April 5, 1932.

W. F. RAMSAY

1,852,899

DOUBLE POLE ELECTRIC SWITCH

Filed Aug. 21, 1930

2 Sheets-Sheet 1

Fig. 1.

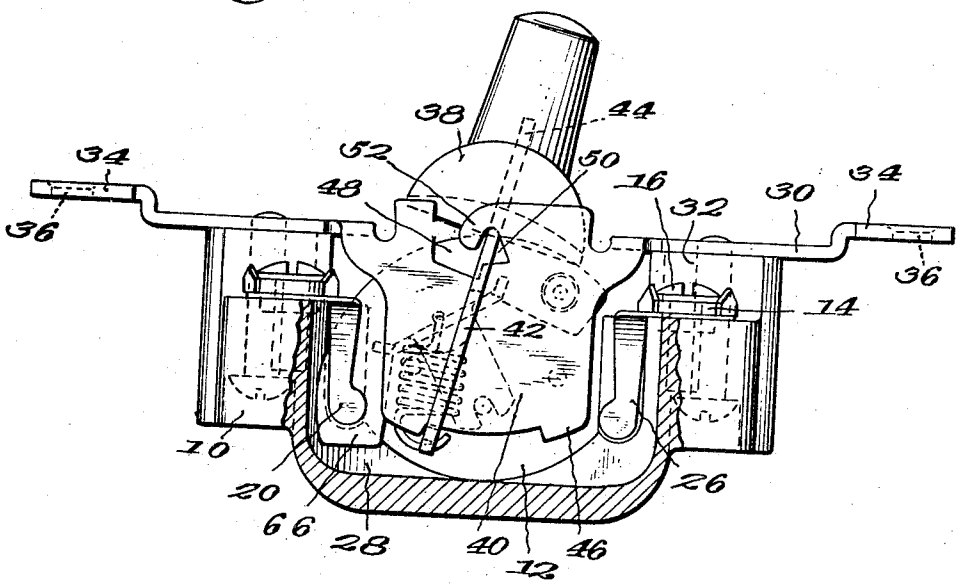

Fig. 2.

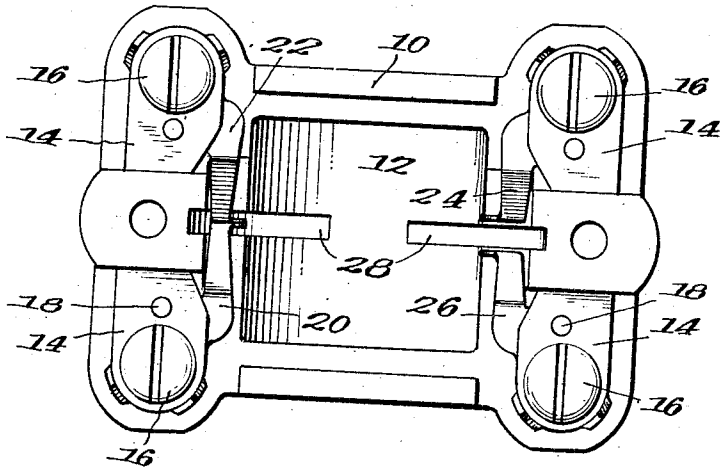

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Fig. 3.

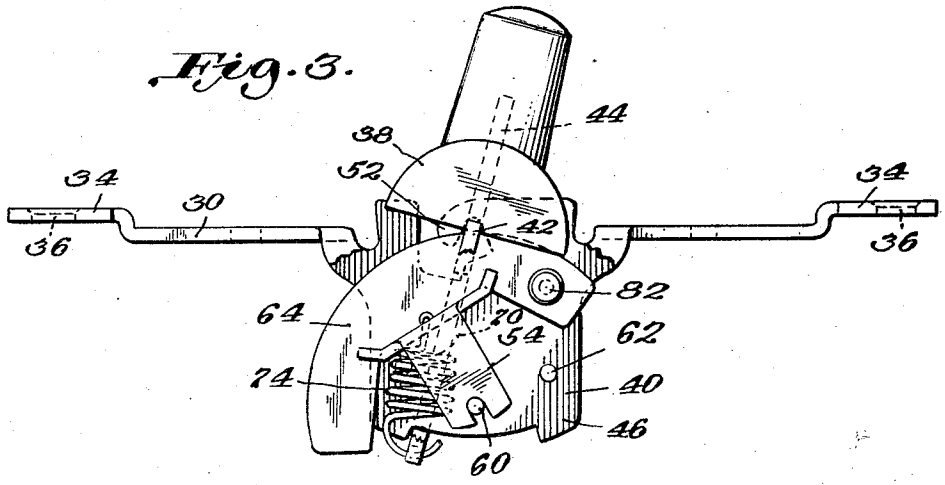


Fig. 4.

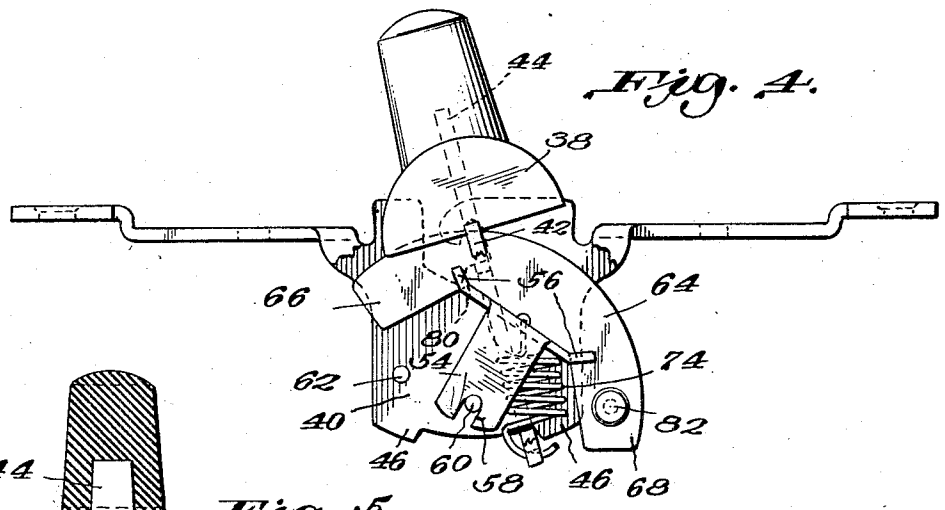
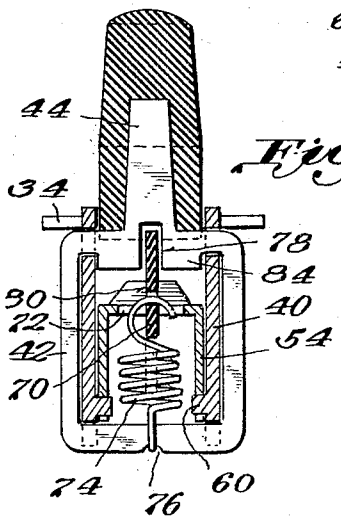


Fig. 5.



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UNITED STATES PATENT OFFICE

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DOUBLE POLE ELECTRIC SWITCH

Application filed August 21, 1930. Serial No. 476,917.

This invention relates to electric switches and more particularly it relates to a double pole electric switch of the lever type.

In switches of this general type it has hitherto been the practice to have both negative contact plates arranged at one end within a casing and their corresponding positive contact plates disposed at the opposite end. Actuating mechanism is then provided for simultaneously connecting each negative contact plate with its corresponding positive. This connection is usually made by a pivoted contact arm. The disadvantages accompanying a switch constructed as described are numerous. One of the greatest of these disadvantages is the necessity for insulating means to separate the contact strip from the actuating mechanism to prevent possible short circuits. Such a switch also requires a considerable number of parts which, of course, add to the cost and difficulty of manufacture.

The present invention obviates the disadvantages recited as well as other disadvantages present in the prior art. It introduces a new switch which in many respects is a radical departure from that which has preceded it. The present invention is, in effect, an innovation in switch design and construction.

One of the objects of this invention is to provide a double pole electric switch of the lever type in which positive and negative contact strips are disposed at each end within the casing.

Another object of this invention is the provision of a novel means for positively and simultaneously making or breaking contact between the negative and positive contact strips at each end of the casing.

Still a further object of this invention is the provision of an insulating member to make and break the circuits and an actuating mechanism therefor which has a positive start and a spring finish.

As a further object this invention contemplates a switch which while meeting the requirements of underwriters, may be easily and inexpensively manufactured of a few simple parts.

These and other objects will become more apparent from the following description when read in conjunction with the accompanying drawings and the appended claims.

In the drawings:

Fig. 1 is a side elevation view of the switch with a portion of the casing removed to disclose the actuating mechanism.

Fig. 2 is a plan view of the casing, with the actuating mechanism removed to show the positioning of the contact strips.

Fig. 3 is a side elevation view of the actuating mechanism as it appears when the switch is in open position. One of the side plates is cut away to more clearly show the inner mechanism.

Fig. 4 is a view similar to that shown in Fig. 3, but showing the actuating mechanism as it appears when the switch is in closed position.

Fig. 5 is a sectional end view of the mechanism and the actuating lever when the latter is substantially in vertical position.

The switch shown is of the flush type and is adapted to be inserted in a wall recess in the well known fashion, and to be covered with a plate (not shown) having a central recess therein to allow the actuating lever to protrude therethrough.

Referring first to Figs. 1 and 2, the switch is comprised of a base portion or casing 10 of porcelain, bakelite, or other suitable insulating material. This casing is provided with an interior chamber 12 opening at the top and houses the contact strips and actuating mechanism to be later described.

Terminal plates 14 and terminal posts 16 are located on depressed ledges at the four corners of the casing 10. The terminal plates are secured to the casing by means of screws 18 and the terminal posts are threaded to be received by threaded recesses in the terminal plates and in the ledge portions directly therebelow. Contrary to the usual arrangement, the terminal posts 16 at each end of the casing are attached to negative and positive wires (not shown) so that each end of the switch will have a negative and a positive terminal post.

Secured to the terminal plates 14 are contact strips 20, 22 and 24, 26 which extend

downwardly along the end walls of the interior chamber 12. The contact strips are of spring material and two of them 20, 22 converge downwardly so that their lowermost positions meet to form an electrical connection. The spring material of which they are constructed acts to press these contact strips 20 and 22 in a normally contacting position.

The oppositely disposed contact strips 24 and 26 also converge but their lowermost portions normally remain separated.

A vertical groove 28 is cut centrally in each end wall of the interior chamber 12 and extends partially along the floor thereof.

The actuating mechanism is shown in Fig. 1 as being housed in the interior chamber 12 of the casing 10. It is comprised of a supporting bar 30 which is removably secured to the top of the casing by means of screws 32 lodged in vertical bores in the ends of the casing. The ears 34 of the supporting bar 30 are provided with apertures 36 through which screws may be passed to secure the switch in a wall recess in the conventional manner.

The supporting bar extends across the open face of the interior chamber 12 at which point the bar is cut out to provide an opening for the operating lever 38.

Downwardly depending from opposite sides of the mid portion of the supporting bar 30 are side plates or wings 40 which are preferably integral with the supporting bar and form therewith a supporting frame in which the actuating mechanism proper is mounted.

The switch is operated by the lever 38 and is provided with an arrangement whereby the circuit is broken or made by a snap movement having a positive start, a kick off, and a spring finish. Generally, this movement is well known in the art, but the present invention also includes several novel features and a new arrangement of the operative elements.

A rectangular frame portion 42 is provided with a projecting member 44 which extends within the operating lever 38. The operating lever is of hard rubber, bakelite, or other suitable insulating material and the projecting member 44 is preferably inserted in the lever when the latter is moulded into form. The rectangular frame portion is thus effectively secured to the operating lever so as to be integral therewith.

The lower edges of the side plates 40 are arcuate and have downwardly projecting portions 46 at each end. The upper edges of these side plates 40 are provided with irregular shaped cut-out portions 48. From Figs. 1 and 5 it will be apparent that these cut-out portions 48 permit the rectangular frame 42 to be slipped into position over the end of the supporting bar 30 and the side plates 40. In operative position the upper portion of the rectangular frame rests in the recess indicated by the reference numeral 50, the rectangular frame in this position being in a plane substantially at right angles to the plane of the side plates. The downwardly projecting arm 52 and the projecting portions 46 aid in retaining the rectangular frame in its proper positions. The projections 46 also mark the extreme limits of the traveled path of the frame's base.

The actuating lever 38 and its integral rectangular frame portion 42 may now rock back and forth, the recess 50 acting as a pivot point therefor.

Between the side plates or wings 40 is positioned a rocker member 54 which is substantially in the form of an inverted U. This member is of a width slightly less than the distance between the side plates 40 and is provided with outwardly and upwardly extending arms 56 of spring material.

The lower ends of the side portions of the rocker member 54 have slots 58 cut therein which engage pivot pins 60 projecting inwardly from the side plates 40. The rocker member 54 is effectively limited in this movement by the stop pins 62 which also project inwardly from the side plates 40.

An arcuate circuit maker and breaker of insulating material such as a stiff fibre is indicated by the reference numeral 64. Between its two arms 66 and 68 is an apertured downwardly projecting center piece 70 (shown in dotted lines) which projects through a cut-out portion 72 in the top of the rocker member 54 to be engaged by the main coil spring 74. The opposite end of the coil spring is secured to the central portion of the base of the rectangular frame 42, a notch 76 being provided to keep the spring in place. The arcuate member 64 is also held in vertical position by a groove 78 cut in the rectangular frame and by grooves 80 in the arms 56 of the rocker member 54.

The grooves 28, shown in Fig. 2 as located in the sides and floor of the interior chamber 12, guide the arcuate circuit maker and breaker in its traveled path.

The arm 68 of the arcuate member is provided with a contact stud 82 which passes therethrough.

The operation of the mechanism to make and break the electrical connections will now be described. In Fig. 1 the switch is shown in open position. The contact strips 24 and 26 are in their normally separated position and the arm 66 of the arcuate member 64 is lodged between the contact strips 20 and 22 to prevent them from assuming their normally contacting position.

When the operating lever 38 is thrust from right to left its movement will first be resisted by the spring coil 74 and by the spring arm 56 of the rocker member 54 which is forced into bending position by the portions 84 (Fig. 5) of the rectangular frame 42. As the coil

spring is carried past the pivot pin 60 by the base of the rectangular frame 42, the spring arm 56 of the rocker member will bend sufficiently to allow it to snap past the portions 84 of the rectangular frame 42. This is known in the art as a "kick off". The coil spring 74 will then cause the members to complete their traveled path and to come to rest in the positions shown in Fig. 4. Thus the actuating mechanism is said to have a positive start and a spring finish. In this position (Fig. 4) it is apparent that the arm 66 of the arcuate member 64 has been withdrawn from between the contact strips 20, 22 allowing them to spring together in their normal contacting position. The other arm 68 of the arcuate member 64 has been thrust between the normally spaced contact strips 24 and 26 and the contact stud 82 acts to complete the connection between them. Both pairs of contact strips are now connected and the switch is in closed position.

To open the switch the movement is the same, however, the parts must obviously travel in the opposite direction.

The switch described is characterized by its simplicity of construction, its relatively few ports, and its positive action. The use of pairs of negative and positive contact strips, one of which is normally in closed position and the other being normally in spaced position, and the use of the arcuate arm of insulating material not only make possible the construction of a superior switch but obviate the disadvantages which usually accompany double pole switches of the lever type.

It is apparent that these marked improvements may be used with equal effectiveness in a rotary type switch, a switch having three or more poles, and also in a single pole and a three-way switch, and I do not wish to limit myself to the particular embodiment herein disclosed.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A double pole flush switch comprising a casing having an interior chamber, a pair of normally contacting contact strips of spring material disposed at one end of the interior chamber, a pair of normally spaced contact strips of spring material disposed at the other end of said interior chamber, and actuating means housed within said interior chamber for simultaneously making or breaking the connection between the contact strips comprising each pair.

2. A switch comprising, a pair of normally contacting contact strips, a pair of normally spaced contact strips, a member of nonconducting material having a contact stud on one end thereof, means to actuate said member of nonconducting material, said member in one position adapted to separate said pair of normally contacting contact strips, and in another position to be withdrawn from between said normally contacting contact strips and to be thrust between said normally spaced contact strips, said contact stud forming a connection therebetween.

3. A switch comprising a pair of normally contacting contact strips, a pair of normally spaced contact strips, a member of insulating material, a contact stud on one end of said member of insulating material, said contact stud in one position adapted to connect said normally spaced contact strips, and means to actuate said member of insulating material to withdraw said contact stud from between said normally spaced contact strips and to thrust the other end of said member between said normally spaced contact strips to break the connection therebetween.

4. A double pole flush switch comprising a casing having an interior chamber, a pair of normally contacting contact strips of spring material disposed at one end of the interior chamber, a pair of normally spaced contact strips of spring material disposed at the other end of said interior chamber, and an actuating mechanism housed in said interior chamber, said actuating mechanism comprising an arcuate member of nonconducting material, a contact stud passing through one end of said arcuate member, and means to actuate said arcuate member either to assume a position in which the said contact stud connects said normally spaced contact strips, the other contact strips remaining normally in contacting position, or to assume a position in which the contact stud is withdrawn from between said normally spaced contact strips and the opposite end of the arcuate member is lodged between the pair of normally contacting contact strips to separate them.

In testimony whereof I have hereunto set my signature.

WILLIAM F. RAMSAY.