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(54) **Electrical switch/button mechanism or change-over switch with quick connection**

(57) It is made up of four quick connection keys -2-, two by two, on sides of the base -1- in a V shape, lateral cylindrical pins -17- being situated on semicylindrical seats -18- that the base -1- has in the sides of respective location housings -3- of each key -2-, swinging there from the horizontal position prior to placement until the initial vertical position of the electrical wire -19-connection, said key -2- being in this vertical position, until the bottom of the cylindrical hollow -20-, situated on its external face -21-. This key -2- is forkshaped at its internal face -2-, forming an upper aperture -23-, wherein is situated the front face of the corresponding knife contact -4- and -4a-, whose face is equipped with an aperture -4b-, which upon initiating the displacement of the key -2- towards inside the base, penetrates inside the aperture -23-cutting through both sides of the insulation of the wire -19- of the aperture -4b-, making contact with its core, and trapping it. In its initial stable position, the key -2- has two buffers, next to its edge, wherefrom a stub -24- is located inside a slot -25- of the base -1- and one stub -26- outside of the edge thereof. It also has another stub -27-, rested on a spring -28- of the base -1-, situated below the lower face of its lateral walls and is positioned, finally, behind said spring -28- by clipping. The base -1- has four teeth -13-, two by two, to situate the contacts -4- and -4a-, fitted into internal slots -14- of the cover -12-, base and cover remaining held shut and the mechanism closed. According to the switch and push button, it only needs requires three knife contacts, a moving contact -8-, which in its "non contact" position rests on a buffer -29- of the base -1-, comes into contact with the third -4a-. It has a light emitting device -30-, above the swinging element -11- equipped with contacts -31- which penetrate through apertures -16a- in the cover -12-.

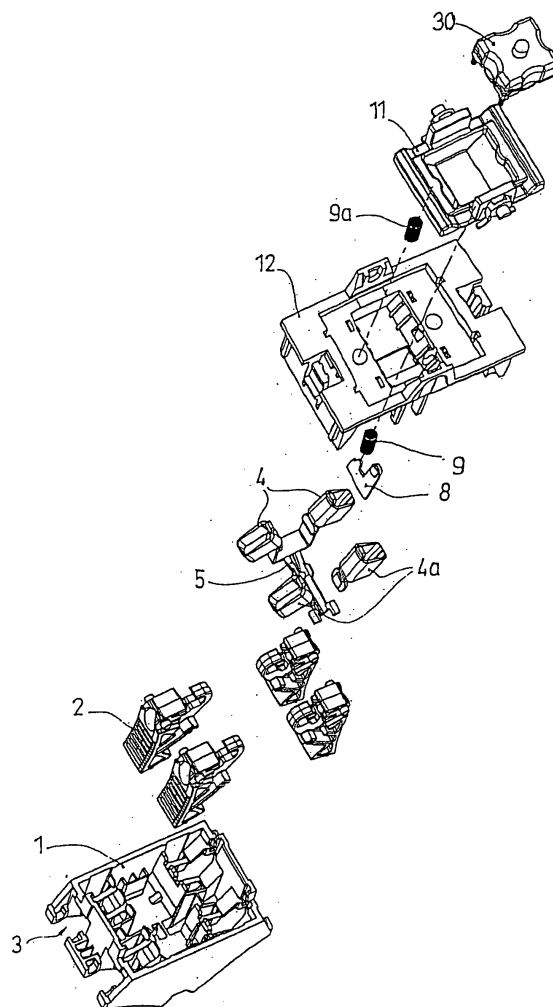


FIG. 1

Description

[0001] The present invention relates to an electrical mechanism devised for its application in low voltage systems in applications such as a switch or button or change-over switch, essentially **characterized in that** it is provided with a series of elements which permit the quick and sufficient connection of the conductors related thereto, elements which are characterized both by their special structure as well as by the manner of placement and application, also being characteristic of said mechanism the arrangement of the base, whose lower face is featured in a V-shape, and the permanent coupling with its cover, once the components have been arranged in the interior thereof. All of this will be described in detail over the course of the present specification.

[0002] One of the basic special features of the electrical mechanisms which are used in low voltage systems, generally domestic or in small shops, offices or such like, is that of facilitating the work of the installer as much as possible by means of the presentation of these mechanisms, in their applications as switches, buttons or change-over switches, equipped with devices which permit them to carry out, in the wiring process of the assembly, a quick connection of the electrical conductors which come in contact with the mechanism, both at the intake and outlet, thereby guaranteeing that this connection will be sufficient and permanent, establishing the electrical contact necessary and preventing an accidental detachment of the conductor, which will remain in this fixed and stable position.

[0003] The mechanism object of the present invention offers advantages which meet the previously detailed requirements, as it is equipped with an assembly of suitable components to carry out this quick connection, the mechanism being complemented with the suitable arrangement of the rest of the already known components, essential to complete the mechanism, such as, in the example that will be disclosed, the arrangement of a light emitting device.

[0004] This mechanism features the following applications, by means of the simple necessary change of the corresponding contacts, of general use such as: switch, light switch, push button switch, light push button switch, change-over switch and push button change-over switch. A characteristic of the mechanism object of the present invention is that it features a variant of its base, which permits its use for all of the previously listed applications, except those of change-over switch and push button change-over switch. For this reason, in the embodiment of this variant various unnecessary small partitions have been eliminated, with the subsequent saving of material.

[0005] With the aim of describing the special features of the mechanism in full detail, drawings wherein a practical embodiment thereof has been represented, in a non-limitative manner, have been attached.

[0006] In said drawings,

- fig. 1 is a perspective and exploded view of the mechanism in the application of change-over switch with light, showing the first base variant;
- fig. 2 shows, in perspective view, the placement of a connection key in the base of the mechanism, it previously being positioned horizontally, the base being drawn in cross-section by its theoretical longitudinal plane of symmetry;
- fig. 3 draws the same key already placed, situated in horizontal position, and likewise shows the placement of the cover closing the upper part of the body, being drawn in perspective view and, both the cover and the body, sectioned according to their longitudinal plane of symmetry;
- fig. 4 is a perspective view wherein the base is sectioned at its half and the cover at a quarter, of the assembly of the body with its cover attached and a quick connection key attached to the body and in horizontal position;
- fig. 5 partially draws, and in cross-section, the position of the connection key to initiate the connection process of the end of the wire or electrical conductor placed there;
- fig. 6 is a view similar to that of the previous figure, in the intermediate position of the connection key when the conductor is connected;
- fig. 7 finally, draws the final position of the connection key, when this connection operation of the conductor has already been carried out and with the connection key attached to the base by means of clipping;
- fig. 8 is a perspective view from above the base in its application as change-over switch, showing the location of the contacts, variant 1 of embodiment;
- fig. 9 is a perspective view from below, of the same base;
- fig. 10 is a perspective view from above the base in its application as switch and/or button, showing the location of the contacts, in its 2nd variant of embodiment;
- fig. 11 is a perspective view and from below of the base of the previous figure;
- fig. 12 is a perspective view from below the cover of the mechanism;
- fig. 13 draws, in perspective and from below, a swinging element, already known in this type of mechanisms; and
- fig. 14 is a perspective view from below of the light emitting device.

[0007] In accordance with these drawings, the electrical mechanism for various applications (switch, button, cross-over switch) with quick connection device, is constituted by a base -1-, the lower part whereof adopting the characteristic V-shape, with the purpose of leaving more space for the wiring of the assembly, and whereon

the facing sides whereof are placed connection keys -2-, both situated on housings -3- located on the outer part of the base -1-.

[0008] The assembly or group of contacts is situated in the interior of said base -1-; the contacts, grouped two by two, are known as the so-called "knife" type -4- and -4a-, open at their front face with a vertical aperture -4b-, similar to two facing knives, wherein the end of the conductor wire -19- being connected is held. In the application as cross-over switch there are two knife contacts -4-, and two knife contacts -4a- while in the others only three are necessary. Two of these knife contacts -4- are solidly joined at their lower part by means of a lower connector -5- characteristic of these groups of contacts. The other two knife contacts -4a- are situated facing the previous ones and in the middle area opposing the base -1-, all of these knife contacts -4- and -4a- being housed in spaces -7- delimited by small partitions situated in the interior of the base -1-. All of these knife contacts remain thus positioned, the aperture -4b- being situated outwards, specifically towards the bottom of the housings -3- of the quick connection keys.

[0009] This already known assembly of contacts is completed, in the example represented and thereby making their operation possible, by a moving contact -8- which rests its base on the lower connector -5- so it can swing when it is pushed by its cylindrical spring -9-, situated inside the lower tower -10- of the swinging element -11-, which, when actuated by the exterior push button, not represented in the drawings, causes the operation of this assembly of contacts.

[0010] Said lower connector -5- is fastened on a pivot -6- situated at the bottom of the base -1-.

[0011] A cover -12- closes the assembly of the mechanism, by being attached on the base -1-, as drawn in figs. 3 and 4, being held shut by the action of four teeth -13-, which are part of said base -1- on its upper edges corresponding to the sides where the knife contacts -4- and -4a- are positioned and which fit into the slots -14- of the cover -12- on the inner edge of its upper face. It is clear that the closure of the cover -12- on the base -1- is performed solely when all of the components of the mechanism (knife contacts, group of contacts, springs, etc.) have been previously placed inside the base -1-.

[0012] This cover -12-, whereon the sides -15- whereof are supported the lateral pivots -11a- of the swinging element -11-, has in its interior the apertures necessary -16- for the passage towards the interior of the lower tower -10- of said swinging element -11-, in direction towards the moving contact -8-.

[0013] A cylindrical spring -9a- is situated under the front part of the swinging element -11- in the necessary return action in the variant of application as button.

[0014] Above the swinging element -11- is positioned the light emitting device -30- provided on its lower face with the two contacts -31-, which will be inserted towards the interior of the base -1- through the apertures -12a- on the lower face of the cover -12-.

[0015] Each one of the connection keys -2- is provided, on their rear end, with two cylindrical pins -17-, axial in the direction of an imaginary transversal axis, which allow the connection key -2- to be positioned on the side of the base -1-, these pins -17- fitting into the interior of semi-cylindrical seats -18- of the base -1- in the sides of the corresponding aperture -3- where the key -2- has to be situated.

[0016] The positioning and fastening of the connection key -2- is initiated, as can be observed in figures 2 to 4, previously situating it in horizontal position to make it descend until the pins -17- thereof are positioned in the semi-cylindrical seats -18-; subsequently the cover -12- is placed and then the connection key -2- is turned until reaching its initial stable position for the connection of the electrical conductor wire -19-.

[0017] This attachment or fastening is carried out by the action of two projecting buffers on the connection key -2- (see fig. 5), practically next to its own edge. In the first place, a stub -24- is located inside the slot -25- in the base -1- and a stub -26- (directly below stub -24-), is located outside the edge of the base -1-.

[0018] The connection key -2- has a cylindrical hollow -20- on its external face -21-, a face provided with a suitable threading for a better grip. Inside of this cylindrical hollow -20- will be placed the end of the electrical conductor -19-, until it runs into the bottom thereof, next to the interior face -22- of the key, a face disposed in the shape of a fork and which delimits an upper aperture -23- wherein the front face of the knife contacts -4- are situated, where the apertures -4b- are.

[0019] Said electrical conductor -19- thus placed, upon initiating the displacement of the connection key -2-, as is observed in fig. 6, the front face of the knife contact -4- penetrates towards the interior of the upper aperture -23- of the connection key -1-, actuating the two sides of the aperture -4b- as shearing elements which will come into contact with the sides of the conductor -19-, cutting the plastic coating of the aforementioned conductor and permitting the direct contact of said sides of the aperture -4b- of the knife contact -4- on the copper core of the conductor -19-, which furthermore is sufficiently fastened, trapped by its two sides, preventing the accidental detachment thereof.

[0020] Fig. 7 shows the end of the cycle, when the connection key -2- has made it to its final position, with its external face -21- inclined towards the interior of the lower part of the base -1-, position wherein said key will remain perfectly attached, while the connection is maintained.

[0021] This attachment or fastening is carried out by the actuation of a stub -27-, which in principle leans on a spring -28-, which is on the base -1- in the lower area of the interior face of its side walls. Upon conclusion of the swinging displacement of the connection key -2-, this is stably positioned, as represented in figure 7; the third stub -27- being situated behind the spring -28- by means of a clipping action.

[0022] In this final stable position of the connection key -2-, the conductor -19- remains perfectly connected, after the retaining action of the key -2- and of the knife contact -4-, by means of its front aperture -4b-. As can be observed in figure 7, this final stable position of each one of the connection keys -2- is towards the interior of the lower part of the base -1-, almost coinciding with the V-shape thereof, occupying a minimal space and remaining protected.

[0023] In accordance with that described above, the mechanism will feature a practical variant of base -1 a- (figures 10 and 11) used in the applications as switch and button, applications which only require three knife contacts, two contacts -4- and one contact -4a-, as can be observed in figure 1. Regarding the latter, it will come into contact, in its swinging displacement, with the moving contact -8-, which in its "non contact" position rests against a buffer -29- on the base -1 a- instead of the corresponding space -7-.

[0024] Finally, the mechanism is **characterized in that** it has a light emitting device -30-, situated above the swinging element -11-, and provided with two contacts -31-, which are inserted in the interior of the mechanism through the apertures -12a- that the cover -12- has for said purpose, with the practical aim of coming directly in contact with the contacts which correspond for their specific function.

[0025] The essential characteristics of the electrical mechanism object of the present invention having been sufficiently described, it should be pointed out that any variation in dimensions, shapes, finish and types of materials used in the practical embodiment of the aforementioned mechanism, does not in any way alter the essential nature of the invention, which is summarised in the following claims.

Claims

1. Electrical switch/button mechanism or cross-over switch with quick connection, consisting of a base -1- in whose suitably compartmented interior are located the knife contacts -4- and -4a-, together with a moving contact -8-, actuated by the swinging element -11-, situated above the appropriate closure cover -12- of said base -1-, **characterized in that** it has four quick connection keys -2- which are positioned, two by two, on the opposite sides of the base -1-, which features a V-shape, lateral cylindrical pins -17- being situated axially in transversal direction, in the interior of semi-cylindrical seats -18- of the base -1- on its sides of corresponding location housings -3- of each connection key -2-, all of this so that the key can swing from the horizontal position prior to placement until the vertical starting position of the connection of the electrical conductor wire -19-, previously inserted, said connection key -2- being in this vertical position, until the bottom of the cylindrical

hollow -20- of the key -2-, situated on the external face -21-.

2. Electrical switch/button mechanism or cross-over switch with quick connection, according to the previous claim, in the interior of whose base -1- are installed, in the corresponding spaces -7-, the four knife contacts -4- and -4a-, provided on its external face with a vertical aperture -4b-, the edges whereof are similar to two facing knives, said external face being situated facing towards the bottom of the housing -3- of the connection key -2-, **characterized in that** this connection key -2- features the end of its interior face -22- in the shape of a fork, which delimits an upper aperture -23- wherein the front face of the corresponding knife contact -4- and -4a- is situated. This face is provided with the aperture -4b-, so that upon initiating the displacement of the connection key -2- towards the interior of the base, the aforementioned front face of the knife contact -4- and -4a- penetrates into the interior of the aperture -23- of the connection key -2- actuating the two sides of the aperture -4b- of said knife contact as shearing elements of the sides of the insulating coating of the conductor -19- remaining in direct and sufficient contact on its copper core, while it suitably traps the conductor -19- and prevents its detachment.

3. Electrical switch/button mechanism or cross-over switch with quick connection, according to claims 1 and 2, wherein the swinging displacement from an initial vertical stable position of each connection key -2-, beginning of the connecting action of the electrical conductor -19-, until the final stable position of said key, permits this quick connection of the aforementioned conductor -19-, **characterized in that** in its initial stable position, the quick connection key -2- has two buffers, practically next to its own edge; of which, one stub -24- is located inside the slot -25- of the base -1- and one stub -26- (directly below stub -24-), is located outside of the edge of the base -1-.

4. Electrical switch/button mechanism or cross-over switch with quick connection, according to claims 1 and 2, wherein the swinging displacement from an initial vertical stable position of each connection key -2-, beginning of the connecting action of the electrical conductor -19-, until the final stable position of said key, permits this quick connection of the aforementioned conductor -19-, **characterized in that** in its final stable position, the connection key -2- is situated towards the interior of the lower V-shaped part of the base -1-, shape which allows the entire assembly to occupy less space and facilitates the connection, each connection key -2- being provided with a stub -27-, which, after resting against the spring -28- that the base -1- has on the lower part of the interior face of its side walls, it is finally positioned

behind said spring by means of a clipping action.

5. Electrical switch/button mechanism or cross-over switch with quick connection, according to claim 1, wherein the assembly of its different contacts are suitably situated inside its base -1- before being closed by its cover -12-, **characterized in that** the aforementioned base -1- has four teeth -13-, situated two by two on its upper edges corresponding to the position of the knife contacts -4- and -4a-, which fit into slots -14- in the interior edge of the upper face of the cover -12-, both components, base and cover, remaining held shut and, in this manner, the mechanism being closed.
6. Electrical switch/button mechanism or cross-over switch with quick connection, according to claims 1 and 2, **characterized in that** in the applications of the mechanism as switch and push button, it only requires three knife contacts, two contacts -4- and one contact -4a-, this coming into contact with the moving contact - 8-, which in its "non contact" position will rest against the buffer -29- in the interior of the base instead of the space -7-, featuring, for this, the base variant -1a-mechanism in those two applications.
7. Electrical switch/button mechanism or cross-over switch with quick connection, according to claims 1 and 4, **characterized in that** it has a light emitting device -30-, positioned above the swinging element -11-, provided with contacts -31- which penetrate towards the interior of the mechanism through apertures -12a-which the cover -12- has for said purpose.

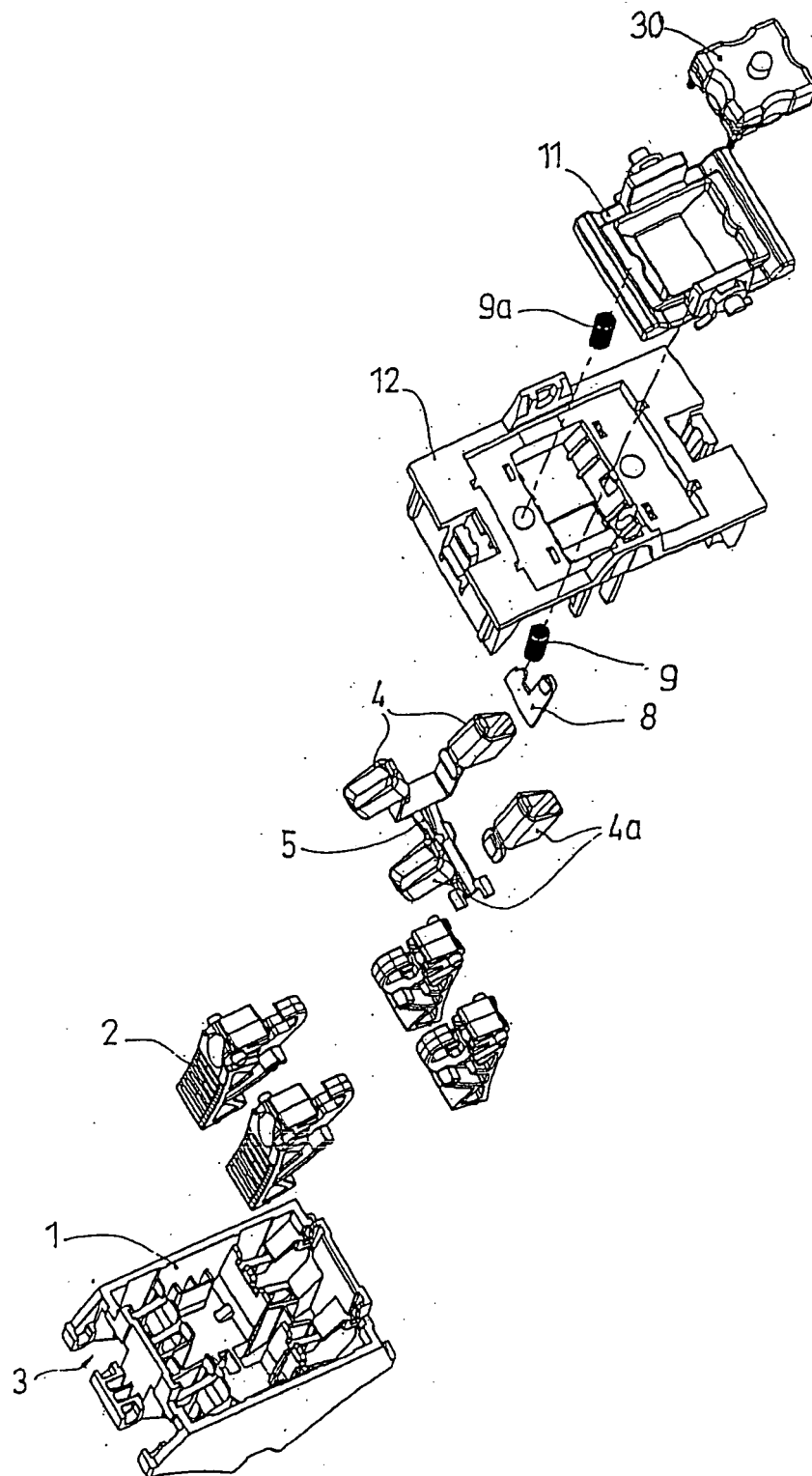


FIG. 1

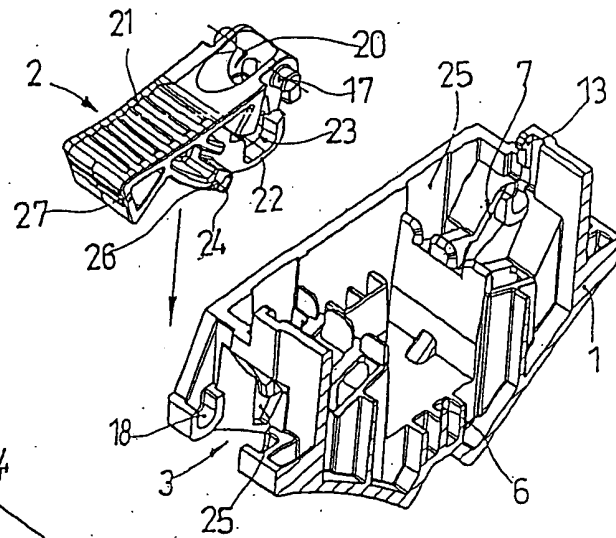


FIG. 2

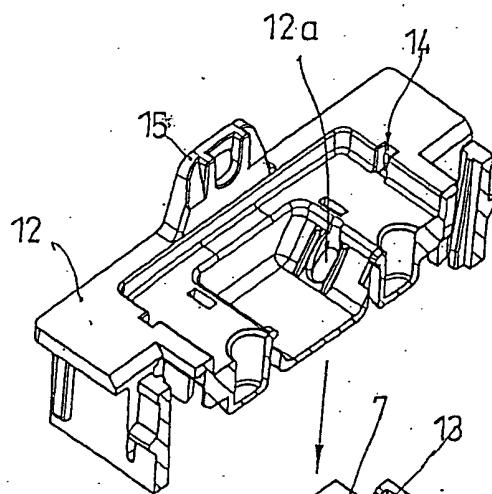


FIG. 3

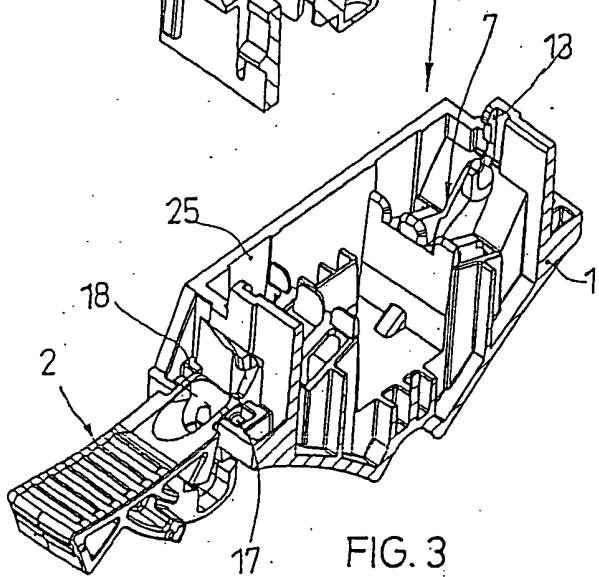


FIG. 4

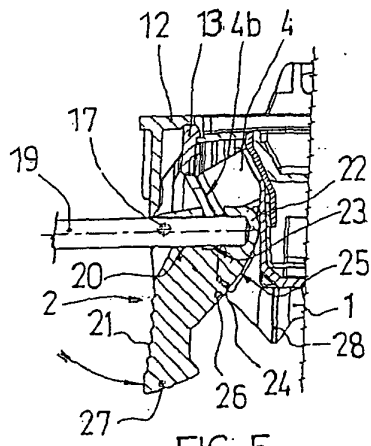


FIG. 5

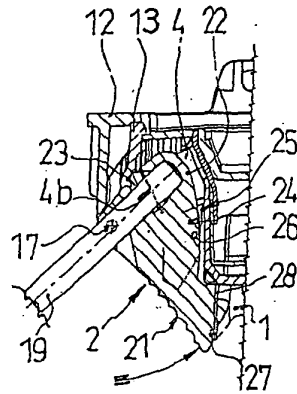


FIG. 6

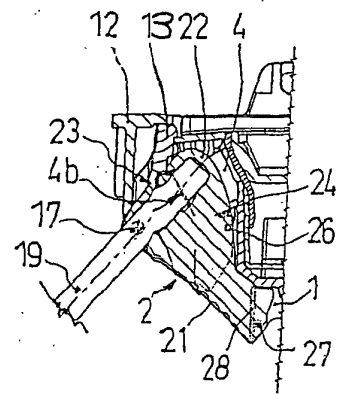


FIG. 7

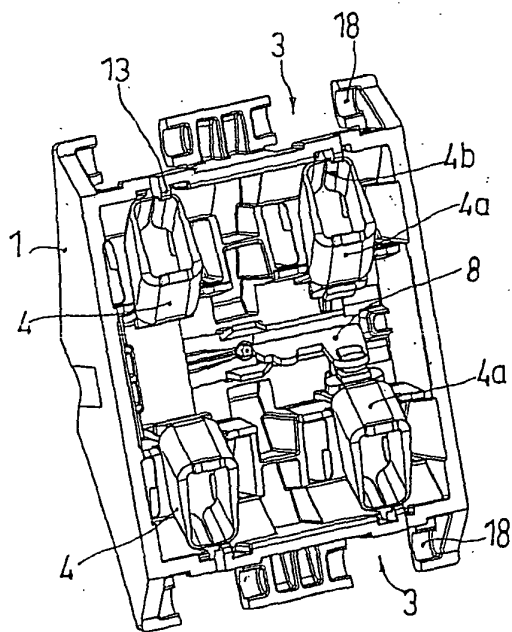


FIG. 8

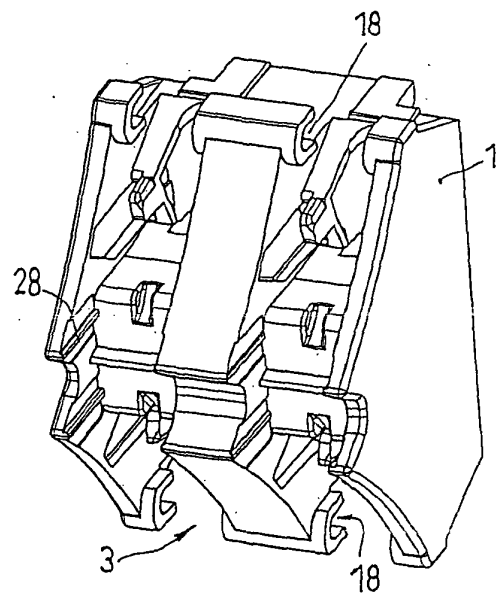


FIG. 9

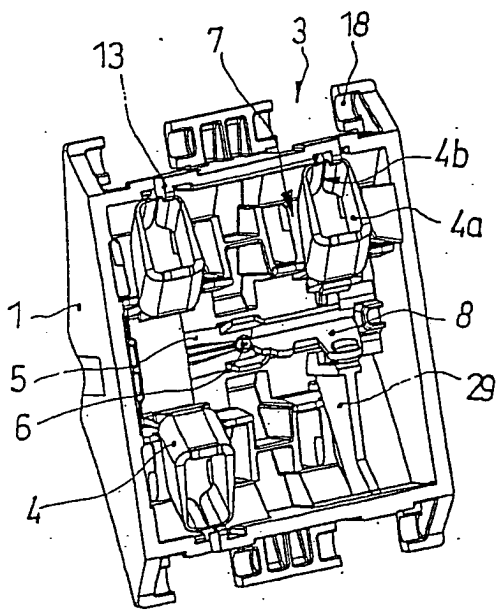


FIG. 10

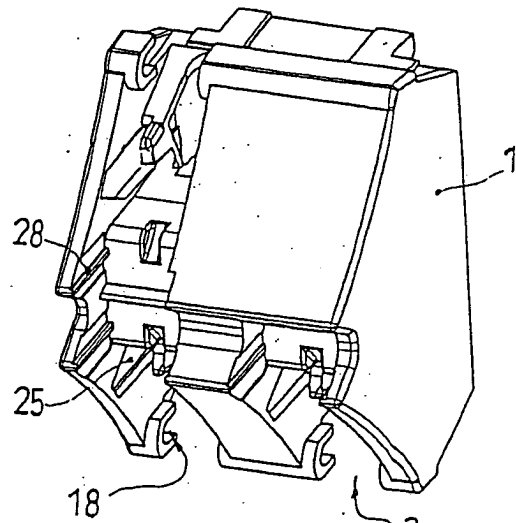


FIG. 11

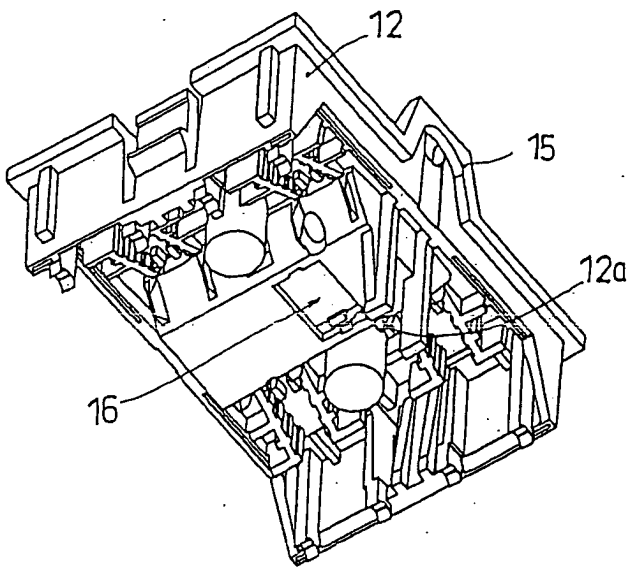


FIG. 12

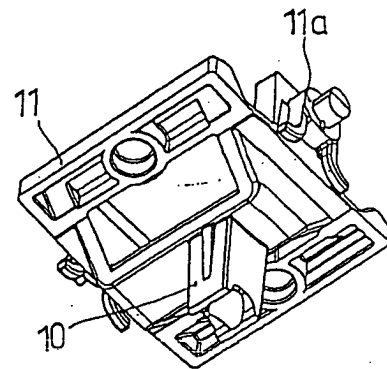


FIG. 13

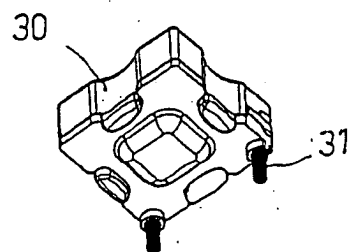


FIG. 14