

June 1, 1937.

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2,082,448

ELECTRIC SWITCH

Filed April 30, 1936

3 Sheets-Sheet 1

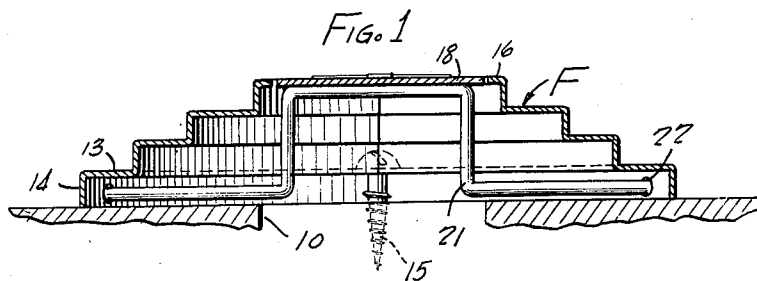
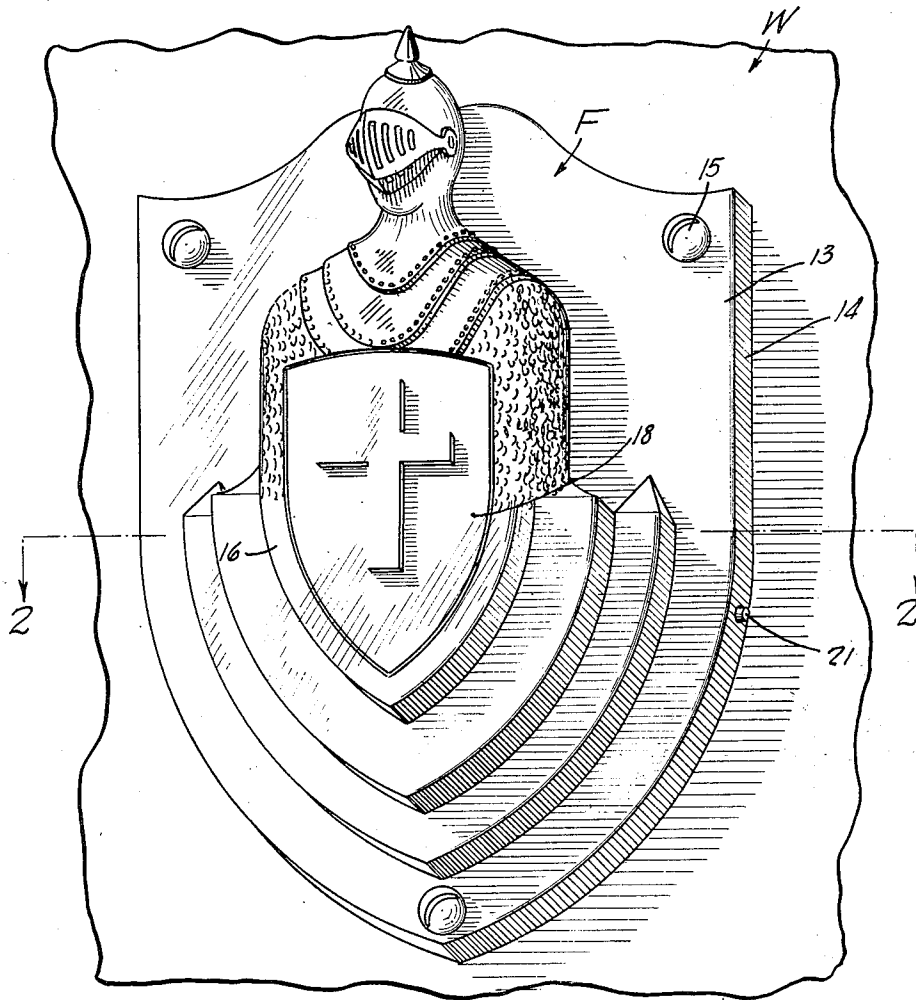


FIG. 2

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3 Sheets-Sheet 2

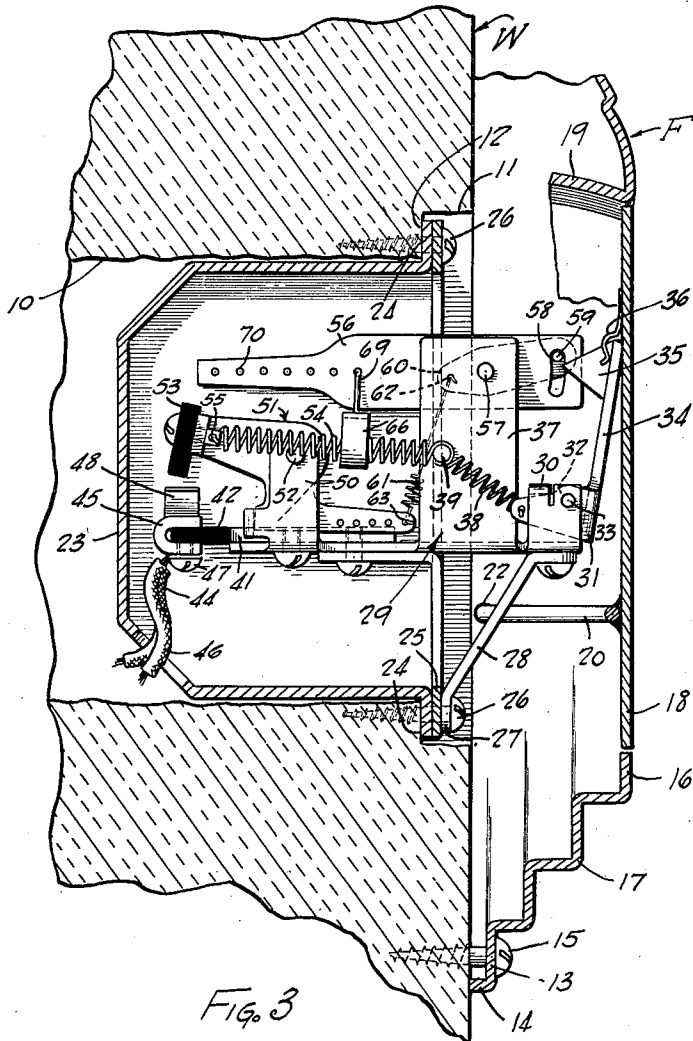


FIG. 3

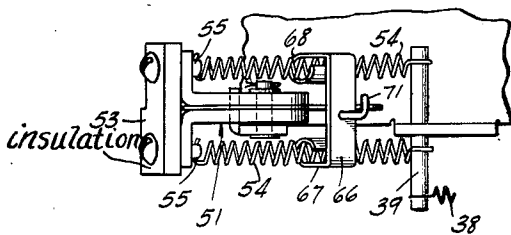


FIG. 7

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ELECTRIC SWITCH

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5 Claims. (Cl 200—67)

This invention relates to the art of electrical switches, and is concerned primarily with switches that are commonly employed for the purpose of turning electric lights on and off in homes, offices and similar places.

Ordinarily electrical switches, of the type with which this invention is concerned are installed on the walls of rooms adjacent points of entry, and in position where they are readily accessible to one entering or leaving the room, for the purpose of turning on or off the lights. Present day installation of these switches is essentially characterized by mounting the switch mechanism beneath the surface of the wall, in an appropriate recess therein, and covering the recess with a face plate which is manipulated to open or close the switch, as the case may be.

Present day practice, as above outlined, is characterized by the use of face plates which are usually just sufficiently large to cover the recess in which the switch mechanism is mounted, and due to the fact that the wall structures in many instances are made from plaster or similar composition, crumbling and cracking of the walls about the opening results, and these undesirable features are directly attributable to the more or less standardized practice of having the face plates just large enough to cover the edges of the opening. This substantial standardization of the size of the face plate is tied up with the feature of these switch constructions which dictate that the operating members project beyond the surface of the plate.

With the foregoing conditions in mind, this invention has in view as an important objective the provision of an electrical switch of the character described, in which the face plate is designed to engage a wall about the mechanism containing recess, and which face plate is formed with an upraised portion which surrounds a switch operating part, which preferably lies flush with this upraised surface.

This invention contemplates a face plate of a much larger dimension, with respect to the recess containing opening, than it has heretofore been the practice to employ, and which face plate includes proper structure to provide a gradual rise to the upraised portion which lies about the switch operating part.

A somewhat more detailed object is to provide, in an electric switch of the type above noted, a face plate including a centrally upraised portion, with which is associated an operating member that ordinarily lies substantially flush with said upraised portion, and which may be depressed to

open or close the switch. In this connection a somewhat more detailed feature resides in the provision of means for yieldably maintaining this operating member in flush position, but which means is overcome when the operating member is depressed for switch manipulating purposes.

Still another object of the present invention is to provide a switchplate of the character described, which includes a central upraised portion and a wall engaging edge, there being a stepped construction providing a gradual rise between the wall engaging edge and the central upraised portion.

Another important object of the present invention is to provide an electrical switch of the type noted, which includes a face plate, which is designed to present a pictorial representation of an ornamental character in visible position with the switch operating part taking the form of a part of the pictorial representation which ordinarily would be movable.

Another important object of the present invention is the provision of an electrical switch which includes a face plate designed along the above noted lines, and with which is associated switch mechanism that is particularly adapted for operation under the influence of the operating part above referred to. Various other detailed objects and advantages are associated with the provision of switch mechanism designed for effective operation under conditions above outlined.

The invention, therefore, comprises an electrical switch including a face plate designed to be positioned over a mechanism containing recess in a wall, and which face plate includes a centrally upraised portion which is spaced from the peripheral edge of the face plate by a stepped construction. A switch operating part is mounted flush with the centrally upraised portion, and is adapted to be pressed to manipulate the switch. This operating part is preferably included in the form of a moving part of a pictorial representation which is emblazoned on the face plate. An important phase of the invention is the actual construction and mode of operation of the novel type of switch mechanism herein provided for, which is designed primarily for cooperation with the said operating part.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings wherein:

Figure 1 is a perspective view of an electrical switch, made in accordance with the precepts of this invention. This view is taken substantially

from the front of a wall on which the switch is mounted, and brings out the disposition of the face plate thereon.

Figure 2 is a horizontal section taken about on the plane represented by the line 2—2 of Figure 1.

Figure 3 is a vertical section through the switch mechanism as it is mounted in a wall.

Figure 4 is a detailed showing of the switch mechanism in circuit closing position.

Figure 5 is an enlarged detailed view in perspective of one of the switch parts.

Figure 6 is another enlarged detailed showing in perspective, bringing out the arrangement of the contact elements of the switch.

Figure 7 is a detailed plan view of the contact actuating assembly, while

Figure 8 is another enlarged detailed view in perspective of a part of the switch mechanism, and

Figure 9 is yet still another detailed perspective showing of another switch part.

Referring now to the drawings, wherein like reference characters denote corresponding parts, and particularly Figures 1 and 3, a portion of a wall W is shown as being made from any material common to the building arts. This wall W is formed with a recess 10, which is designed to receive the switch mechanism provided for by this invention. This recess 10 is, adjacent to the face of the wall W, enlarged as indicated at 11, the enlarged portion 11 being defined by a shoulder 12.

A face plate is referred to generally by the reference character F, and as shown in the drawings this face plate F is in the form of a shield. Obviously the invention is not to be limited in this particular respect, as the face plate F can be made in any shape necessary to carry out the basic concept of any ornamental design. This face plate F is formed with a main body portion 13 that is spaced a slight distance from the face of the wall W by a flange 14, fastening members for holding the face plate F in position on the wall being shown in the form of screws 15.

Centrally of the face plate F, the latter is formed with an upraised portion 16, which may take any form necessary to carry out the ornamental concept of the face plate. In the drawings this central portion 16, on its lower portion, carries out the shield idea of the entire face plate, and the upper part thereof is formed with a representation of a medieval knight. To provide a gradual rise from the main portion 13 of the face plate to the central portion 16, a stepped construction referred to generally at 17 is provided. Obviously this gradual rise may be provided for by other structure, and the stepped construction herein shown is merely intended as exemplary.

This stepped construction has a further function of constituting a guide to the switch operating part, which is included in the central upraised portion 16. A person entering a darkened room, and knowing the general location of the switch may grope about and find the same, whereupon the stepped construction 17 will constitute a guide for his fingers in locating the switch operating part included within the central upraised portion 16, and herein designated 18.

This switch operating part also conforms to the configuration of the main face plate F, and is in the form of a smaller shield, as clearly shown in Figure 1. Inasmuch as the member 18 is intended to be depressed for switch operating purposes, the inner edge of the central upraised por-

tion 16 may be turned inwardly to provide a guard flange 19, as shown in Figure 3.

From the foregoing it is apparent that the face plate F presents the ornamental design of a knight which is mounted on a large shield, and which knight includes a central shield that is depressed to operate the switch, thus carrying out the thought of providing a pictorial representation of an ornamental character, which includes a moving part that is constituted the switch operating part.

Affixed to the under side of the operating plate 18 is a bracket 20, which bracket is formed with feet 21 that find pivotal bearing in the flange 14, as indicated at 22. This bracket 20 is attached to the operating plate 18, adjacent the lower end thereof, so as to provide for a substantial inward swinging of the upper part of this operating plate.

The switch mechanism itself is carried by a housing 23 that is fitted in the recess 10, and which housing is formed with an outturned flange 24 that engages the shoulder 12. Positioned over the flange 24 is a supporting ring 25, from which extends inwardly certain supporting structure, hereinafter to be described in detail.

The supporting ring 25 and housing 23 are held in position by screw fastening elements 26 which extend through appropriate openings in these parts and into the wall 10. One of the fastening elements 26, at the bottom also may pass through an opening formed in a foot portion 27 of a supporting bracket 28. As shown in Figure 3, the bracket 28 and the ring 25 support the frame structure which is referred to in its entirety as 29.

Within the space defined by the stepped construction of the face plate F, the framework 29 is formed with a pair of spaced ears 30, between which is pivotally mounted a bell crank, designated 31. The shorter arm of the bell crank is defined by side portions 32, in which openings are formed which coincide with openings formed in the ears 30, through all of which openings extends a pivotal pin 33.

The longer arm of the bell crank 31 takes the form of an arm 34, which carries a pointed cam element 35. The extremity of the arm 34 engages the under-side of the operating plate 18, and is yieldably maintained in this engaging position by a spring clip 36 that permits of a certain amount of sliding motion between the extremity of the arm 34 and the operating plate 18.

The framework 29 also includes an upright 37, and as shown in Figure 3 a spring 38 has one extremity anchored to the upright 37, as shown at 39, while the other extremity of the spring 38 is attached to one of the shorter arms 32 of the bell crank 31. This spring 38 functions to yieldably maintain the arm 34 in engagement with the operating plate 18, and by this engagement the operating plate 18 is maintained in a position substantially flush with the central upraised portion 16 of the face plate F.

Anchored to the framework 29, by fastening elements which extend through openings at 40 (Figure 6) is a contact carrying member 41. This contact carrying member 41 is formed with a leg 42, which carries the contact members in spaced relation. One of these contact members is shown at 43 and may be properly connected to a conductor 44 by a binding post. This leg 42, which, of course, is of a good insulating material also carries a second contact member 45, which is connected to a conductor 46 by a binding post shown at 47. The binding post for the contact

43 is substantially identical with the binding post 47.

A spring circuit closing member 48 is normally in an upraised position and in spaced relation to the contact 45.

The supporting framework 29 is formed with an upstanding part 50, which pivotally carries an actuating member referred to in its entirety as 51, and shown in Figure 5, the pivotal mounting for the member 51 being indicated at 52 in Figure 3. The actuating member 51 carries a block 53, which is of an insulating material, and this block 53 is normally positioned above the spring circuit closing member 48, with the switch parts in position as shown in Figure 3.

A pair of coil springs 54 are anchored at one end to the actuating member 51, as shown at 55, and at their other extremities to the anchoring pin 39. It is important to note that the springs 54 are normally under tension, and when disposed above "dead center" as defined by the pivotal mounting 52 are effective to maintain the block 53 in an upraised position, but when disposed beneath "dead center" as defined by the pivotal mounting 52, they urge the block 53 against the spring circuit closing member 48, and through this engagement the latter is pressed into contacting engagement with the contact 45.

A lever arm 56 is pivotally mounted on the upright 37 by a pin shown at 57. Forwardly of the pivotal mounting 57 the lever arm is formed with an arcuate slot 58. A pin 59 projects into the slot 58 and is carried by a small lever 60, that is also pivotally mounted on the pin 57. It is notable that the small lever 60 is unbalanced so that when unaffected by other instrumentalities the pin 59 will fall to the bottom of the arcuate slot 58. However, a spring 61 has one end anchored to the shorter end of the small lever 60, as shown at 62, while the other extremity of the spring 61 is anchored at 63 to an arm 64 which is formed as a part of the actuating member 51.

In order to vary the effective tension of the spring 61, the arm 64 is provided with a plurality of spaced openings 65, and the extremity of the spring 61 may be attached to either of these openings as is necessary to provide the required tension. Attention is also called to the fact that the pin 59 is in position which is designed for cooperative engagement with the pointed cam 35 in a manner to be hereinafter described.

Operating connections between the lever 56 and the coil springs 54 are provided in the form of a bracket 66, having legs 67, each of which is formed with an extremity 68 that is coiled about the respective spring 54. A link is shown at 69 as connecting the bracket 66 with the lever arm 56. Adjustment for the operating connections between the lever 56 and coil springs 54 are shown in the form of spaced openings 70, one of which is designed to receive the turned-over extremity 71 of the link 69.

In describing the mode of operation of the foregoing switch mechanism it is noted that with the switch mechanism in a position shown in Figure 3, the spring circuit closing member 48 is upraised and spaced from the contact 45, and when the circuit is open the switch is then said to be off. A person entering the room, desirous of turning on the lights controlled by the switch mechanism, will first locate the face plate F, and guide his hand to the operating plate 18, the stepped construction 17 assisting in this locating.

The operating plate 18 is now depressed, which

causes an inner movement of the pointed cam 35. With the parts in the position shown in Figure 3 the upper surface of the pointed cam 35 engages the pin 59, and as the latter is in the uppermost extremity of the slot 58, the forward end of the operating lever 56 is urged upwardly, causing a downward movement of the opposite end of the lever. This downward movement is imparted to the bracket 66, which causes the coil springs 54 to be urged past "dead center" as defined by the pivotal mounting 52, whereupon the springs 54 become effective to urge the actuating member 51 about the pivotal mounting 52 and cause the block 53 to move downwardly against the circuit closing member 48, and press the latter into circuit closing engagement with the contact 45.

At the same time as the lock 53 is moved downwardly, the arm 64 is swung upwardly, which relieves tension on the spring 61 so that the pin 59 is now free to fall to the bottom of the slot 58 when it is disengaged from the cam 35. This engagement takes place when pressure is released on the operating plate 18, and the latter is returned to its flush position by the effect of the spring 38.

Figure 4 develops the position of the various parts when the switch mechanism is in circuit closing position and prior to the release of the operating plate 18. When it is desired to open the switch, this operating plate 18 will again be depressed, whereupon the lower surface of the pointed cam 35 will engage the pin 59, which is now in the bottom of the slot 58, with the result that the forward end of the lever 56 will be depressed, the rear end raised, and the coil springs 54 passed above the "dead center" of pivotal mounting 52 to snap the block 53 upwardly, and the arm 54 downwardly, to again put tension on the spring 61, and return the pin 59 to the uppermost extremity of the slot 58, where it is again in position adapted for engagement with the pointed cam 35 to cross the switch upon the next subsequent depression of the operating plate 18.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that I am not to be limited to the exact constructions illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

I claim:

1. In an electrical switch, an actuating member movable into positions defining open and closed positions of the switch, said actuating member being mounted on framework which is included as the supporting structure of the switch, spring means anchored at one end to the framework, and at the other end to the actuating member, said spring means being adapted to assume positions on opposite sides of the pivotal mounting to move the actuating member into its effective positions, a lever pivotally carried by the framework of the switch, operating connections between one end of said lever and said spring means, a cam device associated with said lever and movable to cause effective operation thereof, and a pin carried by said lever movable into positions in which it is engaged on opposite sides by said cam, means for causing such movement of the said pin, whereby successive effective movements of the cam cause the switch to open and close in successive order.

2. In an electrical switch of the character described, a lever pivotally mounted and movable into positions defining open and closed positions of the switch mechanism, a second lever pivoted
5 coaxially with said lever, said first mentioned lever being formed with a slot, a pin extending from the second lever through said slot, means for causing movement of the said pin in the slot, an arm pivotally mounted to the framework
10 of the switch and carrying a pointed cam adapted to engage said pin on either side, and a face plate having a movable part in operative engagement with said arm.

3. In an electrical switch of the character described, a lever pivotally mounted and movable into positions defining open and closed positions of the switch mechanism, a second lever pivoted
15 coaxially with said lever, said first mentioned lever being formed with a slot, a pin extending from the second lever through said slot, a bell crank having a long arm, a pointed cam carried by said arm and adapted to engage either side of said pin, spring means associated with the shorter arm of the bell crank and normally
20 effective to maintain the longer arm of the bell crank in a retracted position, and means for causing movement of said pin from one end of the slot to the other, incident to each effective movement of said first mentioned lever.

30 4. Switch mechanism of the character described, comprising supporting framework, an actuating member pivotally mounted on the supporting framework and adapted to assume positions defining open and closed positions of the

switch, means for causing effective movement of said actuating member, said means including a pivoted lever formed with a slot, a second pivoted lever having a pin extending into and through said slot, means to move the pin in the slot, operating connections between the end of said second lever opposite from the pin and said actuating member, and a pointed cam adapted to engage either side of said pin, said pointed cam being movable to cause effective operation
10 of the switch.

5. Switch mechanism of the character described, comprising a supporting framework, an actuating member pivotally mounted on the supporting framework and adapted to assume positions defining open and closed positions of the switch, means for causing effective movement of said actuating member, said means including a pivoted lever formed with a slot, a second pivoted lever having a pin extend into and through
20 said slot, means for causing movement of the said pin in the slot, operating connections between the end of said second lever opposite from the pin and said actuating member, a pivoted arm, a pointed cam carried by said pivoted arm adapted to engage either side of said pin to cause effective movement of the first mentioned lever, a face plate including a movable operating part, and spring means associated with said pivoted arm normally functioning to maintain said arm
25 in engagement with said operating part of the face plate, and in retracted position.

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