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 [31] **9176AM**

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[54] **TWO-POSITION PUSH-OPERATED ELECTRICAL SWITCH**  
 5 Claims, 13 Drawing Figs.

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 200/153  
 [51] Int. Cl. .... **H01h 13/28,**  
 200 67 A;6

**ABSTRACT:** The invention is concerned with electric switches for domestic installations, the switch having a spring-loaded rockable arm arranged, upon rocking movement in opposite directions to make and break contact respectively between a fixed contact member mounted in the switch body and a contact member mounted on the arm. The rocking of the arm to operate the switch is performed by pressure, e.g., manual pressure, applied to a flexible operating plate arranged to engage the free ends of a pair of blades resiliently hinged at the other ends on the arm on opposite sides of its fulcrum.

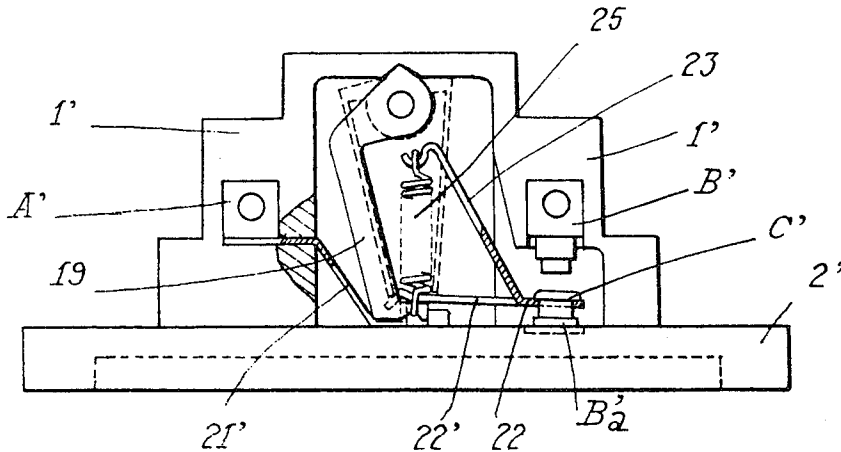


Fig.1

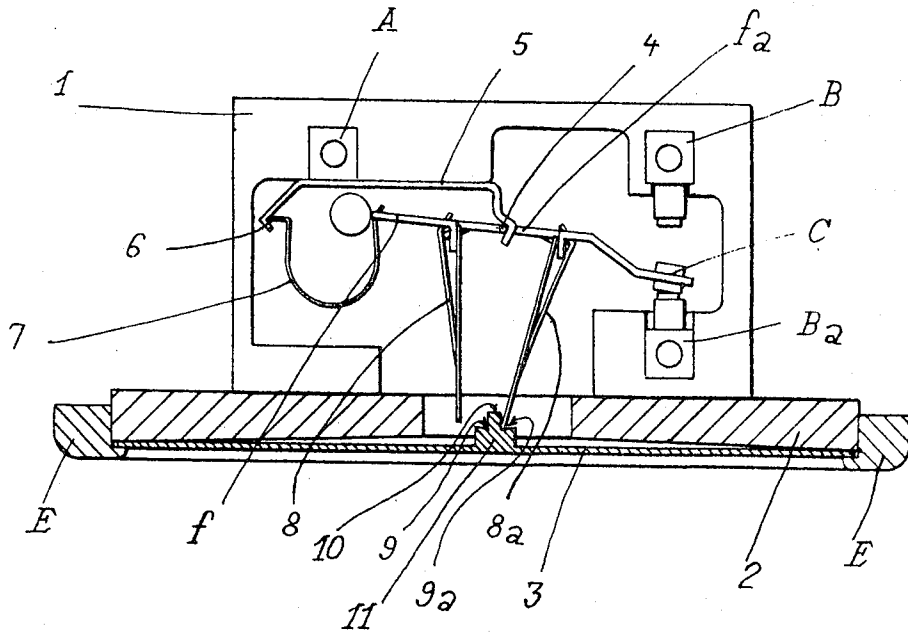
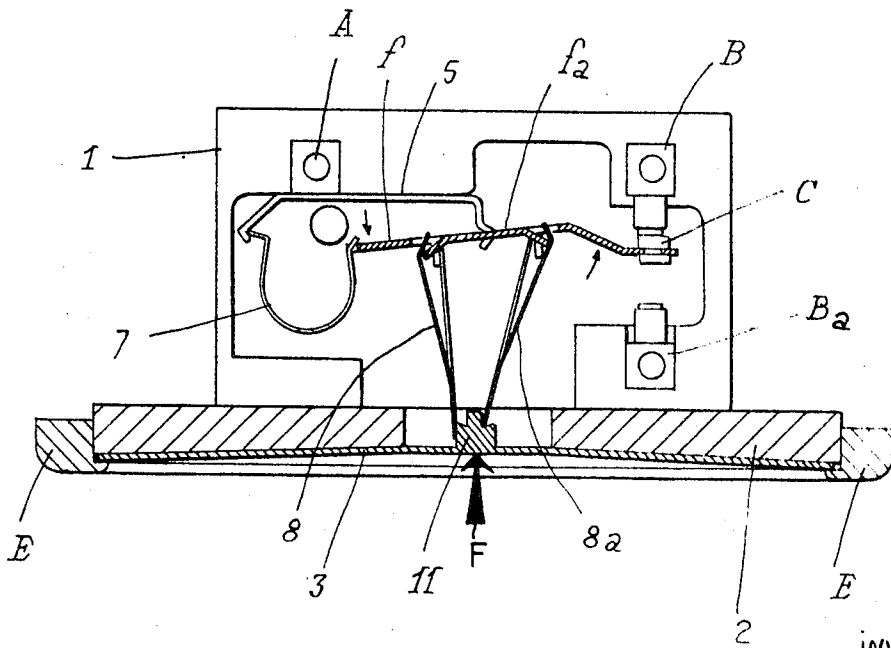


Fig.2



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Fig. 3

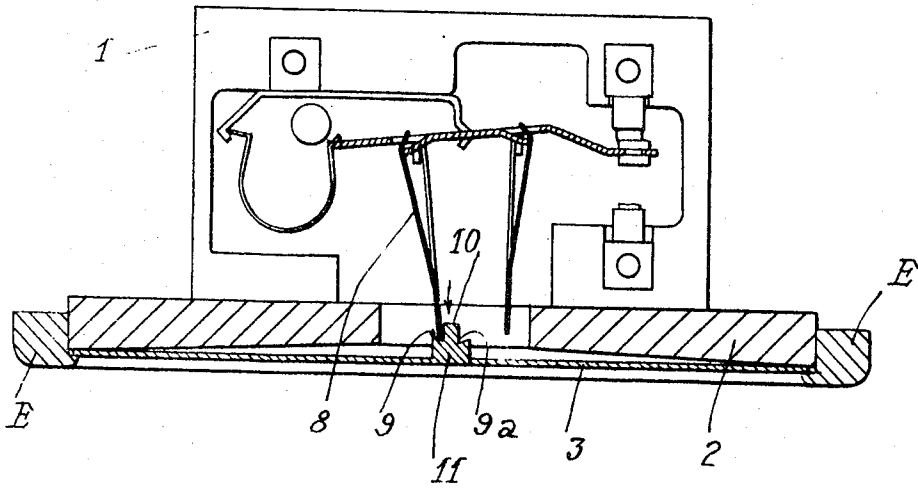


Fig. 4

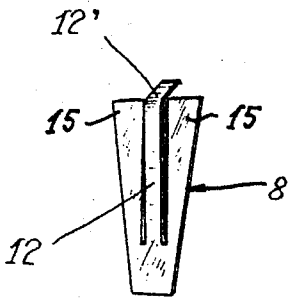


Fig. 5

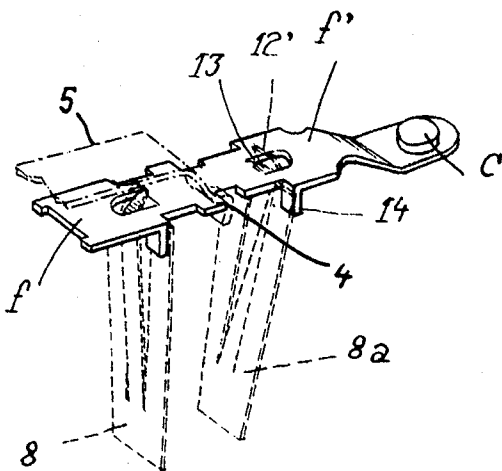
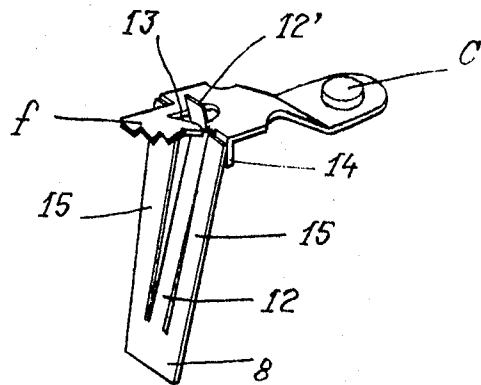
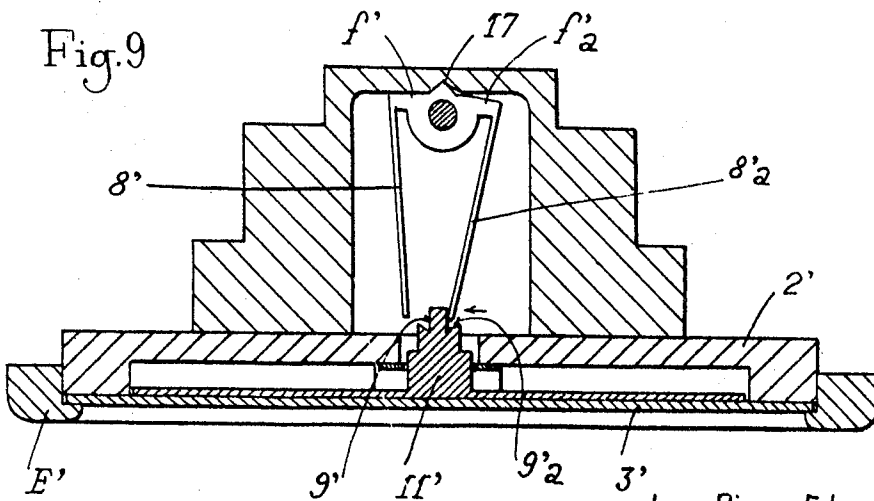
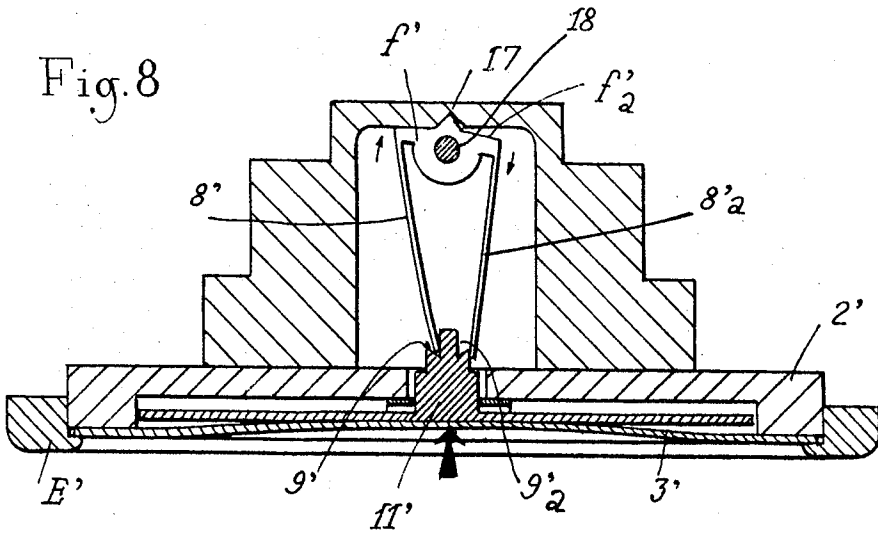
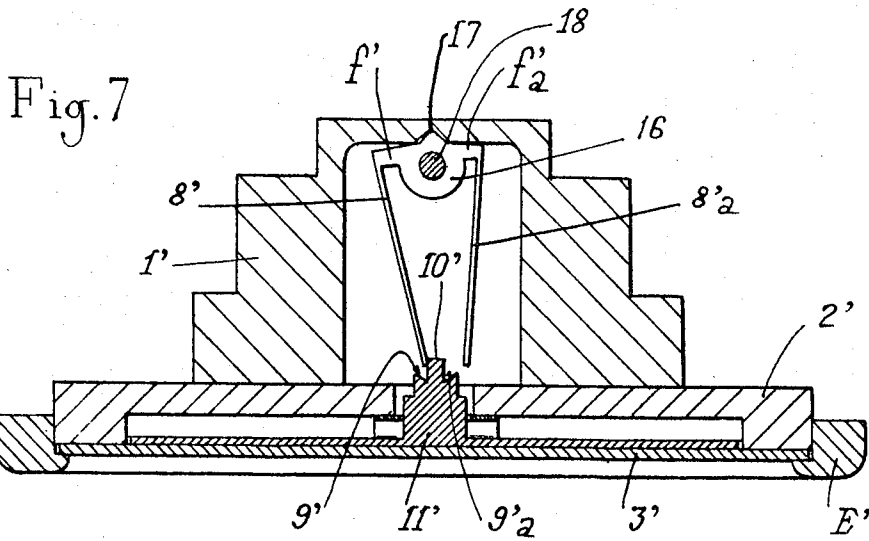


Fig. 6

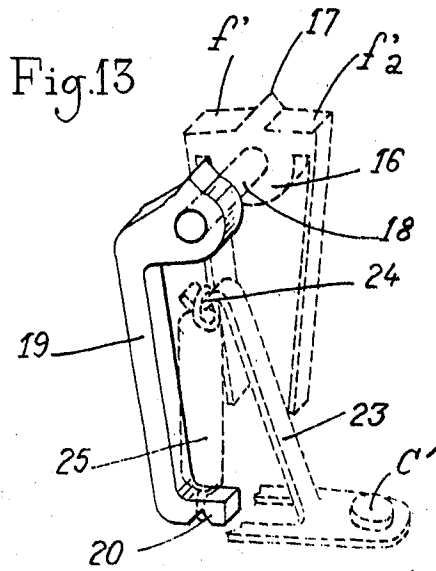
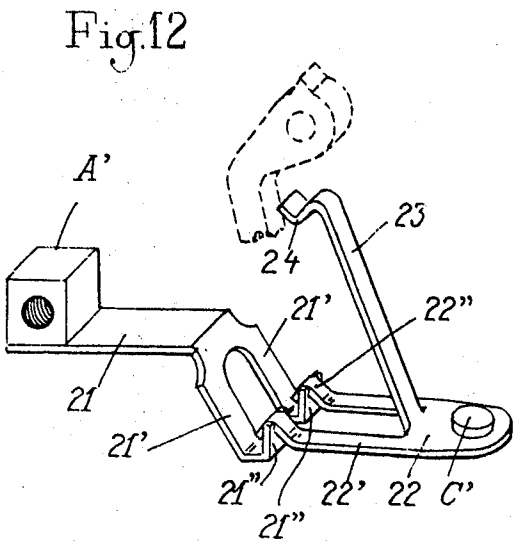
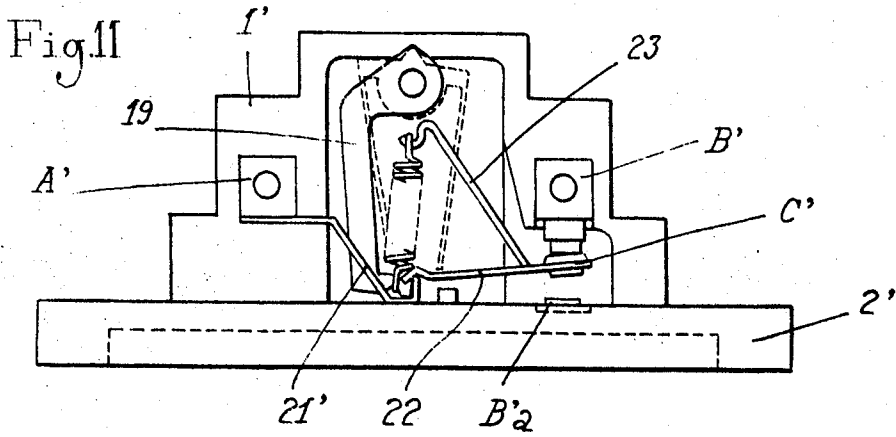
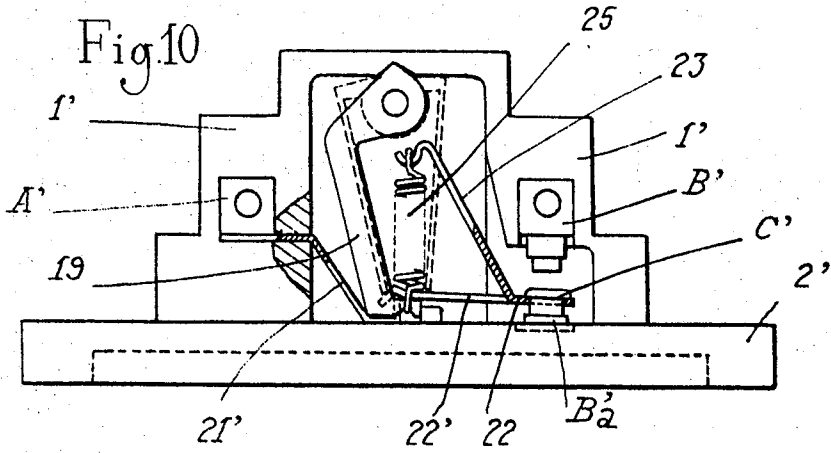
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## TWO-POSITION PUSH-OPERATED ELECTRICAL SWITCH

This invention relates to a switch (on-off or changeover switch) for domestic installations, the mechanism of which, carried by a base having a flexible operating plate, is actuated by hand pressure on this plate, so that the said mechanism, conveniently held in the brickwork or other wall, has no operating button or projection, the said flexible operating plate forming a flat or slightly domed external surface which only projects slightly from the wall surface.

According to the present invention, a switch comprises a flexible operating plate adapted to flex resiliently when pressure is applied to it, a rockable arm mounted to pivot between two stable positions in response to pressure exerted on the operating plate, at least two fixed contacts and a movable contact, the movable contact being electrically connected with one of the fixed contacts and being mounted so as to be movable, in response to rocking of the said arm, between a first position in which it connects with the other fixed contact and a second position in which it is disconnected from the latter.

The characteristics and advantages of the invention will appear from the following description, by way of example, with reference to the attached drawings in which:

FIG. 1 is a sectional view of the switch of the invention shown in its open position, this section being taken at right angles to the flexible operating plate of the switch and parallel to the arms of its rockable arm, which has been assumed to be not sectioned;

FIG. 2 is a view similar to FIG. 1, and shows a first phase of closing movement of the switch, the rockable arm of which has been shown in section;

FIG. 3 is a similar view to FIG. 2 and concerns the final phase of closing movement of the switch;

FIGS. 4, 5 and 6 are detailed perspective views of the switch to a larger scale;

FIGS. 7, 8 and 9 are views similar to FIGS. 1, 2 and 3 respectively and concern an alternative embodiment, of which only the flexible operating plate and the rockable arm have been shown;

FIGS. 10 and 11 are views in elevation of the mechanism of this variant, respectively in its open and closed positions;

FIGS. 12 and 13 are perspective detailed views of this mechanism to a larger scale.

In FIGS. 1 and 3, 1 designates the body of the apparatus, made preferably from moulded insulating plastics material, 2 its base and 3 its flexible operating plate also in plastics material; the inward bending movements of this plate, in response to a pressing action, are permitted and limited by the outer face of the base 2 which forms a concave surface conforming to the deformed surface of the flexible plate; the flexible plate 3 is applied at its periphery against the base 2 and held in place by a rim E.

A and B are fixed terminals or contact studs embedded in the plastic body 1, for the input and output of current; Ba is an insulating stud if the apparatus is a switch, or a second terminal if it is a changeover switch.

The embodiment shown in FIGS. 1 to 6 has a rockable arm, formed from a plate of copper or other conducting metal, divided into two arms *f* and *fa* to either side of and at equal distances from its point of pivot and support 4, FIGS. 1 and 6, which point of pivot and support is constituted by a hook at the end of a strip 5, also of conducting metal, fixed to the body 1 and electrically connected to the terminal A. The end 6 of this strip forms another hook as the support point for one of the ends of a spring 7; this spring has the form of an omega and its other end bears on the arm *f* of the arm in such a manner as to maintain the arm as well in one as in the other of its extreme rocking positions, as a result of the inclination which the arm *f* then has with respect to the thrust towards the right exerted by this spring. The other arm *fa* of the arm carries directly, at its free end, a movable contact stud C, the conduction of the current being effected by the arm itself from A to C.

On the limbs *f* and *fa* of the arm are mounted two slightly flexible blades 8-8a respectively disposed so that their points come alternatively to rest on two bearing surfaces respectively 9-9a, formed on a part 11 fixed to the center of the operating plate 3, and separated from one another by a projection 10 of this part 11.

These FIGS. 4 to 6 illustrate the mounting of these on the limbs of the arm whose movements of inclination they are to follow.

FIG. 4 shows, in perspective, by way of example, the blade 8: it is a slightly resilient strip in which is cut a central tongue 12 bordered by lateral strips 15 and extended beyond the top edge of the strip by an elbow 12'. The blade 8 has a similar makeup. Furthermore, each limb of the arm *f*, *fa*, and also as is shown in FIG. 5 for the single arm *b* is, by puncturing and pressing of metal, pierced to form a hole 13 permitting passage only of the tongue 12' of the corresponding blade 8, 8a; moreover, it has at each side a suitably cut away and bent back edge 14 forming a stop lug for the lateral strips of this blade. It is easy to understand that as the strips of a blade abut at their ends against the arm, the pivotal movement of a blade with respect to the said arm is limited in one direction by abutment of its elbow 12' against this arm, and in the other by lateral abutment of its strips 15 against the lugs 14 of the latter; thus, each blade, whilst being hinged on its arm, is compelled to follow the movements of inclination of the latter. FIG. 6 shows the assembly of the two limbs of the arm with their two blades, the orientations of which are of course the reverse of one another.

The operation of the switch described above is as follows starting from the position shown in FIG. 1.

If, starting from this position and as indicated by the arrow F of FIG. 2, the flexible operating plate 3 is pressed, the blade 8a, urged by its bearing surface 9a, acts on the arm *fa* and causes the arm to rock: the contact C approaches the terminal B until it comes into contact with it and the end of the other blade 8 is applied against the corresponding side of the part 11 whilst flexible slightly, FIG. 2. The closing movement completes itself as a result of the instability of the arm, and the blade 8a escapes from its bearing surface 9a. If the operating plate 3 is then released, it returns resiliently to its natural flat shape, the blade 8a remaining in the position which it has just attained, and the other blade 8 placing its point on the bearing surface 9.

It is clear that if, starting from this state, as shown in FIG. 3, the operating plate 3 is pressed again, it will be the blade 8, which, by pushing on the limb *f*, will cause the arm to rock in the opposite direction and will bring it back by a similar process, into the initial stable position shown in FIG. 1, in which the contact part C is against the terminal B.

In accordance with the alternative embodiment shown in FIGS. 7 to 13, the movable contact part is not carried directly by the arm, but by a spring device, the two positions of which depend on a rockable element pivoting with the arm. In these Figures, the elements similar to corresponding ones in the previous embodiment are designated by the same references distinguished by apostrophes; they will not therefore be described in detail hereafter.

In the embodiment shown in FIGS. 7 to 13, the arm is constituted by a part 16 of plastics material, FIGS. 7 to 9, having a projection 17 which is engaged in a groove of the body 1' of plastics material, and which forms a hinging axis about which the part 17 can rock slightly; it has, on the one hand, blades 8'-8'a at the ends of limbs *f'*-*f'a*, and on the other hand, carried by a shaft 18 with which it is fast, a rockable arm 19 terminating in an elbow 20, FIGS. 10 to 13. Moreover, a strip of copper 21 is fixed to the body 1'. This strip 21 is in an electrical connection with the terminal A' and is terminated by a wide fork whose arms 21' are bent over at their ends at 21'' to form lugs serving as points of support, connection and pivoting for a part 22 carrying the movable contact C'. This part 22 also has for this purpose two arms 22' whose ends are arcuately bent over at 22'' to hook into the lugs 21''; this part 22 has a central tongue 23 which terminates in a hook 24. A spring 25

(FIGS. 10 to 13) is hooked, on the one hand to the hook 24 of the part 22 and on the other hand to the elbow 20 of the rockable arm 19; it establishes a resilient connection between these two elements. The part 22 which carries the movable contact *c'* is thus pulled downwardly by the spring 25 and is seated in stable manner by its two hooks 22'' on the two fixed hooks 21'' which are electrically connected to the terminal A'.

The operation of the two blades 8', 8'a under successive pressing actions on the flexible operating plate 3' is the same as that explained above for the first embodiment; the resulting rocking movements of the arm 19, between the arm 21' of the fork of the part 21, bring the spring 25 alternately into one or other of the positions shown in FIGS. 10 and 11, its pull on the hook 24 of the part 22 causing this part 22 to pivot on the hooks 21'' of the part 21.

Moreover, in this variant, the part 11' which has the bearing surfaces 9', 9'a intended to cooperate with the blades 8', 8'a of the arm, is not carried by the flexible operating plate 3' but by an auxiliary plate which doubles the previous one and is held in contact with the latter by a spring.

I claim:

1. A switch for domestic installations comprising: a flexible operating plate mounted to flex resiliently when pressure is applied to it; an element operatively associated with said plate for movement under the control of said plate; a rockable arm pivotally mounted for pivotal movement between two stable positions; a rockable member fastened to said arm to undergo a rocking movement together with the pivotal movement of said arm; a spring coupled to said rockable member to be moved thereby; two fixed contacts; a metal part in electrical

contact with one of said fixed contacts, hinged about a fixed point, and connected to be subjected to the action of said spring; a movable contact electrically connected to one of said fixed contacts and carried by said metal part in operative association with said arm for movement between a first position in which it connects with the other of said fixed contacts, when said arm is in one of its stable positions, and a second position in which it is disconnected from said other of said fixed contacts, when said arm is in the other one of said stable positions; and two blades resiliently hinged on, and integral with, said rockable arm and operatively associated with said element associated with said plate for pivoting said arm between its said stable positions in response to the flexing of said operating plate.

2. A switch according to claim 1 wherein said element has, to either side of a central projection, two bearing surfaces on which said blades come into contact respectively when said arm is in either one of its stable positions, and from which said blades are removed alternately when said arm is in the other of its stable positions.

3. A switch according to claim 1 wherein said element is integral with said operating plate and projects from the inner surface of the latter.

4. A switch according to claim 1 further comprising an auxiliary plate disposed against the inner face of said operating plate, resiliently urged towards said operating plate, and carrying said element.

5. A switch according to claim 1 wherein said rockable arm and its associated blades form a single component molded from insulating material.

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