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(54) **PUSH-BUTTON SWITCH**  
**DRUCKTASTENSCHALTER**  
**INTERRUPTEUR A BOUTON-POUSSOIR**

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(56) References cited:  
**DE-A- 4 026 292 GB-A- 1 133 925**  
**US-A- 4 758 724**

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## Description

**[0001]** The present invention relates to electric switches and, more particularly, a switch of the type in which the switching occurs as the effect of the displacement of a rocker arm between two stable positions.

**[0002]** A switch of this type, as is described, for example, in the US patent 4,758,724, employs as its operating organ a lever that acts on the rocker arm in such a way as to make it oscillate between one and the other of its two stable positions. Also known are switches in which the organ that operates the rocker arm is a toggle element. In the present description the term switch is intended to designate both a device that opens and closes a single contact and a device that opens one contact and simultaneously closes another contact, and vice versa (diverter switch).

**[0003]** In some applications, for example in lighting installations for dwellings and offices, there is felt the need for switches operated by a push-button rather than a lever or a toggle element.

**[0004]** The object of the invention is to propose a switch of the rocker-arm type, but operated by a push-button.

**[0005]** A push-button switch as defined in the preamble of claim 1 is already known from DE-A-4 026 292.

**[0006]** This object is attained by realizing the switch defined in general terms in Claim 1.

**[0007]** The invention will be understood more clearly from the following detailed description of three embodiments thereof, which is given by way of example and is not to be considered limitative in any way, the description making reference to the attached drawings, of which,

Figure 1 is a side elevation of a first embodiment of the switch in accordance with the invention,  
Figure 2 is a view from below of the switch of Figure 1 in which some parts are shown as transparencies;  
Figures 3a-3d schematically illustrate the switch of Figure 1 in four different operating positions,  
Figures 4 and 5 show, respectively, a side elevation in section and a perspective view with a part in section of a second embodiment of the switch in accordance with the invention, and  
Figure 6 shows a side elevation of a third embodiment of the switch in accordance with the invention.

**[0008]** The switch 1, which is shown in Figure 1 with the push-button dismantled, comprises a supporting structure 2 made of insulating material, plastics for example, having the form of a parallelepiped with two pairs of walls, respectively greater 12, 13 and smaller 14, 15, and a base wall 11. The supporting structure 2 is open, i.e. it does not have a wall counterposed to the base wall 11. A contact-holder structure 16 made of insulating material is joined to the base wall 11 of the supporting structure 2. The structure 16 contains three connection terminals 21.1, 21.2, 21.3, screw clamps for example, accessible by means of two openings (not shown), one for ac-

cessing the screw of the clamp and the other for inserting an electric lead in the clamp. Two of the three connection terminals, 21.1, 21.2, are connected, in the present example as integral portions, to respective sheet-metal tags 24.1, 24.2 situated within the structure 16 below the base wall 11. Each tag is provided at one of its ends with a fixed electric - contact, respectively 3.1, 3.2, that can be accessed from inside the supporting structure 2 by means of a rectangular opening 25 provided in the wall 11. The third connection terminal 21.3 is connected, in the present example as an integral portion, to an L-shaped sheet-metal bar 27 arranged in the structure 16 at right angles to the longer side of the base wall 11 in such a way that its edge 26 emerges from the opening 25 in a central position with respect to the fixed electrical contacts 3.1, 3.2.

**[0009]** A metallic jumper element 4, which has the shape of a rocker arm with a rounded central profile, is arranged on the inside of the supporting structure 2 in such a manner as to be capable of pivoting around an axis at right angles to the larger walls 12 and 13. The jumper element 4 has a central seating part 30 in contact (through the opening 25) with the edge 26 of the bar 27 and two arms provided with electric contacts 5.1, 5.2 at their ends. The seating part 30 extends, transversely with respect to the arms, to form two metallic distance pieces 37 that are inserted between two pairs of counterforts 38 integral with the structure 16. The counterforts 38 only permit the jumper element 4 to perform an oscillatory motion about the edge 26, but not a translatory motion.

**[0010]** A control element 47 is formed by a small block 6 made of insulating material and a spring-controlled pin 7. The small block 6 is mounted inside the supporting structure 2 in such a way as to be capable of pivoting around an axis a2 parallel to the axis of rotation of the jumper element 4. More particularly, on the walls 12, 13 there are situated two opposite holes 33 that accommodate two opposite prominences 32 on the block 6 of the control element 47. The pin 7 has a rounded tip and is pushed by a spring (not visible in the figure) that is compressed in a cavity of the block 6 to constitute an elastic connection between the block 6 and the metallic jumper element 4 below it. The upper part of the block 6 is designed in such a way as to have a cavity with surfaces 36 that are shaped substantially as steps and are symmetrical with respect to a plane containing the axis of rotation a2.

**[0011]** The supporting structure 2 is closed at the top by an operating organ 46 that is connected to the control element 47 and comprises a push-button 42 made of insulating material. In particular, the push-button 42 consists of a rectangular plate 9 and four coupling elements 45 that are integral with the plate. The elements 45 are formed by elastic tongues 40 projecting at right angles from the plate 9 near the ends of its larger sides and guide teeth 41 projecting from the ends of the tongues. The operating organ 46 also comprises a pressure-transmission means 8, which has two ends 44 and a flat sur-

face that faces the lower surface of the plate and is fixed below the plate 9 in such a way as to be capable of pivoting around a third axis  $a_3$  parallel to the two axes  $a_1$  and  $a_2$ . Two foil springs 22 and 10 are arranged between the plate 9 and the pressure-transmission means 8 in such a way as to maintain the latter in a rest position in which its two ends 44 are at the same distance from the plate 9, and to maintain the plate 9 away from the supporting structure 2 when the push-button is in its rest position. To fix the push-button 42 to the supporting structure 2, the teeth 41 are inserted into openings 43 in the larger walls 12 and 13 of the supporting structure 2 to form a tongue and groove joint. The openings 43 permit the teeth 41 to slide inside them and therefore a guided displacement of the push-button 42. The pressure-transmission means 8, the control element 47 and the jumper element 4 are each symmetrical with respect to a plane passing through their respective axes of rotation.

**[0012]** In an embodiment of the present invention the switch 1 is a modular electrical device having the function of a two-way switch, utilizable, for example, for switching the lines of domestic installations. For mounting purposes, the device is fixed to a supporting frame (not shown), usually with joint-type couplings. To this end prominences 17 are provided on the walls 14, 15 of the container 2 and are shaped in such a way as to fit into complementary rebates of the frame.

**[0013]** Prior to every switching of the switch, the push-button 42 is in its rest position at a certain distance from the supporting structure. The pressure-transmission means 8 is likewise in its rest position, its plane of symmetry coinciding with the plane, indicated by the reference number 28, containing the axes of rotation  $a_1$ ,  $a_2$  and  $a_3$ , due to the elastic action of the foil spring 22, which, in this particular embodiment of the invention, integral with the foil spring 10. At the same time, the block 6 of the control element 47 and the jumper element 4 are inclined in one of their two stable angular positions. For example, as shown in Figure 3a, when the block 6 is inclined towards the left, the jumper element 4 is inclined towards the right and the mobile contact 5.1 is pressed against the fixed contact 3.1. When a pressure greater than the elastic resistance of the spring 10 is applied to the plate 9, the operating organ 46 undergoes a downward displacement, the teeth 41 slide in their respective openings 43 and the right-hand end 44 of the pressure-transmission means 8 comes to bear against one of the step surfaces 36 of the block 6 and thus transfers to it the pressure applied to the plate 9. In particular, as shown in Figure 3b, the end 44 comes to bear against the bottom of the right-hand step surface 36, thus causing the block 6 to commence a rotation in the clockwise direction and the pressure-transmission means to rotate in the counter-clockwise direction; subsequently it will come into contact with the side of the step, thus transferring in a transverse direction the pressure applied vertically to the plate 9. As shown in Figure 3c, the transverse thrust causes the block 6 to rotate even further in the clockwise direction

around its axis of rotation  $a_2$ , until it eventually snaps it into its second stable position (Figure 3d) in which it is inclined towards the right. During the movement of the block 6, the pin 7 slides on the jumper element 4 from one end of the rounded profile to the other, causing the jumper element to rotate about its axis  $a_1$ , that is to say, around the edge 26 of the L-shaped bar 27, until it eventually snaps it into its left-hand stable position, in which the mobile contact 5.2 is pressed against the fixed contact 3.2. When the external pressure action terminates, the spring 10 brings the push-button 42 elastically back into its rest position, the pressure-transmission means 8 reacquires its rest position, while the block 6 and the jumper element 4 remain in the new positions they have assumed.

**[0014]** Since the various moving parts are symmetrical with respect to the plane 28, a further pressure applied to the plate 9 will bring both the block 6 of the control element 47 and the jumper element 4 into the positions they occupied prior to the first switching, i.e. with the block 6 inclined towards the left and the jumper element 4 inclined towards the right as shown in Figure 3a.

**[0015]** The second embodiment shown in Figures 4 and 5, in which equal or equivalent parts are indicated by the same reference numbers used for the first embodiment, differs from the first embodiment only on account of some details. More particularly, the elastic element that maintains the pressure-transmission means 8 in position is constituted by two counterposed lamellae 22' that are symmetrical with respect to the plane of symmetry 28 and form an integral part of a structural element of the push button 46. According to a variant not shown in the figures, the elastic element is constituted by two counterposed foils forming an integral part of the pressure-transmission means 8 that rest with their ends against the internal surface of the push-button 46. The elastic element that maintains the push-button in its rest position is constituted by two helicoidal compression springs 10' and the coupling elements between the push-button 46 and the supporting structure 2 are constituted by small cylindrical columns 40' integral with the push-button 46 and corresponding cylindrical seatings 43' provided in the supporting structure 2.

**[0016]** The third embodiment, shown schematically in Figure 6, consists of the switch of Figure 1 modified in such a way as to permit its being used as a traditional push-button, that is to say, as a switch with contacts that are normally open and are closed only while the operating organ is actually operated. To this end the switch comprises a compression spring 50 arranged between the control element 47 and the base wall 11 of the supporting structure 2. When a pressure is applied to the push-button such as to cause the closure of the right hand contact (as seen on the drawing), the spring 50 becomes compressed. As soon as the pressure is removed from the push-button, the spring 50 causes the control element 47 to rotate in the clockwise direction, thus causing the permanent opening of the right-hand contact. Clearly,

the same structure can be used as a push-button switch with contacts that are normally closed by utilizing the left-hand contact, or applying the spring 50 on the right-hand side of the control element 47 rather than the left-hand side.

**[0017]** What has been explained above makes it clear that the switch described herein can be employed both as a one-way switch and as a diverter switch, i.e. as a two-way switch, and, with the sole addition of an elastic means, like the spring 50, that keeps a mobile contact (5.1) and a fixed contact (3.1) apart from each other, also as a traditional push-button.

## Claims

1. A switch comprising
    - a supporting structure (2),
    - two connection terminals (21.1, 21.3),
    - a fixed electric contact (3.1) electrically connected to one of the two connection terminals (21.1),
    - a metallic jumper element (4) capable of pivoting as a rocker arm about a first axis (a1), provided at one of its ends with a mobile electric contact (5.1) and electrically connected to the other of the two connection terminals (21.3),
    - an operating organ (46) connected to the jumper element (4) in such a way as to make it oscillate between two predetermined positions, in one of which the mobile electric contact (5.1) of the jumper element (4) is in contact with the fixed electric contact (3.1),
    - a control element (47) mounted within the supporting structure (2) in such a way as to be capable of rotating around a second axis (a2) parallel to the first axis (a1) and comprising two surfaces (36) arranged symmetrically with respect to a plane containing the second axis (a2) and that the control organ (46) comprises
    - a push-button (42) bound to the supporting structure (2), but mobile in a direction at right angles to the second axis (a2) in response to a pressure applied to it in contrast with the action of a first elastic element (10) and
    - a pressure-transmission means (8) connected to the push-button (42) in such a way as to be capable of rotating around a third axis (a3), parallel to the first axis (a1), maintained in a predetermined position by a second elastic element (22), said pressure transmission means being capable of alternately coming into contact with the two surfaces (36) of the control element (47) to bring the latter into one or the other angular position corresponding to one or the other of the predetermined positions of the jumper element (4),
- characterized in that**

- said second elastic element (22) is interposed

between the push-button (42) and the pressure transmission means (8), and

- said pressure transmission means has two ends (44) capable of alternatively coming into contact with the two surfaces (36) of the control element (47).

2. A switch in accordance with Claim 1, comprising another connection terminal (21.2) and another fixed electric contact (3.2) electrically connected to the other connection terminal (21.2), wherein the jumper element (4) is provided with another mobile electric contact (5.2) at one of its ends and wherein said other mobile electric contact is in contact with the other fixed electric contact (3.2) in one of the two angular positions of the control element (47).
3. A switch in accordance with Claim 1 or Claim 2, wherein the surfaces (36) are substantially shaped in the manner of a step and wherein each of the two ends (44) of the pressure-transmission means (8) is shaped and arranged in such a manner as to exert on the step surfaces first a thrust in the direction of motion of the push-button and then a thrust in the direction at right angles to the direction of motion of the push-button.
4. A switch in accordance with any one of the preceding claims, wherein the push-button (42) comprises a plate (9), a multiplicity of tongues (40) projecting at right angles from the edge of the plate and a like number of guide teeth (41) at the ends of the tongues, and wherein the supporting structure (2) comprises walls (12, 13) with openings (43) suitable for receiving the guide teeth (41) and permitting them to slide.
5. A switch in accordance with Claim 4, wherein the elastic element (22) of the pressure-transmission means (8) and the elastic element (10) of the push-button (42) are foil springs formed as a single piece and fixed to the plate (9) of the push-button.
6. A switch in accordance with any one of the Claims 1 to 3, wherein the push-button comprises a plate (9) and two little columns (40') that extend at right angles from the plate and wherein the supporting structure (2) comprises two seatings (43') for said little columns (40').
7. A switch in accordance with Claim 6, wherein the elastic element of the pressure-transmission means (8) comprises two counterposed lamellae (22') forming an integral part of the push-button (46).
8. A switch in accordance with Claim 6 or Claim 7, wherein the elastic element of the push-button (46) comprises two helicoidal compression springs (10').

9. A switch in accordance with any one of the preceding claims, wherein the jumper element (4) has a rounded central profile and the control element (47) comprises a small block (6) and a spring-controlled pin (7) that is in sliding contact with the rounded profile of the jumper element(4). 5
10. A switch in accordance with any one of the preceding claims, comprising elastic means capable of keeping the mobile electric contact (5.1) and tile fixed electric contact (3.1) apart from each other when the push-button (42) is not subject to an operating pressure. 10
11. A switch in accordance with Claim 10, wherein the elastic means comprise a compression spring (50) arranged between the control element (47) and a part (11) integral with the supporting structure (2). 15

## Patentansprüche 20

1. Ein Schalter, der folgende Merkmale aufweist:

eine Tragestruktur (2),  
 zwei Verbindungsanschlüsse (21.1, 21.3), 25  
 einen stationären elektrischen Kontakt (3.1), der mit einem der beiden Verbindungsanschlüsse (21.1) elektrisch verbunden ist,  
 ein metallisches Jumperelement (4), das in der Lage ist, als ein Kipparm um eine erste Achse (a1) zu schwenken und das an einem seiner Enden mit einem mobilen elektrischen Kontakt (5.1) versehen ist und mit dem anderen der beiden Verbindungsanschlüsse (21.3) elektrisch verbunden ist, 30  
 ein Arbeitsorgan (46), das mit dem Jumperelement (4) derart verbunden ist, dass es bewirkt, dass dasselbe zwischen zwei vorbestimmten Positionen schwingt, wobei in einer derselben der mobile elektrische Kontakt (5.1) des Jumperelements (4) den stationären elektrischen Kontakt (3.1) berührt, 40  
 ein Steuerelement (47), das innerhalb der Tragestruktur (2) derart angebracht ist, dass es in der Lage ist, sich um eine zweite Achse (a2), die parallel zu der ersten Achse (a1) ist, zu drehen, und das zwei Oberflächen (36) aufweist, die bezüglich einer Ebene, die die zweite Achse (a2) enthält, symmetrisch angeordnet sind, wobei das Steuerorgan (46) einen Druckknopf (42) 45  
 aufweist, der an die Tragestruktur (2) gebunden ist, jedoch in einer Richtung im rechten Winkel zu der zweiten Achse (a2) ansprechend auf einen Druck, der auf denselben ausgeübt wird, im Gegensatz zu der Wirkung eines ersten elastischen Elements (10) mobil ist, und 50  
 eine Druckübertragungseinrichtung (8), die mit dem Druckknopf (42) derart verbunden ist, dass 55

sie in der Lage ist, sich um eine dritte Achse (a3), die parallel zu der ersten Achse (a1) ist, zu drehen, und die durch ein zweites elastisches Element (22) in einer vorbestimmten Position gehalten wird, wobei die Druckübertragungseinrichtung in der Lage ist, abwechselnd die beiden Oberflächen (36) des Steuerelements (47) zu berühren, um Letzteres in die eine oder andere Winkelposition entsprechend der einen oder anderen der vorbestimmten Positionen des Jumperelements (4) zu versetzen,

**gekennzeichnet dadurch, dass**

- das zweite elastische Element (22) zwischen den Druckknopf (42) und die Druckübertragungseinrichtung (8) eingefügt ist, und
- die Druckübertragungseinrichtung zwei Enden (44) aufweist, die in der Lage sind, abwechselnd die zwei Oberflächen (36) des Steuerelements (47) zu berühren.

2. Ein Schalter gemäß Anspruch 1, der einen weiteren Verbindungsanschluss (21.2) und einen weiteren stationären elektrischen Kontakt (3.2), der mit dem anderen Verbindungsanschluss (21.2) elektrisch verbunden ist, aufweist, wobei das Jumperelement (4) mit einem weiteren mobilen elektrischen Kontakt (5.2) an einem seiner Enden versehen ist, und wobei der weitere mobile elektrische Kontakt den weiteren stationären elektrischen Kontakt (3.2) in einer von zwei Winkelpositionen des Steuerelements (47) berührt.
3. Ein Schalter gemäß Anspruch 1 oder Anspruch 2, bei dem die Oberflächen (36) im Wesentlichen in einer Art und Weise einer Stufe geformt sind, und bei dem jedes der zwei Enden (44) der Druckübertragungseinrichtung (8) in einer Weise geformt und angeordnet ist, um auf die Stufenoberflächen zuerst eine Schubkraft in der Bewegungsrichtung des Druckknopfs und dann eine Schubkraft in der Richtung im rechten Winkel zu der Bewegungsrichtung des Druckknopfs auszuüben.
4. Ein Schalter gemäß einem der vorhergehenden Ansprüche, bei dem der Druckknopf (42) eine Platte (9), eine Mehrzahl von Zungen (40), die im rechten Winkel von der Kante der Platte vorstehen, und eine gleiche Anzahl von Führungszähnen (41) an den Enden der Zungen aufweist, und bei dem die die Tragestruktur (2) Wände (12, 13) mit Öffnungen (43), die zum Aufnehmen der Führungszähne (41) geeignet sind und es diesen ermöglichen zu gleiten, aufweist.
5. Ein Schalter gemäß Anspruch 4, bei dem das elastische Element (22) der Druckübertragungseinrichtung

tung (8) und das elastische Element (10) des Druckknopfs (42) Folienfedern sind, die als ein einzelnes Stück gebildet sind und an der Platte (9) des Druckknopfs befestigt sind.

6. Ein Schalter gemäß einem der Ansprüche 1 bis 3, bei dem der Druckknopf eine Platte (9) und zwei kleine Säulen (40'), die sich im rechten Winkel von der Platte erstrecken, aufweist, und bei dem die Tragestruktur (2) zwei Auflageflächen (43') für die kleinen Säulen (40') aufweist. 5
7. Ein Schalter gemäß einem Anspruch 6, bei dem das elastische Element der Druckübertragungseinrichtung (8) zwei sich gegenüberliegende Lamellen (22'), die einen integralen Teil des Druckknopfs (46) bilden, aufweist. 10
8. Ein Schalter gemäß Anspruch 6 oder 7, bei dem das elastische Element des Druckknopfs (46) zwei schraubenförmige Druckfedern (10') aufweist. 15
9. Ein Schalter gemäß einem der vorhergehenden Ansprüche, bei dem das Jumperelement (4) ein gerundetes zentrales Profil aufweist und das Steuerelement (47) einen kleinen Block (6) und eine federgesteuerte Nadel (7), die sich in Gleitkontakt mit dem gerundeten Profil des Jumperelements (4) befindet, aufweist. 20
10. Ein Schalter gemäß einem der vorhergehenden Ansprüche, der eine elastische Einrichtung aufweist, die in der Lage ist, den mobilen elektrischen Kontakt (5.1) und den über eine Platte befestigten elektrischen Kontakt (3.1) voneinander fern zu halten, wenn der Druckknopf (42) keinem Arbeitsdruck ausgesetzt ist. 25
11. Ein Schalter gemäß Anspruch 10, bei dem die elastische Einrichtung eine Druckfeder (50) aufweist, die zwischen dem Steuerelement (47) und einem Teil (11), der in die Tragestruktur (2) integriert ist, angeordnet ist. 30

## Revendications

1. Interrupteur comprenant une structure (2) de support, deux bornes (21.1, 21.3) de connexion, un contact électrique fixe (3.1) connecté électriquement avec l'une (21.1) des deux bornes de connexion, un élément métallique (4) de connexion temporaire capable de pivoter en tant que bras basculant autour d'un premier axe (a1) doté, au niveau de l'une de ses extrémités, d'un contact électrique mobile (5.1), et connecté électriquement avec l'autre (21.3) des 35

deux bornes de connexion, un organe (46) de mise en oeuvre connecté avec l'élément (4) de connexion temporaire de façon à l'amener à osciller entre deux positions prédéterminées, dans l'une desquelles le contact électrique mobile (5.1) de l'élément (4) de connexion temporaire est en contact avec le contact électrique fixe (3.1), un élément (47) de commande monté à l'intérieur de la structure (2) de support de façon à pouvoir tourner autour d'un deuxième axe (a2) parallèle au premier axe (a1) et comprenant deux surfaces (36) agencées symétriquement par rapport à un plan contenant le deuxième axe (a2), et que l'organe (46) de commande comprend un bouton-poussoir (42) qui est lié à la structure (2) de support, mais mobile dans une direction à angle droit par rapport au deuxième axe (a2) en réponse à une pression qui lui est appliquée contrairement à l'action d'un premier élément élastique (10) et un moyen (8) de transmission de pression lié au bouton-poussoir (42) de façon à pouvoir tourner autour d'un troisième axe (a3), parallèle au premier axe (a1), maintenu dans une position prédéterminée par un second élément élastique (22), ledit moyen de transmission de pression pouvant venir alternativement en contact avec les deux surfaces (36) de l'élément (47) de commande pour amener ce dernier dans l'une ou l'autre des positions angulaires correspondant à l'une ou à l'autre des positions prédéterminées de l'élément (4) de connexion temporaire, **caractérisé en ce que**

- ledit second élément élastique (22) est interposé entre le bouton-poussoir (42) et le moyen (8) de transmission de pression, et
- ledit moyen de transmission de pression comporte deux extrémités (44) pouvant venir alternativement en contact avec les deux surfaces (36) de l'élément (47) de commande.

2. Interrupteur selon la revendication 1, comprenant une autre borne (21.2) de connexion et un autre contact électrique fixe (3.2) connecté électriquement avec l'autre borne (21.2) de connexion, dans lequel l'élément (4) de connexion temporaire est doté d'un autre contact électrique mobile (5.2) au niveau de l'une de ses extrémités, et dans lequel ledit autre contact électrique mobile est en contact avec l'autre contact électrique fixe (3.2) dans l'une des deux positions angulaires de l'élément (47) de commande. 40
3. Interrupteur selon la revendication 1 ou la revendication 2, dans lequel les surfaces (36) sont sensiblement formées à la manière d'un dénivelé, et dans lequel chacune des deux extrémités (44) du moyen (8) de transmission de pression est formée et agencée de façon à exercer d'abord, sur les surfaces de dénivelé, une poussée dans la direction de déplacement. 45

ment du bouton-poussoir et ensuite une poussée dans la direction qui se trouve à angle droit par rapport à la direction de déplacement du bouton-poussoir.

les moyens élastiques comprennent un ressort (50) de compression agencé entre l'élément (47) de commande et une partie (11) intégrante d'une seule pièce avec la structure (2) de support.

4. Interrupteur selon l'une quelconque des revendications précédentes, dans lequel le bouton-poussoir (42) comprend une plaque (9), une multitude de languettes (40) faisant saillie à angle droit du bord de la plaque, et un nombre identique de dents (41) de guidage au niveau des extrémités des languettes, et dans lequel la structure (2) de support comprend des parois (12, 13) dotées d'ouvertures (43) appropriées pour recevoir les dents (41) de guidage et pour leur permettre de coulisser. 5  
10  
15
5. Interrupteur selon la revendication 4, dans lequel l'élément élastique (22) du moyen (8) de transmission de pression et l'élément élastique (10) du bouton-poussoir (42) sont des ressorts à lame métallique formés en tant que pièce unique et fixés à la plaque (9) du bouton-poussoir. 20
6. Interrupteur selon l'une quelconque des revendications 1 à 3, dans lequel le bouton-poussoir comprend une plaque (9) et deux petites colonnes (40') qui s'étendent à angle droit à partir de la plaque, et dans lequel la structure (2) de support comprend deux logements (43') destinés auxdites deux petites colonnes (40'). 25  
30
7. Interrupteur selon la revendication 6, dans lequel l'élément élastique du moyen (8) de transmission de pression comprend deux lamelles disposées symétriquement (22') formant une partie intégrante du bouton-poussoir (46). 35
8. Interrupteur selon la revendication 6 ou la revendication 7, dans lequel l'élément élastique du bouton-poussoir (46) comprend deux ressorts hélicoïdaux (10') de compression. 40
9. Interrupteur selon l'une quelconque des revendications précédentes, dans lequel l'élément (4) de connexion temporaire a un profil central arrondi, et dans lequel l'élément (47) de commande comporte un petit bloc (6) et une broche commandée par ressort (7) qui est en contact glissant avec le profil arrondi de l'élément (4) de connexion temporaire. 45  
50
10. Interrupteur selon l'une quelconque des revendications précédentes, comprenant des moyens élastiques capables de maintenir le contact électrique mobile (5.1) et le contact électrique fixe (3.1) espacés l'un de l'autre lorsque le bouton-poussoir (42) n'est pas soumis à une pression de mise en oeuvre. 55
11. Interrupteur selon la revendication 10, dans lequel

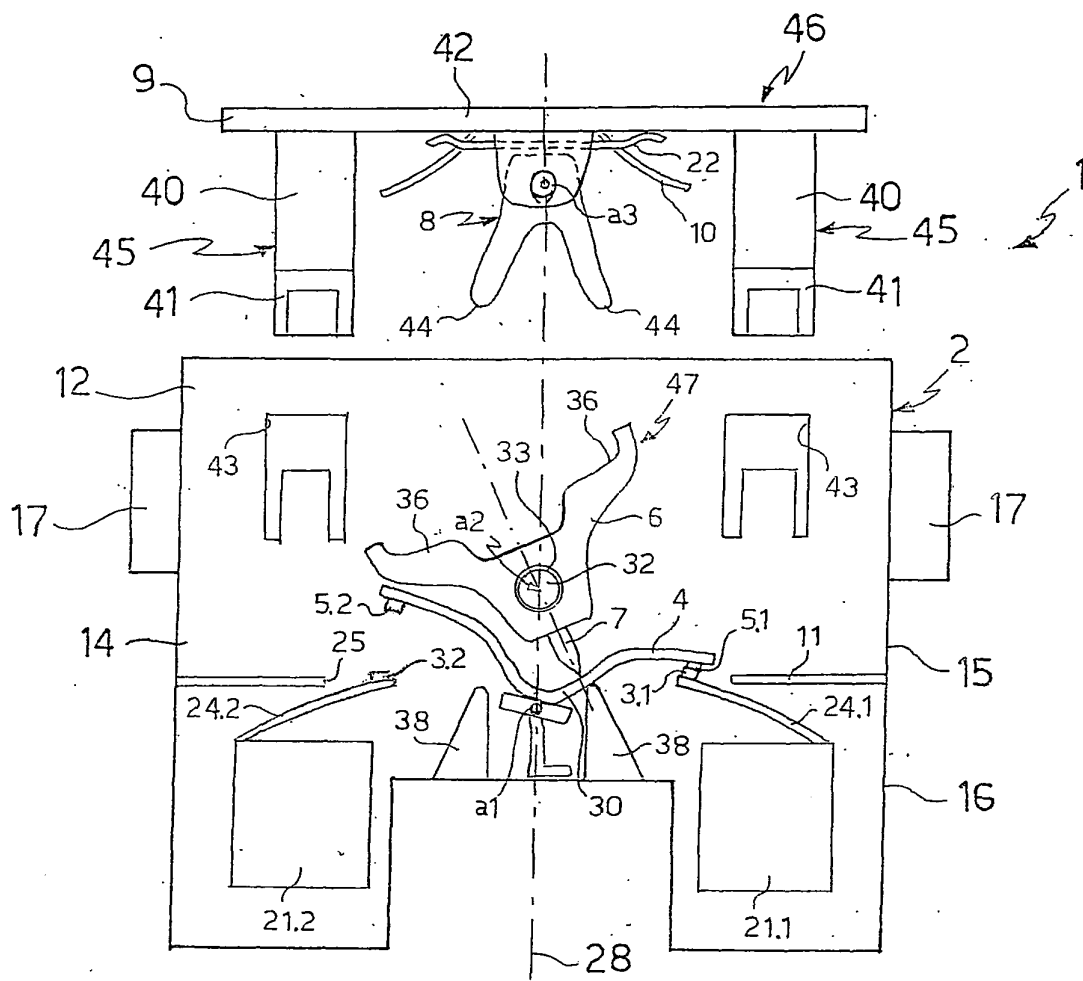


FIG. 1

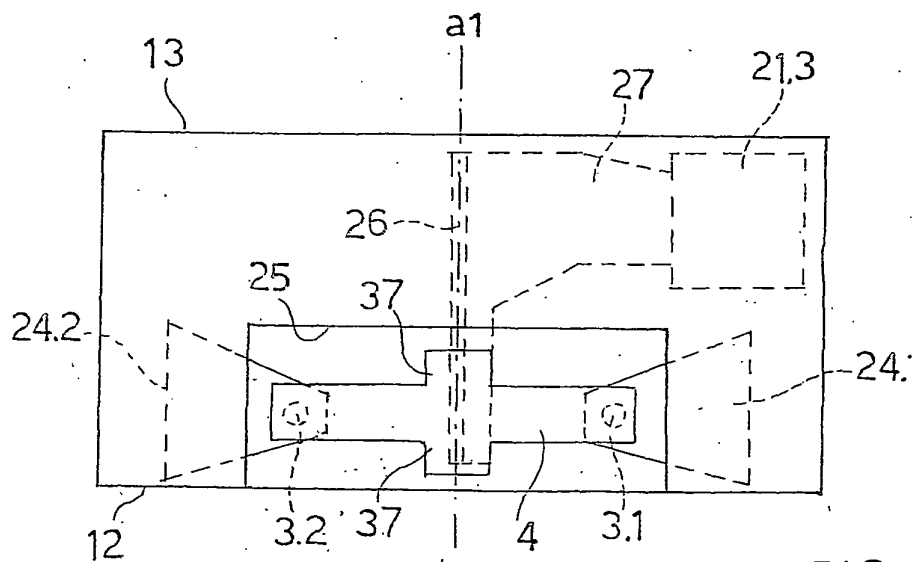


FIG. 2



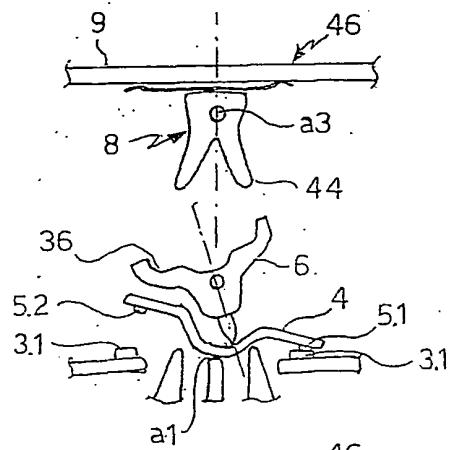


FIG. 3a

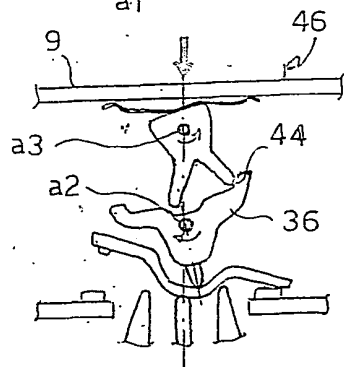


FIG. 3b

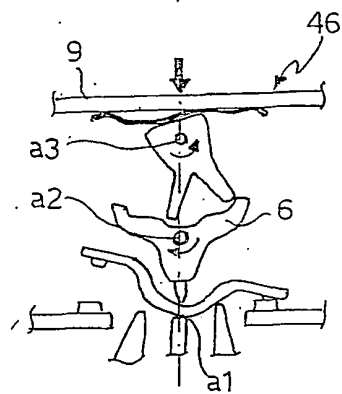


FIG. 3c

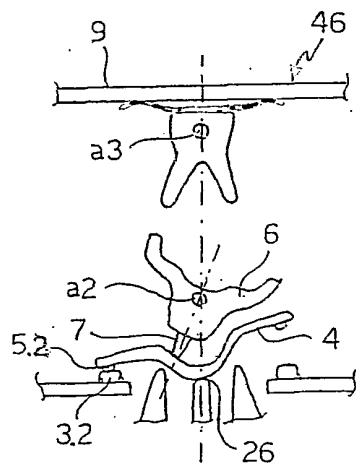


FIG. 3d

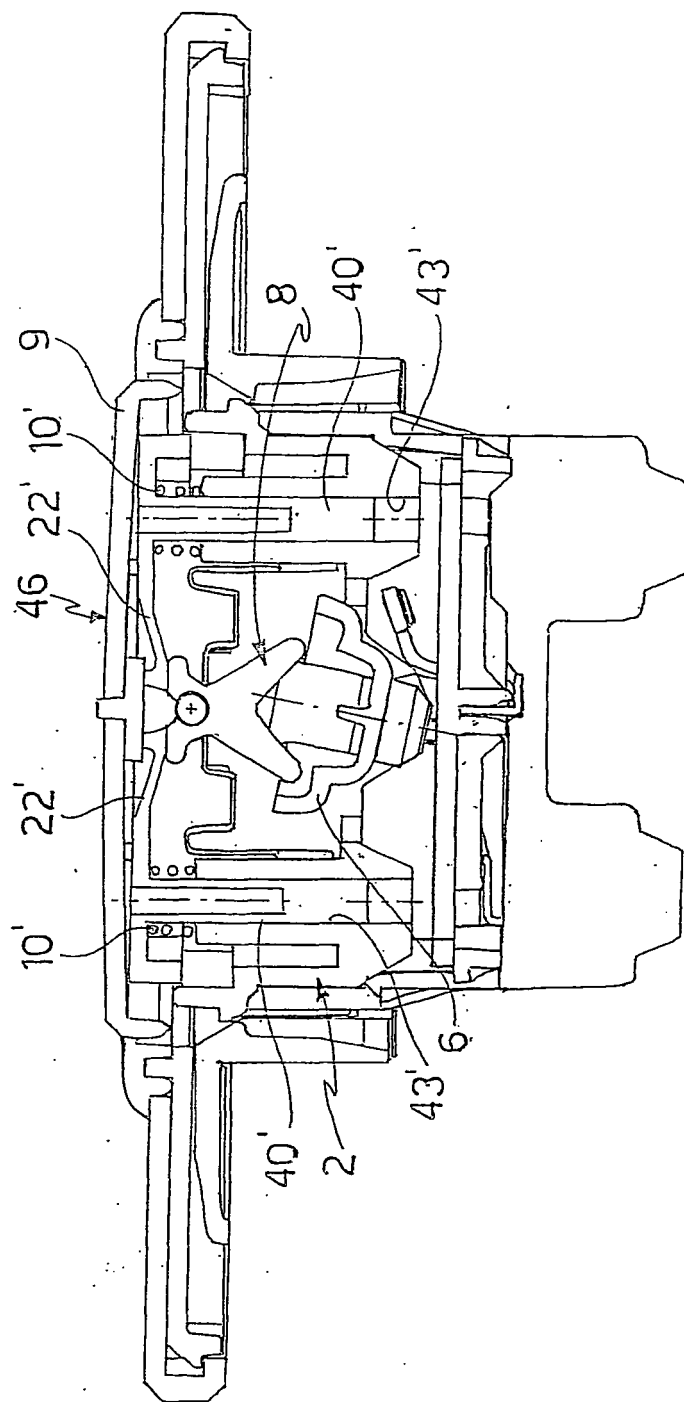
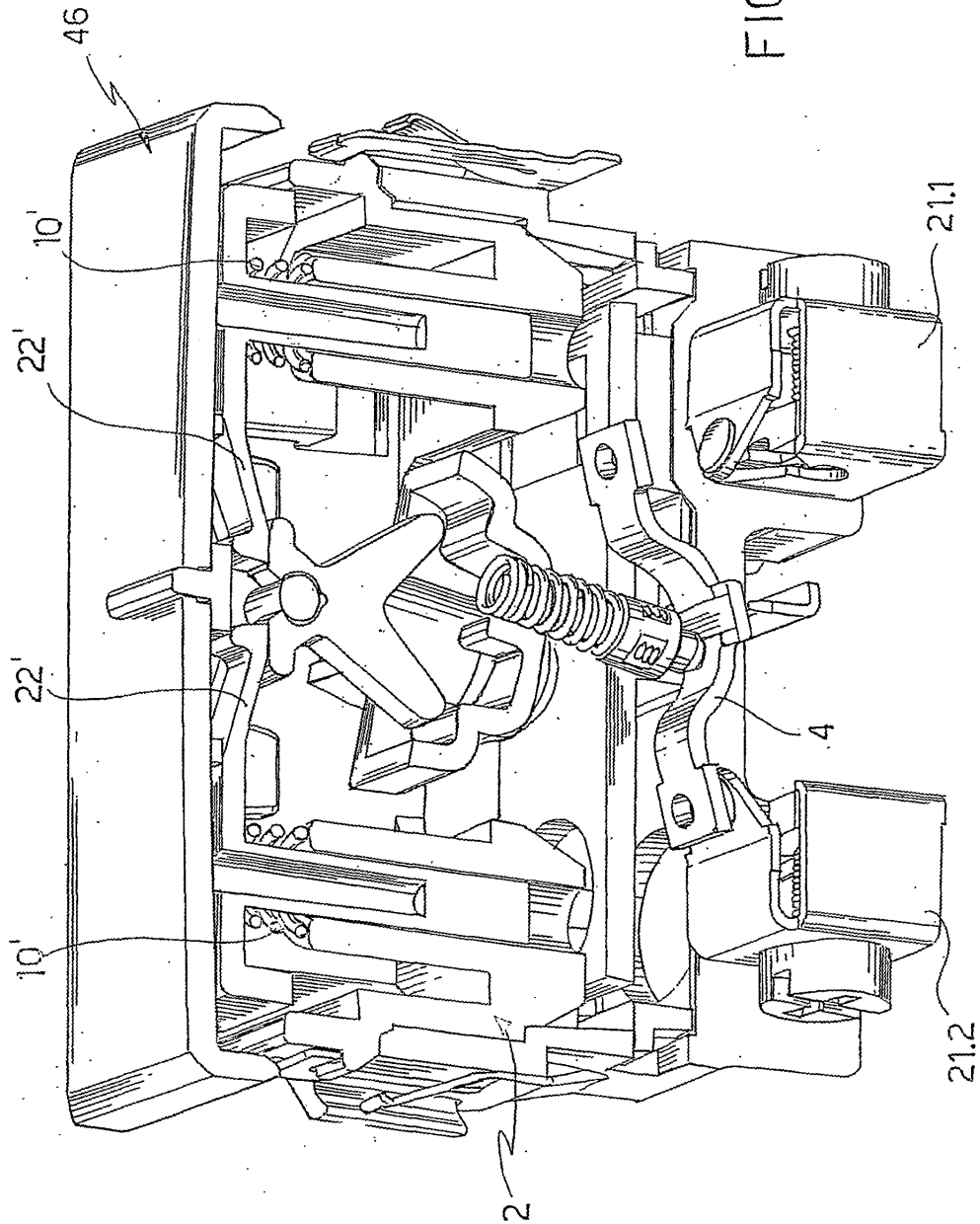


FIG. 4



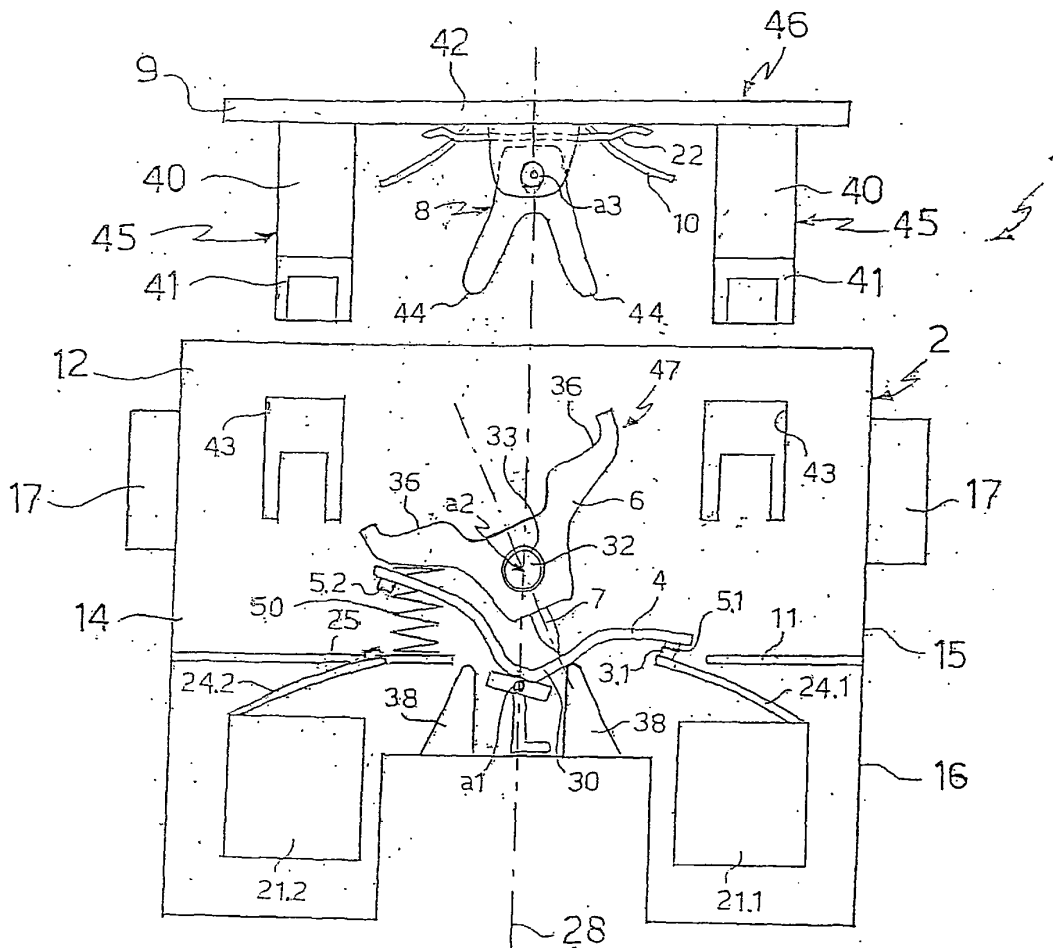


FIG. 6

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- US 4758724 A [0002]
- DE 4026292 A [0005]