United States Patent

Lambert et al.

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[54] WEATHERPROOF ENCLOSURE

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[52] U.S. Cl. **52/79**, 52/264, 52/274, 52/588

[51] **Int. Cl.** **E04h 1/12**, E04h 5/04

[58] **Field of Search** 52/264, 274, 79, 284, 285, 52/282, 588, 293, 403

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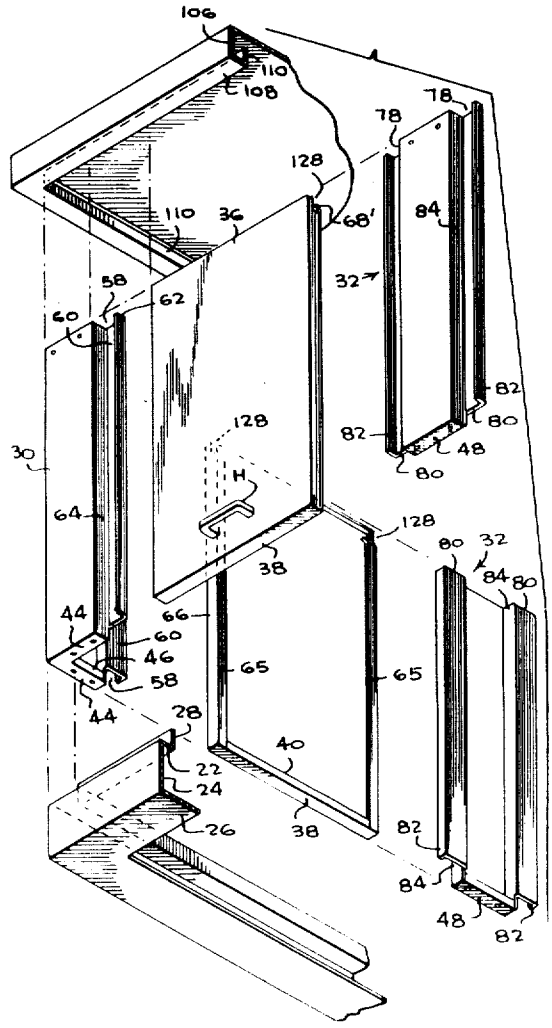
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[57] **ABSTRACT**

A weather-proof enclosure formed with a plurality of vertically extending posts and wall panel members in which the posts and wall panel members have mating groove and lug connections along each end and are overlapped at their upper end by a top cover member with all of the component connections being made from the interior of the enclosure in order that a weatherproof construction is achieved; another feature of the invention resides in the top construction which is in the form of two portions joined along a transversely extending line by an L-shaped channel on one portion matingly receiving a downwardly extending similarly shaped flange on the other portion with an elastomeric sealing member being located between the flanges.

13 Claims, 9 Drawing Figures



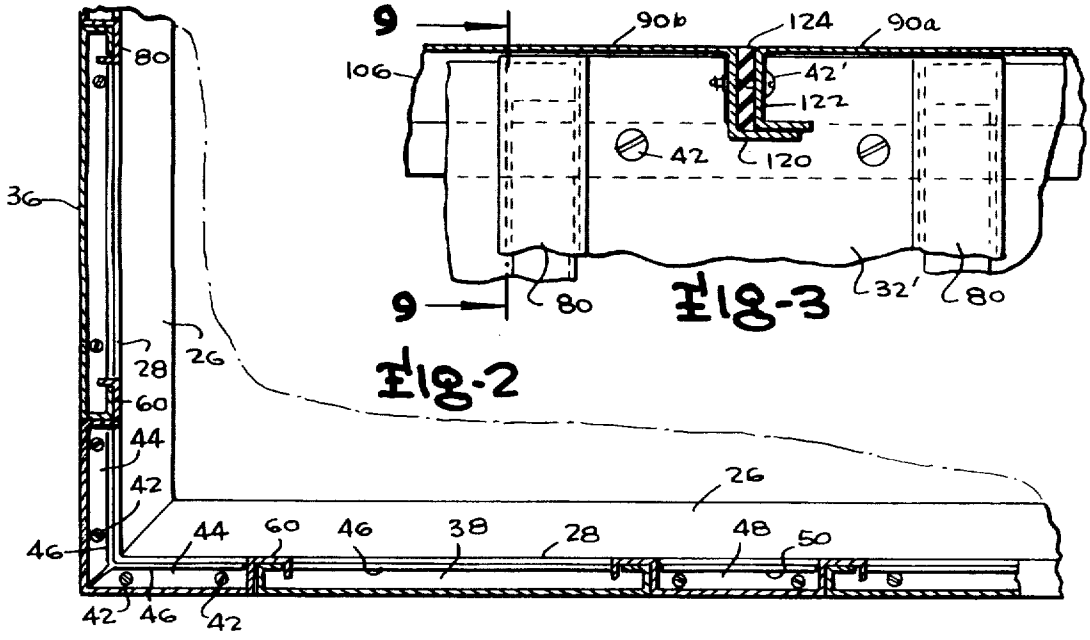


Fig-3

Fig-2

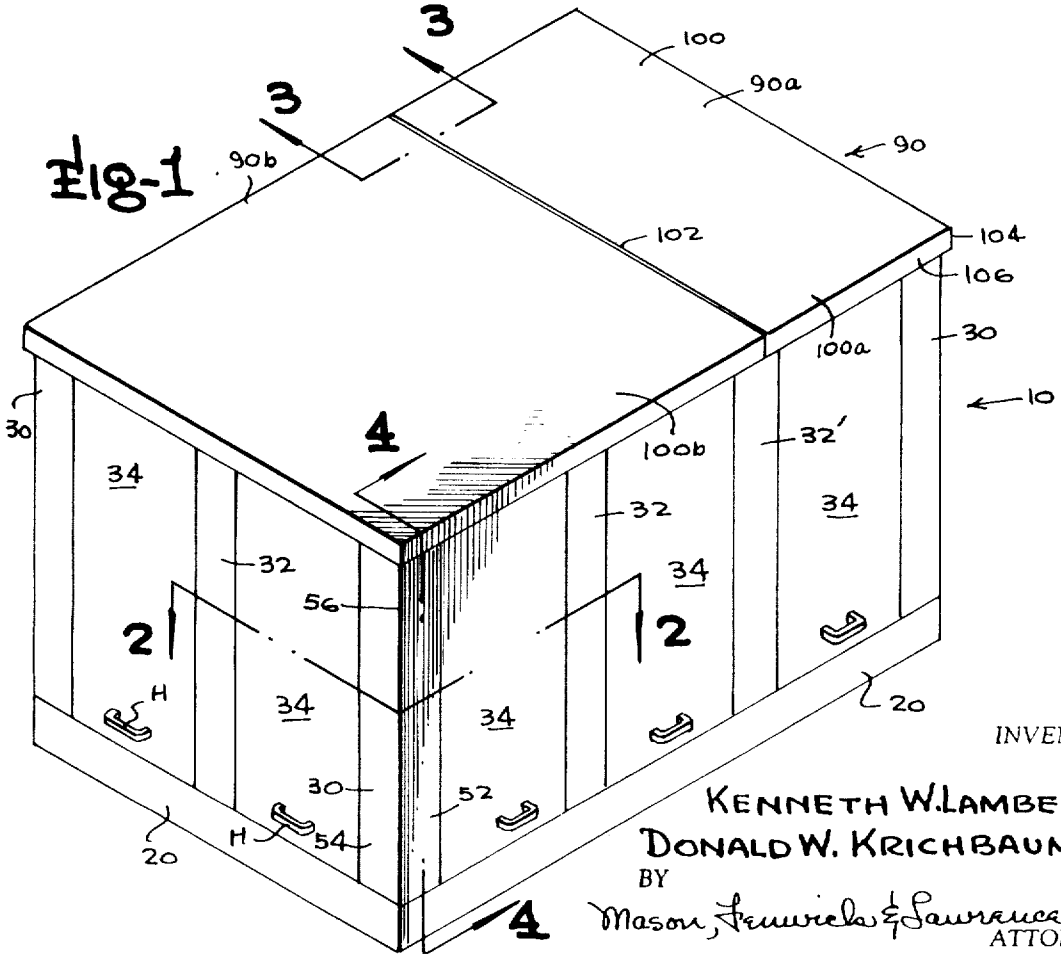


Fig-1

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Fig-4

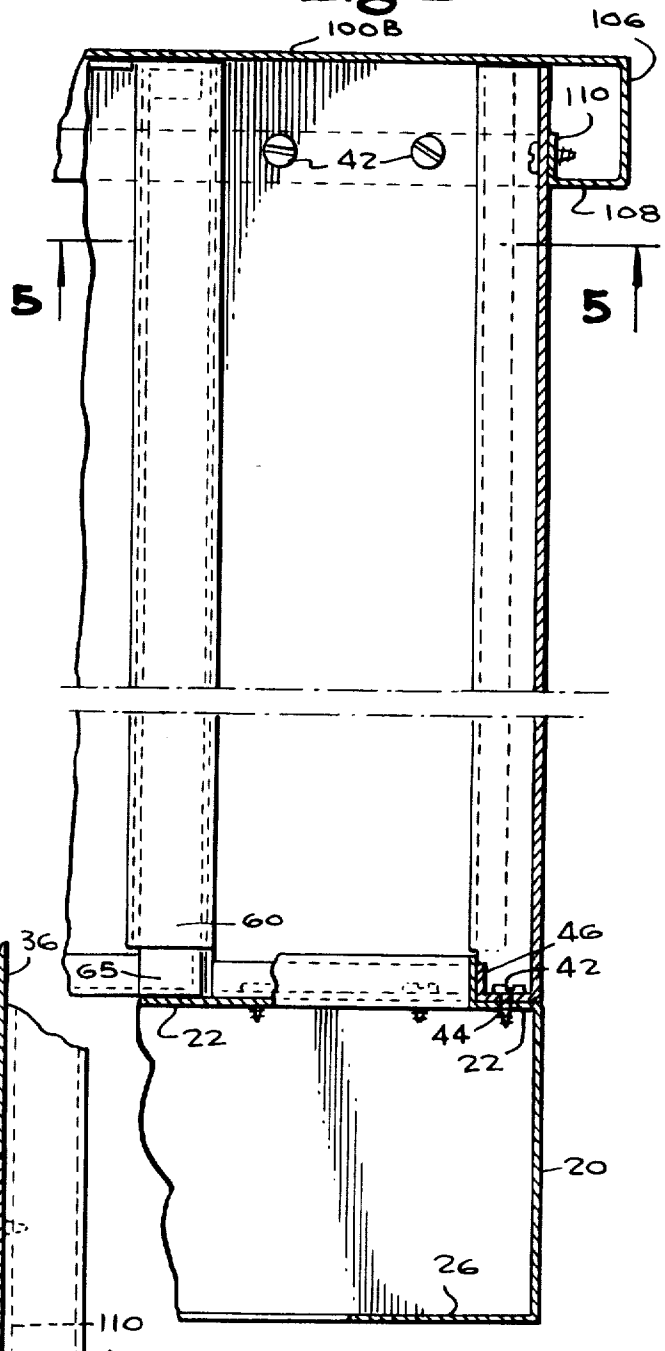


Fig-6

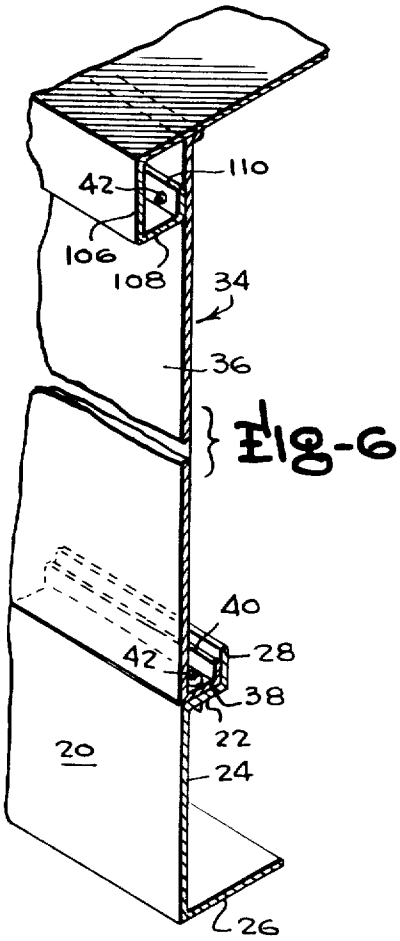
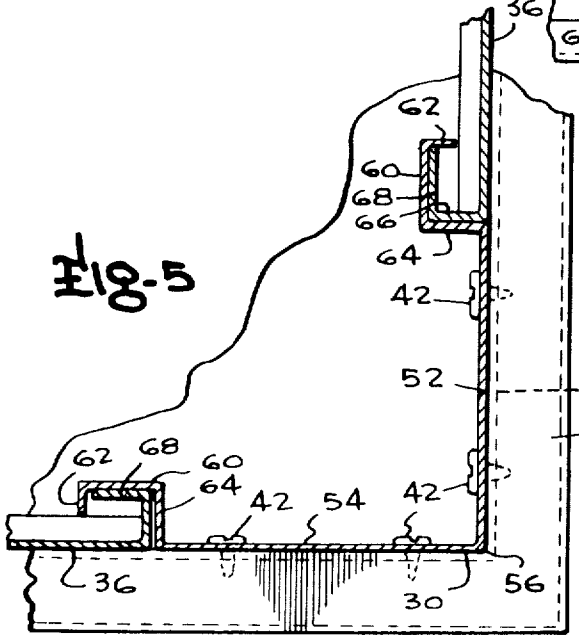


Fig-5



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Fig-7

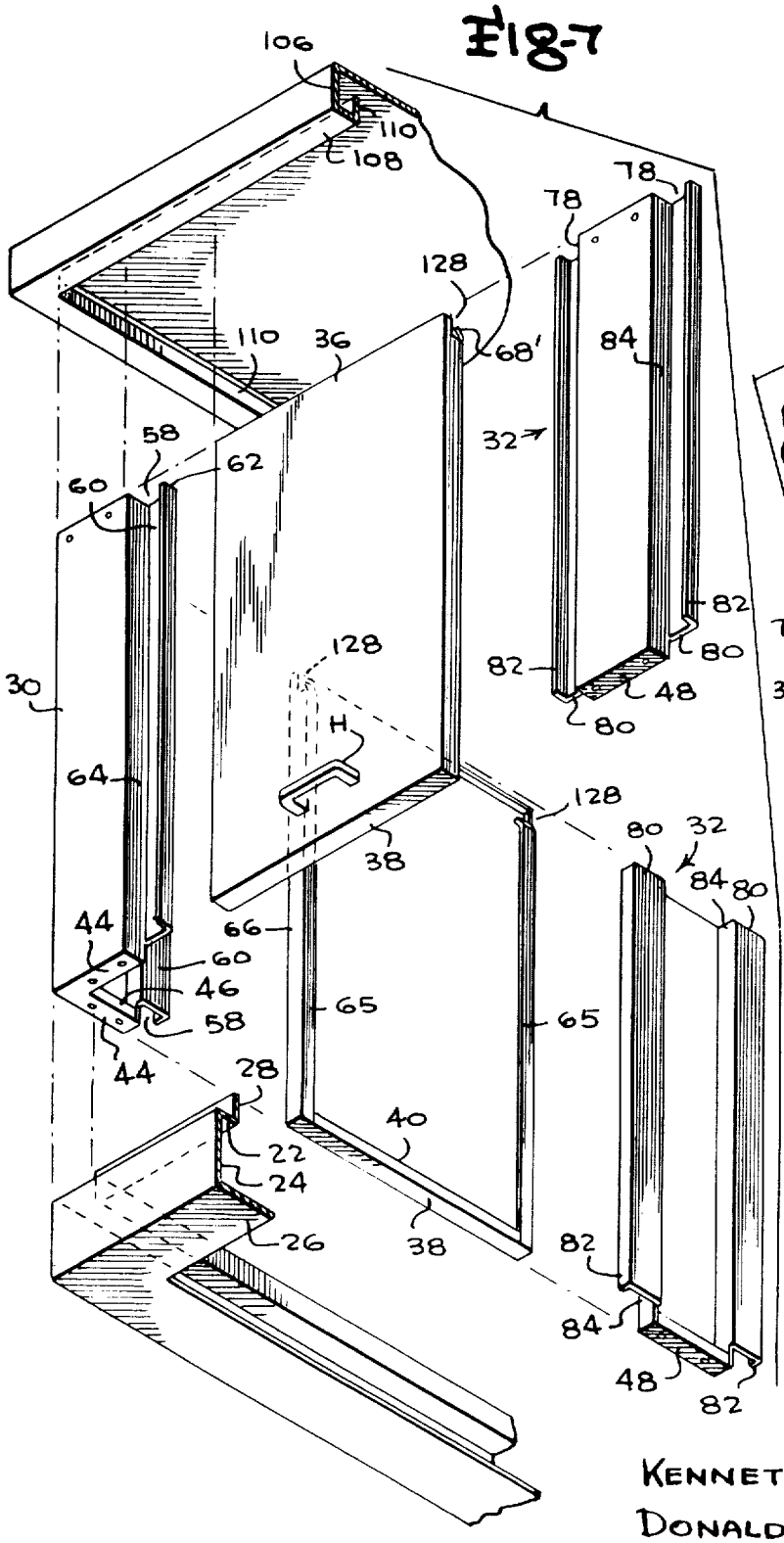


Fig-8

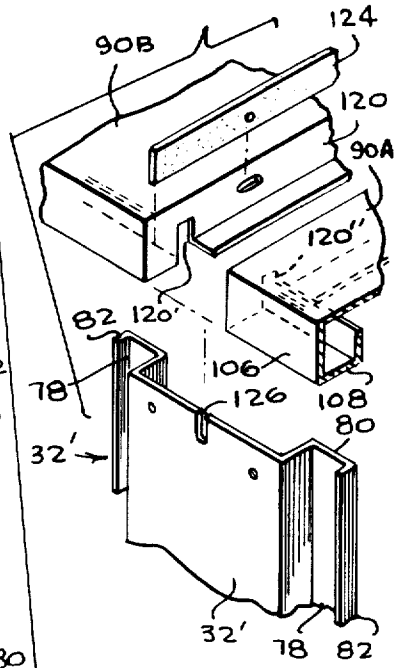
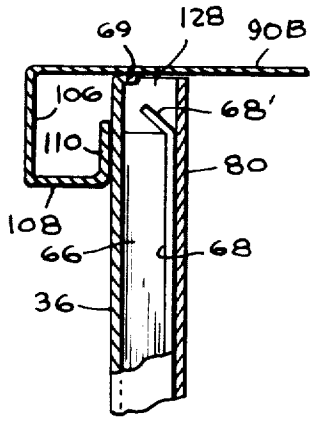


Fig-9



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WEATHERPROOF ENCLOSURE

This invention is in the field of enclosures and is particularly directed to a sheet-metal type enclosure formed of extruded, stamped or otherwise fabricated metal components which are assembled to provide a weatherproof structure. The primary purpose of such a structure is for housing air conditioning equipment, heating equipment or the like on the roof of a building.

Numerous expedients have been employed in the past in providing enclosures for air conditioning equipment and the like; however, a number of problems have arisen by virtue of the fact that many of the prior known devices have been prone to eventual leakage so that moisture can enter the interior of the device. Consequently, the optimum protection required for the devices on the interior of the enclosure is not obtained. Moreover, many of the prior known devices are of limited internal volumetric capacity and, as a consequence, have not been adequate for environmentally protecting equipment of substantial size.

Additional problems which the prior devices have suffered from include difficulty in assembly, high cost of production and assembly and difficulty in enabling access to the interior of the enclosure.

Therefore, it is the primary object of this invention to provide a new and improved weatherproof enclosure that is economical to construct, assemble and maintain.

An understanding of the manner in which the object of this invention is obtained will be better understood with reference to the following written description and the drawings, in which:

FIG. 1 is a perspective view of the preferred embodiment of the invention;

FIG. 2 is a sectional view taken along lines 2—2 of FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 1;

FIG. 4 is a sectional view taken along lines 4—4 of FIG. 1;

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 4;

FIG. 6 is an end perspective view illustrating the manner of connection of a number of the inventive components;

FIG. 7 is an exploded perspective view of a portion of the preferred embodiment;

FIG. 8 is an enlarged perspective view illustrating one aspect of the preferred embodiment; and

FIG. 9 is a sectional view taken along lines 9—9 of FIG. 3.

Attention is initially invited to FIG. 1 of the drawings which illustrates the preferred embodiment generally designated 10 which would normally be mounted on a roof or supporting slab and which includes a peripheral base frame 20 of rectangular configuration which provides support for the remaining components; FIG. 6 illustrates the cross-sectional shape of frame 20. It should be noted that frame 20 includes an upper surface formed of an inwardly extending horizontal support flange 22 extending inwardly from the external periphery of the flange which is defined by a vertical web member 24 and which, in turn, is connected to a horizontal base plate 26. A vertically extending positioning flange 28 extends upwardly from the innermost edge of horizontal support flange 22.

Base frame 20 provides support for four corner post members 30 (FIG. 1) extending upwardly from the base frame. Additionally, base frame 20 also provides support for a plurality of intermediate vertical post members 32 and a plurality of side panel members 34 which are provided in each of the walls of the enclosure 10 with the vertical post members 32 and the corner members 30 serving to separate the panel members.

The side panel 34 will now be discussed with initial reference being made to FIG. 6 which illustrates a side panel member 34 as associated with the base frame 20. Each side panel member includes a main panel 36, the lower edge of which is defined by a main panel horizontal abutment flange 38 which extends inwardly from the main panel 36 and which terminates in a vertical abutment flange 40 which is facingly engaged with the outer face of the vertical positioning flange 28 as shown in the drawings. The horizontal abutment flange 38 is facingly engaged with the horizontal support flange 22 in an obvious manner and a handle H is provided adjacent the lower end of the main panel 36 for enabling placement and removal of the panel. The main panels are normally retained in position by frictional engagement with the associated elements of which they engage as will be discussed in detail hereinafter; however, should it be desired to retain the panels in a more or less permanent installed condition, access screws such as screw 42 in FIG. 6 can be provided to extend through the flanges 38 and 22 to retain the panel in relatively permanent position.

Each of the vertical corner post members 30 is attached to the base frame by screw members 42 extending through flange 22 and a horizontal abutment flange 44 which is analagous to the horizontal abutment flange 38 of the side panel. A vertical abutment flange 46 (FIG. 7) which is analagous to the vertical abutment flange 40 of the side panel member is provided along the innermost edge of flange 40 for engagement with vertical positioning flange 28.

In like manner, the intermediate vertical frame members 32 are also provided adjacent their lowermost ends with a horizontal abutment flange 48 (FIG. 7) and a vertical abutment flange 50 with screw members 42 connecting the vertical posts to the base frame 20 in the same manner as the previously discussed connection of the corner posts to the base frame.

A weatherproof connection between the side panel members and the corner posts is enabled in a manner best illustrated in FIG. 5. It should be noted that the corner post 30 is formed of first and second perpendicular external panels 52 and 54 joined at an apex 56. The edges of the external side panels opposite the apex are provided with vertical grooves 58 (FIG. 7) which extend along the entire length of each edge of the external panels. Outwardly facing grooves 58 are defined by an inwardly positioned base plate 60 from which outwardly extending ribs 62 and 64 extend. It should be noted that ribs 64 are connected to the outermost edge of the external panel 52 or 54. It should also be noted that the width of rib 62 is substantially less than the width of rib 64 as will be apparent from inspection of FIG. 5.

Each of the side panels 34 is provided along its vertical edge with an inwardly extending linear channel lug 65 (FIG. 7) which is matingly received in grooves 58 and which is in the form of an inwardly extending side wall 66 and a floor plate 68. The upper end of the main panel member 36 is provided with a top flange 69 (FIG. 9) which extends inwardly a slight distance and the upper edge of the side wall 66 terminates at a small distance beneath the top flange 69. Moreover, the uppermost end of the plates 68 is in the form of an inwardly extending tab 68' extending toward the main panel member 36. The reason for providing the tab 68' and the shortened upper flange 69 is to permit the lower end of the access panel to be pulled outwardly by the handle member H in order to enable an easy insertion or removal of the panel. However, the upper edge of the members 66 and 68' is within the confines of the top or cover which will be discussed hereinafter. Consequently, a weathertight connection is enabled between the edges of the side panels 36 and the vertical corner post members 30 when lug 65 is in groove 58.

Additionally, the intermediate vertical post members are provided with vertically extending grooves 78 along each edge thereof as shown in FIG. 7 with the grooves 78 (FIGS. 7, 8) formed of a base plate 80 analagous to base plate 60 and of equal dimensions and shape as plate 60 and, a rib 82 analagous to rib 62 and a second rib 84 analagous to rib 64. Consequently, the grooves 78 on each edge of the intermediate vertical post members are of identical size, shape and dimension as the grooves on each edge of the corner post members as previously discussed.

The lower ends of the members 80, 82 terminate above the bottom plate 48 a distance slightly greater than the distance from the top of the horizontal support flange 22 to the top edge of the vertical positioning flange 28. Consequently, the base plate 80 is received in vertical alignment with the vertical

positioning flange **28**. Similarly, the lower ends of members **60**, **62** and **64** are positioned above the upper edge of the vertical positioning flange **28** as shown in FIG. 7.

A top or cover generally designated **90** rests upon the upper ends of the vertical corner post **30**, the side panel **34** and the intermediate vertical post **32**. Top **90** is divided into two cover member portions **90***a* and **90***b* each of which includes a main top planar panel member **100***a* and **100***b* respectively, and which are joined along a linear line **102** extending transversely across the width of the enclosure **10** as best shown in FIG. 1. The manner of connection between the top components will be discussed in detail hereinafter.

Top **90** is provided with a peripheral rim **104** extending about its entire periphery and overlapping the upper ends of the vertical corner posts, the intermediate posts and the side panels in an obvious manner. Peripheral rim **104** is formed of a downwardly extending rim flange **106** and an inwardly extending lower panel **108** which terminates along its innermost edge in an upwardly extending fastening flange **110**. The details of the rim construction are best illustrated in FIG. **4**. Screw members **42** on the inside of the enclosure extend outwardly through the vertical post in the permanently installed side panels. However, it should be kept in mind that those side panels which are not permanently installed are retained in position by the frictional engagement between flanges **22** and **38** and the fact that the upper end of the panel cannot move outwardly due to its abutment with flange **110**. Moreover, the panel cannot move inwardly due to the engagement of each edge with the corner members or the intermediate vertical posts.

Additionally, screw members **42** are provided on the inside of the enclosure extending outwardly from each of the vertical post members for connection to the fastening flange **110** for retaining the top in place on the enclosure. However, in some circumstances, it may be desirable to eliminate the screws for retaining the top in position when it is desirable to be able to obtain easy access to the interior of the enclosure by removal of the top. However, such an expedient would not be feasible for obvious reasons in locations in which heavy winds may be prevalent.

Turning now to FIG. 3, it should be noted that the line of connection **102** between the two components **90***a* and **90***b* of the top is defined by a downwardly extending L-shaped channel member **120** extending integrally downward from the cover portion **90***b*. Similarly, an L-shaped flange **122** extends downwardly from portion **90***a* and is matingly engageable with the member **120** with an elastomeric seal member **124** being positioned between the elements **122** and **120** to provide a weathertight seal. It should also be noted that the line of connection **102** is positioned in alignment with a modified intermediate post **32'** which has a slot **126** formed in its upper edge for the purpose of mating with a pair of slots **120'** and **120''** respectively formed in the vertical portions of members **120** and **122** outwardly of the horizontal portions of said members. The slots **120'** and **120''** are in facing adjacent relationship with respect to each other and are in vertical alignment with slot **126**. Additionally, it should be noted that the top component parts **90***b* and **90***a* are fixed to each other by means of screws **42'** extending through the elements **120**, **122** and **124** as best shown in FIG. 3. Screws **42'** serve to clamp seal member **124** between elements **120** and **122** to provide a weatherproof construction.

The upper ends of the members **65** terminate below the upper edge of the main panel members **36** to provide a notch **128** adjacent each side of the panel members as shown in FIG. 7. The purpose of notch **128** is to enable the panel bottom portion to be pivoted outwardly by handle **4** to remove or insert a single panel from the enclosure and to permit access to the interior of the enclosure. Obviously, such a removable panel would not be attached to the remainder of the enclosure by means of screws **42**; however, the force of friction will retain the panels **34** in position. Moreover, a simple latch adjacent the bottom of the panel and connected to the frame **20** could be used to retain the bottom portion of the panel in position. The engagement of the upper edge of panel **36** with the fastening flange **110** of the top and members **80** etc. will retain the top of the panel in position as was noted previously. Consequently, such a removable panel could be easily removed for obtaining access to the interior of the enclosure.

Therefore, it will be seen that the subject invention provides a uniquely versatile enclosure that could be of any desired size and which can be easily assembled with a minimum of cost and effort. Numerous modifications will occur to those skilled in the art and it should be understood that the scope of the invention should be limited solely by the appended claims.

We claim:

1. An enclosure for providing a weatherproof structure in which air conditioning, heating or the like units can be installed, said enclosure comprising a peripheral base frame of rectangular configuration having an upper surface formed of an inwardly extending horizontal support flange extending inwardly from the external periphery of said base frame and a vertically extending positioning flange extending upwardly from said horizontal support flange, corner post members attached to and extending upwardly from the corners of said base frame, each of said corner post members including first and second perpendicular external panels joined at an apex and an outwardly facing linear groove extending along each vertical edge opposite from said apex with each of said outwardly facing grooves being formed of an inwardly positioned base plate and outwardly extending ribs extending outwardly from each edge of said base plate, side panel members each including a main panel, and channel lugs extending along each vertical edge of said main panel members of a side wall connected along one vertical edge of said main panel member and on an inner edge to a floor plate oriented perpendicular to said side walls, said channel lugs being matingly received in said outwardly facing grooves, said side panel members being positioned intermediate said corner members for providing a resultant enclosure wall, the lower ends of said corner posts being defined by a horizontal abutment flange engagingly extending inwardly from said external panels along the upper surface of said horizontal support flange and a vertical abutment flange extending along an inner edge of said horizontal abutment flange and engaging said positioning flange, the lower ends of said side panel members being defined by a main panel horizontal abutment flange engagingly extending inwardly from said main panel along the upper surface of said horizontal support flange and a vertical abutment flange extending along an inner edge of said main panel horizontal abutment flange and engaging said positioning flange, a cover having a peripheral rim extending about an upper edge of said corner posts and said side panel members, fastening means accessible solely from the interior of said enclosure for fastening the lower ends of said corner posts to said horizontal support flange and for fastening the upper ends of said corner posts to said peripheral rim and wherein said cover comprises a main top panel and said peripheral rim is defined by a peripheral downwardly extending rim flange extending downwardly from the outer edge of said main top panel, an inwardly extending lower panel extending inwardly from the lower edge of said peripheral downwardly extending rim and an upwardly extending fastening flange extending upwardly from the innermost edge of said inwardly extending lower panel and positioned in abutting relationship with respect to said main panel members and said first and second perpendicular external panels of said corner post.

2. The invention of claim **1** wherein means for fastening the lower ends of said corner posts to said horizontal support flange comprises screw members extending downwardly through said horizontal abutment flange members into said upper surface of said horizontal support flange.

3. The invention of claim **1** wherein said fastening means for fastening said peripheral rim to the upper ends of said corner posts comprises screw means extending outwardly through said first and second perpendicular external panels of said

corner posts for threaded engagement with said vertical upwardly extending fastening flange of said cover.

4. The invention of claim 1 additionally including intermediate vertical post members attached to said base frame intermediate said corner post members.

5. The invention of claim 4 wherein there are a plurality of side panel members in each wall of said enclosure with said intermediate vertical post members being individually positioned between the side panels with each vertical post member being provided with outwardly facing linear grooves along each vertical edge identical in size and configuration to the grooves along each edge of said vertical post members so that the channel lugs of said side panels can be matingly received in said grooves on each edge of said intermediate vertical post members.

6. The invention of claim 5 wherein each of said intermediate vertical post members in each of the walls of said enclosure is in lateral alignment with another intermediate vertical post member of the opposite wall.

7. The invention of claim 6 wherein said main top panel and downwardly extending peripheral rim cover member is divided into two cover member portions along a linear line extending across the width of said cover member with one of said portions having a downwardly extending L-shaped channel member and the other of said portions having a downwardly extending L-shaped flange and additionally including an elastomeric sealing element between said downwardly extending sealing L-shaped channel member and said L-shaped flange to provide a weathertight seal.

8. The invention of claim 7 wherein said linear line dividing said top panel into two cover members extends across the top of the two aligned intermediate post members and a slot is provided in the top edge of said post members for receiving end portions of said L-shaped channel member and said L-shaped flange.

9. The invention of claim 1 wherein said main top panel and downwardly extending peripheral rim cover member is divided into two cover member portions along a linear line extending across the width of said cover member with one of said portions having a downwardly extending L-shaped channel member and the other of said portions having a downwardly extending L-shaped flange and additionally including an elastomeric sealing element between said downwardly extending sealing L-shaped channel member and said L-shaped flange to provide a weathertight seal.

10. The invention of claim 9 wherein means for fastening the lower ends of said corner posts to said horizontal support flange comprises screw members extending downwardly through said horizontal abutment flange members into said upper surface of said horizontal support flange.

11. The invention of claim 10 wherein said fastening means for fastening said peripheral rim to the upper ends of said corner posts comprises screw means extending outwardly through said first and second perpendicular external panels of said corner posts for threaded engagement with said vertical upwardly extending fastening flange of said cover.

12. The invention of claim 11 additionally including intermediate vertical post members attached to said base frame between the said corner post members.

13. The invention of claim 12 wherein there are a plurality of side panel members in each wall of said enclosure and said intermediate vertical post members are individually positioned between the side panels with each vertical post member being provided with outwardly facing linear groove along each vertical edge identical in size and configuration to the grooves along each edge of said vertical corner post members so that the channel lugs of said side panels can be matingly received in said grooves on each edge of said intermediate vertical post member.

* * * * *