

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 890 698 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
16.06.2004 Bulletin 2004/25

(51) Int Cl.7: **E06B 1/60**

(21) Application number: **98610022.0**

(22) Date of filing: **09.07.1998**

(54) **A building facade member and a set of fittings for external mounting in an opening in a building facade and a method of mounting such a facade member**

Fassadenelement und Befestigungsbausatz zur Aussenmontage in einer Fassadenöffnung und sein Montageverfahren

Elément de façade et jeu d'éléments de fixation pour son montage extérieur dans une ouverture de la façade ainsi que son procédé de montage

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

- **Helmersen, Lars**
4040 Jyllinge (DK)
- **Frederiksen, Per**
3650 Ølstykke (DK)
- **Wind, Aage**
3540 Lyngby (DK)

(30) Priority: **11.07.1997 DK 85097**

(43) Date of publication of application:
13.01.1999 Bulletin 1999/02

(74) Representative: **Raffnsøe, Knud Rosenstand et al**
Internationalt Patent-Bureau,
23 Høje Taastrup Boulevard
2630 Taastrup (DK)

(73) Proprietor: **Windoor AB**
573 24 Tranås (SE)

(56) References cited:

DE-A- 2 523 487	DE-A- 3 642 340
DE-A- 4 135 126	DE-C- 3 540 159
DE-U- 29 507 600	DE-U- 29 622 611
FR-A- 2 607 548	GB-A- 2 109 850
GB-A- 2 255 999	US-A- 3 503 168

(72) Inventors:

- **Pedersen, Hans Ove**
3500 Vaerløse (DK)
- **Thomsen, Morten Werner**
4000 Roskilde (DK)

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 890 698 B1

Description

[0001] The present invention relates to a combination of a building facade member having a framework structure, including lower and upper horizontal hollow profiles and vertical hollow profiles for external mounting in an opening in a building facade defined by a substantially horizontal lower spandrel portion and a substantially horizontal upper ceiling portion and a set of mounting fittings for mounting the facade member in the facade opening.

[0002] The object of the invention is in particular external mounting of building facade members of the type known from EP-A-0 474 582 and EP-A-0 687 783. Such a facade member may typically be designed as a framework structure comprising two horizontal and two vertical hollow profiles and adapted for mounting over an opening for a balcony, a door or a window or other types of facade openings in buildings.

[0003] Prior art building facade members have usually been mounted in façade openings by fastening the facade member to the lower spandrel portion and the upper ceiling portion of the opening by means of fittings in the form of mounting angles of L, U or Z shape, or flat bars which engage mating parts of the façade member frame structure and are secured to the spandrel and ceiling portions by screw or bolt connections.

[0004] When using this way of mounting, the facade member will typically project from the front of the building facade and thus not appear as an integral part thereof. The mounting of facade members by this method is furthermore very labour demanding and involves considerable costs, to which may be added that fittings of the above type will not normally be able to compensate for irregularities, if any, in and about the facade opening.

[0005] In another possible mounting method, the facade member is first placed directly resting, possibly with adjustment, on the spandrel portion of an opening in a building facade, following which screw or bolt connections are established by drilling through hollow profiles and adjacent parts of the supporting building structure.

[0006] Such a drilling through the hollow profiles of the facade member entails a risk of moisture and water penetration with subsequent corrosion damage both to the profiles of the facade member and to the building reinforcement, and a weakening of the hollow profiles such that a reinforcement or overdimensioning is required, the result being additional costs.

[0007] In addition, it applies to both of the above-mentioned known mounting methods that the mounting process may be difficult to control in a safe way, since during part of the mounting, until fastening in the facade opening has taken place, the facade member is freely movable relative to the facade opening, ultimately involving the risk that the facade member gets completely out of control and is damaged or lost, which in the latter case entails the risk of damaging other objects or per-

sons.

[0008] From US-A-2 475 885 it is known per se to mount a window member in a building facade from the inside by means of pre-mounted fittings which are fastened to the spandrel and ceiling portions of the facade opening. The embodiments of framework profiles and mounting fittings proposed for this purpose are not suited, however, for external mounting.

[0009] From US-A-3 503 168 it is known, in connection with mounting of window sash constructions in railway cars, to make use of a specially profiled sash frame having an external flange portion for engagement with the external side of horizontal upper and lower rail members defining the window opening in the railway car and a horizontally disposed web portion for engagement by an angular fitting of conventional L-form secured to the internal side of the rail members. Between the profiled sash frame and the rail members defining the window opening a plurality of slotted clip members are disposed each having a flange portion engaging a groove in the sash frame and a closed elongate inclined slot to be engaged at its innermost end by a roll pin, which is inserted in a hole in the rail member in a temporary position of the sash construction with respect to the rail members. By longitudinal displacement of the clip member with respect to the profiled sash frame during inwards movement of the sash construction to its final position the roll pin is moved to the outermost end of the inclined slot, and in this displaced position the clip member is locked by insertion of an additional roll pin in a hole drilled in the rail member. In view of the need for insertion of the roll pins through the slot in the clip member into the holes in the rail member the slot in each clip member must obviously be accessible outside the sash frame to be subsequently covered by mounting of the internal angular L-fittings. Installation of a window or other framework construction by this prior art procedure is thus rather complicated and time-consuming and not suitable for installation of façade members in building facades.

[0010] On this background it is the object of the invention to provide a simple, quick and safe external mounting of building facade members of the type stated above.

[0011] To meet this object the combination of a building facade member and a set of mounting fittings as defined above is characterized according to the features of independent claim 1.

[0012] By this combination of the design of the building facade member and the accompanying set of mounting fittings a quick and simple temporary support and fixing of the facade member in the facade opening is obtained without any need for penetrating the hollow profiles of the facade member by drilled bores for screw or bolt connections. All individual parts of the set of mounting fittings may be mounted in the facade opening and on the facade member, respectively, before any handling of the framework structure of the facade member is initiated, whereby the risk that the facade member will get out of control during the mounting and get dam-

aged or lost is minimized.

[0013] Preferred embodiments of the combinations are stated in dependent claims 2 to 13.

[0014] The invention also relates to a method for mounting a building facade member of the type stated over an opening in a building facade by use of a set of mounting fittings as defined.

[0015] According to the invention this method is characterized in that after positioning of its lower horizontal hollow profile relative to the first fitting member designed as a profiled rail member the facade member is turned by a tilting movement towards said unlocked position, in which the lower horizontal hollow profile is supported by said profiled rail member, and that at the end of said tilting movement said second and third fitting members are brought into mutual engagement in said engagement position of the third fitting member and locked with respect to each other after displacement of the third fitting member to said locking position.

[0016] Preferred embodiments of this method are stated in dependent claims 15 and 16.

[0017] In the following the combination and method according to the invention will be explained in further detail with reference to the schematic drawings, in which

Fig. 1 illustrates the mounting of a building facade member in a facade opening by means of a set of mounting fittings of conventional design,

Fig. 2 is a sectional view of a first embodiment of a building facade member with an associated set of fittings for mounting according to the invention,

Fig. 3 is a perspective view illustrating the co-operation between second and third fitting members of the set of mounting fittings shown in Fig. 2,

Fig. 4 shows an embodiment of a brick-shaped adjusting member for use in mounting a first fitting member of the set of mounting fittings,

Fig. 5 is a sectional view of a second embodiment of the building facade member with associated sets of mounting fittings,

Fig. 6 is a perspective view illustrating the design of the third fitting member of the set of mounting fittings shown in Fig. 5, and

Fig. 7 illustrates phases of the mounting process for a building facade member by means of a set of mounting fittings as shown in Fig. 5.

[0018] The building facade member 1 shown in Fig. 1 is manufactured as a framework structure with an upper horizontal hollow profile 2, a lower horizontal hollow profile 3 and vertical side profiles 4 and 5 and moreover comprises, in the embodiment shown, a horizontal middle portion 6, and in the lower one of the window openings 7 and 8 separated by said middle portion a glazing bar portion 9 which like the middle portion 6 may be designed as a hollow profile.

[0019] The facade opening 10 shown in the figure comprises a lower spandrel portion 11 and an upper ceiling

portion 21 and is moreover defined by side walls 13 and 14.

[0020] For the mounting of such a building facade member conventional fittings may be used which comprise flat bars 15 and 16 fastened to the spandrel portion 11 of the facade opening and to the lower horizontal hollow profile 3 of the building facade member, respectively, and L-shaped angle-fittings 17 and 18 fastened to the ceiling portion 12 of the facade opening 10 and to the upper horizontal hollow profile 2 of the building facade member 1.

[0021] At the mounting, the fittings designed as flat bars and angle-fittings are brought into abutment against each other and connected with bolt and nut joints. Until this joining has been effected, the mounting is performed without any kind of safe guiding of the building facade member, and after the fastening by means of said bolt-nut-joints, the building facade member will be displaced and protrude in front of the building facade and so to speak be hanging on the outside thereof, such that subsequently an extensive flashing will be required in order to ensure the necessary tightness against water penetration and wind impact.

[0022] Fig. 2 shows in a simple and schematic design a possible embodiment of a building facade member 19 according to the invention with an upper horizontal hollow profile 21 and a lower horizontal hollow profile 22, which together with side profiles (not shown) encase a pane portion 20 which may be retained in conventionally designed recesses 23 and 24.

[0023] In the embodiment shown the lower horizontal hollow profile 22 has two wall portions 25 and 26 projecting downwards from the bottom side, of which a first downwards projecting wall portion 25 has a height greater than that of the second downwards projecting wall portion 26, whereas the latter wall portion has an L-shaped cross section providing a foot member 27.

[0024] This design of the profile 22 is intended for positioning and provisionally supporting the building facade member relative to a first fitting member 28 of a set of mounting fittings designed for the mounting of the building facade member 19. The member 28 is formed as an elongate profiled rail member which at its top side is provided with an external opening recess 29 for positioning of the first downwards projecting wall portion 25 of the profile 22 and an internal groove 30 for accommodating the second downwards projecting wall portion 26 with the foot member 27.

[0025] The profiled rail member 28 is fastened to the lower spandrel portion 31 of the facade opening by means of screws 32, and with a view to ensuring a horizontal positioning of the member 28, one or more brick-shaped adjusting members 33 of a design e.g. as illustrated in Fig. 4, may be arranged between the profile member and the spandrel portion.

[0026] A second fitting member of the set of mounting fittings is fastened to the upper ceiling portion 34 of the facade opening, said second fitting member having the

shape of a screw 35, which is screwed into a bore 36 in the ceiling portion 34.

[0027] The upper horizontal hollow profile 21 of the building facade member is at its upper side provided with projecting, L-shaped wall portions 37 and 38 defining an upwards open groove 39 of a preferably dovetailed cross section.

[0028] For engagement with the screw 35 screwed into the ceiling portion 34, a third fitting member in the form of a locking fitting 40 is retained to be longitudinally displaceable, but fixable in the groove 39. As will be seen more clearly from Fig. 3, the locking fitting 40 comprises a substantially horizontal wall portion 41, in which a slot 43 is provided which opens at a side edge 42 of the wall portion 41, the bottom of said groove being displaced relative to the opening thereof in the direction of displacement of the locking fitting 40, which is defined by two substantially T-shaped foot members 44 and 45 corresponding to the cross sectional profile of the dovetailed groove 39. The foot members 44 and 45 may at their top side 79 furthermore be provided with fixing means (not shown), for instance small pins or the like, for engagement with the projecting wall portions 37 and 38 during the process of tightening.

[0029] In the embodiment shown the slot 43 is substantially L-shaped, such that, when the locking fitting 40 is in an engagement position, it may get into engagement with the screw 35 mounted in the ceiling portion of the facade opening at the end of the tilting movement of the facade member 19, by which the second downwards projecting leg 26 from the lower horizontal profile 21 is brought in supporting abutment against the groove 30 in the profiled rail member 28.

[0030] When this engagement has been effected, the locking fitting 40 is displaced in the groove 39 in the direction of the arrow 46 in Fig. 3 to take up a locking position, in which the fitting 40 is retained relative to the screw 35 and fixed when the screw is tightened.

[0031] The method of mounting the facade member shown in fig. 2 in the facade opening shown thus comprises an initial mounting of the profiled rail member 28 and the screw 35 in the spandrel and ceiling portions 31 and 34 of the facade opening and mounting of the longitudinal locking fitting 40 in the groove 39 in the upper horizontal profile of the facade member 19, such that all three fitting members of the set of mounting fittings have been mounted prior to commencing of the handling of the facade member 19.

[0032] The facade member 19 is then positioned relative to the profiled rail member 28 by bringing the first downwards projecting wall portion 25 of the lower horizontal profile 22 in abutment against the exterior recess 29 of the profiled rail member 28. By tilting the facade member about the axis of rotation thus determined, the second downwards projecting wall portion 26 with the foot member 27 is now brought into supporting abutment against the bottom of the groove 30 in the profiled rail member 28, and simultaneously the locking fitting

40, which has been mounted in the groove 39 in advance in a suitable engagement position, is brought into engagement with the screw 35, following which the locking fitting 40 is displaced to the locking position and fixed therein by tightening of the screw 35.

[0033] Both in connection with the mounting of the profiled rail member 28 in the spandrel portion 31 and of the screw 35 in the ceiling portion 34, a compensation for irregularities in the facade opening may be performed by an adjustment by means of one or more adjusting members 33 of the design shown in Fig. 4.

[0034] As will be seen from this figure, the brick-shaped adjusting member 33, which may be manufactured by moulding or punching from a suitable metal or plastics material, for instance nylon, may be designed as a comparatively flat disc-shaped member with an open recess 47 corresponding to the shaft diameter of the screw or bolt together with which the adjusting member is to be used, and with a projecting catch member 48 facilitating correct insertion of the adjusting member 33. To avoid projecting parts, the catch member 48 may at the mounting advantageously be turned to be positioned in parallel with the longitudinal direction of the hollow profile 51 or be provided opposite its free end with a weakening line 80 to be broken off after its insertion. The desired adjustment may be effected by the use of a suitable number of adjustment members 33. By punching the blocking up member the recess 47 and the catch member 48 may advantageously be of complementary shape. The adjusting member 33 may have a wedge-shaped cross section, such that two members which may be provided with engagement means on their surfaces may be pushed together from opposite sides to obtain a controllable adjustment height.

[0035] The balcony facade member 49 shown in Fig. 5 and having a sliding pane portion 50 is provided with an upper horizontal hollow profile 51 and a lower horizontal hollow profile 52 with a design in principle known from EP-A-0 687 783, three canals or grooves 55, 56 and 57 being formed by projecting L- and T-shaped wall portions 53 and 54, respectively, at the upper side of the upper profile 51 and at the bottom side of the lower profile 52, said canals or grooves having preferably a dovetailed cross section.

[0036] The first fitting member of the set of fittings designed as an elongate profiled rail member 58 comprises a substantially plane wall portion 60 for abutment against the spandrel portion 59 of the facade opening, possibly through one or more adjusting members 33, and a wall portion 61 projection upwards therefrom and having a hook-shaped, bent edge portion 62, which may be introduced in the uttermost groove 55 in the bottom side of the lower horizontal profile 52 of the locking member 49.

[0037] At its free edge the edge portion 62 is provided with a recess 63 serving as abutment for an external, open edge portion 64, which is formed by the L-shaped wall portion 53, for the groove 55.

[0038] The second fitting member of the set of mounting fittings may like in the embodiment in Fig. 2 comprise a screw 67 for mounting in a wall peg in a bore in the ceiling portion 68 of the facade opening.

[0039] The third fitting member designed as a locking fitting may be designed in the same manner as shown in Fig. 3 suited for longitudinal and fixed mounting in the middle groove 56 of the three grooves 55 - 57 at the top side of the upper profile 51 of the facade member 49.

[0040] As more clearly visible in Fig. 6 the locking fitting 69 may in a modification be designed such that at the ends of the substantially horizontal wall portion 70, in which, in this case, a linear, tilting slot 71 is provided, it is provided with staggered end portions 72 and 73 for bolts 74, the heads 75 of which are introduced in the groove 56. The fixing of the lock member 69 in the groove 56 may here be performed by tightening of nuts 76 positioned on the opposite side of the end portions 72 and 73, the locking fitting 69 being after engagement with the screw 66 displaced in the groove 56 into the locking position.

[0041] The method for mounting the facade member 49 in Fig. 5 is, as far as the positioning of the lower horizontal profile 52 of the facade member 49 is concerned, substantially identical with the one described above in respect of the embodiment in Fig. 2, such as will be seen from Fig. 7, which describes a) - e) various phases of the mounting process.

[0042] There is, however, in respect of the co-operation between the second and the third fitting members of the set of mounting fittings the difference that the locking of these members relative to each other comprises two steps, a tightening of the screw 66 mounted in the ceiling portion 68 being first performed, when the facade member 49 by means of a suitable adjustment has been brought in plumb, following which a tightening of the bolt/nut joints 74 - 76 is performed with a subsequent alignment of the facade member 49 to uniform diagonal measures, the bolt heads 75 being thereby locked in the groove 56.

[0043] The invention is not limited to the embodiment shown of the hollow profiles and the fitting members, but may within the scope of the appended claims be used in connection with hollow profiles of arbitrary cross sectional profiles.

[0044] The first fitting member of the set of mounting fittings does not necessarily have to be designed as a through-going profiled rail member, though this will normally be preferred.

[0045] The number of the second and third fitting members may be varied according to the size of the actual facade member.

Claims

1. A combination of a building facade member (19, 49) manufactured as a framework structure, composed

of lower and upper horizontal hollow profiles and vertical hollow profiles (21, 22; 51, 52) for external mounting in an opening in a building facade defined by a substantially horizontal lower spandrel portion (31, 59) and a substantially horizontal upper ceiling portion (34, 68) and a set of mounting fittings for mounting the facade member in the facade opening,

characterized in that

the set of mounting fittings comprises a first fitting member (28, 58) designed as a profiled rail member to be fastened on the spandrel portion (31, 59) of the facade opening for engagement with said lower horizontal profile of the facade member (19, 49), said first fitting member (28, 58) and said lower horizontal hollow profile (22, 52) being provided with mutually co-operating positioning and support members for initial positioning and support of the facade member (19, 49) in an unlocked position; and second and third fitting members (35, 40; 67, 69) comprising mutually co-operating engagement and locking members

said second fitting means to be mounted in a fixed position on said ceiling portion (34, 68) and said third fitting means to be mounted longitudinally displaceable on said upper horizontal profile (21, 51) of the facade member (19, 49) such that said third fitting means being longitudinally displaceable relative to said upper hollow profile (21, 51) between an engagement position, in which it is engageable with said second fitting member (35, 67), and a fixable locking position, in which the second fitting member (35, 67) is retained in a locked position; such that, when the building facade member (19, 49) is turned by a tilting movement towards said unlocked position said lower horizontal profile (22, 52) is supported by said profiled rail member whereby at the end of said tilting movement said second and third fitting members (35, 40; 67, 69) are brought into mutual engagement, following which the third fitting member (40, 69) is displaced and fixed in said locking position.

2. The combination of claim 1,

characterized in that said lower horizontal hollow profile (21) has an underside formed with first and second downwards projecting wall portions (25, 26), the height of the first downwards projecting wall portion (25) being bigger than that of the second downwards extending wall portion (26), and that the first fitting member comprises a profile member (28) having an externally open recess (29) and an internal groove (30) for receiving said first and second downwards extending wall portions (25, 26), respectively, to enable said tilting movement of the facade member (19) after placement of first downwards projecting wall portion (25) in said recess (29), to bring the second downwards extending wall

portion (26) into supporting abutment with said internal groove (30).

3. The combination of claim 2,
characterized in that said second downwards projecting wall portion (26) has an L- or a T-shaped cross-sectional profile providing a foot member (27) for abutment against the bottom of said internal grooves.
4. The combination of claim 1,
characterized in that the lower hollow horizontal profile (52) of the facade member (49) is provided at its underside with a downwards opening groove (55) with a preferably dovetailed cross section, and that the first fitting member comprises a profiled rail member (58) having a wall portion (61) extending upwards from a substantially plane wall portion (60) for abutment against the spandrel portion (59) of the facade opening, said upwards projecting wall portion (61) having an edge portion (62) bent into hook-shape for insertion into said groove (55), said edge portion (62) being provided at its free edge with a recess (63) serving as abutment for an external opening edge portion (64) of said groove (55), said upwards projecting wall portion (61) having at its side opposite said edge portion (62) an externally protruding abutment flange (65) as support for an internal opening edge member (66) of said groove (55) following said tilting movement of the façade member by tilting of said lower hollow profile (52) about the hook-shaped edge portion (62) of the profile member (58) inserted in said groove (55).
5. The combination of any of the preceding claims,
characterized in that said upper horizontal hollow profile of the facade member (19, 49) is provided at its top side with an upwards opening groove (39, 56) of a preferably dovetailed cross section, and **in that** said second and third fitting members comprise a screw or bolt member (35, 67) for screwing into a bore at said ceiling portion (34, 68) and a locking fitting (40, 69), respectively, said locking fitting being retained in longitudinally displaceable relationship with said groove (39, 56) and having a substantially horizontal wall portion (41, 70), in which a slit (43, 71) is provided to extend from an opening at a side edge (42, 72) of said wall portion to a bottom for engagement of a shaft portion of said screw or bolt member (35, 67) in an untightened condition thereof with said opening in said engagement position of the locking fitting (40, 69) and locking of the locking fitting (40, 69) with respect to the screw or bolt member (35, 67) by tightening of the screw or bolt member (35, 67) after longitudinal displacement of the locking fitting (40, 69) for engagement of the screw or bolt member (35, 67) by said bottom of the slit (43, 71).

6. The combination of claim 5,
characterized in that in connection with said substantially horizontal wall portion (41) said locking fitting (40) comprises, on either side of said slit (43), two substantially T-shaped foot members (44, 45) for insertion into said groove (39).
7. The combination of claim 5, **character-ized in that** said locking fitting (69) is provided at the ends of said substantially horizontal wall portion with end portions (72, 73) displaced relative to said wall portion (70) and provided with holes for bolts (74) having heads in engagement with said groove (56), nuts (76) being provided to engage said bolts (74) on the opposite side of said end portions (72, 73) with respect to said bolt heads (75) for fixing the locking fitting (69) with respect to said groove (56) after locking of the locking fitting (69) with respect to the screw or bolt member (67) in said locking position.
8. The combination of any of claims 5 or 6, **character-ized in that** the slit (43) in the substantially horizontal wall portion of the locking fitting (40) is substantially L-shaped.
9. The combination of any of claims 5 or 7, **character-ized in that** the slit (71) in the substantially horizontal wall portion of the locking fitting (69) is substantially linear and extends obliquely with respect to said side edge of the wall portion (70).
10. The combination of any of the preceding claims,
characterized in that said first fitting member (28) is designed as an elongate profiled rail member, **in that** the set of mounting fittings further comprises screws or bolts (32) for fastening the first fitting member to the spandrel portion (31) of the facade opening and that the set of mounting fittings further comprises a brick-shaped adjusting member (33) for positioning below the elongate profiled rail member (28) and engaging a shaft portion of said screws or bolts (32).
11. The combination of claim 10,
characterized in that said adjusting member (33) comprises an open recess (47) corresponding to said shaft portion and an protruding catch member (48).
12. The combination of claim 11,
characterized in that opposite its free end said catch member (48) is provided with a weakening line (80).
13. The combination of claims 10, 11, or 12, **character-ized in that** the cross section of the adjusting member is wedge-shaped.

14. A method for external mounting of a building facade member (19, 49) as claimed in any of the preceding claims in an opening in a building facade by use of a set of mounting fittings as claimed in any of the preceding claims, **characterized in that** after positioning of its lower horizontal hollow profile (22, 52) relative to the first fitting member designed as a profiled rail member (28, 58) the facade member (19, 49) is turned by a tilting movement (Figs 7a - 7d) towards said unlocked position (Fig. 7e), in which the lower horizontal hollow profile (22, 52) is supported by said profiled rail member (28, 58), and that at the end of said tilting movement said second and third fitting members (35, 40; 67, 69) are brought into mutual engagement in said engagement position of the third fitting member and locked with respect to each other after displacement of the third fitting member (40, 69) to said locking position.
15. A method according to claim 14 using a mounting fitting set as claimed in any of claims 5 - 9, **characterized in that** the slit (43, 71) in the substantially horizontal wall portion (41, 70) of said locking fitting (40, 69) in said engagement position is brought into engagement with said shaft portion of the second fitting member designed as a screw or bolt member (35, 67) and that the screw or bolt member (35, 67) is tightened relative to the ceiling portion (34, 68) of the facade opening after displacement of the locking fitting to the locking position.
16. A method according to claim 15 using a set of mounting fittings comprising a locking fitting as claimed in claim 7, **characterized in that** the locking fitting (69) is fixed with respect to said groove (56) at the top side of the upper horizontal profile (51) of the facade member (49) by tightening of the bolts (74) introduced in said groove (56) by means of said nuts (76), prior to tightening of said screw or bolt member (67) relative to said ceiling portion (68).

Patentansprüche

1. Kombination eines als Rahmenkonstruktion aus unteren und oberen waagrechten Hohlraumprofilen und senkrechten Hohlraumprofilen (21, 22; 51, 52) hergestellten Fassadenelements (19, 49) für äussere Montage in einer Öffnung in einer Gebäudefassade, das von einem im wesentlichen waagrechten unterem Brüstungsabschnitt (31, 59) und einem im wesentlichen waagrechten oberen Deckenabschnitt (34, 68) abgegrenzt ist, und mit einem Befestigungsbausatz zum Montieren des Fassadenelements in der Fassadenöffnung, **dadurch gekennzeichnet, dass** der Befestigungsbausatz einen ersten als Profilschiene ausgebildeten Beschlag (28, 58) umfasst, der auf dem Brüstungsabschnitt (31,

59) der Fassadenöffnung zum Eingriff in erwähntes untere waagrechte Profil des Fassadenelements (19, 49) vorgesehen ist, wobei der erste Beschlag (28, 58) und das untere waagrechte Hohlraumprofil (22, 52) für festgelegte Lage und Unterstützung des Fassadenelements (19, 49) in einer nicht verschlossenen Stellung mit gegenseitig zusammenarbeitenden Positions- und Stützelementen versehen sind; und dass ein zweiter und dritter Beschlag (35, 40; 67, 69) im Befestigungsbausatz mit untereinander zusammenarbeitenden Eingriffs- und Schliesselementen vorgesehen ist, wobei der zweite Beschlag für Montage in einer fixierten Stellung auf dem Deckenabschnitt (34, 68), und der dritte Beschlag für Montage auf dem oberen waagrechten Profil (21, 51) des Fassadenelements (19, 49) in Längsrichtung versetzbar vorgesehen ist, so dass der dritte Beschlag gegenüber dem oberen Hohlprofil (21, 51) zwischen einer Eingriffsstellung, in welcher der Beschlag in den zweiten Beschlag (35, 67) eingreifen kann, und einer fixierbaren Schliessstellung, in der der zweite Beschlag (35, 67) in einer verschlossenen Stellung festgehalten ist, in Längsrichtung verschiebbar ist, derart, dass bei Schwenken des Fassadenelements (19, 49) durch eine Kippbewegung in die nicht verschlossene Stellung die Profilschiene das untere waagrechte Profil (22, 52) unterstützt, wobei nach beendeter Kippbewegung die zweiten und dritten Beschläge (35, 40; 67, 69) in gegenseitigen Eingriff gebracht werden, und der dritte Beschlag (40, 69) verschoben wird und in der Schliessstellung festgehalten wird.

2. Kombination nach Anspruch 1, **dadurch gekennzeichnet, dass** das untere waagrechte Hohlraumprofil (21) auf seiner Unterseite mit ersten und zweiten nach unten ragenden Wandabschnitten (25, 26) versehen ist, wobei die Höhe des ersten nach unten ragenden Wandabschnitts (25) grösser ist als jene des zweiten nach unten ragenden Wandabschnitts (26), und dass der erste Beschlag ein Profilelement (28) mit einer äusseren offenen Aussparung (29) und eine inwendige Rille (30) zur Aufnahme der ersten bzw. zweiten nach unten ragenden Wandabschnitte (25, 26) umfasst, um nach Platzieren des ersten nach unten ragenden Wandabschnitts (25) in der Aussparung (29) die Kippbewegung des Fassadenelements (19) zu ermöglichen, um den zweiten nach unten ragenden Wandabschnitt (26) in unterstützende Anlage mit der inwendigen Rille (30) zu bringen.
3. Kombination nach Anspruch 2, **dadurch gekennzeichnet, dass** der zweite nach unten ragende Wandabschnitt (2) ein L- oder T-förmiges Querschnittsprofil aufweist, das einen zur Anlage gegen den Boden der inwendigen Rillen geeigneten

Fussteil (27) bildet.

4. Kombination nach Anspruch 1, **dadurch gekennzeichnet, dass** das untere waagrechte Hohlraumprofil (52) des Fassadenelements (49) auf seiner Unterseite mit einer nach unten wendenden offenen Rille (55) mit vorzugsweise schwalbenschwanzförmigem Querschnitt ausgebildet ist, und dass der erste Beschlag eine Profilschiene (58) ist und einen aus einem im wesentlichen ebenen Wandteil (60) nach oben ragenden Wandteil (61) mit einem in Hakenform gebogenen Kantenteil (62) umfasst, zum Einführen in die Rille (55), welcher Kantenteil (62) an seiner freien Kante eine Aussparung (63) aufweist, die als Anlage für einen äusseren Öffnungskantenteil (64) der Rille (55) dient, wobei der nach oben vorspringende Wandabschnitt (61) auf seiner im Verhältnis zum Kantenteil (62) gegenüberliegenden Seite einen nach aussen vorspringenden Anlageflansch (65) als Unterstützung für eine inwendige Öffnungskante (66) der Rille (55) dient, wonach die Kippbewegung des Fassadenelements durch Schwenken des unteren Hohlraumprofils (52) um den hakenförmigen Kantenteil (62) des in der Rille (55) eingesetzten Profilelements (58) vorgenommen wird.
5. Kombination nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das obere waagrechte Hohlraumprofil des Fassadenelements (19, 49) auf seiner Oberseite mit einer nach oben öffnenden Rille (39, 56) mit vorzugsweise schwalbenschwanzförmigem Querschnitt versehen ist, und dass die zweiten und dritten Beschläge eine Schraube oder einen Bolzen (35, 67) zum Einschrauben in ein Bohrloch auf dem Deckenabschnitt (34, 68) bzw. in einen Schliessbeschlag (40, 69) umfassen, welcher Schliessbeschlag in Längsrichtung versetzbar in der Rille (39, 56) festgehalten ist und einen im wesentlichen waagrechten Wandabschnitt (41, 70) aufweist, in welchem ein Schlitz (43, 71) vorgesehen ist, der sich von einer Öffnung auf einer Seitenkante (42, 72) des Wandabschnitts zu einem Boden erstreckt, zwecks Eingriff eines Schaftteils der Schraube oder des Bolzens (35, 67) in einem nicht festgespannten Zustand, mit erwähnter Öffnung in der Eingriffsstellung des Beschlags (40, 69) und Schliessen des Beschlags (40, 69) in bezug auf die Schraube oder den Bolzen (35, 67) durch Festspannen von Schraube oder Bolzen (35, 67) nach Versetzen des Beschlags (40, 69) in Längsrichtung zum Eingreifen der Schraube oder des Bolzens (35, 67) durch erwähnten Spaltboden (43, 71).
6. Kombination nach Anspruch 5, **dadurch gekennzeichnet, dass** erwähnter Schliessbeschlag (40) in Verbindung mit dem im wesentlichen waagrechten

Wandabschnitt (41) auf jeder Seite des Spalts (43) zwei im wesentlichen T-förmige Fussteile (44, 45) zum Einsetzen in die Rille (39) umfasst.

7. Kombination nach Anspruch 5, **dadurch gekennzeichnet, dass** erwähnter Schliessbeschlag (69) an den Enden des im wesentlichen waagrechten Wandabschnittes (70) mit im Verhältnis zum Wandabschnitt (70) versetzten Endteilen (72, 73) mit Löchern für Bolzen (74) ausgebildet ist, wobei die Bolzenköpfe (75) in die Rille (56) eingreifen, und Muttern (76) zum Eingreifen der Bolzen (74) auf der im Verhältnis zu den Bolzenköpfen (75) gegenüberliegenden Seite der Endteile (72, 73) vorgesehen sind, die den Schliessbeschlag (69) nach Verriegeln des Schliessbeschlags in bezug auf die Schraube oder den Bolzen (67) in der Schliessstellung gegenüber der Rille (56) fixieren können.
8. Kombination nach Anspruch 5, 6 oder 7, **dadurch gekennzeichnet, dass** der Schitz (43) in dem im wesentlichen waagrechten Wandabschnitt des Schliessbeschlags (40) hauptsächlich L-förmig ist.
9. Kombination nach Anspruch 5, 6 oder 7, **dadurch gekennzeichnet, dass** der Schlitz (71) in dem im wesentlichen waagrechten Wandabschnitt (69) im wesentlichen gerade ist und im Verhältnis zur Seitenkante des Wandabschnitts schräg verläuft.
10. Kombination nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste Beschlag (28) als eine längliche Profilschiene ausgebildet ist, dass der Befestigungsbausatz ferner Schrauben oder Bolzen (32) zum Befestigen des ersten Beschlags auf dem Brüstungsabschnitt (31) der Fassadeöffnung umfasst, und dass der Befestigungsbausatz ein ziegelförmiges Justierelement (33) zum Anbringen unter der länglichen Profilschiene (28) und Eingriff in einen Schaftteil der Schrauben oder Bolzen (32) umfasst.
11. Kombination nach Anspruch 10, **dadurch gekennzeichnet, dass** das Justierelement (33) eine zu erwähntem Schaftteil passende offene Aussparung (47) und einen hervorstehenden Greifer (48) umfasst.
12. Kombination nach Anspruch 11, **dadurch gekennzeichnet, dass** der Greifer (48) gegenüber seinem freien Ende eine Schwächungslinie (80) aufweist.
13. Kombination nach Anspruch 10, 11 oder 12, **dadurch gekennzeichnet, dass** der Querschnitt des Justierelements keilförmig ist.
14. Verfahren zum äusseren Montieren eines Fassadenelements (19, 49) nach einem der vorhergehenden

den Ansprüche in eine Öffnung einer Gebäudefassade unter Verwendung eines Befestigungsbausatzes, wie in einem der vorhergehenden Ansprüche angeführt, **dadurch gekennzeichnet, dass** das Fassadenelement (19, 49) nach Anbringen des unteren waagrechten Hohlraumprofils (22, 52) im Verhältnis zu dem als Profilschiene (28, 58) ausgebildeten ersten Beschlags durch eine Kippbewegung (Fig. 7a-7d) in die nicht verschlossene Stellung (Fig. 7e) geschwenkt wird, in welcher Stellung das untere waagrechte Hohlraumprofil (22, 52) von der Profilschiene (28, 58) unterstützt wird, und dass nach Beendigung der Kippbewegung die zweiten und dritten Beschläge (35, 40; 67, 69) in gegenseitigen Eingriff in die Eingriffsstellung des dritten Beschlages gebracht werden, und nach Verschieben des dritten Beschlages (40, 69) untereinander in der Schliessstellung verriegelt werden.

15. Verfahren nach Anspruch 14 unter Verwendung eines Befestigungsbausatzes, wie in einem der Ansprüche 5-9 angeführt, **dadurch gekennzeichnet, dass** der Spalt (43, 71) in dem im wesentlichen waagrechten Wandabschnitt (41, 70) des Schliessbeschlages (40, 69) in der Eingriffsstellung mit erwähntem Schaftteil des als Schraube oder Bolzen (35, 67) ausgebildeten zweiten Beschlages in Eingriff gebracht wird, und dass nach Versetzen des Schliessbeschlages in die Schliessstellung die Schraube oder der Bolzen (35, 67) gegenüber dem Deckenabschnitt (34, 68) der Fassadenöffnung festgespannt wird.
16. Verfahren nach Anspruch 15 unter Verwendung eines Befestigungsbausatzes umfassend einen Schliessbeschlag, wie in Anspruch 7 angeführt, **dadurch gekennzeichnet, dass** der Schliessbeschlag (69) vor dem Festspannen der Schraube oder des Bolzens im Verhältnis zum Deckenabschnitt (68) gegenüber der Rille (56) auf der Oberseite des oberen waagrechten Profils (59) des Fassadenelements durch Festspannen der über Muttern in die Rille (56) eingesetzten Bolzen (74) fixiert wird.

Revendications

1. Combinaison d'un élément pour construire une façade (19, 49) faite comme une construction de cadre, composée de profilés creux, horizontaux inférieurs et supérieurs et de profilés creux verticaux (21, 22 ; 51, 52) pour montage extérieur dans une ouverture dans une façade de bâtiment définie par une portion d'allège inférieure et essentiellement horizontale (31, 59) et une portion de plafond supérieure et essentiellement horizontale (34, 68) et un jeu d'éléments de montage pour monter l'élément

de façade dans l'ouverture de façade, **caractérisée en ce que** le jeu d'éléments de montage comprend un premier élément de montage (28, 58) conçu comme profil de rebord à fixer sur la portion d'allège (31, 59) de l'ouverture de façade pour engagement avec ledit profilé horizontal inférieur de l'élément de façade (19, 49), premier élément de montage (28, 58) et profilé creux horizontal et inférieur (22, 52) qui sont pourvus de parties de positionnement et de support l'une coopérant avec l'autre pour positionnement et support initiaux de l'élément de façade (19, 49) dans une position non-fermée ; et deuxième et troisième éléments de montage (35, 40 ; 67, 69) qui comprennent des parties d'engagement et de fermeture l'une coopérant avec l'autre, deuxième élément de montage à monter dans une position fixée sur ladite portion de plafond (34, 68) et troisième élément de montage à monter de manière à pouvoir se déplacer longitudinalement sur le profilé horizontal supérieur (21, 51) de l'élément de façade (19, 49) si bien que ledit troisième élément de montage susceptible de se déplacer longitudinalement par rapport audit profilé creux supérieur (21, 51) entre une position d'engagement, dans laquelle il peut s'engager avec ledit élément deuxième élément de montage (35, 67), et une position de fermeture à fixer, dans laquelle le deuxième élément de montage (35, 67) est retenu dans une position fermée ; si bien que lorsque l'élément pour construire une façade (19, 49) est tourné par un mouvement basculant vers ladite position non-fermée, ledit profilé horizontal inférieur (22, 52) est soutenu par ledit profil de rebord, le mouvement basculant terminé, lesdits deuxième et troisième éléments de montage (35, 40 ; 67, 69) sont mis en engagement mutuel, puis le troisième élément de montage (40, 69) est déplacé et fixé dans ladite position de fermeture.

2. Combinaison selon la revendication 1, **caractérisée en ce que** ledit profilé creux horizontal inférieur (21) présente une face inférieure pourvue de première et deuxième portions de paroi faisant saillie vers le bas (25; 26), la hauteur de la première portion de paroi faisant saillie vers le bas (25) étant plus importante que celle de la deuxième portion de paroi s'étendant vers le bas (26), et **en ce que** le premier élément de montage comprend un profil (28) présentant un évidement (29) s'ouvrant vers l'extérieur (29) et une rainure intérieure (30) pour recevoir lesdites, respectivement première et deuxième, portions de paroi s'étendant vers le bas (25, 26) afin de permettre ledit mouvement basculant de l'élément de façade (19) après le positionnement de la première portion de paroi faisant saillie vers le bas (25) dans ledit évidement (29) pour mettre la deuxième portion de paroi s'étendant vers le bas (26) en appui supportant avec ladite rainure intérieure (30).

3. Combinaison selon la revendication 2, **caractérisée en ce que** ladite deuxième portion de paroi faisant saillie vers le bas (26) présente un profilé ayant une section en L ou en T et créant un élément de pied (27) pour appui contre le fond desdites rainures intérieures. 5
4. Combinaison selon la revendication 1, **caractérisé en ce que** le profilé creux inférieur et horizontal (52) de l'élément de façade (49) à sa face inférieure est pourvu d'une rainure ouvrant vers le bas (55) avec une section préférablement en queue-d'aronde, et **en ce que** le premier élément de montage comprend un profil de rebord (58) ayant une portion de paroi (61) s'étendant vers le haut depuis une portion de paroi essentiellement plane (60) pour appui contre la portion d'allège (59) de l'ouverture de façade, portion de paroi faisant saillie vers le haut (61) qui présente une portion d'arête (62) pliée dans une forme de crochet pour insertion dans ladite rainure (55), portion d'arête (62) qui est pourvue à son arête libre d'un évidement (63) servant d'appui pour une portion d'arête ouvrant vers l'extérieur (64) de ladite rainure (55), portion de paroi faisant saillie vers le haut (61) qui est pourvue à son côté opposé de ladite portion d'arête (62) d'une bride d'appui faisant saillie vers l'extérieur (65) comme support pour un élément d'arête ouvrant vers l'intérieur (66) de ladite rainure (55) suivant ledit mouvement basculant de l'élément de façade par un basculement du dit profilé creux inférieur (52) autour d'une portion d'arête en forme de crochet (62) du profil de rebord (58) inséré dans ladite rainure (55). 10 20 25 30
5. Combinaison selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le profilé creux supérieur et horizontal de l'élément de façade (19, 49) est à son côté supérieur pourvu d'une rainure ouvrant vers le haut (39, 56) d'une section préférablement en queue-d'aronde, et **en ce que** lesdits deuxième et troisième éléments de montage comprennent respectivement un élément de vis ou de boulon (35, 67) pour visser dans un alésage à ladite portion de plafond (34, 68) et une garniture de fermeture (40, 69), garniture de fermeture qui est retenue à manière de pouvoir se déplacer longitudinalement par rapport à ladite rainure (39, 56) et présente une portion de paroi essentiellement horizontale (41, 70), dans laquelle une fente (43, 71) est pourvue pour s'étendre d'une ouverture à une arête latérale (42, 72) de ladite portion de paroi à un fond pour engagement d'une portion d'arbre dudit élément de vis ou de boulon (35, 67) dans une condition non-serrée de celui-ci avec ladite ouverture dans ladite position d'engagement de la garniture de fermeture (40, 69) et de fermeture de la garniture de fermeture (40, 69) par rapport à l'élément de vis ou de boulon (35, 67) par serrage de l'élément de vis ou de boulon (35, 67) après déplacement longitudinal de la garniture de fermeture (40, 69) pour engagement de l'élément de vis ou de boulon (35, 67) par ledit fond de la fente (43, 71). 35 40 45 50
6. Combinaison selon la revendication 5, **caractérisée en ce que** liée à ladite portion de paroi essentiellement horizontale (41), ladite garniture de fermeture (40) comprend sur tous les côtés de ladite fente (43) deux éléments de pied essentiellement en T (44, 45) à insérer dans ladite rainure (39). 55
7. Combinaison selon la revendication 5, **caractérisée en ce que** ladite garniture de fermeture (69) aux bouts de ladite portion de paroi essentiellement horizontale est pourvue de portions terminales (72, 73) déplacées par rapport à ladite portion de paroi (70) et pourvues de trous pour des boulons (74) ayant des têtes en engagement avec ladite rainure (56), des écrous (76) étant pourvus pour engager lesdits boulons (74) sur le côté opposé desdites portions terminales (72, 73) par rapport aux dites têtes de boulon (75) pour fixer la garniture de fermeture (69) par rapport à ladite rainure (56) après fermeture de la garniture de fermeture (69) par rapport à l'élément de vis ou de boulon (67) dans ladite position de fermeture.
8. Combinaison selon l'une quelconque des revendications 5 ou 6, **caractérisée en ce que** la fente (43) dans la portion de paroi essentiellement horizontale de la garniture de fermeture (40) est essentiellement en L.
9. Combinaison selon l'une quelconque des revendications 5 ou 7, **caractérisée en ce que** la fente (71) dans la portion de paroi essentiellement horizontale de la garniture de fermeture (69) est essentiellement linéaire et s'étend obliquement par rapport à ladite arête latérale de la portion de paroi (70).
10. Combinaison selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le premier élément de montage (28) est conçu comme un profil de rebord allongé, **en ce que** le jeu d'éléments de montage comprend aussi des vis ou des boulons (32) pour fixer le premier élément de montage à la portion d'allège (31) de l'ouverture de façade, et **en ce que** le jeu d'éléments de montage comprend également un élément de réglage en forme de brique (33) à arranger au-dessous du profil de rebord allongé (28) et à engager une portion d'arbre des vis ou boulons (32).
11. Combinaison selon la revendication 10, **caractérisée en ce que** ledit élément de réglage (33) comprend un évidement ouvert (47) correspondant à ladite portion d'arbre et un élément de prise faisant

saillie (48).

12. Combinaison selon la revendication 11, **caractérisée en ce qu'**opposé de son bout libre, l'élément de prise (48) est pourvu d'une ligne de relâchement (80). 5

13. Combinaison selon la revendication 10, 11 ou 12, **caractérisée en ce que** la section de l'élément de réglage est cunéiforme. 10

14. Procédé de montage extérieur d'un élément pour construire une façade (19, 49) selon l'une quelconque des revendications précédentes dans une ouverture dans une façade de bâtiment à l'usage d'un jeu d'éléments de montage selon l'une des revendications précédentes, **caractérisé en ce qu'**après le placement de son profilé creux inférieur et horizontal (22, 52) par rapport au premier élément de montage conçu comme un profil de rebord (28, 58), l'élément de façade (19, 49) est tourné par un mouvement basculant (figures 7a-7d) vers ladite position non-fermée (figure 7e) dans laquelle le profilé creux inférieur et horizontal (22, 52) est soutenu par ledit profil de rebord (28, 58), et **en ce que** vers la fin dudit mouvement basculant, le deuxième élément de montage et le troisième élément de montage (35, 40 ; 67, 69) sont mis en engagement mutuel dans ladite position d'engagement du troisième élément de montage et fermés l'un par rapport à l'autre après déplacement du troisième élément de montage (40, 69) à ladite position de fermeture. 15
20
25
30

15. Procédé selon la revendication 14 utilisant un jeu d'éléments de montage selon l'une quelconque des revendications 5-9, **caractérisé en ce que** la fente (43, 71) dans la portion de paroi essentiellement horizontale (41, 70) de ladite garniture de fermeture (40, 69) dans ladite position d'engagement est mise en engagement avec ladite portion d'arbre du deuxième élément de montage conçu comme un élément de vis ou de boulon (35, 67), et **en ce que** l'élément de vis ou de boulon (35, 67) est serré par rapport à la portion de plafond (34, 68) de l'ouverture de façade après le déplacement de la garniture de fermeture à la position de fermeture. 35
40
45

16. Procédé selon la revendication 15 utilisant un jeu d'éléments de montage selon la revendication 7, **caractérisé en ce que** la garniture de fermeture (69) est fixée par rapport audit évidemment (56) au côté supérieur du profilé supérieur horizontal (51) de l'élément de façade (49) par serrage des boulons (74) introduits dans ledit évidemment (56) au moyen desdits écrous (76), avant le serrage dudit élément de vis ou de boulon (67) par rapport à ladite portion de plafond (68). 50
55

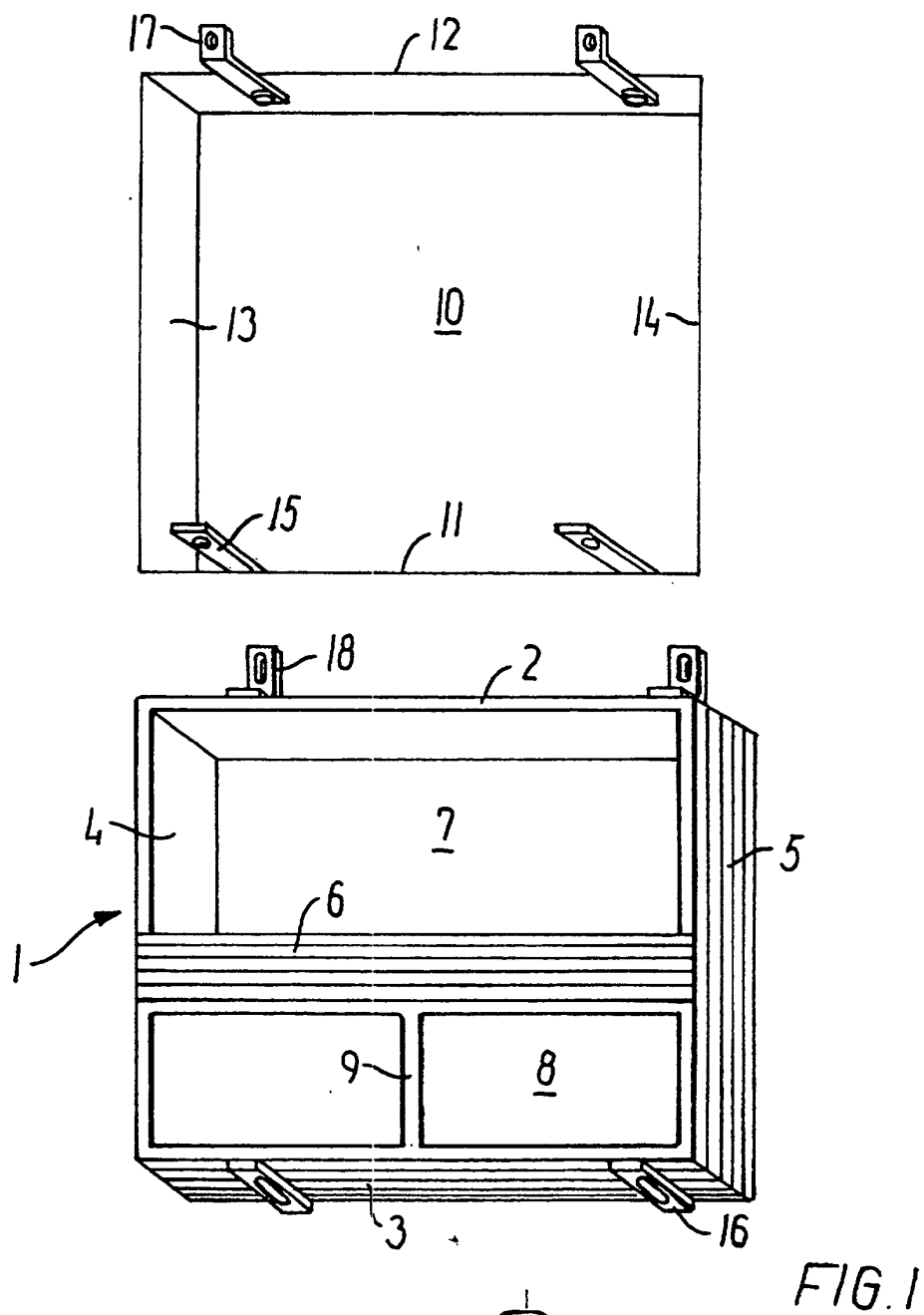


FIG. 1

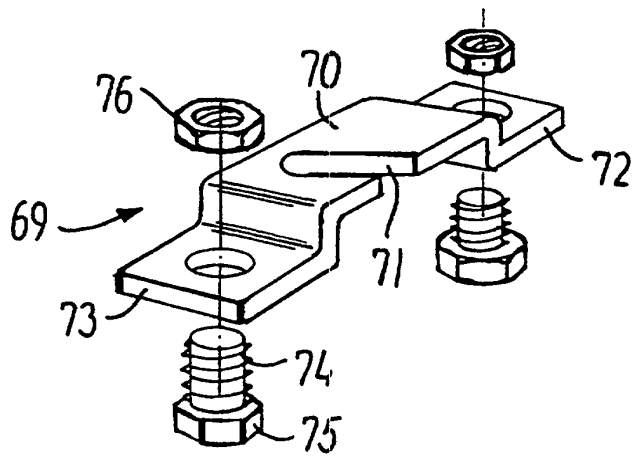


FIG. 6

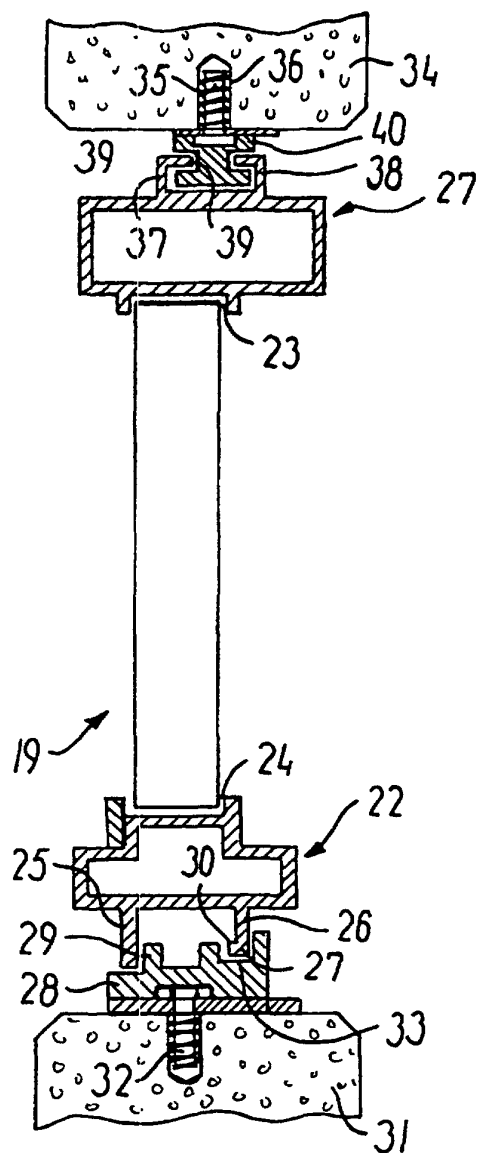


FIG. 2

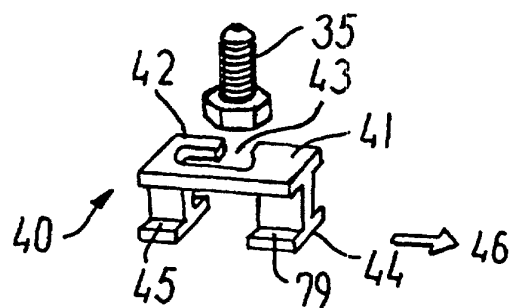


FIG. 3

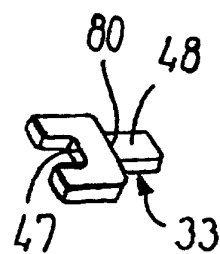


FIG. 4

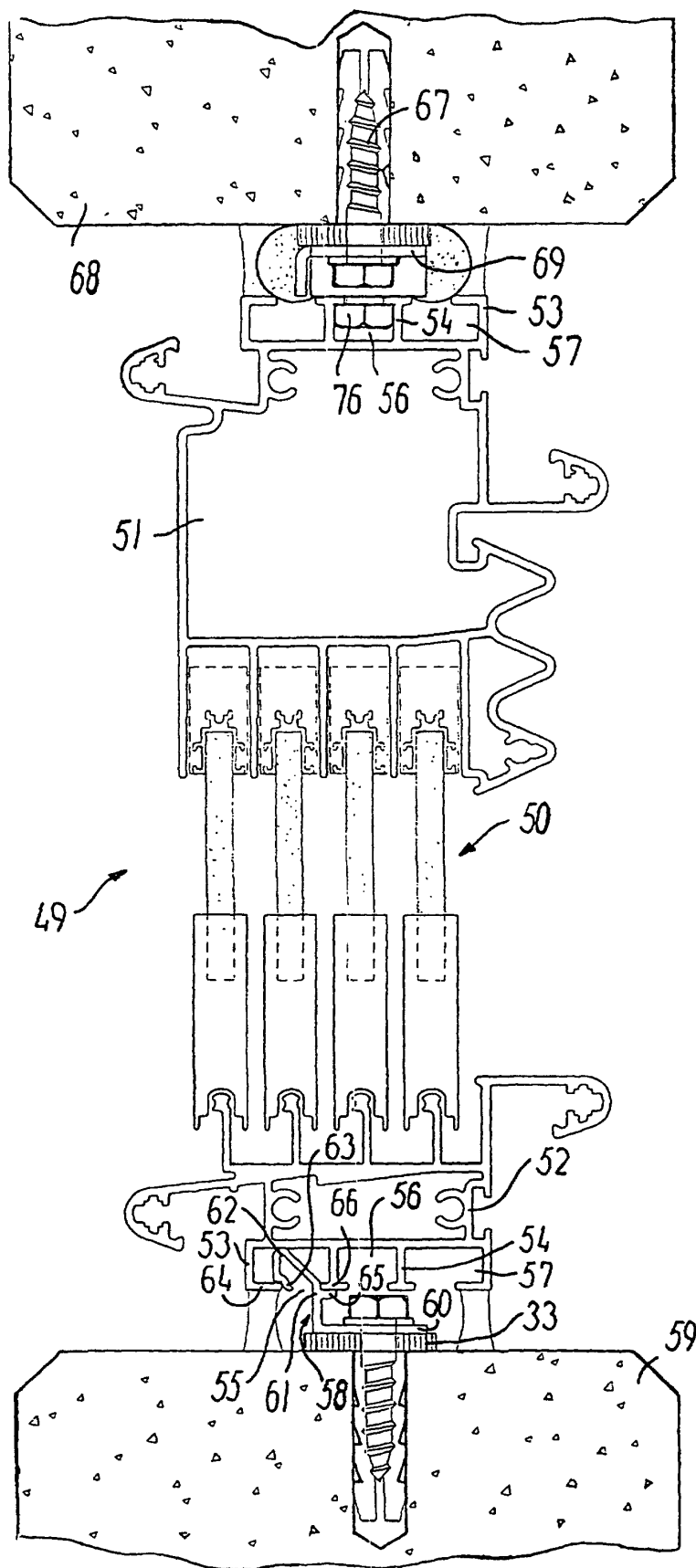


FIG. 5

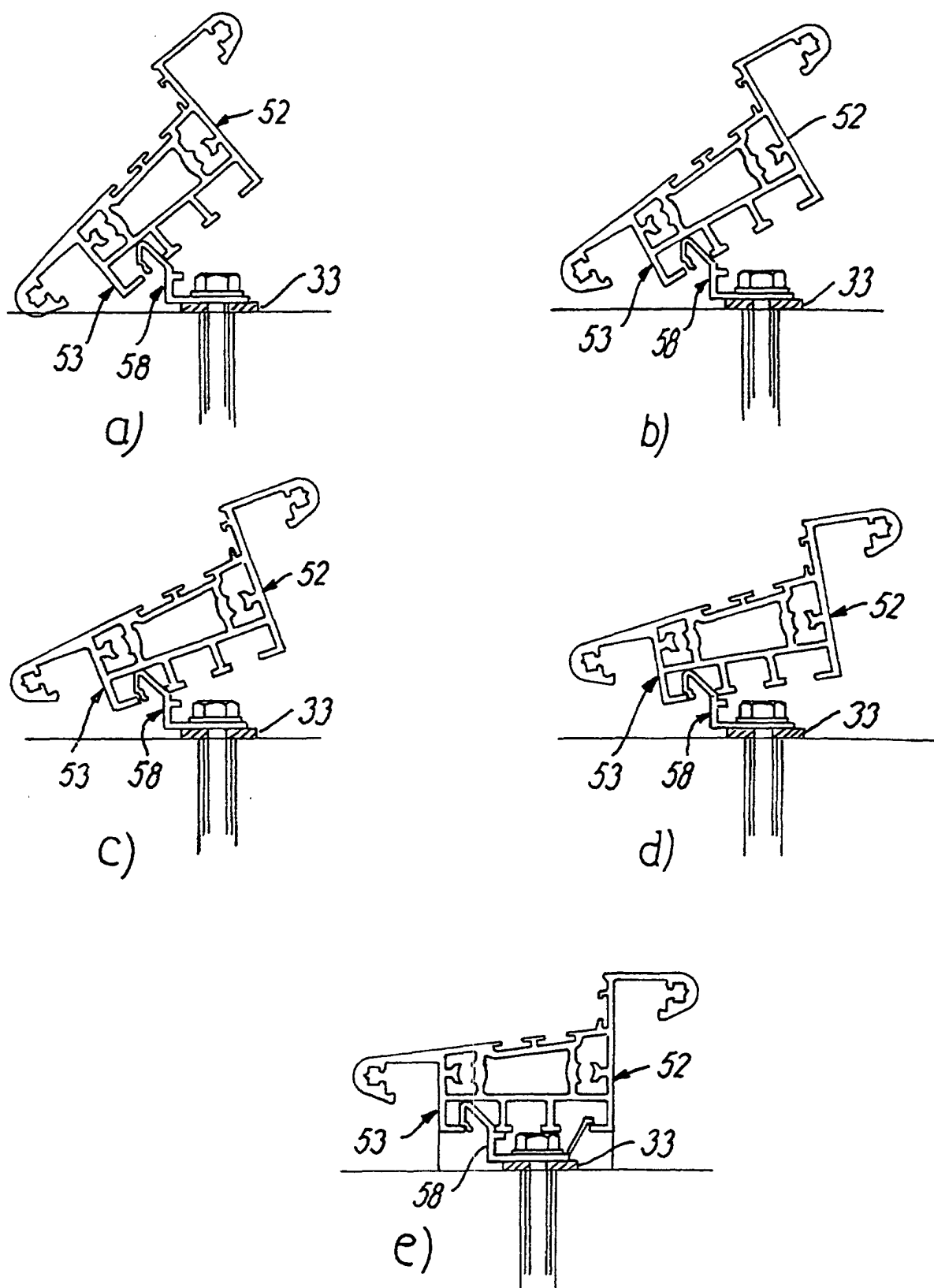


FIG. 7