

[54] **PANEL BOARD FOR STACKED ELECTRICAL DEVICES WITH SEALING COVERS**

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[52] U.S. Cl. **317/106, 49/402, 312/100, 317/120**
 [51] Int. Cl. **H02b 1/12**
 [58] Field of Search **49/401, 402, 465; 312/100, 312/198, 199; 317/104-107, 120**

[56] **References Cited**

UNITED STATES PATENTS

3,087,097 4/1963 Janson 317/104 X
 3,382,611 5/1968 Zandelin 49/402 X

FOREIGN PATENTS OR APPLICATIONS

688,138 6/1964 Canada 317/104

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[57] **ABSTRACT**

A panelboard of the type having a plurality of open front compartments adapted to accommodate electrical devices, respectively, and arranged in an upright row, each compartment having an individual cover. Each cover is connected at its upper margin to the panel adjacent the top of its associated compartment. The lower margin of the cover of each compartment overlies and conceals the connection of the cover of the compartment immediately therebeneath. A rain tight seal is provided by a combination of the shapes of forward margins of the compartment walls, the shapes of flanges and lower margins of the respective covers comparable with said margins, and the arrangement of gaskets between the coating flanges and margins.

10 Claims, 7 Drawing Figures

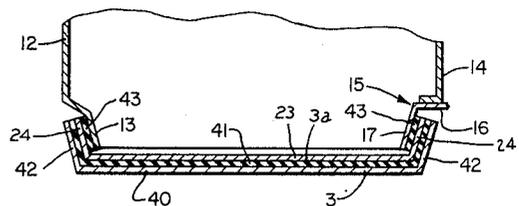
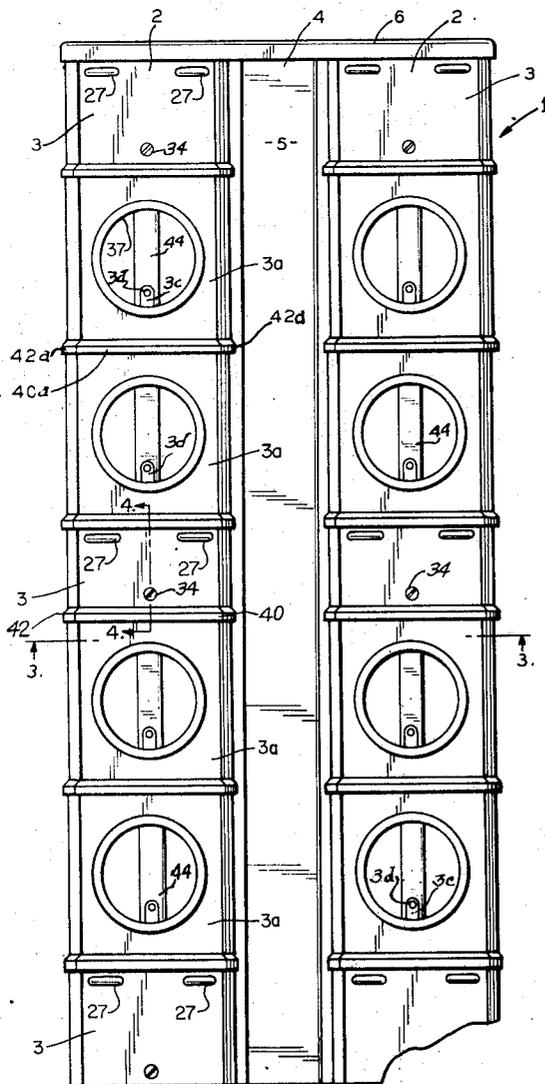
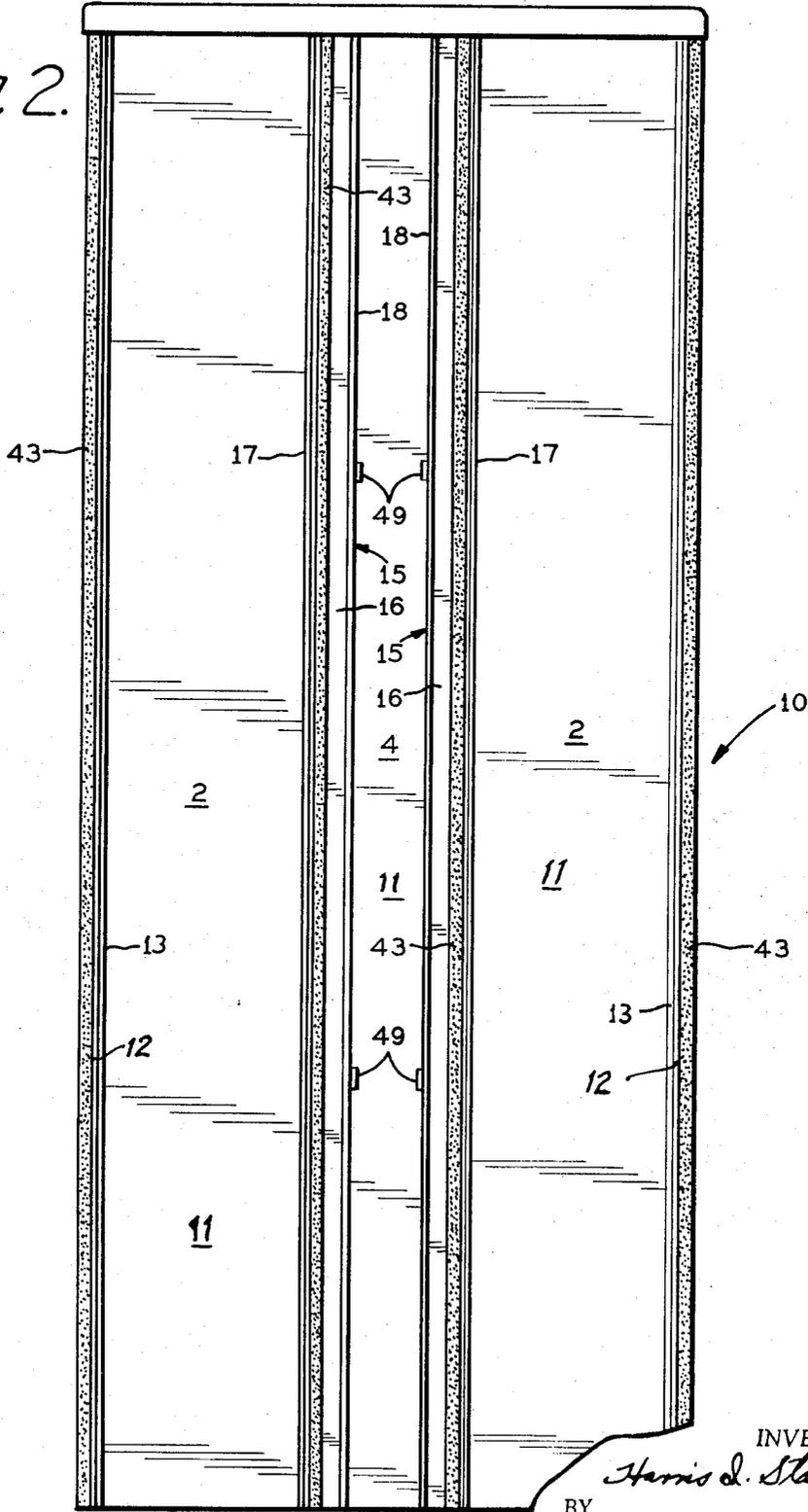


Fig. 2.



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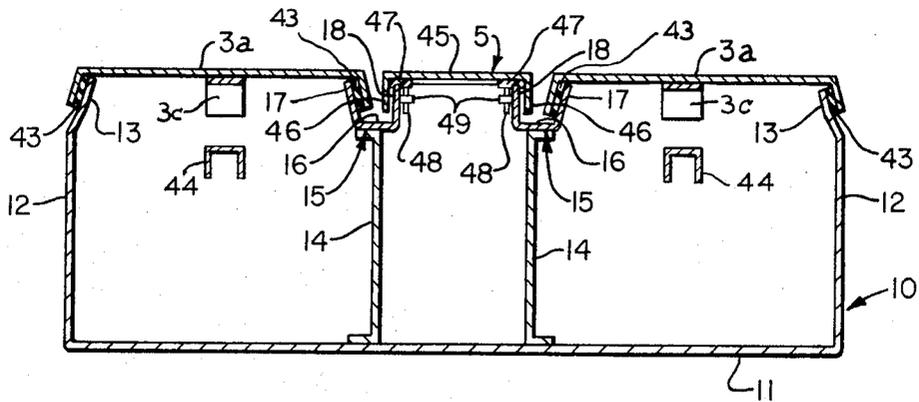


Fig. 3.

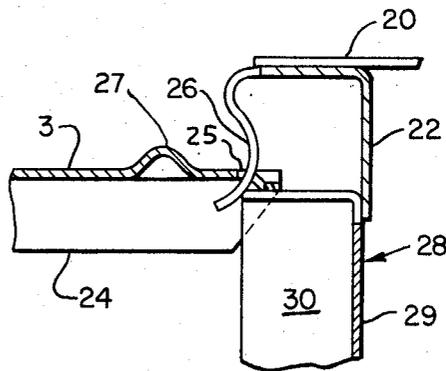
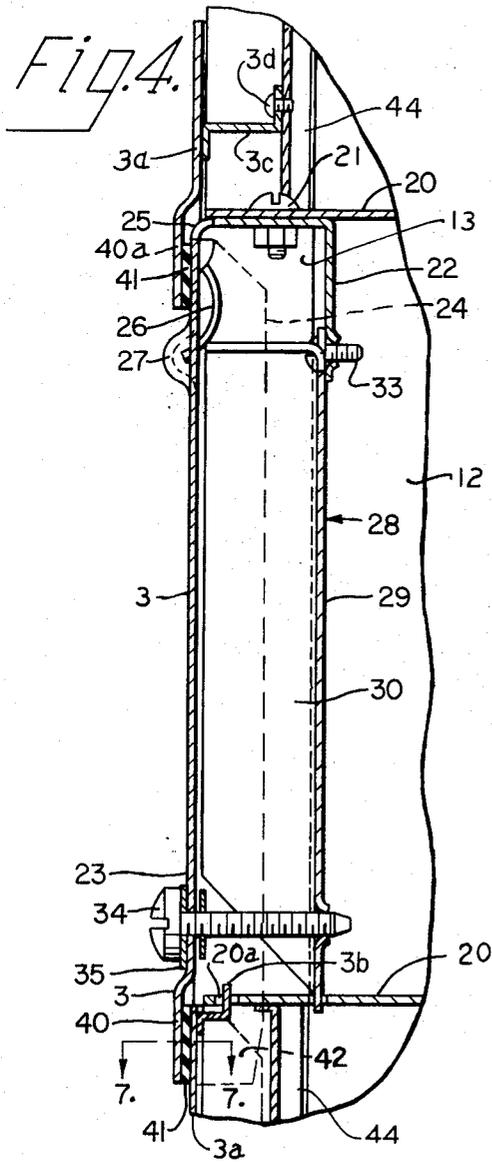


Fig. 6.

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Fig. 5.

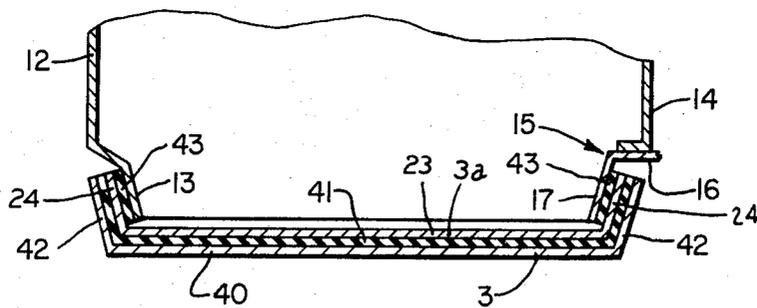
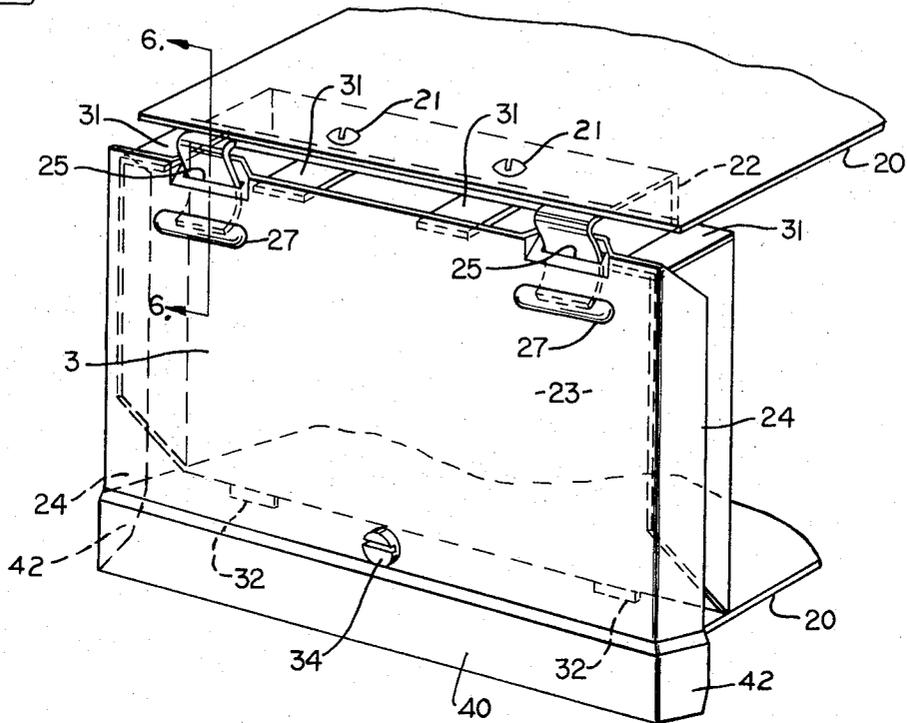


Fig. 7.

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PANEL BOARD FOR STACKED ELECTRICAL DEVICES WITH SEALING COVERS

This invention relates to weatherproof enclosures for stacked arrangements of electrical devices and particularly to a mounting panel in the form of a box-like structure having compartments arranged in a row, one above the other, each for supporting an electric device, and covers for the compartments, respectively, of the general type and mounting disclosed in my copending application, Ser. No. 15,370, filed Mar. 2, 1970 now U.S. Pat. No. 3,617,814, and entitled "Concealed-Hinge Mounting for Rain-Tight Cover of Multi-Metering Electrical Panelboard."

BACKGROUND OF INVENTION

Heretofore, as disclosed in the above identified application, covers for such compartments for accommodating circuit breakers, meters and the like, have been provided, but extreme difficulties have been experienced in providing proper seals against the entrance of rain water and the like between the covers and the compartment walls.

For example, in the case of panels in which portions of the equipment, such as the glass covers of meters, protrude forwardly through openings in the faces of the covers, water striking the top of the meters bounces back up beneath the lower margin of the compartment cover immediately above the compartment cover through which the meter glass cover protrudes, and thus finds its way to the connection of the meter compartment cover and into the compartments themselves. Furthermore, water running down the side walls of the row of compartments between flanges on the cover and the forward margins of the side walls drains down to about the upper edge of the third cover in the row downwardly from where the water entered and into the interior of the adjacent compartments.

Also, it is very difficult to seal the space between the flanges of the covers and the outward face of the forward margins of the side walls of the compartments, despite the provision of gaskets mounted on the cover flanges.

The principal object of the present invention is to assure a rain proof seal between each cover and the covers adjacent thereto in the row and between the covers and the forward margins of the side walls of the compartments by the shaping of the cover and side walls and the specific relation of gaskets to the cover and side walls.

Various specific objects and advantages of the invention will become apparent from the following description wherein reference is made to the drawing, in which:

FIG. 1 is a front elevation of a panel having multi-row compartments for receiving electrical devices, respectively;

FIG. 2 is an enlarged fragmentary front elevation of the panel with the covers of the compartments, electrical wiring, and electrical devices, omitted for clearness in illustration;

FIG. 3 is an enlarged horizontal sectional view of the panel taken on the line 3—3 in FIG. 1;

FIG. 4 is an enlarged fragmentary vertical sectional view of the panel taken on the line 4—4 of FIG. 1, showing a portion of a compartment and its cover;

FIG. 5 is a fragmentary perspective view of the panel showing a single circuit breaker compartment and the manner in which the cover is mounted in relation to the top and bottom walls of the compartments;

FIG. 6 is a fragmentary sectional view taken on the line 6—6 in FIG. 5, but showing a compartment with its cover in open position; and

FIG. 7 is a fragmentary horizontal sectional view taken on the line 7—7 of FIG. 4 and showing the relation of sealing gaskets at the lower margin of a cover.

Referring to the drawings, the panel, indicated generally at 1, is preferably in the form of a box-like structure having two upright rows of open front compartments 2, each compartment of each row being arranged for accommodating a selected electrical device such, for example, as an electrical meter or a circuit breaker. Each compartment is provided

with a separate front cover, the covers of circuit breaker compartments being indicated at 3 and those of meter compartments being indicated at 3a. The rows are spaced apart to provide therebetween a wiring trough 4 closed by a front cover 5. Both the top compartments 2 of the rows and the trough 4 therebetween are closed by a common cover 6.

In the form illustrated, the dual row panel 1 comprises essentially an open front box, indicated generally at 10, having a back wall 11 and outer side walls 12, as best illustrated in FIGS. 2 and 3. The forward margins of the outer side walls 12 have flanges 13 which are convergent relative to each other in a direction forwardly of the box for sealing purposes, later to be described.

In the multi-compartment box illustrated, the rows of compartments 2 have inner adjacent side walls 14, respectively, which are spaced apart from each other laterally of the rows and which form also the side walls of the trough 4 between the rows. At their forward portions, the walls 14 have extensions 15 which are channel shaped, each having a bottom 16 and forward laterally spaced marginal flanges 17 and 18. Each forward marginal flange 17 converges forwardly of the compartment relative to the forward marginal flange 13 of the nearest or adjacent side wall 12 of the box. The opposite marginal flange 18 of each channel 15 may extend forwardly parallel to its adjacent side of the wiring trough 4.

As described in the above identified application, now U.S. Pat. No. 3,617,814 the circuit breaker compartments may be provided with suitable interior trim panels. Insofar as the present invention is concerned, the compartments are essentially the same functionally. Accordingly, a circuit breaker compartment with a cover 3, but only the cover connecting means of a meter compartment with a cover 3a, are described in detail. Each circuit breaker compartment has top and bottom partition walls 20, respectively. The top wall 20 of each compartment is the bottom wall 20 of the compartment immediately thereabove. A suitable bracket 22 is secured to the top wall 20 by suitable bolts 21 or otherwise, and is arranged for connecting the upper margin of the cover 3 of the compartment to the panel for swinging about a horizontal axis at the upper margin of the cover. Each cover 3 has a front panel portion 23 and rearwardly extending side flanges 24 which diverge rearwardly and are generally parallel respectively to the flanges 13 and 17 of the compartment side walls and spaced outwardly therefrom in a closed position of the cover. The panel 23 is provided with a pair of horizontally spaced slots 25 near its upper edge, these slots being positioned for effecting a hinged connection with the bracket 22. For this purpose, the bracket 22 is provided with legs 26.

Portions of the panel 23 above the slot 25 are inwardly offset, and below the slots 25 the panel is provided with rearwardly concave embossments 27 which provide a pair of inner cavities for receipt of the free ends of the legs 26. An interior trim panel 28 is provided and may comprise a generally flat rectangular panel back wall 29 with a pair of opposed forwardly extending flanges 30 at its opposite lateral edges. The panel 28 has four laterally spaced tongue portions 31 arranged one at each side of each leg 26, respectively.

The trim panel 28 is provided at its lower edge with horizontally spaced tabs 32 which extend through appropriate slots in the bottom wall 20 of the associated compartment. The panel 28 is connected at its upper rear edge to the bracket 22 by a screw 33.

The cover 3 is secured in closed position by suitable means, such as a screw 34, which is in threaded engagement with the rear wall 29 of the trim panel 28, a suitable sealing gasket 35 being provided between the head of the screw 34 and the front wall of the cover 3.

The cover 3 is so proportioned that when it is connected at its upper end to the panel by the bracket 22, a portion of the resulting hinge connection is exposed just beneath the top wall 20 of the associated compartment.

In order to seal the covers 3 properly in closed position, each cover 3 is provided at its lower end portion with a de-

pending bottom marginal flange 40 which extends the full width of the cover and laterally beyond the side flange 13 of the outer side wall of the compartment and the opposite forward flange 17 at the inner side of the compartment. Each cover 3a has a corresponding bottom flange 40a. The bottom flange of each cover is shaped and arranged so that with two vertically adjacent covers in closed position, the bottom flange of the upper one of the covers lies in front of the top wall 20 of the compartment immediately therebeneath, which, as mentioned, is also the bottom wall of the upper of the two adjacent compartments. The flanges 40 and 40a, as the case may be, extend downwardly sufficiently past the exposed upper portion of the lower one of two adjacent covers in a row so as to shield and conceal the upper portion of the latter.

A suitable gasket 41 is interposed between the inner face of each bottom flange 40 and 40a and the forward face of the upper margin of the next adjacent lower cover. The gasket 41 is arranged so that with the covers in closed position it is compressed sufficiently between the flange 40 or 40a and the forward face of the upper margin of the lower cover to form an effective seal against access of water to the upper edge of the lower cover.

For purposes later to be described, this gasket 41 extends laterally of the cover entirely to and beyond the lateral outer limits of the marginal flanges 13 and 17 of the compartments.

At their lateral edges, the flanges 40 and 40a are provided with rearwardly extending lateral flange portions 42 and 42a, respectively, which also depend from, and are continuations, of the side flanges 24 and 24a and which diverge rearwardly and are generally parallel, respectively, to the flanges 13 and 17 of the compartment side walls and spaced outwardly therefrom, in a closed position of the covers.

In order to provide a seal along the lateral forward flanges of the compartments, suitable resilient gaskets 43 are provided. Here it is to be noted that the forward marginal flanges 13 and 17 are coextensive endwise with the row of compartments so that only one gasket 43 is required for each flange 13 and one for each flange 17. The gaskets 43 are bonded firmly to the flanges 13 and 17, instead of to the flanges 24 and 24a of the covers 3 and 3a, so that the gaskets are continuous and uninterrupted for the entire length of the row of compartments.

It has been found that mounting the gaskets on the forwardly convergent side wall margins or flanges 13 and 17 and bonding them thereto, a more effective seal is provided than could be provided were the gaskets 43 bonded to the inner faces of the flanges 24 and 24a of the covers.

The flanges 40 and 40a and the gasket 41, heretofore discussed extend sufficiently far laterally of the row of compartments to overlies the portions of the forward edges of the gaskets 43 which are aligned therewith forwardly and rearwardly of the compartments, thus forming an extremely tight seal to prevent the entry of water between the covers and the side walls of the row of compartments. The rearward divergence of the flanges 24 and of the flanges 24a and forward convergence of the marginal flanges 13 and 17 of the compartment assure that the gaskets will be engaged and compressed without undue scuffing and binding so as to assure a tight seal between the lateral flanges of each cover and the forward marginal flanges of the associated compartments.

Furthermore, the upper end margins of the flanges 24 and 24a of the covers 3 and 3a, respectively, are inclined from front to rear so that should any water reach these edges, it will drain downwardly rearwardly and thus to the outside of the side walls of the associated compartment, rather than accumulate and reach the inside of the compartment as could be the case were the upper edges of the flanges 24 and 24a horizontal.

It is pointed out that the covers 3a are not hinged, as are the covers 3, but are detachably secured in operating positions by screws or other means so that they can be removed forwardly.

Referring to FIGS. 1 and 2, the covers 3a may be secured in place by providing at the top of each cover a tongue 3b which

engages a slot 20a in the bottom wall 20 of the compartment thereabove, and at the bottom a bracket 3c which is secured to a mounting channel 44 in the associated compartment by means of a screw 3d.

Here it is to be noted that if only one row of compartments is to be provided, one side wall 14 of the trough 4 becomes the outer side wall of the panel. In such a case, its marginal flange 17 may be omitted, as the flanges 18 are all that are necessary for connecting the trough cover 5 to the wiring trough 4.

As illustrated in FIGS. 1 and 3, the wiring trough cover may be in the form of a shallow channel having a wall 45 and side flanges 46 arranged to lie alongside and in outwardly spaced relation to, the outer faces of the flanges 18. Suitable gaskets 47 are interposed between the forward edges of the flanges 18 and the rear face of the cover 5 for providing an effective seal.

The cover 5 may be secured in place in any suitable manner, for example, by suitable latching cam 48 disposed in spaced relation along its length and operable to engage suitable complementary cams 49 carried by the flanges 18.

With the arrangements thus described, each compartment cover, in turn, is effectively sealed at the bottom and two sides with respect to its associated compartment and, in turn, its connection at the top is sealed by the lower flange portion 40 or 40a of the cover thereabove.

As mentioned, the topmost compartment of each row is sealed by the cover 6 which, in event of a dual row installation, is common to both rows and the upper end of the wiring trough. Any suitable closure may be provided at the lower end of the panel and extend the full width of the panel.

The specific devices mounted in the compartments and the specific circuitry employed are omitted, as they are not a part of this invention which is directed primarily to the structure for sealing individual covers for the compartments relative to the compartments and to each other.

Having thus described my invention, I claim:

1. A panelboard for stacked electrical devices comprising:

a panel having a plurality of open front compartments arranged one above the other in an upright row and for accommodating electrical devices, respectively;

the compartments having opposite side walls which are common to the compartments and each of which is continuous and unbroken from the top to the bottom of the row;

upright front covers for the compartments, respectively;

connecting means detachably connecting the covers the panel, respectively, with an upper margin of each cover exposed at the forward face of the panel;

each cover having a lower portion which, in the closed position of the cover, is in forwardly overlying spaced relation to said upper margin of the cover of the compartment immediately therebelow in the row and thereby conceals and shields the upper margin;

characterized in that:

each cover has lateral flanges extending endwise of the cover for its full length and positioned so that, when the cover is in closed position, each flange overlies outwardly laterally of the row the outer face of the forward margin of the side wall adjacent to it and coextensive endwise with it; and

bottom gaskets are provided on the rear faces of said lower portions of the covers, respectively, each bottom gasket extending the full width of the associated cover at said lower portion of the cover and being shaped to be compressed between said lower portion of its associated cover and the said upper margin of the next adjacent cover therebelow in the row, and to provide a seal, thereby to prevent ingress of water between the lower portion of the cover of each compartment and said upper margin of the cover of the compartment immediately therebelow.

2. The structure according to claim 1 further characterized in that the forward margins of said side walls are convergent relative to each other forwardly of the compartments; and

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said gaskets are provided on, and are coextensive endwise with, said outer faces of said forward margins, respectively, and are shaped to be compressed between said cover flanges and said forward margins when the covers are in fully closed position, thereby to provide a seal between said cover flanges and said forward margins.

3. The structure according to claim 2 wherein each bottom gasket extends laterally of the row outwardly across and beyond the front edges of the side gaskets so as to be in sealing engagement therewith when the cover is in closed position.

4. The structure according to claim 2 wherein the lateral flanges of each cover are divergent relative to each other rearwardly of the associated cover.

5. The structure according to claim 4 wherein another row of such compartments and covers is arranged alongside and parallel to said first mentioned row with the adjacent side walls of the rows spaced laterally of the rows from each other;

a wiring trough is disposed between said rows; portions of the opposite side walls of the trough are the adjacent side walls of the rows of compartments, respectively;

said trough side walls, at their forward end, having lateral forwardly directed flanges, respectively, which are spaced inwardly laterally of the trough, toward the midportion of

the trough from the forwardly converging flanges of said trough side walls; and

a trough cover is mounted on said trough side walls and, in closed position, has lateral flanges disposed alongside the outer faces of the lateral flanges of said trough.

6. The structure according to claim 5 wherein sealing gaskets are disposed between the forward edge of each trough side wall flange and the rear face of the cover.

7. The structure according to claim 1 wherein top cover means cover the compartments at the top of the row and have a lower portion which overlies forwardly the upper margin of the cover of the top compartment and conceals and shields the connecting means of the top cover.

8. The structure according to claim 6 wherein the lateral flanges of said trough are planar and parallel to each other.

9. The structure according to claim 1 wherein the top edge of the upper end margin of each lateral flange on each cover slopes downwardly from the front substantially to the rear of the flange.

10. The structure according to claim 2 wherein the side gaskets are bonded to the outer faces of the forward margins of the side walls.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,675,085 Dated July 4, 1972

Inventor(s) Harris I. Stanback

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 4, line 47, for "the" (second occurrence) read --to--.
Col. 5, line 1, for "said" read --side--.

Signed and sealed this 2nd day of January 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

UNITED STATES PATENT OFFICE
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