

[72] Inventor **Wayne C. Tam**
Monterey Park, Calif. (752 La Portada,
South Pasadena, Calif. 91030)

[21] Appl. No. **828,654**
[22] Filed **May 28, 1969**
[45] Patented **May 25, 1971**

FOREIGN PATENTS

814,281	6/1959	Great Britain.....	52/235
---------	--------	--------------------	--------

OTHER REFERENCES

Sweets Architechtural File of 1956 Lib. No. TH455, S8c2,
Vol. 17; 17a Sec. Bay p. 23

Primary Examiner—Henry C. Sutherland

Assistant Examiner—Sam D. Burke, III

Attorney—Paul M. Coble

[54] PANEL FRAME ASSEMBLY
7 Claims, 6 Drawing Figs.

[52] U.S. Cl..... 52/656,
52/475

[51] Int. Cl. E04c 2/38

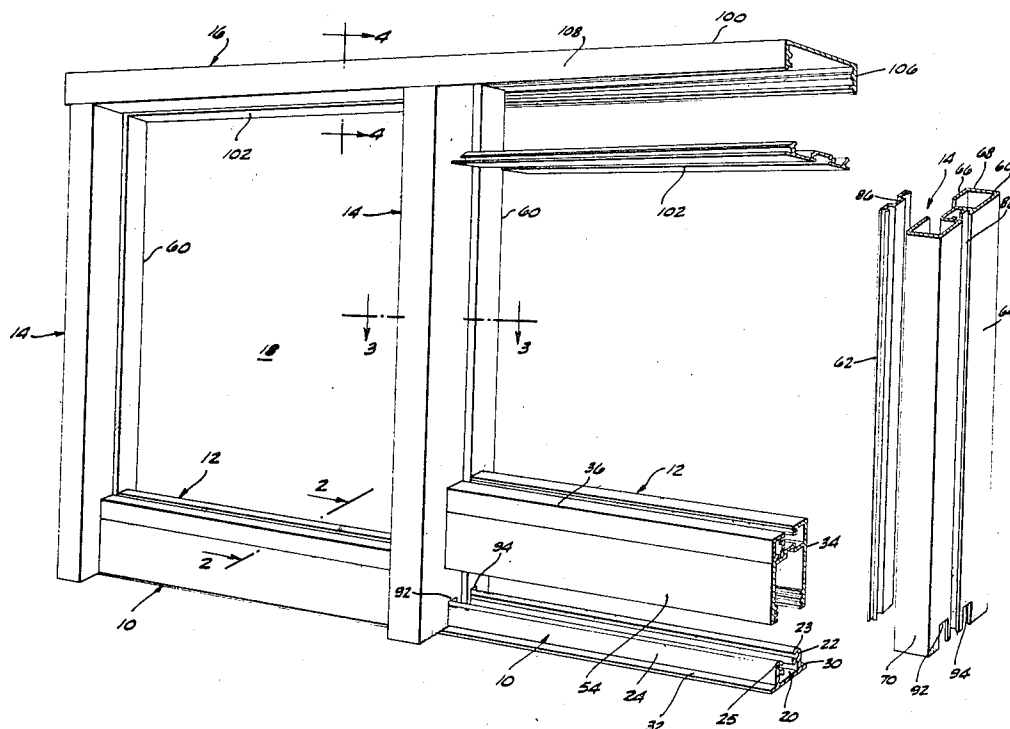
[50] **Field of Search**..... 52/97, 475,
498, 664, 665, 235, 656, 455, 476

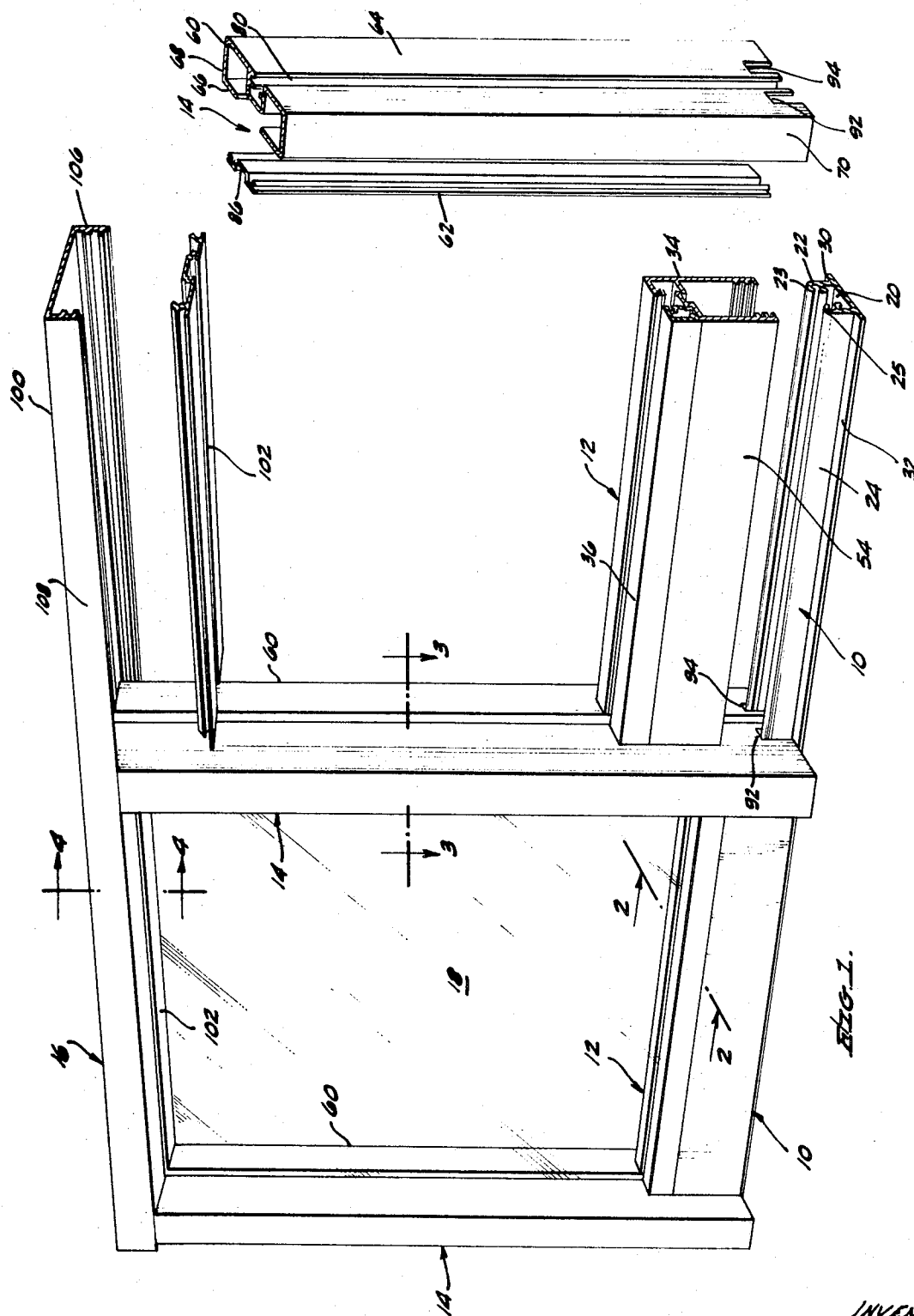
References Cited

UNITED STATES PATENTS

1,471,020	10/1923	Zahner	52/475
2,949,985	8/1960	Becker et al.	52/455(X)
3,205,630	9/1965	Felix et al.	52/455(X)
3,267,629	8/1966	Waring et al.	52/475(X)
3,323,270	6/1967	DiCesare et al.	52/476(X)
3,388,514	6/1968	Archinal et al.	52/97
3,389,527	6/1968	Collard	52/656(X)

ABSTRACT: In a disclosed panel frame system at least one sill assembly is supported by an elongated base member, with a pair of vertically extending mullion or jamb assemblies disposed on the base member at opposite ends of the sill assembly, and with an elongated head channel assembly secured to the ceiling in alignment with the base member. The sill, mullion, and head channel assemblies each include a removable plate which may be snapped into rigid mating relationship with the sill, mullion, or head channel members. The inwardly facing surfaces of the sill, mullion and head channel plates may be provided with a panel receiving recess. The lower extremity of a mullion member broad wall defines a pair of notches which snugly receive flanged sidewalls of the base member. A single base rail embodiment and a ledge sill embodiment of the frame system are also disclosed.





INVENTOR.
WAYNE C. TAM,
BY
Paul M. Coffe

ATTORNEY.

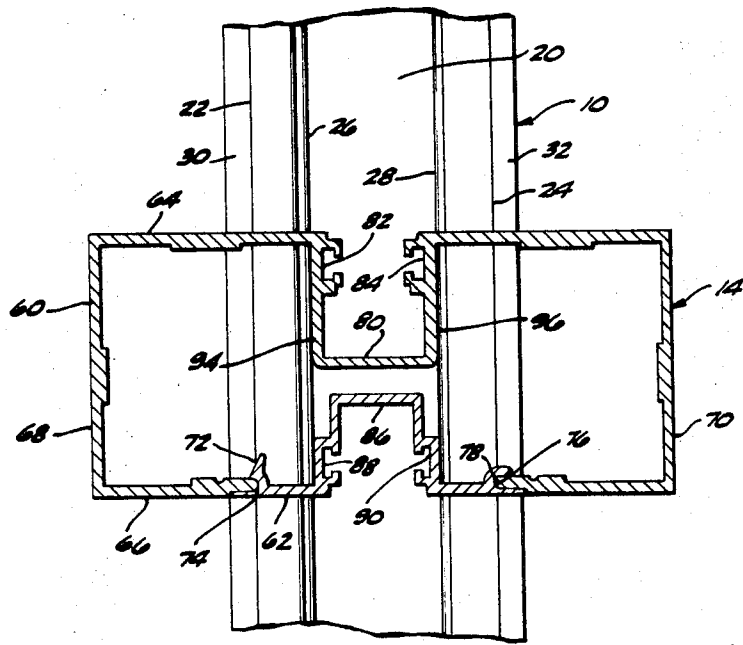


FIG. 3.

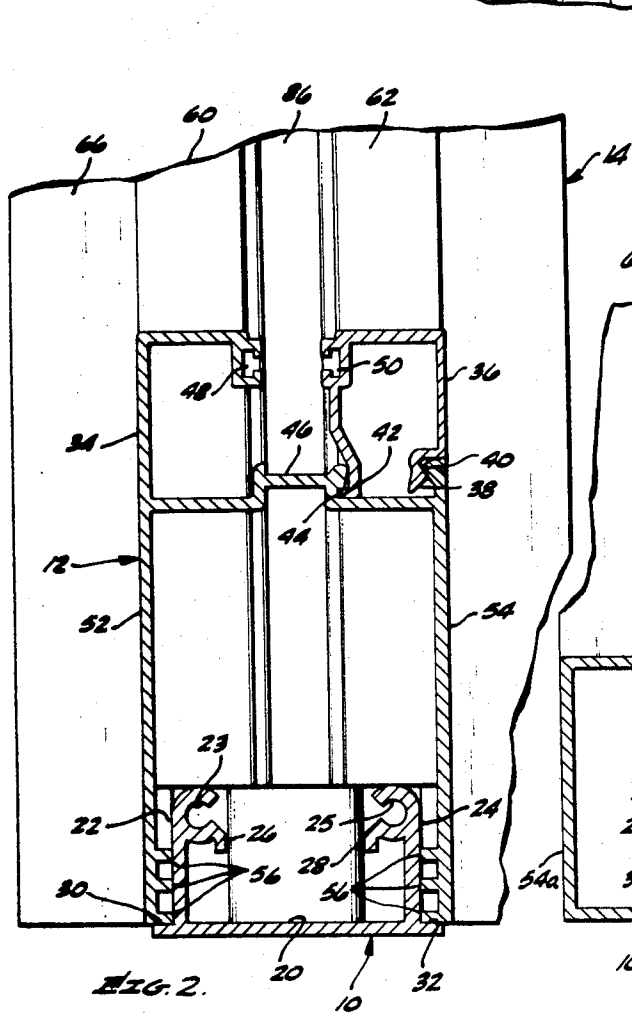


FIG. 2.

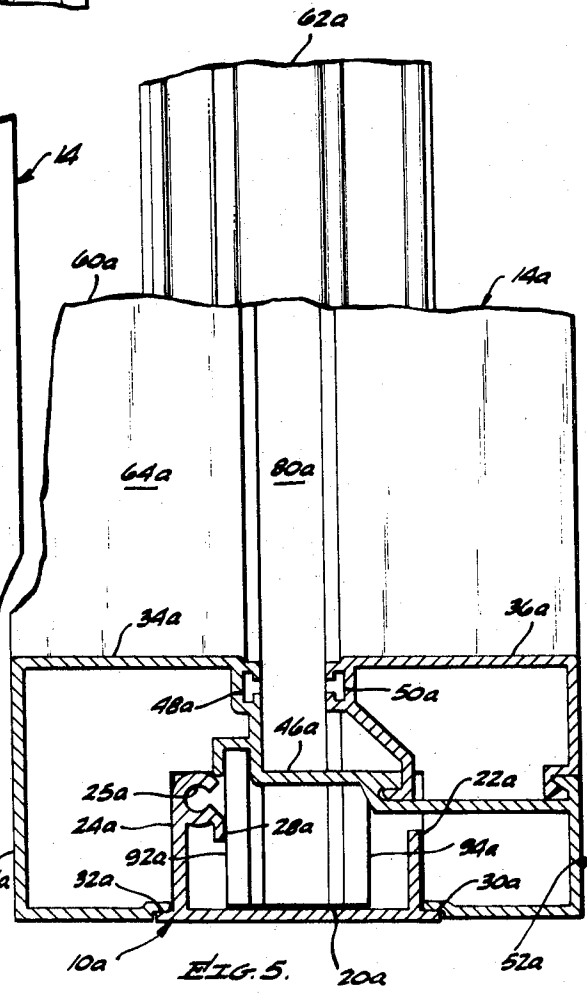
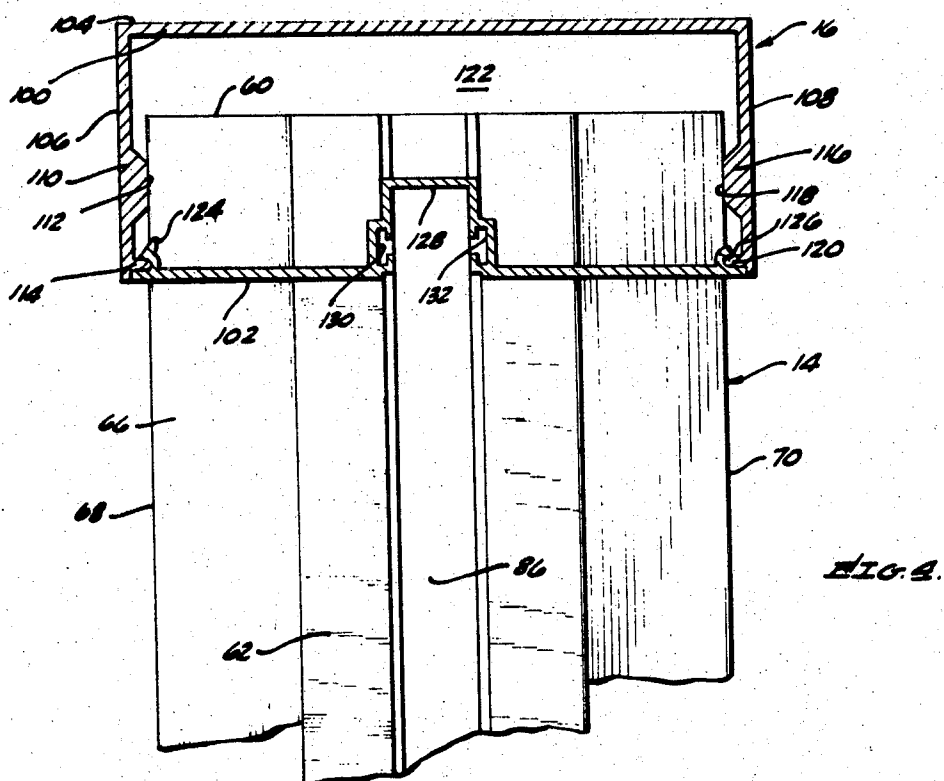


FIG. 5.



PANEL FRAME ASSEMBLY

This invention relates to panel framing, and more particularly relates to a readily assembled and disassembled frame system for doors, windows, and the like.

It is an object of the present invention to provide a frame system of the foregoing type which requires fewer parts and which can be assembled and disassembled in considerably less time than prior art frame systems of this type.

It is a further object of the present invention to provide a panel frame assembly in which the various frame members are held in a rigid secured relationship without the use of screws or clips between the various frame members.

It is a still further object of the present invention to provide a panel frame system which is highly versatile and which permits relatively wide dimensional tolerances in some of the frame parts.

In accordance with these objects, a panel frame assembly according to the invention includes a sill arrangement mounted on a base member having a bottom wall and a pair of parallel sidewalls. Vertical frame members are disposed on the base member at opposite ends of the sill arrangement. Each vertical frame member has a pair of sidewalls and a broad wall disposed perpendicular to the base member sidewalls. An elongated plate is adapted to contact each vertical frame member in engaging relationship therewith at a location opposite to each broad wall. An elongated head channel member is adapted to be affixed to a ceiling surface in substantial alignment with the base member. The head channel member has a top wall and a pair of sidewalls disposed parallel to the base member sidewalls and spaced from one another by a distance greater than the width of the vertical frame member broad wall, each head channel member sidewall being adapted to contact the outer surface of the adjacent sidewall of each vertical frame member. An elongated head channel plate is adapted to contact the head channel member in engaging relationship therewith at a location opposite to its top wall.

Additional objects, advantages, and characteristic features of the invention will become readily apparent from the following detailed description of preferred embodiments of the invention when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view, partly in exploded form, illustrating a panel frame assembly in accordance with an embodiment of the invention;

FIGS. 2, 3 and 4 are cross-sectional views taken along lines 2-2, 3-3, and 4-4, respectively, of FIG. 1;

FIG. 5 is a sectional view similar to FIG. 2 but taken from the opposite side of the vertical frame member for an alternate embodiment of the invention; and

FIG. 6 is a perspective view illustrating still another embodiment of the invention.

Referring to the drawings with greater particularity, the left side of FIG. 1 illustrates one section of a panel frame system according to the invention in assembled relationship, the right side illustrating an adjacent section of the frame system with the various parts shown in exploded form in order to better illustrate their construction details and their manner of assembly. As used herein the word "panel" refers to the element being framed and may be a door, window, wall, or other partitioning member. Although the panel is usually of glass, it alternatively may be of metal, wood, or other material. The frame members are preferably of a rigid, light, and durable metal such as aluminum.

As shown in FIG. 1, a frame system according to the invention comprises an elongated base member 10 which may be securely fastened to the floor, a sill assembly 12 supported by the base member 10 and which serves as the bottom frame element, vertically extending mullion or jamb assemblies 14 disposed on the base member 10 at opposite ends of the sill assembly 12 and which serve as the side frame elements, and an elongated head channel assembly 16 which is secured to the ceiling in alignment with the base member 10 and which serves as the top frame element. For exemplary purposes, a

glass window panel 18 is shown framed within the elements 12, 14 and 16.

Referring to FIGS. 1 and 2, the base member 10 has a bottom wall 20 and a pair of parallel sidewalls 22 and 24 extending upwardly from the bottom wall 20 in tracklike fashion. Sidewalls 22 and 24 define near their upper extremities respective inwardly projecting longitudinal flange portions 23 and 25 essentially in the form of a screw race, i.e., having an essentially C-shaped cross section. The bottom legs of the respective C-shaped flange portions 23 and 25 define elongated flat surfaces 26 and 28, respectively, extending parallel to the walls 22 and 24. The base member bottom wall 20 defines a pair of ledge portions 30 and 32 which extend laterally outwardly beyond the respective sidewalls 22 and 24.

The sill assembly 12 includes a sill member 34 and a cooperating removable sill member 36 securely engageable with one side of the upper portion of sill member 34. Removable sill member 36 is made sufficiently resilient so that beveled lower edge 38 of its outer sidewall is slidable over curved flanged surface 40 of sill member 34 while flange portion 42 on the lower edge of the opposite sidewall of removable member 36 resides in groove 44 of the member 34 to facilitate insertion of the removable member 36 into rigid mating relationship with the member 34 in the position shown in FIG. 2. Removal of member 36 allows for insertion of the door or window panel with its bottom edge resting against sill member surface 46 and the subsequent retaining of the panel in secured relationship after the removable sill member 36 has been inserted into its mating relationship with the sill member 34. Opposing inner portions of the sill members 34 and 36 may define elongated recesses 48 and 50, respectively, in order to accommodate weatherstripping in the event the panel being framed is of glass.

The sill member 34 defines a pair of parallel sidewalls 52 and 54 extending downwardly from the panel supporting surface 46 at locations laterally outwardly of the respective base member sidewalls 22 and 24. The sill member sidewalls 52 and 54 each define near their lower extremity a plurality of inwardly projecting longitudinal ridges 56. The walls 52 and 54 are sufficiently resilient so that the sill member 34 may be mounted on the base member 10 with the inner flat surfaces of the ridges 56 contacting and being urged against the base member sidewalls 22 and 24, and with the bottom surface of each lowermost ridge 56 resting on the adjacent base member ledge portion 30 or 32.

The described base member and sill arrangement possesses several advantageous features. By supporting the sill assembly 12 on the base member ledge portions 30 and 32, uniform support may be provided for the sill assembly 12 even though the floor on which the frame is mounted may not be level. The plurality of ridges 56 provides an extended contact area between the sill member 34 and the base member 10 in order to more securely hold these members in their desired assembled relationship, and in addition prevents water from rising by capillary action between the adjacent sill and base member sidewalls 52 and 22 (or 54 and 24).

Referring to FIGS. 1-3, the mullion or jamb assemblies 14 may be seen to comprise a mullion or jamb member 60 and a cooperating removable plate 62 securely engageable with one wall of the member 60. Specifically, mullion member 60 has a pair of opposite broad walls 64 and 66 and a pair of opposite sidewalls 68 and 70, with broad wall 66 defining an elongated central opening to accommodate the removable plate 62. The walls of mullion member 60 are made sufficiently resilient so that beveled surface 72 near one edge of plate 62 is slidable over curved end surface 74 of wall 66 while groove 76 at the opposite edge of plate 62 engages curved surface 78 on the opposite edge of wall 66 to facilitate insertion of plate 62 into rigid mating relationship with member 60 in the position shown in FIG. 3.

Mullion member broad wall 64 may define in its central portion an elongated recess 80 for receiving the panel being framed. Opposing portions of sidewalls 94 and 96 of recess 80

may define further elongated recessed portions 82 and 84, respectively, in order to accommodate weatherstripping in the event the panel is of glass. Similarly, plate 62 may define a panel receiving recess 86, the sidewalls of which may define elongated weatherstrip receiving recesses 88 and 90, respectively. It is pointed out that the panel receiving recesses 80 and 86 are used only for window or wall panels. When a door is being framed recesses 80 and 86 would be omitted, leaving a flat outer surface along mullion broad wall 64 or plate 62 (whichever surface is adjacent the door).

As may be seen from FIG. 1, the bottom portion of mullion broad wall 64 defines a pair of notches 92 and 94, respectively, extending upwardly from the bottom edge of the wall on opposite sides of the recess 80. The notches 92 and 94 are dimensioned to snugly fit over the sidewalls 24 and 22, respectively, of the base member 10 and their inwardly extending C-shaped screw race portions 25 and 23, respectively, when the mullion assembly 14 is inserted in its assembled position over the base member 10.

When in this assembled position, the bottom of mullion member 60 rests on base member ledge portions 30 and 32, with the bottom edge of plate 62 (which is in mating relationship with member 60) resting on the upper surface of screw race portions 23 and 25, as shown in FIG. 2. The inner edges of mullion member broad wall 66 contact the outer surfaces of base member sidewalls 22 and 24. The notches 92 and 94 in mullion member broad wall 64 contact the outer surfaces of respective base member sidewalls 24 and 22, as well as respective surfaces 28 and 26 at the lower inner edges of screw races 25 and 23, respectively. Thus, six surfaces of contact are provided between the mullion assembly 14 and the base member 10 (four by the mullion wall 64 and two by the mullion wall 66), thereby preventing the mullion assembly 14 from both lateral movement, i.e., movement in a direction perpendicular to the length of the base member 10, and rotational movement about a vertical axis. When mullion wall 64 is provided with panel receiving recess 80, the outer surfaces of the sidewalls 94 and 96 of the recess 80 contact respective flat surfaces 26 and 28 of the base member screw race portions 23 and 25, respectively, thereby providing extended surfaces which further prevent the mullion assembly 14 from the aforementioned lateral and rotational movement. When the sill assemblies 12 are in their assembled position on the base member 10 their ends abut broad walls 64 and 66 of the mullion assembly 14, thereby preventing the mullion assembly from moving longitudinally along the base member 10.

By mounting the mullion assembly 14 on the base member ledge portions 30 and 32, not only is the mullion assembly uniformly supported, but in addition, space is provided below the mullion assembly to facilitate the drainage of water. Drainage may be further enhanced by providing holes (not shown) in the base member sidewalls 22 and 24 to allow water in the interior regions of the frame assembly to run out into the space below the mullion assemblies.

Referring to FIGS. 1 and 4, the head channel assembly 16 may be seen to comprise an elongated head channel member 100 and one or more removable plates 102 each having a length essentially equal to that of a panel being framed. The head channel member 100 may be affixed to a ceiling surface and disposed substantially in alignment with and longitudinally coextensive with the base member 10. Each removable plate 102 may be secured to a portion of the head channel member 100 in rigid mating relationship therewith.

Head channel member 100 has a top wall 104 and a pair of parallel sidewalls 106 and 108, respectively. The sidewalls 106 and 108 are spaced from one another by a distance slightly greater than the overall width of mullion member broad wall 64 so that the top of mullion member 60 may snugly fit between the head channel member sidewalls 106 and 108.

As may be seen from FIG. 4, head channel member sidewall 106 defines a first inwardly projecting longitudinal flange 110 having an extended flat surface 112 and further defines near its lower extremity a second inwardly projecting longitudinal

flange 114 having a curved edge. Head channel member sidewall 108 is similarly provided with a first inwardly projecting longitudinal flange 116 having an extended flat surface 118 and near its lower extremity with a second inwardly projecting longitudinal flange 120 having a curved edge. Head channel flange surfaces 112 and 118 (and also the edges of flanges 114 and 120) are adapted to contact mullion member sidewalls 68 and 70, respectively, and thereby preclude the mullion assembly 14 from both lateral movement and rotational movement about a vertical axis.

It should be noted that head channel member 100 is mounted so as to leave a space 122 between its top wall 104 and the upper edge of mullion member 60. Thus, mullion members of slightly varying lengths and having ends which may not be exactly perpendicular to the longitudinal mullion surfaces may be readily used in a frame assembly according to the present invention.

Head channel plate 102 is similar to mullion member plate 62 and may include a beveled surface 124 similar to surface 72 of plate 62 near one edge and a longitudinally extending groove 126 similar to groove 76 of plate 62 at the opposite edge. Plate 102 may be secured to the head channel member 100 in rigid mating relationship therewith in the position shown at the left side of FIG. 1. When a pair of plates 102 have been inserted in head channel member 100 and abut broad walls 64 and 66 of mullion member 60, the mullion assembly 14 becomes locked into position and precluded from longitudinal movement along the head channel member 100. Moreover, since the upper edge of the mullion assembly 14 is hidden from view by means of the head channel member sidewalls 106 and 108 and the plate 102, an excellent joint appearance results.

As was disclosed with respect to mullion member plate 62, when a window or wall panel is being framed, head channel plate 102 may be provided with a panel receiving recess 128 similar to recess 86 of plate 62, with the sidewalls of recess 128 having weatherstrip receiving recesses 130 and 132 similar to respective recesses 88 and 90 of plate 62 when the panel is of glass.

A frame system according to the present invention is uniquely adapted for ready and rapid assembly and disassembly. Specifically, in an exemplary assembling sequence, head channel member 100 is first securely attached to the ceiling where the panel or panels such as 18 are to be located. Base member 10 is then located along the floor directly under the head channel member 100, by means of a plumb line, for example, after which the base member 10 is securely attached to the floor. Mullion or jamb assemblies 14 are then mounted on the base member 10 and within the head channel member 100 in approximately their desired longitudinal locations along the members 10 and 100. Then, sill members 34 are mounted in their desired assembled positions on the base member 10, and head channel plates 102 are inserted into their mating relationship with head channel member 100. Next, the panels such as 18 are inserted into the panel receiving recesses 46, 80, 86 and 128, after which the mullion or jamb assemblies 14, the sill members 34, and the plates 102 are moved to their ultimate longitudinal positions which lock the mullions in place in their desired longitudinal locations. Finally, removable sill members 36 are inserted into their mating relationship with sill members 34, thereby securing the panels such as 18 within the frame assembly.

An alternate embodiment of the present invention is illustrated in FIG. 5. The embodiment of FIG. 5 is similar to that of FIGS. 1-4; therefore, components in the FIG. 5 embodiment which are essentially the same as corresponding components in the embodiment of FIGS. 1-4 are designated by the same reference numeral digits as their corresponding components except for the addition of a suffix letter *a*. Since the head channel assembly for the FIG. 5 embodiment is the same as that for the embodiment of FIGS. 1-4, the head channel assembly is not shown in FIG. 5.

The embodiment of FIG. 5 differs from the embodiment of FIGS. 1-4 primarily in that a substantially shorter sill assembly is provided and in that only base member sidewall 24a of the two base member sidewalls 22a and 24a is provided with a screw race flange portion 25a. The other base member sidewall 22a is of a shorter height in order to accommodate the portion of sill member 34a adapted to receive removable sill member 36a. It is pointed out that even with only a single screw race flange 25a, the arrangement of FIG. 5 is able to provide five surfaces of contact between the base member 10a and the mullion assembly 14a (instead of six such surfaces for the embodiment of FIGS. 1-4). These five surfaces of contact are between the outer edge of notch 92a and base member sidewall 24a, between the opposite edge of notch 92a and flat flange surface 28a, between the outer edge of notch 94a and base member sidewall 22a, and between the respective edges of the mullion broad wall opposite to wall 64a and the base member sidewalls 24a and 22a.

A still further embodiment of the present invention, especially adapted for use in framing a panel over a ledge, is illustrated in FIG. 6. Components in the embodiment of FIG. 6 which are similar to corresponding components in the embodiment of FIGS. 1-4 are designated by the same reference numeral digits as their corresponding components except for the addition of a suffix letter *b*. Since the head channel assembly for the FIG. 6 embodiment is the same as that for the embodiment of FIGS. 1-4, the head channel assembly is not shown in FIG. 6.

In the embodiment of FIG. 6, the base member and the sill assembly of the embodiment of FIGS. 1-4 are combined into a base sill member 124b having a bottom wall 20b adapted to be secured to the earth 126b. An upwardly extending longitudinal flange 128b is provided at the rear extremity of the base member bottom wall 20b, while the front edge of the base member wall 20b is provided with a flange having a portion 130b extending upwardly from the wall 20b and a portion 132b extending downwardly from the wall 20b immediately outside of a permanent (brick, concrete, or the like) earth support wall 134b. Upwardly extending flanges 128b and 130b contact the sidewalls of the mullion assembly 14b and prevent the mullion assembly 14b from both lateral movement and rotational movement about a vertical axis.

A pair of removable sill members 36b, each having a cross section of essentially inverted U-shape, are adapted to be longitudinally disposed parallel to one another on opposite sides of base sill member bottom wall 20b and to engage base sill member 124b in mating relationship therewith. When in the desired assembled mating relationship, removable sill members 36b abut the opposite broad walls of the mullion assembly 14b to preclude the mullion assembly from longitudinal movement and to hold the mullion assembly in the desired position.

Although the present invention has been shown and described with reference to particular embodiments, nevertheless various changes and modifications which are obvious to one skilled in the art are deemed to lie within the spirit, scope and contemplation of the invention.

I claim:

1. A panel frame assembly comprising:

an elongated base member having a bottom wall and a pair of parallel sidewalls, said bottom wall defining a pair of ledge portions respectively extending beyond said sidewalls, at least one of said sidewalls defining near its upper extremity an inwardly projecting longitudinal flange portion having a flat surface disposed parallel to said sidewalls;

at least one sill member having a pair of sidewalls disposed parallel to and outwardly of said sidewalls of said base member, each of said sidewalls of said sill member defining at its lower extremity at least one inwardly projecting portion resting on the adjacent one of said base member ledge portions and the inner edge of which is disposed adjacent one of said base member sidewalls;

first and second vertical frame members disposed on said base member at opposite ends of said sill member, each said vertical frame member having a first broad wall of a width greater than the distance between said sidewalls of said base member and disposed perpendicular to said sidewalls of said base member, a pair of sidewalls, and a pair of broad wall portions spaced from said first broad wall and extending inwardly from the respective vertical frame member sidewalls into contact with the outer surfaces of the respective base member sidewalls, said first broad wall defining adjacent its bottom end a pair of notches having their respective outer edges contacting the respective outer surfaces of said base member sidewalls and each notch being dimensioned to snugly receive said one of said base member sidewalls and its flange portion, an elongated plate adapted to contact the inner extremities of said broad wall portions of each said vertical frame member in engaging relationship therewith, the lower edge of said plate being adapted to rest on the upper extremity of said one of said base member sidewalls;

an elongated head channel member adapted to be affixed to a ceiling surface in substantial alignment with said base member, said head channel member defining a top wall and a pair of sidewalls disposed parallel to said sidewalls of said base member, said head channel member sidewalls being spaced from one another by a distance slightly greater than the width of said vertical frame member first broad wall and each being adapted to contact the outer surface of one of said sidewalls of each said vertical frame member, an elongated head channel plate adapted to contact said head channel member in engaging relationship therewith at a location opposite to said top wall.

2. A panel frame assembly according to claim 1 and further including a removable sill member adapted to contact said sill member in engaging relationship therewith, said removable sill member and the upper portion of said sill member together defining a panel receiving recess; and wherein said head channel plate and at least one of said vertical frame member first broad wall and the said elongated plate in engaging relationship with the inner extremities of said broad wall portions of said vertical frame member defines a panel receiving recess on its outer surface.

3. A panel frame assembly according to claim 1 wherein said inwardly projecting longitudinal flange portion of said one of said sidewalls of said elongated base member has an essentially C-shaped cross section.

4. A panel frame assembly according to claim 1 wherein said vertical frame member first broad wall defines a panel receiving recess having a pair of parallel sidewalls, at least one of which is disposed at a location adjacent said longitudinal flange portion of said one of said base member sidewalls.

5. A panel frame assembly according to claim 1 wherein each of said sidewalls of said sill member defines a plurality of inwardly projecting longitudinal ridge portions having flat surfaces contacting the adjacent one of said base member sidewalls, the bottom ridge portion of each sill member sidewall resting on the adjacent one of said base member ledge portions.

6. A panel frame assembly according to claim 5 wherein each of said sidewalls of said elongated base member defines near its upper extremity an inwardly projecting longitudinal flange portion having a flat surface disposed parallel to said base member sidewalls.

7. A panel frame assembly according to claim 1 wherein said sill member has a pair of bottom wall portions extending inwardly from the lower extremities of the respective sill member sidewalls to a preselected distance such that the spacing between the respective inner extremities of said bottom wall portions is slightly less than the width of said base member bottom wall, said sill member bottom wall portions each defining an inwardly and upwardly projecting flange portion adapted to rest on the adjacent one of said base member ledge portions.