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FR-A- 2 186 626	FR-A- 2 425 746
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US-A- 4 645 286	

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Description

FIELD OF THE INVENTION

This invention relates to coupling devices for electrical fixtures, such as connecting a lamp to ceiling or wall outlet.

BACKGROUND OF THE INVENTION

It is appreciated that it is very awkward and potentially hazardous for the average person to wire or rewire electrical connections involving electrical fixtures, such as lamps, outlet plugs and the like. Normally, this sort of work is left to the skilled tradesman; however, there are many householders who for various reasons wish to make their own installations. It would therefore be expedient for both the skilled tradesman and the householder to have a simple hazard-free form of installing lamp fixtures and the like on wall and ceiling outlet boxes. This problem has been appreciated for some time and as a result many solutions have been posed as exemplified in the following patents.

A simple form of plug-in arrangement is disclosed in United States patents 1,486,896; 1,511,594 and 2,671,821. The wall or ceiling outlet box has provided in a sealed face thereof a standard type of plug outlet. The lamp to be secured to the outlet box has a base plate which is coupled in one form or another to the outlet box. Before such coupling is completed, the lamp fixture plug is simply plugged into the outlet plug of the electrical box. This type of arrangement reduces hazard in the average householder making connections and for the skilled workman provides an expedient form of connection. It is appreciated, of course, that the outlet box has to have been prewired by a competent individual.

All of the devices described in the aforementioned patents significantly protrude into the electrical outlet box (or wall or ceiling if there is no such box). This degree of protrusion into the electrical outlet box is in contravention of most electrical safety codes. Furthermore, all of the devices described in the prior art patents require two or more steps for detachment or mounting of a fixture within appropriate connector.

In addition, the prior art devices cannot be used universally for connecting a wide variety of fixtures. For example, the devices of U.S. patents 1,486,896 and 1,511,594 are designed specifically for wall mounting wherein the downward weight of the fixture is required to maintain the connection. U.S. patent 2,671,821 discloses a hanger system limited to hanging type fixtures.

Canadian patent 1,040,606 discloses an electrical coupling system which simultaneously pro-

vides for electrical contact of the fixture to the outlet box wiring, while securing the light fixture in place. The electrical outlet box is provided with a face plate which presents the electrical contacts in combination with lug portions. The light fixture includes mating lug portions which on rotation clip into and secure the light fixture in place on the face plate. The lug portions on the light fixture also include electrical contacts which lead to the lamp of the fixture. Hence when the lug portions are engaged to support the light fixture, the electrical contacts engage to complete the circuit. The drawback with this system is that, due to the inter-relationship of the lugs and the electrical contacts, there is a limitation on the amount of support that can be provided in the lug systems while continuing to provide suitable engagement of the electrical contacts. Furthermore, the electrical contacts are left exposed thereby presenting potential hazard in mounting the light fixture in place or allowing the user to reach up into the outlet of the face portion and contact one or more of the live electrical leads.

Canadian patent 1,040,606 also suffers from the disadvantage of the prior art U.S. patents in that it cannot be universally applied to connecting a wide variety of fixtures. For example, Figures 1 and 2 of the prior art Canadian patent illustrate that a central threaded tubular rod is mounted to the coupling as a central tubular rod connector. The threaded tubular rod is relatively short and is designed to hold the cover plate in position and to provide a thread to attach a ring (or hook) upon which a light fixture or chain is hung. The disclosure describes use of the ring (or hook) in terms which are specific to the application of hanging a light fixture or chain therefrom.

These prior art coupling devices suffer from the disadvantages that they protrude significantly into the electrical junction box; they are of complex design; and installation of the fixtures is typically complex (i.e. requiring two or more steps).

US-A-3 985 417 shows a two-part coupling device for an electrical fixture in which cooperating electrical contacts in the two parts all lie on the same radius, but are rotationally asymmetrically disposed to prevent an incorrect electrical coupling between the two parts. The arrangement associated with the contacts also provides mechanical coupling of the two parts; thus it is the only arrangement preventing incorrect mechanical coupling of the two parts, and it also determines the strength of the mechanical coupling. In the present invention the mechanical and electrical coupling functions are separated, whereby features associated with each function may be improved without impairment of the other function.

FR-A-2 425 745 is an example of a two-part coupling arrangement where electrical contacts lie

on different respective radii.

DE-A-3 335 759 to which the preamble of claim 1 relates represents the closest state of the art. This discloses a two-part coupling for detachably securing a hanging light fitting to the ceiling, in which one part of the coupling is secured to the ceiling and connected to the electricity supply, and the other part is electrically connected to a flex from the light fitting, and releasably securable to the one part. Respective parts of a rotationally asymmetrical plug and socket arrangement permit connection of the light fitting to the electricity supply in only one way. Because the plug and socket members extend axially of the two parts, it is necessary to couple the two parts by movement along their axes, without rotation. Furthermore, and particularly when coupling the two parts, accidental contact with the electricity supply is possible; this could be either by direct contact with upstanding pins in the one part, or by insertion of a conductor within a socket of the one part.

In contrast, the present two-part device requires a rotational movement to join the two parts, the electrical contacts between the two parts extend laterally and are coupled by the rotary motion required to join the parts, and the live contacts in the part coupled to the electricity supply are recessed. Thus there is a difference in the manner in which the mechanical joining of the two parts and the electrical coupling therebetween is achieved, and there is also a significant improvement occasioned by (a) the shielding of the live contacts, and (b) the fact that the live contacts extend laterally, making it considerably more difficult for accidental contact to occur.

The present invention provides an electrical coupling device for detachably securing a fixture to an electrical junction box or directly to a building structure, said coupling device comprising male and female interconnecting components, said fixture being connected to said male component which is then secured to said female component by rotating one component relative to the other, said female component having a plurality of catches, said male component having a plurality of studs for insertion and engagement with said catches by way of rotational movement of said studs into said catches, said catches and studs being spaced apart in circular arrays at a first radius, at least two spaced-apart female resilient clips of electrically conductive metal on said female component, at least two spaced-apart contacts of electrically conductive metal on said male component, said male contacts being in register with said clips when said studs are in register with said catches, said clips being located in an unsymmetrical array about said circular pattern to ensure polarity matching of said corresponding contacts

with said clips, rotation of said male component to engage said studs with said catches simultaneously engaging said contacts with said clips to depress said clips slightly to ensure electrical contact, characterised in that:

- (a) said clips are arranged in a circular pattern at a second radius on said female component;
- (b) said contacts are located in a circular pattern at said second radius on said male component, and extend laterally relative to said male component; and
- (c) said live electrical contacts in the female component are so recessed within the base plate to substantially eliminate the possibility of accidental contact.

The present invention enables the provision of an electrical coupling device which does not significantly protrude into the electrical outlet box or ceiling as in prior art devices and which may require a simple rotation to attach and detach a light fixture that has an appropriate connector. Such a device may be applicable to a wide range of light fixture types and electrical box sizes, and can be directly mounted to a building surface, without an electrical junction box, and without protrusion into the wall or ceiling.

Preferred embodiments of the invention are shown in the drawings, wherein:

Figure 1 is an exploded perspective view from above of the electrical fixture coupling according to an aspect of this invention;

Figure 2 is an exploded perspective view of the electrical fixture coupling of Figure 1 from the underside;

Figure 3 is a section through the male and female components of the coupling prior to assembly;

Figure 4A is a section view along the lines 4A-4A in Figure 3;

Figure 4B is a section through the assembled coupling;

Figure 5 is a combined half-section and exploded view of a bolt mounted fixture according to a first alternative embodiment of the present invention;

Figure 6 is a combined half-section and exploded view of a modified bolt mounted fixture according to a second alternative embodiment of the present invention;

Figure 7 is an exploded perspective view of a central tubular spacer ring for the bolt mounted fixture of Figures 5 and 6;

Figure 8 is an exploded perspective view of tubular rod spacer rings for the bolt mounted fixtures of Figures 5 and 6;

Figure 9 is an exploded sectional view of a central tubular rod mounted fixture according to a third alternative embodiment of the present

invention;

Figure 10A is an exploded sectional view of a hanging cord lamp fixture mounted according to a fourth alternative embodiment of the present invention and Figure 10B is a detail thereof;

Figure 11 is an exploded sectional view of a hanging chain lamp fixture mounted according to a fifth alternative embodiment of the present invention; and

Figure 12 is an exploded perspective view of the female component 14 of the electrical fixture coupling device of the present invention including a ground strap.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

It is appreciated that a variety of electrical outlet boxes and fixtures are available in the marketplace. For purposes of discussion of this invention and demonstration of its principles, specific reference will be made to a well known type of outlet box and fixture constructions. It is, of course, appreciated that the principles of the invention would, however, apply to any other type of readily available fixture and electrical outlet. With reference to Figures 1 and 2, the electrical fixture coupling device 10 comprises male and female components 14 and 12. The female component 12 is secured within or to a standard type of octagonal shaped electrical outlet box 16. Wiring 18 is fed through a cable shield 20 which may be of flex link metal and through the inlet coupling 22 of the outlet box 16. The three electrical leads 24, 26 and 28 of the standard 110 volt wiring system are coupled to the corresponding terminals 30, 32 and 34. In accordance with standard practice, two of the leads, for example 26 and 28, will be positive and negative leads, whereas lead 24 is the common ground. Each terminal 30, 32 and 34 is surrounded by a raised ridge portion 36, 38 and 40. The raised ridge serves to contain the looped end portion of the respective electrical wire lead and captured in place during connection of the leads to the terminals.

It is also possible to friction fit the contact terminals 30, 32 and 34 (see for example, Figure 3) and to have a self attaching connector in which electrical wires 24, 26 and 28 are pushed into a hole (not shown) in which electrical contact is made and the wires are secured. The preferred push connector of Figure 3 is characterized by significant advantages over prior art push connectors common on existing switches and receptacles.

The male component 14 has an electrical wire 42 which is connected to a light fixture or the like extending through a decorative dished-shaped exterior plate 44 and through an aperture 46 of the

male component 14 and into the chamber generally designated 48. Three electrical wires of the incoming light fixture wire 42 which are shown designated 50, 52 and 54. However, in practice, only two such wires 52 and 53 are used, the ground wire 50 commonly being replaced by an electrical contact between the metal body of the fixture and the cross bar (not shown) of the outlet box.

The wires 50, 52 and 54 are respectively secured to the electrical terminals 56, 58 and 60. As with the terminals of the female component 12, the terminals 56, 58 and 60 are surrounded by a raised ridge portion 62, 64 and 66. This assists in assembly and connection of the electrical wires to the terminals to capture them in place. Each of the terminals 56, 58 and 60 include outwardly extending contacts 68, 70 and 72. These male contacts engage corresponding female contacts of the female component 12, as will be discussed with respect to Figures 2, 3 and 4.

The male component 14 includes elongate recesses 74 and 76 which receive nut and bolt combinations for connecting decorative plates, such as plate 44, and for securing the light fixture to the male component 14. For example, self tapping screws 8 or bolts may be extended through the elongate recesses 74 and 76 and threaded into apertures 78 and 80 of lugs 82 and 84 to secure the attachment plate 14 in position, as described in greater detail below with reference to Figures 5, 6 and 8. Each recess 74 and 76 is surrounded by a suitable ridge 86 and 88 to enclose the respective bolt head.

In order to prevent accidental dislodgement, a locking device is incorporated into the female component 12 in the form of small domed protrusions or dimples 79 and 81 which are designed to slide over the surfaces of winged recesses 74 and 76 of male component 14 when the male component 14 is being rotated clockwise relative to female component 12 for connecting the male and female components. However, the dimples 79 and 81 abut the winged recesses 74 and 76 when the male component is rotated into connection with the female component, thereby effectively preventing inadvertent counter-clockwise rotation of the male component 14 relative to the female component 12 without the application of a reasonable amount of torque.

As shown in Figure 2, the female component 12 is secured to the electrical outlet box 16 by use of bolts 90 and 92. The bolts extend through apertures 94 and 96 and are threaded into the threaded apertures 98 and 100 of the outlet box lugs 102 and 104. Alternatively, the bolts may extend through slotted apertures 95 and 97 for smaller sized electrical boxes. The slotted holes 95 and 97

may be used also as screw holes for mounting to a wall or ceiling, or to a wiring terminal block mounted on the building surface. The secured position of the female component 12 in the electrical outlet box 16 is shown in Figure 4. Provided on the upper surface 13 of the female component 12 is a ridge 15 which defines an octagonal shape which corresponds to the inner dimensions of a standard octagonal electrical outlet box 16. The raised ridge 15 correctly locates the base plate bolt holes 94 and 96 with the bolt holes 98 and 100 on the lugs 102 and 104 of the electrical box 16. This ensures a secure fitment of the female component 12 to position the component in the electrical outlet box 16. The circular disk, or flange 99, outside the octagon shaped ridge 15 extends beyond the dimensions of the electrical box and thereby ensures that the component 12 fits flush to a wall or ceiling even though the outlet box may be recessed or misaligned.

In some installations an electrical box is not required to house the electrical household wiring for the lamp fixture. In such cases, the female component 12 includes a further ridge 17 for providing clearance for the electrical wiring extending between the female component 12 and the ceiling. In addition, the raised ridge may provide clearance, (e.g. a few centimeters) for a terminal block for the electrical wiring which comes through the building surface. The overall dimensions of male component 14 and female component 12 can be reduced in such an installation. In practice this means that the circular disk, or flange 99, and the octagonal shaped ridge 15, which extend outwards from the raised ridge 17, of the base plate 12 are no longer necessary and can be eliminated.

The underside 106 of the female component 12 (Figure 2), which constitutes the face plate of the electrical outlet box, includes two sets of semi-circular ring portions generally designated 108, 110, 112 and 114. Ring set 108 and 110 include a plurality of catches, the entrance to which are defined by the respective recesses 116, 118, 120 and 122. The inner set of rings 112 and 114 include the female resilient clips of electrically conductive metal. The entrance to those clips is defined by recesses 124, 126 and 128. The clips are recessed so as to conceal live electrical parts.

The male component 14 includes on an outer ring set 130 and 132 the outwardly projecting stud portions 134, 136, 138 and 140. As already noted, on the inner ring portion, as defined by circular edge 142, outwardly extending male contacts 68, 70 and 72 are provided. The male component is provided with an integrally molded arrow 144 which, when aligned with the indented arrow 146 of the female component, automatically aligns the studs 134, 136, 138 and 140 with the recesses 116,

118, 120 and 122. Also, the electrical contacts 68, 70 and 72 are aligned with the recesses 124, 126 and 128.

To assemble the male component 14 to the female component 12 with the arrows 144 and 146 aligned, the male component 14 is rotated in the direction of arrow (clockwise) 148 to engage the studs with the catches. As shown in Figure 3, the studs are defined by the lugs 136 and 138 which are of inverted L-shape to define undercut portions 150 and 152. The catches of the female component 12 are defined by the depending ledges 154 and 156 to define supporting surface 158 and 160. To support the male component, when engaged with the female component, the faces 150 and 152 rest on and are engaged with the faces 158 and 160 to support the light fixture in a manner to be discussed with respect to Figure 4. The terminals 30 and 32 include resilient clips 162 and 164. As shown in the section of Figure 4A, clips are J-shaped as protected by face portions 166 and 168 of the respective ring portion 112 and 114. The ledges 166 and 168 in covering the clips 162 and 164 prevent the user from engaging the clips with their fingers or various tools, such as screwdrivers, and hence substantially reduce the risk of electric shock during installation.

The J-shaped clips 162 and push connectors 163 are secured to the female component at the raised block portion 170 by way of the terminal screw or rivet 172. Hence a cantilever mounting of the J-shaped clip 162 is provided with a flexible distal portion 174.

Multistrand wire may be inserted between clip 162 and push connector 163 which yields under bending pressure. The connector 163 then clamps down on the wire and secures the wire in place with a contact area extending fully around the arcuate portion of connector 163. The push connector arrangement of Figure 4A may also be advantageously used for the terminals 58 and 32. When the male contact portion 72 abuts the sloping portion 174 during rotation of the male component relative to the female component, the distal portion 174 is pushed upwardly by the male contact 72 to ensure secure electrical contact between the male and female components. A similar action occurs with respect to the other electrical clips of the female component which occurs at the same time as the stud components of the male couplings 68 and 70 engage the associated catches of the female components (e.g. 162 and 164). As a result the assembled unit, as shown in Figure 4, has the studs 134, 136, 138 and 140 engaged with the respective supporting ledges as exemplified in Figure 4 as 154 and 156. The male contacts 70 and 72 engage the respective clips 162 and 164, thereby effecting a hanging cord lamp fixture connection

as shown in Figures 10A and B. As discussed above, the electrical cord 42 is secured by means of a cord restrainer 1004. The restrainer effectively transfers the weight of the fixture to the flange 180 surrounding the aperture 46 of male component 14, and thereby to the female component 12 through the male component 14 via the support lugs 134, 136, 138 and 140 engaging the corresponding catches of the female component. No stress is applied to the electrical contacts 70 and 72. Hence the design of the lugs and catches of the male and female components is independent of the electrical contacts to thereby support any desired weight of the light fixture without interfering with the electrical contacts. In this way, the electrical contacts resiliently urge the clips upwardly to ensure continued electrical contact of the light fixture to the power source in incoming line 18.

As shown in Figure 4, the male component 14 has extending outwardly of the stud portions a plate extremity 182, 184 for supporting the two-bolt fixture of Figures 5 and 6 via apertures 74 and 76. As discussed above, when the unit is assembled, the female component 12 is flush against the face of the finishing material for the wall or ceiling to complete the assembly and provide a flush mount of the light fixture, and the cover plate 44 extends so as to cover the entire connector and fit flush with the wall or ceiling.

The male and female components of the coupling device are attached by means of the separate inter-engaging studs and catch portions. The system has been designed for close tolerances to achieve a secure and strong connection between the components. Once locked the components have a very low profile for preventing the female component 12 from intruding into the outlet box, and to ensure that the device remains inconspicuous when the male component 14 is not attached. The components of the device may be injection molded of suitable plastic resin. The plastic resin may include flame retardant, heat resistant, creep resistant additives. A suitable plastic may be that of acrylonitrile butadiene styrene composition.

In addition to the light fixture mountings illustrated in Figures 1-4, additional mountings are contemplated within the terms of the present invention, as follows:

- bolt mounted fixtures (Figures 5 and 6);
- central tubular rod mounted fixtures (Figure 9);
- hanging cord lamp fixtures (Figure 10);
- hanging chain lamp fixtures (Figure 11); and
- integrally molded fixtures (not illustrated).

Turning to Figure 5, a combined half-section and exploded view is provided of a bolt mounted fixture according to a first alternative embodiment mounted in the form of a retrofit. An ordinary two-bolt light fixture is mounted on the male component

14 by means of a pair of bolts 500 and 502 inserted through apertures 76 and 74, and secured by means of lock nuts 504 and 506, spacer nuts 508 and 510, and decorative nuts 512 and 514. The height of the cover plate 44 is determined by adjustment of spacer nuts 508 and 510. The bolts 500 and 502 are maintained in a correct width position within slots 74 and 76 by means of lock nuts 504 and 506. The cover plate 44 is secured to the bolts 500 and 502 by means of nuts 512 and 514, respectively.

A modified light fixture is illustrated with reference to Figure 6. Manufacture installed mounting lugs 600 and 602 are provided with holes 604 and 606 through which a pair of self-taping screws 608 and 610 may be inserted, via holes 76 and 74 of the male component 14. The mounting lugs are installed at an appropriate height for correct positioning of the male component attachment plate 14 relative to the female component base plate 12.

Correct spacing between the male component 14 and the associated bolt mounted light fixture can also be realized by employing either central tubular spacer rings or tubular rod spacer rings as shown in Figures 7 and 8, respectively. According to Figure 7, a central tube spacer ring 700 is mounted via a friction fit over the raised circular portion 702 of the male component 14. The spacer ring 700 can be constructed to various heights for achieving selective spacing of the cover plate 44 relative to the male component 14. Figure 8 shows a pair of tubular rod spacers 800 which can be manufactured to predetermined heights to achieve selective spacing of the cover plate 44 relative to the male component 14. A pair of bolts 500 and 502 are inserted through the apertures 74, 76 of the component 14 and through the tubular rod spacers 800. A pair of decorative nuts 512 and 514 are fastened to the bolts 500 and 502 which protrude to respective apertures in the cover plate 44.

Traditional central tubular rod mounted fixtures are screwed into a cross bar that is bolted to the electrical outlet box. However, according to the embodiment of Figure 9, the base plate or female component 12 is substituted for the cross bar of traditional installations, and the tubular rod 900 of the fixture is held in place by a pair of nuts 902 and 904 which lock the centrally mounted fixture in position. A cover plate (not shown) is then fastened to the central tubular rod 900 by means of a radially oriented screw, in a well known manner. The electrical wiring 42 runs through the tubular rod 900 and is connected to the attachment plate or male component 14 by means of electrical connector bolts or screws 56, 58 and 60 (Figure 1). A cover plate 44 (Figure 1 and 2) is attached to the central tubular rod 900 in the traditional fashion.

Figure 10A illustrates a hanging cord fixture embodiment of the present invention in which a flexible electrical cord 42 extends from a lamp shade 1002 through an aperture 46 in the male component 14 which is held in place with a cord restrainer 1004 shown in detail with reference to Figure 10B. The cord restrainer 1004 slides along the electrical cord 42 for adjusting the height of the lamp and the length of wiring which extends to the electrical contacts on the male component 14. The cord restrainer 1004 fits into and is compressed by the aperture 46 which restrains movement of the cord. A cover plate 44 is shown in Figure 10A attached via a friction fit over the raised circular portion 702 of the male component 14.

Figure 11 shows a hanging chain fixture according to another alternative embodiment of the present invention, wherein chain links 1100 are supported by a hook 1102 having a central threaded aperture for receiving a threaded tubular rod 1104. A pair of lock nuts 1106 connect the tubular rod 1104 to the male component 14. The hook 1102 is threaded onto the tubular rod 1104 for supporting the fixture connected at a remote end of chain 1100 and to hold the cover plate 44 to the building surface. The electrical cords 50 and 52 twine through the chain links 1100 in a well known manner.

Additionally, the attachment plate or male component 14 may be directly injection molded with a lamp fixture base to produce an integral unit (not shown). In such a case, only the central portion of the male component 14 is utilized. The elongated recesses 74 and 76 would not be used. Also, the electrical cord 46 is substituted with a direct electrical connection from the contacts 68, 70, 72 to the light bulb socket or sockets.

Turning to Figure 12, an alternative embodiment of the male component 14 is shown with a ground strap 1200 for providing a ground connection between a metal light fixture and the ground terminal 60 (Figure 1) of the male component 14. The ground strap 1200 is secured by a screw 1202 to a metal threaded insert (not shown) extending from the terminal 60 to the ground strap 1200. Thus, the threaded metal insert is screwed on both sides of the male component (e.g. via terminal 60 on one side and via screw 1202 on the other side).

A distal end of the ground strap 1200 is secured to male component 14 via a screw or rivet 1204.

The ground strap 1200 provides a ground contact for central tubular mounted or like fixtures by securing the strap between the lock nut 902 and 904 in Figure 9 or 1106 in Figure 11. With reference to the Figure 9 embodiment, the lock nut 904 would be placed on the central tubular rod 900, then the rod would be inserted through the ap-

erture in the strap 1200 and into the aperture 46 of the male component 14. Likewise, with reference to the embodiment of Figure 11, the nut 1106 would be threaded onto tubular rod 1104 in a similar manner. Once secured, the lock nut 902 (or 1106) effectively secures the strap 1200 against the male component 14 for providing the necessary electrical connection between the central tubular rod 900 (or 1104) and terminal 60 via the screw 1202 through the ground strap to the terminal.

The ground strap 1200 also provides a ground connection for the two point mounted fixture illustrated in Figures 5 and 6. The screw 500 (or 608) is inserted through the aperture 76 of the male component 14 and then through the slotted aperture of the ground strap. When the screw 500 (or 608) is fastened, the strap 1200 is secured between the lock nut 504 (or lug 600) and the male component thus providing an electrical connection between the screws securing the cover plate 600, and hence between the metallic fixture cover and the ground terminal 60.

Although preferred embodiments of the invention have been described herein in detail, it will be understood by those skilled in the art that variations may be made thereto without departing from the scope of the invention as defined by the appended claims.

Claims

1. An electrical coupling device for detachably securing a fixture to an electrical junction box (16) or directly to a building structure, said coupling device comprising male (14) and female (12) interconnecting components, said fixture being connected to said male component which is then secured to said female component by rotating one component relative to the other, said female component having a plurality of catches (154, 156), said male component having a plurality of studs (134 - 140) for insertion and engagement with said catches by way of rotational movement of said studs into said catches, said catches and studs being spaced apart in circular arrays at a first radius at least two spaced-apart female resilient clips (e.g. 162, 164) of electrically conductive metal on said female component, at least two spaced-apart contacts (68, 70, 72) of electrically conductive metal on said male component, said male contacts being in register with said clips when said studs are in register with said catches, said clips being located in an unsymmetrical array about said circular pattern to ensure polarity matching of said corresponding contacts with said clips, rotation of said male component to engage said studs

with said catches simultaneously engaging said contacts with said clips to depress said clips slightly to ensure electrical contact,

characterised in that:

- (a) said clips (e.g. 162, 164) are arranged in a circular pattern at a second radius on said female component (12);
- (b) said contacts (68, 70, 72) are located in a circular pattern at said second radius on said male component (14), and extend laterally relative to said male component (14); and
- (c) said live electrical contacts (e.g. 162, 164) in the female component are so recessed within the base plate to substantially eliminate the possibility of accidental contact.

2. An electrical fixture coupling device according to claim 1, wherein the female component (12) is adapted to be connected to an electrical junction box or directly to the building structure and there maintain substantially flush contact with the building surface and comprises
 - i) a base plate (12) having an inner junction box side and an outer wall surface side;
 - ii) attachment means (90-96) cooperating with said base plate adapted to provide connection to junction boxes of various sizes and standards;
 - iii) a plurality of circumferentially spaced female supporting means (108, 110) which extend outwardly from the wall surface side of the base plate and have circumferentially extending female lugs (154, 156) spaced from the base plate surface whereby to define said catches (154,156);
 - iv) circumferentially spaced female contacting means (108, 110) which extend outwardly from the wall surface side of the base plate and include recesses (124, 126, 128) and said female resilient clips, each recess being associated with a respective clip;
 and the male component is releasably couplable to said female component to provide electrical and load-bearing connection to the electrical fixture and comprises
 - v) an attachment plate (14) with an inner surface which is adapted to releasably engage said female assembly of the base plate and has means to permit electrical connection from electrical conductors extending from the electrical fixture to electrical connectors (56, 58, 60) on the attachment plate, and an opposite outer surface of the attachment plate adapted for variable connection to the electrical fixture;

vi) a plurality of circumferentially spaced male supporting means (130, 132) extending upwards from the inner surface of the attachment plate, each male supporting means having a circumferentially extending said male stud (136, 138, 134, 140) having engagement means (150, 152) complementary to respective engagement means (158, 160) of the female lug, each stud being adapted to be accepted into a respective said catch;

vii) circumferentially spaced male contacting means on the inner surface of the attachment plate which provide said male contacts (68, 70, 72);

so that the contacts of the male component may be moved into the recesses of the female component with the male studs adjacent the said catches, whereupon the male component may be rotated relative to the female component to cause the engagement means of each female supporting means to engage the complementary engagement means of the male supporting means thereby providing a load bearing support and restricting rotation between the male and female components to substantially prevent accidental disengagement of the components, and contemporaneously the male contacts frictionally engage the female contacts and thereby permit the conduction of electricity to the electrical fixture.

3. An electrical coupling device according to claim 1 or claim 2, wherein each of said clips is a generally J-shaped metal clip (162) which is compressible, said contacts depressing said clips to maintain electrical contact.
4. An electrical coupling device according to any preceding claim, wherein there are three spaced-apart female clips and three spaced-apart male contacts.
5. An electrical coupling device according to any preceding claim, wherein the junction box side of the female component has an octagonal ridge (15) extending from its surface to frictionally engage a common octagonal junction box, said octagonal ridge is contained within a circular outer edge of said female component, said outer edge to flush mount the base plate where the junction box is recessed in the building surface.
6. An electrical coupling device according to any preceding claim, wherein six said male and female supporting means are circumferentially spaced so that each male and female com-

bination transfers a substantially equal load.

7. An electrical coupling device according to any preceding claim, wherein to assist in correct alignment of the male and female components and therefore polarity of the electrical connectors, an arrow (146) is moulded into the electrical fixture side of the base plate for alignment with a protrusion (144) of the male component before rotational engagement. 5 10
8. An electrical coupling device according to any preceding claim, wherein said male component has two long slots (74, 76) which allow it to be mounted to a variety of light fixtures utilising a pair of screws in a two point hanging system, said slots being recessed from the mounting surface to accommodate the screws, said male component also has a central hole (46) to accommodate one point mounted fixtures with a hexagonal profile moulded into the attachment plate to aid and secure attachment of the fixture to the attachment plate via one hexagonal nut. 15 20 25
9. An electrical coupling device according to any preceding claim, wherein said attachment plate is deep so as to provide room for attaching centrally mounted light fixtures, as well as to provide room for wiring. 30
10. An electrical coupling device according to any preceding claim, wherein said base plate and attachment plate have a raised border where the terminals are to be connected to ensure proper positioning of the electrical contacts, as well as to retain electrical wires. 35
11. An electrical coupling device according to any preceding claim, wherein said attachment plate further includes a pair of apertures (74,76) for receiving a pair of threaded bolts (500, 502) to which a cover plate of said electrical fixture is attached via one or more nuts (504, 506, 508, 510). 40 45
12. An electrical coupling device according to any one of claims 1 to 10, wherein said attachment plate further includes a pair of apertures (74,76) for receiving a pair of self tapping screws (608,610) by which a cover plate of said electrical fixture is connected to said attachment plate. 50
13. An electrical coupling device according to any preceding claim, further including a spacer ring (700) attached via friction fit to said attachment plate for effecting a predetermined spacing 55
14. An electrical coupling device according to any one of claims 1 to 12, further including a pair of tubular rod spacers (800), a pair of corresponding bolts (500, 502) extending through apertures within said attachment plate and further apertures within a cover plate of said electrical fixture, and a pair of decorative nuts (512, 514) for threadably securing said cover plate to said attachment plate, said tubular rod spacers being provided for effecting a predetermined spacing between said attachment plate and cover plate.
15. An electrical coupling device according to any preceding claim, wherein said electrical fixture includes a threaded tubular rod (900) for insertion through an aperture within said attachment plate, and a pair of lock nuts (902, 904) being provided for threadably securing said tubular rod to a flange extending around said aperture within said attachment plate.
16. An electrical coupling device according to any one of claims 1 to 14, wherein said attachment plate is provided within an aperture (46) through which an electrical cord extends from said electrical fixture, said electrical cord being provided with a cord restrainer (1004) for gripping and thereby restraining said electrical cord within said aperture of said attachment plate.
17. An electrical coupling device according to any one of claims 1 to 10, wherein said electrical fixture is further provided with a chain (1100) and a threaded hook (1102) portion for supporting said chain, a threaded tubular rod (1104) for insertion within an aperture of said attachment plate, and a pair of lock nuts (1106) for securing said threaded tubular rod to a said attachment plate, and said hook portion being threadably secured to said threaded tubular rod for securing said electrical fixture to said attachment fixture.
18. An electrical coupling device according to any preceding claim, further comprising a ground strap (1200) forming an electrical connection between said fixture and a ground said contact (60) of said male component for electrically grounding said fixture.
19. An electrical coupling device according to claim 18, wherein said ground strap is connected to an underside of said male compo-

ment via a screw (1202) secured within a threaded metal insert extending from said underside to said ground contact.

20. An electrical coupling device according to claim 18 or claim 19, wherein said ground strap is provided with a slotted aperture at a remote end thereof, said aperture being aligned with a corresponding aperture in said male component, for receiving a nut and bolt assembly for securing an attachment plate of said fixture to said male component and therefore also electrically grounding said attachment plate.

Patentansprüche

1. Elektrische Kupplungsvorrichtung für eine lösbare Befestigung eines Körpers an einer elektrischen Anschlußdose (16) oder unmittelbar an einen Gebäudeteil mit männlichen (14) und weiblichen (12) miteinander verbundenen Teilen, wobei der Körper mit dem männlichen Teil verbunden ist, der dann durch Drehung eines Teils relativ zu dem anderen an dem weiblichen Teil befestigt wird, und das weibliche Teil eine Vielzahl von Haken (154, 156) und das männliche Teil eine Vielzahl von Anschlägen (134 - 140) zum Eingriff und zur Verriegelung mit den Haken durch eine Drehbewegung der Anschläge in die Haken aufweist, wobei die Haken und die Anschläge in kreisförmigen Anordnungen bei einem ersten Radius voneinander beabstandet sind, mit wenigstens zwei voneinander beabstandeten weiblichen nachgiebigen Klammern (z. B. 162, 164) aus einem elektrisch leitenden Metall auf dem weiblichen Teil, mit wenigstens zwei voneinander beabstandeten Kontakten (68, 70, 72) aus einem elektrisch leitenden Metall auf dem männlichen Teil, wobei die männlichen Kontakte mit den Klammern übereinstimmen, wenn die Anschläge mit den Haken übereinstimmen, wobei die Klammern in einer unsymmetrischen Anordnung um das kreisförmige Muster angeordnet sind, um eine Polaritätsanpassung der entsprechenden Kontakte mit den Klammern sicherzustellen, und wobei eine Drehung des männlichen Teils, um die Anschlag mit den Haken in Angriff zu bringen, gleichzeitig die Kontakte mit den Klammern in Angriff bringt, um die Klammern etwas herunterzudrücken und so den elektrischen Kontakt sicherzustellen, **dadurch gekennzeichnet**, daß
- (a) die Klammern (z. B. 162, 164) in einem kreisförmigen Muster bei einem zweiten Radius auf dem weiblichen Teil (12) angeordnet sind;

(b) die Kontakte (68, 70, 72) in einem kreisförmigen Muster bei dem zweiten Radius auf dem männlichen Teil (14) angeordnet sind und sich seitlich relativ zu dem männlichen Teil (14) erstrecken; und

(c) die unter Spannung stehenden elektrischen Kontakte (z.B. 162, 164) in dem weiblichen Teil in der Grundplatte derart zurückgesetzt sind, daß sie die Möglichkeit einer zufälligen Berührung weitestgehend verhindern.

2. Elektrische Kupplungsvorrichtung nach Anspruch 1, in der das weibliche Teil (12) dafür vorgesehen ist, mit einer elektrischen Anschlußdose oder unmittelbar mit dem Gebäudeteil verbunden zu werden und dort im wesentlichen mit der Gebäudeoberfläche abschließt, enthaltend

i) eine Grundplatte (12) mit einer Innenseite für eine Anschlußdose und einer Außenseite für eine Wandoberfläche;

ii) Befestigungsmittel (90 - 96), die mit der Grundplatte zusammenarbeiten und eine Verbindung mit Anschlußdosen mit verschiedenen Größen und Standards bewirken;

iii) eine Vielzahl von entlang des Umfangs beabstandeten weiblichen Trägermitteln (108, 110), die sich von der Wandoberflächen-Seite der Grundplatte nach außen erstrecken und sich entlang des Umfangs erstreckende weibliche Ansätze (154, 156) aufweisen, die von der Grundplatten-Oberfläche beabstandet sind und dadurch die Haken (154, 156) bilden;

iv) entlang des Umfangs beabstandete weibliche Kontaktmittel (108, 110), die sich von der Wandoberflächen-Seite der Grundplatte nach außen erstrecken und Aussparungen (124, 126, 128) sowie die weiblichen nachgiebigen Klammern enthalten, wobei jede Aussparung einer entsprechenden Klammer zugeordnet ist; wobei das männliche Teil mit dem weiblichen Teil lösbar kuppelbar ist, um eine elektrische und belastungsfähige Verbindung mit dem elektrischen Körper herzustellen, und enthält:

v) eine Befestigungsplatte (14) mit einer inneren Oberfläche, die zur lösbaren Eingriff der weiblichen Anordnung der Basisplatte dient und Mittel aufweist, die eine elektrische Verbindung von elektrischen Leitern ermöglichen, die sich von dem elektrischen Körper zu elektrischen Leitern (56, 58, 60) auf der Befestigungsplatte erstrecken, und mit einer gegenüberliegenden äußeren Oberfläche der Befestigungsplatte, die zu einer veränderbaren Verbindung mit dem

elektrischen Körper dient;

vi) eine Vielzahl von entlang dem Umfangs beabstandeten männlichen Trägermitteln (130, 132), die sich von der inneren Oberfläche der Befestigungsplatte nach oben erstrecken, wobei jedes männliche Trägermittel, das entlang eines Umfanges von dem männlichen Anschlag (136, 138, 134, 140) ausgeht, Eingriffsmittel (150, 152) aufweist, die zu den entsprechenden Eingriffsmitteln (156, 160) des weiblichen Ansatzes komplementär sind, und wobei jeder Anschlag dafür vorgesehen ist, in einem entsprechenden Haken aufgenommen zu werden;

vii) entlang eines Umfangs beabstandete männliche Kontaktmittel auf der inneren Oberfläche der Befestigungsplatte, die die männlichen Kontakte (68, 70, 72) bildet;

so daß die Kontakte des männlichen Teiles in die Aussparungen des weiblichen Teiles bewegt werden können, wobei die männlichen Anschläge an den Haken anliegen, woraufhin das männliche Teil relativ zu dem weiblichen Teil gedreht werden kann, um die Eingriffsmittel jedes weiblichen Trägermittels zu veranlassen, mit den komplementären Eingriffsmitteln der männlichen Trägermittel in Eingriff zu gelangen, um dadurch eine belastungsfähige Halterung und eine eingeschränkte Drehbewegung zwischen den männlichen und weiblichen Teilen zu bewirken und so eine zufällige Lösung der Teile weitestgehend zu verhindern und gleichzeitig die männlichen Kontakte durch Reibung die weiblichen Kontakte erfassen und dadurch die Stromleitung zu dem elektrischen Körper ermöglichen.

3. Elektrische Kupplungsvorrichtung nach Anspruch 1 oder 2, in der jede der Klammern eine im wesentlichen J-förmige Metallklammer (162) ist, die zusammendrückbar ist, wobei die Kontakte die Klammern zur Aufrechterhaltung eines elektrischen Kontaktes niederdrücken.
4. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der drei voneinander beabstandete weibliche Klammern und drei voneinander beabstandete männliche Kontakte vorgesehen sind.
5. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der die Anschlußdosen-Seite des weiblichen Teiles eine achteckige Erhebung (15) aufweist, die sich von deren Oberfläche aus erstreckt und durch Reibung mit einer im wesentlichen achteckigen Anschlußdose in Eingriff gelangt, wobei die achteckige Erhebung in einer kreisförmigen

äußeren Kante des weiblichen Teiles enthalten ist und die äußere Kante mit der Grundplatte abschließt, wenn die Anschlußdose in die Gebäudeoberfläche eingesetzt ist.

6. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch worin sechs männliche und weibliche Trägermittel entlang eines Umfangs beabstandet sind, so daß jede männliche und weibliche Kombination eine im wesentlichen gleiche Last überträgt.
7. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der zur Erleichterung einer genauen Ausrichtung der männlichen und weiblichen Teile und daher der Polarität der elektrischen Leiter ein Pfeil (146) auf die Seite der Grundplatte für den elektrischen Körper angeformt ist, und zwar für eine Ausrichtung mit einem Vorsprung (144) des männlichen Teiles vor einem Eingriff durch Drehung.
8. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der das männliche Teil zwei lange Schlitze (74, 76) aufweist, die es ihm ermöglichen, auf einer Vielzahl von Leuchten-Körpern befestigt zu werden, und zwar unter Verwendung eines Paares von Schrauben in einem Hängesystem an zwei Punkten, wobei die Schlitze von der Montagebefestigungs-Oberfläche zurückgesetzt sind, um die Schrauben aufzunehmen, und wobei das männliche Teil auch ein zentrales Loch (46) aufweist, um den Körper mit einer Einpunktbefestigung an ein sechseckiges Profil anzupassen, das in die Befestigungsplatte eingeformt ist, um eine Befestigung des Körpers an der Befestigungsplatte über eine sechseckige Nut zu erleichtern und sicherzustellen.
9. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der die Befestigungsplatte so tief ist, daß sie einen ausreichenden Raum bildet, um zentral befestigte Beleuchtungskörper zu befestigen und zusätzlich einen Raum für die Verdrahtung zu bilden.
10. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der die Grundplatte und die Befestigungsplatte eine hochgezogene Kante aufweisen, wo die Anschlußklammern verbunden werden müssen, um so eine richtige Positionierung der elektrischen Kontakte sicherzustellen und außerdem die elektrischen Drähte aufzunehmen.
11. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der die Befesti-

- gungsplatte außerdem ein Paar von Öffnungen (74, 76) zur Aufnahme eines Paares von Gewindebolzen (500, 502) enthält, an der eine Abdeckplatte des elektrischen Körpers über eine oder mehrere Nuten (504, 506, 508, 510) befestigt wird.
12. Elektrische Kupplungsvorrichtung nach einem der Ansprüche 1 -10, in der die Befestigungsplatte außerdem ein Paar von Öffnungen (74, 76) zur Aufnahme eines Paares von selbstschneidenden Schrauben (608, 610) aufweist, durch die eine Abdeckplatte des elektrischen Körpers mit der Befestigungsplatte verbunden wird.
13. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, außerdem enthaltend einen Abstandsring (700), der über einen Reibungssitz mit der Befestigungsplatte verbunden ist, um einen vorbestimmten Abstand zwischen der Befestigungsplatte und der Abdeckplatte des elektrischen Körpers herzustellen.
14. Elektrische Kupplungsvorrichtung nach einem der Ansprüche 1 - 12 mit einem Paar von röhrenförmigen, stabförmigen Abstandshaltern (800), einem Paar von entsprechenden Bolzen (500, 502), die sich durch Öffnungen in einer Befestigungsplatte und außerdem durch Öffnungen in der Abdeckplatte des elektrischen Körpers erstrecken, und einem Paar von vier Ziermuttern (512, 514) für eine Schraubbefestigung der Abdeckplatte an der Befestigungsplatte, wobei die röhrenförmigen, stabförmigen Abstandshalter dazu dienen, einen vorbestimmten Abstand zwischen der Befestigungsplatte und der Abdeckplatte zu bilden.
15. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, in der der elektrische Körper einen röhrenförmigen Gewindestab (900), der durch eine Öffnung in der Befestigungsplatte greift sowie ein Paar von Kontermuttern (902, 904) für eine Schraubverbindung des röhrenförmigen Stabes an einem Flansch aufweist, der sich um die Öffnung innerhalb der Befestigungsplatte erstreckt.
16. Elektrische Kupplungsvorrichtung nach einem der Ansprüche 1 - 14, in der die Befestigungsplatte mit einer Öffnung (46) versehen ist, durch die sich eine elektrische Leitung von dem elektrischen Körper erstreckt, wobei die elektrische Leitung mit einer Zugentlastung (1004) versehen ist, die die elektrische Leitung umgreift und dadurch innerhalb der Öffnung
- der Befestigungsplatte arretiert.
17. Elektrische Kupplungsvorrichtung nach einem der Ansprüche 1 - 10, in der der elektrische Körper außerdem mit einer Kette (1100) und einem mit Gewinde versehenen Hakenteil (1102) zum Tragen der Kette versehen ist, sowie mit einer mit Gewinde versehenen rohrförmigen Stange (1104) zum Eingriff in eine Öffnung der Befestigungsplatte, und mit einem Paar von Kontermuttern (1106) zur Befestigung des mit Gewinde versehenen rohrförmigen Bolzens an der Befestigungsplatte, wobei das Hakenteil über ein Gewinde mit dem mit Gewinde versehenen rohrförmigen Bolzen verbunden ist, um den elektrischen Körper an dem Befestigungskörper zu sichern.
18. Elektrische Kupplungsvorrichtung nach jedem vorangehenden Anspruch, ferner enthaltend einen Erdungsbügel (1200), der eine elektrische Verbindung zwischen dem Körper und einem Erdungskontakt (60) des männlichen Teiles für eine elektrische Erdung des Körpers bildet.
19. Elektrische Kupplungsvorrichtung nach Anspruch 18, in der der Erdungsbügel mit einer Unterseite des männlichen Teiles über eine Schraube (1202) verbunden ist, die in einem Gewinde-Metalleinsatz enthalten ist, der sich von der Unterseite zu dem Erdungskontakt erstreckt.
20. Elektrische Kupplungsvorrichtung nach Anspruch 18 oder 19, in der der Erdungsbügel mit einer geschlitzten Öffnung an seinem entfernten Ende versehen ist, wobei die Öffnung mit einer entsprechenden Öffnung in dem männlichen Teil ausgerichtet ist, und zwar für die Aufnahme einer Anordnung aus einer Mutter und einem Bolzen für die Befestigung einer Befestigungsplatte des Körpers an den männlichen Teil und demzufolge auch für die elektrische Erdung der Befestigungsplatte.

Revendications

1. Dispositif de couplage électrique pour fixer de façon détachable un équipement sur une boîte de jonction électrique (16) ou directement sur une structure de bâtiment, ledit dispositif comprenant des composants d'interconnection mâle (14) et femelle (12), ledit équipement étant connecté audit composant mâle qui est ensuite fixé audit composant femelle en faisant tourner un composant par rapport à l'autre, ledit composant femelle présentant une pluralité de crochets (154, 156), ledit composant

mâle comportant une pluralité de tenons (134-140) devant venir s'insérer et s'engager avec lesdits crochets par suite d'un mouvement de rotation desdits tenons dans lesdits crochets, lesdits crochets et tenons étant espacés les uns des autres selon des arrangements circulaires d'un premier rayon, au moins deux clips élastiques femelles espacés l'un de l'autre (par exemple 162, 164) en métal électriquement conducteur sur ledit composant femelle, au moins deux contacts espacés l'un de l'autre (68, 70, 72) en métal électriquement conducteur sur ledit composant mâle, lesdits contacts mâles étant en correspondance avec lesdits clips lorsque lesdits tenons sont en correspondance avec lesdits crochets, lesdits clips étant disposés selon un arrangement dissymétrique autour dudit arrangement circulaire afin d'assurer un accord de polarité desdits contacts correspondant avec lesdits clips, la rotation dudit composant mâle pour faire venir en prise lesdits tenons et lesdits crochets, faisant venir en prise simultanément lesdits contacts et lesdits clips afin d'appuyer légèrement sur lesdits clips pour assurer un contact électrique,

caractérisé en ce que :

a) lesdits clips (par exemple 162, 164) sont disposés dans un arrangement circulaire selon un second rayon sur ledit composant femelle (12) ;

b) lesdits contacts (68, 70, 72) sont disposés dans un arrangement circulaire selon ledit second rayon sur ledit composant mâle (14) et ils s'étendent latéralement par rapport audit composant mâle (14), et

c) lesdits contacts électriques sous tension (par exemple 162, 164) dans le composant femelle sont encastrés dans la plaque de base de manière à éliminer essentiellement la possibilité de contact accidentel.

2. Dispositif de couplage d'équipement électrique selon la revendication 1 dans lequel le composant femelle (12) est conçu de façon à être connecté à une boîte de jonction électrique ou directement sur la structure d'un bâtiment et en maintenant un contact sensiblement au même niveau que la surface du bâtiment et qui comprend :

i) une plaque de base (12) présentant un côté de boîte de jonction interne et un côté de surface de paroi externe ;

ii) des moyens de fixation (90-96) coopérant avec ladite plaque de base et adaptés pour assurer une connexion sur des boîtes de jonction de différentes dimensions et standards ;

iii) une pluralité de moyens de support femelles espacés circonférentiellement (108,110) qui s'étendent vers l'extérieur à partir du côté de surface de paroi de la plaque de base et qui présentent des pattes femelles s'étendant circonférentiellement (154, 156), espacées de la surface de la plaque de base définissant ainsi lesdits crochets (154, 156) ;

iv) des moyens de contact femelles espacés circonférentiellement (108, 110) qui s'étendent vers l'extérieur à partir du côté de surface de paroi de la plaque de base et qui comprennent des évidements (124, 126, 128) et lesdits clips élastiques femelles, chaque évidement étant associé à un clip respectif ;

et ledit composant mâle peut être coupé de façon détachable audit élément femelle de façon à assurer une connexion électrique et pouvant supporter une charge, avec l'équipement électrique et qui comprend :

v) une plaque de fixation (14) ayant une surface interne qui est conçue de façon à venir en prise, de manière détachable, avec l'assemblage femelle de la plaque de base et qui comporte des moyens permettant une liaison électrique à partir de conducteurs électriques, s'étendant depuis l'équipement électrique, vers des connecteurs électriques (56, 58, 60) sur la plaque de fixation, et une surface externe opposée de la plaque de fixation conçue de manière à assurer une connexion variable avec l'équipement électrique ;

vi) une pluralité de moyens de support mâles circonférentiellement espacés (130, 132) s'étendant vers le haut depuis la surface interne de la plaque de fixation, chaque moyen de support mâle ayant un tenon mâle s'étendant circonférentiellement (136, 138, 134, 140) et comportant des moyens d'engagement (150, 152) complémentaires des moyens d'engagement respectifs (158, 160) de la patte femelle, chaque tenon étant adapté à être accepté dans un crochet respectif ;

vii) des moyens de contact mâles circonférentiellement espacés sur la surface interne de la plaque de fixation, qui assurent lesdits contacts mâles (68, 70, 72) ;

de manière que les contacts du composant mâle puissent être déplacés dans les évidements du composant femelle, avec les tenons mâles adjacents aux crochets femelles, après quoi le composant mâle peut être entraîné en rotation par rapport au composant femelle afin d'amener les moyens d'engagement de cha-

- que moyen de support femelle en prise avec les moyens d'engagement complémentaires des moyens de support mâles, ce qui procure un support pouvant porter une charge et subir une rotation restreinte entre les composants mâles et femelles afin d'empêcher essentiellement un désengagement accidentel des composants et, en même temps, les contacts mâles viennent en prise par frottement avec les contacts femelles en permettant ainsi la conduction de l'électricité vers l'équipement électrique.
3. Dispositif de couplage électrique selon la revendication 1 ou la revendication 2 dans lequel chacun desdits clips est un clip métallique ayant généralement la forme d'un J (162), qui est compressible, lesdits contacts appuyant sur lesdits clips afin de maintenir un contact électrique.
 4. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel il existe trois clips femelles espacés les uns des autres et trois contacts mâles espacés les uns des autres.
 5. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel le côté de la boîte de jonction du composant femelle possède une nervure octogonale (15) s'étendant depuis sa surface pour venir s'engager à frottement sur une boîte de jonction octogonale commune, ladite rainure octogonale est contenue dans une arête externe circulaire dudit composant femelle, ladite arête externe permettant un montage au niveau de la plaque de base à l'endroit où la boîte de jonction est encastrée dans la surface du bâtiment.
 6. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel lesdits six moyens de support mâles et femelles sont circonférentiellement espacés de manière que chaque combinaison mâle et femelle transfère une charge sensiblement égale.
 7. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel, pour aider à assurer un alignement correct des composants mâles et femelles et par conséquent, une polarité des connecteurs électriques, on moule une flèche (146) dans le côté de l'équipement électrique de la plaque de base afin d'assurer l'alignement avec une saillie (144) du composant mâle, avant l'engagement par rotation.
 8. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel ledit composant mâle comporte deux longues fentes (74, 76) qui en permettent le montage sur une variété d'équipements légers en utilisant une paire de vis dans un système de suspension à deux points, lesdites fentes étant en retrait à partir de la surface de montage afin de recevoir les vis, ledit composant mâle comportant également un trou central (46) destiné à recevoir des équipements montés par un point avec un profil hexagonal moulé dans la plaque de fixation afin d'aider et d'assurer la fixation de l'équipement à la plaque de fixation, à l'aide d'un écrou hexagonal.
 9. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel ladite plaque de fixation est suffisamment profonde pour délimiter un espace afin de fixer des équipements légers montés centralement, et également pour laisser de la place au câblage.
 10. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel ladite plaque de base et la plaque de fixation comportent une bordure surélevée à l'endroit où les bornes doivent être connectées en vue d'assurer un positionnement approprié des contacts électriques et également pour maintenir les câbles électriques.
 11. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel ladite plaque de fixation comporte en outre une paire d'ouvertures (74, 76) en vue de recevoir une paire de goujons filetés (500, 502), sur lesquelles une plaque de couverture dudit équipement électrique est fixée par un ou plusieurs écrous (504, 506, 508, 510).
 12. Dispositif de couplage électrique selon l'une quelconque des revendications 1 à 10 dans lequel ladite plaque de fixation comprend en outre, une paire d'ouvertures (74, 76) destinées à recevoir une paire de vis de taraudage (608, 610) grâce auxquelles une plaque de couverture dudit équipement électrique est connectée à ladite plaque de fixation.
 13. Dispositif de couplage électrique selon l'une quelconque des revendications précédentes comprenant en outre une bague d'espacement (700) fixée par ajustage par frottement à ladite plaque de fixation afin de réaliser un espace-

- ment prédéterminé entre ladite plaque de fixation et la plaque de couverture dudit équipement électrique.
- 14.** Dispositif de couplage électrique selon l'une quelconque des revendications 1 à 12 comportant en outre une paire d'entretoises en tige tubulaire (800), une paire de boulons correspondant (500, 502) s'étendant au travers d'ouvertures dans ladite plaque de fixation et d'autres ouvertures dans une plaque de couverture dudit équipement électrique et, une paire d'écrous décoratifs (512, 514) pour fixer par vissage ladite plaque de couverture sur ladite plaque de fixation, lesdites entretoises en tige tubulaire étant prévues pour réaliser un espacement prédéterminé entre ladite plaque de fixation et la plaque de couverture.
- 15.** Dispositif de couplage électrique selon l'une quelconque des revendications précédentes dans lequel ledit équipement électrique comprend une tige tubulaire fileté (900) devant s'insérer au travers d'une ouverture dans ladite plaque de fixation et une paire d'écrous de verrouillage (902, 904) étant prévus pour fixer par vissage ladite tige tubulaire sur un flasque s'étendant autour de ladite ouverture dans ladite plaque de fixation.
- 16.** Dispositif de couplage électrique selon l'une quelconque des revendications 1 à 14 dans lequel ladite plaque de fixation est pourvue d'une ouverture (46) au travers de laquelle s'étend un cordon électrique provenant dudit équipement électrique, ledit cordon électrique étant muni d'un encastrer de cordon (1004), pour saisir et par conséquent retenir ledit cordon électrique dans ladite ouverture de la plaque de fixation.
- 17.** Dispositif de couplage électrique selon l'une quelconque des revendications 1 à 10 dans lequel ledit équipement électrique est en outre muni d'une chaîne (1100) et d'une portion de crochet fileté (1102) pour supporter ladite chaîne, une tige tubulaire fileté (1104) pour s'insérer dans une ouverture de ladite plaque de fixation, et une paire d'écrous de verrouillage (1106) afin de fixer ladite tige tubulaire fileté sur une plaque de fixation, et ladite portion de crochet étant fixée, de façon vissable, à ladite tige tubulaire fileté afin de fixer ledit équipement électrique sur ledit équipement de fixation.
- 18.** Dispositif de couplage électrique selon l'une quelconque des revendications précédentes
- comprenant en outre un étrier de masse (1200) formant une liaison électrique entre ledit équipement et un contact de masse (60) dudit composant mâle, pour mettre électriquement à la masse ledit équipement.
- 19.** Dispositif de couplage électrique selon la revendication 18 dans lequel l'étrier de masse est connecté sur le dessous dudit composant mâle à l'aide d'une vis (1202) fixée dans un insert métallique fileté s'étendant depuis le dessous vers ledit contact de masse.
- 20.** Dispositif de couplage électrique selon la revendication 18 ou la revendication 19 dans lequel ledit étrier de masse est muni d'une ouverture en forme de fente à une extrémité éloignée de celui-ci, ladite ouverture étant alignée avec une ouverture correspondante dudit composant mâle afin de recevoir un assemblage écrou-boulon, pour fixer une plaque de fixation dudit équipement sur ledit composant mâle et, par conséquent, mettre également électriquement à la masse ladite plaque de fixation.

FIG. 1.

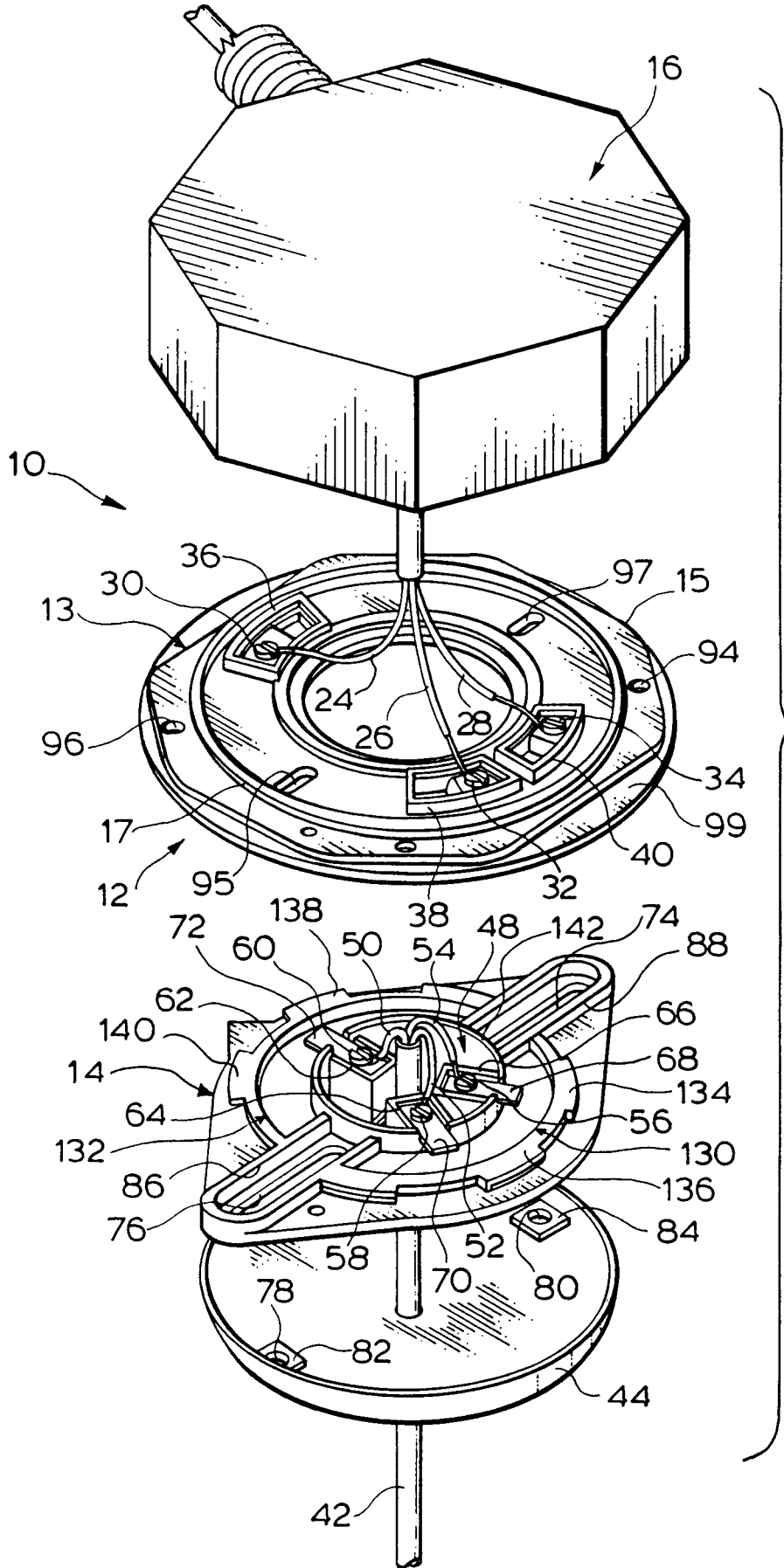


FIG. 2.

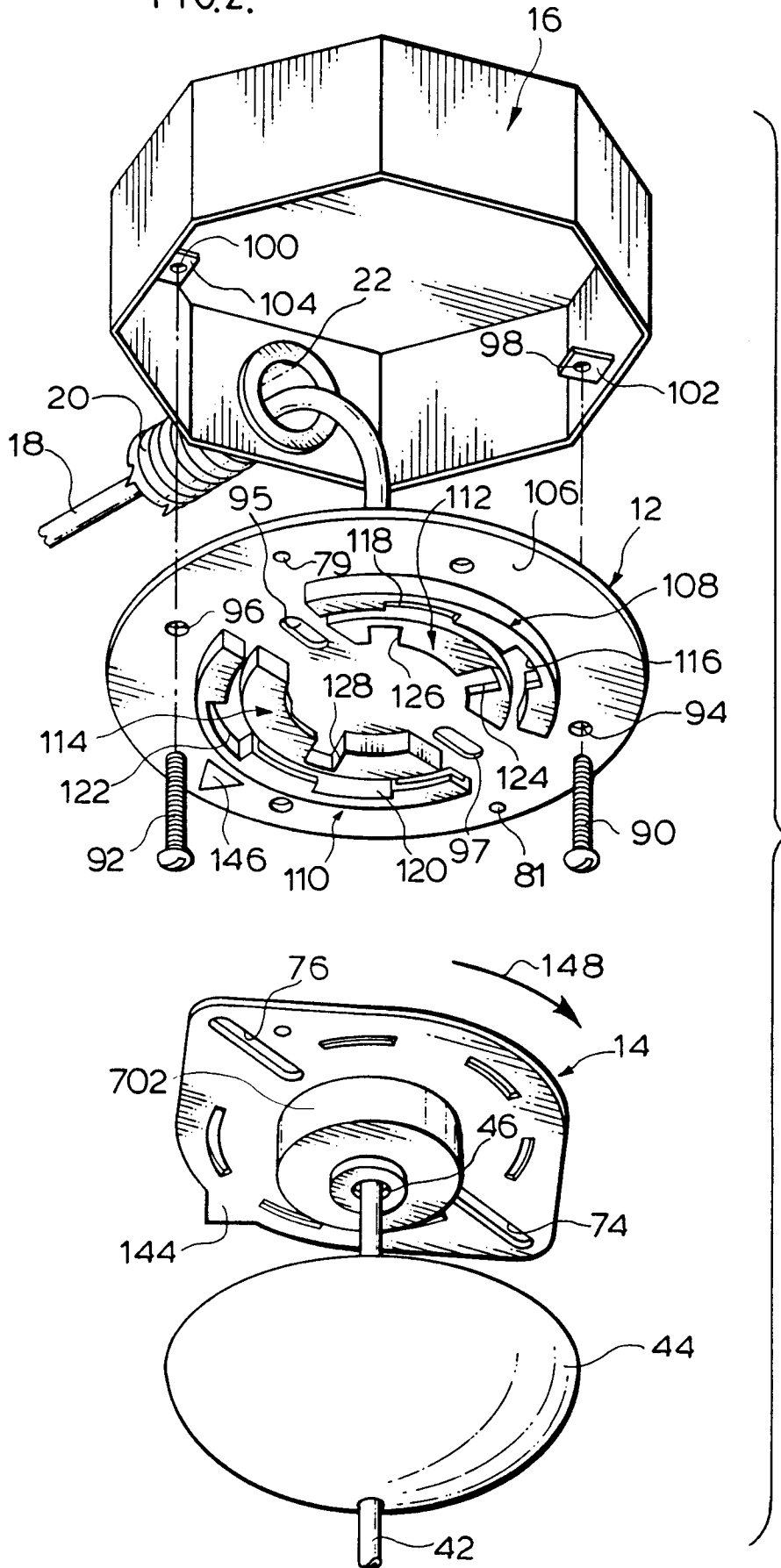
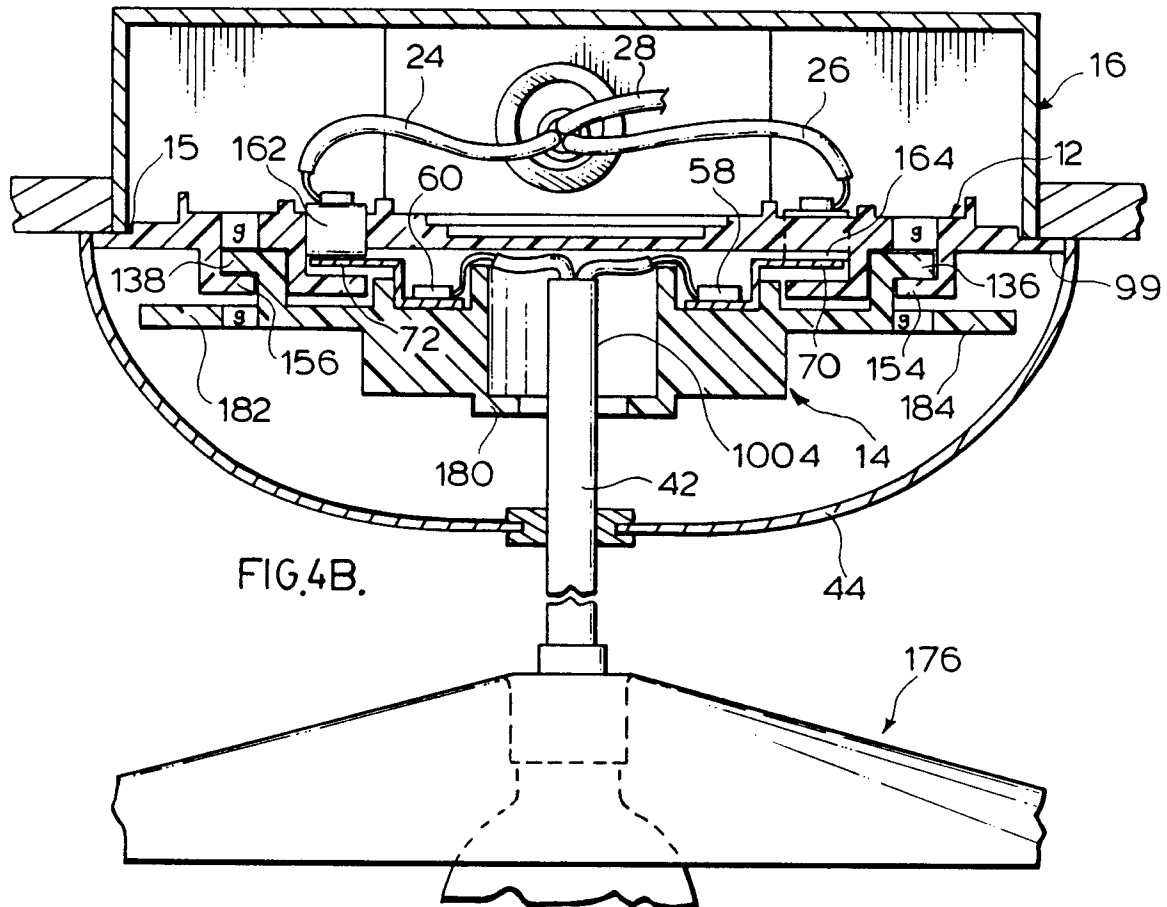
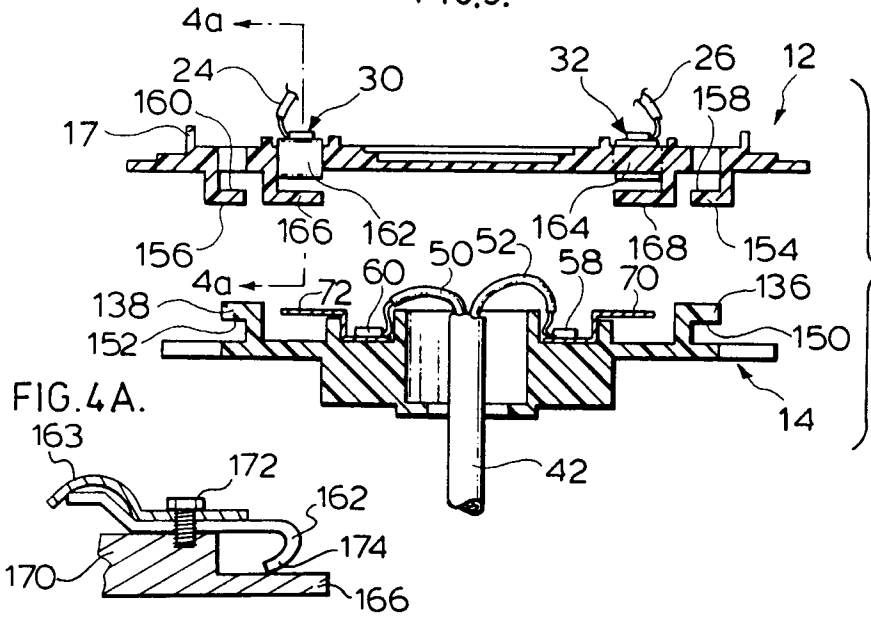
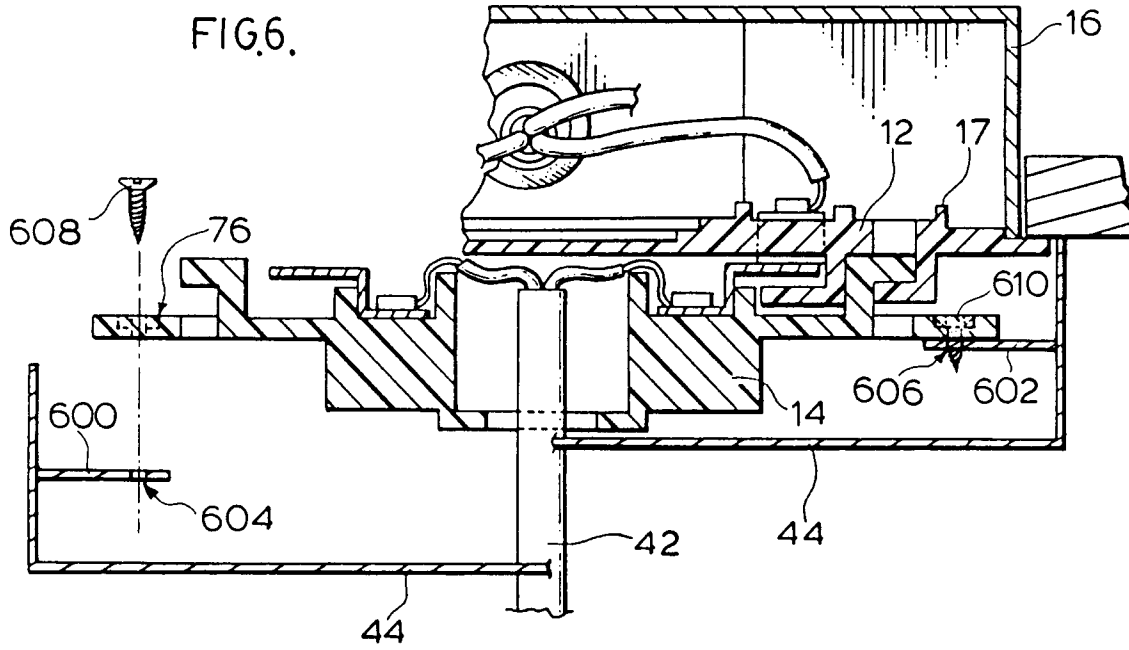
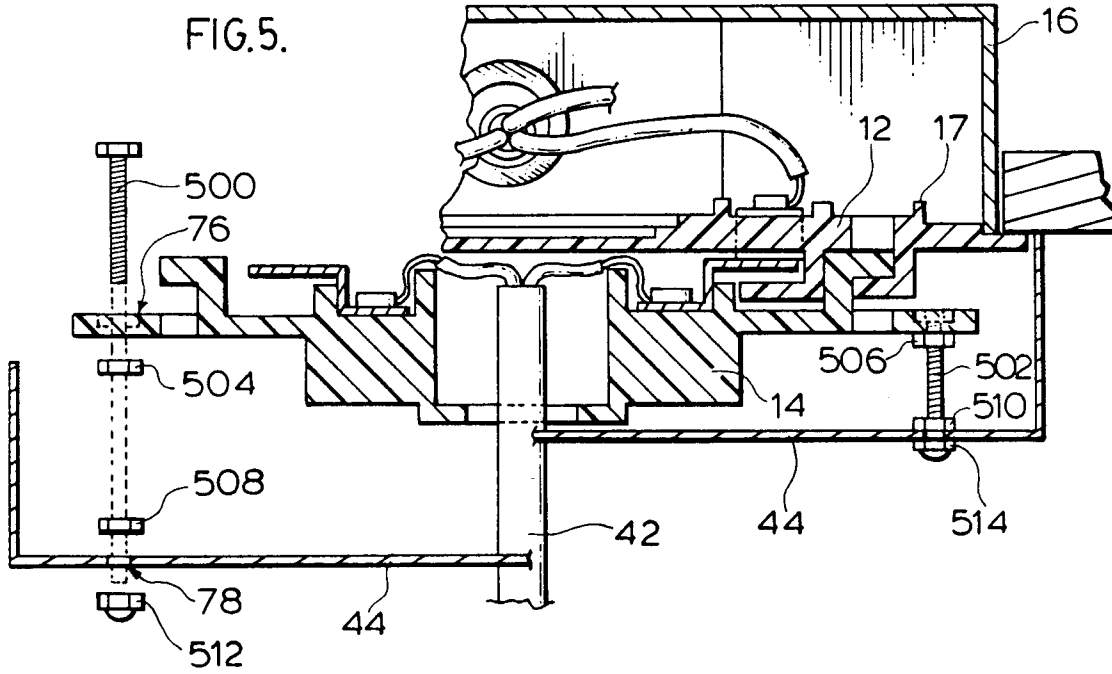


FIG.3.





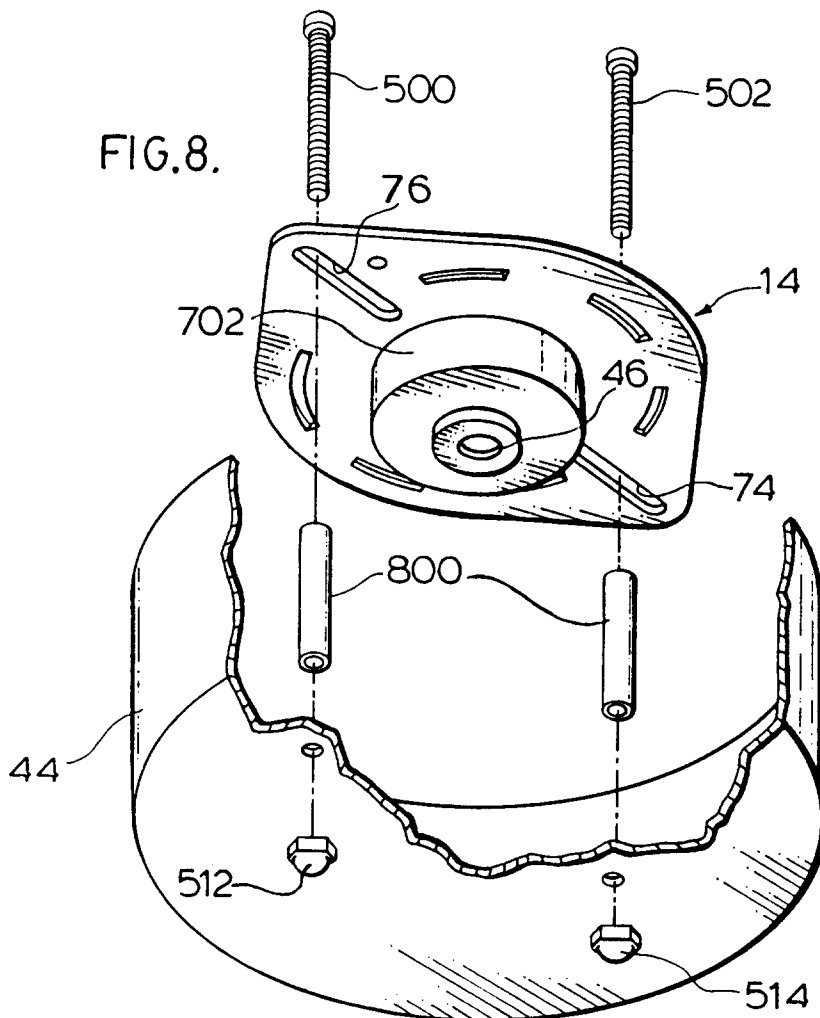
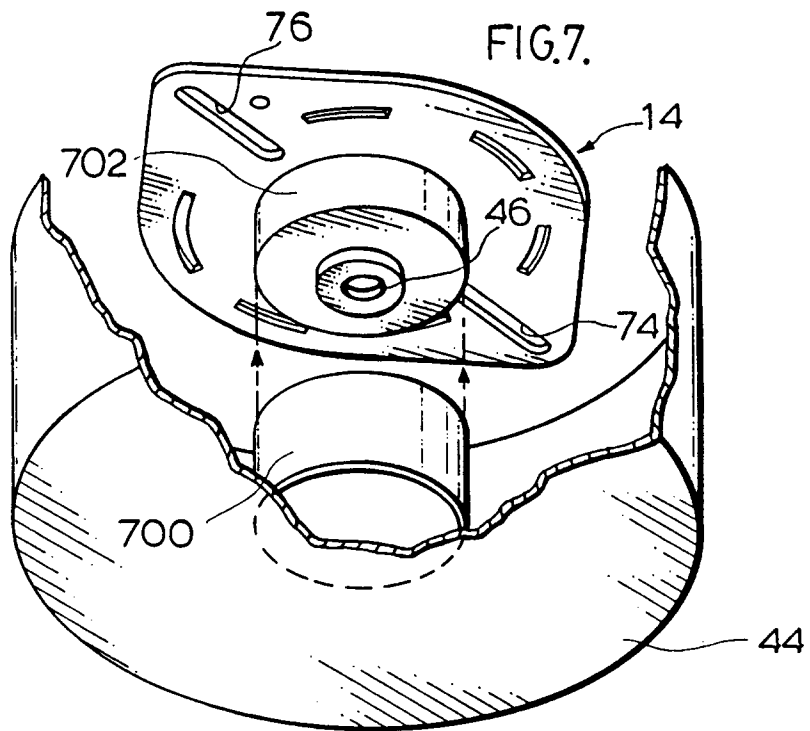


FIG.9.

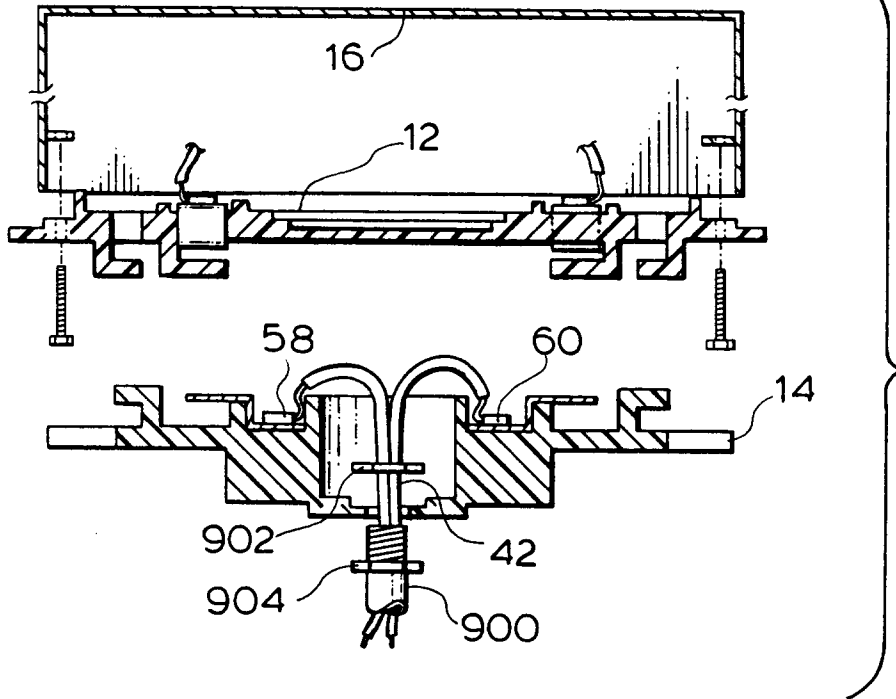


FIG.10A.

