H. F. KRANTZ.

SAFETY PANEL BOX.

APPLICATION FILED MAR. 31, 1917.

1,292,810.

Patented Jan. 28, 1919

2 SHEETS—SHEET 1.

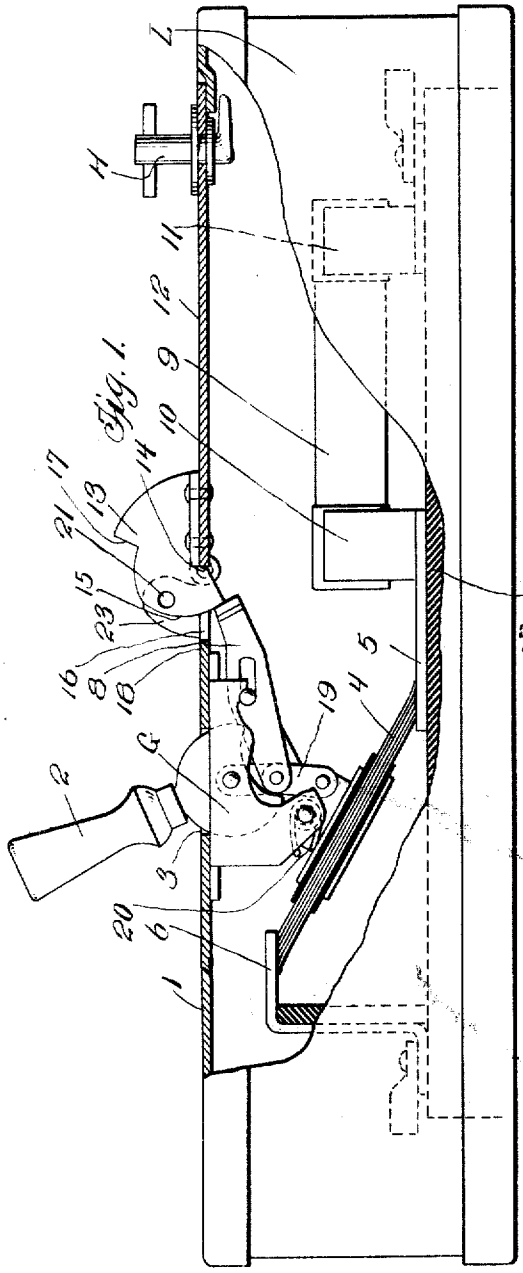


Fig. 1.

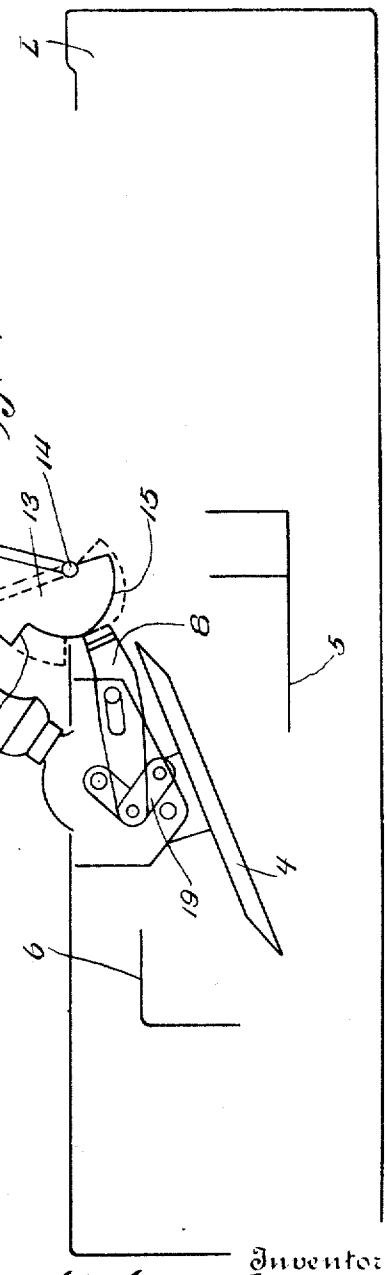


Fig. 2.

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2 SHEETS-SHEET 2.

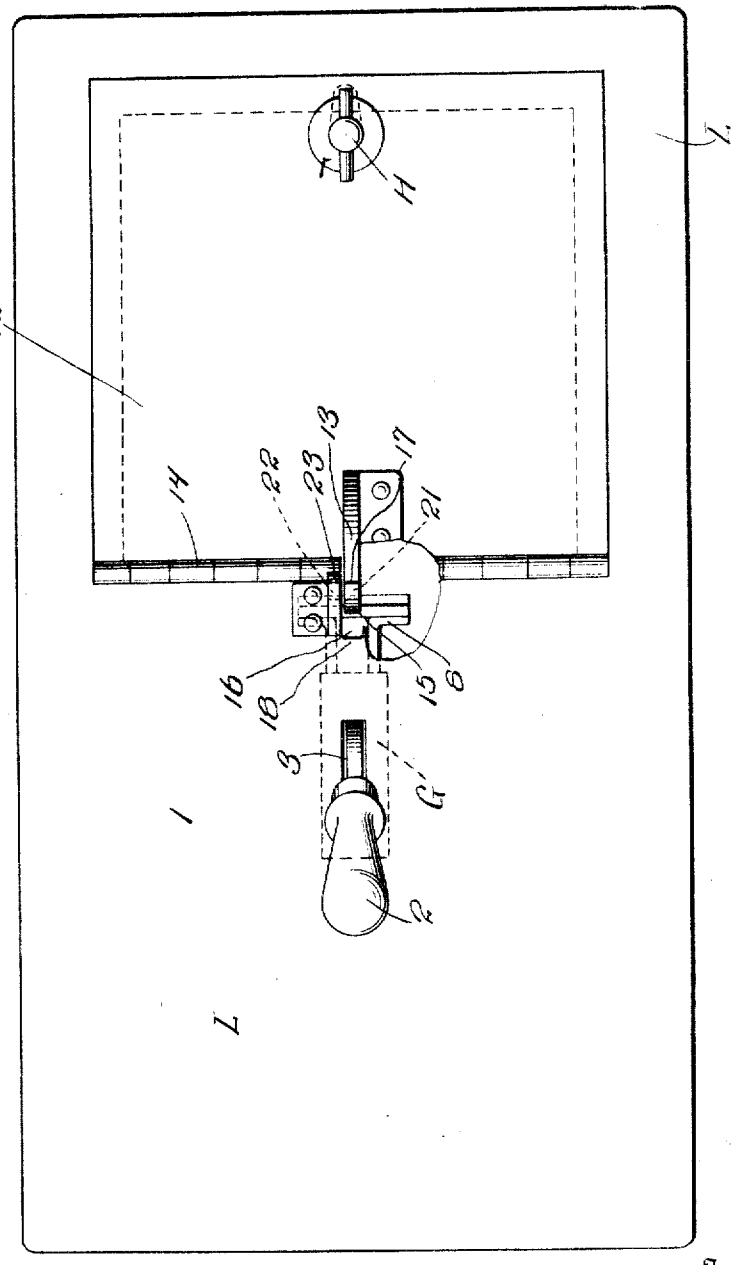


Fig. 3.

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UNITED STATES PATENT OFFICE.

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

SAFETY PANEL-BOX.

1,292,810. Specification of Letters Patent. Patented Jan. 28, 1919.

Application filed March 31, 1917. Serial No. 158,960.

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.

A particular object of the invention is to provide improved and positively operating means for rendering the panel box safe and uniformly efficient even in the hands of an inexperienced operator.

A more specific object is to provide a panel box in which the switch mechanism is mounted in a stationary position within the box, and in which a simple and efficient means is provided and operatively associated with the switch mechanism for positively insuring an "off" position of the switch mechanism, and even for positively locking the switch mechanism in an "off" position whenever the door is open.

A further more detailed object is to provide a member fixed to and movable with the door and having a cam-like part disposed to operatively engage the movable portion of the switch mechanism in such manner that any opening movement of the door will impress a cam or wedge action against said movable part, whereby to move the switch mechanism into "off" position and to lock or positively retain the switch mechanism in said "off" 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 longitudinal vertical sectional view through a panel box constructed in accordance with this invention, the parts being illustrated in elevation, and the switch being shown in the "on" position.

Fig. 2 is a diagrammatic view illustrating the parts of Fig. 1 in the position assumed when the door is open, and:

Fig. 3 is a top plan view of the structure shown in Fig. 1, parts being broken away for better disclosing the structural arrangement.

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 drawing, 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 the opening 3 formed through said upper wall.

The switch mechanism *per se* is substantially the same as that illustrated in my copending application Serial No. 79,094, and comprises a swinging double-ended contact member or blade 4, adapted to be swung by the handle 2 for moving its opposite ends into and out of electrical engagement with the stationary contact members 5 and 6, which are within the box, being preferably carried upon a suitable base 7 of insulating material.

In connection with the switch mechanism is a plunger 8 which is projected, as in Fig. 1, when the switch mechanism is in the "on" position, but which is withdrawn, as shown in Fig. 2, when the switch mechanism is in the "off" position. Forceful movement of the plunger from the position of Fig. 1 to the position of Fig. 2 will cause the switch blade 4 to move from the "on" to the "off" position.

A particular manner of connecting the plunger within the switch mechanism is immaterial to the present invention, but is clearly shown and described in the above mentioned copending application.

The usual fuse, or fuses 9 are arranged within the box being carried between suitable clips, 10 and 11, and being disposed so that when the blade is in the "on" position, the electric current will pass to said fuses through the contact 5 from the supply contact 6.

When the switch blade is in the "off" position the current is dead-ended in the contact members 6 and there is no charge whatever either in the contact 5 or in the switch blade, or in the fuse. Hence when the switch blade is in the "off" position, the operator may insert a fuse at will and without danger of receiving a shock, and the presence of the switch mechanism and switch blade will constitute an efficient barrier to guard against possible chance of an operator's hand or tool coming into engagement with the current supply contact 6.

When the switch blade is in the "on" position, however, the operator's hand must not be inserted into the box for any purpose, and for this reason, the door as 12 which is provided as a part of the upper wall 1 just above the fuse position for giving access to the fuse, is formed with a rigid extension 13, which is arranged adjacent the hinge 14 of the door and which has a curved edge surface 15 beyond the hinge. The extension 13 is disposed mostly exteriorly of the box but works through an opening 16 formed in the top wall 1 back of the hinge. The inner end portion of the length of the surface 15 is eccentric to the hinge and a part of this eccentric portion stands at all times within the box, being substantially in engagement with the end surface of the plunger 8. The opposite end of the surface 15 terminates in a shoulder 17 which, when the door is thrown open, engages against a surface portion 18 of the top wall to serve as a stop for limiting the opening movement of the door.

As the door is thrown open, the eccentric or cam part of the surface 15, presses the plunger 8 backwardly and positively moves the switch blade to the "off" position. This movement throws the handle 2 forwardly toward the door so that the end of the handle stands in position to limit the opening movement of the door, as indicated at 24 in Fig. 2. In some cases the engagement of the door with the end of the handle may serve as an auxiliary to the shoulder 17 for limiting the movement of the door while in other cases the shoulder 17 may be dispensed with and the end of the handle depended upon as the sole means for arresting the opening movement of the door.

In some cases it may be desirable to make the full length of the surface 15 eccentric to the hinge while in other cases it may be desirable to make the eccentric part of less length than illustrated in the drawings herewith.

It will be understood, by reference to Fig. 1, that a very slight movement of the plunger 8 will result in breaking the toggle 19 and in permitting the spring 20 to drive the switch blade instantly into full "off" position. It is intended that the surface 15 of the cam be of such shape as to impart this necessary slight movement to the plunger before the door has opened for any appreciable distance. The continued eccentricity of the surface 15 will serve to insure the inward movement of the plunger in the event of a failure of the spring to perform its function and to positively hold, or lock, the plunger in its innermost position after the door has been fully opened.

The outer end of the plunger may stand at all times in direct engagement with the surface 15 or it may stand in a position spaced a slight distance from said surface when the door is closed, as preferred. The inevitable inaccuracies which occur during manufacture will therefore not detrimentally affect the operation of this device.

If desired, a door retaining latch H may be employed at the free edge of the door for locking the door closed. This latch may also serve as a handle by means of which the door may be readily manipulated.

Also, if desired, means may be provided in conjunction with the member 13 for locking the door closed. Such a means is indicated by the aperture 21 formed through the member 13 and mating with an aperture 22 formed through a standard 23, fixed to the upper wall of the box. When the door is closed, a pad lock or other separately formed locking elements may be passed through the apertures 21 and 22 to positively lock the door closed.

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 drawings, shall be interpreted as illustrative only and not in the limiting sense.

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

1. A panel box having a movable door, a switch mechanism having a switch blade movable into "on" and "off" positions, the switch mechanism including toggle parts adapted to stand in a straightened condition when the switch blade is in the "on" position and to permit movement of the switch blade into "off" position when the toggle is broken, and means operatively associated with the door and with the toggle parts to break the toggle coincident with a movement of the door.

2. A panel box having a movable door, a switch mechanism having a switch blade movable into "on" and "off" positions, the switch mechanism including toggle parts adapted to stand in a straightened condition when the switch blade is in the "on" position and to permit movement of the switch blade into "off" position when the toggle is broken, a cam carried by and movable with the door, and connections whereby the cam will break the toggle coincident with a movement of the door.

3. A panel box having a movable door, a switch mechanism having a switch blade movable into "on" and "off" positions, the switch mechanism including toggle parts adapted to stand in a straightened condition when the switch blade is in the "on" position and to permit movement of the switch blade into "off" position when the toggle is broken, a cam carried by and movable with the door, and a slidably mounted plunger connected by one end to the knee of the toggle and having its other end disposed in proximity with the cam, whereby to be slid by the cam to break the toggle, coincident with the movement of the door.

4. A panel box having a pivotally mounted door, a switch mechanism having a switch blade movable into "on" and "off" positions, the switch mechanism including toggle parts adapted to stand in a straightened condition when the switch blade is in the "on" position and to permit movement of the switch blade into "off" position when the toggle is broken, a cam carried by the door to swing therewith, and means associated with the toggle and extending into proximity with the cam to receive movement therefrom for breaking the toggle when the door is swung.

5. A panel box having a pivotally mounted door, a switch mechanism having a part movable into "on" and "off" positions, a cam arranged exteriorly of the door being fixed of the door to be moved therewith and having a part extending into the box through an opening formed through the wall of the box, and a member within the box associated with the switch mechanism adapted to be engaged by the said inwardly projecting part of the cam and to receive movement from the cam when the door is thrown open, whereby to produce an operation of the switch mechanism.

6. A panel box having a door pivoted to swing into open and closed positions, switch mechanism within the box having an operating handle projecting exteriorly of the box and movable into "on" and "off" positions, a cam carried by the door movable therewith, and said switch mechanism having a part coöperatively engaged by said cam when the door is opened adapted to move said handle to dispose said handle in "off" position to constitute a stop for limiting the opening movement of the door.

7. A panel box having a door giving entrance thereto, a switch mechanism within the box operable into "on" and "off" positions, and means whereby to produce an operation of the switch mechanism by movement of the door, said means including a cam arranged exteriorly of the door being fixed to the door to move therewith, said cam being positioned to move through an opening through the wall of the box into the interior of the box by movement of the door, and said switch mechanism having a part arranged to be operated by the cam as the cam moves into the box.

8. A panel box having a pivotally mounted door, a switch mechanism within the box having a part movable into "on" and "off" positions, a cam carried by the door to move therewith comprising a member arranged edgewise to the surface of the door and having an edge surface disposed eccentric to the door pivot, and the switch mechanism having a part disposed to engage said edge surface to be moved thereby when the door is opened, whereby to produce an operation of the switch mechanism by movement of the door.

9. A panel box having a pivotally mounted door, a switch mechanism within the box having a part movable into "on" and "off" positions, a cam carried by the door to move therewith, said cam comprising a piece of sheet metal fixed to the door having a portion bent to stand in a plane transverse of the door pivot and having an edge surface formed eccentric to the door pivot, said piece of sheet metal also being formed with means adapted to serve in part for locking the door in one of its positions, and means associated with the switch mechanism and extending into engagement with said eccentric edge surface whereby to produce an operation of the switch mechanism upon opening movement of the door.

10. A panel box having a pivotally mounted door, a switch mechanism within the box having a part movable into "on" and "off" positions, a cam carried by the door to move therewith comprising a member arranged edgewise to the surface of the door and having an edge surface disposed eccentric to the door pivot, said member also having its edge surface formed to provide a shoulder for engaging a portion of the box to limit opening movement of the door, and the switch mechanism having a part disposed to engage said eccentric edge surface to be moved thereby when the door is opened whereby to produce an operation of the switch mechanism by movement of the door.

11. A panel box having a door pivotally

mounted to swing into open and closed positions, a switch mechanism within the box having a switch blade movable into "on" and "off" positions, an operating handle for the switch blade extending exteriorly of the box, a cam carried by the door to move therewith, and means associated with said cam and with the switch mechanism whereby a movement of the door will produce an operation of the switch mechanism.

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

HUBERT F. KRANTZ.

Witnesses:

JOHN L. KOLLE,

J. A. NEWTON.