G. B. THOMAS.

ELECTRIC SWITCH.

APPLICATION FILED SEPT. 9, 1916.

1,249,857. Patented Dec. 11, 1917.

Fig. 1

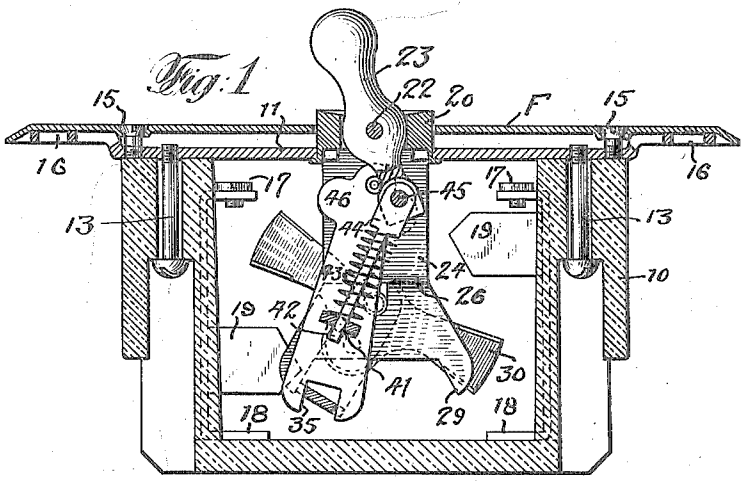


Fig. 2

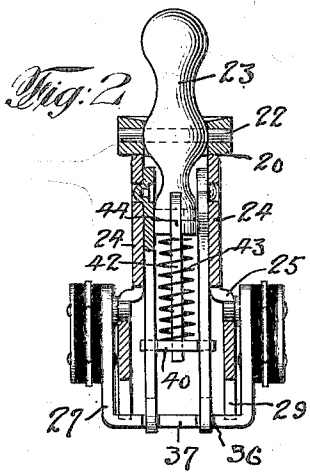


Fig. 3

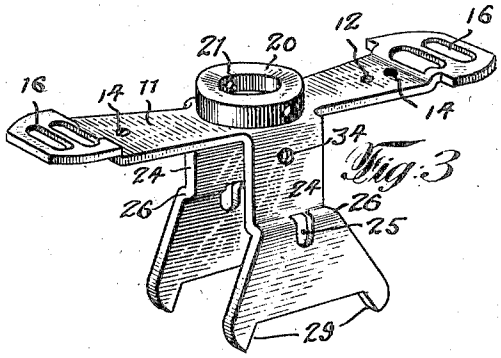


Fig. 4

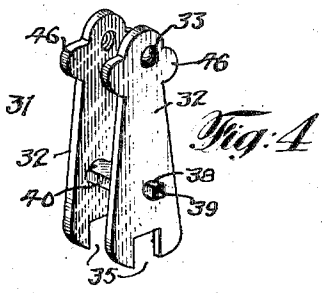


Fig. 5

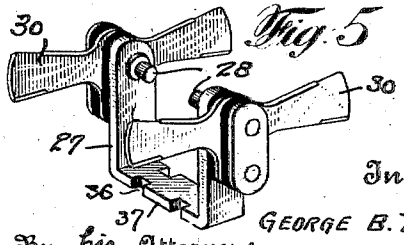
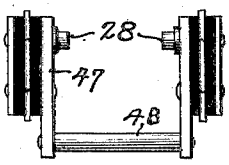


Fig. 6



Inventor

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By his Attorneys

Thomas and Thomas

UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

1,249,857. Specification of Letters Patent. Patented Dec. 11, 1917.

Application filed September 9, 1916. Serial No. 119,295.

To all whom it may concern:

Be it known that I, GEORGE B. THOMAS, a citizen of the United States of America, and residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and Improved Electric Switch, of which the following is a specification.

My invention relates to electric switches and particularly to a switch-operating mechanism, the object of my invention being to provide an efficient mechanism which may be cheaply manufactured and readily assembled and by which a quick make and break may be secured in the operation of the switch.

Referring to the accompanying drawings,

Figure 1 is a longitudinal section through a flush switch in which my invention is illustratively embodied;

Fig. 2 is a section at right angles through the switch mechanism alone;

Fig. 3 is a perspective of the switch frame;

Figs. 4 and 5 are similar views of the portions of the switch mechanism; and

Fig. 6 is a side elevation of a modified construction of a switch blade carrier.

In the particular embodiment of my invention illustrated in Figs. 1 to 5 I have shown a flush switch comprising a cup-shaped body 10 of insulating material, across the open face of which extends a supporting bar 11 tapped at 12 to receive the securing screws 13 by means of which the same is mounted upon the body 10. It is also tapped at 14 to receive the short screws 15 by which the face plate F is held in position after the switch has been mounted in an outlet box (not shown) by means of screws passing through the end slots 16. At the corners of the body recesses are formed to admit the connecting wires to binding screws 17, carried by straps 18 to which the switch terminals 19 are secured in well known manner.

The bar 11 is centrally apertured and a ring 20 secured in register therewith by peening over lugs which enter slots leading from the central apertures in the bar. This ring is perforated on opposite sides at 21 to receive the pivot pin 22 on which oscillates the operating thumb lever 23, the outer end of which projects outward a convenient distance beyond the face plate. Substantially parallel side frame members 24, preferably integral with the bar 11 and located on opposite sides of the ring 21, extend downward into the switch chamber of the base 10 and form the supporting frame for the switch mechanism. At their inner ends the members 24 are offset farther apart and slots 25 formed therein which extend inward from the offset shoulders 26 to afford an open bearing for the switch blade carrier 27. The latter is of yoke shape and has at the open end of the yoke a pair of oppositely faced studs 28 which rest in the bottoms of the bearing slots 25. The distance between the studs 28 being slightly greater than that of the offset portion of the frame 24, the yoke may straddle the latter and the studs 28 pass above the shoulders 26 and into the bearing slots 25. Stop lugs 29 formed at the inner ends of the sides 24 limit the extent of oscillation of the yoke 27 and thus limit the throw of the switch blades 30 which are insulated from but carried by the yoke and coöperate with the switch terminals 19.

To operate the yoke 27 from the lever 23, I provide a connecting lever 31 preferably formed as shown from a pair of links 32 of identical form each having at its outer end a stud 33 pressed from the metal of the link and engaging in holes 34 formed in the opposite sides of the frame. At the inner end of the lever recesses 35 are struck which engage in notches 36 cut in the margins of the yoke bar 37, so that the movement imparted to the connecting lever is transmitted to the switch blade yoke. Intermediate the ends of the link are formed round holes 38 to freely receive the reduced ends 39 of an abutment plate 40. The latter is centrally apertured at 41 to permit the passage therethrough of a guide pin 42 around which is coiled the switch spring 43. The upper end of this spring bears against the head 44 of the guide pin which is pivoted at 45 to the inner slotted end of the operating lever 23. The latter is arranged between the outer ends of the links 32 and is of such diameter that it maintains their studs 33 seated in the bearing apertures 34 in the sides of the frame. To insure this function of the lower end of the lever 23, the links 32 are provided with wings 46 which extend the area of contact and against which the lower end of the lever bears in its extreme positions. Inas-

much as this engagement also serves to prevent the pivot pin 45 from escaping the lower end of the lever 23 it is unnecessary to spread the ends thereof.

The assembly of the mechanism is extremely simple. The switch yoke 27 is first slipped into position in its bearings 25. The links 31 with abutment plate 40 in position, is then arranged with its studs 33 in their bearings 34, whereupon the operating lever 23, which carries at its lower end the guide pin 32, is passed down through the bearing ring and the guide pin passed through the switch spring 43 and abutment plate 40. The spring 43 is finally placed under sufficient pressure to permit the cross pin 22 to be inserted through the lever 23 and the perforations in the ring 20 and the mechanism is completely assembled ready for adjustment in the body 10. No bolts, rivets, or other securing means are needed to hold the parts assembled, with the exception of the pin 22, the ends of which may be readily spread beyond the opposite sides of the ring 20 and the mechanism thus permanently secured with its parts in proper relationship. It is obvious that as the operating lever 23 is swung in one direction or the other on its pivot pin 22, the bearing 45 of the switch spring guide pin is swung to one side or the other of the axis of oscillation of the connecting lever 31 with the result that the switch spring exerts its pressure to bias the lever 31, and thus the yoke 27, first in one direction and then in the other to secure the make or break action of the switch.

In Fig. 6 I have shown a modified form of yoke in which the sides 47 thereof are connected by a rivet 48 which is engaged in the recesses 35 of the connecting lever 31 in precisely the same way as the bar 37 of the yoke previously described.

Various other modifications in detail will readily occur to those skilled in the art which do not depart from what I claim as my invention.

I claim as my invention:—

1. In an electric switch, a frame having substantially parallel sides, an oscillating lever comprising a pair of links arranged between and adjacent said side frames, a free pivotal connection between said links and frame, in combination with an operating lever arranged between and having a sliding engagement with said links and serving to maintain the pivotal joint between the latter and the frame.

2. In an electric switch, a frame having substantially parallel sides, an oscillating lever comprising a pair of links arranged between and adjacent said side frames, a free pivotal connection between said links and frame, in combination with an operating lever arranged between and having a sliding engagement with said links and serving to maintain the pivotal joint between the latter and the frame, said links having enlarged areas at the point of sliding engagement between the same and said operating lever.

3. In an electric switch, a frame having substantially parallel sides, an oscillating lever comprising a pair of links arranged between and adjacent said side frames, a free pivotal connection between said links and frame, in combination with an operating lever arranged between and having a sliding engagement with said links and serving to maintain the pivotal joint between the latter and the frame, together with a spacing plate freely engaged between said links at a point removed from that of the engagement of the operating lever therewith.

4. In an electric switch, a frame having substantially parallel sides, an oscillating lever comprising a pair of links arranged between and adjacent said side frames, a free pivotal connection between said links and frame, in combination with an operating lever arranged between and having a sliding engagement with said links and serving to maintain the pivotal joint between the latter and the frame, together with a spacing abutment plate engaged between said links at a point removed from that of the engagement of the operating lever therewith and a switch spring operatively interposed between said bearing plate and operating lever.

5. In an electric switch, a pivoted operating lever, a connecting lever having an independent axis of oscillation, a switch blade carrier having a third fixed axis of oscillation, all of said axes being substantially in parallel, an operative engagement between the connecting lever and the switch blade carrier, and a switch spring engaged between the operating and connecting levers and serving to bias the latter on the actuation of the former.

6. In an electric switch, a pivoted operating lever, a connecting lever having an independent fixed axis of oscillation, a switch blade carrier having a third fixed axis of oscillation, all of said axes being substantially in parallel, an operative engagement between the connecting lever and the switch blade carrier, and a switch spring engaged between the operating and connecting levers and serving to bias the latter on the actuation of the former.

7. In an electric switch, a connecting lever pivoted at one end, a pivoted switch blade carrier jointed thereto at its opposite end, all of said axes being substantially in parallel, a spring abutment intermediate the ends of said connecting lever, an operating lever, and a switch spring interposed between the

latter and the spring abutment on the connecting lever, for the purpose described.

8. In an electric switch, a pivoted operating lever, a connecting lever having an independent axis of oscillation, a pivoted switch blade carrier, all of said axes being substantially in parallel, a spring abutment carried by the connecting lever, a switch spring bearing at one end against said abutment and operatively connected at its other end to the operating lever at a point shiftable, upon the actuation of the latter, from one side to the other of the axis of oscillation of the connecting lever.

9. In an electric switch, a pivoted operating lever, a connecting lever having an independent axis of oscillation, a pivoted switch blade carrier, a spring abutment carried by the connecting lever, a switch spring bearing at one end against said abutment and operatively connected at its other end to the operating lever at a point shiftable, upon the actuation of the latter, from one side to the other of the axis of oscillation of the connecting lever and between said axis and the axis of the switch blade carrier.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE B. THOMAS.

Witnesses:
G. W. GOODRIDGE,
H. M. WICHERT.