H. F. KRANTZ.

SAFETY PANEL BOX.

APPLICATION FILED MAR. 31, 1917.

1,306,345.

Patented June 10, 1919.

2 SHEETS—SHEET 1.

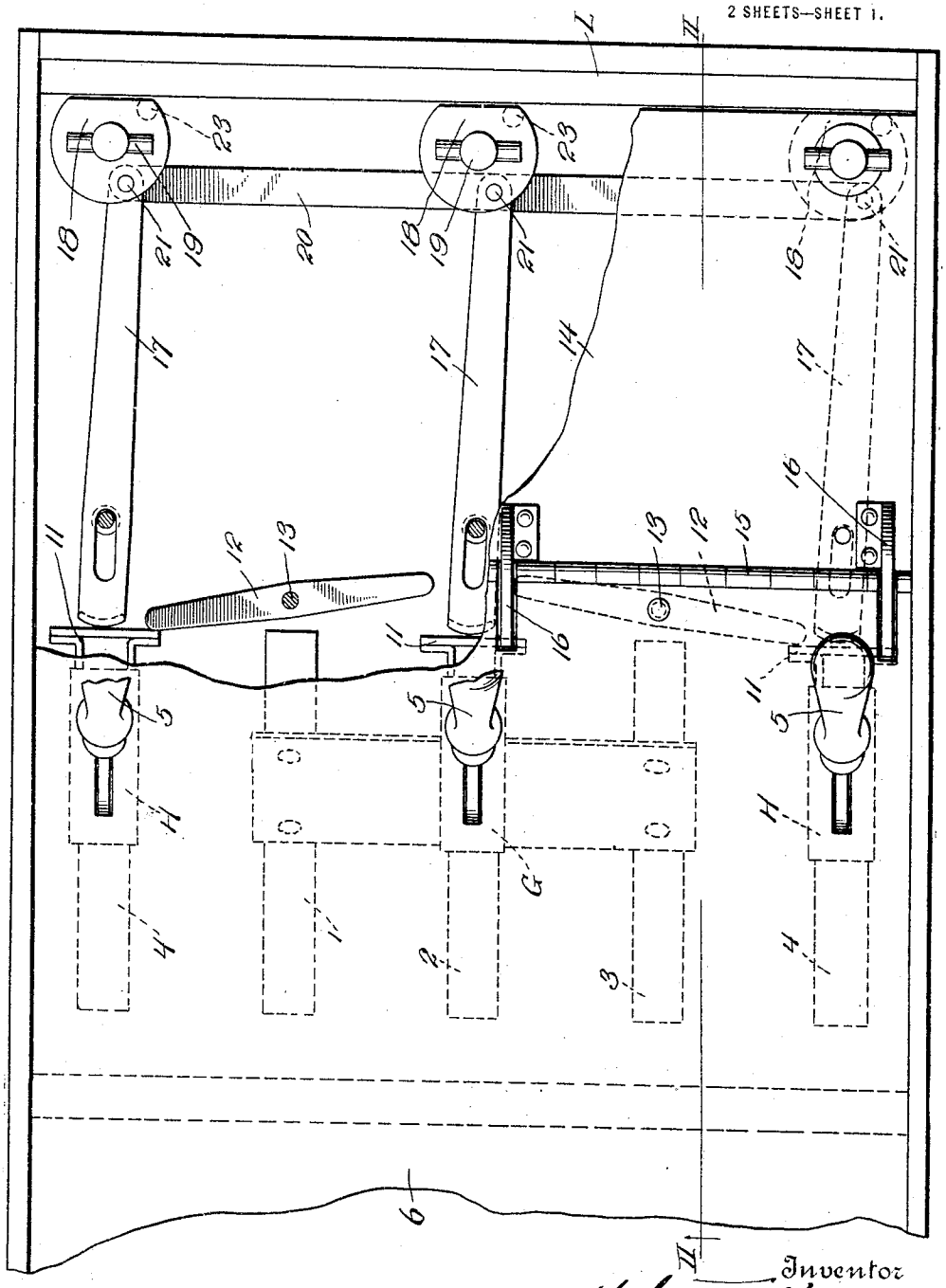


Fig. 1.

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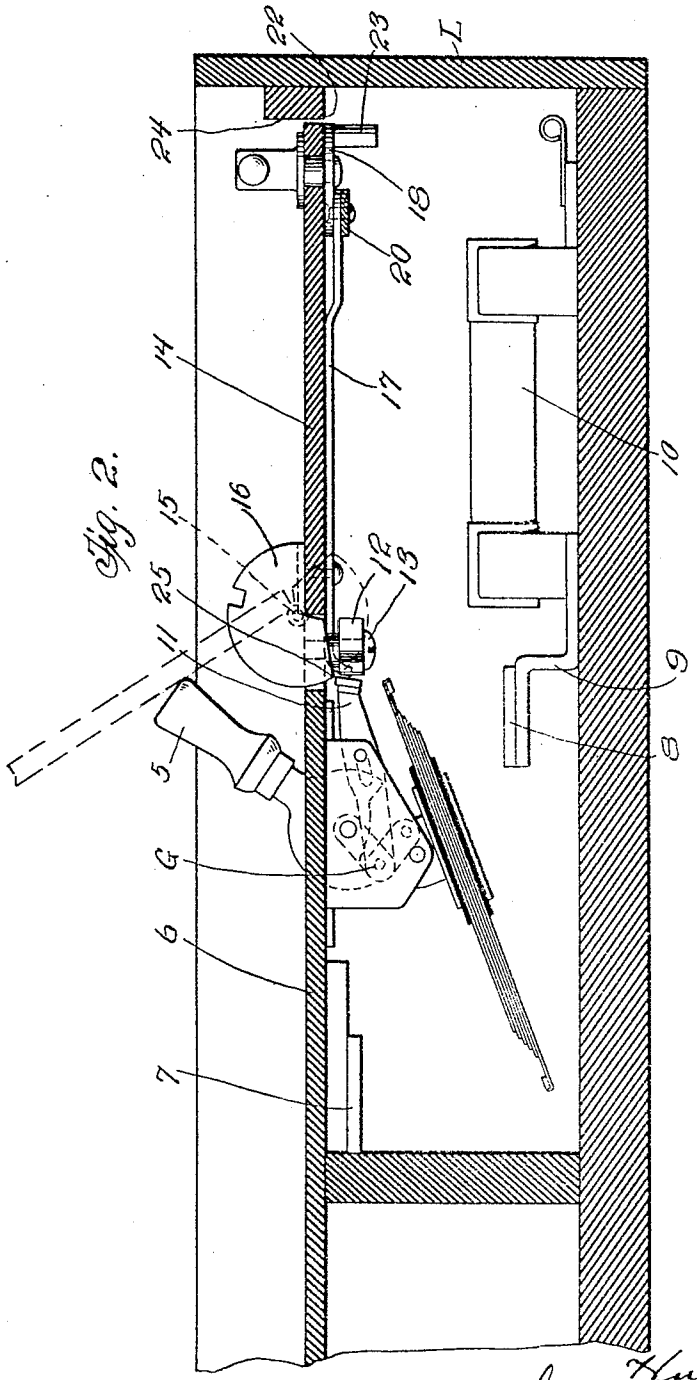


Fig. 2.

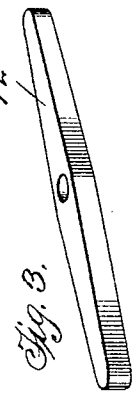


Fig. 3.

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UNITED STATES PATENT OFFICE.

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SAFETY PANEL-BOX.

1,306,345. Specification of Letters Patent. Patented June 10, 1919.

Application filed March 31, 1917. Serial No. 158,958.

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 Safety Panel-Boxes, of which the following is a specification.

This invention relates to a safety panel box.

The principal object of the invention is to provide a simple and thoroughly efficient means for positively preventing the improper manual operation of two or more switches or sets of switches with respect to each other.

A further object is to provide a simple and thoroughly efficient means for preventing the box from being opened, and to adapt said means to be controlled by any one or more of the switches, or sets of switches, to the end that the box will be positively held closed whenever any one of the switches, or sets of switches is in the "on" position.

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 top plan view of a portion of a switch box constructed in accordance with this invention, a part of the top wall of the box being broken away for better disclosing the arrangement of the parts within the box.

Fig. 2 is a vertical sectional view taken substantially upon the plane of line II—II of Fig. 1; and

Fig. 3 is a detailed perspective view of one of the parts shown in the other figures.

Referring to the drawings for describing in detail the various elements shown therein, the reference character L indicates the panel box generally. Within this box is mounted a central switch mechanism G and opposite sides switch mechanisms H. These switch mechanisms may have any number of contact blades, but as illustrated, the central switch mechanism G is provided with three contact blades, as 1, 2 and 3, while the contact mechanisms H each have only a single contact blade, as 4.

The several switch mechanisms may be adapted for any purpose, according to the requirements of the situation in which the panel box is employed.

In the instance illustrated, however, it is desirable that the switch mechanism G shall, under no consideration, be allowed to stand in the "on" position while either of the mechanisms H is in that position.

Each of the switch mechanisms is independently manually controllable through the medium of a swinging handle, as 5, which projects through the top wall 6 of the box into a position to be readily grasped by the hand of an operator.

When any one of the handles 5 is swung to throw the respective contact blade or blades into the "on" position, said contact blade or blades engage against contact members 7 and 8 within the box in the usual manner, so that the current which is otherwise dead ended in the contact-member 7 can pass through said contact blade or blades into the respective contact member 8. It will be understood that there is preferably a separate contact member 8 for each of the contact blades within the box.

From the contact members 8 the current passes through suitable connectors 9 into and through the fuses 10, one fuse being allotted to each contact member 8 in the usual manner.

The detail construction of the switch mechanisms G forms no part of the present invention. The parts 11 of the switch mechanisms indicate plungers with regard to which it is sufficient to say that when the operating handles 5 are thrown from an "off" to an "on" position the plungers are projected outwardly, that is toward the right in the drawings, and that it is impossible to throw the handles from the "off" to the "on" position except with the accompanying outward movement of the plungers. Also that a forced movement of the plunger from an outer to an inner position will automatically move the switch mechanism from an "on" to an "off" position. One manner of connecting these plungers in the switch mechanism is clearly illustrated in

my co-pending application Serial Number 42,956.

In order that the switch mechanisms H may not be allowed to stand in the "on" position at a time when the switch mechanism G is in said "on" position, a pair of levers 12 is pivotally mounted as at 13 upon the under surface of the top wall 6 so that the opposite ends of said levers stand in the path of movement of the parts 11 of the respective switch mechanisms. One of the levers 12 is arranged to coöperate between the central switch mechanism G and one of the switch mechanisms H, while the other lever 12 is arranged to coöperate between the central switch mechanism and the remaining switch mechanism H. The exact position of the levers is such that whenever the plunger 11 of the central switch mechanism is thrust forward it carries the inner end of the levers with it and causes the outer ends of said levers to move backwardly so that in the event that either of the side switch mechanisms is in the "on" position the plunger 11 of said side switch mechanism will be forced backwardly and thereby move the switch mechanism to the "off" position.

Likewise if the central switch mechanism is in the "on" position at a time when it is desired to move one of the side switch mechanisms into the "on" position, the forward movement of the plunger 11 of said side switch mechanism will swing the adjacent lever 12 so as to press the plunger 11 of the central switch mechanism backwardly into the "off" position.

Hence it is seen that the movement of either of the side switch mechanisms into the "on" position will automatically insure an "off" position in the central switch mechanism, and vice-versa.

In order to give access into the interior of the box, for reaching the fuses 10, or other purposes, the top wall 6 is provided with a door 14, which is hinged, as at 15.

At the point of each of the plungers 11 the door is fitted with a retaining disk 16 adapted to have its peripheral surface pass into the path of movement of the respective plunger 11 whenever the door is opened so as thereby to positively prevent the outward movement of the plunger while the door is open. This device is similar to that shown and fully described in my copending application Serial Number 158,957.

Mounted upon the under side of the door is a plurality of slide rods 17, one for each of the plungers 11. These rods have their rear ends turned down slightly and disposed in the path of movement of the respective plungers and are adapted to be slid forwardly by the forward movement of said plungers. The outer ends of the rods are pivotally connected to latch disks 18 which are rotatably mounted upon the door and, at least one of which is provided with an operating handle, as 19, which projects through the material of the door so that it may be manually rotated into a locked or unlocked position at the proper times.

The disks 18 are connected together by a link 20 which is pivotally connected thereto by the same pivot pins as 21 which serve to connect the rods 17 with said disks.

Each of the slide rods is connected to its respective disk slightly off center so that the forward movement of said rods will impart rotation to the disks. By this arrangement it is apparent that whenever any one of the rods is slid forward the link 20 will transmit the motion to all of the disks and rods. Hence the door will become locked whenever any one of the switch mechanisms is moved to the "on" position.

It is preferable that each of the disks 18 be adapted to have a portion thereof rotate into position beneath a shoulder, as 22, of the box structure whenever one of the rods is thrust outwardly so as to lock the door at a plurality of spaced points. This, however, is not essential as obviously the provision of a lock at a single point only may be sufficient in some cases.

It is also desirable that one or more of the disks be provided with a downwardly extending lug, as 23, for impinging against the forward surface 24 of the shoulder 22 in the event that attempt is made to move one of the switches in to the "on" position just at the time when the corner 25 of the adjacent retaining disk 16 has passed out of the path of the respective plunger 11. The respective rod 17 will therefore be restrained against forward movement and the switch mechanism prevented from being moved into the "on" position. Inaccuracies of manufacture are thus efficiently cared for as more fully explained in my co-pending application Serial Number 158,957.

While the drawing illustrates only three independently operable switch mechanisms connected for coöperative functioning, nevertheless it is apparent that any number of such mechanisms may be connected and correlated in the same manner within the scope of this invention.

As many changes could be made in this construction without departing from the scope of the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawing 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. In a safety panel box having a movable wall part for giving access to the interior

thereof and having a plurality of independently operable switch mechanisms therein, the combination therewith of means independently controllable from any one of said switch mechanisms for locking said wall part in a closed position.

2. In a safety panel box having a movable wall part for giving access to the interior thereof and having a plurality of independently operable switch mechanisms therein, the combination therewith of a latch device for locking said wall part in a closed position, and link mechanism extending into proximity with all of said switch mechanisms whereby to control said latch device from any one of said switch mechanisms.

3. In a safety panel box having a movable wall part for giving access to the interior thereof and having a plurality of independently operable switch mechanisms therein, the combination therewith of a latch device for locking said wall part in a closed position, a plurality of slide rods one associated with each of said switch mechanisms adapted to be slid by an operation of said switch mechanisms, and a link connecting said slide rods together and with said latch device whereby the operation of any one of said switch mechanisms will move the latch device to locking position.

4. In a safety panel box having a movable wall part for giving access to the interior thereof and having a plurality of independently operable switch mechanisms therein, the combination therewith of a plurality of latch devices carried by said movable wall part for locking said movable wall part in a closed position, and means associated with said latch devices and with said switch mechanisms whereby all of said latch devices are simultaneously controllable from any one of said switch mechanisms.

5. A safety panel box having a hinged door forming a part of the wall thereof, a latch carried at the free edge of said door movable into and out of position for locking the door closed, a plurality of switch mechanisms arranged adjacent the hinge of the door, and means extending from said latch common to all of said switch mechanisms whereby to control the movement of the latch by an operation of any one of said switch mechanisms.

6. In a safety panel box having a movable wall part for giving access to the interior thereof, a latch device for locking said wall part closed, and a plurality of independently operable elements within the box which it is desired shall not be operated except when the latch device is in locking position, the combination therewith of means independently controllable from any one of said mentioned elements for moving the latch device into locking position.

7. In a safety panel box having a movable wall part for giving access to the interior thereof, a latch device for locking said wall part closed, and a plurality of independently operable elements within the box which it is desired shall not be operated except when the door is closed and locked, the combination therewith of means for preventing the operation of any one of the mentioned elements while the door is open, and of other means independently controllable from any one of said mentioned elements when the door is closed for moving the latch device into locking position co-incident with an operation of said mentioned element.

8. In a safety panel box having a movable wall part for giving access to the interior thereof and having two independently manually operable switch mechanisms therein, the combination therewith of means to prevent movement of both of said switch mechanisms into the "on" position at the same time, together with means arranged to be operated by either of said switch mechanisms to retain said wall part closed when either of said switch mechanisms is "on."

9. In a safety panel box having a movable wall part for giving access to the interior thereof and having two independently manually operable switch mechanisms therein, the combination therewith of means to cause movement of one of said switch mechanisms into the "off" position when the other is operated into the "on" position, together with means arranged to be operated by either of said switch mechanisms to retain said wall part closed when either of said switch mechanisms is "on."

10. In a safety panel box having a movable wall part for giving access to the interior thereof and having two independently manually operable switch mechanisms therein, plunger parts connected to the switch mechanisms to be projected therefrom when the respective switch mechanisms are moved "on," and a lever pivotally mounted intermediate the switch mechanisms having its two ends disposed in the path of movement of said plungers respectively whereby outward movement of one plunger will insure a withdrawn position of the other plunger, the combination therewith of means arranged to be operated by either of said plungers to retain said wall part closed.

11. In a safety panel box having a movable wall part for giving access to the interior thereof, a plurality of switch mechanisms therein, and a plurality of independently operable operating elements one for each switch mechanism, the combination therewith of means whereby an operation of any one of said switch operating elements will effect retention of said movable wall part.

12. A safety panel box having a movable

wall part for giving access to the interior thereof and having a plurality of independently operable switch mechanisms therein, the combination therewith of a latch device for locking the wall part closed, and means whereby to control said latch device from any one of said switch mechanisms.

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

HUBERT F. KRANTZ.

Witnesses:
JOHN L. KOLLE,
J. A. NEWTON.