H. F. KRANTZ.

SWITCH MECHANISM.

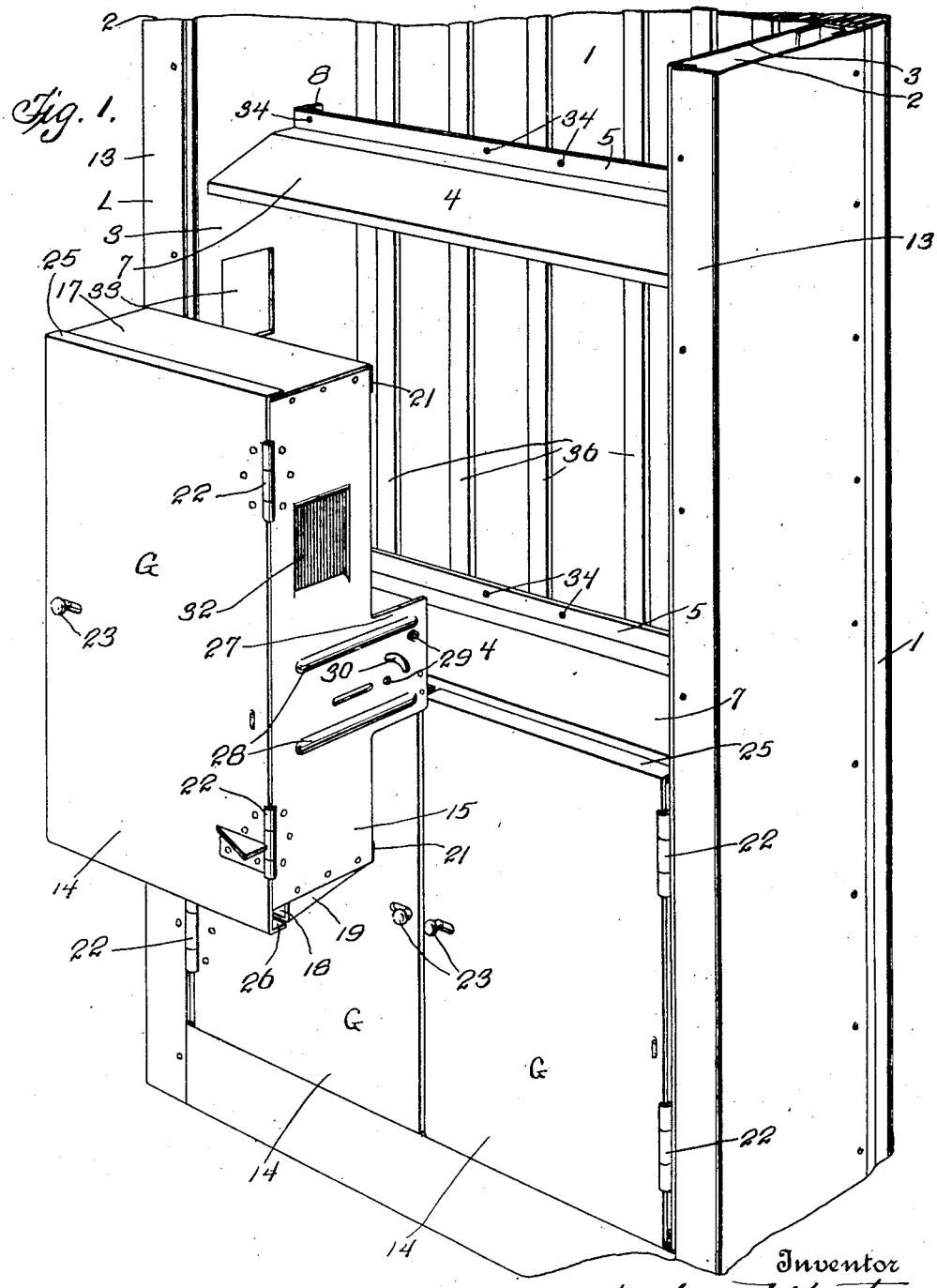
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1,379,767.

Patented May 31, 1921.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

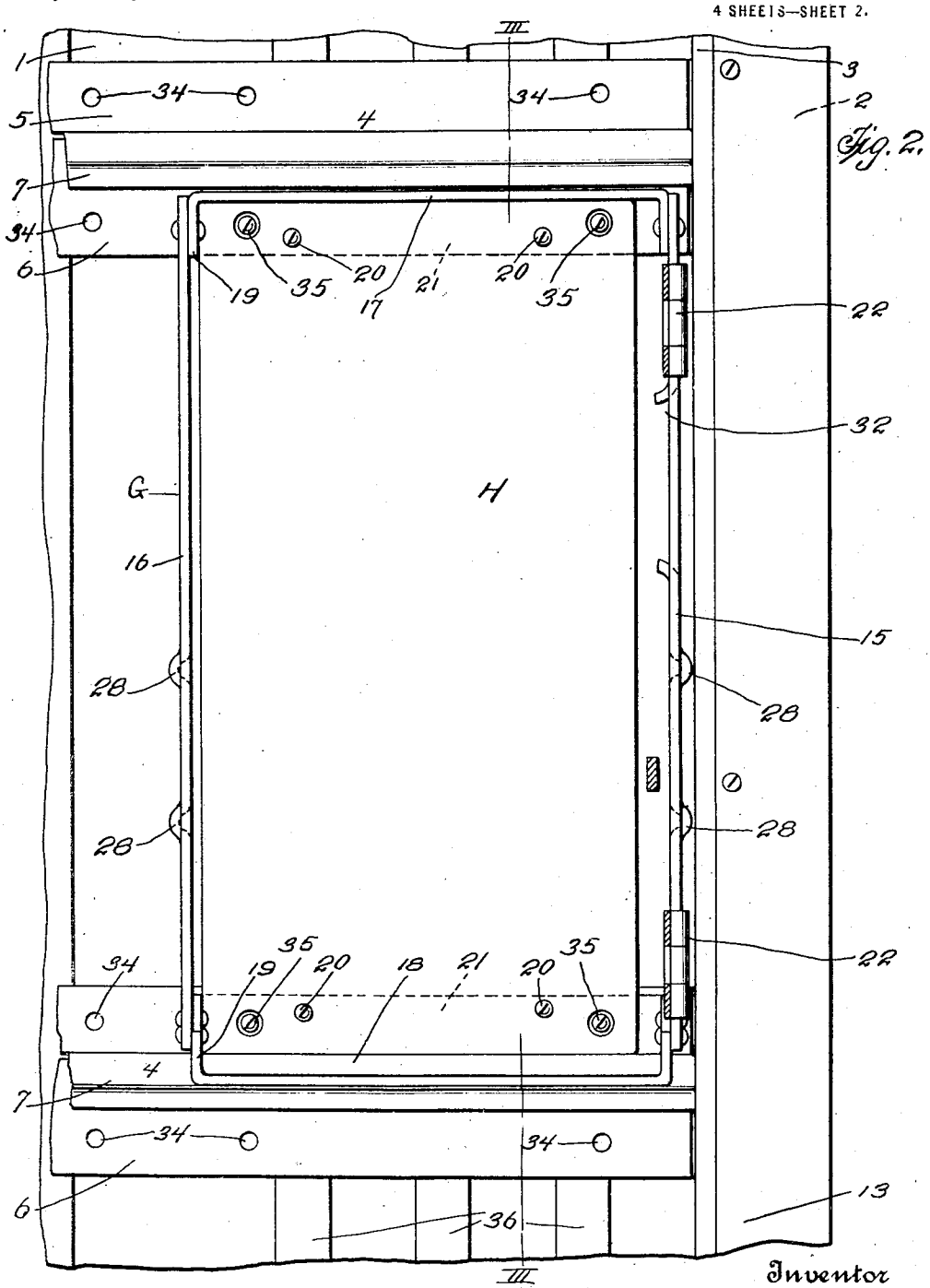


Fig. 2.

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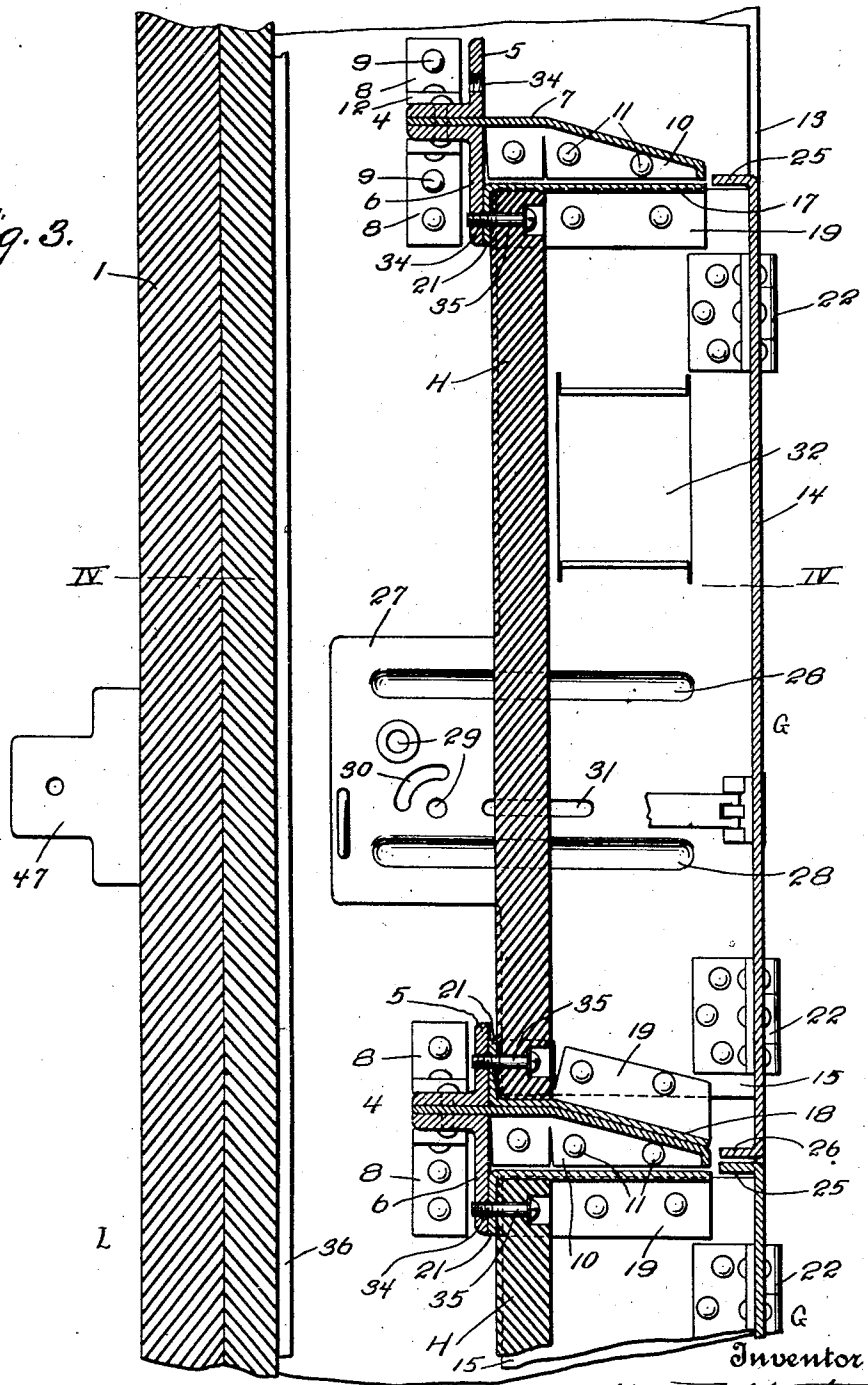
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4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

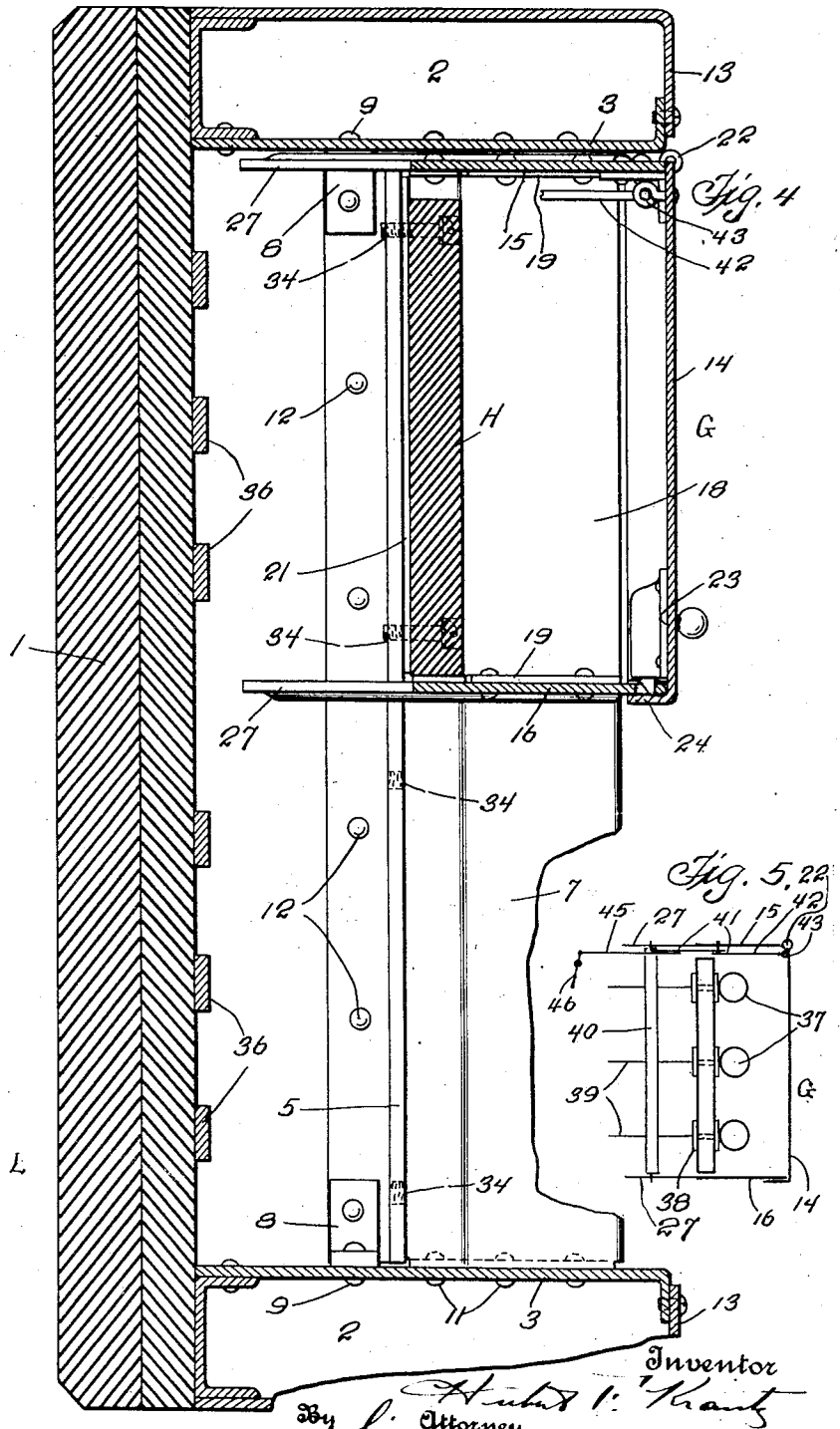


Fig. 4

Fig. 5.

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UNITED STATES PATENT OFFICE.

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SWITCH MECHANISM.

1,379,767. Specification of Letters Patent. Patented May 31, 1921.

Original application filed December 26, 1917, Serial No. 208,799. Divided and this application filed February 11, 1919. Serial No. 276,349.

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 Switch Mechanism, of which the following is a specification.

This invention relates to a multiple unit panel board, and is a division of my copending application Serial No. 208,799, filed December 26, 1917.

The object of the present invention is to provide a switch unit structure of a character such that a plurality thereof may be independently removably mounted in a panel board structure, each unit comprising a substantially closed container within which certain parts of the mechanism may be held and protected at all times even after the unit is detached from the board.

A further object is to provide the detachable units with covers or doors formed as parts thereof and said doors being adapted when the units are assembled with the board collectively to constitute a protecting wall at the rear of the board.

A further object is to construct the detachable switch units each as a closed container and to provide opposite side walls of each container with extensions adapted to constitute supporting means for mechanisms exteriorly of the containers, which mechanisms may coöperate with parts of the board structure when the units are assembled with the board.

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 perspective view illustrating a switch board constructed in accordance with this invention and showing one of the switch units detached and in position to be connected with the board.

Fig. 2 is a rear elevational view of a portion of the board enlarged and showing one of the switch units attached, the cover of the switch unit being omitted for the sake of clearness.

Fig. 3 is a vertical sectional view taken substantially upon the plane of line III of Fig. 2.

Fig. 4 is a horizontal sectional view taken substantially upon the plane of line IV of Fig. 3, and

Fig. 5 is a diagrammatic view, on a reduced scale, illustrating one of the complete switch units.

Referring to the drawings for describing in detail the structure which is illustrated therein, the reference character L indicates that portion of the device which is herein referred to as the board structure, and the reference character G indicates what is herein referred to as one of the removable switch units, of which there may be as many as desired.

In order that the full purpose and value of the removable units may be correctly and thoroughly understood in association with the switch board structure, a description of the board structure is as follows:

The board structure includes the base plate 1 and the two branch line wire channels 2 spaced apart one at each of the vertical edges of the base plate 1. Extending horizontally between the inner wall members 3 of the branch line wire channels is arranged a plurality of cross members or shelves 4. These are spaced apart and serve as the means for attaching the switch units.

The cross members are preferably identical in construction and method of attachment and each is made up of a pair of angle-irons 5 and 6 connected together and to a shelf plate 7. The opposite ends of the angle irons are connected with the walls 3 preferably by brackets 8 and rivets 9 and the opposite ends of the shelf plate are connected to the wall members 3 by having down-turned flanges 10 thereon fixed by rivets 11. The rear longitudinal edge portion of the shelf plate 7 is fixed between the angle irons by rivets 12 so as thus to effectually reinforce the angle irons especially against any tendency to bend toward or away from the base plate 1. In turn, the angle irons reinforce the shelf plate against any tendency to bend in a vertical plane.

The rearward longitudinal portion of each base plate is inclined downwardly and terminates in a plane somewhat inside of the plane of the outer or rear wall 13 of the channels 2.

The switch units G are each substantially identical in size and construction, and each comprises a front wall member H, a back wall member 14, opposite side wall members 15 and 16, a top wall member 17, and a bottom wall member 18.

The top and bottom wall members 17 and 18 are connected with the side wall members by having flanges 19 thereon to which the side wall members are riveted.

The front wall member is connected with the top and bottom wall members by screws or the like 20 which engage flanges 21 formed at the front edges of said top and bottom wall members.

The rear wall member 14 is pivotally supported by the hinges 22 to the rearward edge of the side wall member 15 and constitutes a door which may be opened or closed for controlling access to the container. It is provided with a spring catch 23 for engaging the opposite side wall member 16. A flange 24 at the free edge of the door is adapted to lap over the forward edge of the wall member 16 when the door is closed. Top and bottom flanges 25 and 26 are also provided for stiffening the door and for bridging the space between the main plane of the door and the rear edge of the wall members 17 and 18.

The bottom wall member 18 is preferably inclined to correspond to the inclination of the shelf plates 7 and the object is first to stiffen the structure and second to prohibit the laying down of tools or other devices which might objectionably affect the contents of the container.

All of the wall members are of sheet metal excepting the front wall member H and this is preferably of insulating material such as slate, or the like, so that it is better adapted for the attachment of current carrying parts of the switch mechanism.

Here it should be noted that although the present invention is particularly adapted for use in connection with such a switch mechanism as is shown and described in my co-pending application, Serial No. 184,011, filed August 2, 1917, nevertheless it is obvious that other types of electrical devices may readily be employed and that any part or parts of said devices which are mounted on the inner face of the wall member H are entirely concealed and protected whenever the door is closed.

In order to accommodate the type of switch mechanism shown in the pending application above referred to the side wall members 15 and 16 are formed with forward extensions 27, reinforced by strengthening beads 28 and having the pivot bearings 29 and the slots 30 and 31 for accommodating parts of the switch mechanism. Of course the features 29, 30 and 31 may be altered to suit the different types of devices which may be mounted.

Each of the wall members 15 is preferably formed with an opening 32 through which branch line wires may lead into the container from the wire channels 2, the walls 3 of the wire channels of course being also provided with openings, as 33, to register with the openings 32.

As a simple means for attaching the units, the angle-irons 5 and 6 are each provided with threaded apertures 34 therein arranged in pairs and disposed to register with apertures formed through the front wall member H of the respective switch units so that screws, as 35, inserted through the apertures in the wall H engage within the apertures 34. The screws also extend through apertures formed in the flanges 21 of the top and bottom wall members 17 and 18.

The cross members or shelves 4 define a plurality of superposed compartments between the wire channels 2 and each of these compartments is adapted to receive two switch units arranged side by side so that each switch unit has its outer side wall member 15 lying adjacent to one of the walls 3 of the wire channels. Branch line wires may thus be easily threaded through its mating apertures 32 and 33 into all of the containers.

In the structure illustrated the base plate 1 carries bus bars 36 at its rear face. It will be noted that where switch mechanism carried by the switch units is adapted to cooperate with these bus bars, the fixed position of the angle-irons 5 and 6 with relation to the bus bars positively determines the position of the switch units, and hence of the switch mechanism, by the simple act of attaching the switch units to the angle-irons.

Referring to Fig. 5, it will be noted that the front plate H carries fuse, or like parts 37 upon its inner face and switch contact parts 38 upon its outer face arranged to be engaged by the blades 39 which are held by the carrier 40, said carrier being rotatably mounted by means of the extensions 27 from the side walls 15 and 16 of the container. The operating mechanism, as 41, for the carrier 40 is partly arranged within the container and includes a control link 42 extending into connection with the door, as at 43. The parts 37 and 38 are electrically connected through the wall H, as at 44, and the portion of the switch operating mechanism which is arranged within the container, together with said parts 37, are, of course, protected by the walls of the container, and the blades 39 exteriorly of the container are adapted to connect the contacts 38 with the

bus bars at will. A link 45 also extends forwardly from the operating mechanism 41 and is adapted to extend through the face plate 1 of the switch board and to be operated by a handle 46 mounted in bracket 47 at the front face of the base plate.

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.

It will be understood, of course, that the terms "front" and "rear" as applied to the walls H and 14 above, are employed merely for a clear understanding of the construction and operation of the device. Obviously, if desired, in practice the wall 14 may be considered a front wall, and the wall H a rear wall.

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

1. In a switch board structure, a removable switch unit made up as a container, having a front wall, top and bottom walls and opposite side walls, and portions of said opposite side walls being extended laterally beyond the front wall whereby to constitute a mounting for mechanisms exteriorly of the container.

2. In a switch board structure, a removable switch unit made up as a container having front and back walls, top and bottom walls, and opposite side walls, the front wall being of insulating material whereby conductor elements arranged within and protected by the walls of the container may be directly supported at the inner surface of said front wall, and whereby other conductor elements exteriorly of the container adapted for coöperation with other parts of the switch board may be directly supported at the outer surface of said front wall, and the side wall members of the container having extensions thereon projecting beyond said front wall adapted to constitute a mounting for mechanisms exteriorly of the container which may coöperate with said last mentioned conductor elements.

3. A switch box having one of its exterior wall portions made of insulating material; conductor elements mounted upon the opposite surfaces of said wall of insulating material, and a switch device carried by the box exteriorly thereof adapted to coöperate with said mentioned conductor elements.

4. A switch box having one of its exterior wall portions made of insulating material, a conductor element arranged within the box being supported upon the inner surface of said wall of insulating material, another conductor element supported by said wall of insulating material exteriorly thereof being connected through said wall of insulating material with said first conductor element, together with a switch blade carried by the box, and means to operate the switch blade into and out of engagement with said second mentioned conductor element.

5. A switch box having one of its exterior wall portions made of insulating material, a conductor element arranged within the box being supported upon the inner surface of said wall of insulating material, another conductor element supported by said wall of insulating material exteriorly thereof being connected through said wall of insulating material with said first conductor element, together with a switch blade, means carried by the box constituting a pivotal mounting for said switch blade, and means to swing the switch blade into and out of engagement with said second mentioned conductor element.

6. A switch box having one of its exterior wall portions made of insulating material, conductor elements mounted upon the opposite surfaces of said wall of insulating material, a switch device carried by the box exteriorly thereof adapted to coöperate with said mentioned conductor elements, the box comprising a door giving access to said first mentioned conductor elements, and connections between the switch device and the door to prevent "on" position of the switch device while the door is open.

7. A switch box having one of its exterior wall portions made of insulating material, a conductor element arranged within the box being supported upon the inner surface of said wall of insulating material, another conductor element supported by said wall of insulating material exteriorly thereof being connected through said wall of insulating material with said first conductor element, a switch blade carried by the box, means to operate the switch blade into and out of engagement with said second mentioned conductor element, the box comprising a door giving access to said first mentioned conductor element, and means to prevent "on" movement of the switch blade except when the door is closed.

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

HUBERT F. KRANTZ.

Witnesses:
S. L. WHITLOCK,
J. A. NEWTON.