Sept. 20, 1932. F. T. SHULL 1,878,335

PANEL BOARD CONSTRUCTION

Filed Jan. 18, 1928 2 Sheets-Sheet 1

Fig. 1.

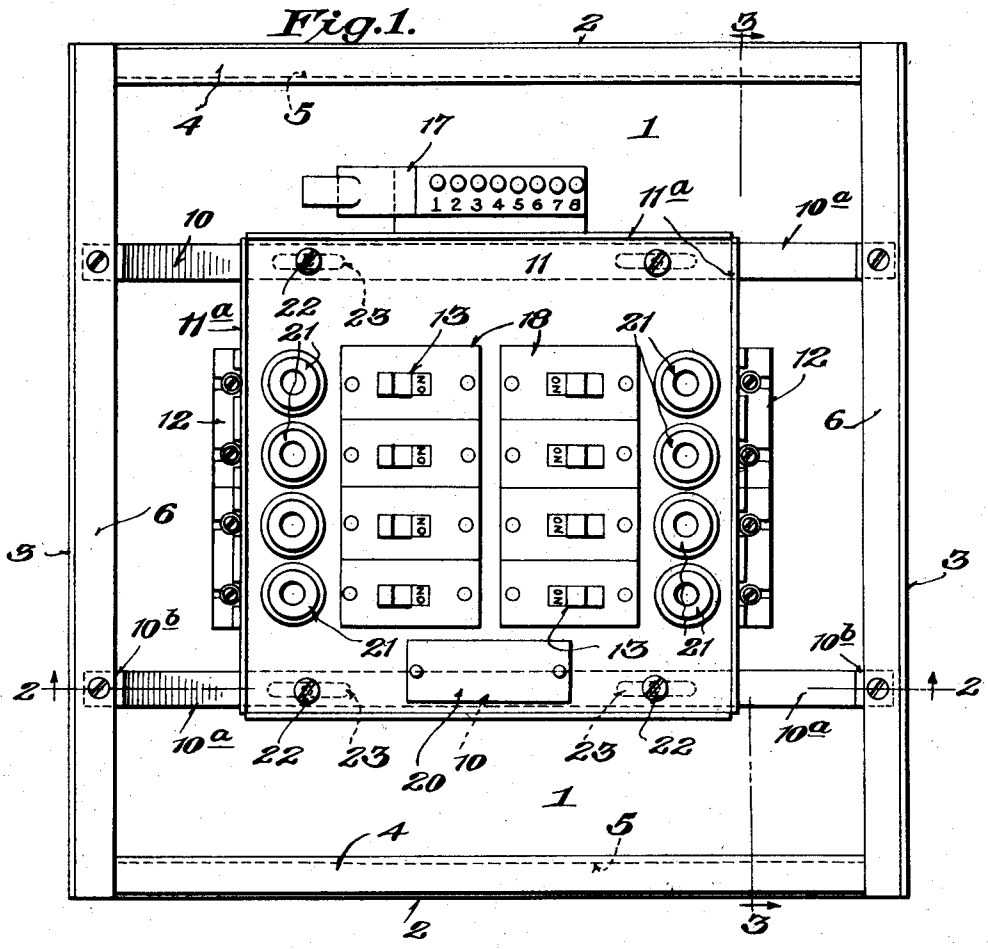
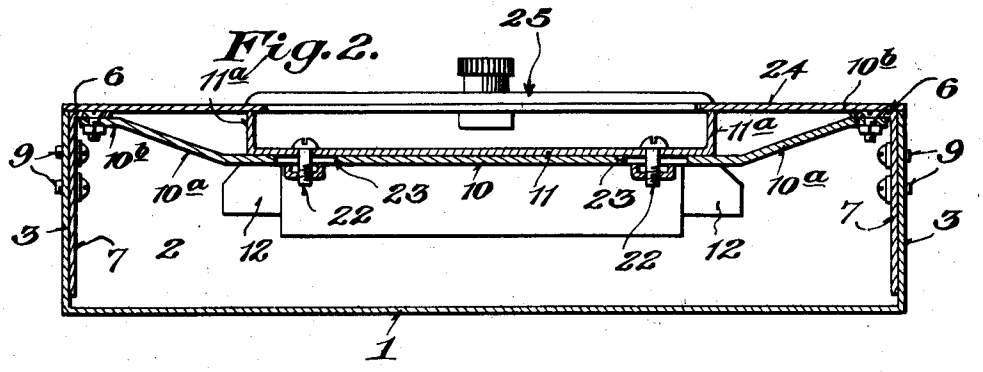


Fig. 2.



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Fig. 3.

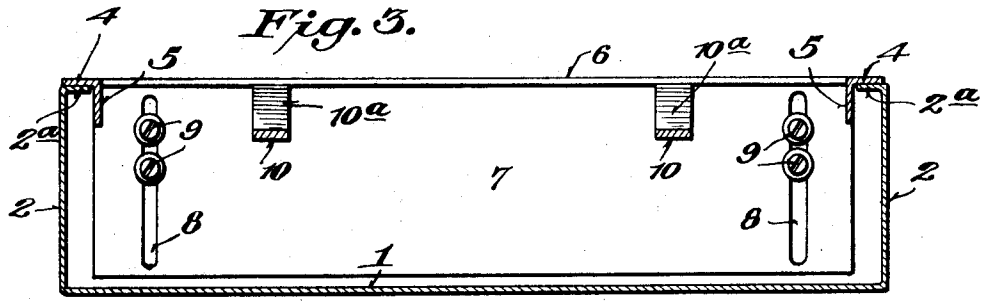


Fig. 4.

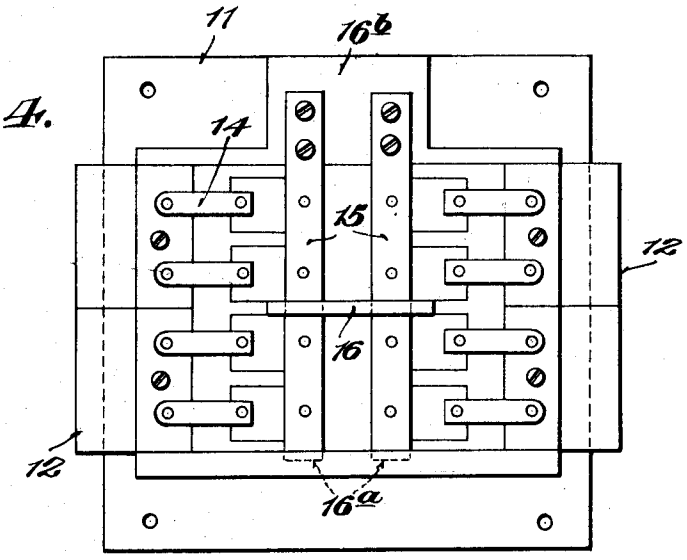
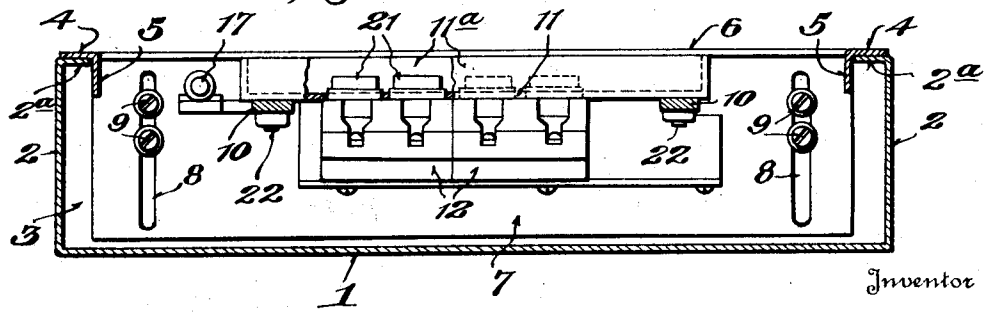


Fig. 5.



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UNITED STATES PATENT OFFICE

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PANEL BOARD CONSTRUCTION

Application filed January 18, 1928. Serial No. 247,576.

This invention relates to panel board constructions of the general class known in the electrical art as "Safety" or "Dead front" panel boards, adapted to be mounted in or upon walls of buildings or the like, for use in the control of circuit wiring for the distribution of light, heat, power, and the like.

In prior art construction of panel boards of the "Safety" type, it has been largely the practice to employ a slate or marble base with connecting side walls of similar material forming a box-like receptacle in which were positioned the usual circuit-control mechanism including the bus-bars, switches, and associated parts, over which were placed suitable cover-plates through which the hand-control levers for the switches projected. In such connections, the bus-bars, switches, and associated mechanism were mounted in various ways to the slate or marble base or side walls thereof, or from supports projecting from these parts. These prior constructions are usually quite heavy, complicated, expensive, and usually inaccessible for removal or repair of parts, etc.; and it is the primary object of the present invention to overcome recognized existing difficulties and defects in panel board constructions, generally.

One of the main features of the present invention is to eliminate the necessity of the usual heavy base or box-like construction of slate or similar material, and to constitute a cover-plate or pan as the carrying medium for not only the hand-controlled operating switch levers and fuses, but also as the support and carrying means for the bus-bars, switches, and associated mechanism.

To the above end, it is contemplated to provide a carrying plate or pan, preferably of metal, upon the rear surface of which are mounted the usual bus-bars, switches, and associated mechanism, and upon the front surface of which are mounted the usual hand-control levers, with the result that the said pan or plate constitutes not only a protecting covering for the major portion of the mechanism, thereby answering the requirements of a "Safety" panel board; but said plate also constitutes a carrying mechanism for said parts, as well.

Since the carrying pan or plate is preferably constructed of metal, structures of this type are thereby rendered considerably cheaper to produce; and because of the lightness thereof, the various mechanism attached thereto may be very readily handled, in application to the usual panel boxes or enclosures.

Provision is also made for the removal of the carrying plate or pan with the attached switch mechanism and bus-bars as a complete unit from the enclosing panel box, together with novel means of support for said plate or pan, permitting of such necessary adjustments as may be required in the installation of the panel board to said enclosing box.

Another feature of the invention resides in the novel construction and arrangement of panel box facing and operatively associated supporting characteristics of the panel board, permitting of adjustment of the panel board mechanism with respect to said facing as well as adjustment of the facing with relation to the panel box.

Other improvements and novel details in the construction and arrangement of parts will be appreciated from the description to follow, which for a clear understanding thereof is to be considered in connection with the accompanying drawings forming a part hereof and wherein is disclosed for the purpose of illustration a convenient and satisfactory embodiment of the invention; though it is to be understood in this connection that minor changes and details in the construction and arrangement of parts may be resorted to without departing from the broad principle of the invention.

In the drawings:

Figure 1 is a front elevation of a panel box with the front facing removed, whereby to illustrate the invention applied to a panel box construction;

Figure 2 is a section substantially on the line 2—2 of Figure 1;

Figure 3 is a section substantially on the line 3—3 of Figure 1;

Figure 4 is a rear elevation of my panel board construction removed from the panel

box, with the covering for the switches, etc., detached; and

Figure 5 is a section similar to that of Figure 3, with the panel board and attachments in place.

With more particular reference to the drawings, wherein like reference numerals refer to corresponding parts throughout the several views, A designates generally an enclosing panel box comprising a bottom or back wall 1, end walls 2, and side walls 3. The end walls 2 preferably have an inwardly extending flange 2^a at the upper edge thereof.

There is preferably provided a combined facing or ground strip for the exposed edges of the sides of the box and supporting medium for the panel board construction to be presently described, which facing and supporting medium make possible, adjustment for the facing or ground strip to the side walls of the box, to the end that said facing may constitute a properly aligned ground strip for the workmen in finishing the surrounding wall to which the box is applied, and in this way take care of any irregularity in the assembly of the panel box in said wall; and in view of the fact that the panel board construction is supported from the said adjustable facing or ground strip, the panel board will be simultaneously adjusted with the facing and assume a plumb position with respect to the wall, as does the facing or ground strip.

Said facing for the panel box includes strips preferably of metal 4 having inwardly extending flanges 5 overlying but spaced inwardly from the inner surfaces of the end walls 2. To the facing strips 4 are secured transversely extending facing strips 6 from the outer edges of which depend side sections 7 preferably integral therewith and of substantially the width of the side walls 3, and adapted to have slidable contact therewith. The side sections 7 are provided with slotted ways 8, whereas the side walls 3 are provided with apertures in line with said slotted ways and adapted to receive bolts 9 which project through said slots and apertures and when seated will firmly secure the side sections 7 of the facing to the side walls 3 of the panel box. By loosening the bolts 9 it will be appreciated that the side sections 7 together with the facing strips 4 and 6 may be adjusted with respect to the end and side walls 2 and 3 of the panel box, and thereby properly line up the facing strips with respect to the finished wall of the building, the side strips constituting a true ground strip for the workmen in the finishing of the wall.

In the adjustment of the facing strips in the manner just stated, a space will be left between the facing strips 4 and the flanges 2^a of the end walls 2 for the reception of plaster in the wall-finishing operation, and in this way constitute an anchoring means for the plaster at this point and thereby insuring a smooth finish to the wall.

It will be observed in this connection that the depending flanges 5 on the facing strips 4 will constitute an abutment for such plaster as may find its way into the space between the facing strips 4 and the flange 2^a at the top of the adjacent side wall and thereby prevent the plaster from finding its way into the mechanism adapted to be enclosed by the panel box.

Projecting across the panel box are supporting bars 10, the body portions of which bars assume a position well within the edges of the box, and the sides of which bars are upwardly bent at 10^a, which bent portions terminate in offset connecting parts 10^b projecting beneath and secured to the facing strips 6.

The brace bars 10 constitute a supporting medium for the novel panel board construction herein contemplated; and from the description to follow it will be appreciated that this supporting medium for the panel board mechanism spaces said mechanism from the base or back of the panel box, and that said panel board mechanism being wholly otherwise unsupported from the panel box may be readily removed as a complete unit, as desired, and will also be adjusted forwardly and rearwardly with respect to the face of the box simultaneously with the forward and rearward adjustment of the panel box facing strips.

The panel board mechanism preferably includes a supporting or carrying plate or pan 11, conveniently formed of metal and having struck-up edges forming sides 11^a. On the rear surface of this plate is conveniently mounted the main control mechanism including the switches, bus-bars, etc., the main framework for this mechanism being constructed of suitable moulded material. A portion of said moulded framework constitutes fuse holders 12. 13 designates, generally, switches of any approved type, and 14 designates connecting copper pieces projecting between the fuse holders and the switches. Main bus-bars 15 are operatively associated with the respective switches and are mounted at their ends in recesses provided in the molded frame as indicated in dotted lines 16^a, Figure 4. Suitable intermediate bus-bar supports (one being illustrated at 16) may be provided, the same having slots therethrough for the passage of said bus-bars, as indicated in dotted lines, Figure 4. The lug end of the main bus-bar is supported by a lug cover section 16^b.

A neutral bus-bar or terminal plate 17 is conveniently supported from one of the cross-braces 10.

In order to obtain ready access to the switches and bus-bars, the plate 11 has a series of cutouts in line with the switches,

the same being adapted to be enclosed by cover-plates 18 of metal. The said cover-plates 18 are removable at will and have openings therein for the reception of the usual hand-control operating lever 19. A similar opening leading to the lower bus-bar supporting member and lug enclosure is enclosed by a cover-plate 20 which also is removable at will.

The pan or plate 11 is provided with a series of openings for the reception of fuse holders adapted for the fuses 21.

That portion of the moulded frame which constitutes a support for the lower end of the main bus-bars is separated at its outer edges from the pan or plate 11 by a recess adapted to receive one of the transversely extending bars or supports 10 when the panel board is applied in position on said bars.

The main plate or pan 11 is adapted to rest adjacent opposite edges on the transverse brace-bars and is adjustably secured in place by bolts 22 which pass through apertures adjacent the corners of the bottom of the pan adapted to register with slotted ways 23 in the brace-bars 10. The brace-bars and slotted ways are somewhat wider than the bolts so that when the bolts are loosened the pan may have a slight adjustment laterally with respect to the slotted ways, and of course the same may be adjusted longitudinally along the bars, because of the slots and bolt connections.

By reason of the peculiar adjustable connection between the pan and the brace-bars it is possible to obtain adjustment in different directions.

It is understood that a suitable cover-plate will be provided, the same being generally designated 24 and having a movable door 25 overlying an opening centrally of the cover-plate in registration with the panel board construction described more particularly above.

From the description above, it will be appreciated that none of the parts of the panel board being formed of the usual heavy material such as marble or slate, there results a materially cheapened construction over prior panel boards, coupled with the additional advantage that the weight of the apparatus as a whole is materially reduced, which facilitates handling in application, adjustment and removal of parts, as desired, and also lessens the cost of freight in transportation.

It will also be appreciated that by reason of the direct connection between the supporting pan or tray and the facing strips of the enclosing housing, the adjustment of the facing strips whereby to line up the latter with the walls of the building and whereby to constitute a true ground strip for the workmen and the plaster operations, the panel board mechanism will be adjusted simultaneously so that it will occupy at all times the proper position with respect to the facing strips and the surrounding wall of the building.

The very material advantage will further be appreciated, in constituting the pan or tray not only as a "safety" covering for the switching mechanism but as a carrying medium for the latter, to the end that all of this mechanism may be very readily removed, at will. Should, however, it not be desired to remove the pan or covering tray, the individual covering plates on the bottom wall of the pan may be removed, whereby access to the individual parts positioned on the rear or under side of the tray may be had.

Certain features herein described and illustrated constitute the subject-matter of claims in my copending application filed concurrently herewith, Serial No. 247,577, filed January 18, 1928.

What I claim is:

1. In a panel board construction, the combination of an enclosing housing, supports projecting between and supported by the side walls of the housing adjacent the front face of the housing, and a carrying-plate for switches and fuse connections mounted on said supports, the said plate being longitudinally adjustable with respect to the supports and the supports being inwardly or outwardly adjustable with respect to the side walls of the casing.

2. In a panel board construction, the combination of a metallic pan, fuse holders, switches, and bus-bars, supported on the rear surface thereof, said pan having a plurality of openings therethrough and removable switch plates secured to said pan at said openings, whereby to permit the access to and removal of one of the switches without disturbing the other switches.

3. In a panel board construction, the combination of a housing, a plurality of supports extending from side to side of the housing, a carrying plate medially attached to said supports and spaced from the back of the housing, said plate having on its rear surface thereof and secured thereto a bus-bar and switching mechanisms, said plate being further provided with suitable openings therein for permitting independent access and removal of the switches from the forward face thereof.

4. In a panel board construction, the combination of a housing, a plurality of supporting bars secured to and extending from side wall to side wall of the housing, means for inwardly and outwardly adjusting said supporting bars, said bars having elongated slots therein, a carrying plate having mounted thereon switches, fuse holder and bus-bars, and means projecting from said plate and engaging in said slots of the supporting bars to permit adjustment of the plate on said bars.

5. In a panel board construction, the combination of a housing, facing strips having inward and outward adjustment with respect to the housing, supporting members extending across the housing and secured at their ends to the opposite facing strips, and a carrying plate mounted on said supporting members and longitudinally adjustable with respect thereto whereby said plate may be adjusted relative to the side walls of the housing as well as adjusted inwardly and outwardly with reference to the back wall of the housing.

6. In a panel board construction, the combination of a housing, a supporting member extending from side wall to side wall of the housing, means for inwardly and outwardly adjusting said supporting member, a carrying plate having mounted thereon switches, fuse holders, and bus-bars, said plate being slidably connected to said supporting member for independent adjustment thereon.

7. In a panel board construction, the combination of an enclosing casing, facing strips arranged within the side walls of the casing and adapted for inward or outward adjustment with respect to the casing, supports carried by said facing strips, a carrying plate secured to said supports and having mounted thereon switches and fuse connections, and means for longitudinally adjusting the position of said plate on said supports.

8. In a panel board construction, the combination of a housing, facing strips coextensive with the side walls of the housing and having an inward or outward adjustment with respect to the housing, a support carried by the facing strips, a carrying plate secured to said support, and means for independently adjusting the position of said plate on said support.

In testimony whereof I have hereunto affixed my signature.

FRANK T. SHULL.