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(54) **Improved device for constructing walls, racks and the like**

(57) Device (1) for building walls, shelves and the like, which mainly consists of a construction of vertical

beams (2) and wall panels (3) provided to it, characterised in that each wall panel (3) of a built wall can be individually and separately removed and mounted.

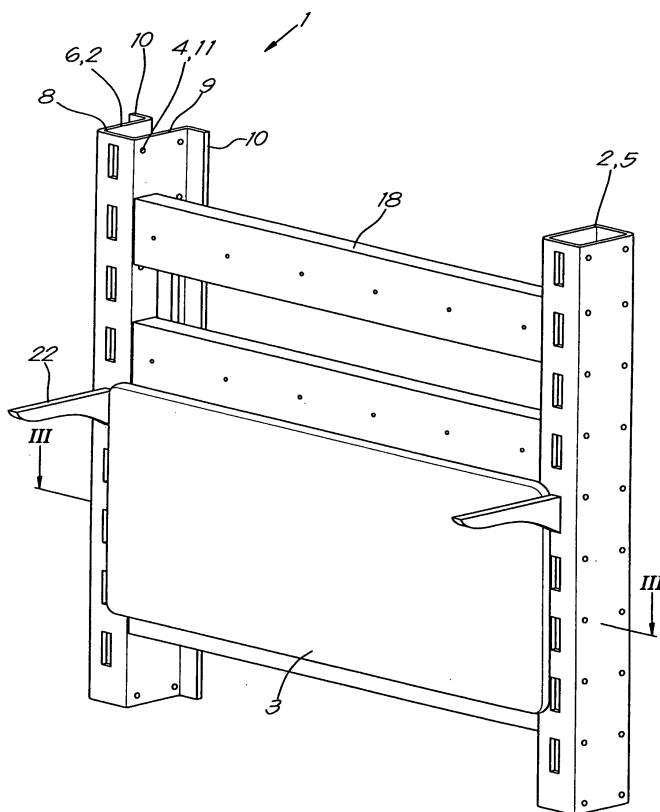


Fig. 1

Description

[0001] The present invention concerns an improved device for building walls, shelves and the like.

[0002] Devices for building walls are already known which mainly consist of a construction of vertical supports on which wall panels are fixed by means of screws, glue or the like.

[0003] Such known devices are usually made to size on the spot, which requires skilled personnel.

[0004] The custom-made work usually implies that building such devices is relatively time-consuming and labour-intensive, and as a consequence such a device is relatively expensive.

[0005] Moreover, the use of tools is necessary for the construction.

[0006] Rebuilding such known devices is usually not possible without damaging the supports and wall panels and it also requires the necessary custom work to adjust the recycled supports and wall panels, as a result of which such known devices are often rather intended as permanent devices.

[0007] The present invention aims to remedy one or several of the above-mentioned and other disadvantages.

[0008] In particular, the invention aims a multifunctional device that makes it possible to build walls, shelves and the like with a restricted number of parts that are easy to mount and to dismount, in an endless combination, without having to use any tools, such that they can also be easily and quickly rebuilt.

[0009] To this end, the invention concerns an improved device for building walls, shelves and the like, which mainly consists of a construction of vertical beams and wall panels provided to the latter, whereby every wall panel of a built wall can be individually and separately removed and mounted.

[0010] The wall panels can be mounted in a simple and flexible manner and they can be removed from the built wall without any tools being required.

[0011] Thus, walls can be built in a simple manner as desired by fixing the wall panels in any desired arrangement to the vertical beams.

[0012] An advantage of this device is that anyone can mount or remove wall panels without any special training being required.

[0013] Another advantage is that the walls can be reconfigured in a very simple manner, since every panel can be individually replaced without first having to dismount the entire wall or a major part of it.

[0014] The invention indeed makes it possible to replace any panel whatsoever individually and as separate from all the other panels and accessories by another panel having a different structure, function or shape.

[0015] The wall panels can be made in different embodiments.

[0016] These embodiments may be formed for example of straight or bent wall panels.

[0017] The wall panels can also be made of different materials and with different finishes or coatings, as transparent or non-transparent panels.

[0018] They can also be made as open pass-on panels, in the shape of light panels and the like.

[0019] These different embodiments allow for endless combinations.

[0020] By combining bent hollow and round wall panels, either or not with different curvatures, smooth, bent walls that are aesthetically nice can be realised in any conceivable shape.

[0021] Such a device has a universal use and can be applied in shops, large shopping spaces, showrooms, the hotel and catering industry, offices, public spaces and house-building.

[0022] The wall panels can also be used to finish walls that hence do not need to be finished with a coat of plaster or the like. All facilities such as electricity, water, gas and the like can be concealed behind the panels and as a result are easily accessible later on for alterations and repairs.

[0023] Thanks to the modular and dismountable character of the device, the vertical beams and wall panels can also be packed in a very compact manner and they can be transported by a single person.

[0024] Another advantage is that the device can be re-used as it can be dismounted without causing any damage and that it can be re-built just as easily in another place, either or not having the same shape and composition.

[0025] The vertical beams and the wall panels are preferably made of recyclable materials.

[0026] In order to make the device even more multifunctional, additional accessories may be provided that are equipped with at least one loose or integrated hook with which the accessory concerned can be attached in a detachable manner in a recess of a vertical beam.

[0027] Such accessories are for example joists; shelves; supports; hooks and other suspension systems; displays; light fittings; cupboard elements; see-through elements; open pass-on elements; tables; worktops and the like.

[0028] In a practical embodiment, the vertical beams can be provided with at least three rows of recesses, as a result of which several panels and accessories can be fixed in the same spot on the vertical beams.

[0029] In another preferred embodiment, the vertical beams may be provided with only one row of recesses, whereby the recesses stay at least partly free when two wall panels are fixed next to one another on one and the same vertical beam, such that this free space can be used for mounting accessories by for example hooking or snapping them in said recesses.

[0030] Fixing means are preferably provided with which a wall panel can be provided in a detachable manner on a vertical beam.

[0031] In order to better explain the characteristics of the invention, the following preferred embodiments of an

improved device for building walls and/or shelves according to the invention are given as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 schematically represents a first embodiment of a device according to the invention, seen in perspective, during the construction of a combined wall and shelf arrangement;
figure 2 represents the part indicated by the frame F2 in figure 1 to a larger scale;
figure 3 represents a section according to line III-III in figure 2;
figure 4 schematically represents another embodiment of the device according to the invention, seen in perspective, during the construction of a combined wall and shelf construction;
figure 5 represents the part indicated by F5 in figure 1 to a larger scale;
figures 6 and 7 are views as that in figure 5, but during following steps of the construction;
figure 8 represents a section according to line VIII-VIII in figure 7;
figure 9 represents the part indicated by the frame F9 in figure 4 to a larger scale, but as dismantled;
figure 10 represents a variant of a device according to figure 1; and,
figures 11 and 12 represent two more variants of a combined wall and shelf construction, but seen from above.

[0032] Figures 1 to 3 schematically represent a first embodiment of a device 1 according to the invention which mainly consists of a construction of vertical beams 2 and of horizontal standing wall panels 3 provided against them.

[0033] The vertical beams 2 are preferably made of metal and they are provided with at least one row of recesses 4.

[0034] The vertical beams 2 may be cylindrical 5 or omega-shaped 6. Said omega shape 6 consists of a U-shaped beam 7 with two parallel, opposite walls 8,9 that are folded back outward at right angles along their free edge so as to form flanges 10 with which said beams 6 can be fixed to a wall or the like if necessary.

[0035] In the embodiment as represented in figure 1, the vertical beams 2 in two opposite walls 8,9 are provided with a row of recesses 4, in the shape of bore holes 11 provided at regular distances from one another in the longitudinal direction of the beam 2.

[0036] In the recesses 11 of the vertical beams can be provided fixing means 12, which in the given embodiment consist of laterally protruding elements 13 that are made in the shape of a plastic bush 14 in the case of figure 2 attached to the beam 2, for example by means of a fastening screw 15 or a bolt provided in the above-mentioned bore hole 11.

[0037] In the given example, the wall panels 3 are

made of a plate material.

[0038] Naturally, the wall panels 3 can be made of any material whatsoever, or in any shape whatsoever. The wall panels 3 can be either or not transparent, and with any desired finish.

[0039] The wall panels 3 have a front side 16 and a back 17. On the back 17 of the wall panel 3 is in this case provided a fastening plate 18.

[0040] This fastening plate 18 can be fixed to the wall panel 3 in many ways. Preferably, screws 19 are used to screw down the fastening plate 18 in the wall panel 3.

[0041] This fastening plate 18 has an upper edge 20 that is folded back at right angles and that is subsequently folded back downward so as to form an opening 21 that widens towards the bottom with which the fastening plate 18 and a boundary element can be hooked over opposite plastic bushes 14 of two vertical beams 2.

[0042] Further, the device 1 can be provided with accessories 22 that are equipped with at least one loose or integrated hook 23 with which the accessory 22 concerned can be hooked in a detachable manner in an above-mentioned recess 24 of a vertical beam 2.

[0043] The construction of the device 1 is very simple and as follows.

[0044] First, the vertical beams 2 are erected at an appropriate distance from one another, for example by fixing them to a wall to be coated or on supports.

[0045] Then, for every wall panel 3 to be provided, a plastic bush 14 can be put in a recess 11 of each of the vertical beams 2 against which the wall panel 3 is to be provided.

[0046] This plastic bush 14 can be fixed by means of a screw 15.

[0047] Further, a fastening plate 18 is fixed to the back 17 of the wall panel 3 by means of glue, screws or the like.

[0048] As soon as the wall panel 3 and the fastening plate 18 have been connected, it is very easy to apply the wall panel 3 to the vertical beams 2 by hooking the bent edge 25 of the fastening plate 18 behind the plastic bushes 14.

[0049] As the bent edge 25 defines an opening 21 that widens towards the bottom, together with the fastening plate 18, the wall panel 3 will automatically be drawn towards the vertical beams 2, to which end the length of the fastening plate 18 is smaller than the distance between two successive vertical beams 2.

[0050] Hence, no tools are required to apply and remove the wall panels 3.

[0051] The shape and dimensions of the device 1 are such that the wall panels 3 can be mounted or dismantled individually and each as separate without thereby having to remove any other wall panels 3.

[0052] To this end, a play 26 will be provided for example between the two panels 3 mounted on top of each other, such that use can be made of this play 26 to push a wall panel 3 forward unhindered so as to detach it.

[0053] In particular, the device 1 has been developed in such a way that after two adjacent wall panels 3 have

been hooked onto one and the same beam 2, at least a part of a row of recesses 4 in the vertical beam 2 on the front side 16 of the panels 3 still remains free, and the free space can be used for mounting accessories 22.

[0054] In another embodiment of the device 1, as shown in figure 4, in one of the walls 28, the vertical beam 2 is provided with at least three parallel rows 4 of slot-shaped recesses 29 extending in the longitudinal direction of the vertical beams.

[0055] These recesses 29 are situated at a distance from one another and they are distributed at regular distances from each other over the length, preferably over the entire or practically the entire length of the vertical beams 2.

[0056] The box beams 5 are preferably provided with three rows of recesses 4 in two opposite walls 28A, 28B of the vertical beams 2 as represented in figure 4, but it is not excluded for the three rows of recesses 4 to be provided in only a single wall 28.

[0057] In this embodiment, the wall panels 3 are made of plate material whose upper edge 30, lower edge 31 and both side edges 32 are folded back at right angles, and whose upper edge 30 and lower edge 31 are both provided with a downward bent and downward extending lip, 33 and 34 respectively, whereby the lip 34 of the lower edge 31 is made longer than the lip 33 of the upper edge 30, as represented in figure 8.

[0058] In the device of figure 4, apart from full panels 3A, are also applied transparent panels 3B.

[0059] In order to fix the wall panels 3 to the vertical beams 2, the fixing elements 12 in this embodiment are formed of at least one hook 35 on at least one side edge 32 of the wall panel 3.

[0060] The wall panel 3 concerned can be fixed with the latter in a detachable manner to the side edge 32 concerned in a recess 29 of a vertical beam 2.

[0061] Said hook may be integrated in the wall panel 3 or it may be a loose hook 35.

[0062] In the given example are provided loose hooks 35, made as double flat hooks with a lath-shaped body 36, and on a side edge 37 of this body 36 are provided two hook parts 38 situated in each other's prolongation that can work in conjunction with two recesses 29 of a vertical beam 2 and that have a thickness to this end that is smaller than the width of the recesses.

[0063] These loose hooks 35 are provided with a protruding part behind which the wall panels 3 can be hooked.

[0064] The opening of the hooks 35, in other words the smallest distance between the hook parts 38 and the side edge 37, is preferably equal to or somewhat larger than the thickness of the walls of the vertical beams 2, such that the hooks 35 can be attached in the vertical beams 2 in a fitting manner, i.e. without any play or with very little play.

[0065] The top end of the body 36 of the loose hooks 35 is formed as an upward protruding part 39, behind which the wall panels 3 can be hooked with the lip 33 on

their upper edge 30 or with the lip 34 on their lower edge 31, as represented in figure 8.

[0066] To this end, said far end 39 is provided with an appropriate stepped notch 40 in the upper angle on the side edge 37.

[0067] As an option, the vertical beams 2 can be connected to one another by means of cross struts 41 which can be provided in passages 42 with their crosscut ends, which are provided opposite one another at the same height to that end in the facing walls of two successive vertical beams 2, whereby, as represented in figure 9, the cross struts 41 are provided with a cross slot 43 in their crosscut ends, with which the far end concerned of the cross strut 41 can be pushed over the edge of an above-mentioned passage 42 of a box beam 2 so as to attach it to the latter.

[0068] The width of the slots 43 is preferably equal to or somewhat larger than the thickness of the walls of the vertical beams 2, such that the above-mentioned far ends can be fixed to the vertical beams 2 without any play.

[0069] The construction of the device 1 is very simple and as follows.

[0070] First, the vertical beams 2 are erected at an appropriate distance from one another, for example by fixing them to a wall to be covered or on supports.

[0071] If the vertical beams 2 are freestanding, the cross struts 41 can be first provided between the vertical beams 2 and be fixed.

[0072] Next, the loose hooks 35, as represented in figure 5, are hooked at a suitable height in the recesses 29 of an outer row of recesses 4 and then, starting from the bottom, the wall panels 3, as represented in figure 6, are fixed to the vertical beams 2 one by one by hooking them with a lip 33 or 34 behind the hooks 35, whereby the lower lip 34 is also hooked behind the upper edge 30 of an underlying panel.

[0073] In this way, entire walls can be built of successive, connecting vertical strips of wall panels 3 mounted on top of one another, whereby sidelong adjacent wall panels 3 are fixed to one and the same vertical beam 2, one with hooks 35 in recesses 29 of the left outer row 4 and the other with hooks in the recesses 29 of the right row, and whereby there is left an opening 44 between these sidelong adjacent wall panels 3 so as to keep the middlemost row of recesses 4 free, as represented in figure 4 and figure 7.

[0074] As the middlemost row of recesses 4 is kept free, all sorts of accessories 22 can be provided, equipped with at least one loose or integrated hook 23 with which the accessory 22 concerned can be hooked in a detachable manner in an above-mentioned recess 29 of a vertical beam 2.

[0075] Such an accessory 22 is represented by way of example in figure 4, in the shape of a shelf 45 with supports 46 that can be hooked in the recesses 29.

[0076] It is clear that the device 1 can be easily dismounted again or converted, without using any tools, by detaching the parts and then remounting them in another

place if required, so as to obtain a new arrangement of the wall panels 3 and accessories 22.

[0077] It is clear that it is also possible to fasten all sorts of other accessories 22 in the same manner.

[0078] It is also clear that the hooks 35 must not necessarily be loose parts, but that they can also be integrated in the wall panels 3 or in the accessories 22, whereby the dimensions of the parts are such in this case that a wall panel 3 can be fixed to a vertical beam 2 with one side edge 32 by means of a hook in such a manner that the side edge 32 concerned overlaps only one row of recesses while the other rows stay free.

[0079] This is obtained for example as the integrated hooks 35 of the wall panels 3 are situated at a distance from the above-mentioned side edges 32, which distance is smaller than the distance between the two adjacent rows of recesses 4.

[0080] Figure 10 represents a variant of a device 1 according to the invention, whereby the vertical beams 2 are in this case provided with ceiling fixing means 47 and/or with wall fixing means 48, equipped with at least one loose or integrated hook 49 with which the wall fixing means 48 can be hooked in a detachable manner in an above-mentioned recess 29 of a vertical beam 4.

[0081] Moreover, the vertical beams 2 are provided with supports 50 that can be adjusted in height in this embodiment so as to level the device 1, whereby these supports 50 can be concealed for example behind a skirting 51.

[0082] Figure 10 also represents an intermediate support 52 in the shape of a U-section, with three rows 4 of recesses in the cross wall and passages 42 in the parallel walls, similar to the passages 42 in the box beams 2, but whereby these passages 42 are in this case connected via a slot 53 to the edges of the free edges of the parallel walls, as a result of which the cross struts 41 can be provided in the passage 42 via this slot 53.

[0083] By providing an intermediate support 52, the wall panels 3 can also be mounted in a laterally crossed relation, as represented in figure 10.

[0084] On the crosscut far end of the wall can be provided a finishing strut 54.

[0085] Figure 11 shows an angular wall arrangement seen from above.

[0086] Figure 12 represents another wall arrangement, in which bent wall panels 3 are used instead of flat wall panels 3, so as to form a smooth, continuously bent wall.

[0087] Although double hooks 35 are represented in the figures, it is not excluded to use simple or multiple hooks.

[0088] The recesses 29 do not necessarily have to be slot-shaped, but they can also have other shapes.

[0089] The three rows of slot-shaped recesses can be combined, if need be, as a single row of recesses whereby the width of the recesses is larger in this case than the total thickness of two hooks of wall panels and the thickness of the hook of the accessories, such that two

wall panels and an accessory can be simultaneously hooked in one and the same recess.

[0090] The present invention is by no means restricted to the embodiments described as an example and represented in the accompanying drawings; on the contrary, an improved device according to the invention for building walls, shelves and the like can be made in all sorts of shapes and dimensions while still remaining within the scope of the invention.

Claims

1. Device (1) for building walls, shelves and the like, which mainly consists of a construction of vertical beams (2) and wall panels (3) provided to it, **characterised in that** each wall panel (3) of a built wall can be individually and separately removed and mounted.
2. Device (1) according to any one of the preceding claims, **characterised in that** the wall panels (3) can be removed and mounted without using any tools.
3. Device (1) according to any one of the preceding claims, **characterised in that** between two wall panels (3) mounted on top of one another there is provided a play (26).
4. Device (1) according to any one of the preceding claims, **characterised in that** it is provided with one or several additional accessories (22) that can be removed and mounted individually and as separate.
5. Device (1) according to any one of the preceding claims, **characterised in that** every vertical beam (2) is provided with at least one row of recesses (4) for mounting or fixing the wall panels (3) and/or the accessories (22).
6. Device (1) according to any one of the preceding claims, **characterised in that** the recesses (29) are distributed at regular distances from one another over the length of the vertical beams (2).
7. Device (1) according to any one of the preceding claims, **characterised in that** at least one of the above-mentioned rows of recesses (4) stays at least partly free when two wall panels (3) are fixed next to one another on one and the same vertical beam (2), such that this free space (24) can be used to mount accessories (22).
8. Device (1) according to anyone of claims 4 to 7, **characterised in that** it is provided with one or several additional accessories (22) that are equipped with at least one loose or integrated hook (23) with which

the accessory concerned (22) can be hooked in a detachable manner in an above-mentioned recess (24) of a vertical beam (2).

9. Device (1) according to anyone of claims 4 to 8, **characterised in that** the above-mentioned accessories (22) are selected from the following non-limitative list of accessories: joists; shelves; supports; hooks and other suspension systems; displays; light fittings; cupboard elements; see-through elements; open pass-on elements; tables; worktops and the like. 5
10. Device (1) according to any one of the preceding claims, **characterised in that** the wall panels (3) are flat or bent. 10
11. Device (1) according to any one of the preceding claims, **characterised in that** each of the above-mentioned vertical beams (2) is a box beam (5) or an omega beam (6). 15
12. Device (1) according to any one of the preceding claims, **characterised in that** the vertical beams (2) are provided with wall fixing means (48) and/or ceiling fixing means (47). 20
13. Device (1) according to claim 12, **characterised in that** the wall fixing means (48) are provided with at least one loose or integrated hook (49), with which the wall fixing means (48) concerned can be hooked in a detachable manner in an above-mentioned recess (29) of a vertical beam (2). 25
14. Device (1) according to any one of the preceding claims, **characterised in that** the vertical beams (2) are connected to one another by means of cross struts (41). 30
15. Device (1) according to claim 14, **characterised in that** the vertical beams (2) in the facing walls are provided with opposite passages (42) in which the above-mentioned cross struts (41) can be provided with their crosscut ends, whereby the cross struts (41) are provided with a cross slot (43) at each crosscut end with which this far end can be pushed over the edge of an above-mentioned passage (42) of the vertical beam (2) so as to fix the cross strut (42) to the vertical beam (2). 35
16. Device (1) according to any one of the preceding claims, **characterised in that** fastening means (12) are provided with which a wall panel (3) can be provided in a detachable manner to a vertical beam (2). 40
17. Device (1) according to claim 16, **characterised in that** the above-mentioned fastening elements (12) are formed of protruding elements (13) in one of the walls of the vertical beams (2) and **in that** the wall 45

panels (3) are provided with a fastening plate (18) in the back (17) whose upper edge (20) is folded down at right angles and is provided with a downward bent edge, such that the wall panel (3) can be provided by hooking the bent edge over the protruding elements (13).

18. Device (1) according to claim 17, **characterised in that** the above-mentioned protruding elements (13) are formed of a plastic bush (14) that can be provided on the vertical beam (2) with a fastening screw (15) at a row of recesses (4) that are provided in the vertical beams (2). 50
19. Device (1) according to claim 17 or 18, **characterised in that** the downward bent edge (20), together with the actual fastening plate (18), defines an opening (21) that widens towards the bottom. 55
20. Device (1) according to claim 16, **characterised in that** the above-mentioned fastening elements (12) are formed of at least one hook (35) on at least one side edge (32) of the wall panel (3) with which the wall panel (3) concerned can be hooked in a detachable manner to the side edge (32) concerned in a recess (29) of a vertical beam (2). 60
21. Device (1) according to claim 20, **characterised in that** the above-mentioned hook (35) is integrated in the wall panel (3) or is a loose hook. 65
22. Device (1) according to claim 20 or 21, **characterised in that** the vertical beams (2) are provided with at least three parallel rows of recesses (4) extending in the longitudinal direction of the vertical beams. 70
23. Device (1) according to claim 22, **characterised in that** the hooks (35) of the wall panels (3) are situated at a distance from the above-mentioned side edges (32) of the wall panel (3), which distance is smaller than the distance between the two adjacent rows of recesses (29). 75
24. Device (1) according to anyone of claims 20 to 23, **characterised in that** the hooks (35) are made as double or multiple hooks having two or several hook parts (38) situated in one another's prolongation, which can work in conjunction with two or several recesses (29) of a row of recesses (4) of a vertical beam (2). 80
25. Device (1) according to anyone of claims 20 to 24, **characterised in that** the hooks (35) are loose hooks, provided with a protruding part (39) behind which the wall panels (3) can be hooked. 85
26. Device (1) according to anyone of claims 20 to 25, **characterised in that** the wall panels (3) are pro-

vided with a downward extending lip (34) on their lower edge (31) that can be hooked behind an underlying wall panel (3) and/or behind a hook (35) of an underlying wall panel (3).

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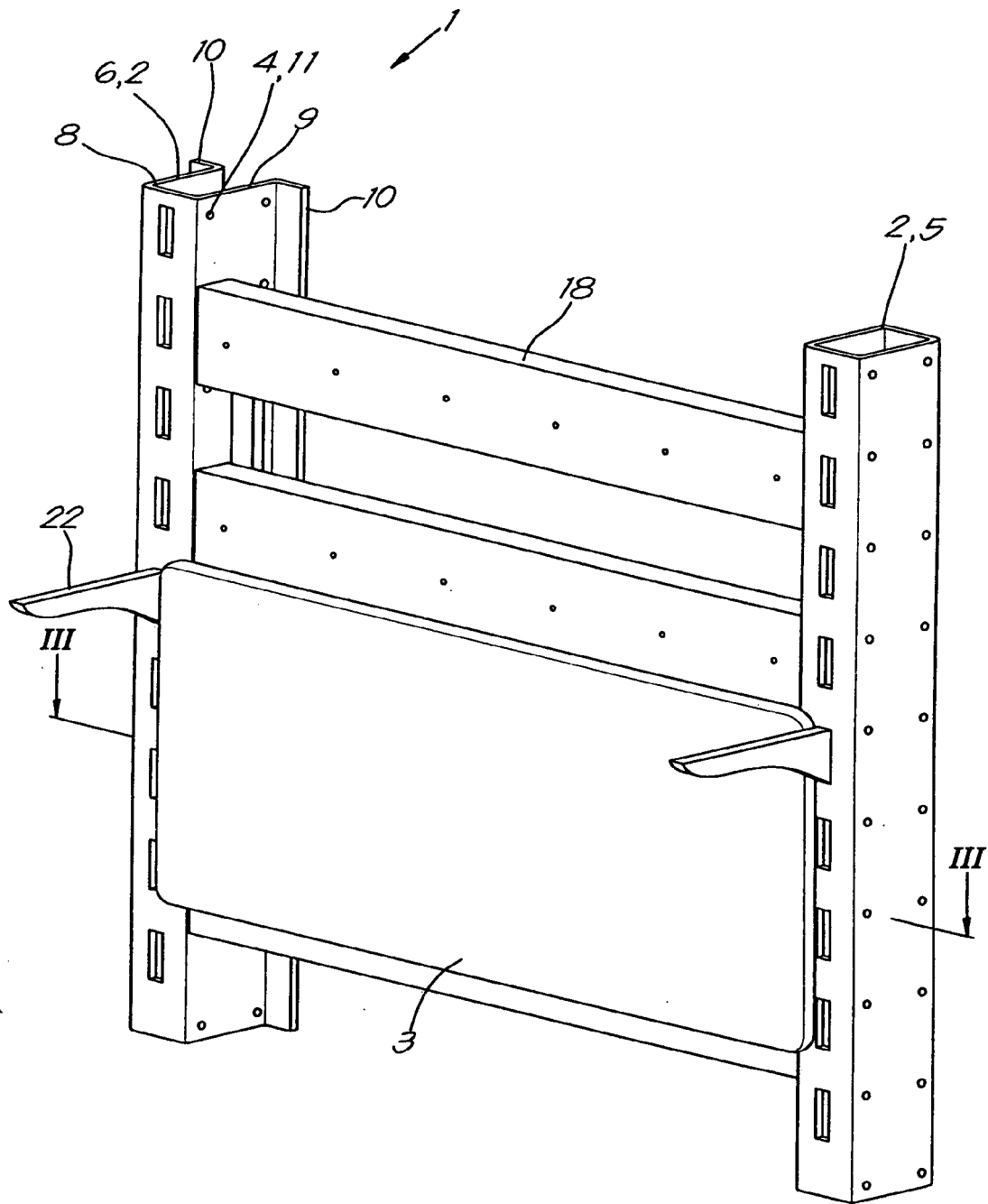


Fig. 1

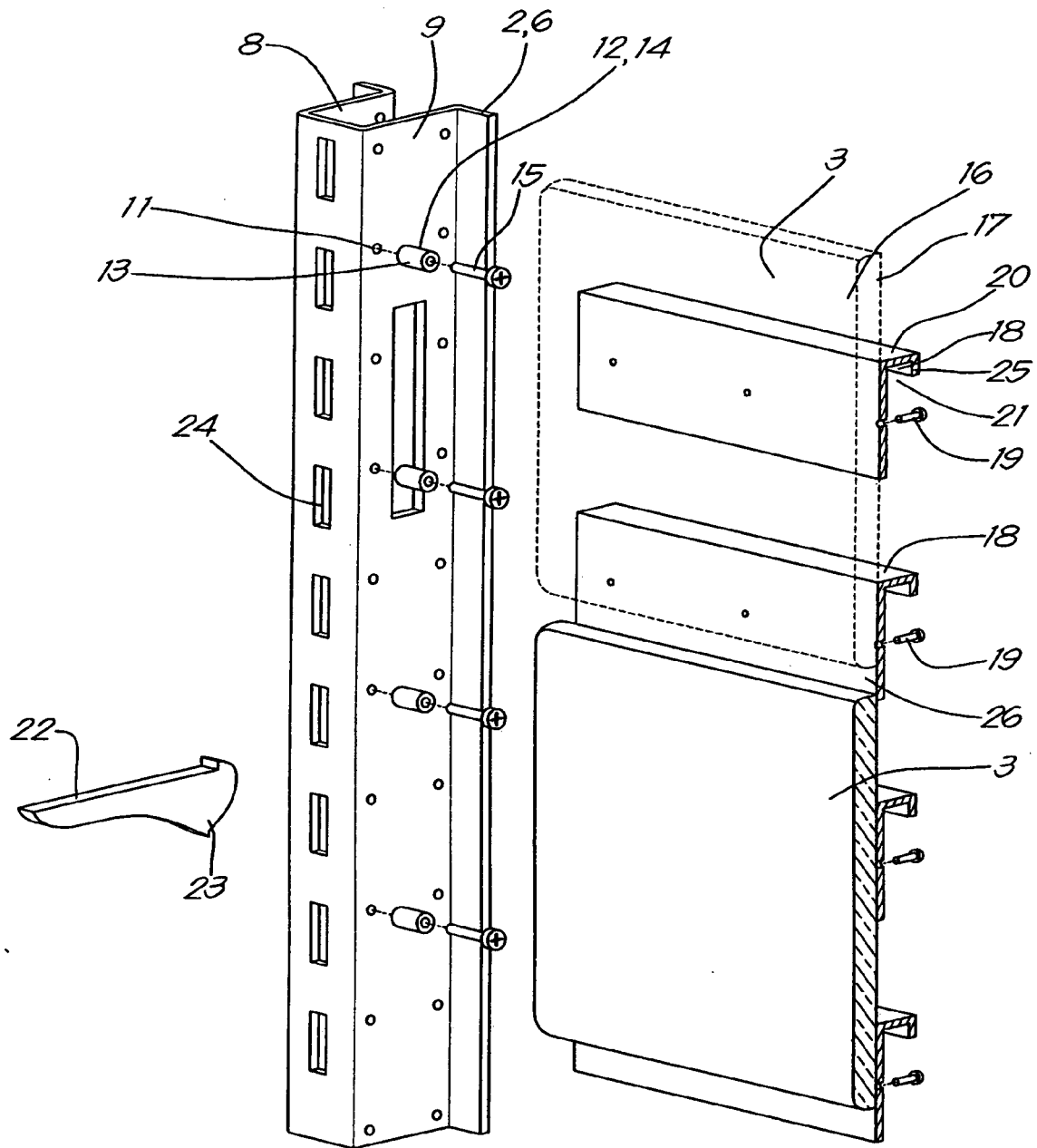


Fig. 2

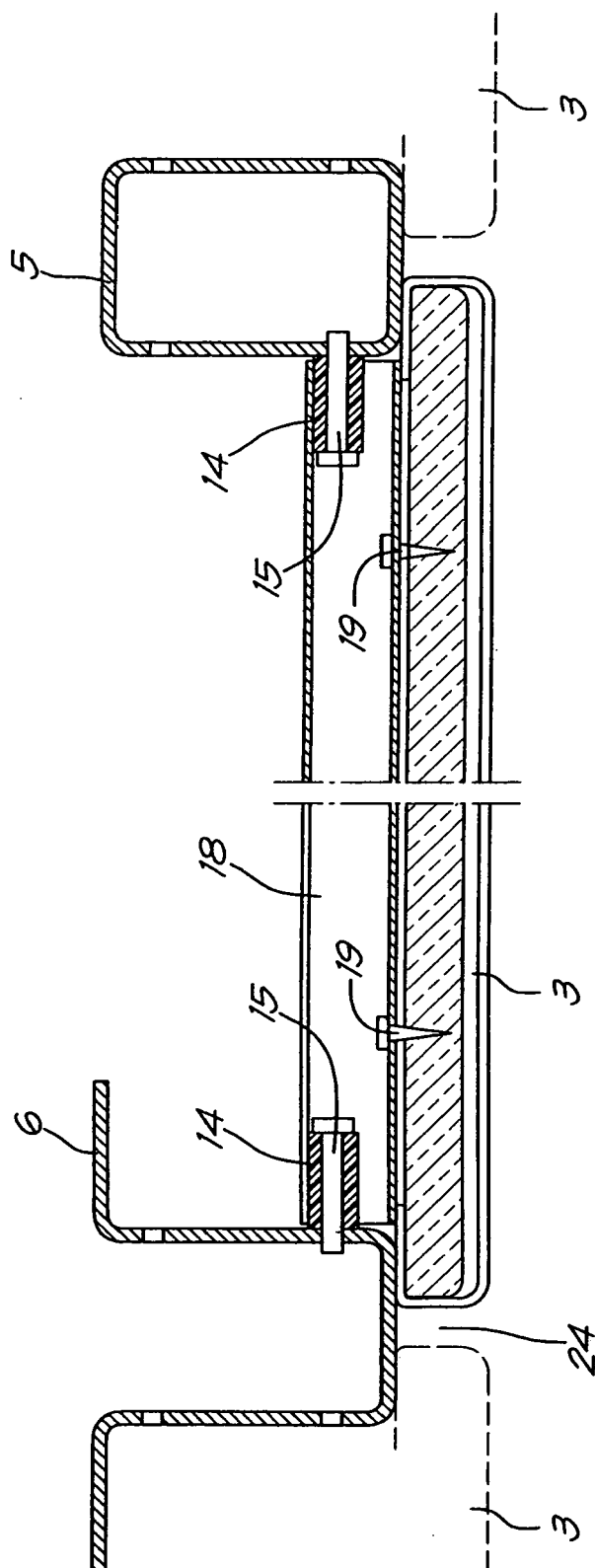
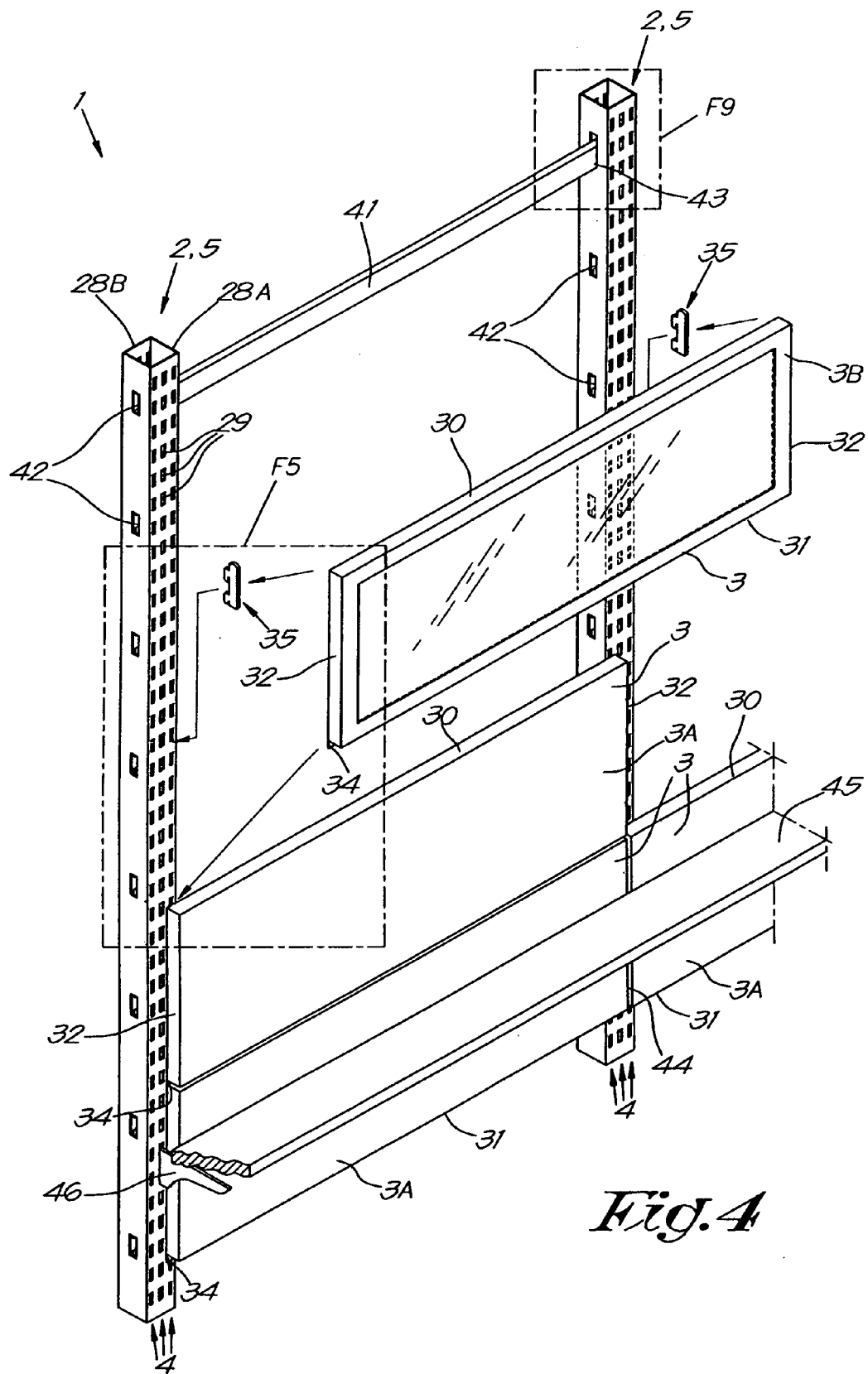


Fig. 3



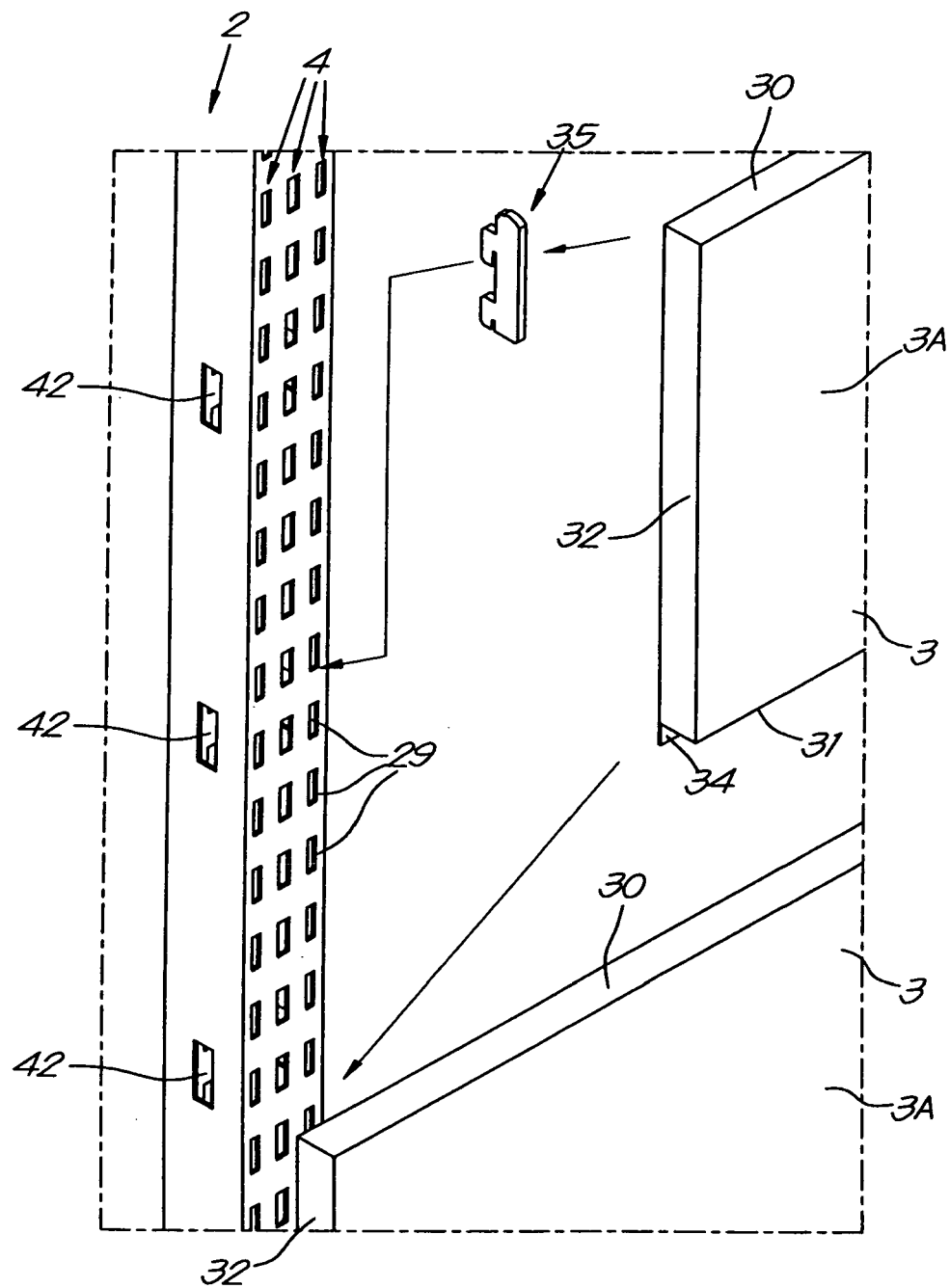


Fig.5

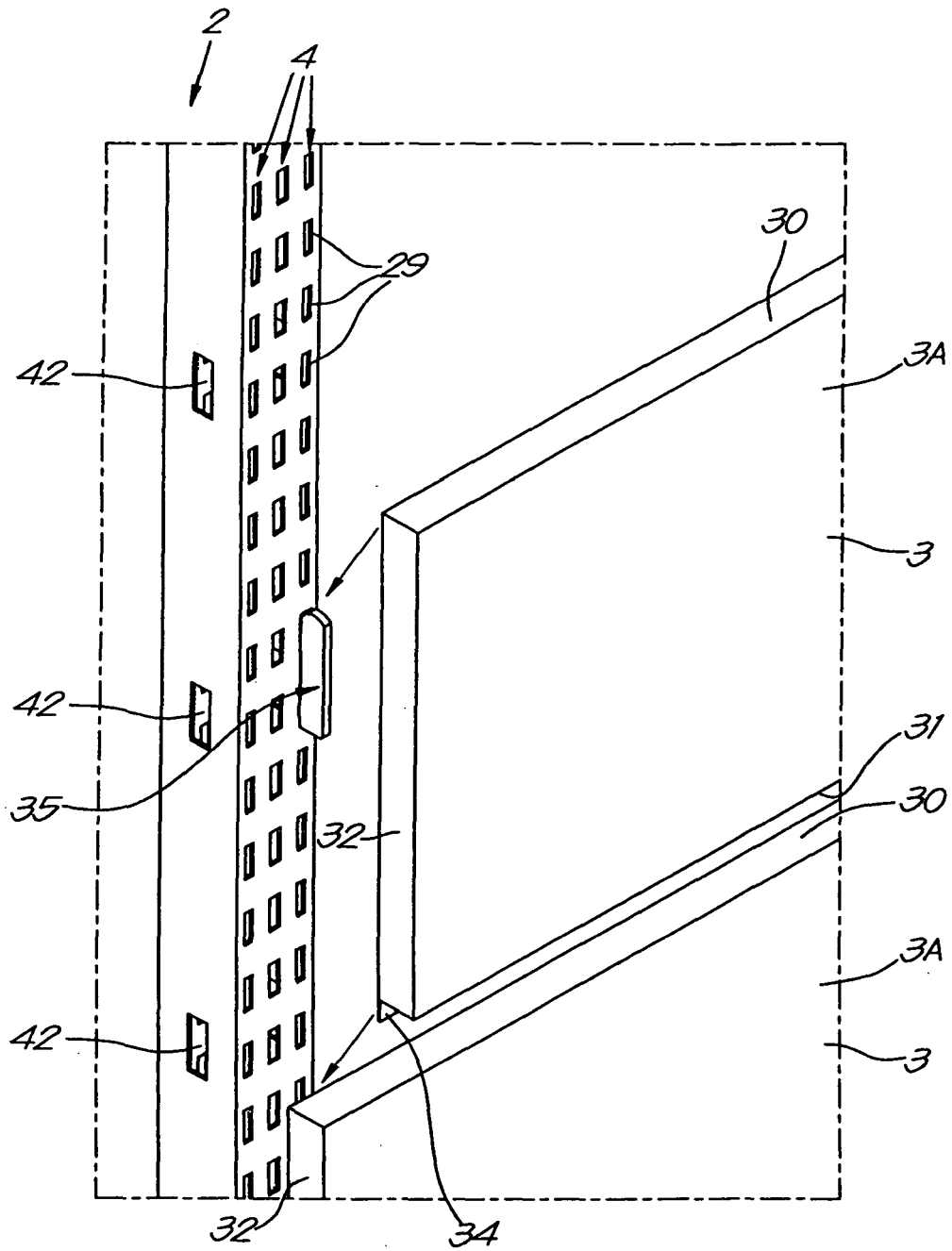
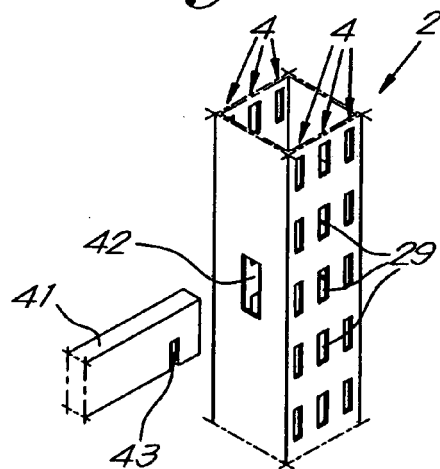
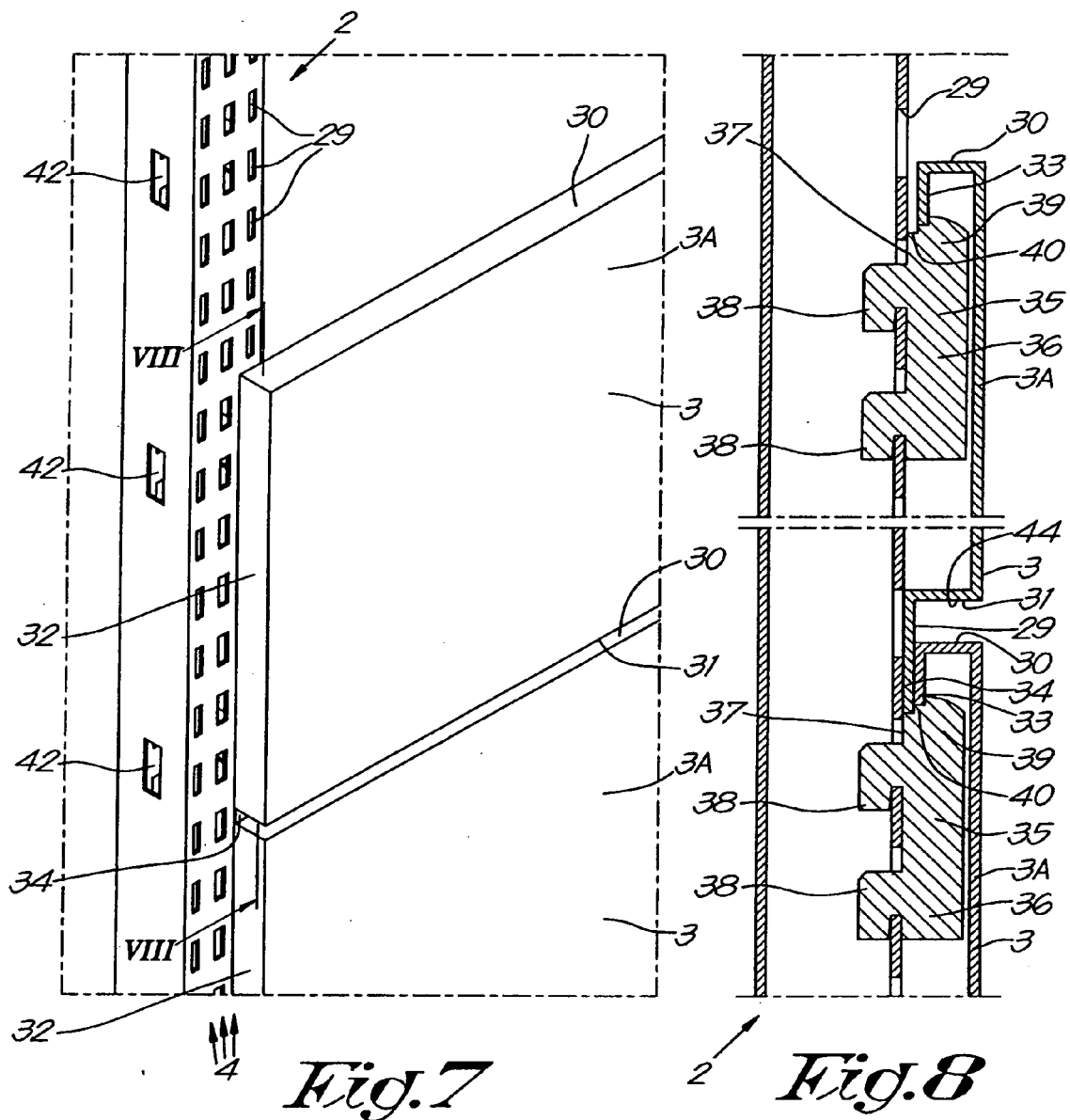


Fig. 6



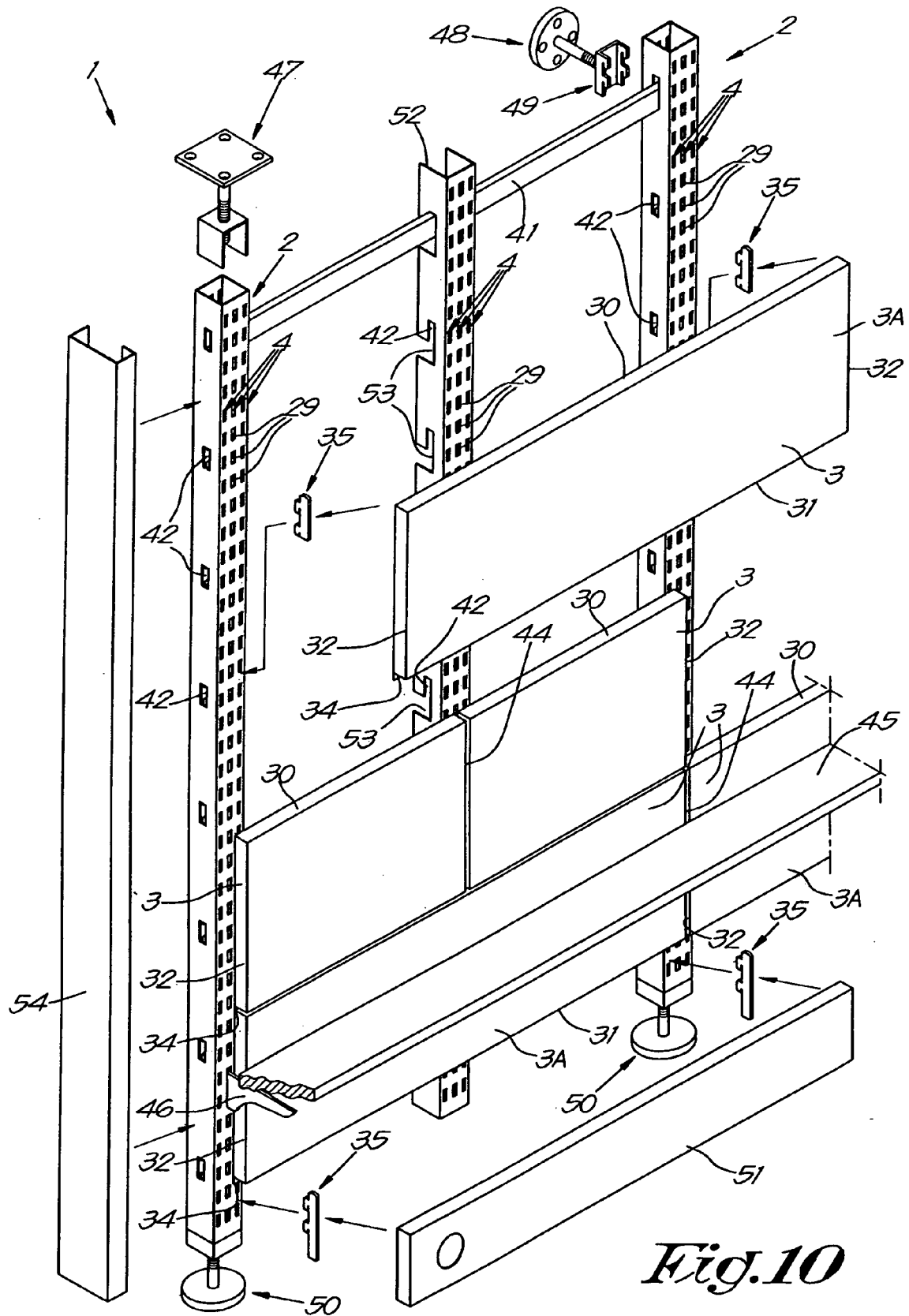


Fig.10

