

Jan. 30, 1962

W. SCHLEGEL

3,018,524

WINDOW

Filed March 23, 1960

4 Sheets-Sheet 1

FIG. 1

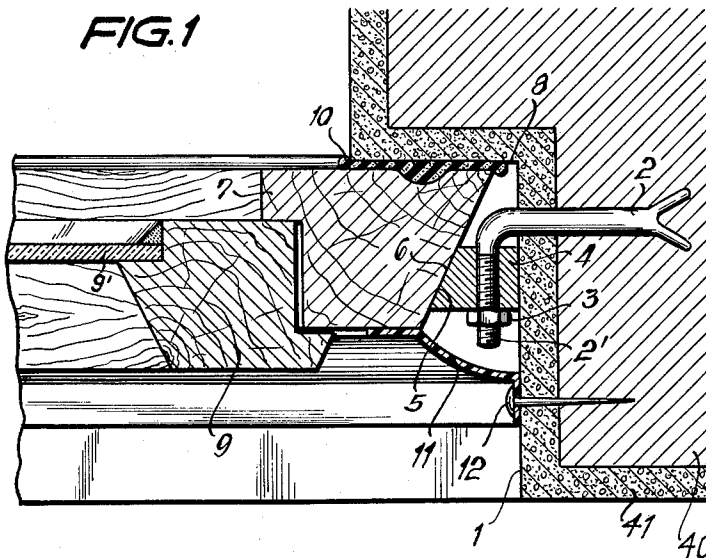
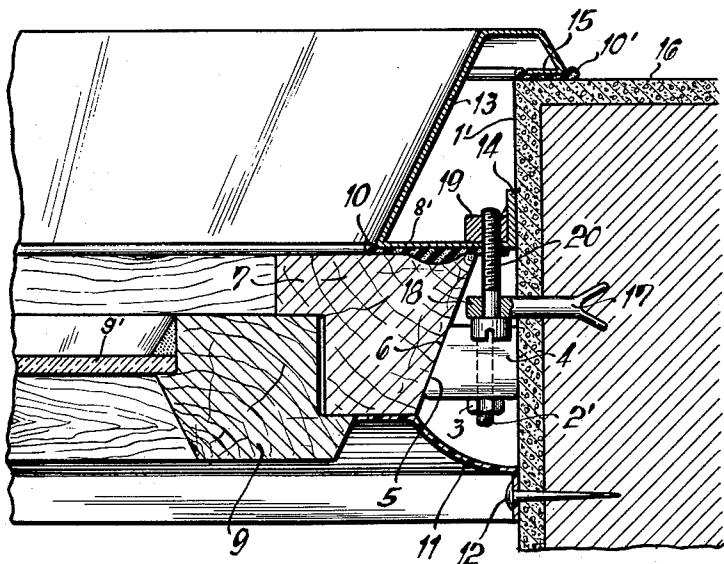


FIG. 2



INVENTOR:
Werner Schlegel

BY

Karl F. Born
Agent

Jan. 30, 1962

W. SCHLEGEL

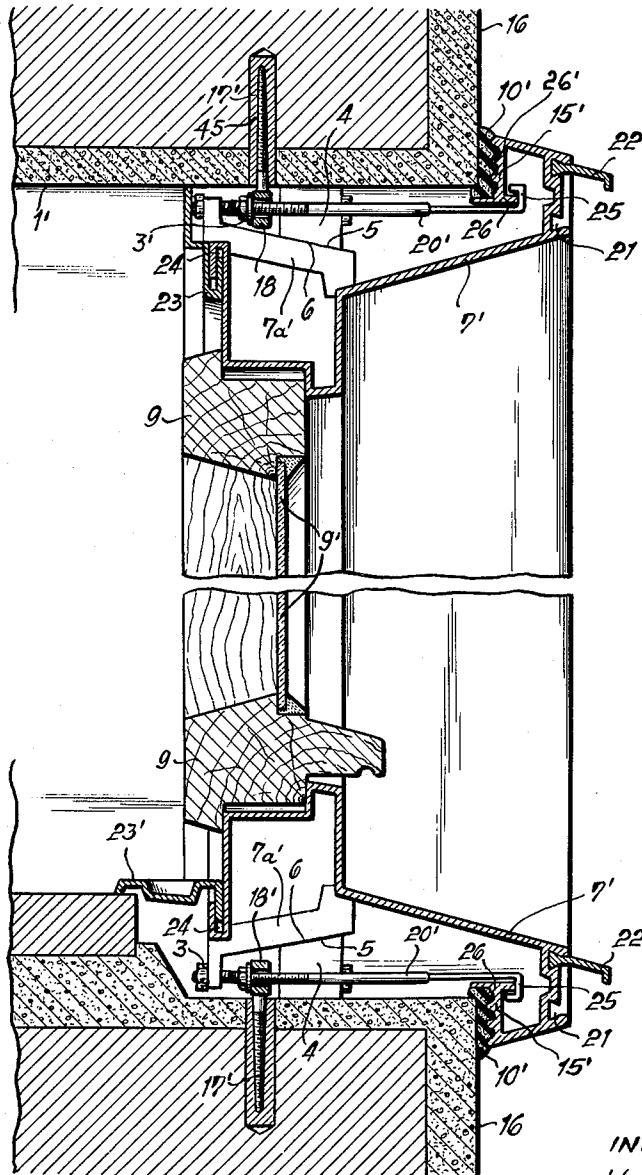
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WINDOW

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FIG. 3



INVENTOR:
Werner Schlegel

BY

Karl F. Parr
Agent

Jan. 30, 1962

W. SCHLEGEL

3,018,524

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FIG. 4a

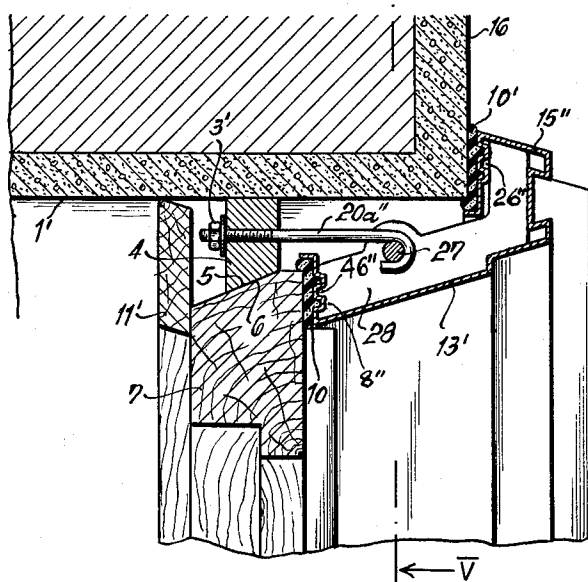
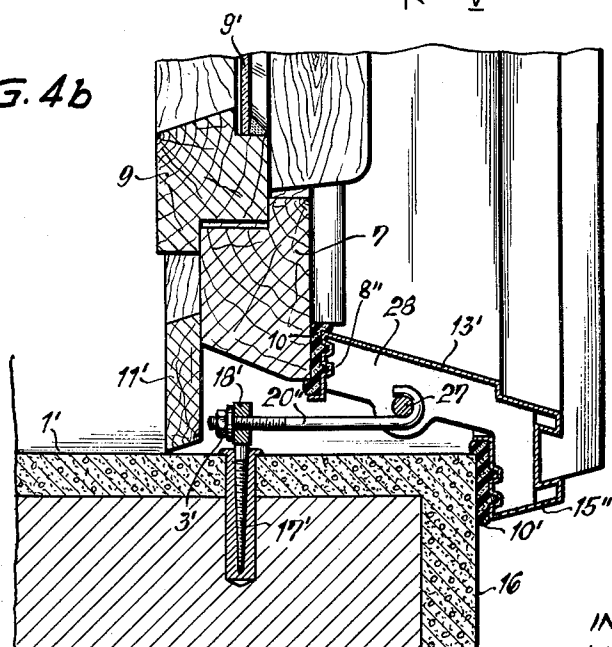


FIG. 4b



INVENTOR:
Werner Schlegel

BY

Karl F. Rorn
Agent

Jan. 30, 1962

W. SCHLEGEL

3,018,524

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FIG. 5

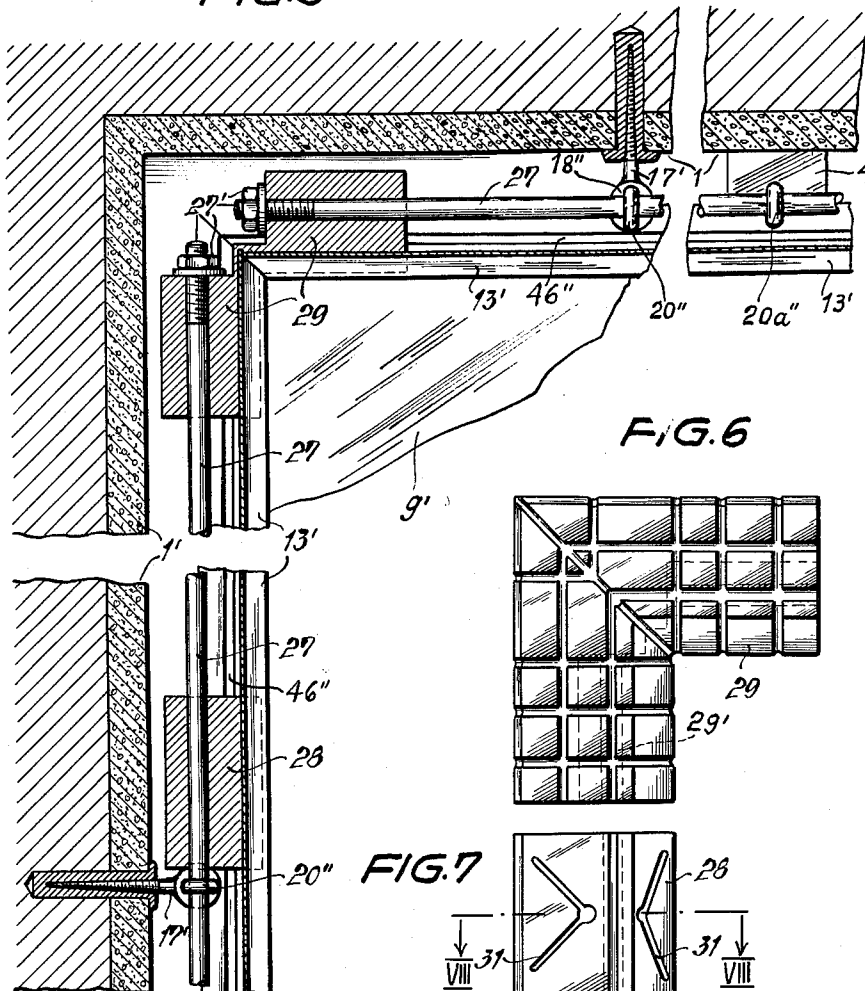


FIG. 6

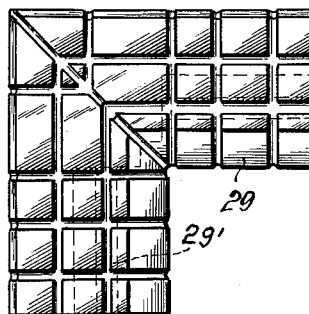


FIG. 7

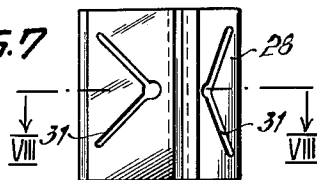
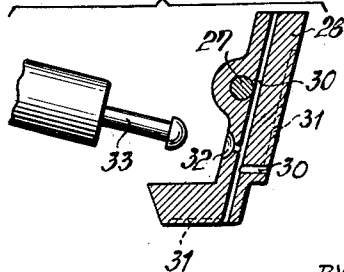


FIG. 8



INVENTOR:
Werner Schlegel

BY

Walter F. Born
Agent

1

3,018,524
WINDOW

Werner Schlegel, Kastanienallee 3, Essen, Germany

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15 Claims. (Cl. 20—40)

My present invention relates to windows and, more particularly, to means for securing a window frame in a window opening.

It is an object of my invention to provide improved means for securing a prefabricated window in a suitable opening therefor which has been pre-formed in the structure of a building.

Another object of the invention is to provide means for effectively sealing a demountable window frame against the weather.

Still another object of my invention is to provide an improved window adapted to be mounted in a pre-formed enclosure without necessitating the finishing touches (e.g. plastering, puttying and painting) normally required after the installation of earlier types of windows.

According to a principal feature of the invention, a prefabricated window, complete with frame, sash and at least one glass pane, is received within an embrasure provided therefor in a building shell. To position and/or center the window within the embrasure, I provide a plurality of wedge members distributed about the periphery of the window frame and located between the latter and the walls of the embrasure with freedom of movement in a direction transverse to the plane of the window, e.g. from its sheltered side to its weather side, to clamp the assembly in place. The embrasure is preferably constructed with dimensions somewhat larger than the corresponding dimensions of the mating portions of the window frame in order to facilitate the insertion of the window therein. As the wedge members are forced by suitable tightening means into the clearance between the window frame and the walls of the embrasure, they lock the window in position while positively spacing the frame members from the walls of the embrasure in accordance with the proper dimensional tolerances which may be the same or different along the top, bottom and side positions of the window frame.

According to another feature of the invention, a plurality of anchors are imbedded in the walls of the embrasure and are adapted to co-operate with a plurality of threaded tightening members operable to draw the window frame against an abutment rigid with the embrasure to secure the window in place. The abutment may be a generally annular (e.g. rectangular) seating surface formed integral with the embrasure or a separate retaining element of similar configuration fastened to it by, for example, the aforementioned anchors; advantageously, this retaining element is in the shape of an ancillary frame so designed as to have an aesthetically pleasing outer surface whereby the need for additional finishing steps may be obviated.

According to still another feature of the invention, a resiliently compressible gasket, formed, for example, from synthetic-resin elastomers, rubber, flexible asphaltic liners or the like, is interposed between the seating surfaces of the window frame and the abutment in order to prevent the penetration of moisture or air currents into the building. The sheltered side of the window frame may be provided with removable masking strips adapted to afford access to the tightening members while normally concealing them from view.

The above and other objects, features and advantages of my present invention will become more readily apparent from the following description, reference being made to the accompanying drawing in which:

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FIG. 1 is a cross-sectional view of a window secured within an embrasure in accordance with the invention;

FIG. 2 is a view similar to FIG. 1 but showing the window thereof fastened in another type of embrasure;

FIG. 3 is another cross-sectional view illustrating a modified window according to the invention;

FIGS. 4a and 4b are cross-sectional views respectively similar to the upper and the lower portion of FIG. 3, illustrating a further embodiment of a window according to the invention shown with its pane-carrying sash removed (FIG. 4a) and in place (FIG. 4b);

FIG. 5 is a cross-sectional view taken on the line V—V of FIG. 4a;

FIG. 6 is a bottom-plan view of a corner reinforcement for the window of FIGS. 4a, 4b and 5;

FIG. 7 is a bottom-plan view, similar to FIG. 6, of an intermediate reinforcement for the same window; and

FIG. 8 is a cross-sectional view taken along line VIII—VIII of FIG. 7.

In FIG. 1 I show a window opening or embrasure 1 dimensioned with sufficient clearance to admit a window frame 7 which forms part of a prefabricated window provided with a sash 9 and a pane 9'; sash 9 may be swingably mounted in frame 7 by conventional hinges, not shown, to permit the window to be opened or closed. The window opening 1 is lined with a layer of finishing plaster 41 which covers the rough building material 40 (e.g. brick or concrete). A plurality of anchor bolts 2 are imbedded in the building material 40 at spaced locations distributed about the periphery of the frame 7. Each anchor bolt is formed with a threaded extremity 2', bent at right angles to the shank of the bolt and adapted to pass through suitable bores provided in wedges 4. The wedges are provided with beveled surfaces 5 which frictionally engage complementary surfaces 6 of the frame 7 as a nut 3 is tightened onto the threaded extremity 2', thereby urging the frame 7 against a rectangular shoulder 8 formed in opening 1 so as to clamp the frame in place while simultaneously spacing it in a more or less centered position away from the walls of the embrasure in accordance with predetermined tolerances. The abutting surface of frame 7 is provided with a weatherstrip gasket 10 which is compressed between the frame and the shoulder 8 to prevent any leakage of moisture or outside air into the building around the periphery of the frame. Access to the threaded members 2', 3 of the fastening assembly is afforded from the interior of the building where the window is shown framed by a resilient cover strip 11 nailed to the walls of the opening 1, as shown at 12, to conceal the bolts 2 and to give a finished appearance to the installation.

If the window is to be installed in an embrasure or opening with straight walls lacking an abutment-forming shoulder 8, such opening 1' may be fitted with a retaining frame 13, as shown in FIG. 2, to provide an abutting surface 8' for the frame 7 of the window. Spacedly projecting inwardly from the walls of this opening are anchor lugs 17, formed with eyes 18, which are separate from the bolts 2 and adapted to receive screws 20 threaded into bosses 19 that bear upon an abutment-forming flange 8' of the retaining frame 13. Flange 8' is provided with inturned lips 14 which slide along the walls of the embrasure while a flange 15 on the frame 13 makes firm contact with the outer wall surface 16 along the edges of opening 1' as the screw 20 is tightened. The retaining frame 13 may, therefore, be fastened in place by the screws 20 before the window frame 7 is introduced into the opening, whereupon the window may be secured in the embrasure with the aid of the bolts 2 as described with reference to FIG. 1. To provide further insurance against the penetration of moisture or outside air, another

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gasket 10' is compressed between the flange 15 and the outer wall 16.

In the embodiment illustrated in FIG. 3 I provide the embrasure 1' with expansion bolts 17' whose shanks are received by expansion sleeves 45 imbedded in the walls of the embrasure. The window comprises a supporting frame 7', which is composed of profiled horizontal and vertical members preferably made of a light metal (such as aluminum or magnesium) and extruded in the desired cross-sectional configuration, and a hinged sash 9 carrying a glass pane 9'. The frame 7' of the prefabricated window is formed with an outer flange 15' adapted to be drawn against the outer wall 16 of the structure by the tightening of a number of nuts 3' which are each threaded onto an extremity of a respective hooked rod 20' passing through the eye 18' of a corresponding lug 17'. The hooked extremities of rods 20' engage one branch of the T 26 formed on flange 15' while the other branch serves to position a gasket 10' between the flange and the wall 16. The wall-engaging surface of the flange 15 is provided with channels 26' to increase the seepage path between the frame and the wall and thus to impede the passage of moisture and outside air. The frame 7' is provided with peripherally spaced bracing elements 7a' whose inclined surfaces 6' are engaged by the complementary beveled surfaces 5 of corresponding wedge members 4 which are located in the concavity of the composite frame 7'. Cover strips 23 and 23', also of extruded metal, are provided with flanges adapted to enter respective slots 24 along the sheltered side of the window to conceal the various fastening members. On its weather side the profiled members of the frame 7' are formed with undercut grooves 21 which may be fitted with rain deflectors 22 extending along the upper and lower horizontal members of the frame.

In FIGS. 4a, 4b and 5 through 8 I show a window assembly comprising a prefabricated window whose frame 7 surrounds a sash 9 with a pane 9' as described with reference to FIG. 1. The window opening 1' is fitted with a retaining frame 13', the frame being constituted by two horizontal members and two vertical members which form miter joints between them and are maintained in rectangularly abutting relationship by means of compression rods 27 and corner clamping blocks 29. The compression rods 27 are provided with threaded extremities adapted to receive nuts 27' which serve to tighten them against the blocks 29, these blocks being suitably undercut to accommodate the nuts. Along the members of frame 13', between the corner blocks 29, I provide intermediate reinforcing blocks 28 which have the same profile (FIG. 8) as the corner blocks and, like them, are preferably formed in a casting operation from, for example, aluminum. The blocks 28 and 29 are provided with bores 30 and surface passages 31, 29' which, as particularly shown in FIG. 8 for the block 28, form channels for the distribution of a suitable adhesive over their surfaces engaging the concave side of the profile of frame 13'. Thus, a cementitious substance preferably of synthetic material may be injected into these channels via a socket recess 32 by means of a high-pressure gun 33 to join the reinforcing blocks 28 and 29 to the frame 13' and to the rods 27. The assembled retaining frame 13' is then secured within the opening 1' by a plurality of hooked bolts 20'' which engage the compression rods 27 are received in the eyes 18' of the expansion bolts 17'. The threaded extremities of bolts 20'' are provided with nuts 3' which, when tightened, draw the flange 15'' of the frame 13' against a weatherproofing gasket 10' and the outer wall 16 of the building. Channels 26'' and 46'' are provided along the abutting surface of retaining frame 13' in order to increase the seepage path for precipitation.

Another set of hooked bolts 20a'' engage the rods 27 and pass through wedge members 4 whose beveled surfaces 5 engage complementary surfaces 6 of frame 7 to

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urge the outer seating surface of this frame against a gasket 10 carried on the inner flange 8'' of the retaining frame 13' as the nuts 3' are tightened on the extremities of bolts 20a''. Simultaneously, the wedges 4 (which may alternate with the anchor blocks 28) position the window within the embrasure with the required all-around clearance on all four sides thereof and, by bearing upon both the frame 7 and the walls of opening 1', lodge the window firmly in place. Cover strips 11' are nailed to the frame 7 to conceal the bolts 20'', 20a'' and the nuts 3' as described above with reference to the cover strips 11 and 23, 23'. It will be understood that the bolts 20'' and 20a'' may follow one another in any order on the four sides of the window frame 7.

The invention as described and illustrated admits of many modifications and variations believed to be well within the ability of persons skilled in the art and intended to be included within the spirit and scope of my invention except as further limited by the appended claims.

I claim:

1. In a window assembly fitted into an embrasure, in combination, abutment means at said embrasure, a window frame received with clearance in said embrasure and bearing upon said abutment means, anchor means in said embrasure, centering means inserted between said frame and said embrasure, said centering means being displaceably engaged by said anchor means for firmly clamping said frame in said embrasure by movement in a direction transverse to the plane of the window, tightening means for displacing said centering means in said direction relatively to said frame, said centering means having an inclined surface adapted to exert upon a complementary frame surface a wedging action for shifting said frame within said plane upon a displacement of said centering means by said tightening means, and a pane-carrying sash in said frame.

2. The combination according to claim 1 wherein said embrasure and said frame are rectangular, said centering means comprising at least one independently movable wedge member on each side of the rectangle.

3. The combination according to claim 1, further comprising a compressible gasket extending completely around said embrasure between said frame and said abutment means.

4. A window assembly comprising, within a building wall provided with an embrasure, abutment means forming a generally annular, inwardly projecting shoulder all around said embrasure, a window frame with a beveled periphery received with all-around clearance in said embrasure forwardly of said shoulder as seen from the sheltered side of the window, said frame being in firm contact with said shoulder, a centering means for said frame including a plurality of wedge pieces peripherally distributed about said frame within said clearance, respective tightening members in said clearance engaging said wedge pieces for independently displacing same in a frame-clamping sense transverse to said frame, each of said wedge pieces having an inclined surface bearing upon said periphery for shifting said frame within said plane upon a displacement of said wedge pieces by said tightening members, and a pane-carrying sash in said frame.

5. An assembly according to claim 4, further comprising masking means bridging the space between said embrasure and said frame on said sheltered side, thereby concealing said wedge pieces and said tightening members from view.

6. An assembly according to claim 4 wherein said shoulder is integral with said building wall.

7. An assembly according to claim 4, further comprising a retaining frame bearing upon said wall on the weather side of the window, said retaining frame having a flange forming said shoulder.

8. An assembly according to claim 7, further comprising a generally annular compressible gasket interposed

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between said retaining frame and said wall at said weather side.

9. An assembly according to claim 7, comprising a plurality of anchor members projecting inwardly from said embrasure at peripherally spaced locations, said anchor members being lodged in said wall, and fasteners held by said anchor members and adjustably engaging said retaining frame for urging same against said wall.

10. An assembly according to claim 9 wherein said fasteners are rods provided with hooked extremities engaging said retaining frame.

11. An assembly according to claim 10 wherein said retaining frame is composed of four elongated, profiled members which are concave toward said sheltered side and abut one another in miter joints at the corners of a rectangle, said profiled members being provided at their concave sides with reinforcing corner blocks straddling said miter joints and with tensioning rods anchored to said corner blocks for holding said retaining frame together, said hooked extremities engaging said tensioning rods.

12. An assembly according to claim 11, further comprising intermediate reinforcing blocks disposed at the

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concave sides of said profiled members between said corner blocks and traversed by said tensioning rods.

13. An assembly according to claim 12 wherein all of said blocks are adhesively secured to said profiled members and provided with channels opening onto their surfaces contacting said profiled members, said channels having an accessible inlet for the introduction of an adhesive fluid.

14. An assembly according to claim 7 wherein said tightening members are anchored to said retaining frame.

15. An assembly according to claim 7, comprising a plurality of first and second anchor members projecting inwardly from said embrasure at peripherally spaced locations, said anchor members being lodged in said wall, and fasteners held by said first anchor members and adjustably engaging said retaining frame for urging same against said wall, said tightening members being held by said second anchor members.

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