

[54] **MOUNTING ARRANGEMENT FOR ELECTRICAL DEVICE**

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 [51] Int. Cl.F21v 33/00
 [58] Field of Search240/2, 2 S, 2 SP, 8.14, 8.16, 240/52.1; 200/167, 167 A; 248/27, DIG. 6; 174/52, 58

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[57] **ABSTRACT**
 A mounting arrangement for an electrical device in which a housing therein accommodating a pushbutton-type actuator unit is detachably arranged at a predetermined position in the mounting opening on a panel through resilient legs integrally formed at one end of resilient plate units of which resilient mounting members at its other end are detachably inserted in the corresponding slits formed in the sidewalls of said housing.

15 Claims, 8 Drawing Figures

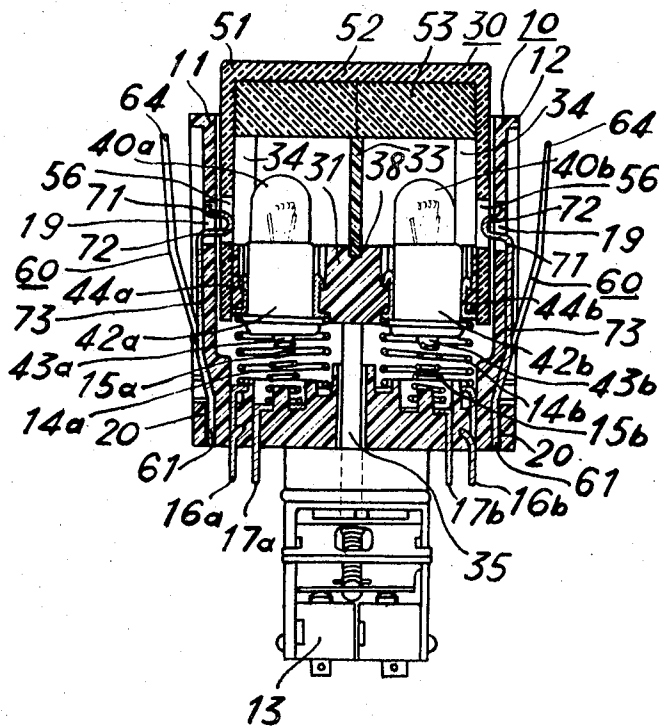


FIG.1

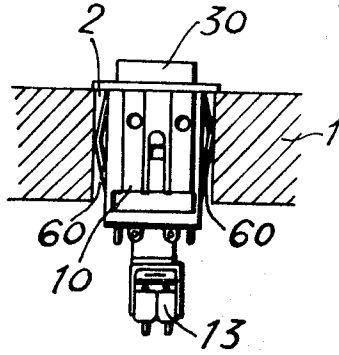
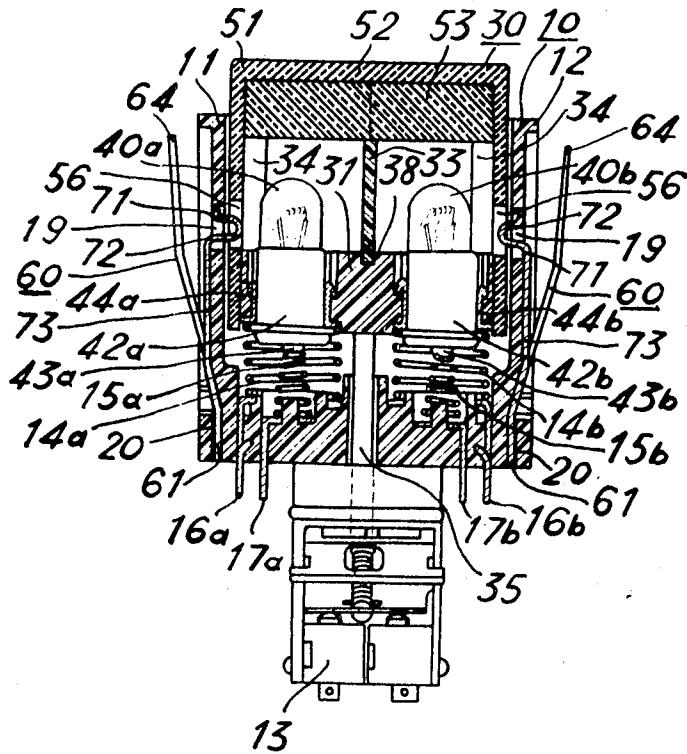
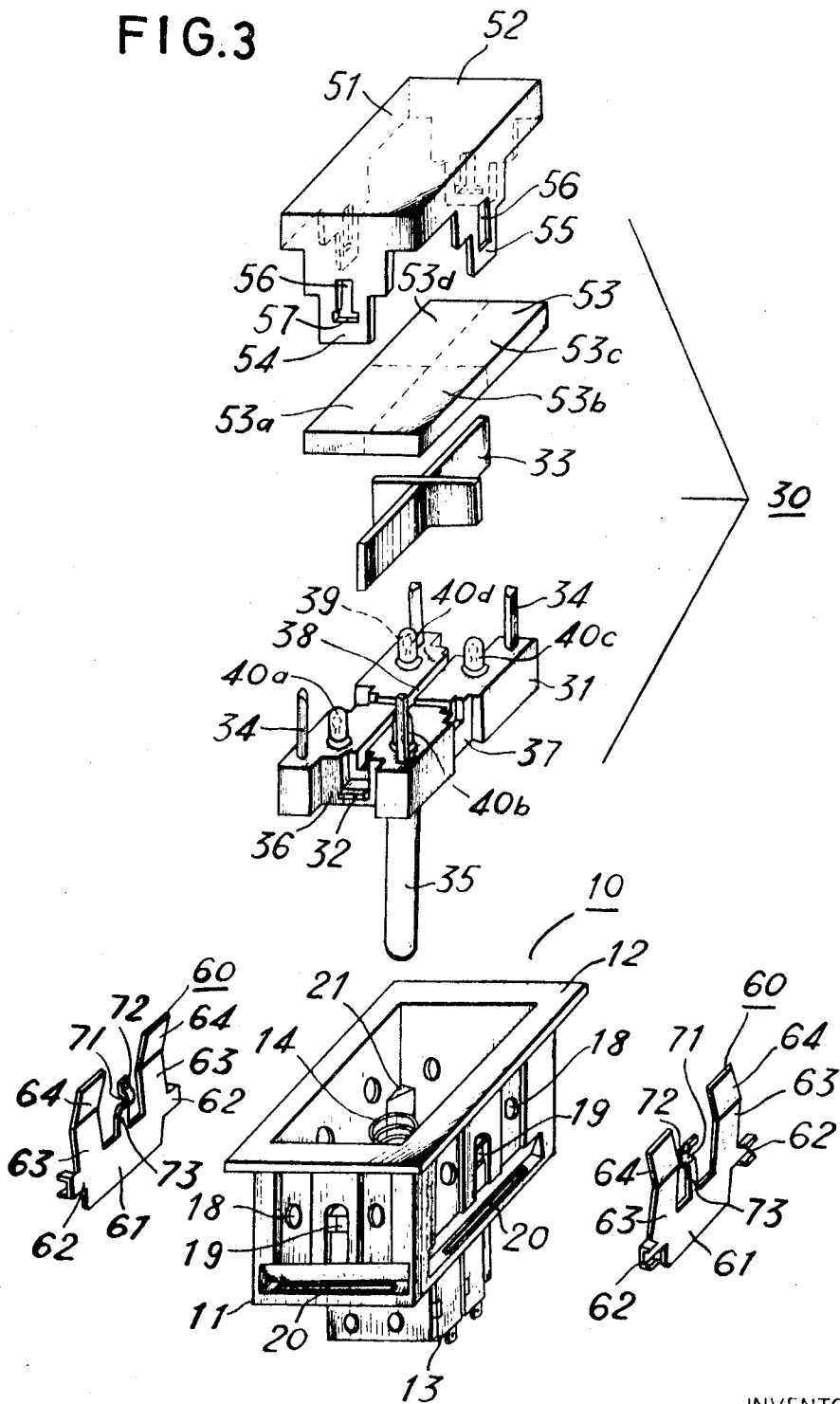


FIG.2



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FIG.3



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FIG. 4

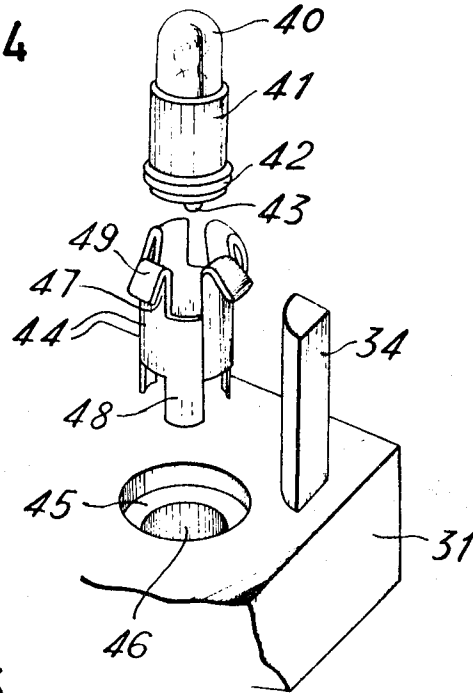
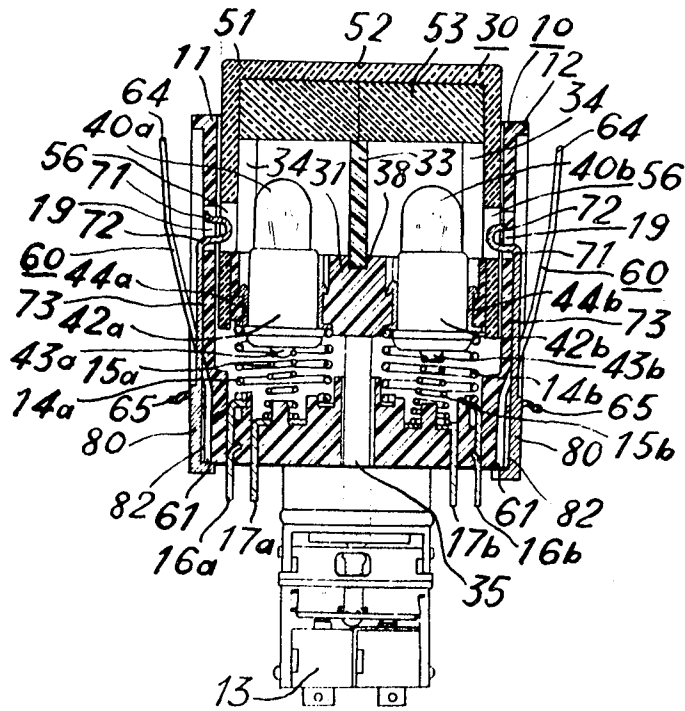
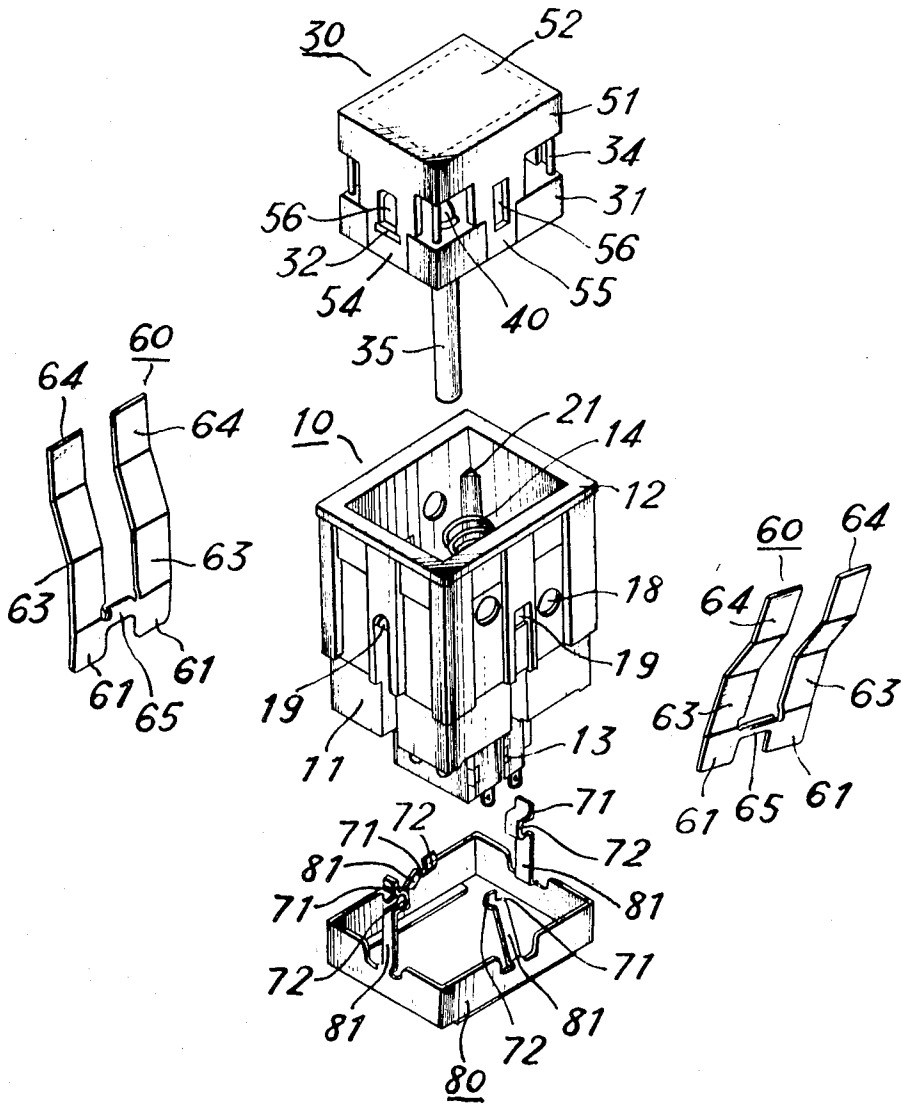


FIG. 5



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FIG. 6



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FIG. 7

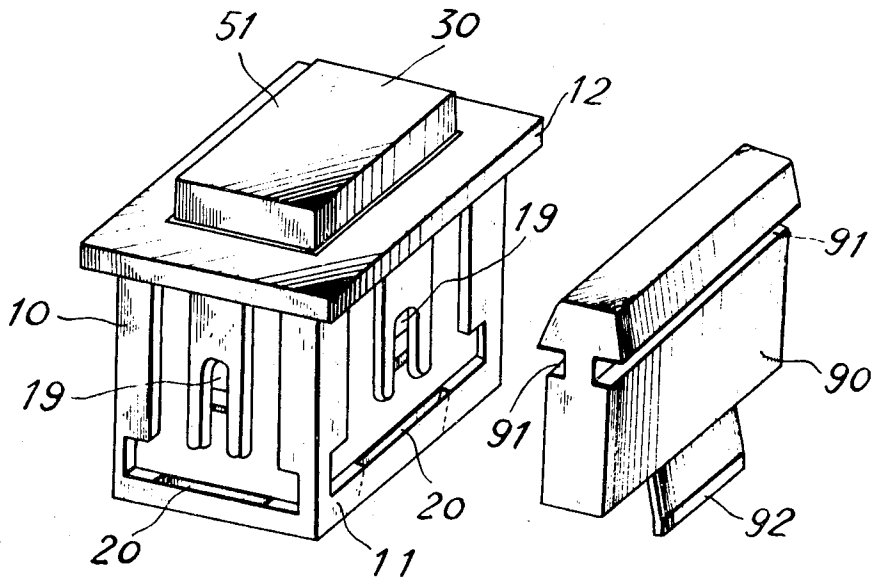
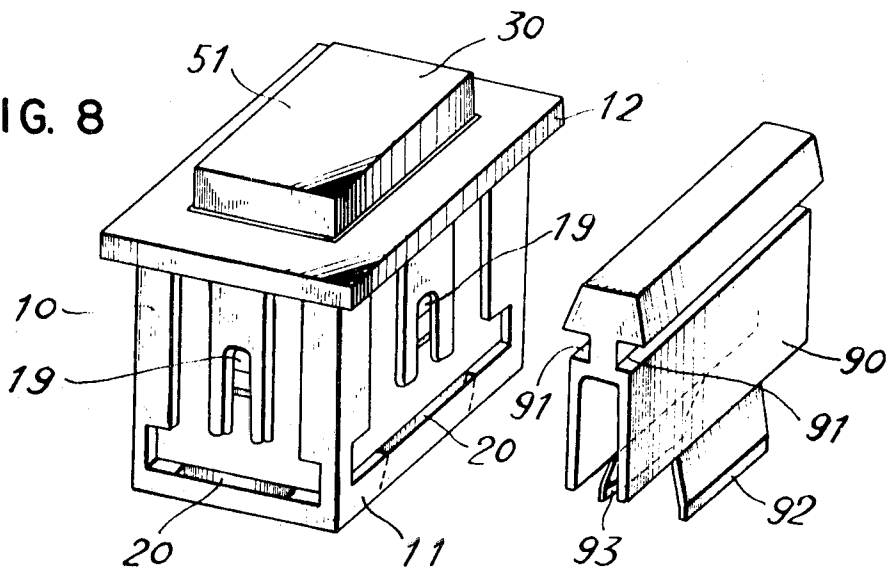


FIG. 8



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MOUNTING ARRANGEMENT FOR ELECTRICAL DEVICE

The present invention relates to a mounting arrangement for an electric device, such as a switch mechanism, of the type wherein independent mounting members are arranged to straddle the device and further are arranged to be fastened thereto by means of a detent fastening arrangement and whereby the resulting unitary structure can be disposed in a mounting opening in a panel by means of a detent arrangement associated with the unitary structure without conventional fastening means being associated with the electric device per se and without the necessity of utilizing tools of any kind.

The electric device of the above type is accommodated in a housing 10, for instance of the form of rectangular container, which is in turn longitudinally or transversely mounted in the mounting opening 2 in a panel 1 as shown in FIG. 1. Accordingly, in order to render said housing 10 to be disposed longitudinally or transversely as desired, it is preferable that any plate units 60 for resiliently securing the housing 10 in the mounting opening 2 of a panel 1 be so designed as to be detachably engaged to any pair of opposed sidewalls of said housing 10. To resiliently secure the housing 10 in the mounting opening 2, the only pair of said plate units 60 is sufficient, but must be so designed as to engage any pair of the opposed sidewalls of the housing whereby said housing 10 can be disposed in any mounting positions in the mounting opening 2.

In the present invention, the resilient plate unit 60 is provided as being formed at its one end with resilient legs of which the resiliency acts to secure the housing in the mounting opening and at its other end with a mounting member to be inserted in a corresponding slit formed on the sidewall of said housing whereby the housing can be resiliently detachably disposed in the mounting opening. A plurality of said slit are provided preliminary arrangements on the sidewalls of the housing which may be various in form such as cylindrical container, rectangular container and so on.

Accordingly, an object of the present invention is to provide a mounting arrangement for an electric device of a novel design characterized in the provision of a housing for operatively housing a pushbutton-type actuator unit associated with a switch mechanism secured to said housing, a plurality of slits formed in sidewalls of said housing, at least one pair of resilient plate units, each being formed at one end with resilient legs and at the other end with a mounting member, and a panel having a mounting opening in which said housing with the actuator unit therein can be received, said housing with said actuator unit therein being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits of said housing, arranged at a predetermined position in said mounting opening on said panel while said legs of said plate units resiliently detachably secure said housing in contact with the opposed side faces of said opening.

In the mounting arrangement for an electric device as hereinbefore described, in the sidewalls of said housing is provided with a plurality of engaging members for operatively and detachably engaging the actuator unit to and within the housing in such a manner as to permit the actuator unit to move in a predetermined range of distance to actuate the switch mechanism. Therefore, it will be understood that any type of actuator unit can be operatively movably engaged within the housing so long as the dimensions of the housing allows the latter to accommodate the actuator unit.

Another object of the present invention is to provide a mounting arrangement for an electric device of the above construction wherein each of said resilient plate units is integrally formed as a resilient plate unit with said engaging member whereby the actuator unit within the housing can be movably engaged to said housing. If said engaging member is formed integrally as an intermediate leg with the resilient plate unit, after inserting the mounting member of said resilient plate unit into the corresponding slit of the housing and then engaging the engaging member of said resilient plate unit with actuator unit

accommodated in the housing, the housing can be resiliently secured in said mounting opening through the resilient legs of said resilient plate unit on both sides of said intermediate leg. At this time said resilient legs are resiliently contacted to the adjacent side faces of the mounting opening. However, the intermediate leg may be independently formed from the resilient plate unit, for example, integrally formed with the housing.

Still another object of the present invention is to provide a mounting arrangement for an electric device of a novel design characterized in the provision of a housing for operatively housing a pushbutton-type actuator unit associated with a switch mechanism secured to said housing, a holding member so designed as to provide a plurality of slits between said holding member and the surrounding sidewalls of said housing when said holding member is engaged to the housing, at least one pair of resilient plate units, each being formed at one end with resilient legs and at the other end with a mounting member to be inserted in said slit, a plurality of fingers integrally formed with said holding member for resiliently and detachably engaging said actuator unit to said housing in a manner as to permit said actuator unit to move in a predetermined range of distance within said housing, and a panel having a mounting opening in which said housing with said actuator unit therein can be received, said housing with said pushbutton-type actuator unit therein being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits formed between said housing and said holding member attached to said housing thereby to detachably engage said actuator unit to said housing by means of said engaging member, disposed at a predetermined position in said mounting opening on said panel while said legs of said plate units resiliently detachably secure said housing in contact with the opposed side faces of said opening.

The present invention will be hereinafter fully described with reference to preferred embodiments thereof shown in the attached drawings, in which;

FIG. 1 is a view, in section, of a mounting arrangement according to the present invention, showing a housing for an electrical device mounted to the mounting panel to which it is mounted,

FIG. 2 is a cross-sectional view of the electrical device shown in FIG. 1,

FIG. 3 is an exploded view, in perspective, of the electrical device,

FIG. 4 is an exploded view, in perspective on an enlarged scale, of a portion of the electrical device,

FIG. 5 is a similar view to FIG. 2, but showing another preferred embodiment of the present invention,

FIG. 6 is an exploded view, in perspective, of the electrical device shown in FIG. 5,

FIG. 7 is an exploded view, in perspective, of a part of the mounting arrangement in a modified embodiment of the present invention, and

FIG. 8 is a similar view to FIG. 7, but showing a further modified embodiment of the present invention.

Referring now to the attached drawings, particularly to FIG. 1 through FIG. 4, a mounting arrangement for an electrical device according to the present invention as shown in FIG. 1 can be disassembled into a housing unit 10 in the form of a substantially rectangular container with four sidewalls and one base, an actuator unit 30 accommodated within said housing unit, and a pair of resilient plate units or plate spring units 60 for fastening said housing unit with respect to the mounting panel 1 to which it is mounted.

The actuator unit 30 may be further disassembled into, as shown in FIG. 3, a pushbutton member 51 in the form of a substantially rectangular cap provided on its upper surface with a transparent or translucent viewing portion 52 and a display screen 53 positioned below said viewing portion 52, and a lamp support block 31 in the form of a rectangular plain plate member.

The housing 11, which may be formed by molding plastic material, is formed at its upper end with a four-sided flange 12. The base of said housing 11 is secured at its exterior surface with a switch mechanism 13 for controlling an external electric circuit (not shown) and at its interior surface with a plurality of pairs of resilient coiled lines 14, 15 of different diameter, each in the form of coil spring, two pairs of which being shown in FIG. 2. One of the coiled lines or a large diameter coil spring 14 connects between a terminal 16 to a contact 42 of corresponding one of lamps 40 and the other coiled line or a small diameter coil spring 15 connects between another terminal 17 to another contact 43 of the same lamp 40. This housing 11 is also formed at its four sidewalls with a plurality of radiator holes 18 for heat exhaust and slots 19 for detachably receiving therein respective engaging members 71 of the plate spring units 60 which will be later mentioned, each of said sidewalls being formed at its lower portion with a slit 20, that is four slits of two pair, for detachably receiving therein a corresponding end or mounting member 61 of each of said plate spring units 60. Provided at one interior corner of said housing 11 is a restricting pillar 21 the function of which will be later mentioned in connection with the actuator unit.

The pushbutton member 51 included in the actuator unit is provided at its upper surface with the transparent or translucent viewing portion 52 and the display screen 53 inserted therein. The pushbutton member 51 is also provided at its four sides with two pairs of downwardly extending arms 54 and 55, each of said arms of two pairs being formed at its lower portion with a guide opening 56. However, of them, the only one pair of said opposed arms 54 is additionally provided with perforations 57 below the adjacent guide opening 56 for receiving therein corresponding projection 32 on the lamp support block 31 for detachably holding at least one lamp which will be later mentioned.

The lamp support block 31 is in the form of a substantially rectangular plain plate member formed by molding plastic material or other suitable member and includes a crossed partition 33 of opaque material, four stems 34 disposed on its upper surface about the four corners thereof, an operating rod 35 projecting from its undersurface downwardly for actuating the switch mechanism 13, and in the instance as shown, four lamps 40 and their sockets 44.

Referring now to FIG. 4 in which a portion of the lamp support block 31 is shown on an enlarged scale, the support block 31 is, as hereinbefore described, provided for each lamp 40 with an opening 45 in which the socket 44 constructed in a hereinbelow described manner can be received. This opening 45 is in turn formed with a reduced diameter portion 46. The socket 24 is formed by rolling to give the cylindrical shape a strip of metal having upper and lower tongues 47, 48, each of the upper tongues being bent to form a fin portion 49 prior to insertion of said rolled metal strip in said opening 45. When these fin portions 49 are to be formed, each of the remaining portions of the upper tongues 47 is somewhat radially inwardly biased to elastically, steadily receive a stem 41 of the lamp 40. This socket 44 thus constructed is in turn inserted in the opening 45, the fin portions 49 are restricted by the reduced diameter portion 46 while the lower tongues 48 are then radially outwardly bent at the back of the lamp support block 31 whereby the socket 44 is nondetachably held in the opening 45 without necessitating a connecting procedure, such as by means of brazing. Of course, the lower tongues 48 are always contacted with the coiled line 14 while these lower tongues 48 serve to electrically connect between the contact 42 of the lamp 40 and the terminal 16 through said line 14.

Referring back to FIG. 3, this lamp support block 31 itself is provided at its four side with two pairs of recesses 36 and 37 engageable to the corresponding pairs of the guide openings 56 on the arms 54 and 55 of the pushbutton member 51. However, the opposed recesses 36 of one pair is provided with the projections 32 engageable to the perforations 57 on the arms 54 of the pushbutton member 51 for restricting an accidental

detachment of the latter from the lamp support block 31. This lamp support block 31 is also formed on its upper surface with a crossed groove 38 for rigidly receiving therein a lower end of the crossed partition 33 of opaque material for the prevention of interference of light of the lamps 40 with respect to the display screen 53. One of the four corners of the lamp support block 31 is cutout to form a cutout portion 39 in register with the restricting pillar 21 provided at the corresponding corner of the housing 11 as hereinbefore described thereby actuator unit 30 being put into the housing 11 at the predetermined position. Alternatively, a pillar or cutout portion provided at a predetermined position within said housing 11 can be registered with a cutout portion or pillar provided at a predetermined position in said actuator unit respectively, whereby engagement between said actuator unit and said housing can be fixed as predetermined.

Still referring to FIG. 3, the display screen 53 when the actuator unit is assembled is, in the instance as shown, divided into four screen sections by the crossed partition 33 for forming a plurality of lamp chambers as indicated by 53a, 53b, 53c and 53d, each being associated with the corresponding lamps 40a, 40b, 40c and 40d. These screen sections 53a through 53d bear on their respective surface numeral characters or color signs representative of the switching patterns of the switch mechanism 13. Therefore, it will be evidently understood by those skilled in the art that, when one switching pattern is fixed by driving the switch mechanism 13, the associated one of the lamps 40 is lightened to illuminate a screen section representative of the same switching pattern. It should be noted that the screen sections 53a through 53d may be individually provided, although in the instance as shown the screen 53 is divided into them by the partition 33, and that the number of display screen 53 may be changed as desired.

The display screen 53 can be steadily rested over the upper ends of said stems 34 disposed about the four corners on the upper surface of the lamp support block 31 while being sandwiched between said lamp support block 31 and the transparent or translucent viewing portion 52 of the pushbutton member 51. In addition, the screen 53 can rest on the upper end of the crossed partition 33. It will be thus understood that the display screen 53 can be steadily held within the actuator unit 30, but easily replaced if the latter is disassembled.

A unitary structure of the actuator unit 30 can be formed by covering the pushbutton member 51 over the lamp support block 31 with the display screen 53 and the crossed partition 33 being accommodated therebetween. At this time, it is necessary to pull the only pair of the arms 54 outwardly to render projections 32 to pass through the perforations 57 in its assembled condition. Due to the intrinsic resiliency of each of the arms 54 of one pair, as the arms 54 are released from their pulled position, the perforations 57 can be rigidly engaged by the projections 32. However, it should be noted that, if separation therebetween is desired, it can be easily performed by a reverse procedure, i.e., by pulling the arms 54 outwardly to permit the projections 32 to disengage from the perforations 57.

In this instance, so long as the arms 55 of one pair are designed to have different width and correspondingly the recesses 37 of the associated pair are designed to have different width, mounting of the pushbutton member 51 with respect to the lamp support block 31 is fixed. In other words, in FIG. 3, the right-hand arm 54 cannot be engaged in the recess opposite to the right-hand recess 36 because of difference in width. This ensures the reliable prevention of false illumination on the display screen 53 when the mounting arrangement of the present invention is assembled to its completion.

The actuator unit 30 thus constructed as hereinbefore fully described is then mounted in the housing 11. In this instance, so long as the restricting pillar 21 of the housing 11 is fixed into the cutout portion of one corner of the lamp support block 31, mounting of the actuator unit 30 with respect to the housing unit 10 is right. In other words, the other corner of the

lamp support block 31 except of the cutout corner cannot be engaged with but collide with the restricting pillar 21 of the housing 11. This ensures the reliable prevention of false connection between lamps 40 and terminals 16, 17 through coiled lines 14, 15 when the mounting arrangement of the present invention is assembled to its completion. When the actuator unit 30 is mounted in the housing unit 10, the condition as illustrated in FIG. 2 is established. Nevertheless, the contacts 42, 43 of each of the lamps 40 are respectively automatically engaged to the adjacent ends of the coiled lines 16, 17 and the operating rod 35 is also extended down into the switch mechanism 13 in position to operate the switch mechanism 13 upon depression of the pushbutton member 51. Of course, the lamps 40 are operatively associated with said switch mechanism to indicate what type of switching pattern is fixed in the switch mechanism 13.

Detachable engagement between the actuator unit 30 and the housing unit 10 accommodating therein said actuator unit 30 is effected by means of the pair of plate spring units 60 of the same size and construction, one of which will be hereinafter described for simplification.

Each plate spring unit is made of a substantially E-shaped resilient plate material generally indicated by 60 in a lower portion of FIG. 3. This plate material 60 includes a mounting member 61 at a lower portion thereof to be detachably inserted in said slit 20, a pair of outwardly channel shaped detents 62 on the both sides thereof, a pair of resilient legs 63 on the both sides thereof above the respective detents 62, each of said legs 63 being provided at its upper end with a shoe portion 64, and an intermediate resilient leg 72 having an engaging member 71 and an inwardly curved free portion 73.

This plate material or unit 60 can be engaged to the housing 11 in such a manner as to insert the mounting member 61 in the corresponding one of the opposed slits 20 formed on the opposed sidewalls of the housing 11. Since the mounting member 61 is slightly curved as shown in FIG. 2, this can be steadily elastically held in the slit 20 without any fastening means.

While this plate material 60 is thus mounted in the slit 20 through the mounting member 61, the engaging member 71 is elastically received in the corresponding slot 19 with its curved portion 73 projecting through the corresponding guide opening 56 of the pushbutton member 51 whereby rigid engagement between the actuator unit 30 and the housing unit 10 is ensured. At this time, the actuator unit 30 can be depressed vertically in a predetermined range of distance because each of the guide openings 56 is provided with a sufficient clearance with respect to the curved portion 73 of the plate unit 60. The actuator unit 30 that has been depressed can be instantaneously returned to its original or inoperative position by the action of the coiled lines 14, 15 and is always maintained in said position. While in the inoperative position, the curved portion 72 is, of course, engaged to a lower portion of the guide opening 56.

It should be noted that the plate unit 60 is preferably designed so as to render it to be mounted in any of the slits 20 so that any positioning of the mounting arrangement for the electrical device of the present invention with respect to the mounting panel 1 to which it is mounted can be appreciated.

The pushbutton-type electrical device of one unitary structure comprising the actuator unit 30, the housing unit 10 and the plate spring units 60 as hereinbefore fully described can be mounted in a mounting opening 2 formed in a panel 1 in such a manner as to insert said electrical device in said opening 2 against the composite resilient force of the plate units 60, whereby the housing unit 10 accommodating said pushbutton-type actuator unit 30 operatively associated with said switch mechanism 13 therein is arranged at a predetermined position in said opening 3 on said panel 1 through said resilient legs of which the resiliency acts to resiliently detachably secure said housing 11 in contact with the side faces of said panel 1. So long as the composite resilient force of the plate units 60 is alive, the mounting arrangement can be rigidly held in said

mounting opening 2. Moreover, when the composite resilient force of the resilient legs 63 of the plate spring units 60 is alive between the housing unit 10 and the mounting opening 2 of the panel 1, the engaging member 71 of the intermediates resilient leg 73 is deeply inserted into the slot 19 of the housing 11 and the guide opening 56 of the pushbutton member 51 in comparison with the condition of that when the plate spring unit 60 is free from the panel 1. If two pair of plate units 60 are provided on all sidewalls of the rectangular housing 11, the housing 11 may be engaged more securely in the mounting opening 2 through said plate units 60 of which resiliency acts to resiliently detachably secure said housing 11 in contact with said panel 1.

To remove said mounting arrangement from the opening 2 of the panel 1, it is merely necessary to pull said electrical device out of said opening 2.

The mounting arrangement constructed as hereinbefore described in accordance with the present invention is, in brief, characterized wherein a portion of each of the plate units 60 is provided with the curved portion 72 which is in turn engaged through the corresponding guide opening 56 in the actuator unit 30 to restrict the free detachment of the latter from the housing unit 10. Accordingly, it will be clearly understood that without any fastening means the overall size of the mounting arrangement can be advantageously reduced.

Alternatively, the pushbutton type electrical device of the present invention can be engaged in the mounting opening 2 of the panel 1 in such a manner as to first insert the housing unit 10 with the plate units 60 on the both sides thereof in said mounting opening 2 and then to insert the actuator unit 30 in said housing unit 10, and thus the mounting procedure completes, whereby when the switch mechanism 13 is operated by the depression of said pushbutton member 51, one of said lamps representative of the switching pattern of the switch mechanism 13 that has been set in is turned on to indicate its switching pattern to the human eyes through the corresponding display section of said display screen 53 and thus said pushbutton member.

Although in this instance as hereinbefore described the substantially E-shaped plate units have been employed, it should be noted that various modification may be made by those skilled in the art, some of which will be hereinafter described with reference to FIG. 5 through FIG. 8.

In FIG. 5 and FIG. 6, the intermediate legs 73 that have been formed integrally in the plate units 60 in the previous instance are omitted. Instead, a four-sided holding member 80 integrally formed with a plurality of fingers 81 corresponding to said intermediate legs 73 is provided on the lower portion of the housing 11 as shown in FIG. 5. Accordingly, the plate unit 60 has no intermediate leg and is provided at its mounting member 61 with a notched portion 65 in register with the root of each of the fingers 81 integral with the holding member 80. These fingers 81 may be of the same shape as the intermediate legs 73 shown in FIG. 3.

The holding member 80 is designed such that, when said holding member is inserted over the four-sided outer periphery of a lower portion of the housing 11, said holding member can provide four slits 82 shown in FIG. 5 between its four sided upper edge and the surrounding sidewalls of said housing for receiving therein the mounting member 61 of the plate unit 60.

It will thus be understood that the actuator unit 30 can be rigidly held within the housing 11 in the same or similar manner as hereinbefore described with reference to FIG. 2 through FIG. 4.

Although not shown in the attached drawings, it should be noted that the intermediate leg 73 or finger 81 may be integrally formed within the housing 11. In this case, it may be possibly contemplated that the housing 11 and the holding member 80 are integrally formed each other with the slits 20 or 82 being reserved. However, the details thereof are set forth in the appended claims.

In FIG. 7 and FIG. 8, a barrier is shown by 90 for connecting two or more electrical device assemblies shoulder to shoulder in a single mounting opening 2 formed in a panel board 1. This barrier 90 is formed at its upper portion with a pair of opposed grooves 91 for receiving therein the flange 12 of the adjacently positioned housings 11. This barrier 90 is also formed at its bottom with one of or a pair of opposed mounting member 92 or 92, 93 outwardly slanting with respect to each other, through which the barrier 90 can be detachably inserted in the slit 20 or 82.

The difference between the barrier shown in FIG. 7 and that shown in FIG. 8 resides in its body portion, that is to say, the barrier shown in FIG. 7 has the rigid body with one of mounting member 92 at its one side, while the barrier shown in FIG. 8 has the recessed body with a pair of mounting members 92, 93 at its both sides, one of which being inserted in the corresponding slit in one of said housings while the other of which being inserted in the corresponding slit in the other of said housings to straddle said housing, whereby said housings connected by said barrier can be detachably arranged in the mounting opening at a predetermined position through said legs of which the resiliency acts to resiliently detachably secure said housings in contact with said panel. In a mounting arrangement for the electrical device as showing in FIG. 7 the combination comprises a panel having a mounting opening, a plurality of housings to be mounted in said mounting opening, each having a switch mechanism secured thereto, a pushbutton-type actuator unit operatively associated with said switch mechanism and movably accommodated within each of said housing, a plurality of slits formed on sidewalls of each of said housings, at least one pair of resilient plate units provided, each being provided at its one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit for resiliently securing said housings in said mounting opening, and at least one barrier member formed at its lower portion with a mounting member to be detachably inserted in said slit of said housing said barrier member being interposed between said housings while the respective mounting member of said barrier member being inserted in the corresponding slit of each of said housing, and housings being detachably arranged in said mounting opening at a predetermined position through said legs of which the resiliency acts to resiliently detachably secure said housings in contact with said panel.

It will be thus understood from the foregoing description of the present invention, that the mounting arrangement can be practised without necessitating any fastening members such as screw or bolt and nut. Moreover, if desired, the electrical device assembly fabricated in accordance with the present invention can be easily disassembled. Furthermore, positioning of the actuator unit with respect to the housing unit and positioning of the pushbutton member with respect to the lamp support block can be ensured as predetermined without any failure.

What is claimed is:

1. In a mounting arrangement for an electrical device, the combination comprising

a panel having a mounting opening,

a housing formed to be mounted in said mounting opening for operatively accommodating an actuator unit associated with a switch mechanism secured to said housing,

plural pairs of slits formed on sidewalls of said housing, and

at least one pair of resilient plate units, each being provided at one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit, said housing being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits, arranged at a predetermined position in said mounting opening through said legs of which the resiliency acts to resiliently detachably secure said housing in contact with said panel.

2. In a mounting arrangement for an electrical device, the combination comprising

a panel having a mounting opening,

a housing formed to be mounted in said mounting opening and provided with a switch mechanism,

an actuator unit operatively associated with said switch mechanism and movably accommodated within said housing,

plural pairs of slits formed on sidewalls of said housing,

at least one pair of resilient plate units, each being provided at one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit, and

a plurality of engaging members integrally formed with said housing for detachably engaging actuator unit to said housing,

said engaging member being so arranged as to permit said actuator unit within said housing to move in a predetermined range of distance, said housing being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits arranged at a predetermined position in said mounting opening through said legs of which the resiliency acts to resiliently detachably secure said housing in contact with said panel.

3. In a mounting arrangement for an electrical device, the combination according to claim 2, wherein

said engaging members are integrally formed with said plate units and,

a plurality of slots for passing said engaging members are provided in sidewalls of said housing,

said engaging member being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits and then their resilient engaging members are inserted in the corresponding slots, so arranged as to permit said actuator unit within said housing to move in a predetermined range of distance, and said housing being arranged at a predetermined position in said mounting opening while said legs of said plate units resiliently detachably secure said housing in contact with said panel.

4. In a mounting arrangement for an electrical device, the combination comprising

a panel having a mounting opening,

a housing formed to be mounted in said mounting opening for operatively accommodating an actuator unit associated with a switch mechanism secured to said housing,

a holding member so designed as to provide a plurality of slits between said holding member and the surrounding sidewalls of said housing when said holding member is inserted over said housing,

at least one pair of resilient plate units, each being formed at one end with a resilient leg and at the other end with a mounting member to be inserted in said slit, and

a plurality of engaging members integrally formed with said holding member for resiliently detachably engaging said actuator unit to said housing through slots formed in sidewalls of said housing in a manner as to permit said actuator unit to move in a predetermined range of distance within said housing,

said housing being, after said plate units are engaged to said housing through their resilient mounting members inserted in said corresponding slits, arranged at a predetermined position in said mounting opening through said legs of which the resiliency acts to resiliently detachably secure said housing in contact with said panel.

5. In a mounting arrangement for an electrical device, the combination comprising

a panel having a mounting opening,

a housing provided with a switch mechanism and formed to be mounted in said mounting opening,

an actuator unit operatively associated with said switch mechanism and movably accommodated within said housing,

display means provided within said actuator unit and including at least one lamp electrically associated with said switch mechanism to indicate operating of said switch mechanism,

a plural pairs of slits formed on sidewalls of said housing, at least one pair of resilient plate units, each being provided at one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit, and

a plurality of engaging members integrally formed with said housing for resiliently detachably engaging said actuator unit to said housing in a manner as to permit said actuator unit to move in a predetermined range of distance within said housing,

said housing being, after said plate units are engaged to said housing through their resilient mounting members inserted in the corresponding slits arranged at a predetermined position in said mounting opening through said legs of which the resiliency acts to resiliently detachably secure said housing in contact with said panel,

said display means being provided for visual representation of switching patterns of said switch mechanism operatively associated with said actuator unit.

6. In a mounting arrangement for an electrical device, the combination according to claim 5, wherein said actuator unit includes

a lamp support block for detachably holding at least one lamp thereon,

an operating rod integrally formed with a lower portion of said lamp support block for actuating the switch mechanism, and

a pushbutton member and detachably positioned above an upper portion of said lamp support block so as to cover over said lamp, whereby when the switch mechanism is operated by the depression of said pushbutton member, said lamp is turned on to indicate the switching pattern of said switch mechanism through said pushbutton member.

7. In a mounting arrangement for an electrical device, the combination according to claim 5, wherein said actuator unit includes

a lamp support block for detachably holding at least one lamp thereon,

an operating rod integrally formed with a lower portion with said lamp supporting block for actuating the switch mechanism,

at least one pair of stems integrally formed with an upper portion of said lamp support block at respective position about corners of said lamp support block, and

a pushbutton member made of transparent material and detachably positioned above an upper portion of said lamp support block so as to cover over said lamp,

and said display means includes

said lamps detachably fitted to said lamp support block and a display screen mounted between said stems and said pushbutton member,

whereby when the switch mechanism is operated by the depression of said pushbutton member, said lamp is turned on to indicate the switching pattern of said switch mechanism through said display screen.

8. In a mounting arrangement for an electrical device, the combination according to claim 5, wherein said actuator unit includes

a lamp support block for detachably holding a plurality of lamps thereon,

an operating rod integrally formed with a lower portion of said lamp support block for actuating the switch mechanism,

at least one partition integrally formed with an upper portion of said lamp support block for forming a plurality of lamp chambers for said lamps, and

a pushbutton member made of transparent material and detachably positioned above an upper portion of said lamp support block so as to cover over said lamps,

and said display means includes

said lamps detachably fitted to said lamp support block and a display screen having a plurality of display sections to be illuminated by the corresponding lamps below said display sections, said display screen being mounted between said partitions and said pushbutton member,

whereby when the switch mechanism is operated by the depression of said pushbutton member, one of said lamps representative of the switching pattern of the switch mechanism through the corresponding display section of said display screen.

9. In a mounting arrangement for an electrical device, the combination according to claim 5, wherein said actuator unit includes

a lamp support block for detachably holding a plurality of lamps thereon,

an operating rod integrally formed with a lower portion of said lamp support block for actuating said switch mechanism,

at least one pair of stems integrally formed with an upper portion of said lamp support block at respective position about corresponding corners of said lamp support block,

at least one partition integrally formed with an upper portion of said lamp support block for forming a plurality of lamp chambers for said lamps, and

a pushbutton member made of transparent material and detachably positioned above an upper portion of said lamp support block so as to cover over said lamps,

and said display means includes

said lamps detachably fitted to said lamp support block and a display screen having a plurality of display sections to be illuminated by the corresponding lamps below said display sections,

said display screen being mounted among said stems, partition and said pushbutton member,

whereby when the switch mechanism is operated by the depression of said pushbutton member, one of said lamps representative of the switching pattern of the switch mechanism through the corresponding display section of the display screen.

10. In a mounting arrangement for an electrical device, the combination according to claim 5, further comprising

a pillar or cutout portion provided at a predetermined position within said housing and

a cutout portion or pillar provided at a predetermined position in said actuator unit in register with said pillar or said cutout portion, respectively,

whereby engagement between said actuator unit and said housing can be fixed as predetermined.

11. In a mounting arrangement for an electrical device, the combination comprising

a panel having a mounting opening;

a housing formed to be mounted in said mounting opening with a switch mechanism secured thereto,

a pushbutton-type actuator unit operatively associated with said switch mechanism and movably accommodated within said housing,

display means provided within said actuator unit and including at least one lamp electrically associated with said switch mechanism to indicate operating of said switch mechanism,

a holding member so designed as to provide a plurality of slits between said holding member and the surrounding sidewalls of said housing when said holding member is inserted over said housing,

at least one pair of resilient plate units, each being formed at one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit, and

a plurality of engaging members integrally formed with said holding member for resiliently detachably engaging said actuator unit to said housing through slots formed in sidewalls of said housing in a manner as to permit said actuator unit to move in a predetermined range of distance within said housing,

said actuator unit including

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a lamp support block for detachably holding at least one lamp thereon,
 an operating rod integrally formed with a lower portion of said lamp support block for actuating the switch mechanism and
 a pushbutton member made of transparent material and detachably positioned above an upper portion of said lamp support block so as to cover over said lamp;
 said housing being, after said plate units are engaged to said housing through their resilient mounting members inserted in said corresponding slits, arranged at a predetermined position in said mounting opening through said legs of which the resiliency acts to resiliently detachably secure said housing in contact with said panel whereby, when the switch mechanism is operated by the depression of said pushbutton member, said lamp is turned on to indicate the switching of said switch mechanism through said pushbutton member.

12. In a mounting arrangement for an electrical device, the combination according to claim 11, wherein said actuator unit includes
 a lamp support block for detachably holding a plurality of lamps thereon,
 an operating rod integrally formed with a lower portion of said lamp support block for actuating the switch mechanism,
 at least one pair of stems integrally formed with an upper portion of said lamp support block at respective position about corresponding corners of said support block,
 at least one partition integrally formed with an upper portion of said lamp support block for forming a plurality of lamp chambers for said lamps, and a pushbutton member made of transparent material and detachably positioned above an upper portion of said lamp support block so as to cover over said lamps and
 said display means includes
 said lamps detachably fitted to said lamp support block and a display screen having a plurality of display sections to be illuminated by the corresponding lamps below said display sections,
 said display screen being mounted among said stems, said partition and said pushbutton member,
 whereby, when the switch mechanism is operated by the depression of said pushbutton member, one of said lamps representative of the switching pattern of the switch mechanism through the corresponding display section of the display screen.

13. In a mounting arrangement for an electrical device, the

combination according to claim 12, further comprising
 a pillar or cutout portion provided at a predetermined position within said housing and
 a cutout portion or pillar provided at a predetermined position in said actuator unit in register with said pillar or said cutout portion, respectively,
 whereby engagement between said actuator unit and said housing can be fixed as predetermined.

14. In a mounting arrangement for an electrical device, the combination comprising
 a panel having a mounting opening,
 a plurality of housings to be mounted in said mounting opening, each having a switch mechanism secured thereto,
 a pushbutton type actuator unit operatively associated with said switch mechanism and movably accommodated within each of said housing,
 a plurality of slits formed on sidewalls of each of said housings,
 at least one pair of resilient plate units provided, each being provided at its one end with a resilient leg and at the other end with a mounting member to be detachably inserted in said slit for resiliently securing said housings in said mounting opening, and
 at least one barrier member formed at its lower portion with a mounting member to be detachably inserted in said slit of said housing, said barrier member being interposed between said housings while the respective mounting member of said barrier member being inserted in the corresponding slit of each of said housing, and said housing being detachably arranged in said mounting opening at a predetermined position through said legs of which the resiliency acts to resiliently detachably secure said housings in contact with said panel.

15. In a mounting arrangement for an electrical device, the combination according to claim 14,
 wherein said barrier is provided at its lower portion with a pair of left-hand and right-hand mounting members, one of which being inserted in the corresponding slit in one of said housings while the other of which being inserted in the corresponding slit in the other of said housing to straddle said housing,
 whereby said housings connected by said barrier can be detachably arranged in the mounting opening at a predetermined position through said legs of which the resiliency acts to resiliently detachably secure said housings in contact with said panel.

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