(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 045 082 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.10.2000 Bulletin 2000/42

(51) Int. Cl.[7]: **E04F 11/18**, A47G 7/04

(21) Application number: **00107057.2**

(22) Date of filing: **04.04.2000**

(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

(30) Priority: **14.04.1999 IT BO990170**

(71) Applicant: **Ferro, Nicolò**
34123 Trieste (IT)

(72) Inventor: **Ferro, Nicolò**
34123 Trieste (IT)

(74) Representative:
Modiano, Guido, Dr.-Ing. et al
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(54) Railing composed of connectable elements, particularly for balconies and staircases

(57) A railing for balconies and staircases, comprising a structure (2) which acts as a parapet and is fixed to vertical tubular posts (3), wherein respective cores (15,30) are inserted in upper and lower ends of the posts, the upper cores (30) having elements (47) for fixing a handrail (52) and the lower cores (15) being rigidly coupled to a base (16) which can be fixed to the masonry of the balcony or staircase, the cores (15,30) being crossed by screws for fixing hooks for anchoring the parapet (2).

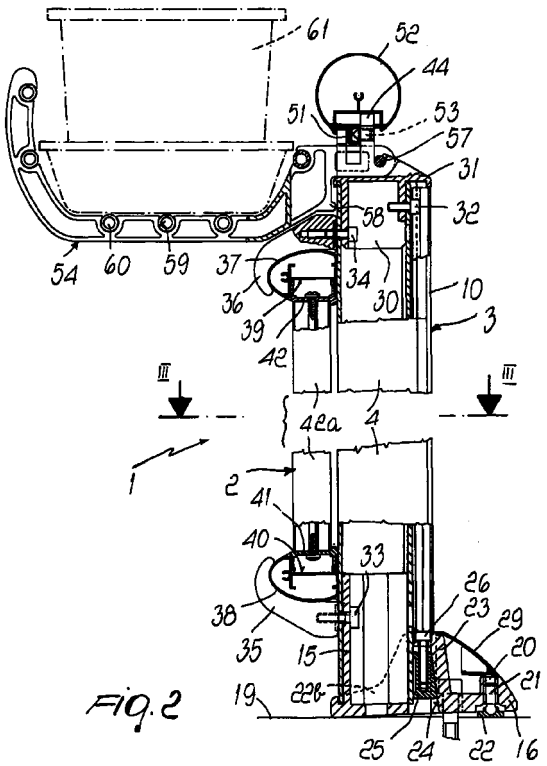


Fig. 2

EP 1 045 082 A2

Description

[0001] The present invention relates to a railing or banister composed of connectable elements, particularly for balconies and staircases.

[0002] Railings of this type are already known. However, they suffer drawbacks as regards their structure, their method of assembly and their flexibility in application.

[0003] The aim of the present invention is to make railings structurally simpler and easier to assemble without compromising their solidity.

[0004] Within the scope of this aim, an object of the present invention is to provide a railing whose structure can be modified so that it can adapt to the installation requirements that must be dealt with in each instance.

[0005] Another object of the present invention is to provide a railing which can be fitted with brackets for supporting flowerboxes.

[0006] This aim, these objects and others which will become more apparent hereinafter, are achieved by a railing for balconies and staircases according to the present invention, which comprises a structure which acts as a parapet and is fixed to vertical tubular posts, characterized in that respective cores are inserted in upper and lower ends of said posts, the upper cores having elements for fixing a handrail and the lower cores being rigidly coupled to a base which can be fixed to the masonry of the balcony or staircase, said cores being crossed by screws for fixing hook-shaped elements for anchoring the parapet.

[0007] Further characteristics and advantages of the present invention will become apparent from the following detailed description of some embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a front view of the railing according to the present invention;

Figure 2 is a sectional view of the railing, taken along the line II-II of Figure 1;

Figure 3 is a sectional view, taken along the line III-III of Figure 2;

Figure 4 is a side view of the core that is to be inserted in the upper end of the posts;

Figure 5 is a front view of a different embodiment of the core of Figure 4;

Figure 6 is a side view of one of the brackets for supporting a flowerbox;

Figure 7 is a plan view of the bracket of Figure 6;

Figure 8 is a sectional elevation view of a different embodiment related to the coupling of the posts to the masonry;

Figure 9 is a sectional elevation view of a different embodiment related to the coupling of the brackets that support the flowerbox;

Figure 10 is a front view of a protective railing for a staircase;

Figures 11, 12 and 13 are three sectional views of a corresponding number of embodiments related to the fixing of the parapet to the vertical tubular posts; and finally

Figure 14 is a sectional view, taken along the line XIV-XIV of Figure 13.

[0008] With reference to Figures 1 to 7, the railing is generally designated by the reference numeral 1 and comprises a structure 2, hereinafter termed parapet, which is applied frontally to a plurality of vertical posts 3.

[0009] The posts 3 are constituted by a tubular section 4 (see in particular Figure 3) which is formed by two lateral cambered walls 5 and 6, a flat front face 7 and a rear rib 8. The rear rib 8, together with the opposite edges of the lateral faces 5 and 6 that protrude from it, forms a slot 9 which is closed by a strip 10 by means of snap engagement of two ridges 11 and 12 which are rigidly coupled to the strip 10 on two raised portions 13 and 14 which protrude into the slot 9 from the opposite edges of the faces 5 and 6.

[0010] The face 7 and the rib 8 form a seat which allows to insert, in the lower end of the tubular section 4, a hollow core 15 which has a rectangular cross-section and rises from a base 16 with which it is monolithic.

[0011] In the base 16 there are provided two slots 17 through which respective

[0012] In the base 16 there are provided two slots 17 through which respective screws 18 are driven; the base is fixed, by means of said screws, to a portion of masonry 19, for example the floor of a balcony or the steps of a staircase.

[0013] The base 16 has a portion which protrudes to the rear and in which a threaded hole 20 is formed. An Allen screw 21 (see Figure 2) is screwed into the threaded hole 20 and is provided with a spherical head 21a which protrudes downward in order to rest on the floor with a plate 22 interposed. By screwing the screw 21 more or less fully before the screws 18 are tightened it is possible to raise the base 16 more or less to the rear and therefore set the post 4 plumb, or more generally give it the intended arrangement, with respect to the floor.

[0014] Two respective walls 22a and 22b rise from the sides of the base 16, and a transverse wing 23 (see Figure 2) protrudes between such walls to the rear of the section 4.

[0015] The wing 23 delimits, together with the core 15, a recess 24 which is open downward and tapers upward and forms, together with the core 15, a slot which allows the passage of the rear rib 8 of the tubular section 4. A wedge 25 is inserted in the recess 24, and a traction screw 26 is inserted therein. The head of the screw 26 rests on a protrusion 27 of the wing 23, so that by screwing in said screw the rib 8 is locked and therefore the section 4 is locked against the core 15.

[0016] The walls 22 and the wing 23 surround a cavity 28 for accessing the screws 18 which is closed by

a cover 29 made of aluminum or other suitable material which is shaped so that it can be retained in the position for closing the cavity by means of an interlock coupling on the base 16.

[0017] A second core 30 is inserted in the upper end of the section 4, has the same cross-section as the core 15, and is provided with a supporting flange 31 (see Figures 4 and 5).

[0018] The core 30 is fixed inside the section 4 by means of a screw 32 which is driven through the rear rib 8.

[0019] Fixing bolts 33 and 34 are driven through the front walls of the cores 15 and 30 and the front face 7 of the section 4 and engage two hook-shaped elements 35 and 36 for anchoring the parapet 2. By tightening the bolts 33 and 34, the hook-shaped elements 35 and 36 are clamped against the front faces of the cores 15 and 30 without deforming the front wall of the section 4. In order to allow access to the bolts 33 and 34 through the cores 15 and 30, the rear faces of the cores and the rib 8 of the section 4 are provided with respective recesses which are large enough to allow the heads of the bolts to pass.

[0020] The parapet 2 can have any structure. In the illustrated example, the parapet 2 is constituted by two parallel tubular sections 37 and 38 which constitute the upper and lower rails of the parapet. The sections 37 and 38 have slots 39 and 40 for the interlock seating of contoured strips 41 and 42. Between the contoured strips 41 and 42 there are multiple tubular rods 42a which are fixed by means of screws which are driven through the contoured strips 41 and 42. A grille-like structure is thus obtained with contoured strips 41, 42 which are perpendicular to the rails 37 and 38 and can be used to form parapets for balconies.

[0021] However, if the railing 1 is to be installed obliquely in order to follow the inclination of a staircase (see Figure 10), the parapet has a rhomboidal grille-like structure, with the rods arranged at an angle with respect to the rails, so as to be vertical when installation is complete.

[0022] The upper core 30 has, above the flange 31, two wings 43, 44 (see Figures 4 and 5) which are mutually spaced by a slot 45. The wings 43, 44 have different heights, and their ends are chamfered in a substantially triangular shape. The lower wing 43 is arranged in front of the higher one 44. Moreover, the wing 43 is, in practice, co-planar to the front face 7 of the section 4 and its triangular top faces a threaded hole 46 formed in the rear wing 44.

[0023] A ramp-shaped raised portion 47 rises from the flange 31, behind the wing 44, and is crossed by a hole 48 which is open in an upward direction. The raised portion 47 is provided at the sides of the wings 43, 44 so as to form two shoulders or saddles 49 and 50 which are flat at the wings 43 and 44 and are concentric around the hole 48.

[0024] The slot 45 is meant to receive a rib 51 of a section 52 which constitutes the handrail of the railing 1. The handrail 52 is provided with slots at the sides of the rib 51, and the tops of the two wings 43, 44 engage inside said slots.

[0025] The handrail is fixed by means of an Allen screw 53 (see Figure 2) which is screwed into the hole 46 and is adapted to clamp the rib 51 against the wing 43.

[0026] It is evident that the described railing can be installed with very simple operations starting from the anchoring of the base 16 to the floor and continuing with the subsequent fitting of the posts 4 on the base 16 and ending with the application of the parapet 2 to the posts 4.

[0027] Attention is drawn in particular to the possibility to vertically align the posts by acting on the Allen screw 21.

[0028] According to a substantial prerogative of the present invention, the structure of the cores 15 and 30 allows to fix the posts without any risk of deforming the sections. The action of the wedge 25 and of the screw 32 in fact remains confined to the clamping of the rib 8 and therefore the clamping force does not compress the section diametrically.

[0029] Another advantage of the above-described railing is the type of fixing of the handrail. The triangular shape of the ends of the wings 43 and 44 in fact allows to tilt the handrail with respect to the posts and allows to make the handrail usable also for protecting staircases.

[0030] Another prerogative of the above-described railing is that it allows to support flowerboxes. For this purpose there are brackets, designated by the reference numeral 54 in Figures 2 and 6, which are constituted by arms which are substantially U-shaped. A fork protrudes from one end of the arm and its tines 55 and 56 are mutually spaced by an extent which is slightly greater than the width of the wings 43 and 44.

[0031] The tines 55 and 56 are rested on the saddles 49 and 50, to the sides of the wings 43 and 44, and are rigidly coupled to the cores 30 by means of a rod 57 which passes through the open holes 48 and holes provided in the tines. Conveniently, the bracket 54 has, below the tines 55 and 56, a step 58 for resting against the front face 7 of the post 3 under the flange 31 of the core 30. The brackets 54 have a plurality of holes 59 for accommodating rods for supporting the flowerboxes 61.

[0032] The above-described rail is susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

[0033] Figure 8 is a view of a variation preset for anchoring the posts to the vertical wall 62 of the masonry, for example against the end of a balcony or a staircase.

[0034] The proposed solution provides for the arrangement of a base 63 in alignment with the core 64 that engages in the post 3. The base 63 is fixed by means of a bolt 65 which is cemented into the masonry 62 and is provided with an Allen screw 66 for adjusting

the verticality of the post 4. The bolt 65 and the Allen screw 66 can be accessed through an opening 67 of the base which can be closed by means of a cover 68.

[0035] In the embodiment of Figure 8, the core for fitting the post 3 is provided with a rib 69 which is shaped so as to form a seat 70 which is open on the rear of the railing in order to accommodate the bolt 33 for fixing the hook-shaped element 35 and engagement walls for two fixing bolts 71, 72 which are driven through the rib 8.

[0036] Figure 9 illustrates a different embodiment of the brackets 54 for supporting the flowerboxes. In this embodiment, the fork of the brackets for coupling to the posts forms two tines 73 which are curved upward like hooks and which, once arranged on the saddles 49 and 50 of the flanges 31, engage the rib 51 of the handrail 52.

[0037] Figure 11 illustrates an embodiment wherein a parapet 2 is provided which is composed of the two parallel rails 37 and 38, in the slots 39 and 40 of which U-shaped sections 74 and 75 are inserted to retain the upper and lower edges of a plate or panel 76.

[0038] In the embodiment of Figure 12, the parapet 2 is composed of a lower rail 38 to which the tubular rods 42a are connected by means of screws as in the example described earlier with reference to Figures 1 to 9.

[0039] The top of the rods 42a is instead directly connected below the handrail, which for this purpose is constituted by a tubular section 77 which has a longitudinal rib 78 which protrudes forward and below which the rods 42a are fixed by means of screws 79.

[0040] The rib 78, together with the tubular element 77, forms an interlock coupling for a covering strip 80 which complements the section 77, so as to give a rounded cross-section to the handrail.

[0041] The version of Figure 12 (and likewise the versions of Figures 11 and 13) furthermore have another particularity, which consists of the fact that the section 77 has, in a downward region, a slot 81 which has a rectangular cross-section and in which the head 82 of an articulated arm 83 engages; said arm can be locked angularly, by means of a bolt 84, between two wings 85 which rise from the flange 31 of the upper core 30. The head 82 can be arranged along the slot 81 and, by means of the articulation of the bolt 84, can be tilted with respect to the post 3 in order to allow the oblique installation of the railing along a staircase.

[0042] Finally, Figure 13 illustrates an embodiment for the upper and lower support of a parapet which is composed of plates or panels and which, instead of the hook-shaped elements 35 and 36, provides for the use of two brackets 85 which are suitable to be fixed to the post 3 by means of bolts 86 which pass through the cores 15 and 30.

[0043] Each bracket 85 comprises two arms which are diametrical with respect to the bolt 86 and at the ends of which cylindrical seats are formed in order to receive bolts 87, 88 which are provided with flanges 89 and 90. The bushes 87 and 88 are driven through holes of the plates or panels 91 and 92 which form the parapet of the railing and are engaged by screws 93 and 94 so as to clamp the plates or panels between the flanges 89 and 90 and the ends of the bracket.

[0044] In the practical execution of the invention, the shapes and the dimensions may be any according to requirements.

[0045] The disclosures in Italian Patent Application No. BO99A000170 from which this application claims priority are incorporated herein by reference.

[0046] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A railing for balconies and staircases, comprising a structure which acts as a parapet and is fixed to vertical tubular posts, characterized in that respective cores are inserted in upper and lower ends of said posts, the upper cores having elements for fixing a handrail and the lower cores being rigidly coupled to a base which can be fixed to the masonry of the balcony or staircase, said cores being crossed by screws for fixing hook-shaped elements for anchoring the parapet.

2. The railing according to claim 1, characterized in that said cores are tubular and have a rectangular cross-section, and in that said screws for fixing said hook-shaped elements are driven through the front wall of said cores so as to clamp said post between said wall and said hook-shaped elements, and in that in the rear wall of said cores there are recesses for the passage of the heads of said fixing screws.

3. The railing according to claim 1, characterized in that said upper core has a flange for resting on the top of said post, two wings being formed above said flange, being mutually spaced by a slot and having ends which are chamfered in a substantially triangular shape, said slot being engaged by a rib of the handrail which can be locked against a lower wing by a screw which is inserted in a threaded hole formed in the other wing.

4. The railing according to claim 3, characterized in that a raised portion rises from said flange, behind the rear wing, and has, at the sides of said wings, respective shoulders for supporting a bracket, said bracket being constituted by an arm which is substantially U-shaped, one end of said arm having a

fork whose tines are shaped so as to rest on said shoulders to the sides of said wings and are rigidly coupled to the respective core by means of a rod which passes through holes formed in said raised portion and in said tines.

5. The railing according to claim 3, characterized in that a raised portion rises from said flange, behind said higher wing, and has, at the sides of said wings, respective shoulders for supporting a bracket, said bracket being constituted by an arm which is substantially U-shaped, one end of said arm having a fork whose tines curve upward like hooks and engage a rib of the handrail once they are placed on said shoulders.

6. The railing according to claim 4 or 5, characterized in that said bracket has, below said tines, a step for resting against the front face of the post.

7. The railing according to one of claims 4-6, characterized in that said brackets have multiple holes for accommodating rods which connect said brackets to each other and support said flowerboxes.

8. The railing according to claim 1, characterized in that the parapet is constituted by two rails which have, on their opposite faces, respective slots for accommodating contoured strips which are mutually connected by rods which form a grille-like structure.

9. The railing according to one of claims 1 to 7, characterized in that said upper rail is an integral part of the handrail.

10. The railing according to one of the preceding claims, characterized in that supporting arms for said handrail are articulated to the cores, which are inserted at the top of said posts, said arms being provided with a head which can be arranged along a slot formed in said handrail.

11. The railing according to one of the preceding claims, characterized in that in order to provide the upper and lower support of a parapet composed of plates or panels, two brackets are fixed to the post by means of bolts which pass through said upper and lower cores, each bracket comprising two diametrical arms at the ends of which there are cylindrical seats for receiving bushes provided with flanges which are driven through holes of said plates or panels, said bushes being engageable by screws so as to clamp the plates or panels between said flanges and the ends of said bracket.

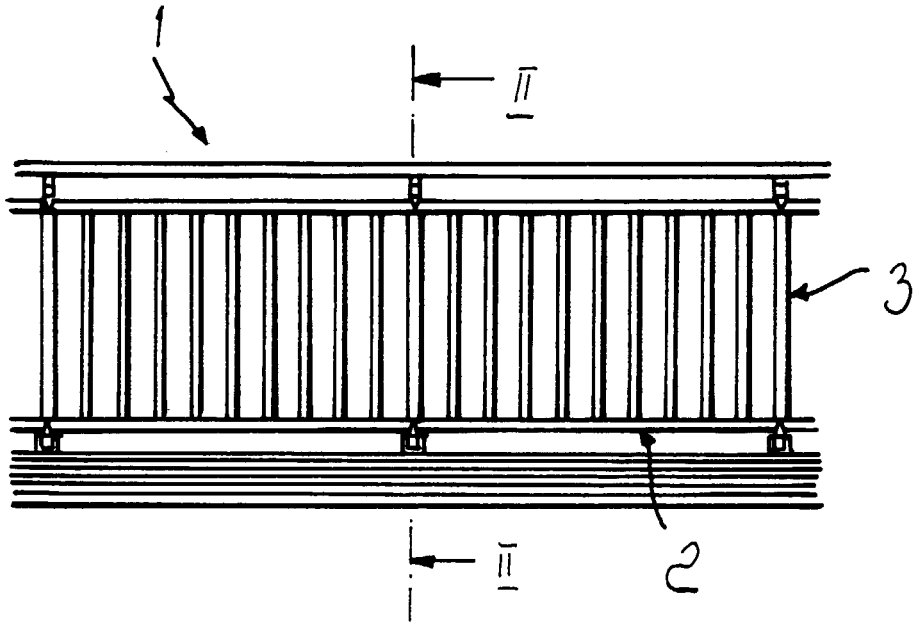


FIG. 1

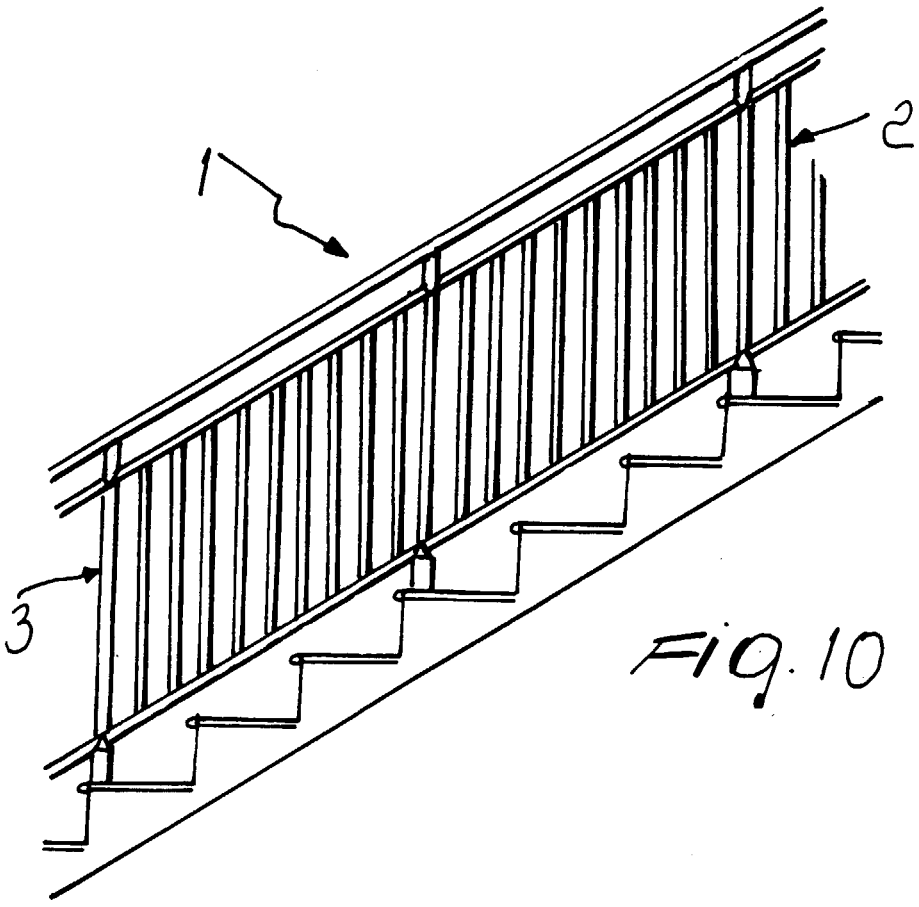


FIG. 10

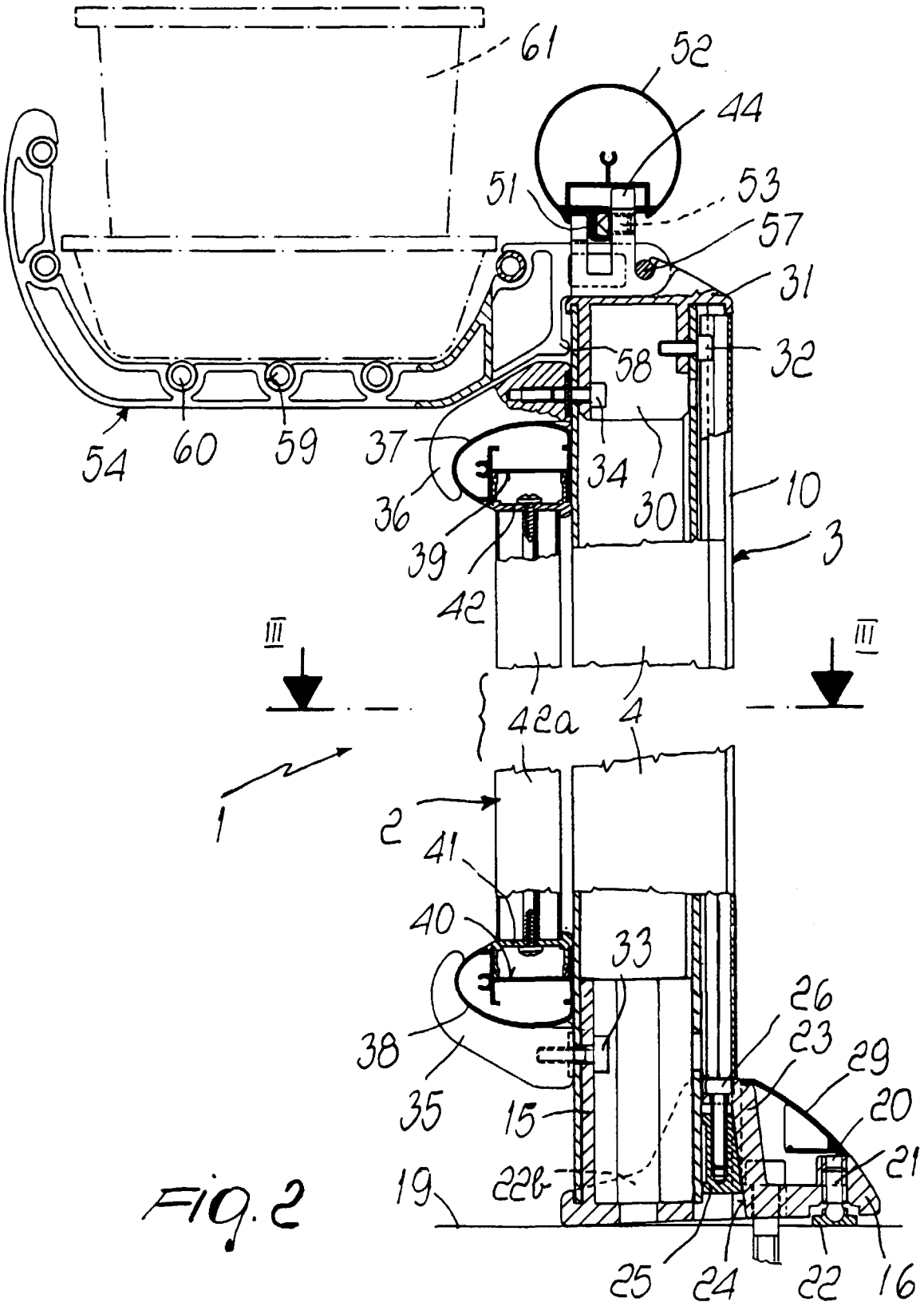

61
52
44
51
53
57
31
58
32
54
60
59
37
34
36
30
10
39
3
42
III
III
42a
4
1
2
41
40
33
26
38
23
29
35
15
20
19
22b
21
25
24
22
16

Fig. 2

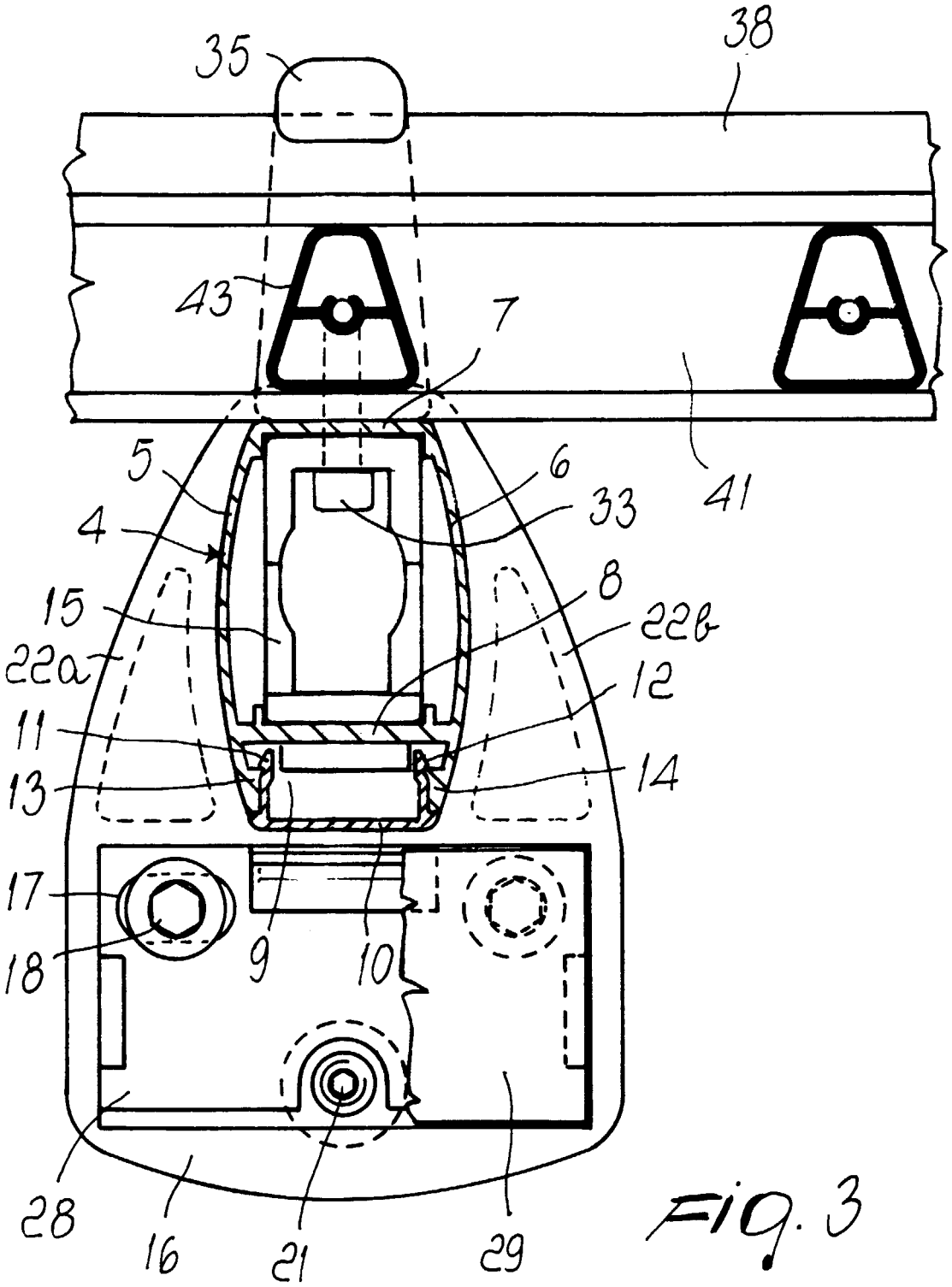


Fig. 3

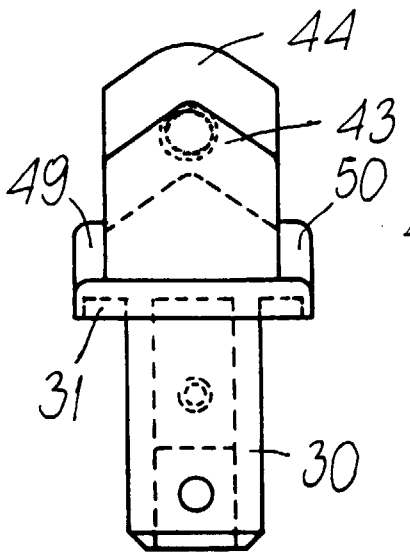


Fig. 5

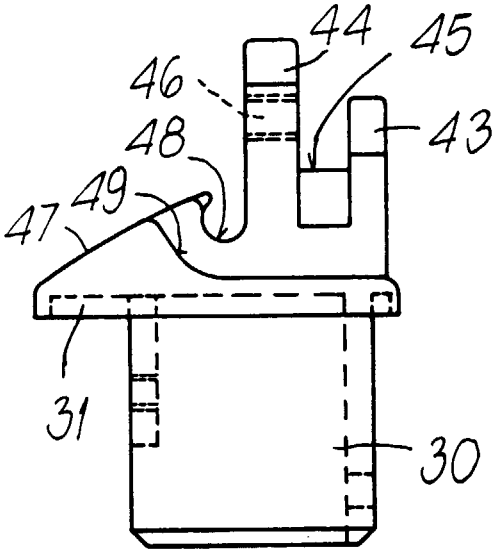


Fig. 4

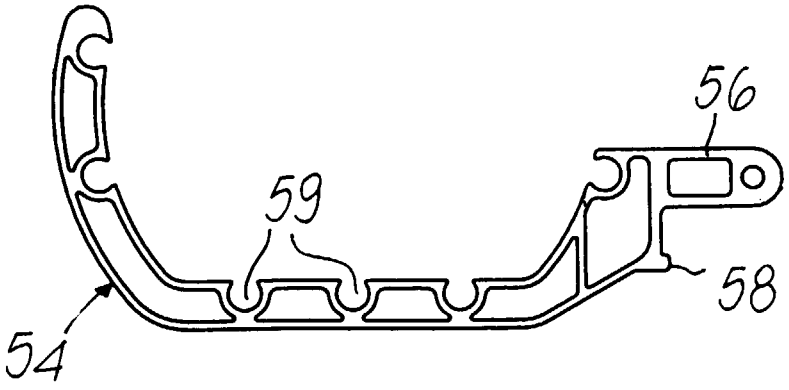


Fig. 6

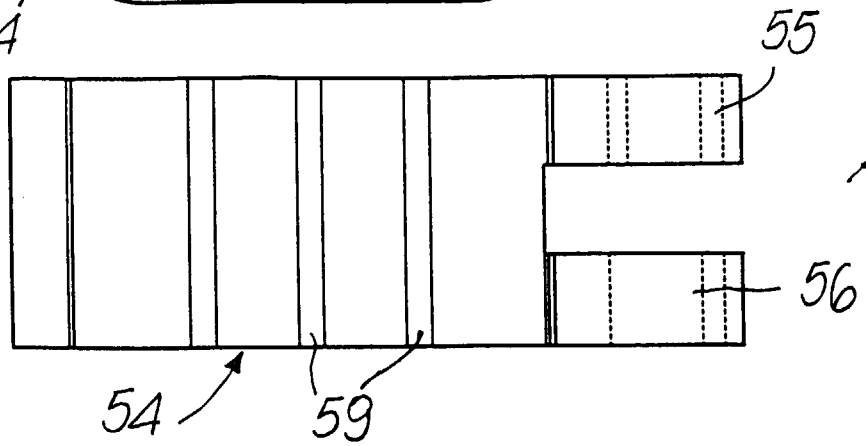


Fig. 7

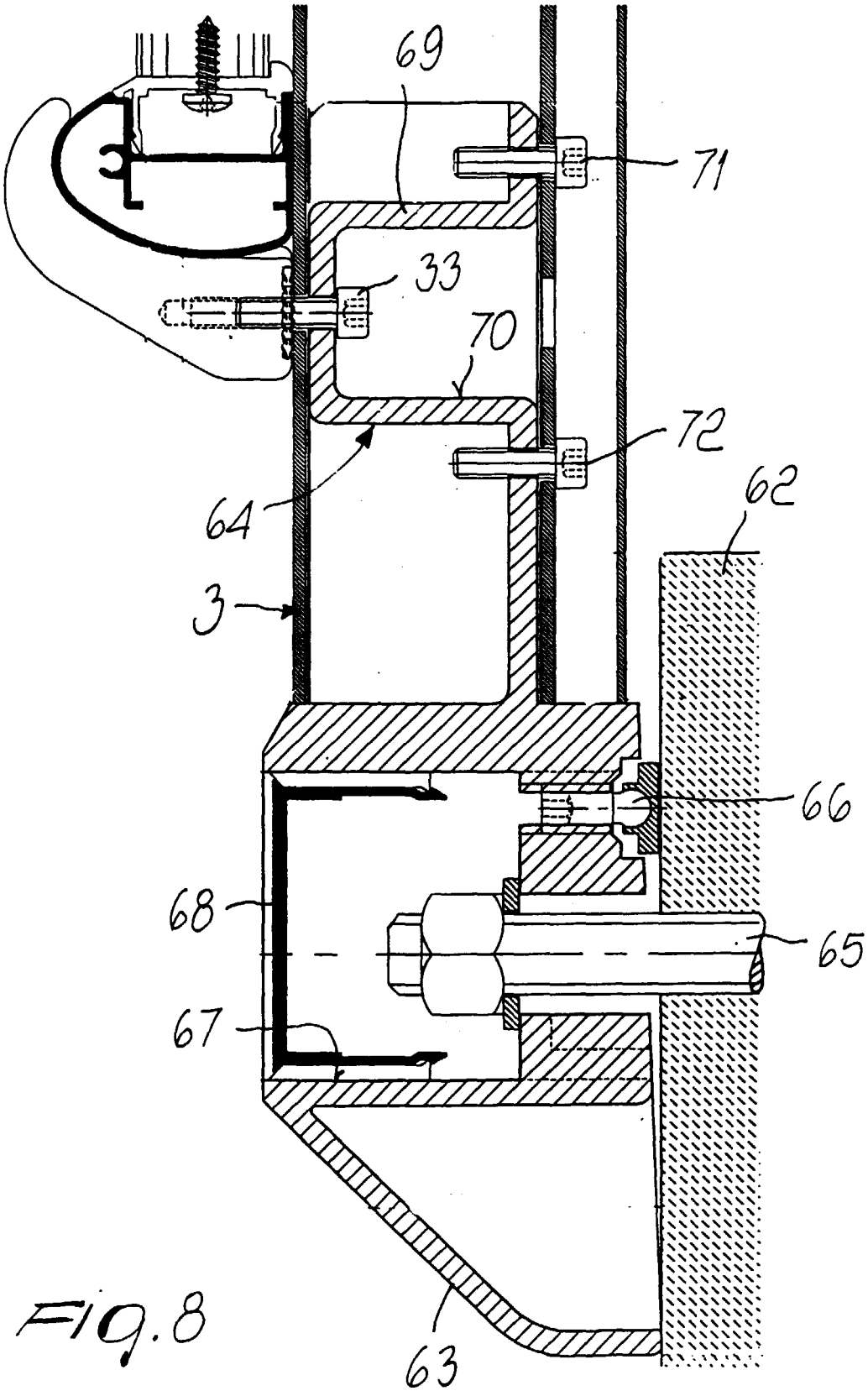


FIG. 8

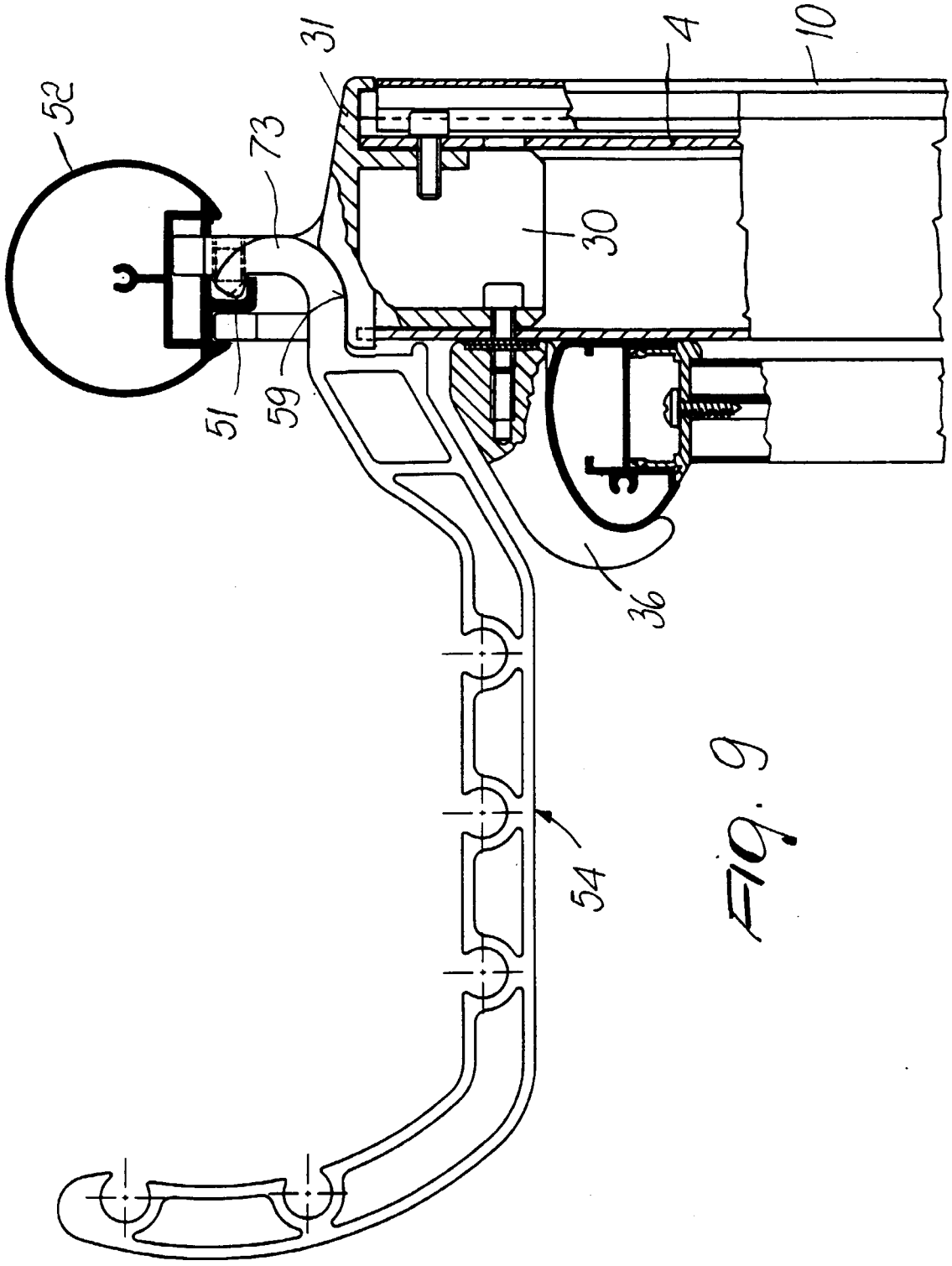


Fig. 9

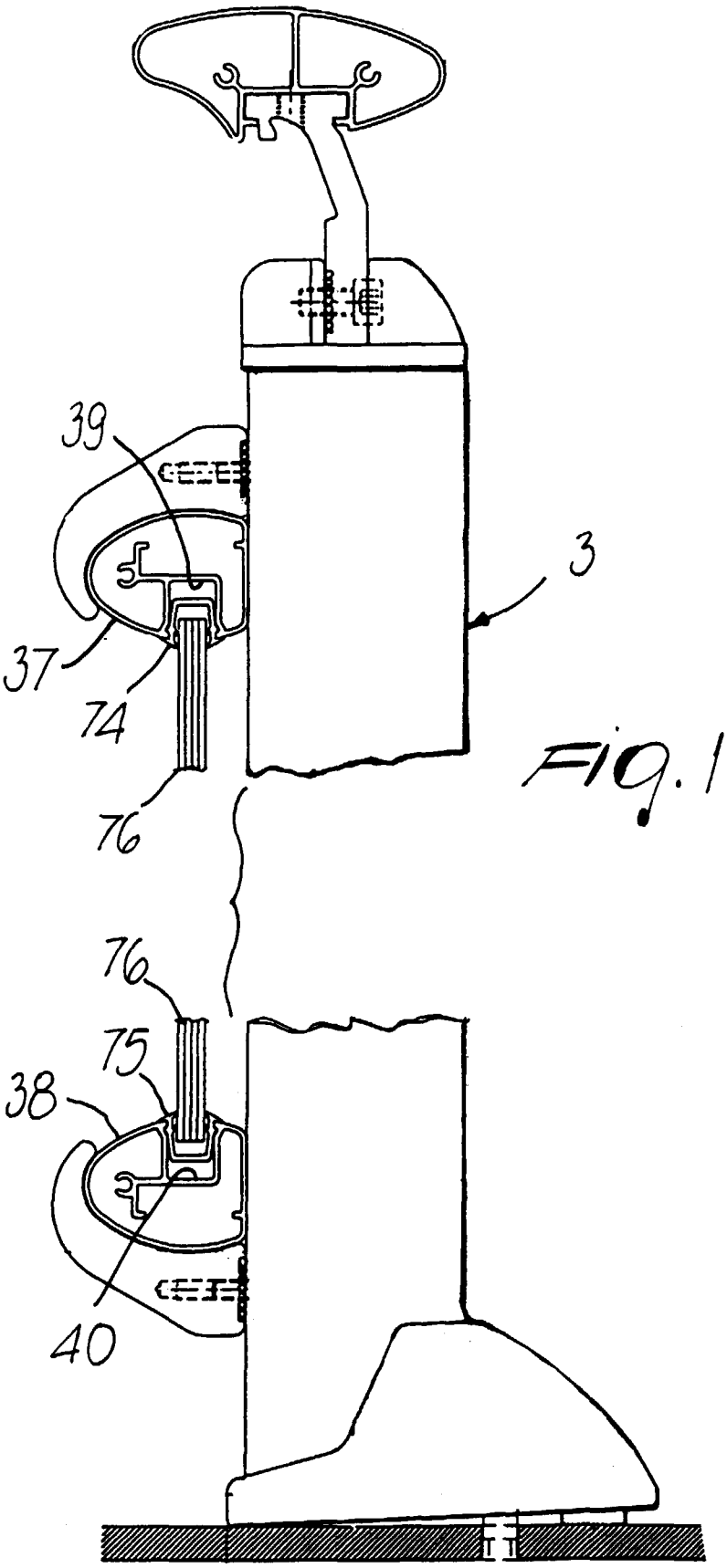


FIG. 11

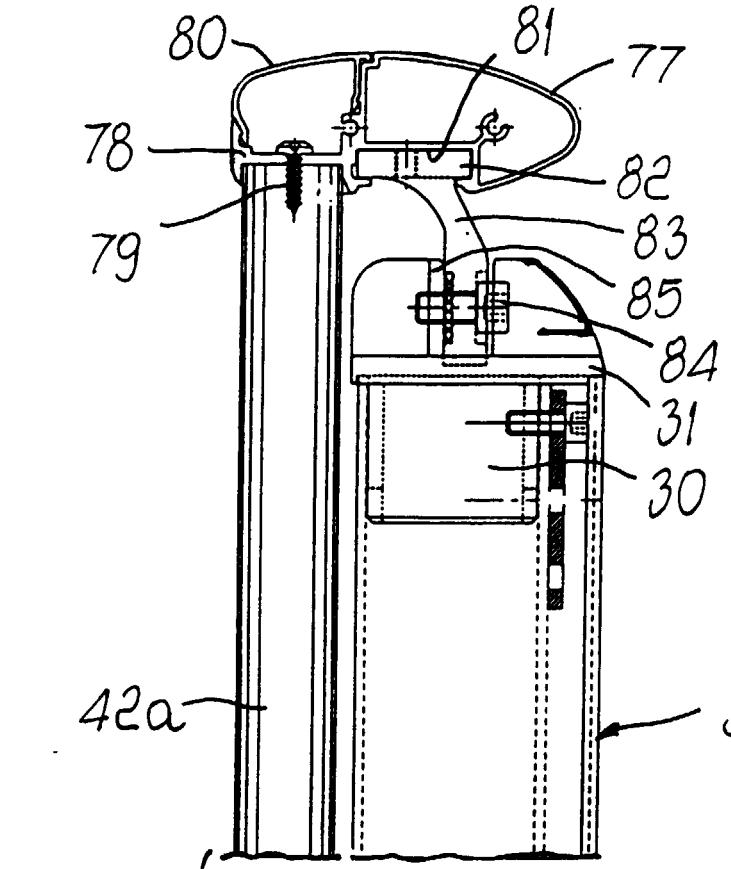
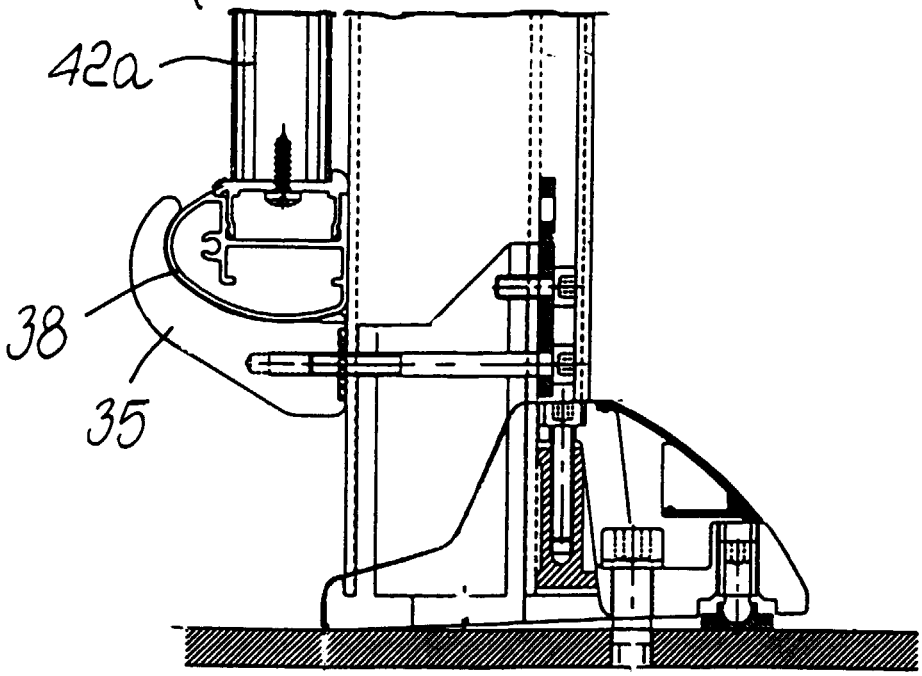


FIG. 12



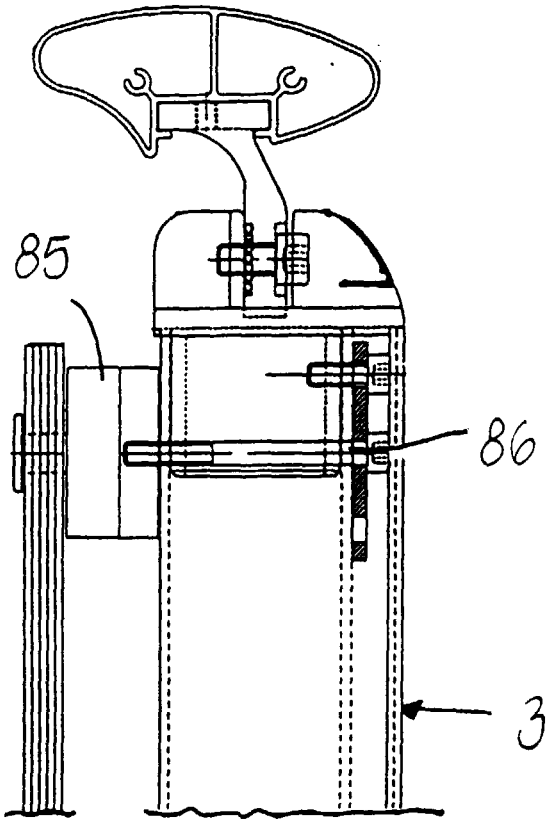


FIG. 13

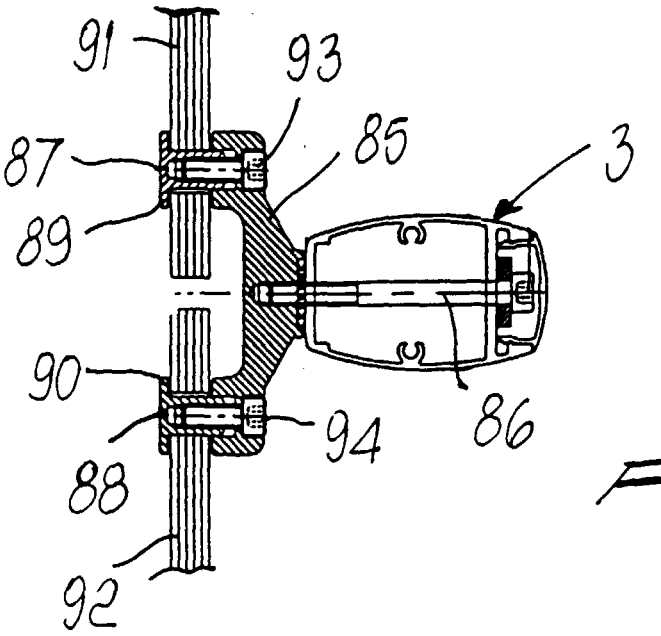


FIG. 14