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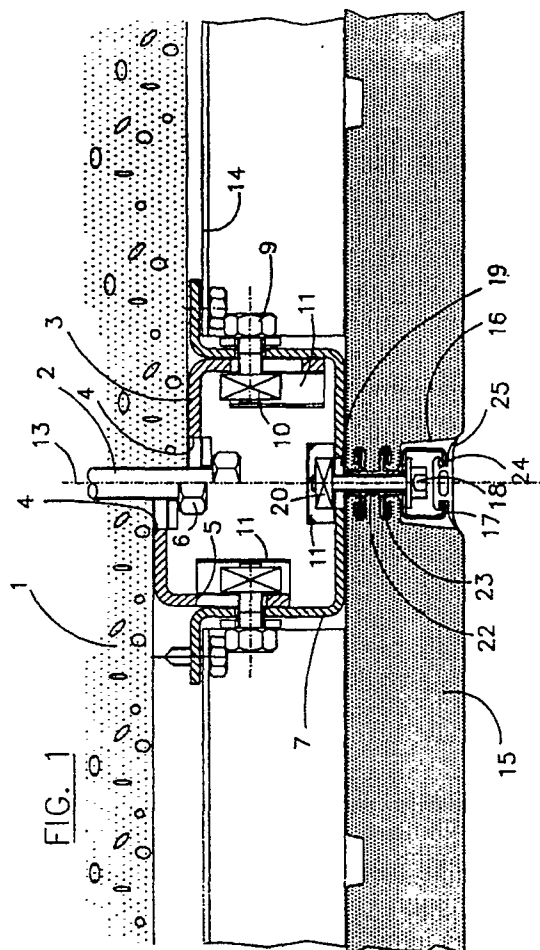
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(54) **Modular sectional construction for the fronts of buildings and/or for insulation coatings of current masonries.**

(57) Modular sectional construction comprising a frame of metallic sections anchored to the bearing building skeleton and/or the building masonry, and a plurality of replaceable panels applied to said frame so as to form a continuous front coating completely the bearing cage and/or the building masonry including the frames of the outer casings, the vertical corners and the top and bottom edges.



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MODULAR SECTIONAL CONSTRUCTION FOR THE FRONTS OF BUILDINGS AND/OR FOR INSULATION COATINGS OF CURRENT MASONRIES

The present invention relates to the field of the modular prefabricated building and in particular a modular sectional construction for insulating coatings and/or fronts of buildings.

The invention seeks to provide an assembly of sectional construction members of the above mentioned type which allows an attractive and practical solution for the fronts of buildings of any type, i.e. either blank fronts or fronts provided with windows, to be accomplished both on designing new buildings and on rebuilding and/or remaking totally or partially fronts of current buildings. In the latter case the construction according to the invention allows an insulation coating with elimination of heat transmission to be carried out, thus avoiding any time-consuming, expensive demolition work, tests, modifications and restoring operations, apart from the considerable expenditure relative to the collection and transport of the waste materials to the dump.

According to the invention a construction is provided which is formed as a frame of metallic sections anchored to the bearing building skeleton and provided with replaceable covering panels applied both vertically and horizontally to said frame so as to form a continuous front for coating the building, including window frames (window jambs and sills), any side corner, the base socle and the cornices.

Such panels are formed of a layer of an insulating material coated on both surfaces with a metallic sheet or other technologically suitable material, and are provided at their edges with a flanged double-seamed garnish embedded into the body of the panel and made of rigid plastic material having the double function of strengthening the edges of the panels to allow the latter to be clamped to the frame of metallic sections, and forming a barrier against the heat transmission between the exterior and the interior of the panels as well as between the panels and the metallic members connected thereto.

The clamping means between panel and metallic frame are formed as bolts inserted at intervals into a section or a substantially C-shaped raceway disposed within the slot formed by two adjacent panels so as to clamp the edges of said panels at said flanged strengthening garnishes.

Still in accordance with the invention the lower horizontal edges of the panels are shaped like a drip, and the corresponding upper horizontal edges are weathered so as to prevent inlet of water.

The front open portion of said substantially C-shaped raceways receiving the anchoring bolts of the panels is sealed by an elastic gasket which is snap-fitted and provided with two longitudinal strips disposed into contact with the adjacent edges of the

panels.

The invention will now be described with reference to the accompanying drawing showing as a way of a non-limitative example a preferred embodiment of the invention.

Fig. 1 shows a section view taken along a horizontal plane of the knot indicated at H in Fig. 2 ; Fig. 2 shows a front view and two section views in smaller scale of the construction in accordance with the invention ;

Fig. 3 is the section taken along a vertical plane of the knot H2 of Fig. 4 ;

Fig. 4 shows three similar views as Fig. 2 with reference to knot H2 ;

Fig. 5 is the front view of knot H3 of Fig. 6 ;

Fig. 6 shows the three views with reference to knot H3 ;

Fig. 7 shows a detail of the corner in section view along a horizontal plane ;

Fig. 8 shows the detail of the socle or base fascia in section view along a vertical plane ;

Fig. 9 shows the detail of the top fascia or cornice in section view along a vertical plane ;

Fig. 10 is a modification of the construction of Fig. 9 ;

Fig. 11 is a partial front view of a continuous front in accordance with the invention ;

Figs. 12 to 16 show the details indicated in Fig. 11 at Roman numerals I to V, respectively ;

Figs. 13A and 16A show two alternatives of the knots of Fig. 13 and 16, respectively ;

Figs. 17 and 18 show the external and internal front views of two adjacent windows.

With reference to Figs. 1 and 2, numeral 1 designates a strong structural part of a building such as for example the reinforced concrete cage, the metallic building skeleton, the masonry a.s.o., to which the continuous front according to the invention should be applied. Threaded bolts 2 are inserted in a vertical alignment into spaced holes of such strong structural part 1 of the building and are locked by epoxy resins or the like. Of course, other anchoring means can be provided for threaded bolts 2 according to the type of structural part 1.

Anchor stirrups 3 having an U-section and provided with setting eyelets 4 and 5 compensating any misalignment in both orthogonal directions are coupled to the threaded bolts 2 (see also Figs. 3 to 6). In particular, eyelets 4 allow the lateral setting and eyelets 5 allow the thickness setting, i.e. in a direction perpendicular to the structural part 1. To this end, in Fig. 1 the right end and the left end of the structural part 1 are at different levels so as to better show said setting possibility.

Stirrups 3 are clamped by nuts 6 and washers 7 to the threaded bolts 2. Omega-shaped and vertically aligned sections 8 are disposed on stirrups 3 and clamped thereto by bolts 9 screwed to corresponding square nuts 10 housed into retainers 11 rigidly connected to stirrups 3 and section 8. Eyelets 12 formed in sections 8 serve to any vertical setting.

Further omega-shaped and horizontally spaced away sections 14 are clamped by bolts 13 on the flanges of sections 8.

The construction formed of the assembly of vertical sections 8 and horizontal sections 14 is a frame having square meshes (Figs. 5 and 6) to which the panels designated by 15 are fixed. Each panel is formed of a layer of thermo-acoustic, foamed, insulating material such as for example polyurethane or other suitable material such as mineral wool or glass wool of appropriate thickness applied to both surfaces along with a metallic sheet or other ferrous and non-ferrous material.

Formed along the edges of each panel is a groove 16 (Fig. 1) in which a substantially C-shaped raceway 17 is received, the latter having the function of connecting two adjacent panels 15 by means of several hexagonal cut-in head bolts 18 with spring washers passing through setting eyelets 19 and screwed to square nuts 20 received into the already described retainers 11. When assembling said raceway further acts as reference means for the size, the alignment and the engagement of the covering panels.

As is apparent from fig. 1 the vertical edges of panels 15 carries a garnish 22 with double-seamed flange 23 embedded into the material of the panel. Said garnish 22 is made of rigid plastic material and has the double function of strengthening the edges of the panels to allow bolts 18 to be tighten, and forming a thermal barrier preventing heat from being transmitted from the interior to the exterior of the panels.

A continuous elastic gasket 24 provided with two strips 25 for sealing grooves 16 is snap-fitted into the open front parts of raceways 17.

At the horizontal edges (Fig. 3) the upper panel has at its bottom edge a drip 26, and the upper edge 27 of the underlying panel is weathered so as to prevent water from entering into the junction area not even by capillarity.

As can be seen in Fig. 3, also in this case the hexagonal cut-in head bolts 28 directly engage the horizontal sections 14 of the frame through square nuts received into retainers welded within the horizontal sections.

From the foregoing it is evident that each panel 15 is structurally independent of the other panels so that any replacement of one or more panels is extremely easy and is executed irrespective of the adjacent panels. This is one of the advantageous characteristics of the invention with respect to other known systems.

In Fig. 7 the assembling of the corner panel 29 is shown which is disposed as already described on a dihedral section 30. The latter is in turn anchored directly to stirrups 3 by bolts 31.

The base fascia or socle of the continuous front (Fig. 8) consists of a panel 32 having a curvilinear section which is rigidly connected along its upper edge to section 14 as already described. Said panel 32 carries at its bottom a housing 33 in which one flange 34 of a L-shaped section is inserted with the interposition of an elastic gasket adapted to take up small expansions, the other flange of said section being connected to the structural part 1 by bolts 35 cooperating with small blocks 36.

The top fascia (cornice) is shown in Fig. 9 and includes a panel 46 having a curvilinear section which is rigidly connected to the first panel 15 of the front and to the vertical flange of a L-shaped section 38 which is in turn connected to the structural part 1 by stirrups 47. Both section 38 and raised edge 44 of panel 46 are protected by a covering sheet 39 which is in turn rigidly connected to stirrups 47 at 40. As can be seen in Fig. 10, between panel 38 and the masonry there is a hollow space which is filled with insulating material.

In Fig. 10 a variation of the described embodiment is shown. In this case the covering panel 41 is provided with a projecting portion having a drip 42 and resting on section 43. Covering panel 41 has a weathered extrados and is provided with a protected raised edge 44 which is covered by another covering sheet 45. The connection to the structural part 1 is accomplished in the same way as shown in Fig. 9.

In Fig. 11 a front which can be built as herein described is shown. It is evident that the front of Fig. 11 shows one of the several possible architectural constructions. In this case the frames 48 of windows 49 are horizontally aligned.

At each window (Fig. 12) an outer panel 50 anchored at 51 is provided having a sealing garnish 52 provided if necessary with a sealing agent 53 and resting directly on window frame 48.

Box 55 having the function of covering the metallic construction is disposed between the upper cross member of frame 48 and the upper floor 54.

The base of the window (Figs. 13 and 14) from the floor 56 upwards is provided with the inner sheet 57, baseboard 58 and sill 59 forming the architectural supplementing with the already described panel 50. The connection to sill 59 is performed at 60 through Z-shaped section 61.

In Fig. 13A a variation of Fig. 13 providing an internal panel 62 is shown.

Figs. 15 and 16 show outer adjacent panels 50 connected by sections 63, and Fig. 16A shows an alternative embodiment of Fig. 16 in which the construction provides a double panel, i.e. an outer panel 15 and an inner panel 62 which have been already described.

In Figs. 17 and 18 the partial outer and inner front view are shown, respectively. The outer front view of Fig. 17 is characterized by the frame 64 formed of the connected panels as already shown.

The present invention has been illustrated and described with reference to a preferred embodiment thereof but it should be understood that structural variations can be made without parting from the scope of protection of this industrial invention.

Claims

1. Modular sectional construction for the fronts of buildings and/or for insulation coatings of current masonries either provided with windows or without windows, characterized in that it includes a frame of metallic sections which is anchored to the bearing building skeleton and/or the masonry of the building and a plurality of replaceable covering panels applied to said frame so as to form a continuous front for coating the building and also the window frames, the side corners, the base socle and the cornice.
2. The construction of claim 1, characterized in that said frame of metallic sections is formed of vertical omega-shaped sections rigidly connected to stirrups directly anchored to the strong structural part of the building or the masonry, and of horizontal omega-shaped sections rigidly connected to said vertical sections.
3. The construction of claims 1 and 2, characterized in that the anchor stirrups, the vertical sections and the horizontal sections are provided with eyelets to adjust the alignments according to three orthogonal directions.
4. The construction of claims 1 to 3, characterized in that said anchor stirrups are fixedly anchored to the building skeleton by means of threaded bolts inserted into holes, formed in said building skeleton at predetermined intervals, and cooperating with an epoxy resin or other suitable sealing agent.
5. The construction of claims 1 to 4, characterized in that said omega-shaped sections are connected to one another by means of bolts clamped by square nut engaged within retainers welded to said sections at the connection points.
6. The construction of claims 1 to 5, characterized in that the frame having square meshes formed by the vertical and horizontal sections has the function to anchor a corresponding set of outer panels forming the continuous covering front of the build-

ing, said panels being replaceable in the respective positions.

7. The construction of claims 1 to 6, characterized in that each panel is formed as a layer of thermo-acoustic insulating material applied on both surfaces of a layer of metallic material or other technologically appropriate, ferrous or non-ferrous material.
8. The construction of claims 1 to 7, characterized in that each panel has a thinner thickness at its edges so as to form a peripheral groove in which a substantially C-shaped raceway is disposed which is open outwards and cooperates with bolts screwed to said frame so that each panel can be replaced.
9. The construction of claims 1 to 8, characterized in that the panels are provided at their edges having thinner thickness with a flanged double-seamed garnish embedded into the body of the panel and made of rigid plastic material having the double function of strengthening the edges of the panels at the connection points, and forming a barrier against the heat transmission between the exterior and the interior of the panels.
10. The construction of claims 1 to 9, characterized in that the front opening of the raceway is sealed by a gasket which is snap-fitted into said opening and is provided with two strips disposed into contact with the two corresponding edges of the adjacent panels.
11. The construction of claims 1 to 10, characterized in that the upper panel is provided with a drip cross-projection along the horizontal connecting edges, and the edge of the lower panel is weathered.
12. The construction of claims 1 to 11, characterized in that the corner panels, the base fascia or socle of the front and the cornice are formed of shaped panels provided with a similar flanged garnish as described in claim 9 and anchored to the metallic frame by means of interposed sections provided with complementary members such as drips and external protection sheets.
13. The construction of claims 1 to 12, characterized in that the windows have metallic frames of the conventional type anchored to an external shaped panel forming a thermal barrier and including the two reveals, the window lintel and the sill.
14. The construction of claims 1 to 13, characterized

in that a sealing gasket provided if necessary with a sealing agent is disposed between the window frame and the panel.

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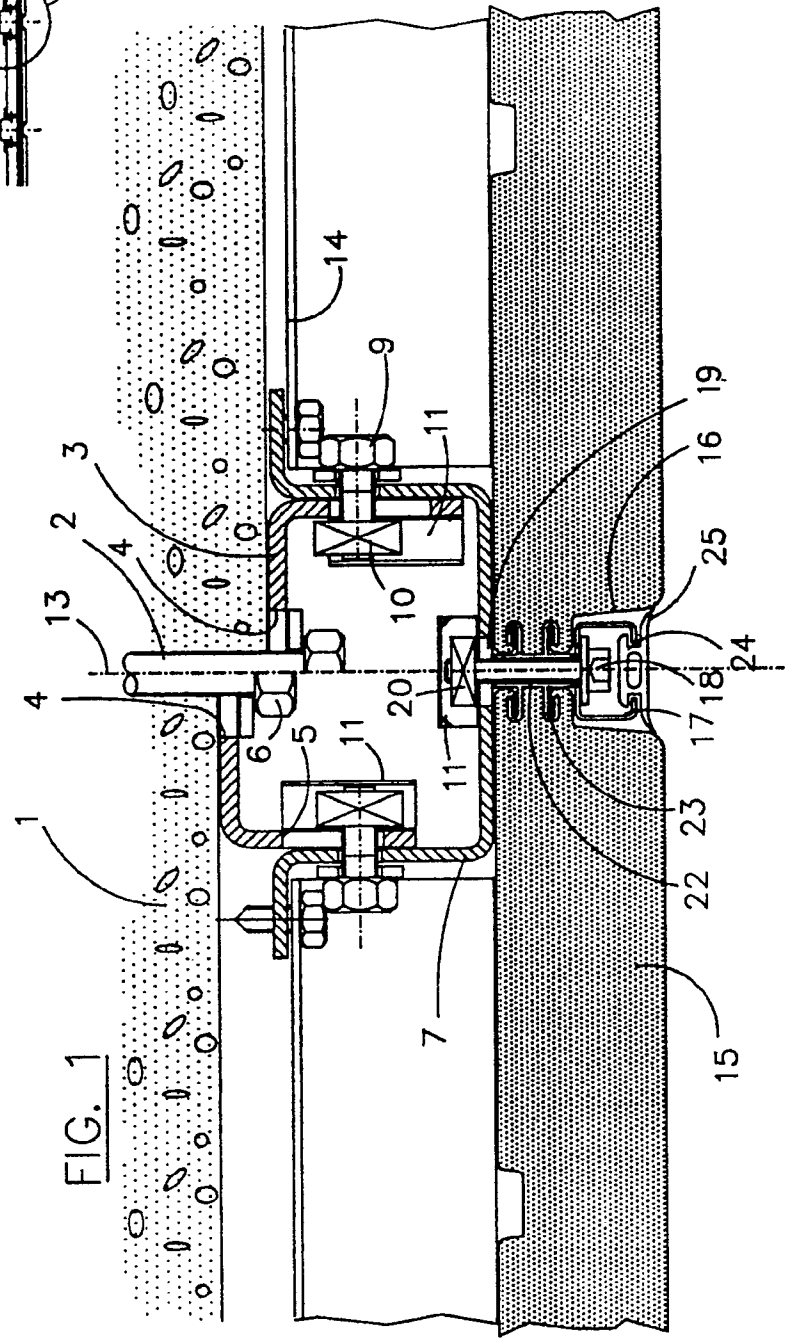
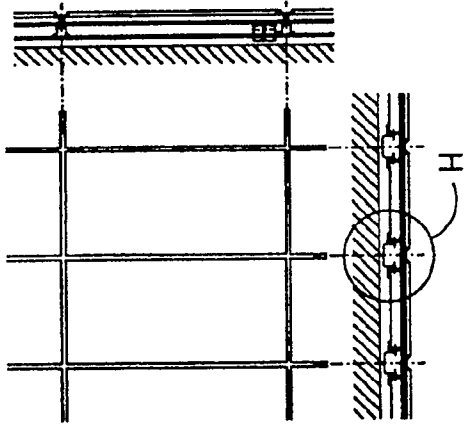
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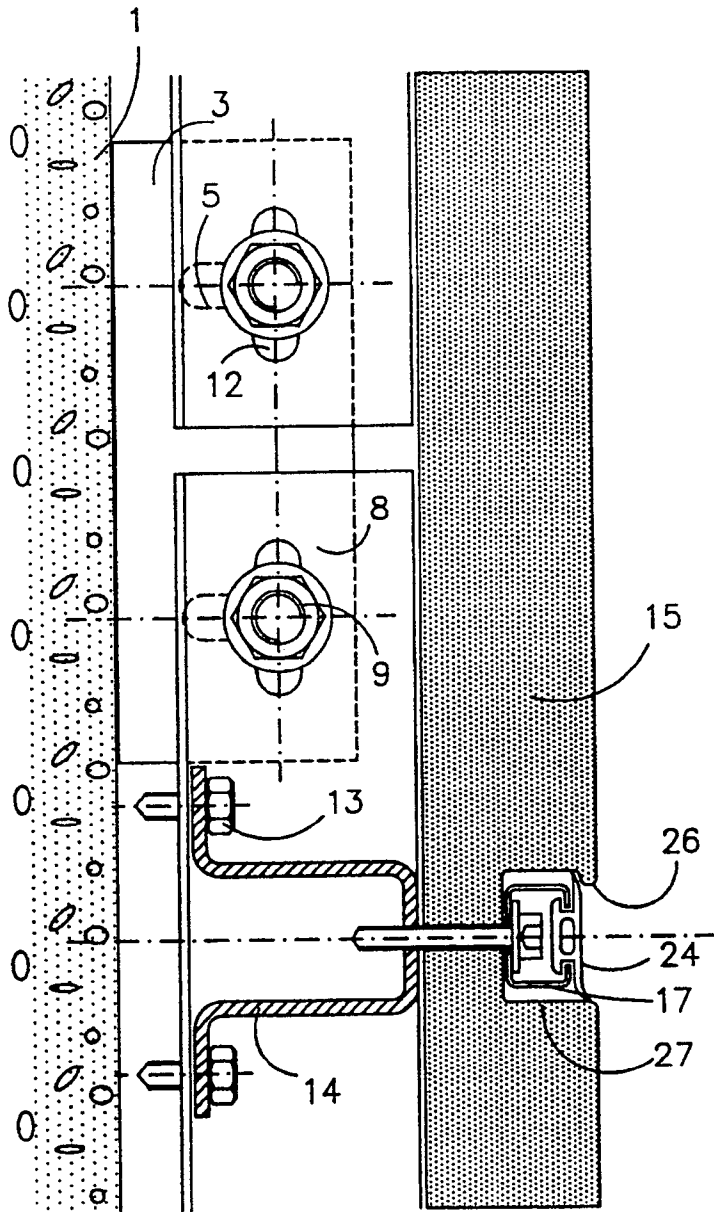


FIG. 3

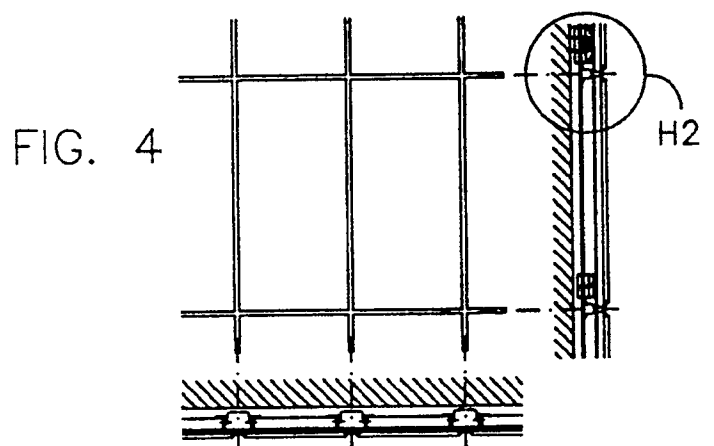


FIG. 4

FIG. 5

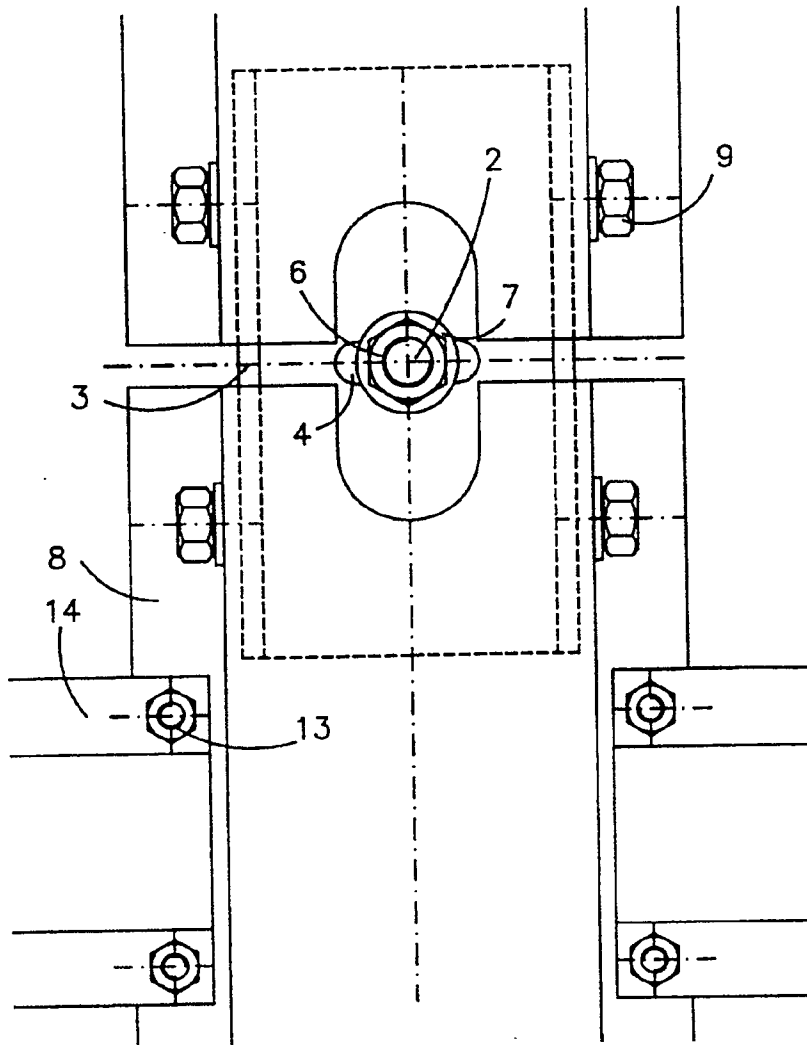


FIG. 6

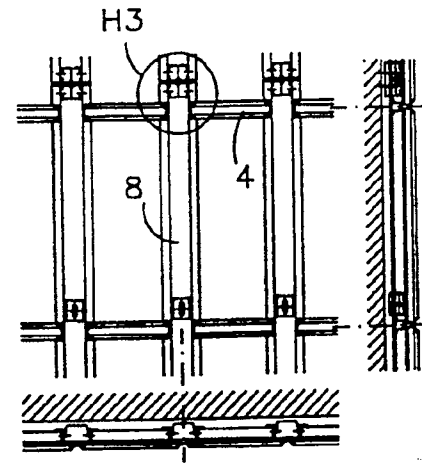
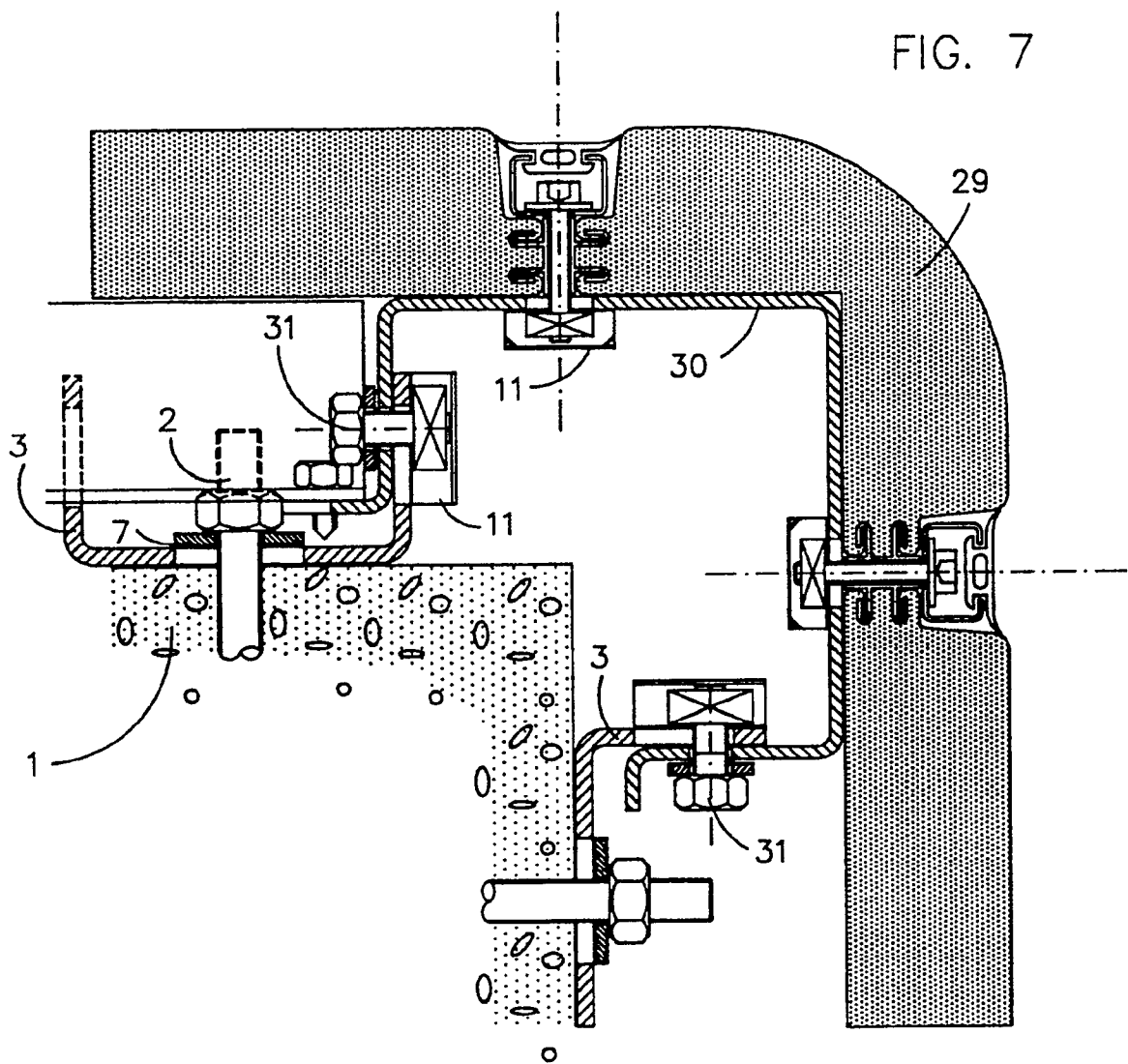


FIG. 7



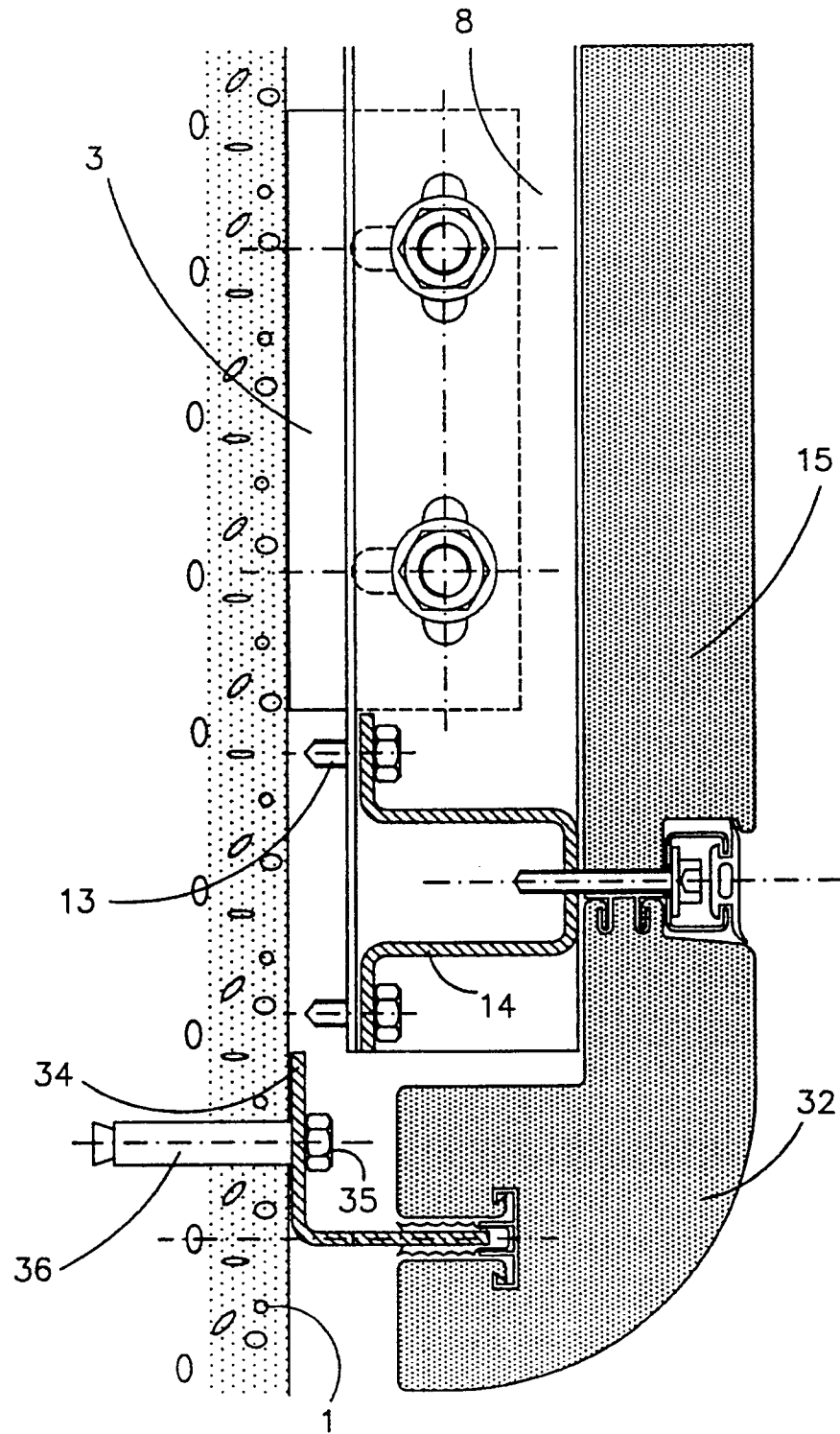


FIG. 8

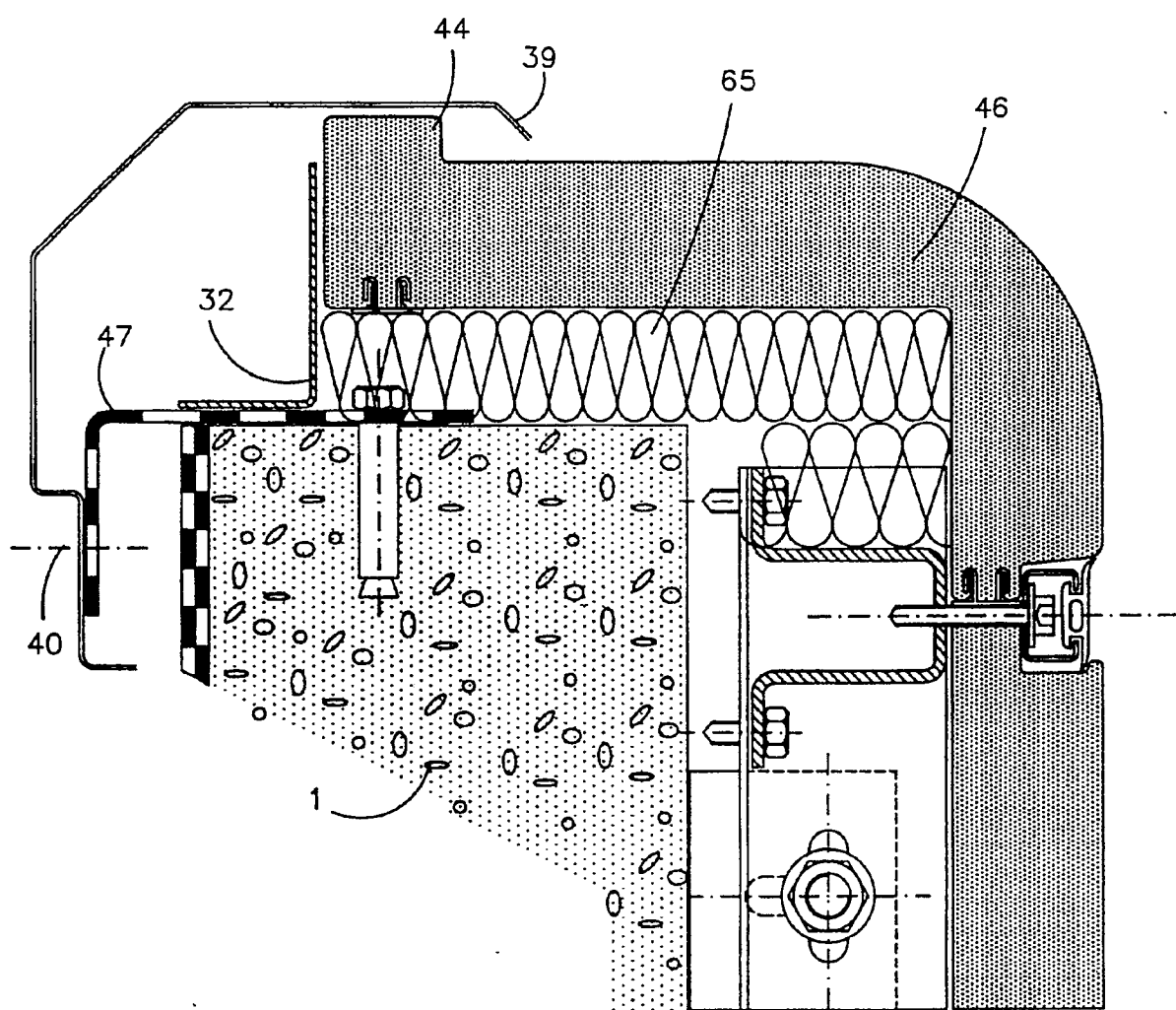


FIG. 9

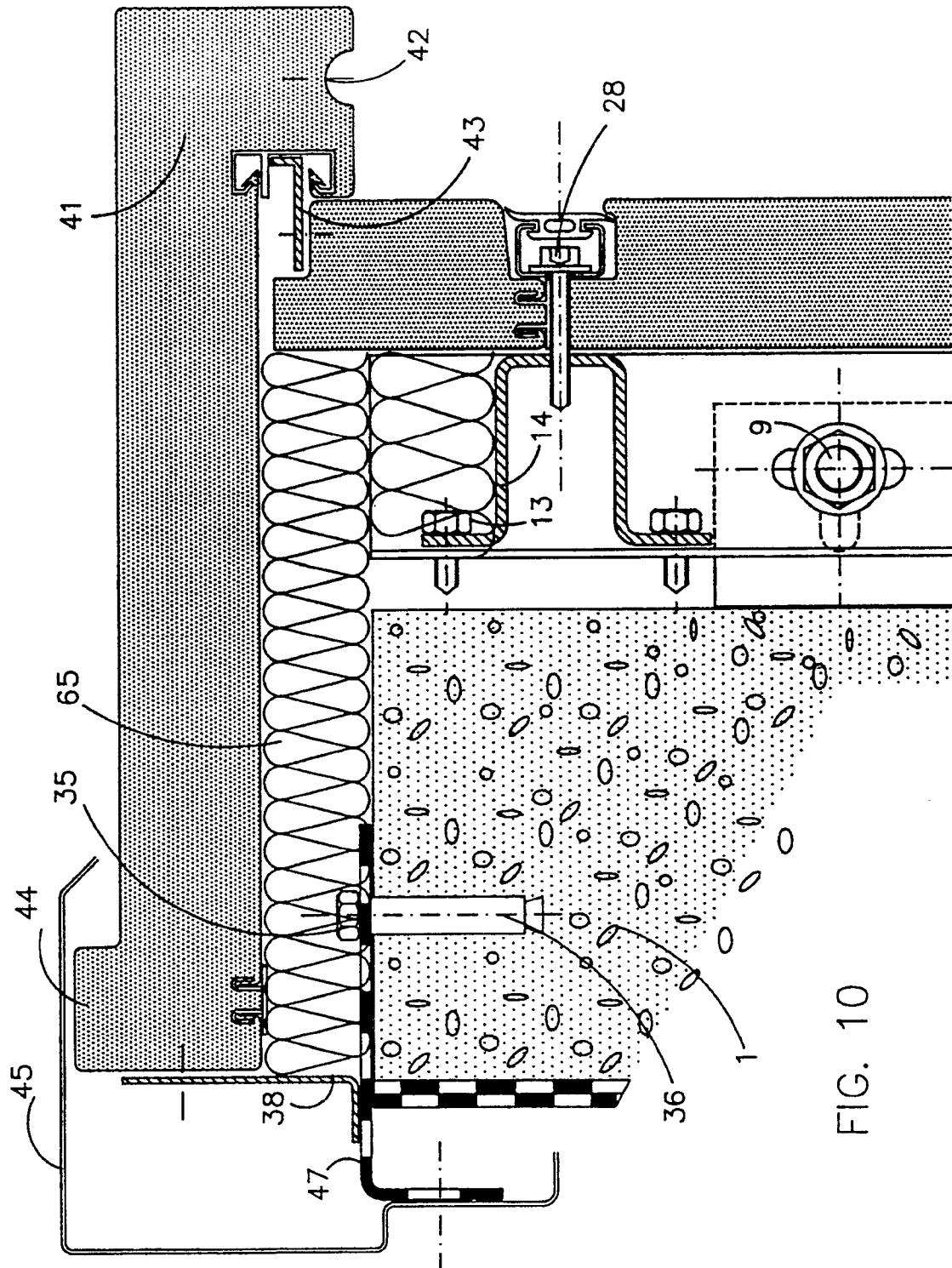


FIG. 10

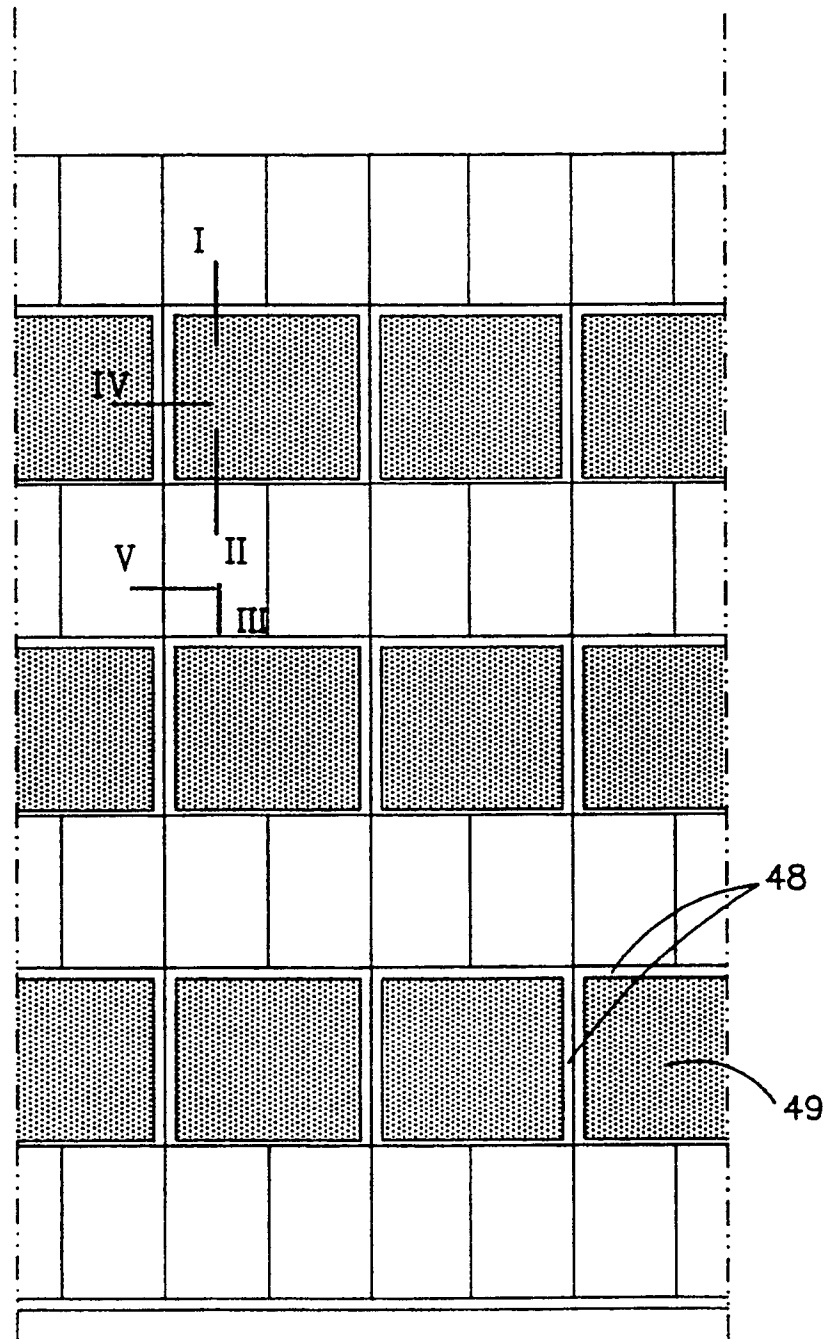


FIG. 11

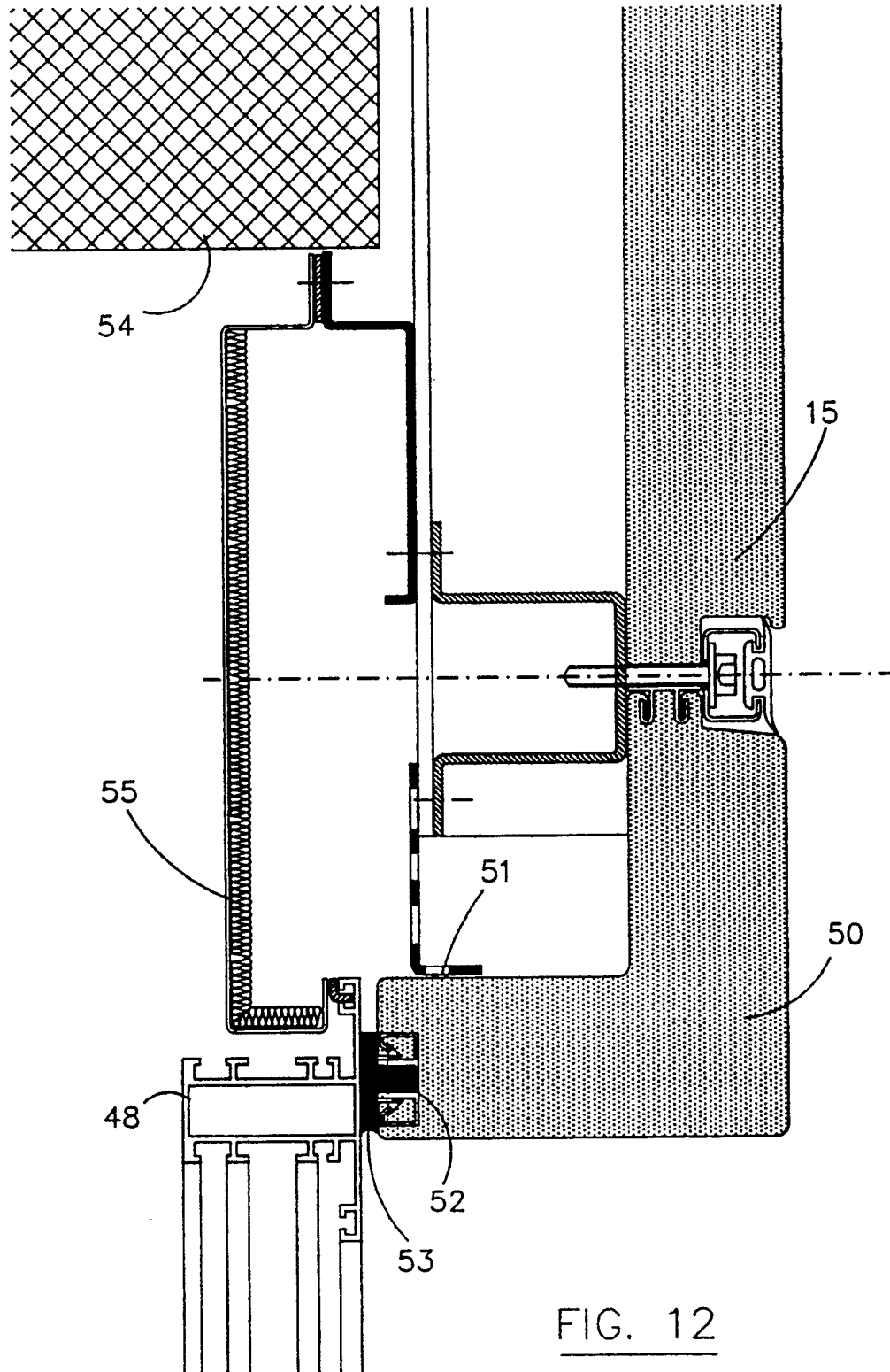


FIG. 12

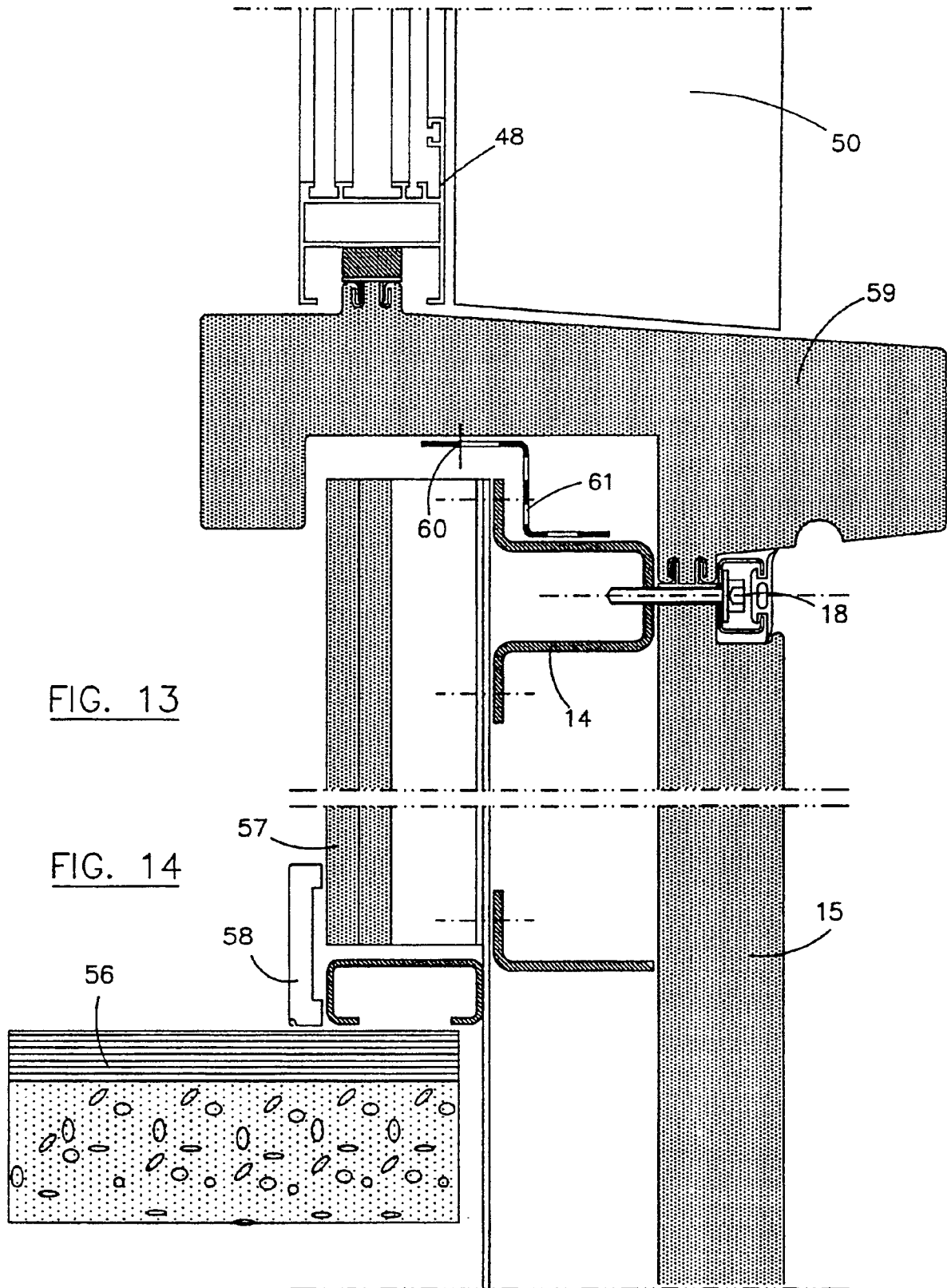


FIG. 15

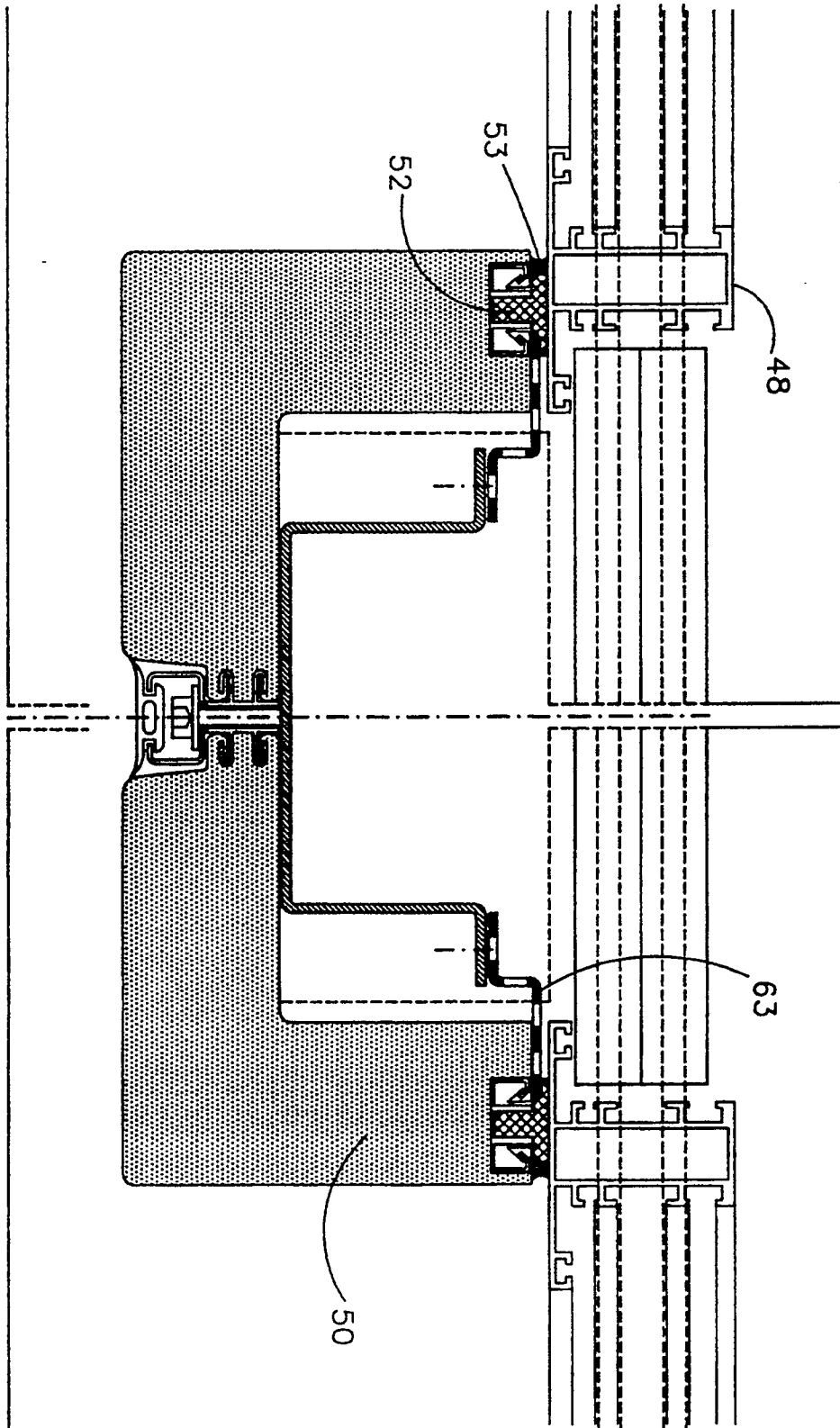
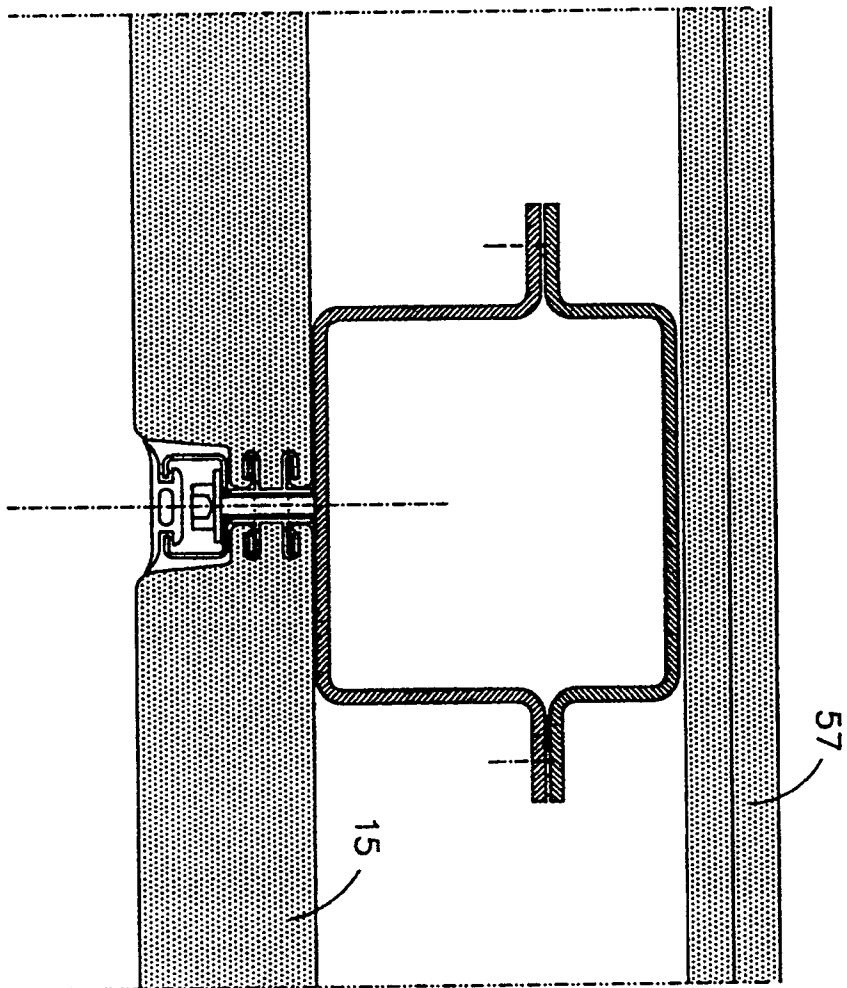


FIG. 16



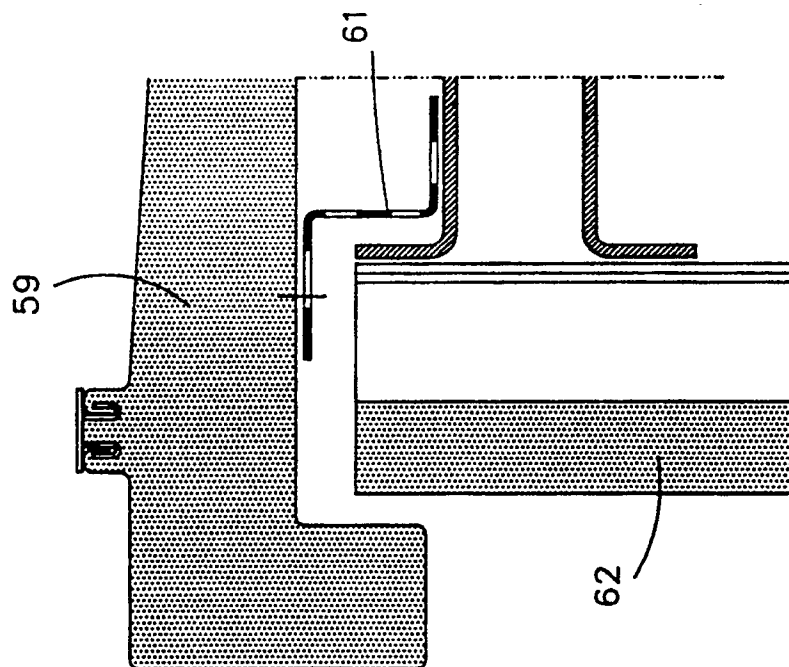


FIG. 13A

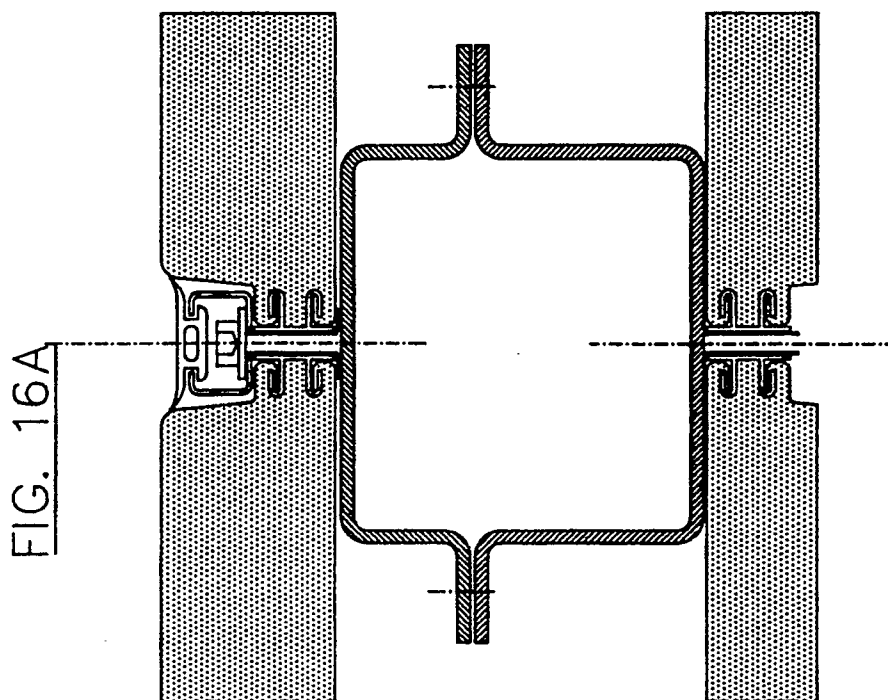


FIG. 16A

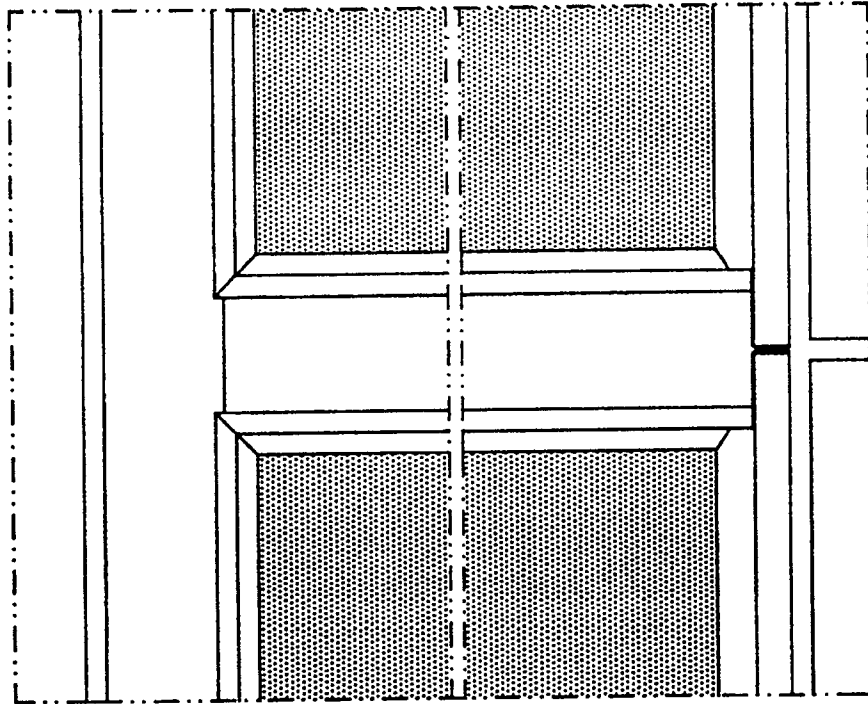


FIG. 18

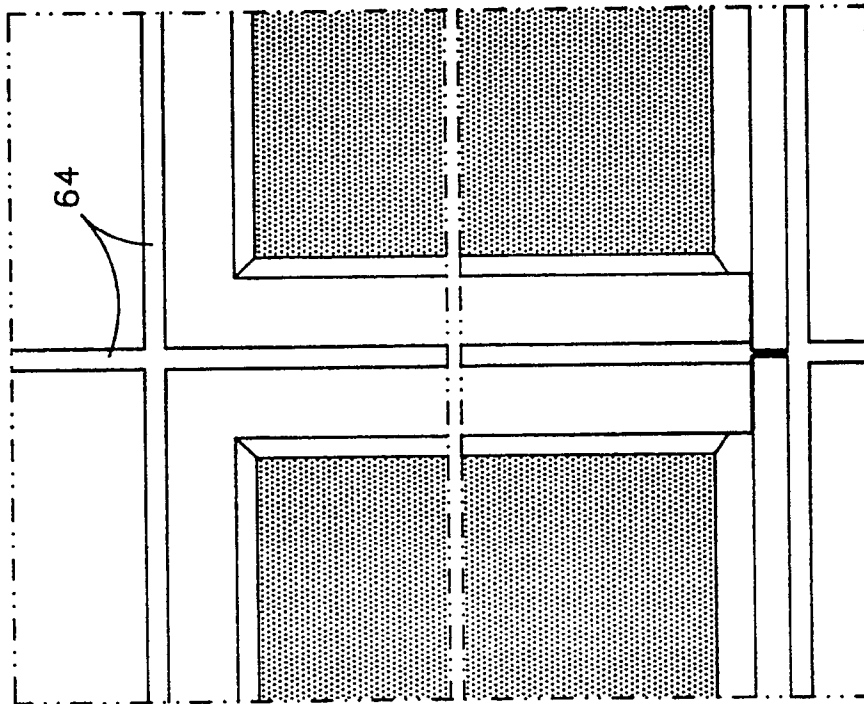


FIG. 17