

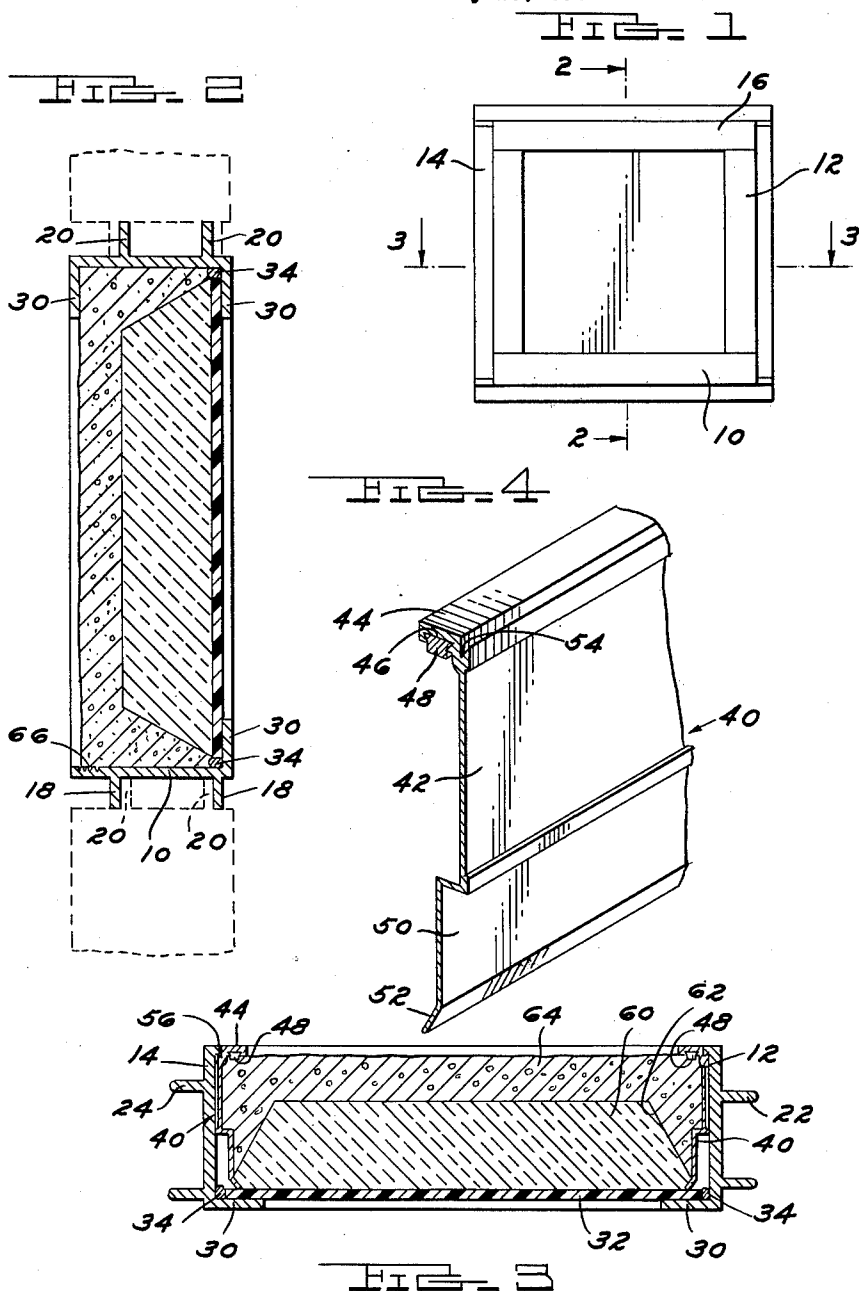
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PRECAST PANEL CONSTRUCTION

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PRECAST PANEL CONSTRUCTION

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This invention relates to a precast panel construction.

In present day architecture, it is now possible to use precast panels in the construction of buildings, these panels being formed in advance of the construction and transported to the site where they can be quickly installed to provide the inner or outer finishing surface of a building. These walls formed of prefabricated units are called curtain walls. As a general rule, they are not a load-bearing wall.

It is an object of the present invention to provide an improved structure for precast panels which has the advantage of good appearance and a weatherproof sealed construction which also incorporated insulation.

It is an object of the invention to provide a reasonably light and attractive construction which can be formed of extruded sections which are suitably joined at the corners and in which a special expansion element is provided not only to lock in an insulating panel but also to serve as a sealing member which prevents separation of a cast aggregate from the frame.

Other objects and features of the invention relating to details of construction and operation will be apparent in the following description and claims.

Drawings accompany the disclosure and the various views thereof may be briefly described as follows:

FIGURE 1, an elevation of the completed panel.

FIGURE 2, a sectional view on line 2-2 of FIGURE 1.

FIGURE 3, a sectional view on line 3-3 of FIGURE 1.

FIGURE 4, a perspective view of a snap-in insert for the jambs of the panel.

Referring to the drawings:

The panel is shown having a sill member 10, right and left jamb members 12 and 14, and a head member 16, all formed of metal such as aluminum extrusion or its equivalent. As shown in FIGURE 2, the sill members 10 have spaced flanges 18 which cooperate with spaced flanges 20 on the head members to permit stacking of the elements vertically. Similarly, the flange members 22 and 24 on the jambs can be suitably spaced to interlock so that the panels can be sealed together horizontally (see FIGURE 3). Each of the members 10, 12 and 14 and 16 are provided with back flanges 30 which form a continuous seat for an insulating back plate 32 which is suitably sealed around the edges by a strip of sealing material 34 such as Thiokol.

The insulating plate 32 is held in place by snap-in strips or retainers 40 (FIGURES 3, 4), each of which comprises a main wall member 42 having a front face flange 44 recessed at 46 on its rear surface in a groove with re-entrant sides to receive and lock a sealing strip 48. Off-set from the main wall 42 is a rearwardly extending strip 50 having an angled flange 52 which contributes to the resilience of the strip as it bears against the back plate 32. The inner corners of the strip 40 are provided with a groove 54 of semi-dovetail form to cooperate with a re-entrant edge flange 56 to hold the strips 40 in place prior to the casting operation to be described.

In the formation of the assembly, the frame members are suitably interfitted and joined at the corners by welding or by other known methods, and the back plate 32

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is dropped in place against the flange walls 30 inside the sealing strips 34 of Thiokol or an equivalent resilient sealing material. The snap-in strips 40 are then applied and if desired, a body of insulating material 60, preferably a light material, is inserted against the back plate 32, preferably having tapered edges 62. On top of this assembly is poured an aggregate material 64 to form the finish surface of the panel. When the aggregate cures, it forms a block whose edge portions are in intimate contact with retainers 40, sill members 10, and the head members. The aggregate can be formed of such materials as quartzite, granite or porcelain glass to give a wide choice of color and texture and the binding material can be inhibited at its surface so that it can be washed off to leave the desired texture of the aggregate.

It will be noted that the forward surface of the sill member 10 is provided with grooves 66 to assist in the keying of the aggregate to the sill. It is preferable also that the sill section be drilled so that any water which may collect therein can drip down on to a horizontal mullion which acts as a drain trough to run to a vertical mullion and to the outside of the building. The cast aggregate then solidifies against the snap-in members or retainers 40 on the sides and seals at the vertical edges against the sealing members 48 on the inner side of the face flanges 44.

Upon completion, it will be seen that expansion or contraction of the concrete at a different degree to that of the metal of the frame members will cause the snap-in members 40 to shift toward and away from the jamb sections, thus preventing the separation of the concrete from these snap-in members insuring a tight joint at this point. The top flange 30 protects the upper edge of the aggregate and any seepage into the sill is drained off as explained above. The slight angle on the groove 54 and edge flange 56 is not sufficient to limit movement of the members 40 in the expansion and contraction function described.

The resulting panel is an extremely light and functional unit which has suitable sealing characteristics and which can serve as a permanent outside finish in many different sizes and assembly units.

I claim:

1. A prefabricated panel for use in construction of a curtain wall comprising,
 - an open center frame formed of a relatively light weight, relatively high expansion co-efficient material,
 - said frame including two end members secured to two side members and having a front and a rear,
 - each of said members having an interior surface which faces said open center of said frame,
 - a retainer disposed adjacent said interior surface of each side member,
 - means adjacent the rearward portion of said frame providing rearward support for holding said retainers in said frame,
 - said retainers and side members having front edge portions adjacent the front of said frame,
 - means forming a joint between the front edge portion of each retainer and the front edge portion of the side member adjacent thereto, said joints providing frontal support for holding said retainers in said frame,
 - and a block of relatively low expansion co-efficient material having edge portions intimate contact with said retainers and said interior surfaces of said end members,
 - said joints being expansible in a side-member-to-side-member direction responsive to differential expansion of said frame and block.

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2. The combination defined in claim 1 wherein each retainer has a flange adjacent its front edge portion extending inwardly toward said open center and having a rearward face, said block of material being in intimate contact with the rearward face of each of said flanges.

3. The combination defined in claim 1 wherein said expansible joint includes interengaged surfaces on said retainer and side member, said surfaces being disposed at an oblique angle to said side-member-to-side-member direction and thereby forming a camming interlock which facilitates the expansion of said joint.

4. The combination defined in claim 2 wherein each of said flanges has a rearwardly opening recess extending lengthwise of the front edge of said retainer.

5. The combination defined in claim 4 wherein a sealing strip is disposed within said recess.

6. A prefabricated panel for use in construction of a curtain wall comprising,

an open center frame formed of a relatively light weight, relatively high expansion co-efficient material,

said frame including two end members secured to two side members and having a front and a rear, each of said members having an interior surface which faces toward said open center of said frame,

a retainer disposed adjacent said interior surface of each side member,

means adjacent the rearward portion of said frame providing rearward support for holding said retainers in said frame,

said retainers and side members having front edge portions adjacent the front of said frame,

means forming a joint between the front edge portion of each retainer and the front edge portion of the side member adjacent thereto, said joints providing frontal support for holding said retainers in said frame,

means providing a closure for the rear of said frame, and a block of relatively low expansion co-efficient material having edge portions in intimate contact with said retainers and said interior surfaces of said end members,

said block having a rearwardly disposed face engaged against said closure,

said joints being expansible in a side-member-to-side-member direction responsive to differential expansion of said frame and block.

7. The combination defined in claim 6 wherein said side and end members have flanges extending inwardly toward said open center, said closure including a back plate having a rear face retained by said flanges and having a front face retained by said retainers.

8. The combination defined in claim 6 wherein a body of insulating material is disposed within said frame and extends throughout the major portion of the open center of said frame, said block having a rear face engaged against frontward portions of said body of insulating material.

9. The combination defined in claim 7 wherein the peripheral edges of said back plate are spaced from said side and end members of said frame.

10. The combination defined in claim 9 wherein seal strips are sealingly disposed in the spaces between said

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back plate and said side and end members of said frame.

11. A prefabricated panel for use in construction of a curtain wall comprising:

an open center frame of a relatively light weight, relatively high expansion co-efficient material,

said frame including two end members secured to two side members and having a front and a rear,

each of said members having an interior surface which faces said open center of said frame,

each of said side members having adjacent its front edge portion a rearwardly disposed groove,

a retainer disposed adjacent said interior surface of each side member,

each retainer having a front edge portion with a groove interengaged with the groove in the side member adjacent thereto,

said interengaged grooves forming joints between the front edge portions of said retainers and side members by which said retainers are frontally held within said frame,

said members having adjacent their rearward portions flanges which project inwardly toward said open center of said frame,

a closure for the rear of said frame which includes a back plate retained within said frame by said flanges,

said retainers having rearward edge portions engaged against said closure and thereby holding said closure against said flanges,

said retainers having adjacent their said front edge portions flanges which project inwardly toward said open center of said frame,

a block of relatively low expansion co-efficient material having edge portions in intimate contact with said retainers and the region of contact including the rearward faces of said flanges on said retainers, said block having a rearwardly disposed portion engaged against said closure,

interengaged portions of said grooves being disposed at an oblique angle to the side-member-to-side-member direction of said frame so that said joints are expansible in said direction responsive to differential expansion of said frame and block.

12. The combination defined in claim 11 in which one of said end members comprises a sill and the other a header, said header having a flange extending inwardly toward said open center, the latter said flange having a rear face engaged by said block.

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