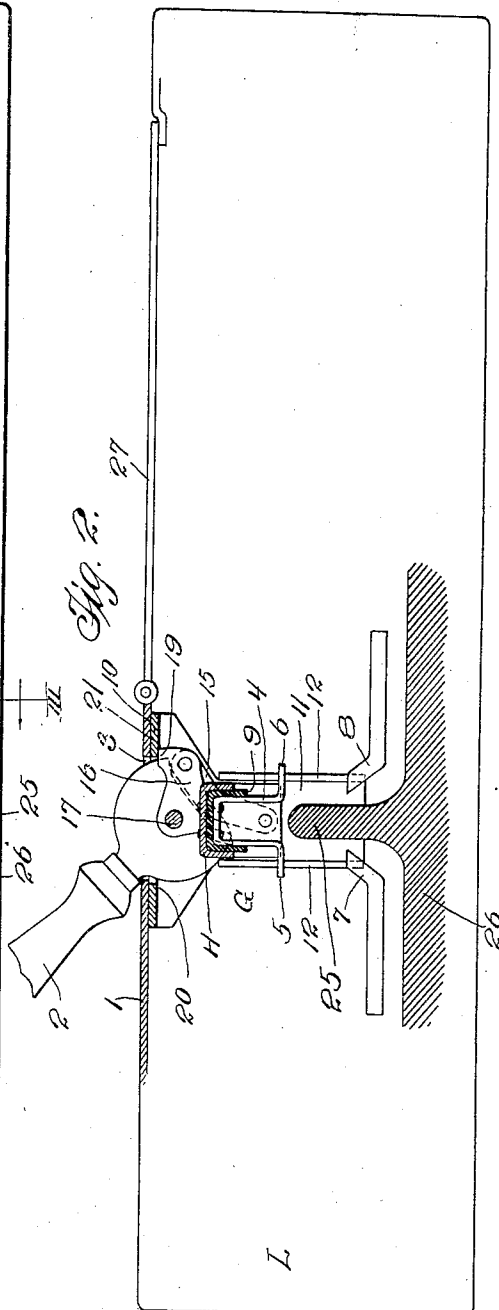
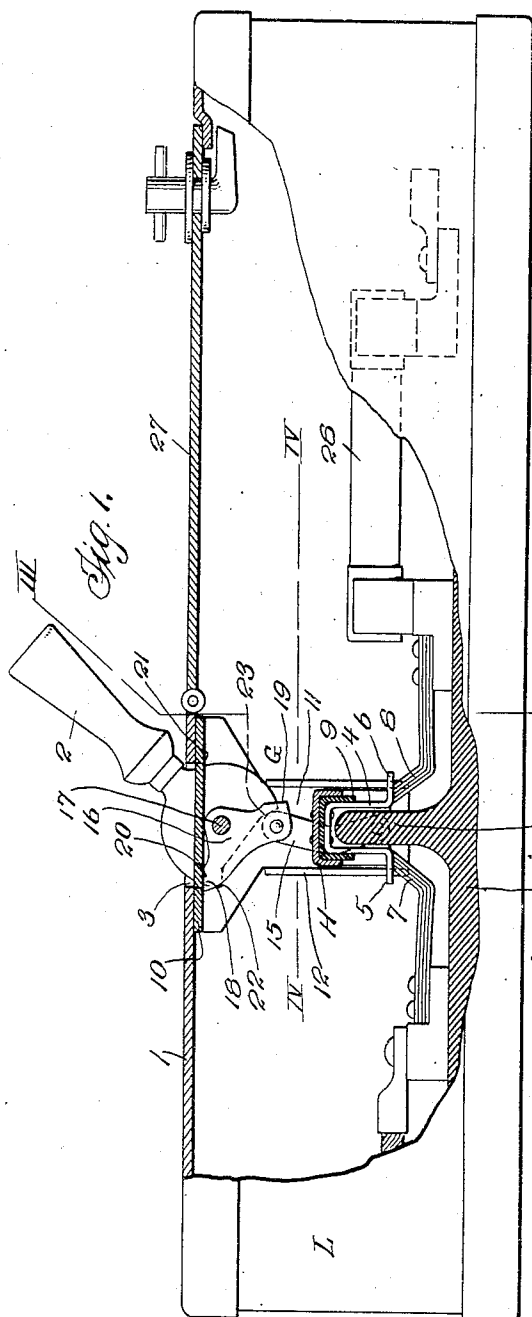


H. F. KRANTZ.
 SWITCH MECHANISM.
 APPLICATION FILED JUNE 16, 1917.

1,399,493.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 1.



INVENTOR

Hubert F. Krantz

BY

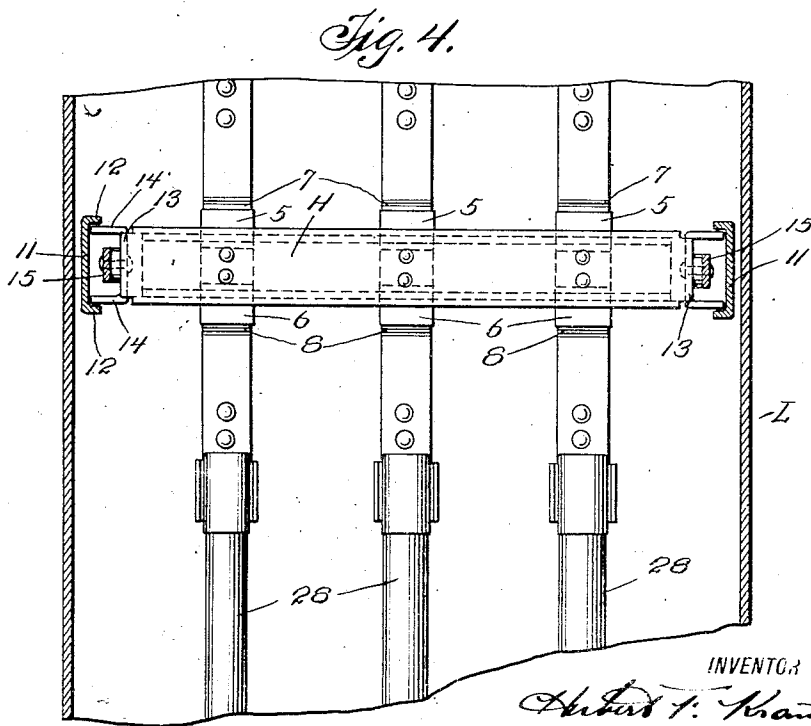
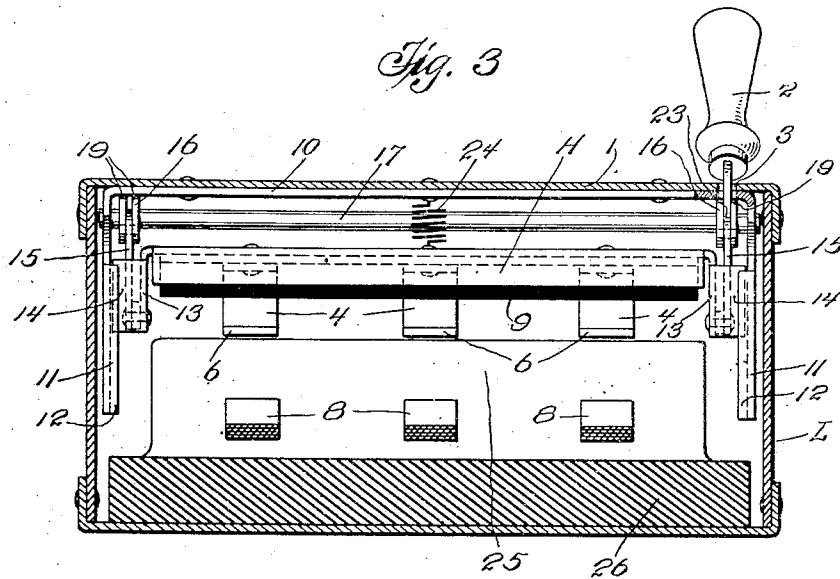
L. Sanford Hinds
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HUBERT F. KRANTZ, OF BROOKLYN, NEW YORK, ASSIGNOR TO KRANTZ MANUFACTURING COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

SWITCH MECHANISM.

1,399,493.

Specification of Letters Patent.

Patented Dec. 6, 1921.

Application filed June 16, 1917. Serial No. 175,196.

To all whom it may concern:

Be it known that I, HUBERT F. KRANTZ, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in a Switch Mechanism, of which the following is a specification.

This invention relates to a switch mechanism for safety panel boxes.

A particular object of the invention is to provide a switch mechanism which will enable a reduction in the size of panel boxes of given current capacity and which will also include parts constituting an efficient barrier against probable contact with the main line terminals when the switch is in the "off" position.

A further object is to provide a switch mechanism which may be readily controlled.

A further and more detailed object is to provide a switch mechanism having spaced contact parts movable in a vertical plane toward and away from fixed contacts, to provide efficient insulating means enabling the fixed contacts to be positioned in close proximity to each other, said insulating means serving always as a guard member for one of the contacts, and to provide simple and efficient means whereby the up and down movements of the movable contacts may be readily accomplished from without the panel box by a single swinging operating handle.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles, constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:

Figure 1 is a longitudinal vertical sectional view through a panel box having a switch mechanism mounted therein constructed in accordance with this invention, the switch being shown in the "on" position.

Fig. 2 is a similar view of the switch mechanism with the parts thereof in the "off" position, and the panel box being diagrammatically illustrated.

Fig. 3 is a vertical transverse sectional

view taken substantially upon the plane of line III of Fig. 1, with the switch mechanism in the "off" position, and

Fig. 4 is a fragmentary horizontal sectional view taken upon the plane of line IV of Fig. 1.

Referring to the drawings for describing in detail the structure which is illustrated therein, the reference character L indicates the panel box generally. This may be made up of any suitable material, either sheet metal or otherwise, according to preference. In the drawings it is shown to be made of sheet metal.

The switch mechanism G is arranged within the box, being preferably fixed to the upper wall 1 of the box and having a handle 2 projecting through an opening 3 formed through said upper wall.

The switch mechanism includes a horizontally disposed carrier H having one or more inverted U-shaped switch blades 4 carried thereby, and dependent therefrom, each switch blade having the lower ends of its legs turned outwardly to form contact portions 5 and 6 spaced apart and adapted for movement into and out of engagement with stationary contact brushes 7 and 8 respectively.

The switch blades may be fixed to the carrier in any suitable manner but the carrier is preferably of channel-shape and the switch blades have their connecting portions nested within the carrier and insulated therefrom and from each other by a suitable channel-shape insulating member 9 which lines the carrier.

The moving parts of the switch mechanism may be mounted directly in the walls of the casing if desired but preferably they are mounted by a suitable frame 10 to form a switch unit which may be readily mounted within the casing.

The frame 10 includes a pair of spaced arms 11 one disposed at each end of the carrier and each arm having side flanges 12 whereby it constitutes a vertical guide-way for guiding the movement of the carrier.

The opposite ends of the carrier are suitably formed for engaging the guide-way. In the instance illustrated the opposite end portions of the carrier are bent downwardly as at 13, and provided with flanges 14 which loosely engage within the guide-way.

The downwardly bent portions 13 serve

as means to which the lower links 15 of a toggle operating mechanism may be connected. Other toggle links 16 are fixed to a shaft 17 which is rotatably mounted in the frame 10 and the free ends of the links 16 are pivotally connected to the links 15. These parts constitute a pair of toggles one at each end of the carrier and connected together for simultaneous operation.

At least one of the links 16 is provided with shoulders 18 and 19 for engaging the under-surface portions 20 and 21 respectively of the carrier 10 to limit movement of the toggle in its two positions.

The operating handle 2 is pivotally mounted loosely upon the shaft 17 and has a pair of shoulders 22 and 23 for operating the toggle into its two positions. The shoulder 22 engages the heel to break the toggle when the handle is thrown to the "off" position, while the shoulder 23 engages the heel to make the toggle when the handle is thrown to the "on" position. These shoulders 22 and 23 are suitably spaced to provide unobstructed snap action for the toggle into "off" position when operated by the shoulder 22.

Any desired means may be employed for urging the carrier normally to its "off" position. Such a means is illustrated for instance by the tension spring 24 connected between the carrier and the frame 10.

A transverse barrier 25 of insulating material is arranged within the casing to constitute a part of the switch mechanism. It is shown to project upwardly from an insulating base 26 and to stand between the legs of the switch blades 4 so that during the operation of the switch the blades 4 move into and out of position straddling the barrier. The contacts 7 and 8 are arranged at opposite sides of the barrier, the presence of the barrier enabling them to be brought within close proximity to each other. The barrier projects upwardly above the plane of the contacts 7 and 8 so that the arcing path between said contacts is sufficiently lengthened for all requirements.

The barrier may serve also to guard the live contact. In this connection note that the barrier, with the remainder of the switch mechanism, is arranged at one side of the region of the panel box door 27 and that the live, or line, contacts 7 are disposed at that side of the barrier which is farthest from said door.

It is important, also, in this connection, that when the carrier is elevated into the "off" position, it constitutes, in effect, an upward extension of the barrier between the door and the live contacts so that the probability of an operator accidentally reaching one of the live contacts is almost entirely eliminated. The switch blades 4 too improve this result, as clearly illustrated.

In order to facilitate a proper electrical engagement of all of the switch blades with their respective fixed contacts, said fixed contacts are preferably of a resilient character so as to compensate for the inaccuracies of construction and adjustment. In the event of one of the fixed contacts being engaged before the others, it will simply be moved downwardly until all of the contacts are in proper engagement.

In the instance illustrated the fixed contacts are shown to comprise laminated brushes, but, where economy of space is required, other forms of fixed contacts may be employed as will be readily understood.

In the operation of the device the main line current flows from one of the contacts 7 into the one leg of the switch blades 4, thence about the barrier 25 to the other leg and out through the opposite contact 8 and through the protecting fuse 28 in the usual manner.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A switch mechanism comprising a pair of contacts spaced apart, a barrier interposed to lengthen the path between said contacts, a U-shaped switch blade movable into and out of position straddling said barrier to dispose the end portions of its legs into and out of engagement with said contacts, and a quick-break mechanism for operating said switch blade.

2. A switch mechanism comprising a pair of contact members spaced apart, a barrier interposed therebetween to lengthen the path between said contacts, a movable switch member having parts disposed at opposite sides of the barrier, a carrier for said switch member, a pair of guide ways for slidably mounting said carrier, a pair of toggle mechanisms connected to said carrier, a connecting rod extending between said toggle mechanisms, and means for actuating the connecting rod to actuate the carrier.

3. A device of the class described comprising a box having a door providing access thereto, a switch mechanism within the box at one side of said door, said switch mechanism comprising a pair of contact members spaced apart, a barrier interposed therebetween for lengthening the path between said contact members, a carrier movably mounted over said barrier, a plurality of switch blades supported by said carrier, each of said switch blades being of U-shape

having its legs depending from the carrier to straddle the barrier, contact members at opposite sides of said barrier with which the opposite legs of said switch blades engage, means to move the carrier and the switch blades toward and away from said contact members, said switch blades being spaced apart along the length of said barrier, and said carrier and said switch blades cooperating with said barrier when said switch blades are "off" to guard the contacts farther from said door only.

4. In a device of the class described, a box having a door providing access thereto, a switch mechanism within the box at one side of said door, said switch mechanism comprising a pair of contacts one relatively near to and the other farther away from the door opening, a permanent guard member within the box interposed between said contacts to guard the second mentioned contact from said door opening, and a switch blade movable into and out of position bridging said guard member for controlling a circuit between said contacts.

5. In a device of the class described, a box having a door providing access thereto, a switch mechanism within the box at one side of said door, said switch mechanism comprising a pair of contacts one relatively near to and the other farther away from the door opening, a permanent guard member within the box interposed between said contacts to guard the second mentioned contact from

said door opening, a switch blade movable into and out of position bridging said guard member for controlling a circuit between said contacts, and a carrier for said switch blade of a character to serve as an auxiliary guard member for said second mentioned contact.

6. In a device of the class described, a box having a door providing access thereto, a switch mechanism within the box at one side of said door, said switch mechanism comprising a pair of contacts one relatively near to and the other farther away from the door opening, a permanent guard member within the box interposed between said contacts to guard the second mentioned contact from said door opening, a switch blade movable into and out of position bridging said guard member for controlling a circuit between said contacts, said guard member extending from adjacent one wall of the box to adjacent the opposite wall of the box but leaving a space between itself and said opposite wall for the operation of the switch blade, and said carrier constituting an auxiliary guard member for occupying a portion of said mentioned space when in "off" position.

In testimony whereof I affix my signature in the presence of two witnesses.

HUBERT F. KRANTZ.

Witnesses:

JOHN L. KOLLE,
FRITZ KREUTZMANN.