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(54) Fenestration system.

(57) Fenestration system for application to window apertures (10) left in or between cladding panels (12) of walls. First parts (13) each fix by one surface (13A) to one side of the cladding panels to present an affixment surface (13B) about the window aperture (10). Second parts (14) each fix by first surfaces (14A) to said affixment surfaces (13A) of the first parts (13) to extend into said window aperture over the thickness of the cladding panels thereat, and present formations (14B, 14C) about said window aperture for directly accepting glass (20) or glazing units. The glazing units can be frames of opening lights. The affixment surfaces (13B) can be extensions of the one surfaces (13A). The second parts (14) are preferably composites of extrusions (14A, B, C).

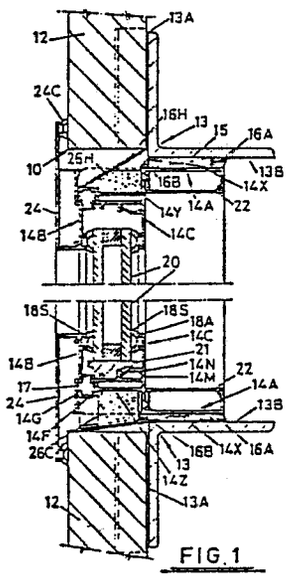

FIG.1

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Description

Fenestration System

This invention relates to fenestration of structures clad with panels.

Many buildings, especially industrial buildings, are clad with panels, often of coated formed metal sheets sandwiching insulation material and edge-formed for mutually inter-fitting purposes. Such cladding is most often fixed to structural steelwork of walls. Windows for such structures require either gapping or aperturing of the panels, sometimes a combination of both, and are usually installed after cladding, frequently by another contractor or sub-contractor. Hitherto, the cladding installer has left window apertures trimmed out through and about the thickness of the panels with no more reference to installation of window units than to assure that specified sizes can be accepted. That can lead to untidy fitting of window frames including undue requirement for packing etc,

It is an object of this invention to facilitate fenestration by way of providing an improved and more orderly system.

According to this invention, apertures formed or left in cladding panels at installation are trimmed off so as to be capable of glazing directly, such trimming off comprising cooperating first and second parts, the first parts fixing by one surface to one side (usually inner) of the cladding and presenting an affixment surface, whether extending parallel with or away from the cladding about a window aperture, and the second parts fixing by first surfaces to said affixment surfaces of the first parts and extending therefrom into the window aperture over the thickness of the cladding.

Henceforth, herein, we refer to the first parts as "framing members", and to the second parts as "glazing extrusions", though it will be appreciated that the latter may be not only directly glazed but alternatively be employed in relation to fitting of window units, i.e. by applicable both to glass or glass units (e.g. double glazed modules) and to frames of windows having opening lights. The framing members will normally be themselves fixed to structural steelwork of the building (wall) concerned, may even be part of at least secondary such steelwork.

The framing members can be of simple angle form mitred together about the cladding aperture with their one surfaces at least overlapping onto the side of the cladding to which they fix. Then, the affixment surfaces may be on a surface of the angle form that extends away from the cladding aperture, but could alternatively be on said one surface but inside the cladding aperture. Other forms of framing member could, of course, be used, for example of channel form with the web affording said one surfaces, or of box section.

The glazing extrusions preferably have their first surfaces to affix to said affixment surfaces of the framing members extending towards or stepped towards inner edges of the cladding aperture from where they extend thereinto, which extension is conveniently from a hollow box formation of the glazing extrusion that is preferably shallow in its extension over the cladding thickness. Such provisions particularly facilitate both of neat packing relative to said affixment of the framing members, and of sealing provision between the box formation and edges of the cladding panels or flashing system between those edges and the provisions hereof.

Overall, and for direct glazing thereto, the glazing extrusions present spaced limbs with confronting seal housing formations for glass sheets etc and it is preferred that at least one of said limbs (usually the outer) have compliance relative to the glazing extrusions as affixed to said affixing surfaces of the framing members. Considering glazing extrusions with said hollow box formation extending into the cladding aperture, it is preferred for extrusion presenting said one limb to extend transversely of said box formation, say in a generally T-configuration. Neat finishing of such provisions is readily afforded by cappings applied over said one limb formation. In some installations such cappings extend onto the other side of the cladding, otherwise into the cladding aperture onto an inset or rebate formation normally contributing to panel interfitting or onto a further extrusion under the framing member, in all cases preferably with a seal-housing formation relative thereto.

For glazing extrusions of heat conducting material, e.g. aluminium, it is particularly preferred that they be of composite construction with first component extrusion affording said first surfaces and box formations together, and second component extrusions affording said one limbs and extending generally transversely of associated first component extrusions, the first and second component extrusions having formations for interconnecting attachment by way of heat insulating resilient material then providing both said compliance and a thermal barrier.

At least for direct glazing purposes, the aforesaid other limb is preferably provided by a third glazing extrusion affixing to the first glazing extrusion, further preferably via a formation at or near the side of its hollow box formation coincident with said extension. Alternatively, however, the last-mentioned formation is utilised in mounting of frame of window units with opening lights.

In addition to peripheral trimming off of cladding apertures, systems hereof can provide partitioning of such apertures via mullion extrusions, conveniently of hollow box formations which can further afford location for said third glazing extrusions at one side and a transverse extrusion at the other side as spaced confronting glazing limbs.

Specific implementation of this invention will now be described, by way of example, with reference to the accompanying drawings, in which

Figure 1 is a section through one embodiment for direct glazing;

Figure 2 shows relevant flashing provisions at one top corner;

Figure 3 shows relevant flashing provisions at one bottom corner;

Figure 4 shows a side (jamb) and mullioned sections;

Figure 5 shows a section through another embodiment for direct glazing;

Figure 6 is a related jamb section;

Figure 7 shows glazing further involving a structural wall member;

Figure 8 shows application to an opening-in window light;

Figure 9 shows application to an opening-out window light;

Figure 10 shows application to a thermally broken window-light opening out; and

Figures 11, 12 and 13 show head, cill and jamb details for another embodiment.

In the drawings, referring first to Figures 1 and 4, an aperture 10 in a cladding panel or panels 12 is shown trimmed off using framing members 13 of angle formation applied, conveniently screwed, at one surface 13A to the inside of the cladding and presenting another surface 13B extending away from that side for affixment of glazing extrusions. Composite glazing extrusions (14) are applied, conveniently screwed, at first surfaces 14X to the other surfaces 13B of the framing members, see also packings 15 and seals 16A, 16B. The surfaces 14X are shown stepped to 14Y at extension into the thickness of the aperture 10.

It will be noted that the framing members 12 and associated glazing extrusions 14 are shown applied over flashing provisions 16, comprised of right angle formed jamb flashings 16J, obtuse-angle formed head flashing 16H, and at least slightly sloping cill flashing 16C. Figures 2 and 3 show jointing of such flashings, which will usually be butt-welded at end edges.

The stepped glazing extrusion surface 14X, Y is shown of a first component extrusion 14A having a formation 14F by whcih it retainingly engages an extrusion of resilient heat insulating material 17. The formation 14F is on a hollow box formation 14S that is shallow in the direction of the thickness of the cladding 12 and is oppositely bounded by the surface 14Y and a surface 14Z within which a glazing unit 20 is installed.

Overall, the glazing formations 14 of Figures 1 to 4 are shown affording spaced limbs with confronting housing formations 18A, 18B for seals 18S, 18D to a glazing unit 20 shown as of double sheet type on setting blocks 21 at its lower edge. The seal housing formation 18B is on a second glazing component extrusion 14B connected to the first component extrusion 14A by retaining engagement at 14G with the heat insulating material extrusion 17. The second component extrusion 14B extends generally transversely of the first component extrusion 14A, and the thermal barrier extrusion 17 affords a degree of compliance between them. The seal housing formation 18A is on a third glazing component extrusion fitting to the first component extrusion 14A via cooperating formations at 14M and 14N.

The first and second glazing component extrusions 14A, 14B have further formations by which they retainingly accommodate snap-fitting cappings 22, 24 over the position of fitting the first extrusion 14A to the frame member 12 and over the second extrusion 14B, respectively. The capping 24 further extends to a seal housing formation 24C onto the outer side of the cladding panels 12.

Location blocks 26H, J and C are shown about the glazing extrusion system 14 at top sides and bottom for location relative to the aforementioned flashing system 16.

Figure 1 shows cladding panels 12 cut or end-spaced to form the aperture 10, i.e. with square edges to that aperture. Figure 4 shows normally interfitting formations 12A and 12B (part only) of the panels 12, i.e. with the panels installed for interfitment vertically and with the aperture 10 assumed to be of a width substantially corresponding to widths, or at least glazing spacing, of the panels 12, though a tongue has been cut from the formation 12B.

Figure 4 also shows a mullion glazing extrusion 26 with a variant indicated dashed at 26′ to allow a choice of depth of mullion to suit span or loading conditions. A basic hollow box section has formations 26A, 26B similar to above-mentioned formations 14M for cooperation with glazing component extrusions similar to those shown at 14C, hence again labelled 14C. The outside of the mullion extrusion 26 has a compliant fixing to a capping extrusion 26C shown via a thermal break extrusion 28.

Figures 5 and 6 show a modified embodiment for use where the cladding panels 12 interfit normally with each other at horizontal adjacency of their formed edges 12C, 12D. Figure 5 shows such interfitting formations and modified exterior cappings 24′ that return to seal housing formations bearing onto a rebate of the panel edge 12D and into a further extrusion 14D of the glazing system that has a hooked edge 14H fitting into a groove of the panel edge 12C. The framing members are shown bolted onto the rebate and the further extrusion, a clip 30 being used at the former. At sides of ther aperture, see Figure 6, an extruded resilient gasket 32 is used for sealing purposes. It will be appreciated that these fixing measures permit fitting without the flashing system 16 of Figures 1 to 4, and related measures could be employed for replacing the flashing system 16 of those Figures, if desired.

Figure 7 shows a way of jointing glazed units against a structural member 40, using a suitable extrusion 41 and site applied sealing beads 42 and tape 43.

Figure 8 is a partial section through a cladding aperture glazed with an inwardly opening light. The third glazing component extrusion 14C of Figures 1 to 6 is omitted, and typical opening light frame extrusions 50 are indicated in thick black lines, together with suitable sealing arrangements 51, 52. Otherwise, the system is similar to that of Figures 1 to 4.

Figure 9 shows a similar section through an outwardly-opening frame, again similar to Figures 1 to 4, but this time with a subframe 60 between the limbs 15A, 15B.

Figure 10 shows an outwardly opening light that

includes a thermally broken subframe composed of two extrusions 70A, 70B connected by thermal barrier extrusions 71, and an opening frame also of two extrusions 72A, 72B connected by a thermal barrier extrusion 73. In this embodiment, the formations for seal housing at 14G and for the third panel extrusion at 14M are shown used for the subframe extrusions.

Figures 11, 12, and 13 show another embodiment in which the first glazing extrusions, some referenced 114A, have their first surfaces 114X for affixment to framing members 113 extend from box section 114S towards inner edges of the cladding aperture. Then, affixement to the framing members 113 is to extension of the same surface 113A as overlaps the cladding aperture. It will be appreciated that the structure shown in Figures 11, 12 and 13 is otherwise similar to that of Figures 5 and 6.

Claims

1. Fenestration system for application to window apertures left in or between cladding panels of walls, comprising first and second parts, the first parts each fixing by one surface thereof to one side of the cladding panels about and presenting an affixment surface about a said window aperture, and the second parts each fixing by first surfaces thereof to said affixment surfaces of the first parts to extend into said window aperture over the thickness of the cladding panels thereat and presenting formations about said window aperture for directly accepting glass or glazing units.

2. Fenestration system according to claim 1, wherein said affixment surfaces extend away from said one surface of the first parts and said window aperture.

3. Fenestration system according to claim 2, wherein said first surfaces of the second parts are stepped from hollow box formations of the second parts extending across the thickness of the cladding panels.

4. Fenestration system according to claim 1, wherein said affixment surfaces are extensions of said one surfaces of the first parts within said window aperture from surrounding cladding panels where the one surfaces overlap.

5. Fenestration system according to claim 4, wherein said first surfaces of the second parts extend away from sides of hollow box formations of the second parts extending transversely of said first surfaces across the thickness of the cladding panels.

6. Fenestration system according to any preceding claim, wherein the second parts present spaced limbs with confronting seal housing formations, at least one such limb having compliance.

7. Fenestration system according to claim 6 with claim 3 or claim 5, wherein said spaced limbs extend from said hollow box formations.

8. Fenestration system according to claim 6 or claim 7, wherein the second parts are of composite construction with a first component extrusion affording said first surfaces and a second component extrusion affording said one limb.

9. Fenestration system according to claim 8, wherein the first and second component extrusions interconnect by way of formations engaging a member of resilient heat insulating material.

10. Fenestration system according to claim 8 or claim 9, wherein the second parts have a third component extrusion fixing to the first component extrusion by cooperating formations and presenting said other limbs.

11. Fenestration system according to any one of claims 6 to 10, comprising cappings at least over said one limbs and having seals at their ends.

12. Fenestration system according to any preceding claim, wherein the first parts serve in fixing relative to structural steelwork of a wall.

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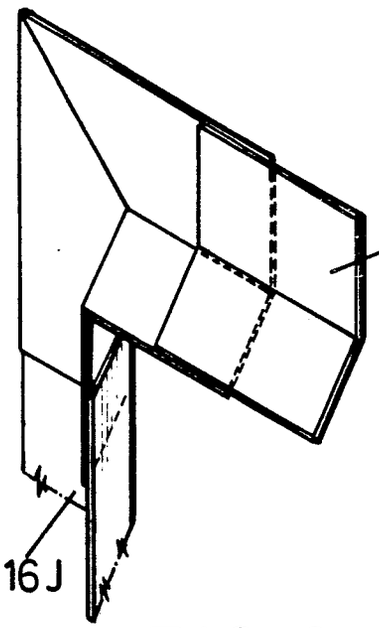

FIG. 2

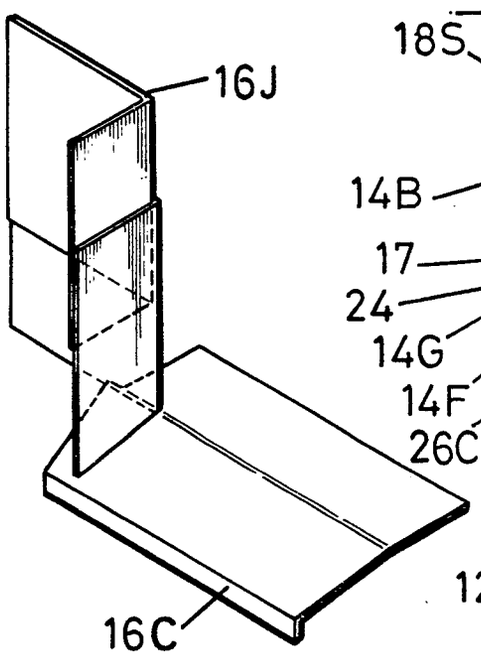

FIG. 3

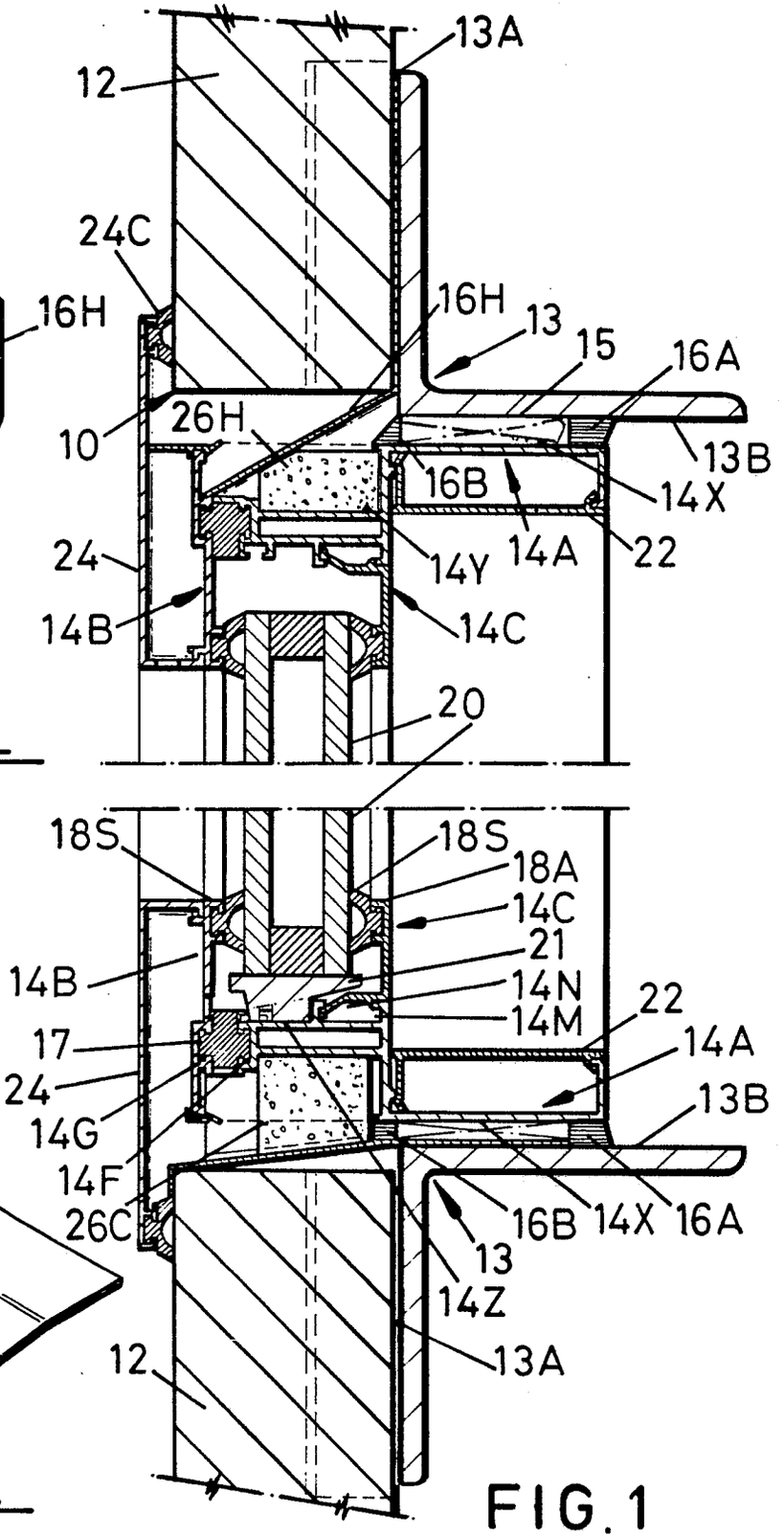

FIG. 1

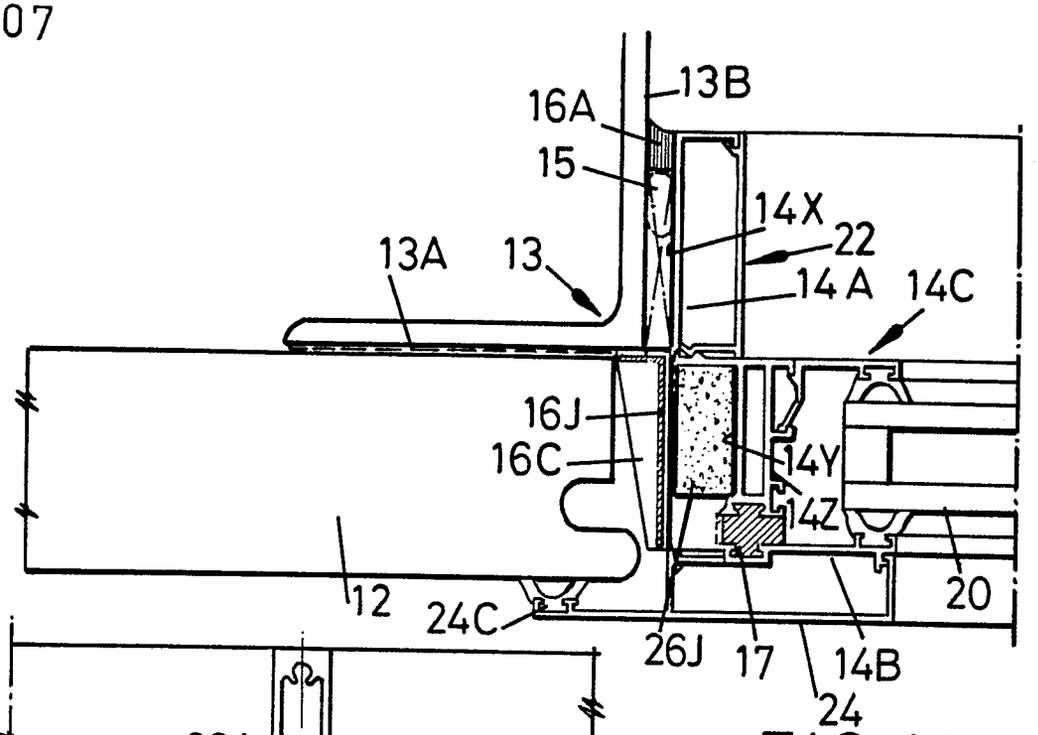

FIG. 4A

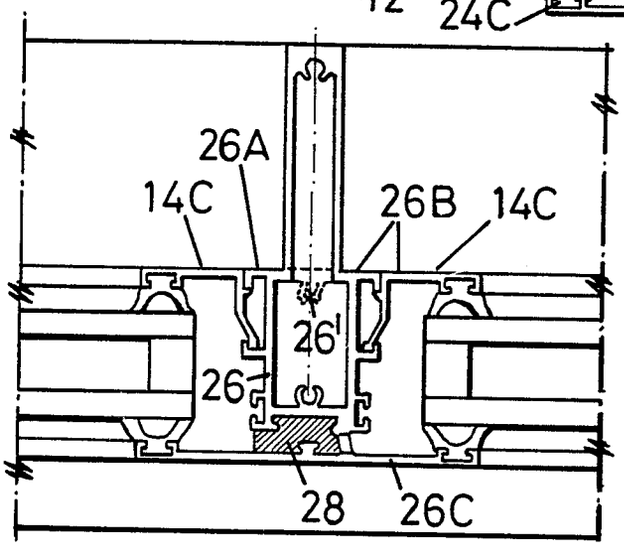

FIG. 4B

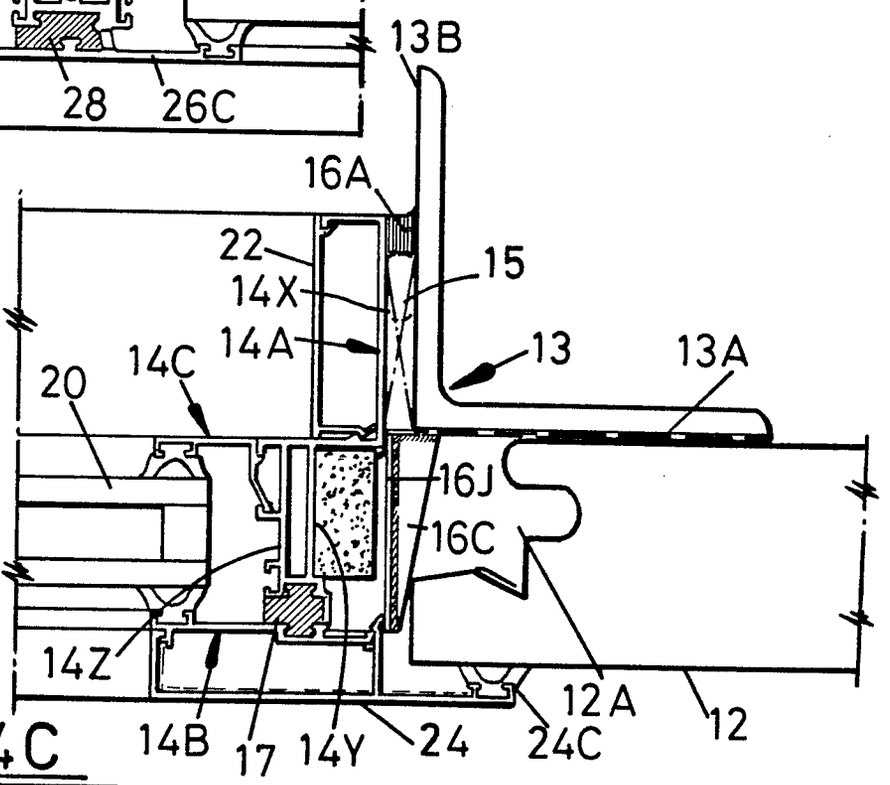

FIG. 4C

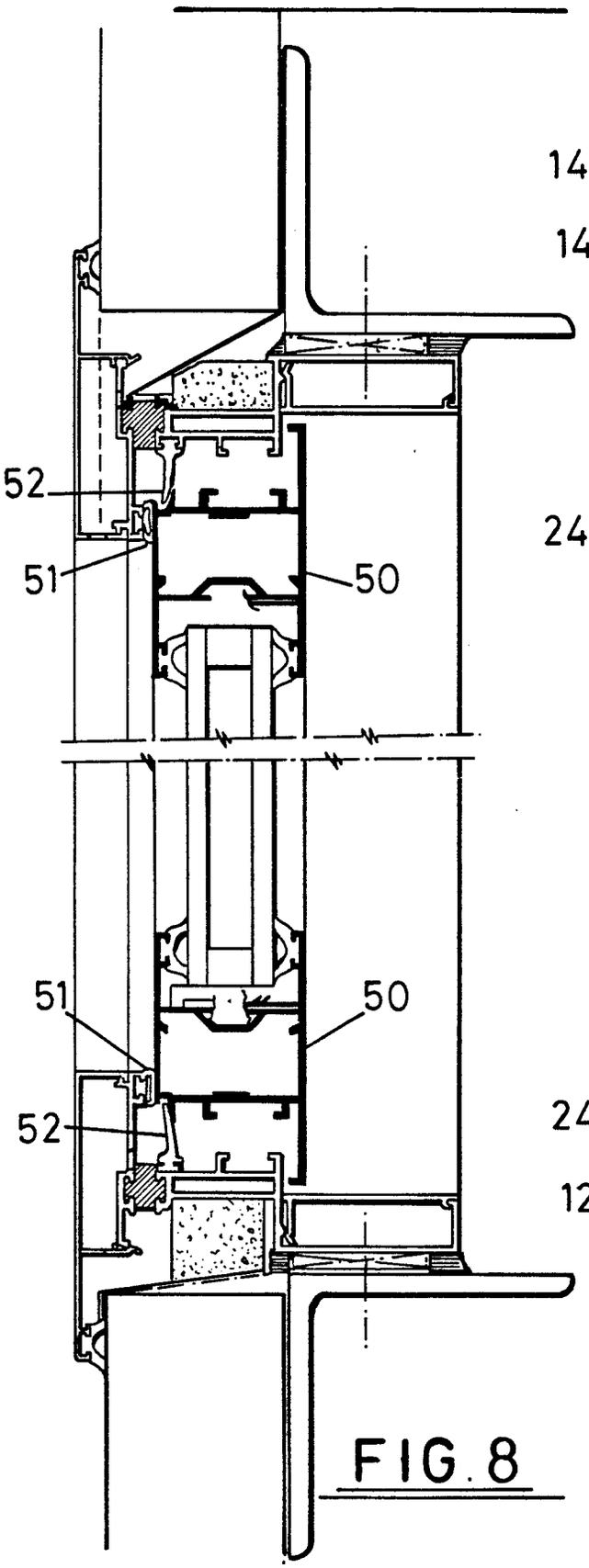

FIG.8

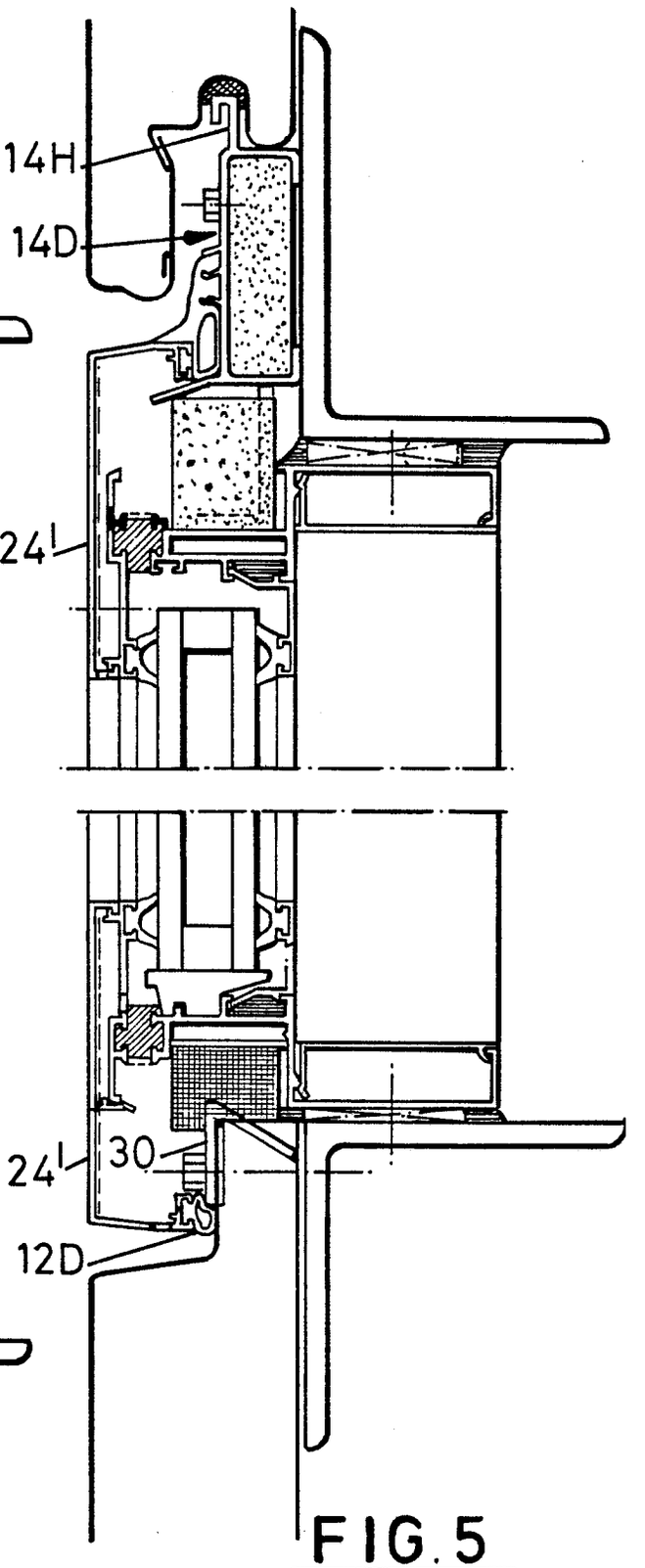

FIG.5

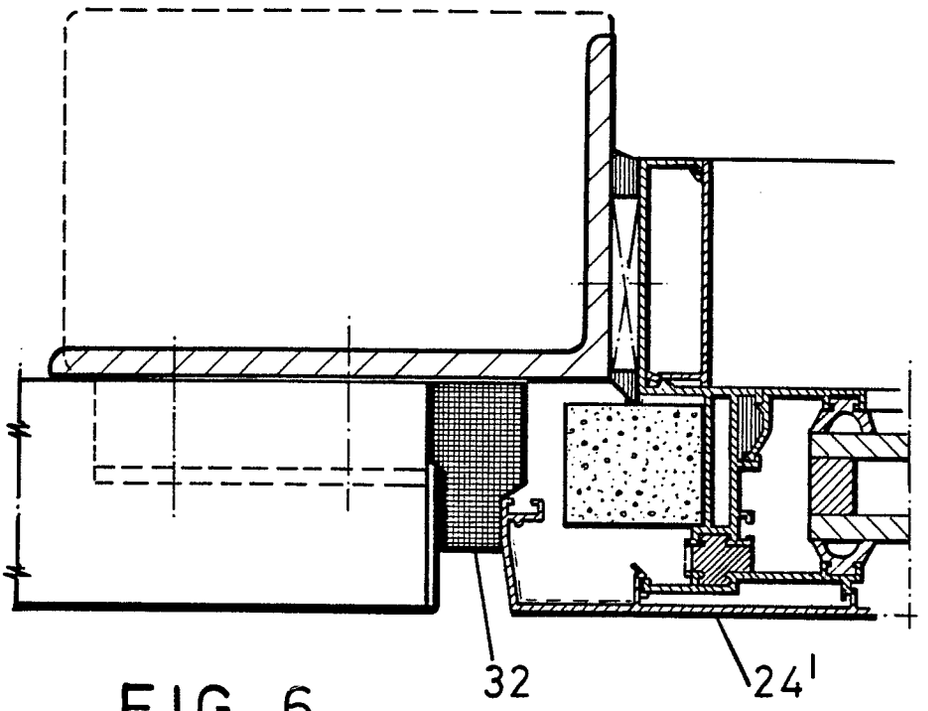

FIG. 6

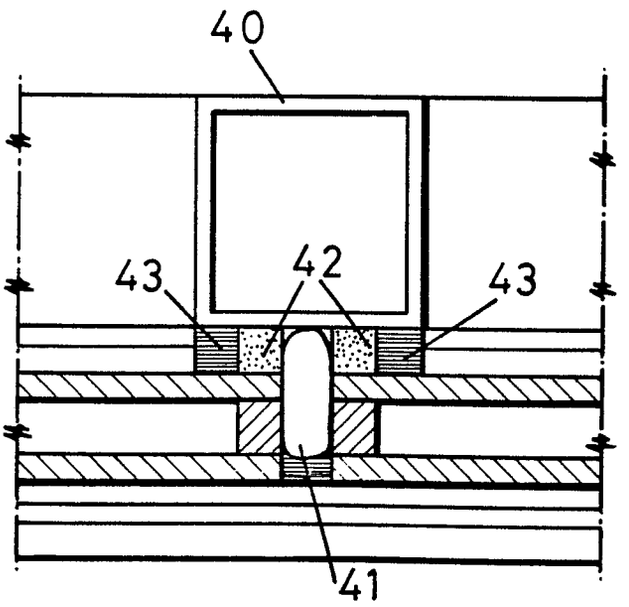

FIG. 7

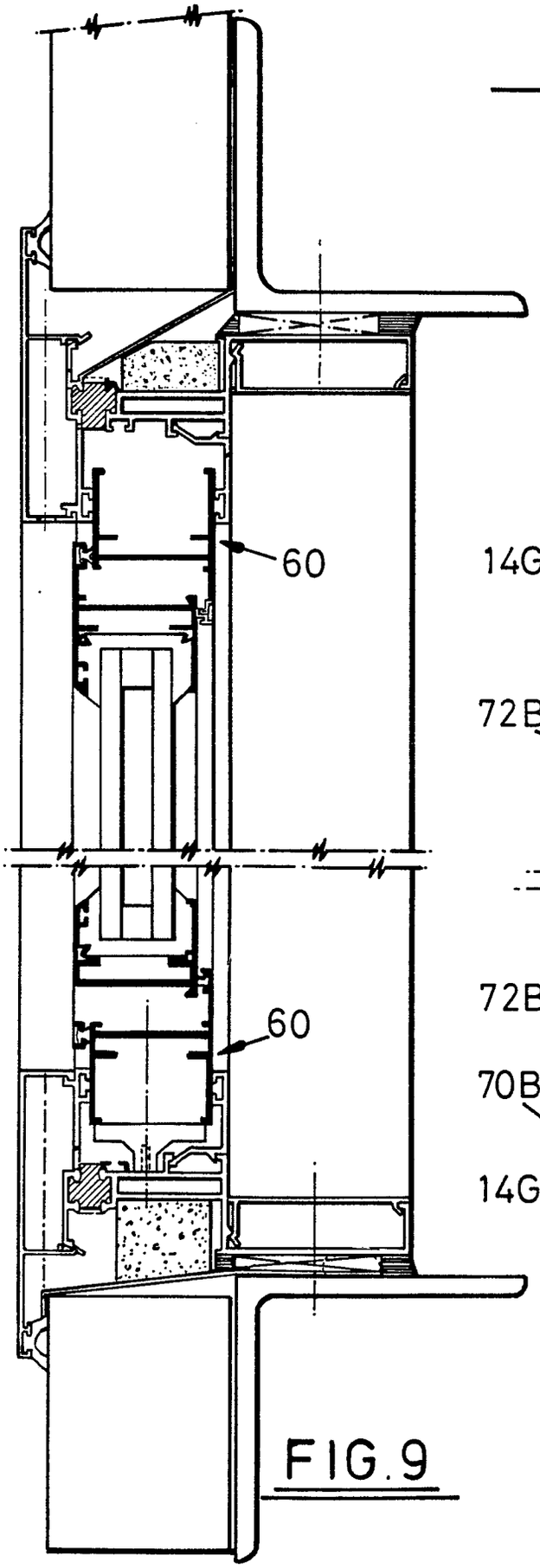

FIG.9

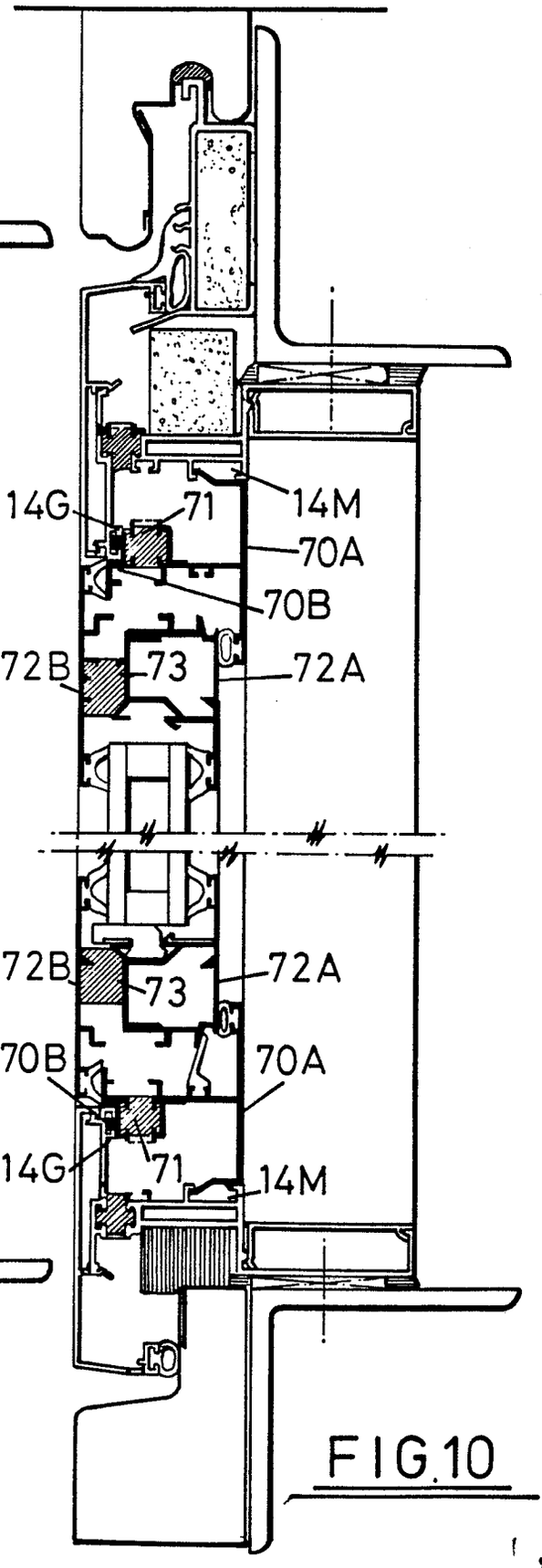

FIG.10

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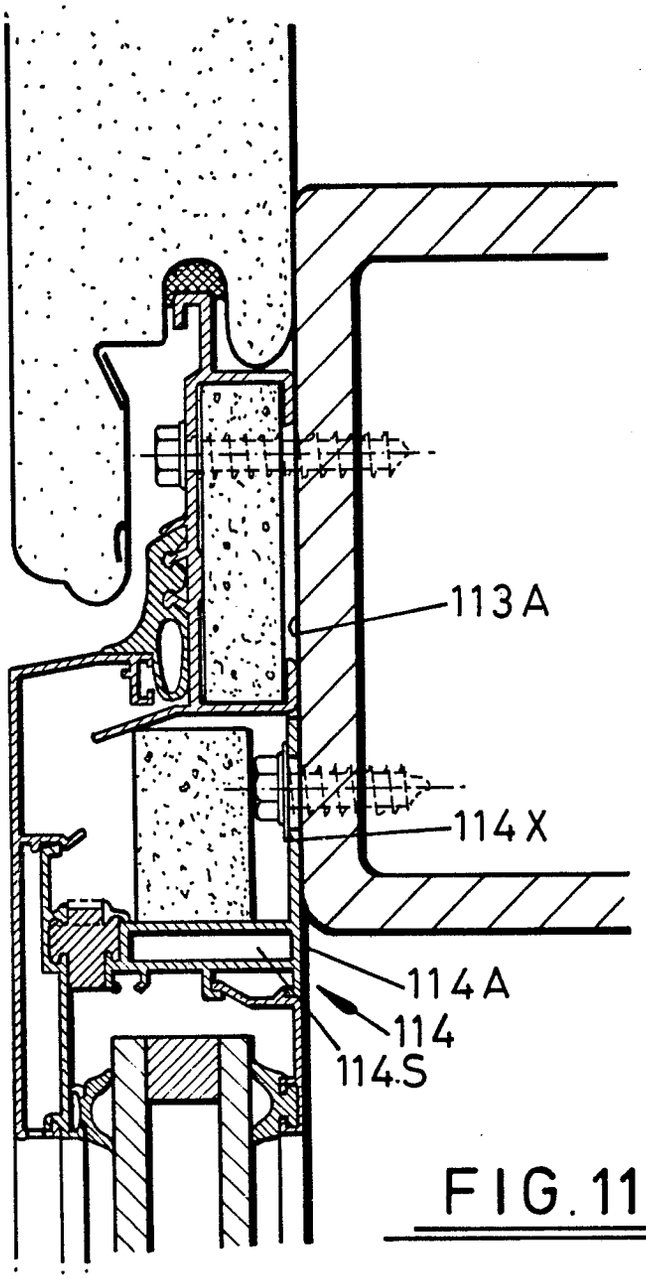

FIG. 11

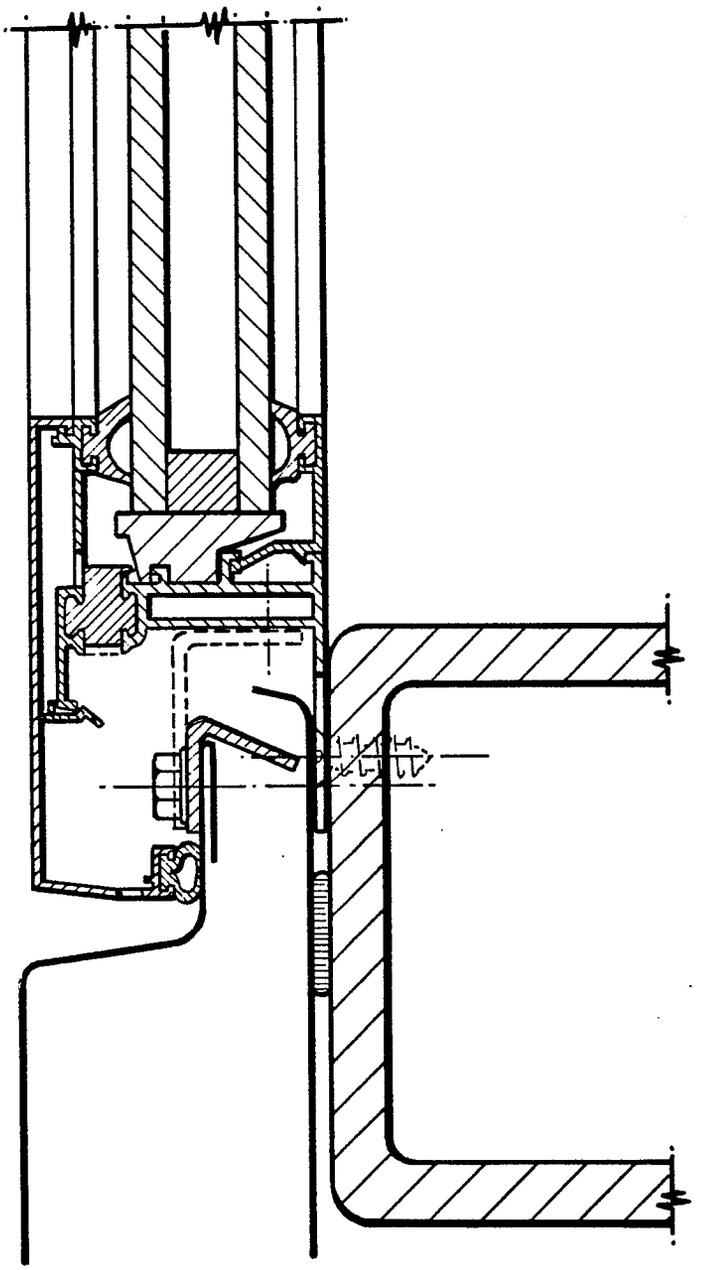

FIG.12

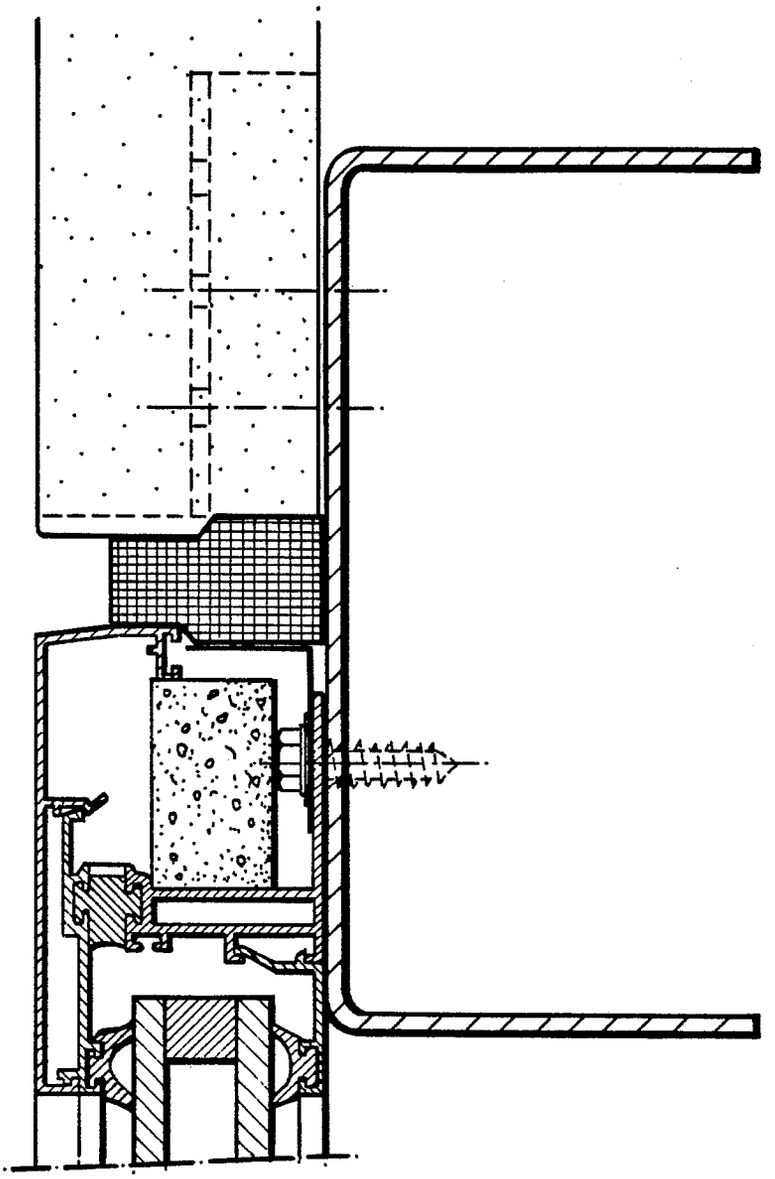

FIG.13