

1,404,865.

Fig. 3.

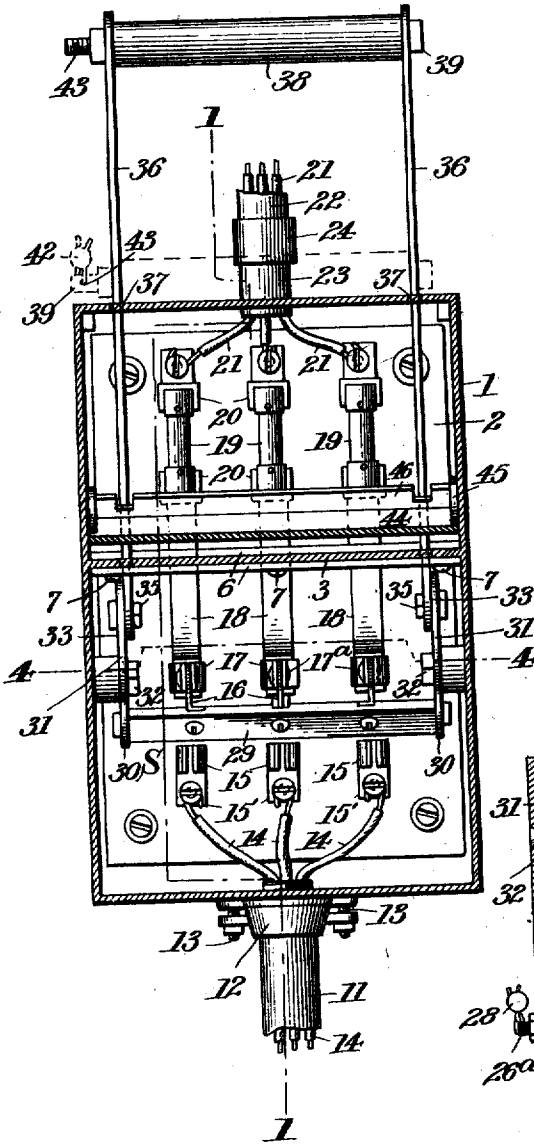


Fig. 5.

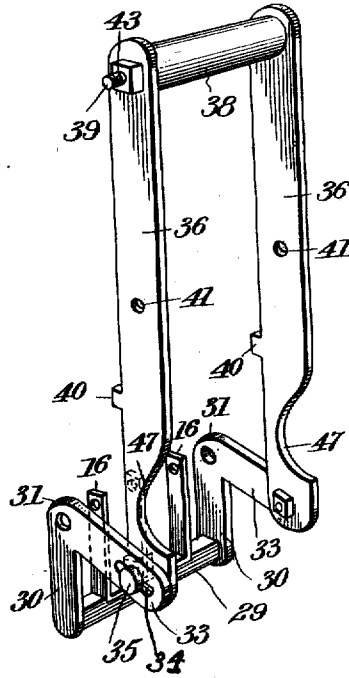
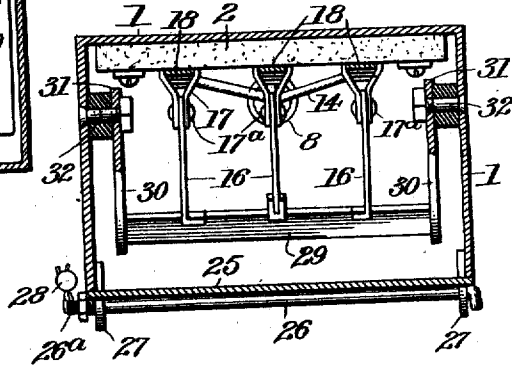


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

1,404,865.

Specification of Letters Patent.

Patented Jan. 31, 1922.

Original application filed March 12, 1910, Serial No. 548,925. Divided and this application filed March 31, 1917. Serial No. 158,849.

To all whom it may concern:

Be it known that I, LAWRENCE F. KRIES, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to electric switches, and more particularly to switches of the kind shown in my prior Patent No. 1,224,880, granted May 1, 1917.

In the said application, I have described and claimed a combined switch and fuse box. The present application is a division of the above mentioned patent, and is based upon the switch mechanism itself.

In designing the particular switch mechanism in question, the objects of the invention were to provide a switch construction capable of handling large as well as small currents, and to provide an actuating mechanism which would be easy and convenient to operate and which would serve to move the switch members accurately, effectively, and with a uniform force. While, as shown in my prior patent, this switching mechanism is especially adapted for use in connection with an enclosing casing, it is not by any means confined to such use, as the movement employed lends itself readily to other conditions.

In order that the invention may be clearly understood, reference is had to the accompanying drawing, forming a part of this specification, and in which,

Fig. 1 is a longitudinal, central section through a combined switch and fuse box, showing my improved switching mechanism, the switch being illustrated as closed;

Fig. 2 is a similar view, the switch being shown as open;

Fig. 3 is a plan view of the box with the cover removed;

Fig. 4 is a transverse section on the line 4-4 of Fig. 3; and,

Fig. 5 is a perspective view of the switching elements and operating mechanism.

Referring to the drawings in detail, the present invention has, as above mentioned, been illustrated in connection with the combined switch and fuse box shown in my prior application. Such box comprises a rectangular casing 1, preferably formed of sheet

metal, in which is mounted a suitable base 2, formed of slate or other insulating material. The box, as shown, is divided into two compartments 4 and 5, by means of a partition 3, secured to, but insulated from the connections carried by the base 2 by insulating strips 6, extending beyond its edge and attached by screws 7. Connections from the street main or other source of current enter the box at 8. These connections preferably consist of a lead sheathed cable 9, attached by means of a conical nipple 10, the lead sheath 11 being clamped by means of a ring 12, held by bolts 13. The conductors 14, of which in the present instance, three are shown, are attached to terminal screws or binding posts 15, which are also secured to clips 15, constituting one set of switch contacts.

The switch is designated in its entirety by the letter S and comprises a plurality of switch blades or elements 16, suitably spaced and pivotally mounted at one end, as indicated at 17^a, to posts or clips 17 secured to the base 2. Extending from the clip 17 below the insulating strips 6 are conductors 18, which connect the clips 17 with one set of fuse terminals 20, adapted to receive cartridge fuses 19. The other set of fuse terminals is indicated at 20^a and is connected with the out-going conductors 21. These are preferably enclosed in a conduit 22, secured to the box by means of a nipple 23 and coupling 24.

The switch compartment 5 is closed by a door 25, hinged at one end as shown, and held closed by means of a rod 26, extending across the same and passing through eyes 27 secured to the box. A seal 28 may be passed through a hole 26^a in the end of this rod, if desired, to prevent the access of unauthorized persons to the interior of the switch box.

The free ends of the switch elements or blades 16 are rigidly secured to a cross-head 29 of insulating material, which holds the blades in their proper spaced relation. The ends of the cross-heads 29 extend beyond the outer switch blades and are connected to arms 30 of a pair of bell crank levers 31. These levers are pivotally mounted at 32 on the sides of the box, and it will be particularly noted that the pivot pins 32 are in sub-

stantial alinement with the pivotal points 17^a of the switch blades. In other words, the bell crank levers 31 and the switch blades turn about a common axis.

5 The bell crank levers 31 are connected with an operating member now to be described. This member consists of a pair of spaced bars 36, pivotally connected at their inner ends to the arms 33 of the bell
10 crank levers, such connection being by means of bolts 35, working in slots 34, formed in the arms 33. These bars 36 extend through slots 37 in the partition or barrier 3 and in the outer wall of the box or casing, and the
15 outer ends of the bars are held in spaced relation by a hollow handle 38, through which passes a bolt 39. It will be seen that the structure formed by the bars 36 and handle 38 constitutes a bail-shaped operating
20 member for the switch. The bars 36 are provided with stop lugs 40 to limit their movement, and with a pair of alined openings 41. These openings are for the purpose of receiving the bolt 39, as indicated in
25 dotted lines in Fig. 3, to lock the switch in open position, as will be apparent. For this purpose, the end of the bolt 39 may be provided with a hole 43, adapted to receive a
30 seal 42.

The fuse compartment 4 is provided with a swinging door 44, pivoted to the casing at 45, and provided with a heel or tail portion 46. This heel co-operates with cam notches 47, formed in the bars 36. As fully described in my above mentioned application,
35 the heel 46 and the cam notches 47 form interlocking parts, serving to hold the door 44 closed when the switch is closed, and to permit such door to be opened after the
40 switch has been opened, as will be apparent. When the door 44 is open, access may be had to fuses 19, but, in the arrangement shown, the switch compartment is permanently closed against unauthorized persons, and all live current carrying parts are thereby rendered inaccessible.

It will be observed that the bars 36 are disposed parallel with the base 2 and substantially at right angles to the barrier 3 and end walls of the box. By virtue of this
50 construction, the box may be located high up on a wall or low down next to the floor and the switch conveniently operated by a direct up or down pull on the handle 38.
55 The bars are guided by the slots 37 so as to move always parallel to the base 2, and the slots 34 permit freedom of movement of the parts.

Owing to the fact that the actuating arms 30 of the bell crank levers 31 are secured to each end of the cross-head 29, all parts of such cross-head will be subjected to the same force and all three of the switch blades will be moved a uniform distance. In other
60 words, this prevents any tendency to un-

equal movement or distortion such as would result if the moving force were applied to one end only of the cross-head 29. My improved construction insures the application of a balanced force throughout the length of
70 such cross-head. This is necessary for the proper working of the switch.

It will also be noted that the arms 30 and cross-head 29 together constitute a U-shaped actuating member for the switch, both sides
75 of which member are connected with the operating bail or member formed by the bars 36 and handle 38.

It will be seen that the switch mechanism above described is extremely simple and
80 rugged in construction, and positive and effective in operation, and it is thought that the many advantages of my invention will be readily appreciated by those skilled in the art, without further discussion. 85

What I claim is:

1. In a switch of the character described, the combination with a base, of a plurality of spaced switch blades pivotally mounted at one end on said base, a cross-head to which
90 the free ends of said blades are rigidly secured, a fixed support, a pair of arms pivotally mounted on said support at points located laterally outside of and in substantial alinement with the pivots of said blades, and
95 connected with the ends of said cross-head, and an operating member pivotally secured to said arms.

2. In a switch of the character described, the combination with a base, of a plurality
100 of spaced switch blades pivotally mounted at one end on said base, a cross-head to which the free ends of said blades are rigidly secured, a fixed support, a pair of arms pivotally mounted on said support at points lo-
105 cated laterally of and in substantial alinement with the pivots of said blades, and connected with the ends of said cross-head, an operating member pivotally secured to said arms, and means for guiding said mem-
110 ber so as to cause it to move longitudinally of itself parallel with said base.

3. In a switch of the character described, the combination with a suitable support, of a plurality of spaced switch blades pivotally
115 mounted at one end thereon, fixed contacts adapted to be engaged by said blades, a barrier adjacent said switch blades, and a switch operating mechanism connected with the free ends of said blades, said mechanism comprising a slidably mounted bail-shaped member having a handle at its outer
120 end, and with its inner ends disposed one on each side of said blades, and means for guiding said bail-shaped member so as to cause
125 it to move in a fixed plane longitudinally of itself.

4. In a switch of the character described, the combination with a casing, of a plurality of stationary pivotal posts, a plurality of
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switch elements inaccessibly mounted therein on the stationary posts, and an operating mechanism for the switch comprising a pair of spaced bars having an operative connection with said switch elements and extending outside the casing, and a handle disposed between and secured to the outer end of said bars, one wall of said casing having openings through which said bars pass.

5. In a switch of the character described, the combination of a casing, a plurality of spaced, stationary contacts, a plurality of similarly spaced switch blades, pivotally mounted at one end, and arranged to engage said contacts, and actuating means for said switch comprising a swinging U-shaped member pivotally mounted at its ends on each side of and in substantial alinement with the pivot points of said switch blades, said U-shaped member being connected with said switch blades adjacent their free ends, all of said parts being enclosed within said casing, and an operating member in the shape of a bail extending outside of said cas-

ing and having its ends connected with both sides of said U-shaped member.

6. In a switch of the character described, the combination of a casing, a plurality of spaced, stationary contacts, a plurality of similarly spaced switch blades, pivotally mounted at one end and adapted to engage said contacts, and actuating means for said switch blades comprising a swinging U-shaped member pivotally supported at its ends by the walls of the casing at each side of and in substantial alinement with the pivot points of said switch blades, said U-shaped member being connected with said switch blades adjacent their free ends, all of said parts being enclosed within said casing, and an operating member extending outside of said casing and connected with said U-shaped member to swing the same on its pivots.

In testimony whereof I have affixed my signature.

LAWRENCE F. KRIES.