endwall of said central well.

14. A multisocket module substantially as hereinbefore described and illustrated in the accompanying drawings.

DATED this 17th day of January, 1997

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ABSTRACT

Multisocket module comprising an insulative material elongate casing (11) provided with a group (G) of connecting terminals (12) at both ends and enclosing all necessary conductive members and, spaced lengthwise of said casing (11), at least two separate sockets (14) each adapted to have a plug plugged into it, said conductive members including at least two bus conductors (15) which extend without discontinuity from one group (G) of connecting terminals (12) to the other and, in vertical alignment with each socket (14), contact members (16, 16') accessible from the exterior, adapted to cooperate plug and socket fashion with the contact members of a plug and forcibly engaged on the bus conductors (15). The casing (11) being formed in two parts (11A, 11B), an upper part or body enclosing all the contact members (16, 16') and a lower part or back, the sockets (14) each include an embellisher (20) separate from the casing (11) and attached to the upper part (11A) thereof, with holes (21, 21') providing access to their contact members (16, 16').

FIG. 1

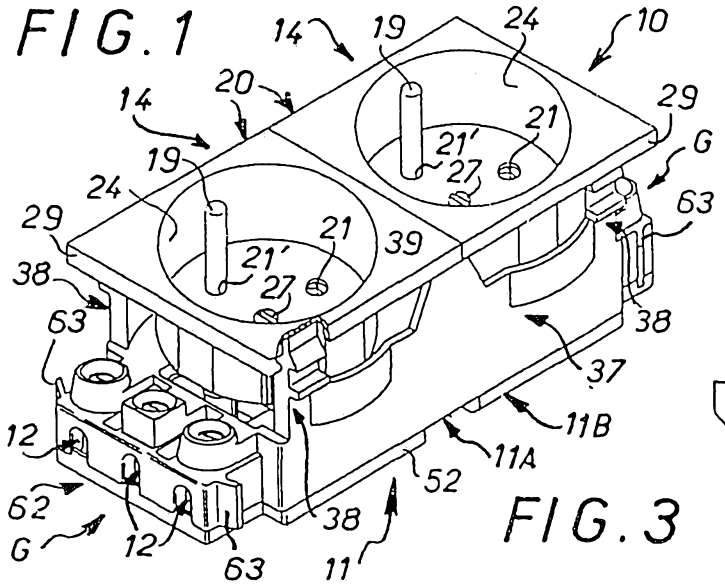


FIG. 4

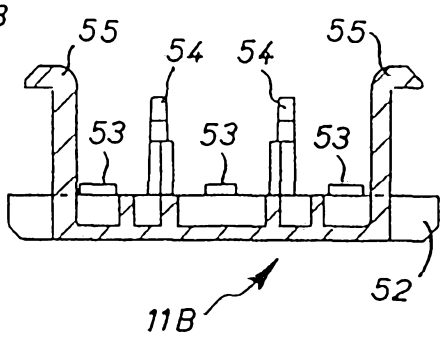


FIG. 3

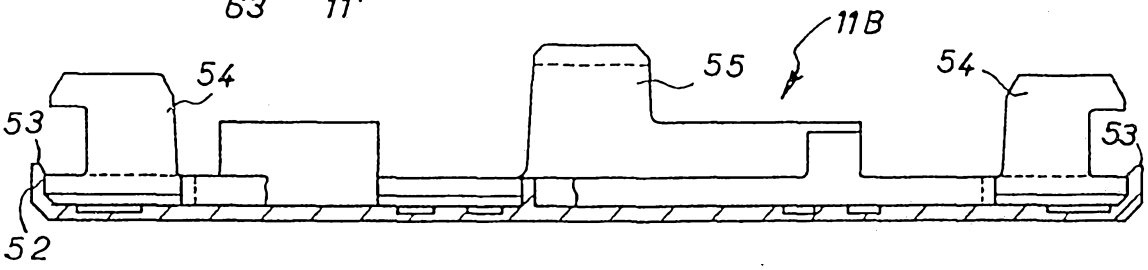


FIG. 5

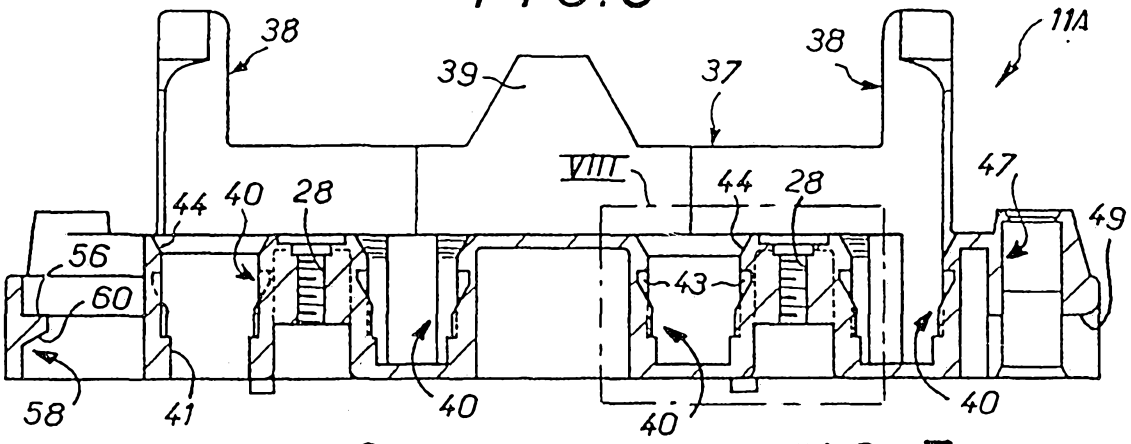


FIG. 6

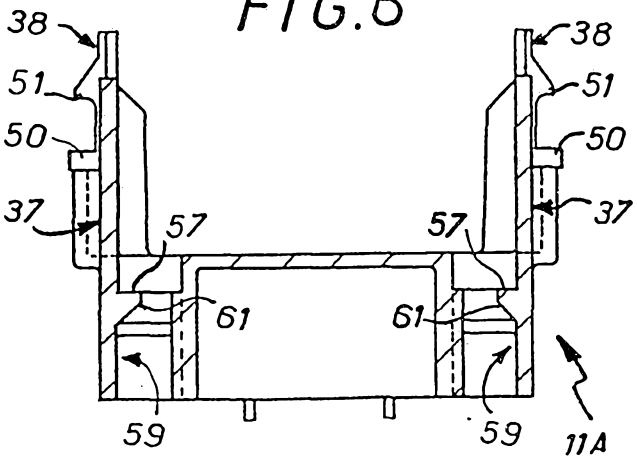


FIG. 7

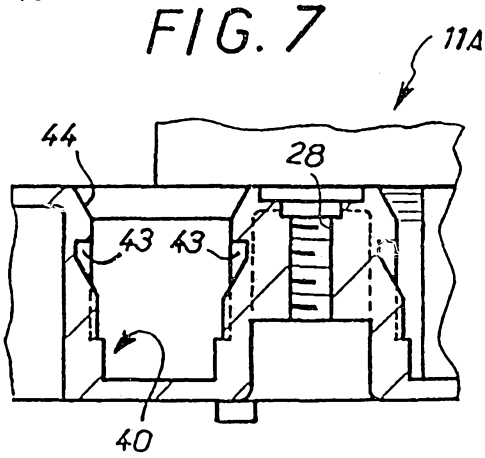
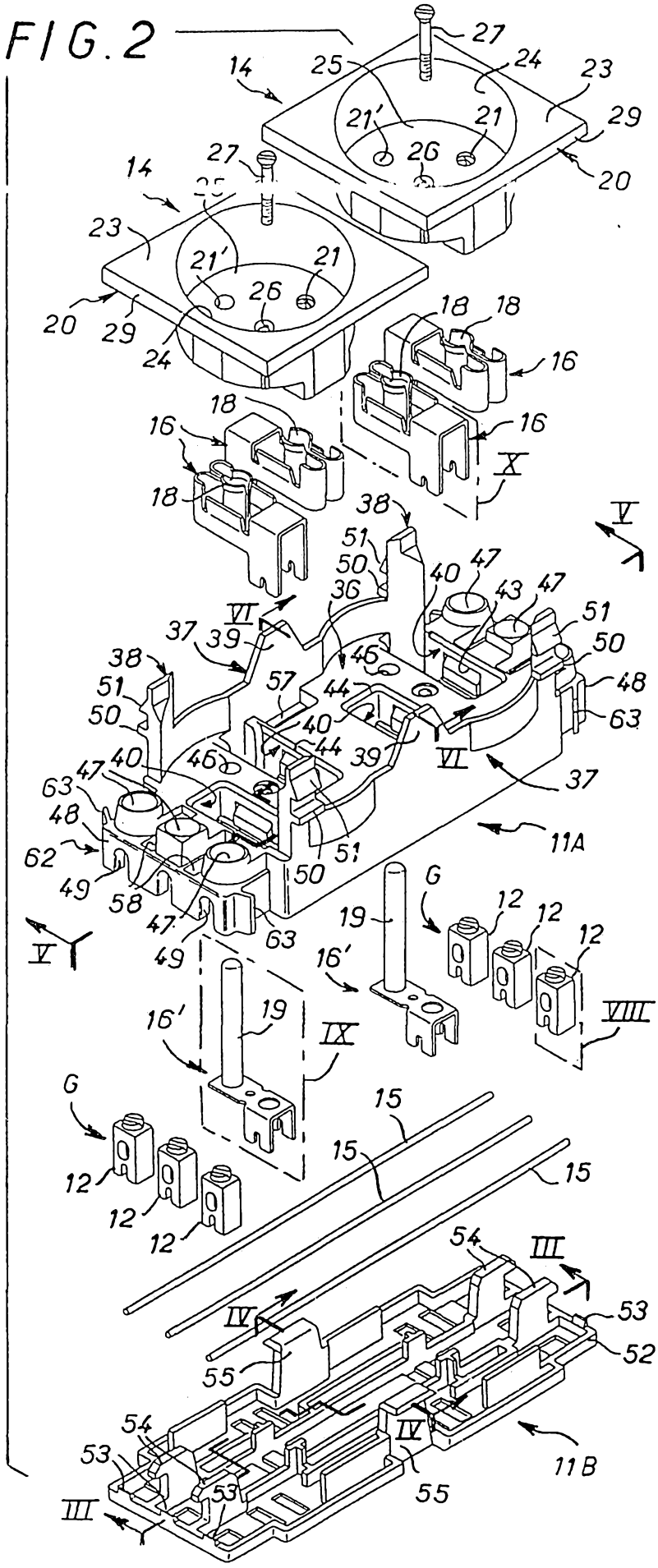


FIG. 2



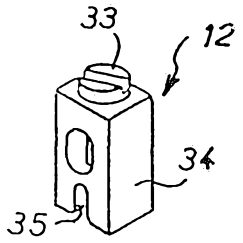


FIG. 8

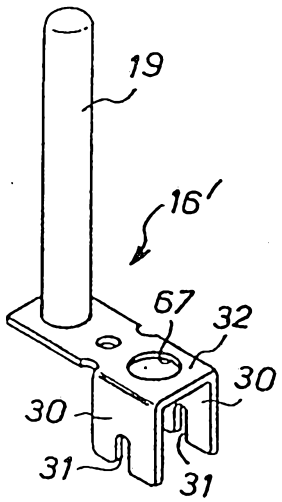


FIG. 9

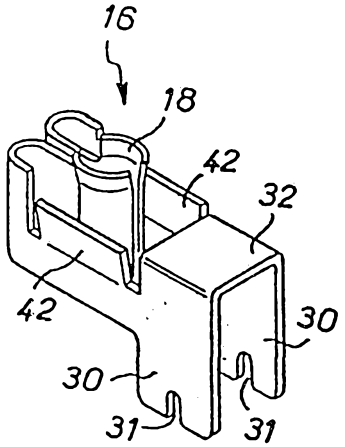


FIG. 10