

United States Patent

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[56]

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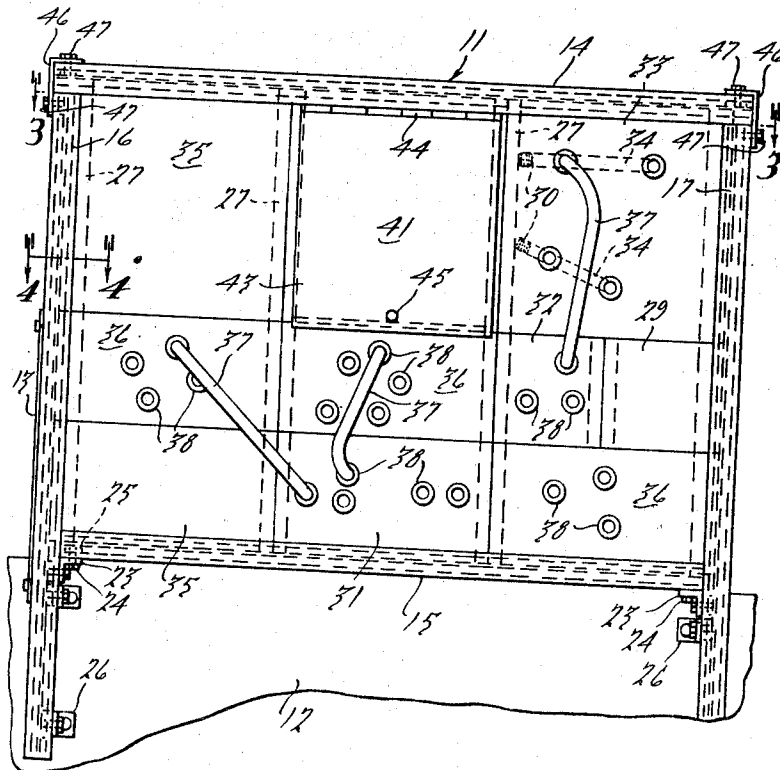
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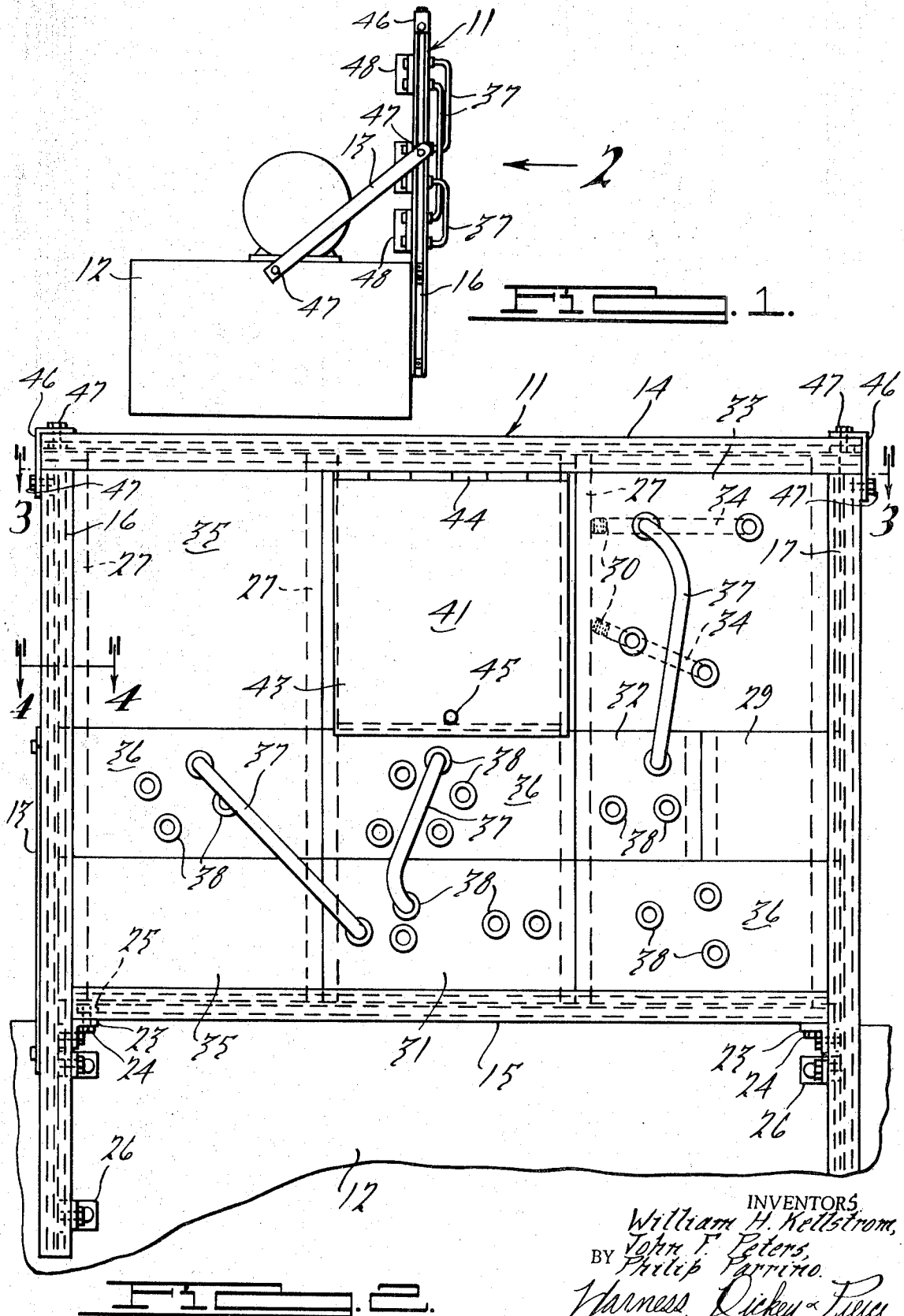
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[54] MODULATED FLUID CONTROL PANEL BOARD
8 Claims, 8 Drawing Figs.

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ABSTRACT: The panel board is made of modulated panel sections which interlock with each other and a frame in which the panel sections are removably retained to form a unit construction. The panel sections are the multiple of a unit which in the illustration example is square so that the panel section can be a rectangle having the dimension of two of the units or a square having a dimension of four of the units and the like.





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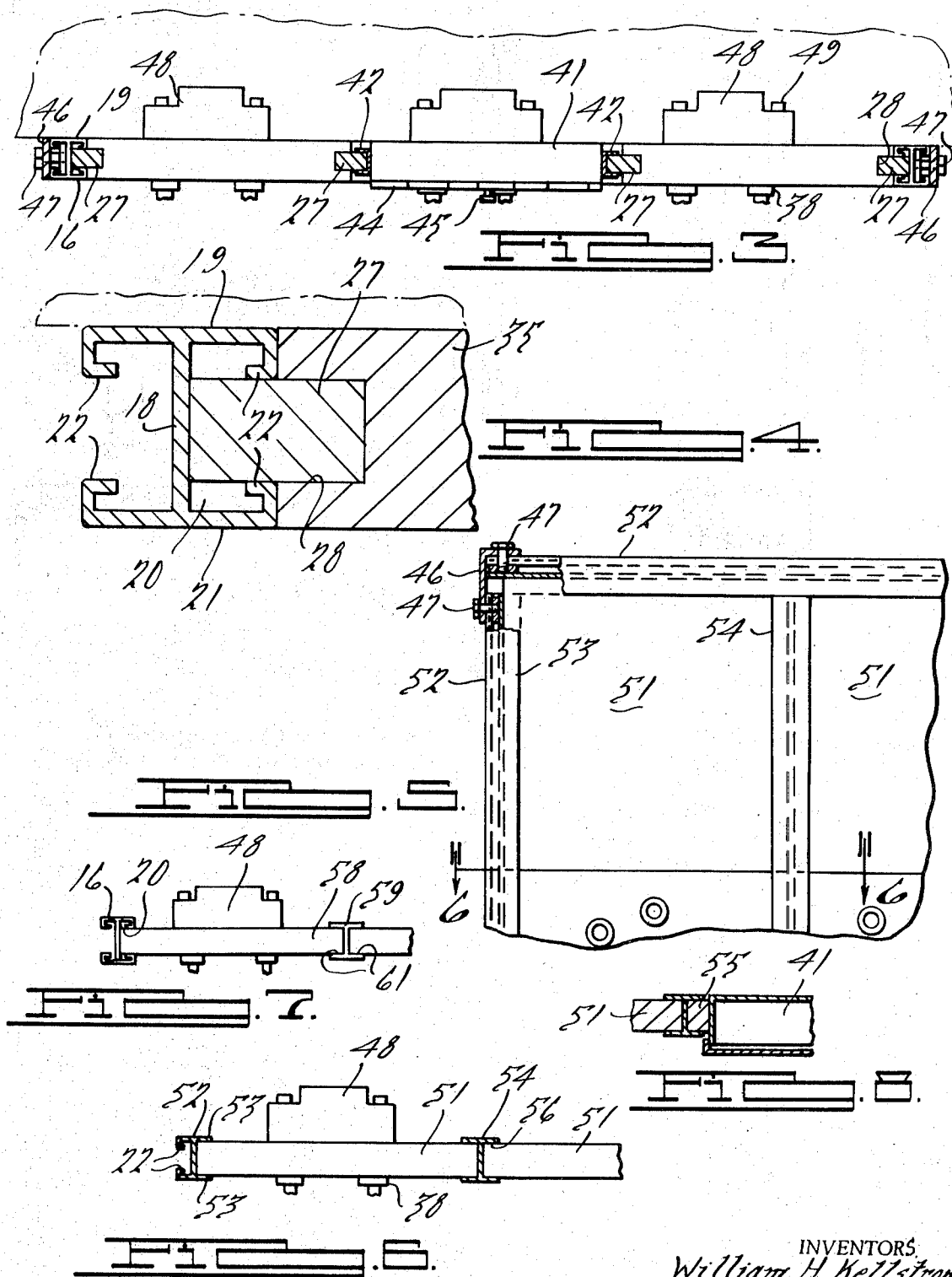
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MODULATED FLUID CONTROL PANEL BOARD

BACKGROUND OF THE INVENTION

Reference may be had to a panel board constructed in accordance with the teaching of U.S. Pat. No. 2,927,602 in which flanged panel sections are bolted together to construct the panel board and over which the present invention is a substantial improvement.

SUMMARY OF THE INVENTION

The panel board of the present invention has a frame made of top and bottom cross members and side rails which are secured together to form a square or rectangular opening. The side rails extend downwardly and are secured to the wall of a tank or other supporting structure. In the embodiment herein illustrated the frame is made from a member having an H-section, providing oppositely presenting channels with the flanges forming the front and rear faces reversely bent to provide reversely presenting channels which anchor nuts for bolts by which the elements are secured together and to the supporting structure. Such a member is securable in the trade, one source would be Unistrut Teal Service Company of 1200 Naughton, Troy, Mich.

The cross member at the bottom of the frame is secured by angle members in the side rails in which solid rectangular bars are placed for supporting the panel sections. The panel sections are solid plates of metal, plastic or other material of predetermined thickness depending upon the size of the valves and the diameter of the conduits connected thereto. In one embodiment of the invention, the plates have a slot provided in each side edge which receives the bars when slid downwardly thereover from the top of the frame. When a plurality of vertical rows of the panel sections are employed additional bars are spaced from each other with their ends extending into the channel of the bottom cross member so that the panel sections may be disposed side-by-side to fill the entire area between the side rails and the top and bottom cross members. Apertures are provided through the panel sections for communicating with valves supported on the front face and with fittings extending from the back face. Passageways in the panel sections interconnect some of the apertures while conduits connect some of the fittings to each other and to fluid operated devices of a machine. In the embodiment illustrated, the side rails are secured to the rear wall of a tank, with straps interconnecting the tank and the upper portion of the side rails for bracing and strengthening the frame.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a fluid supply tank having a panel board attached thereto embodying features of the present invention;

FIG. 2 is an enlarged broken view of the structure illustrated in FIG. 1, as viewed from the point 2 thereof;

FIG. 3 is a sectional view of the structure illustrated in FIG. 2, taken on the line 3-3 thereof;

FIG. 4 is an enlarged, broken sectional view of the structure illustrated in FIG. 2, taken on the line 4-4 thereof;

FIG. 5 is a broken view of structure, similar to that illustrated in FIG. 2, showing a further form of the invention;

FIG. 6 is a sectional view of the structure illustrated in FIG. 5, taken along the line 6-6 thereof;

FIG. 7 is a view of structure, similar to that illustrated in FIG. 6, showing a further form of the invention; and

FIG. 8 is a view of the structure illustrated in FIGS. 6 and 7, showing an electric control box supported in the panel board.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, a panel board 11 is illustrated attached to a fluid supply tank 12 and braced thereon by a pair of straps 13. This is a simplified mounting for the panel board at the source of supply but it is to be understood that the frame may be attached to any other structure, wall or floor, depending upon

the location of the source and the devices to be operated. The panel board 11 has a frame constructed from a top cross member 14, a bottom cross member 15 and side rails 16 and 17. As illustrated more specifically in FIG. 4, the cross members and rails are of H-cross section, having a central web 18, a front flange 19 and rear flange 21. The edges of the flanges 19 and 21 are reversely bent to form spaced channel elements 22 which face inwardly toward the web 18 within the channel 20. The bottom cross member 15 is secured to the side rails 16 and 17 by angle brackets 23 which are secured by bolts 24 to nuts 25 which engage the edges of the inwardly projecting channel elements 22. Similar angle shaped members 26 are secured in the same manner to the rails 16 and 17 and to the rear wall of the tank 12. Rectangular bars 27 are placed within the facing channels 20 of the side rails 16 and 17 between the inwardly facing channel elements 22. As illustrated in FIG. 2, two additional bars 27 are placed in the channel 20 of the cross member 15 equally spaced from each other and the bars 27 in the side rails 16 and 17. Any number of the bars 27 may be so spaced between the side rails 16 and 17, depending upon the number of vertically disposed panel sections which are to be employed across the frame.

The length of the bars and the spacing thereof depends upon the size and shape of the panel sections which are constructed to be a multiple of a selected unit. Each of the panel sections have a slot 28 at the ends for receiving the bars 27 over which they are slid downwardly from the top of the frame. In the present arrangement, a panel section 29 is the unit module, and is illustrated as being square. The panel section 31 is of rectangular shape conforming to the shape of two of the unit panel sections 29. The longitudinal length of the rectangular panel section 31 provides the dimension for spacing the bars 27 from each other. Within this space a unit panel section 32 is joined by a short length of bar 27 to the panel section 29 which is a blank section. The space also receives a square panel section 33 which is four times the size of the unit panel section 29.

As illustrated more specifically in FIG. 4, the panel sections are made from a solid plate of metal, plastic or other suitable material of a thickness to support the valve and the fittings which are threaded into apertures extending through the panel sections. Certain of the apertures are interconnected by drilled passageways 34 from one or more edges of the panel sections which are closed by a plug, as illustrated in the panel section 33. Additional panel sections 35 and 36 are illustrated in FIG. 2 which may have interconnecting passageways for the apertures when provided therethrough which interconnect the valves and the fittings. It will be noted that some of the panel sections such as section 29 and 35 are left blank and are employed to fill the space between the side rails 16 and 17 and the cross members 14 and 15. Conduits 37 are shown by way of example interconnecting the fittings 38 which are threaded into the through apertures from the back side of the panel sections. It is to be understood that any number of the conduits 37 may be employed for interconnecting the valves and any number of the fittings 38 may be employed to provide the desired fluid circuits to hydraulic elements to be actuated. The fittings 38 are interconnected in various manners to the valves by the passageways 34 which interconnect the apertures through the panel sections in a manner conforming to the required fluid circuits. While such passageways are only illustrated in the panel 33, it is to be understood that they are provided in the other panel sections when needed to interconnect the apertures to which the valves and fittings are joined.

A further novel feature of the panel board is that of supporting an electric control box 41 within the frame area. As illustrated in FIG. 3, outwardly presenting channel strips 40 are secured to the side edges of the box for sliding downwardly over the spaced bars 27 to fill a module area therebetween. The box is of conventional type having a cover 43 secured at the top by a hinge 44 and locked in closed position by a latch operated by a knob 45 which may be provided with a lock to prevent unauthorized entrance to the box. After all of the

panel sections, bars 27 and the box have been assembled within the frame area as illustrated in FIG. 2, the top cross member 14 is then secured in position to the top ends of the side rails 16 and 17 by angle members 46 and bolts 47. The bracing strap 13 may be employed between the tank 12 and the side rails 16 and 17 of the frame and secured thereto by additional bolts 47.

Various types of valves 48 may be secured to the front face of the panel sections by screws 49 in sealed relation therewith. The apertures through the panel sections are so located as to communicate with the valve ports. The rear ends of the apertures are threaded for receiving the threaded end of the fittings 38. With this arrangement the various panel sections and the control box 41 are readily assembled within the frame by sliding the panel sections and box downwardly from the top to provide a smooth face across the front and rear of the frame. Any one of the panel sections may be removed without requiring the removal of the other panel sections.

While the panel sections are illustrated as being provided with slots 28 at the ends to engage the bars 27, in FIGS. 5 to 8 a slightly modified form of structure is illustrated. In this arrangement the panel board is constructed from panel sections which have the slots 28 eliminated from the ends. As illustrated in FIG. 6, a panel section 51 of slightly larger dimension than that of the panel section of the structure illustrated in FIGS. 1 to 4, is shown assembled in a frame having side rails and top cross members made from elements 52 which have the inward extending flanges 53 without the reversely bent channel portion 22. This permits the edge of the panel section 51 to extend between the flanges 53 of the side rails and the top and bottom cross members. In place of the bars 27, H-shaped elements 54 are located between the panel sections inwardly of the side rails for receiving the adjacent edges of the panel sections.

The electric control box 41 has a bar 55 secured at each side edge to pass within the channel 56 of the members 52 and elements 54.

The panel sections need not be as thick as those illustrated in FIG. 6, when smaller valves and lighter conduits are employed. A panel section 58 is illustrated in FIG. 7 of the thickness of the bar 27 so that it can extend directly into the channel 20 of the side rails and cross members forming the frame. An H-shaped element 59 having channels 61 therein of the width of the bars 27 receives the ends of the adjacent panel sections 58. The panel sections 51 and 58 are treated in the same manner as those of the structure illustrated in FIGS. 1 to 4 to have valves 48 and fitting 38 secured thereto and with the H-elements 54 and 59 utilized in place of the bars 27.

In any of the constructions, a panel board is provided which meets the specific requirement for the fluid flow to elements of a machine. The panel board is simple in construction, is rugged and is so constructed as to permit the panel sections to be replaced without disassembling the entire panel board. This arrangement is further unique in the provision of the electric

control box of a shape to conform within the module from which the panel sections are constructed so that it may be applied in the same manner by having fittings on the side edges which slide within the area it is to occupy from the top of the frame in the same manner as the panel sections are assembled therein.

We claim:

1. In a panel board, a frame having side rails and top and bottom cross members of inwardly presented channel section, module panel sections of sizes to be multiples of the size of the smallest unit assembled within the channel of the side elements to rest upon each other and the bottom cross member within the channel thereof, at least some of said panel sections having means for supporting valve and fittings thereon communicating with apertures through the panel sections, and means for releasably supporting the top cross member on the side rails providing channel means for securing the panel sections within the frame.

2. In a panel board as recited in claim 1, wherein the elements forming the side rails and top and bottom cross members are of H-section having flanges forming inwardly and outwardly facing channels with the outer ends of the flanges reversely bent to provide spaced inwardly presenting channel elements.

3. In a panel board as recited in claim 1, wherein the panel sections are engaged within the inwardly presented channels of the side elements and top and bottom cross members and wherein an element of H-sections is disposed between the panel sections when in side-by-side relationship.

4. In a panel board as recited in claim 3, wherein an electric control box has side bars provided thereon which extend within the presenting channels of the side rails and H-section elements or a pair of H-section elements so as to be located in a space to be occupied thereby.

5. In a panel board as recited in claim 1, wherein the panel sections have slots in the side edges and wherein bars are disposed within the inwardly presenting channels of the side rails in position to extend into the slots of the panel section when the sections are slid downwardly thereover into engagement with the bottom cross member and each other.

6. In a panel board as recited in claim 5, wherein the assembly of the panel section forms smooth planar front and rear surface within the frames.

7. In a panel board as recited in claim 5, wherein additional bars are supported in the bottom cross member and spaced from each other and the side rail a distance which is the multiple of the unit panel section so that a plurality of rows of the panel sections may be assembled side-by-side within the frame.

8. In a panel board as recited in claim 7, wherein an electric control box has outwardly presented channel sections at the sides in position to slide downwardly over a pair of the spaced bars and be located within the panel board area.

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