(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 107 582 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.10.2009 Bulletin 2009/41

(51) Int Cl.:
H01H 23/12 *(2006.01)* ***H01R 4/24*** *(2006.01)*

(21) Application number: **09380056.3**

(22) Date of filing: **18.03.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(30) Priority: **02.04.2008 ES 200800653 U**

(71) Applicant: **Simon, S.A.**
08013 Barcelona (ES)

(72) Inventor: **Moret Codina, Maria Cristina**
08021 Barcelona (ES)

(74) Representative: **Espiell Volart, Eduardo Maria**
R. VOLART PONS Y CIA. S.L.
Pau Claris, 77, 2.o, 1.a
08010 Barcelona (ES)

(54) Electrical double switch mechanism, with a quick connection

(57) Four knife contacts -4- and -4a- are represented, together with the moving contacts -8-, actuated by swinging elements -11-, situated above the closure cover - 12- of the base -1-, **characterized in that** is has four connection keys -2-, two by two, situated on the sides opposite the base -1-, V-shaped, its lateral cylindrical pins -17- resting axially on semi-cylindrical seats -18- of the base -1- on the side of housings - 3-. Thus, each connection key -2- can swing from the horizontal position prior to placement until the vertical starting position of the connection of the wire conductor - 19-, said key -2- being in this vertical position until the bottom of a cylindrical hollow -20- of the connection key -2-. The key -2- has the end of its lower face -22- in a fork shape, which delimits an upper aperture -23- wherein the front face of the corresponding knife contact -4- and -4a- is situated, a face provided with an aperture -4b-. Additionally, the key -22- has two buffers, one stub -24- inside a slot -25- of the base -1- and another -26-, below stub -24-, located outside of the edge of the base - 1-. Said connection key -2- is situated on the lower part of the V of the base -1-, and has a stub -27-, resting against a spring -28- and positioned by means of a clipping action. The base -1- has four teeth -13-, two by two, which fit into slots -14- in the cover -12-, base and cover remaining held shut and the mechanism closed.

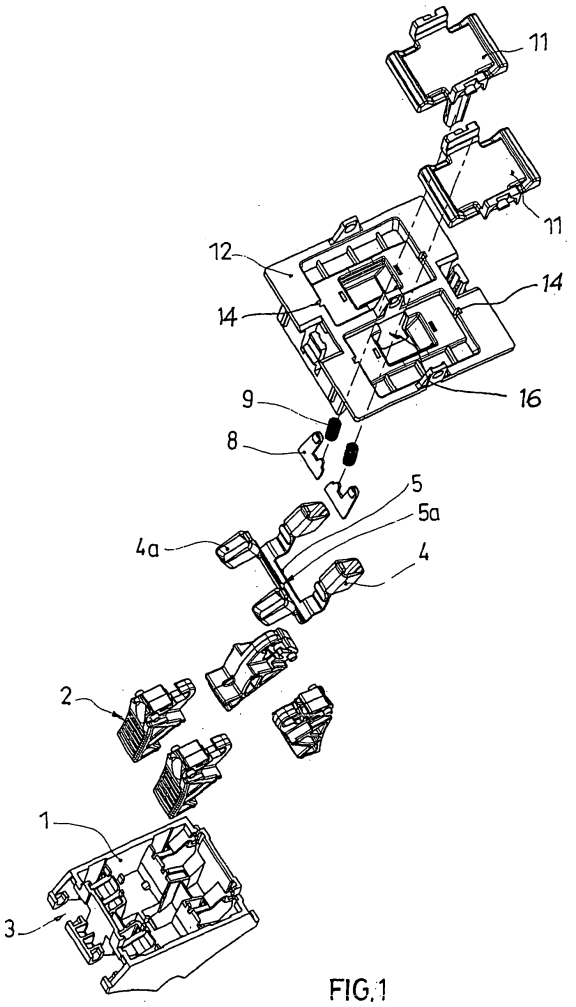

FIG.1

EP 2 107 582 A2

Description

[0001] The present invention relates to an electrical mechanism devised for its application in low voltage systems as a double switch, essentially **characterized in that** it is equipped with a series of elements which permit the quick connection of the conductors related thereto, elements which are characterized both by their structure as well as by the manner of placement and application, also being characteristic of said mechanism the arrangement of the base 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 (switches, buttons, etc.) 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 stable position.

[0003] The mechanism object of the present invention offers advantages which meet the previously detailed requirements, as it is equipped with a series of suitable components to carry out this quick connection, the mechanism being complemented with the suitable arrangement of already known components, essential to complete said mechanism.

[0004] Another essential characteristic of the double switch mechanism is the fact that is has only one single intake and two outlets, each one of these corresponding to each switch.

[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 double switch mechanism, wherein it is highlighted that one of the quick connection keys has been drawn in a different position than the other three, in order to show its shape from below;

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 identical 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, showing the location of the contacts;

fig. 9 is a perspective view from below, of the same base;

fig. 10 is a perspective view from below the cover of the mechanism, and

fig. 11 finally, draws, in perspective and from below, two swinging elements, already known in this type of mechanisms.

[0007] In accordance with these drawings, the electrical double switch mechanism with quick connection is constituted by the 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 exterior part of the aforementioned 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. Two of those knife contacts -4- are solidly joined at their lower part by means of the lower horizontal crosspiece -5-, which, being V-shaped is positioned by its central hoie -5a-, on the cylindrical pivot -6- situated on the lower internal face of the body -1-. The other two knife contacts -4a- are situated facing the previous ones and in the middle area opposite the base -1-, all of these knife contacts -4- and -4a- being housed in the spaces -7- delimited by the partitions situated in the interior of the base -1-. All of these knife contacts will 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 contact assembly is com-

pleted, thereby making their operation possible, by two moving contacts -8- which rest their base on the bottom on the lower V-shaped crosspiece -5- of the knife contacts -4- and -4a-, so that they can swing when they are pushed by their respective cylindrical springs -9-, components situated inside of each lower tower -10- of the two swinging elements -11-, which, upon being actuated independently by the exterior push button, not represented in the drawings, will cause the operation of this described assembly of contacts, corresponding to the double switch application.

[0010] The cover -12- closes the assembly of the mechanism, when being attached on the base -1-, as drawn in fig. 4, being held shut by the action of the four teeth -13-, which are part of the 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-.

[0011] This cover -12-, whereon the sides -15- whereof are supported the lateral pivots -11 a- of each swinging element -11-, has in its interior the apertures necessary - 16- for the passage towards the interior of lower towers -10- of each swinging element -11-, in direction towards the moving contacts -8-.

[0012] Each one of the connection keys -2- is provided, in their rear end, with two cylindrical pins -17-, axial in the direction of an imaginary transversal axis, which will 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.

[0013] The positioning and fastening of the connection key -2- is initiated, as can be observed in figures 4 to 6, 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-

[0014] 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, stub -24- is located inside the slot -25- in the base -1- and stub -26- (directly below stub -24-), is located outside the edge of the base -1-.

[0015] The connection key -2- has a cylindrical hollow -20- on its external face -21-, 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, face disposed in the shape of a fork and which delimits an upper aperture -23- wherein the front face of the knife contacts - 4- and -4a- are situated, where the apertures -7- are.

[0016] 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, similar to two facing knives which 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.

[0017] Fig. 7 draws 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.

[0018] This attachment or fastening is carried out by the actuation of a cylindrical stub -27-, which in principle leans on the spring -28-, which is in 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 in accordance with fig. 7, the third stub -27- being situated behind the spring -28- by means of a clipping action.

[0019] In this final stable position of the quick 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.

[0020] 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 double switch mechanism, with quick connection, consisting of a base -1- in whose suitably compartmented interior are located the knife contacts -4-and -4a-, together with the moving contacts -8-, actuated by swinging elements -11-, situated above the closure cover -12- of the base -1-, **characterized in that** it has four quick connection keys -2- which are positioned, two by two, on the sides opposite the base -1-, V-shaped, its 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 each connection key -2- 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 key -2- being in this vertical position, until the bottom of the cylindrical hollow -20- of the connection key -2-, situated on its own the external face -21-.

2. Electrical double switch mechanism, with quick connection, according to the previous claim, in the interior of whose base -1- are installed, in 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, the aforementioned front face of the knife contact -4- and -4a- penetrates into the interior of the aforementioned 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 double switch mechanism, 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 stub -26- situated directly under stub -24-, is located outside of the edge of the base -1-.

4. Electrical double switch mechanism, 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-, a 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 double switch mechanism, with quick connection, according to claim 1, wherein the assembly of its different contacts for the specific application of a double switch 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.

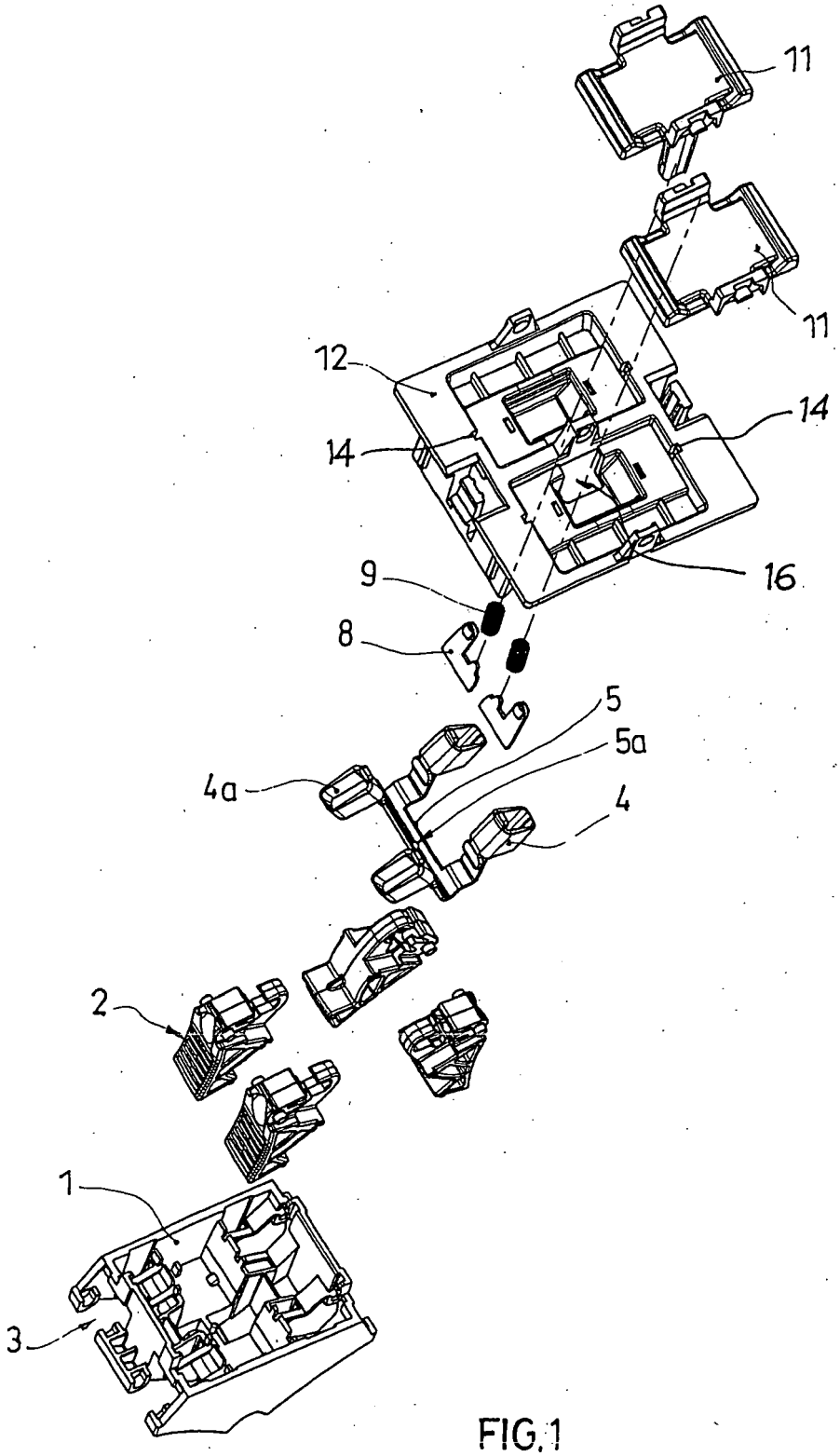

FIG.1

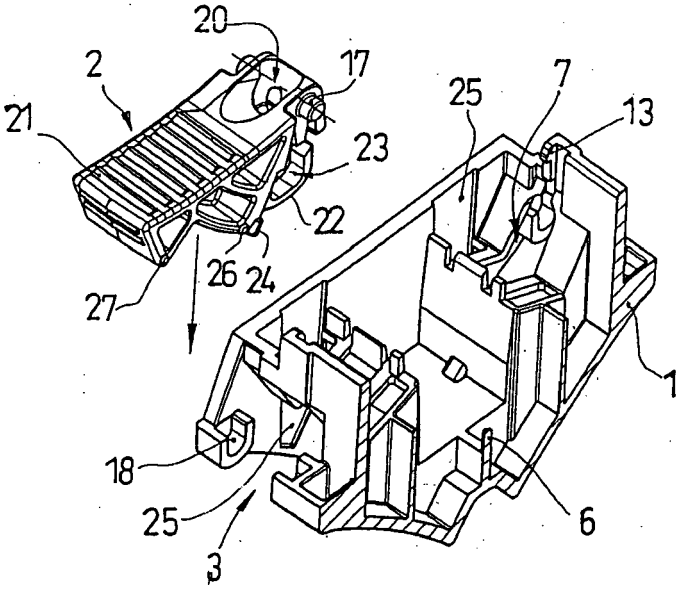

FIG. 2

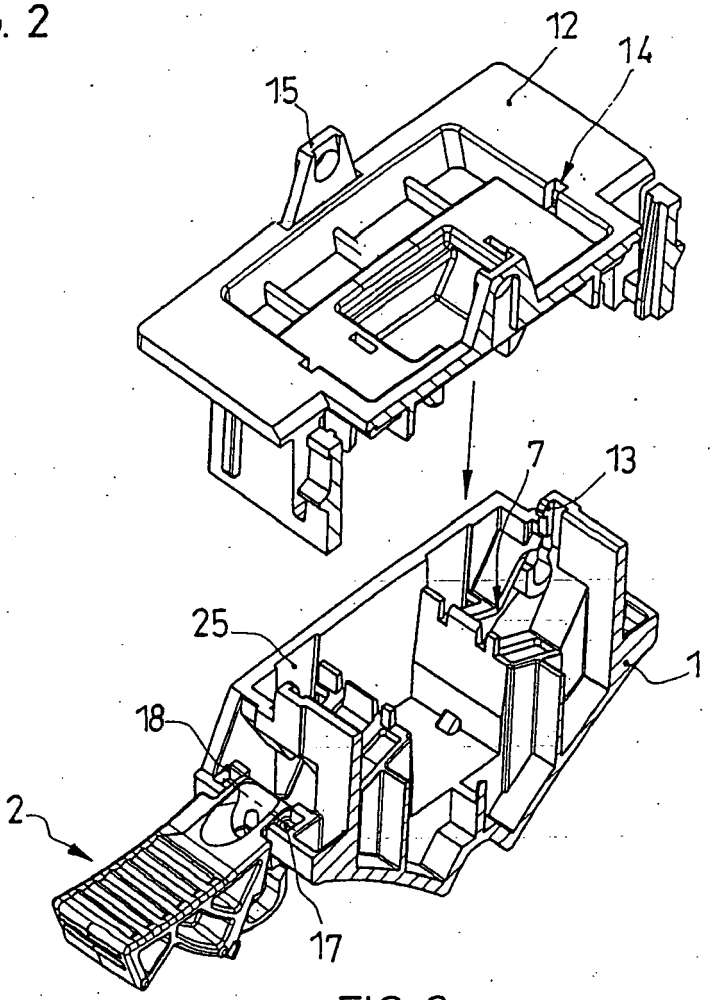

FIG. 3

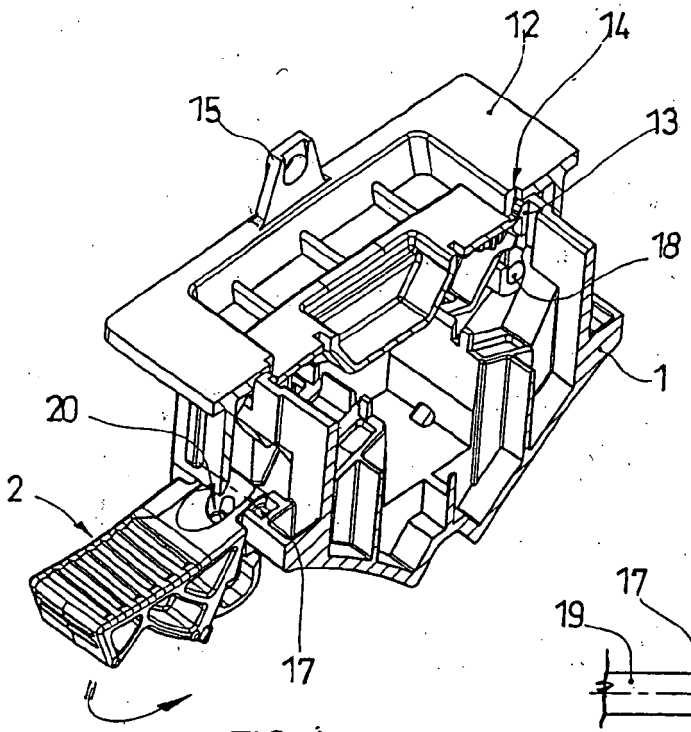

FIG. 4

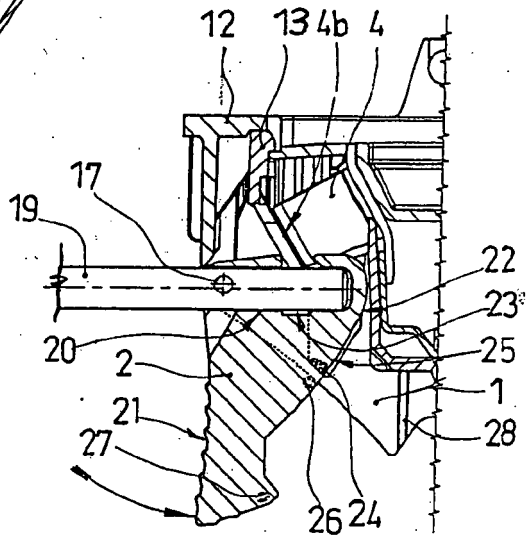

FIG. 5

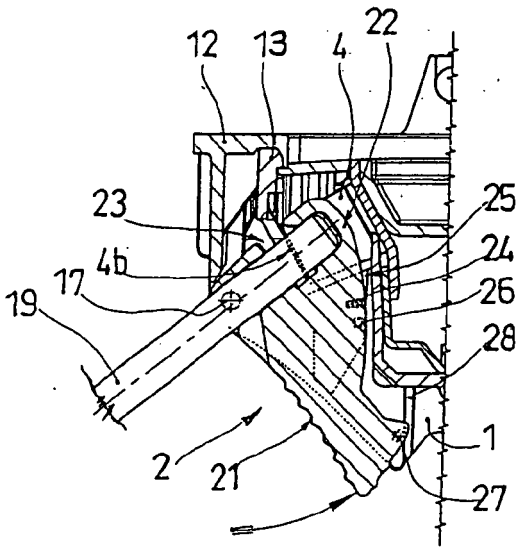

FIG. 6

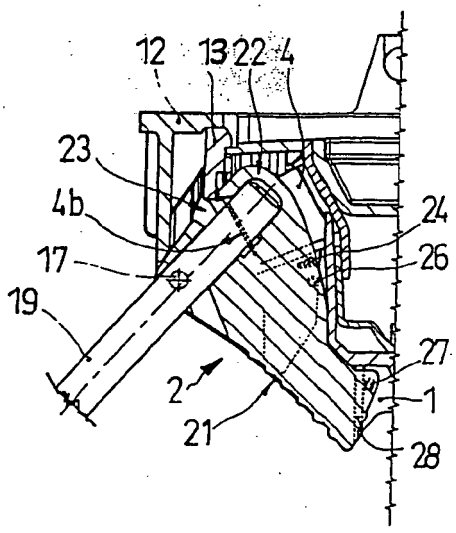

FIG. 7

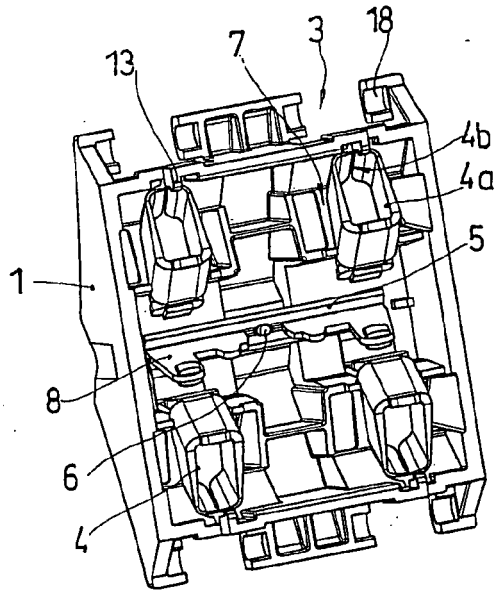

FIG 8

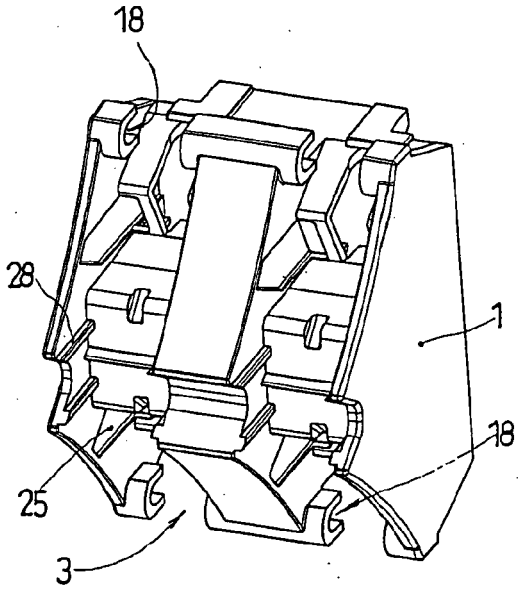

FIG. 9

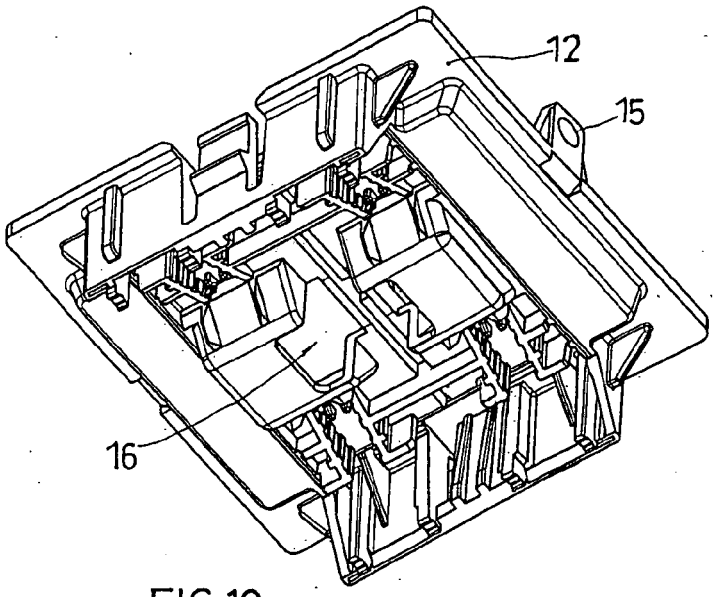

FIG.10

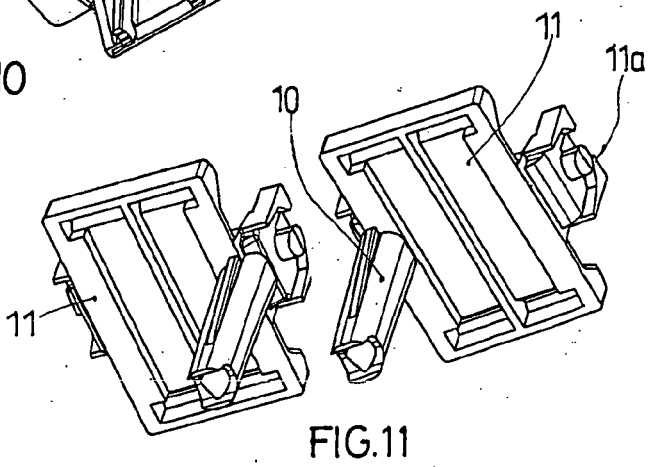

FIG.11