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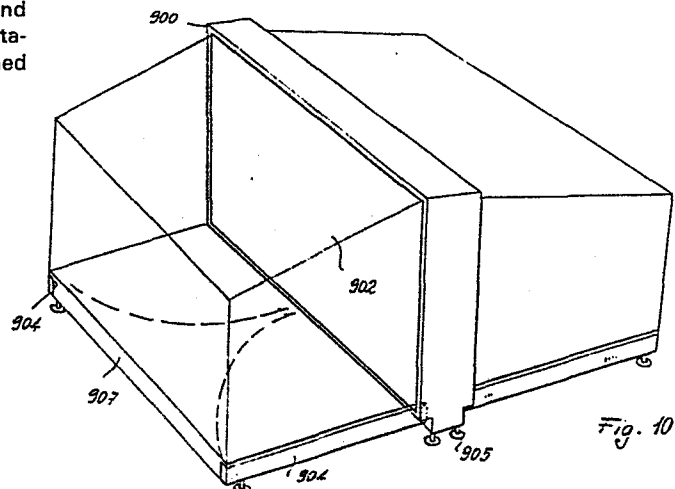
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54 A transportable inhabitative unit of alterable capacity.

57 The inhabitative unit has a reduced floor space for transportation. At the site of use, the floor space is increased and hence the volume of the inhabitative unit by translation, rotation and engagement of the components thereof contained within the original floor space.



A TRANSPORTABLE INHABITATIVE UNIT OF ALTERABLE CAPACITY.

This invention relates to an inhabitative unit, particularly provided for rapid and temporarily realizations such as, for example, in occasion of earthquakes, floods and the like, capable of assuming for transportation a reduced floor space and at the site of use a substantially larger volume or capacity, by using component parts contained within the reduced floor space taken for transportation and without resorting to specialized labour and particular implements and tools of unusual availability.

The invention is directed to achieve the above mentioned objects, in addition to further objects which will become more apparent from the following detailed description, by proposing a transportable inhabitative unit, which is essentially characterized by comprising a base body, provided with an extensible pedestal, on the extension of which at least one additional body can be built, this additional body comprising wall components connected with the base body and mutually engaging to stabilize such an additional body.

The invention will be better understood from the following detailed description given by mere way of unrestrictive example of a preferred embodiment thereof, shown in the accompanying drawings, in which :

Fig. 1 is a schematic perspective view showing the inhabitative unit in its compact base form taken for transportation;

Fig. 2 is a view showing the same inhabitative unit after building of two additional side bodies and a third top additional body;

Fig. 3 is a schematic vertical sectional view corresponding to the line III-III of Fig. 2;

Fig. 4 is a schematic vertical sectional view taken along line IV-IV of Fig. 2;

Fig. 5 is a schematic horizontal sectional view taken along line V-V of

Fig. 1;

Fig. 6 is a schematic vertical sectional view taken along line VI-VI of Fig. 1;

Fig. 7 is a schematic sectional view taken along line VII-VII of Fig. 2,

5 Fig. 8 is a plan view showing the pedestal at extended position of the inhabitative unit according to the invention;

Fig. 9 is a sectional view showing the detail relating to the interengagement of two contour sections; and

10 Fig. 10 is a schematic perspective view showing another embodiment according to the invention, in which the base body is shown by thick lines and the additional body by thin lines.

Referring to the accompanying drawings, the inhabitative may assume two high different volumetrically forms, one of which compact of minor volume, referred to as base body R, at which it is transported, for example
15 on railway car, truck, semitrailer or the like, shown in Fig. 1, and the other of a larger volume at the site of use and shown in Fig. 2.

The inhabitative unit includes a pedestal shown in Fig. 8, comprising two metal longitudinal members having uprights or stanchions 2 welded to the ends thereof. The two uprights or stanchions of a same longitudinal member are joined at the top by longitudinal beams 3, of which one is partly
20 shown in Fig. 3. Thus, two reactangular, vertical and parallel frames are obtained as contained within the planes of the two longitudinal members 1. Said two frames are joined at the ends by metal crosspieces 4 and uprights or stanchions 5 and, at the lower side thereof, by pairs of transverse sections 6, 7 of reactangular section, arranged and welded in seats
25 8 in said longitudinal members 1. At the outer dihedral formed by said longitudinal members 1 and transverse sections 6, 7 threaded bushes 9 are welded, having arranged therein threaded pins 10, at the bottom carrying bearing plates 11, for example by means of any known articulations.
30 The two side frames 1, 2, 3 with the crosspieces 4, 6, 7 and uprights or

stanchions 5 specify the resistant carrying structure of the inhabitative unit in its compact form shown in Fig. 1. Such a structure has connected thereto panelings, provided with passages and casings A, and defining a floor B, ceiling C, front walls E and side walls D of such a compact body.

5 The solidarization is committed to any known means, such as screws, sections, expansible sliding blocks, clamps and the like.

It should be pointed out that, as better shown in Figs. 5 and 8, the floor B, ceiling C and front walls E extend to the contour defined by broken lines H, while the side walls D remain within the uprights or stanchions 1, with the result that on two sides said compact body of Fig. 1 has a room or opening 15, in which at collapsed position the wall and bottom components are received for altering the capacity of the inhabitative unit and that in Fig. 2 are designated by 16, 17, 18, 19 and in the following will be referred to as "panelings" or "panels".

15 For the building up of the additional bodies of the inhabitative unit, and particularly the two side bodies X and Y (Fig. 2), it is provided that in sections 6 on one side and sections 7 on the other side, beams of rectangular hollow section 6A and 7A are telescopically guided, at the outer ends thereof such beams being respectively integral with a rectangular hollow longitudinal member 6B and 7B, having bearings 20 integral
20 therewith and similar to those 9, 10, 11 previously described, but offset to the latter. As shown in Fig. 4, the lower inner face of sections 6, 7 has a wedge 21 screw-secured thereto and a similar wedge 22 is secured to said beams 6A, 7A; the function thereof is to restrict the extraction
25 stroke of such beams.

In order to retain such beams at the two extreme positions thereof, transverse holes 23 are provided both in said sections 6, 7 and beams 6A, 7A for insertion of simple spikes or stop pins.

Upon extraction of the elongations or side extensions 6A, 7A, 6B, 7B of
30 the pedestal, the process will now involve the building of the additional

bodies X and Y thereon. To this end, use is made of the panelings contained in the rooms or openings 15 (Fig. 5) and above mentioned. Particularly, the outermost panel 18 of this figure, adhering along its vertical edges to the front wall E through a sealing 28, is hinged at 29 (see Fig. 7) to the ceiling C of the base body, and therefore can be rotated from the vertical position of Fig. 5 to the inclined position of use shown in Figs. 2 and 7. In order to ensure sealing at said hinge 29, a resilient sealing element 30 is provided surrounding as a band the contour of ceiling C, to which it is secured, for example by means of screws. This paneling, as well as the others, may be made in any known manner, for example in the form of monolythic sandwich structure, formed of external lining plates and an intermediate insulating layer, for example a foamed synthetic material, or a foamed wood composite material.

The paneling 18 of rectangular shape is defined on the three remaining contour sides (the fourth side is that of the above mentioned hinge 29) by a section 35 provided with wings or flanges 36, by which it is secured, for example embedded in the paneling material. The section has a flat cantilevered side or flank 37 terminating with a wing or flange 38 bent over to the panel, and forming with said side or flank 37 an acute angle and on the contour provided with an enlargement 39 and web 40. A groove 41 at the attachment zone of wing or flange 38 promotes the elastic deflection of the latter.

The second paneling, as seen from left to right in Fig. 5, is that forming the floor 19 of the additional bodies X and Y, floor which bears on the beams 6A, 7A of the pedestal extensions and which (as shown in Fig. 4) is connected by double hinge or double articulation 38A, B to the slightly-re-entering edge 39 of floor B. On its two parallel side edges, said section 19 has a section 35A quite identical to section 35 of paneling 18.

In order to assure a correct positioning of floor 19, it is provided that its lower face has secured thereto inclined planes 500 acting to the end

against the inner upper corner 501 of the longitudinal member 6B, 7B.

The third paneling, denoted at 17 and made as above described, is joined by double hinge 50, 51, as shown in Fig. 4, to the outer edge of paneling 19 and on three sides (the fourth side is that of the double hing 50, 51) it has a contour section 35B quite similar (see Fig. 5) to that above de-
5 described in connection with paneling 18, but facing (Fig. 5) with its angled side or flank 38B to the above described panelings 18 and 19.

Panelings 16 are secured to uprights or stanchions 2 and form the front walls (see Fig. 2) of the additional bodies X and Y.

10 Particularly, said panelings 16 are pivoted on vertical axes 60 at a vertical edge thereof, and in order to assure sealing at this edge thereof, denoted at 61, the front wall E of the base body and upright or stanchion have secured thereto a resilient sealing strip 62. On the remaining three sides, that is on the upper, lower and end sides, said paneling 16 also
15 has (see Fig.3) a contour defined by sections 35C, D, which are formally but not substantially different from those described in connection with the preceding panelings. Particularly, referring to the positions taken in said Fig. 3, said section 35C has vertically at the top a groove 70 for receiving a resilient sealing strip 71.

20 Laterally of said channel or groove 70 and particularly on the side or flank 72 of the latter, said section 35C has an outwardly inclined wing or flange 73 substantially coincident with flanges or wings 38 of the above described sections. Thus, as shown in Fig. 3, the enlarged edged 39 of the inclined wings or flanges 37 and 73 can snap interengage by elastic
25 deformation when paneling 16 is rotated about the horizontal axis 60 and moved to its closed position of Figs. 2 and 3.

Snap engagement also occurs at the vertical side (not shown) between the section on the vertical side of paneling 16 and equivalent section on side paneling 17. In order to ensure sealing, gaskets 80 are inserted in
30 the sections to create sealing borders and labyrinths.

The lower section 35D of paneling 16 which, as shown, is intended for snap engagement with section 35A of base paneling 19, has a downward facing cantilevered wing or flange 101, substantially parallel to paneling 16, and an inclined wing or flange 102 provided with enlarged edge 103 in opposite
5 direction to that of section 35A of paneling 19.

Thus, the side walls 16 snap engage along the three free sides respectively with the ceiling 18 of the two additional bodies X and Y, the two sides of floor 19, and the two vertical sides of the outer wall 17, which also snap engages along line 120 of Fig. 2 with the section extending along the
10 corresponding side of ceiling 18 and which corresponds as drawing to that 35 and is also a continuation thereof.

As shown in Fig. 2, the inhabitative unit comprises a third additional body, denoted at Z, superposed to the original base body R and also formed with structural elements (panelings) integral with said base body. This
15 body Z comprises two identical substantially triangular heads 200 and two laps 201, 202.

The lap 201 (see Fig. 6) also formed of a layered panel, is connected to ceiling C of the base body by a double hinge 203, 204, the end arms 205n 206 of which are respectively secured by screws, pins or the like to said
20 lap and ceiling C, to the latter by means of brackets 207 terminating embedded in the material of the ceiling.

The pivoting pin 204 enters a groove or seat 210 of the lap, which at a closer distance from the edge, has a similar groove 211 to receive at erected lap the other pivoting pin 203. At its free end (see Fig. 7) said
25 lap 201 is undercut to be received in a top channel-like section 220, having mounted therein an elastic linear gasket of triangular section. This latter lap, at collapsed position (see Fig. 6) is interposed between lap 201 and said two triangular heads 200, which obviously are of such a height as not to be superposed to each other, that is such as to be contained
30 within a same plane.

The lap 202 is hinged at 230 to the end of a bracket 231 embedded in and projecting from ceiling C. The hinge 230 is arranged within a groove 232 of the lap and located above the upper edge of the sealing band 30, the side or flank 30A of which is, as shown in Figs. 6 and 7, approximately of the same thickness as that of a triangular head 200 and defines a room or opening in which the two heads are received.

For interlocking of laps 201 and 202, a pin 310 (Fig. 7) is slidably arranged in the latter and operable by a lever 311 pivoted at 312 to the wall and provided with a fork 313, in which a cross pin 314 is arranged as placed in the catch 310. This catch 310 is intended to enter an aligned seat 315 in the other lap 201.

As schematically shown by broken line 404 of Fig. 7, sections of the type as sections 35A, B, C, D described in connection with Fig. 5, are arranged along the two parallel edges of the laps.

That is, these sections are such as to allow snap coupling with similar sections provided on adjoining edges of the other panelings.

These sections are snap engaged by those provided on the two inclined sides of the triangular heads 200, which along the lower side are hinged to ceiling C.

Fig. 9 shows on enlarged scale the connection between a side wall 16 and floor 19, that is what already shown at the right lower part of Fig. 3. This Fig. 9 has the purpose of showing how snap engagement occurs between the metal (aluminum) sections defining the adjoining edges not only of panelings 16 and 19, but also of the other panelings comprising the additional bodies X, Y, Z. As shown in Fig. 9, section 35A has as an extension of the edge of floor 19 a wing or flange 37A, involved by a groove 41A adjacent an attachment location of a side or flange 38A forming an acute angle with wing or flange 37A.

The free end of inclined side or flank 38A has an enlargement 39A defined by an arcuate surface 79 followed by a step S and a longitudinal web or

strip 40A. The section 35D has in continuation of its supporting wall 10
a wing or flange 101, followed under acute angle by an inclined wing or
side 102 terminating with an enlargement 103 provided with arcuate surfa-
ce 79 and giving a step T and a web or strip 103A.

5 In each of the sections there is also provided a projection or wedge-like
web 500, the function of which is to restrict the inclination or deflection
of the inclined sides or flanks 38A and 102 when the two sections engage,
and to retain in loco the resilient gaskets, here denoted at P and O, which
are inserted in the respective sections before the interengagement and
10 which, upon engagement, owing to the intrinsic elasticity thereof fit with
the surfaces with which they are in contact. In the engagement between
the two sections, the arcuate surfaces 79A and 79 interfere with each other
and cause the elastic deflection of the respective wings or glanges 38A,
102 to the level of steps S, when the two inclined wings or flanges 38A,
15 102 snap one behind the other forcibly and steadily connecting the sections
and accordingly the panelings to one another. On the same principle are based
the various sections above described and associated with the various pa-
nelings.

For further stabilization of the structures upon erection, use can be ma-
20 de of fingers 700 (see Fig. 9) turnable by a square wrench, which fin-
gers inserti in openings 701 in sections 35A, B in interengagement. Rota-
tion occurs in a plane perpendicular to that of Fig. 9.

The erection of additional body Z is provided by first rotating said lap
201 in conterclockwise direction and then lap 202 in clockwise direction,
25 engaging the former in the ridge channel 220 of the latter and then ope-
rating the catch 310 for steadily restraining the two laps to each other.
Then, the heads are rotated about the horizontal pivoting axes thereof,
which heads 200 bring the contour sections thereof in engagement with
those along the side edges of the laps. From the foregoing the erection
30 procedure for the side additional bodies X and Y is apparent and, sum-

marizing, consists of first rotating in clockwise direction the ceiling

18 and then in counterclockwise direction the assembly comprising the floor 19 and side or flank 17, the latter being then rotated again in counter-

5 clockwise direction and engaged by its upper section with the extreme section of ceiling 18. As apparent, from the base there will be previously extracted and brought to extreme position the side extensions of the pedestal, on which the floor 19 will bear. Then, the two heads 16 of the additional bodies are rotated about the horizontal axes 60, engaging the sections thereof, extending on three sides, with the corresponding sections

10 of ceiling 18, side or flank 17 and floor 19.

Although not shown, in order to prevent in transportation of compact body R said panelings 16, 17, 18 and 19 contained in said room or openings 15, from moving, it is provided that said longitudinal beams 6B, 7B have upward directed wings or flanges, thus acting as containing sides or flanks for

15 the outermost paneling 18 and hence also for the innermost remaining panelings.

As a limit, as shown in Fig. 10, the base body may be a rectangular frame 900, in the opening 901 of which are arranged the various panelings 902 made, arranged and connected as above described and shown in the preceding

20 figures of the drawings. The only difference is that the base frame 903, comprising on two sides two arms 904 rotatable about vertical axes 905 coincident, for example, with those of the bearing feet 906. The Base frame is completed by a longitudinal member 907 forming part of floor 908 of the additional body shown by thin lines in the associated figure.

CLAIMS

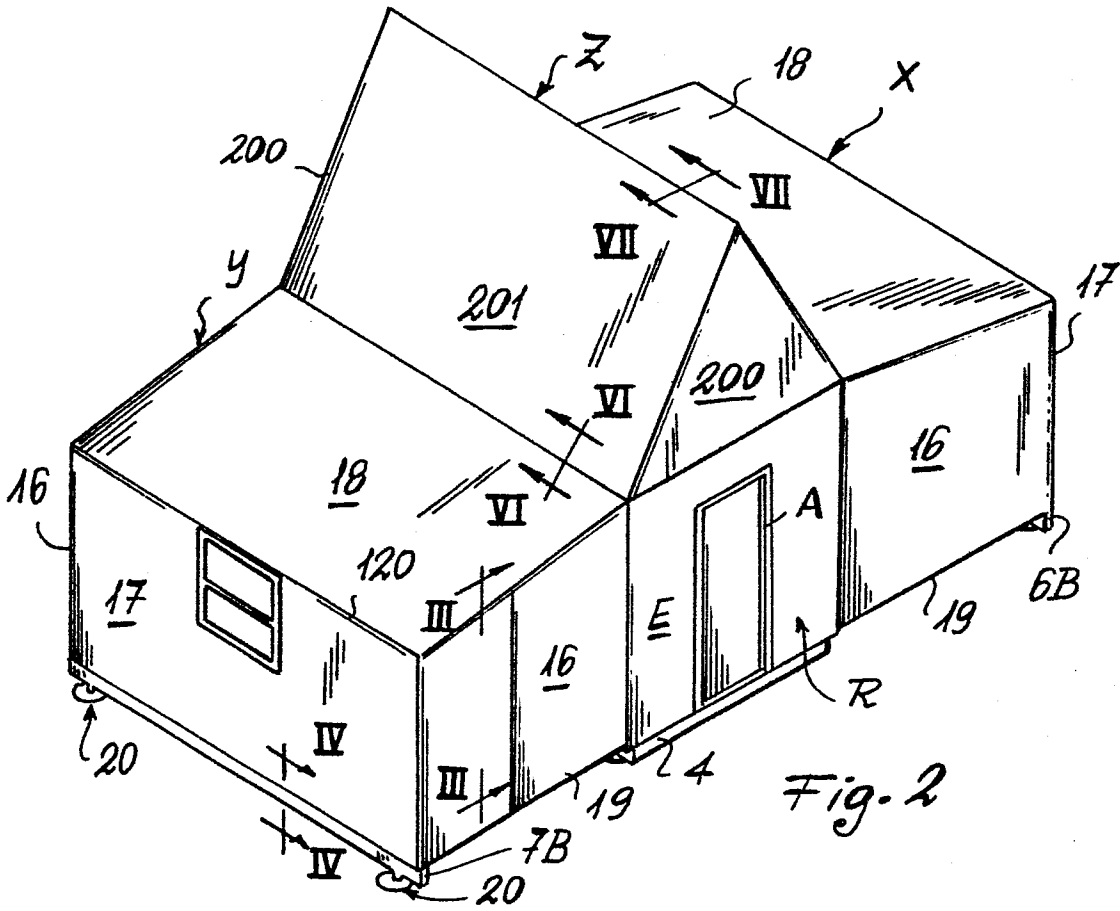
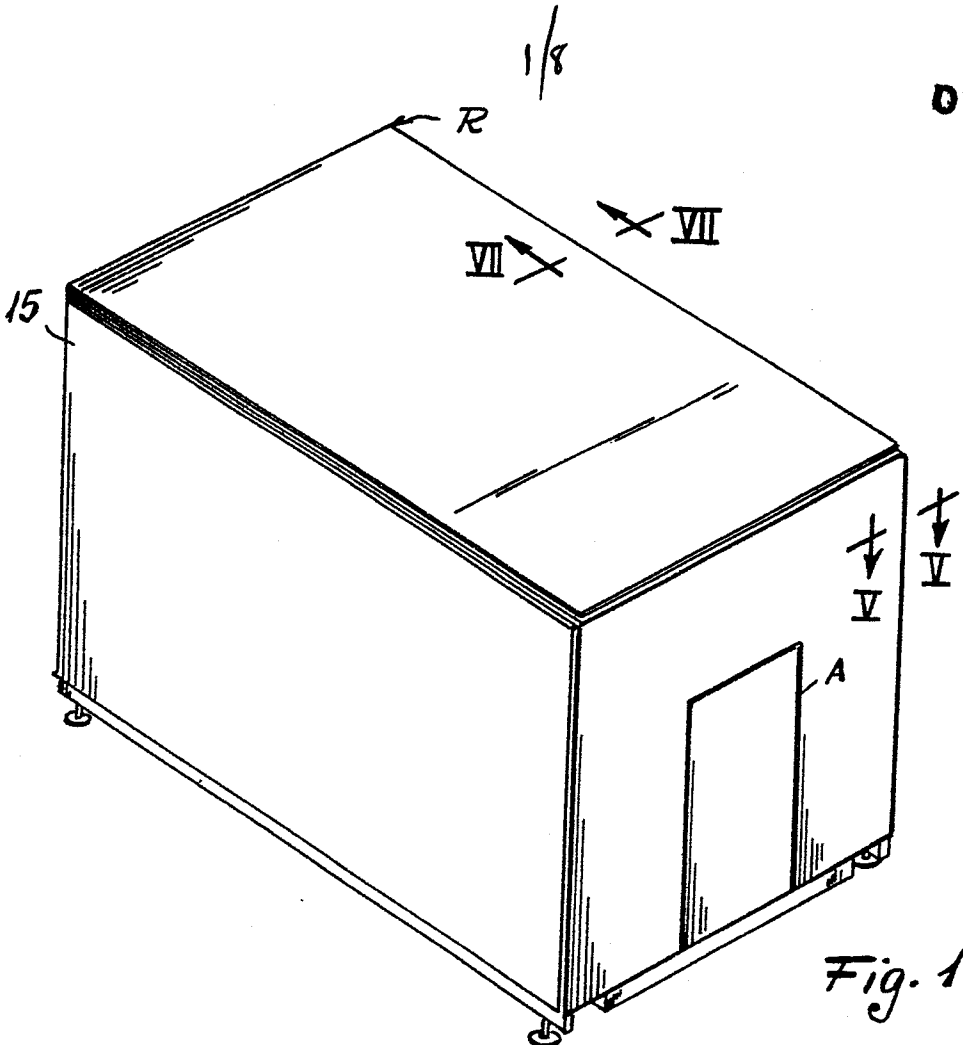
1. A transportable inhabitative unit of alterable capacity, characterized by comprising a base body (R, 900) provided with laterally extensible pedestal, on the extension of which at least one additional body (X, Y) is erected as formed of wall components (16, 17, 18, 19) connected with the
5 base body (R, 900) and interengaging to stabilize said additional body at erected position.
2. An inhabitative unit as claimed in Claim 1, characterized in that said base body (R) comprises a metal framework (1, 2, 3, 4, 5) integral with the extensible pedestal, which comprises at least one telescopically exten-
10 sible part (6A, 6B, 7A, 7B) for the support of the additional body or bo- - dies (X, Y).
3. An inhabitative unit as claimed in any of the preceding claims, characterized in that the wall components (16, 17, 18, 19) of the additional body (X, Y) comprise a floor paneling (19) at the bottom hinged to the
15 base body (R, 900), a side paneling (17) hinged to said floor paneling (19) and a cover paneling (18) at the top hinged to said base body (R, 900), as well as two head panelings (16) in the case horizontally divided into hinged parts, which are hinged about a vertical axis.
4. An inhabitative unit as claimed in any of the preceding claims, charac-
20 terized by providing two side additional bodies (X, Y) preferably symmetrical to each other.
5. An inhabitative unit as claimed in any of the preceding claims, characterized by comprising a top additional body (Z) defined by a pair of interengageable laps (201, 202) rotatable about horizontal axes and two
25 substantially triangular heads (200) rotatable about horizontal axes perpendicular to the former axes.
6. An inhabitative unit as claimed in any of the preceding claims, characterized in that at least one edge of one of said panelings (16, 17, 18, 19, 200 e 201) comprises a section (35A, B,C,D) for engagement with a cor-

responding or conjugated section (35A, B, C, D) provided along the adjoining edge of another paneling.

7. An inhabitative unit as claimed in any of the preceding claims, characterized in that resilient sealings are provided in the sections (35A, B, C, D) intended for snap interengagement.
8. An inhabitative unit as claimed in any of the preceding claims, characterized in that the sections (35A, B, C, D) comprise a channel-like engaging zone defined by a substantially flat wing or flange (37) and a wing or flange (38) forming acute angle with the former and provided with an enlargement (39) with web (40).
9. An inhabitative unit as claimed in any of the preceding claims, characterized in that the base body has at the top a continuous band (30) of resilient material defining a room or opening for receiving the heads (200) of the top additional body (Z) and assuring sealing at the hinging zone of the laps (201) of the heads (200) of the top additional body (Z) to the base body (R).
10. An inhabitative unit as claimed in any of the preceding claims, characterized in that the top additional body (Z) is formed of four panelings, two of which comprise the laps (201) and the other two the heads (200) which are snap coupled with the laps along the mutually adjoining sides by means of sections provided along said sides, while on one free extreme side one of the laps (201) has a top channel-like section (220) for receiving the upper edge of the other lap.
11. An inhabitative unit as claimed in any of the preceding claims, characterized by the provision in one lap (200) of at least one catch (310) for engagement in seat of the other lap to stabilize the connection thereof.
12. An inhabitative unit as claimed in any of the preceding claims, characterized in that at collapsed state the side additional body (X, Y) is contained within a side room or opening (15) of the base body (R).
13. An inhabitative unit as claimed in any of the preceding claims,

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characterized in that the pedestal extensions are provided by arms rotatable about vertical axes, between which a portion of the floor paneling is inserted.



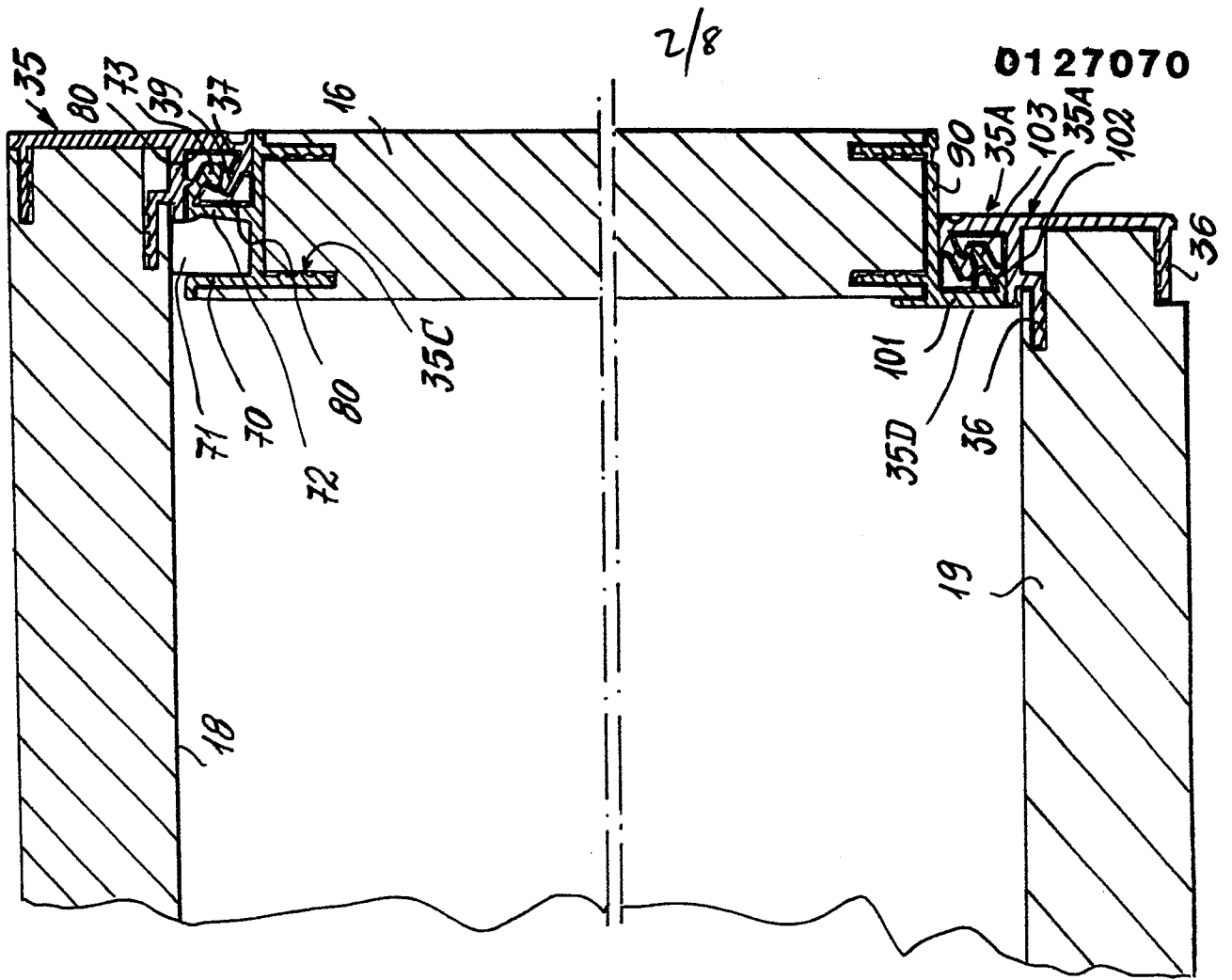


Fig. 3

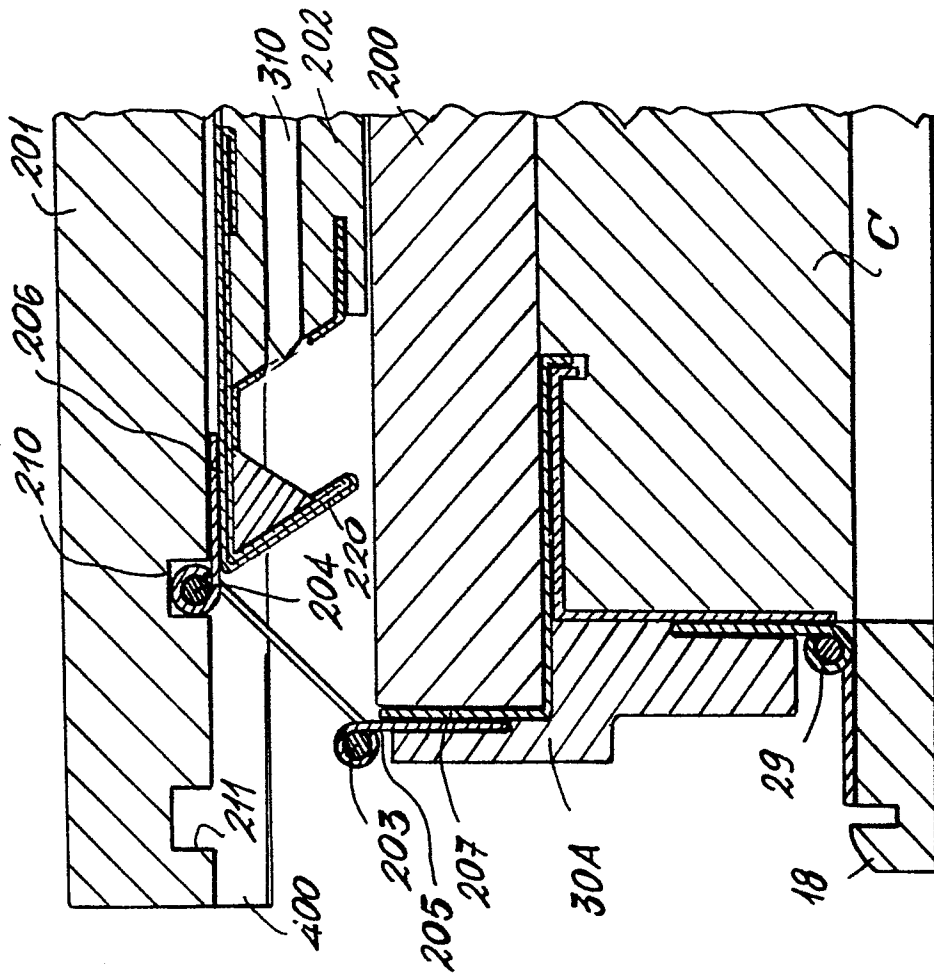


Fig. 6

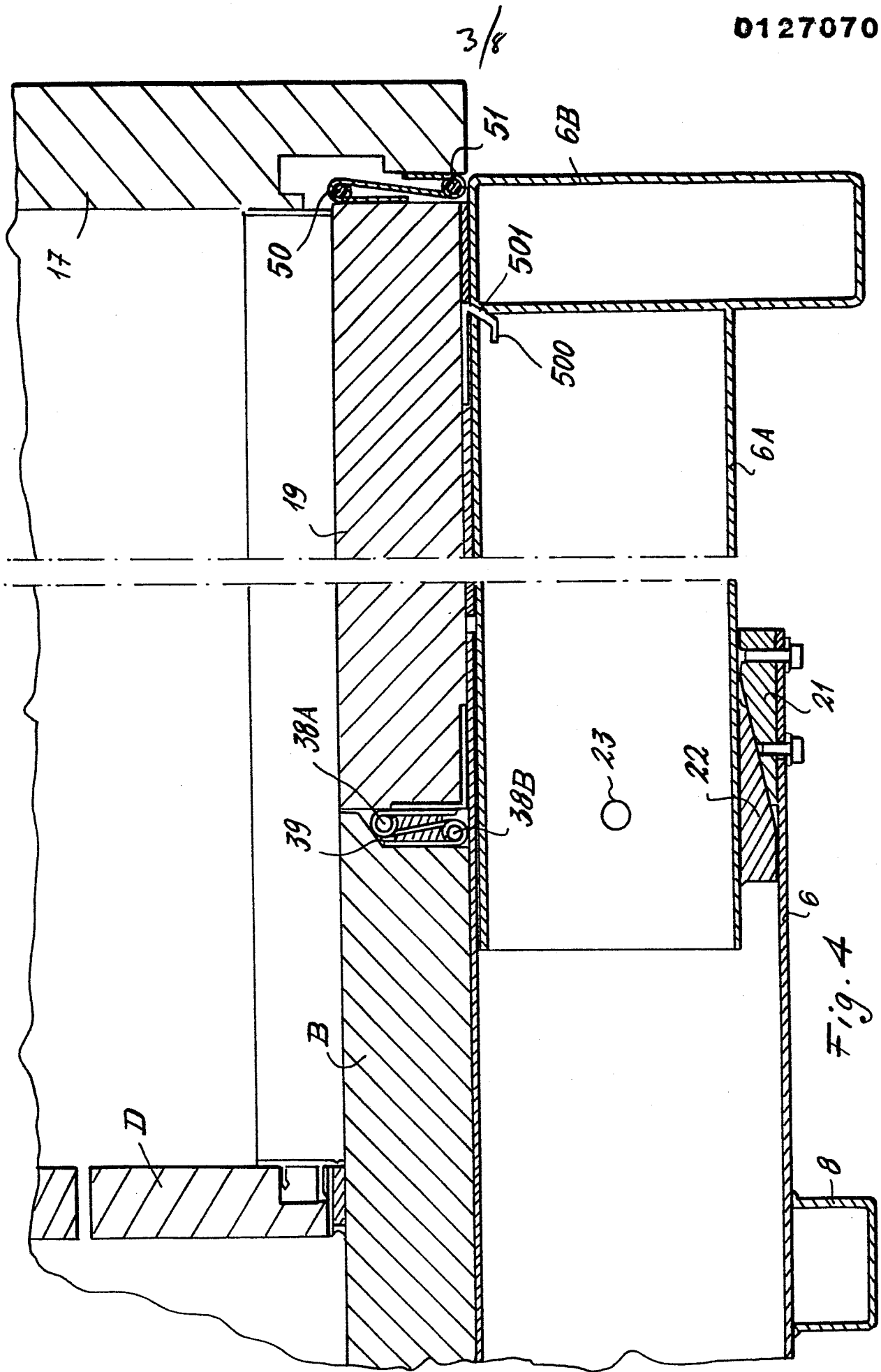
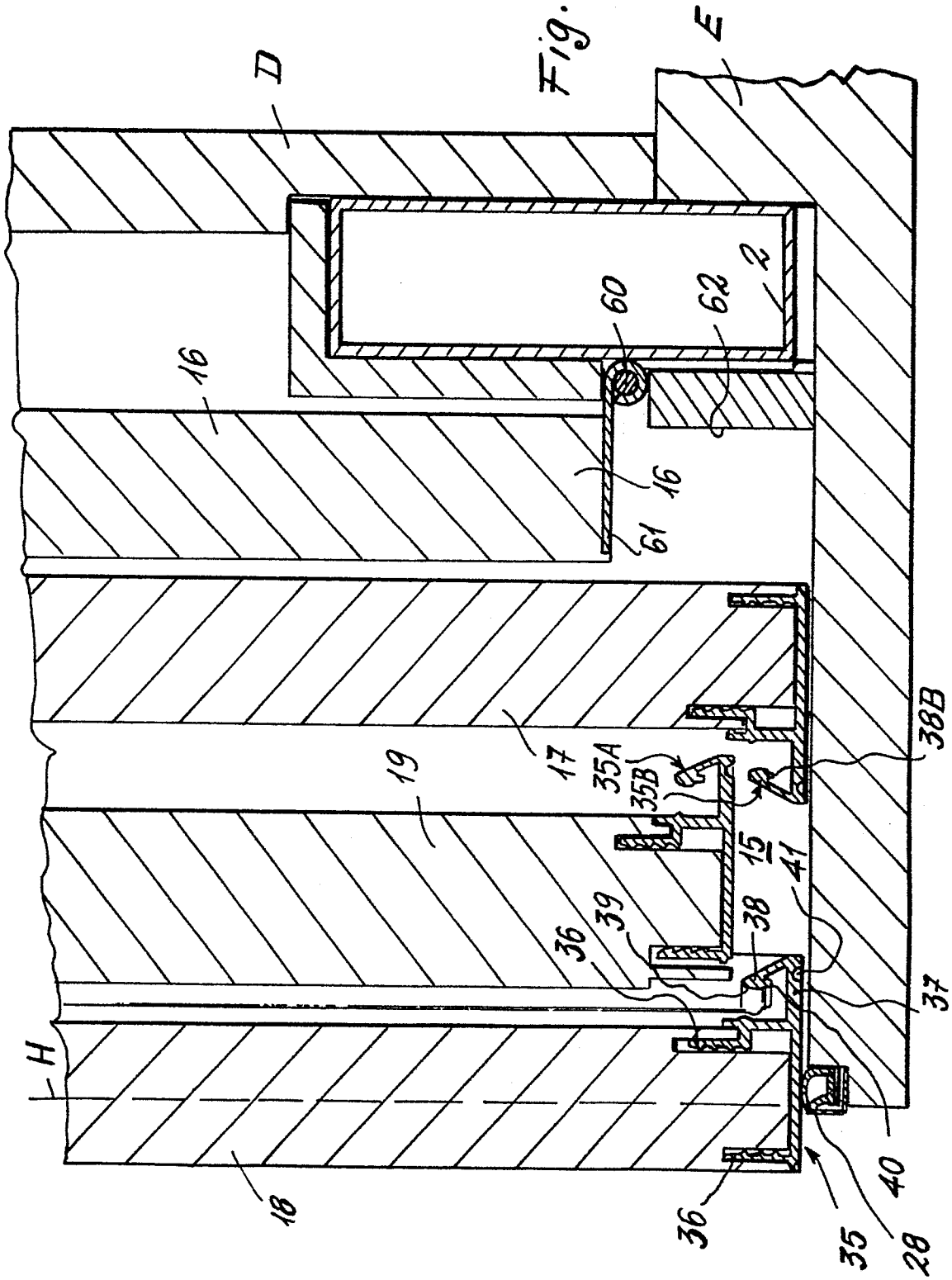


Fig. 5



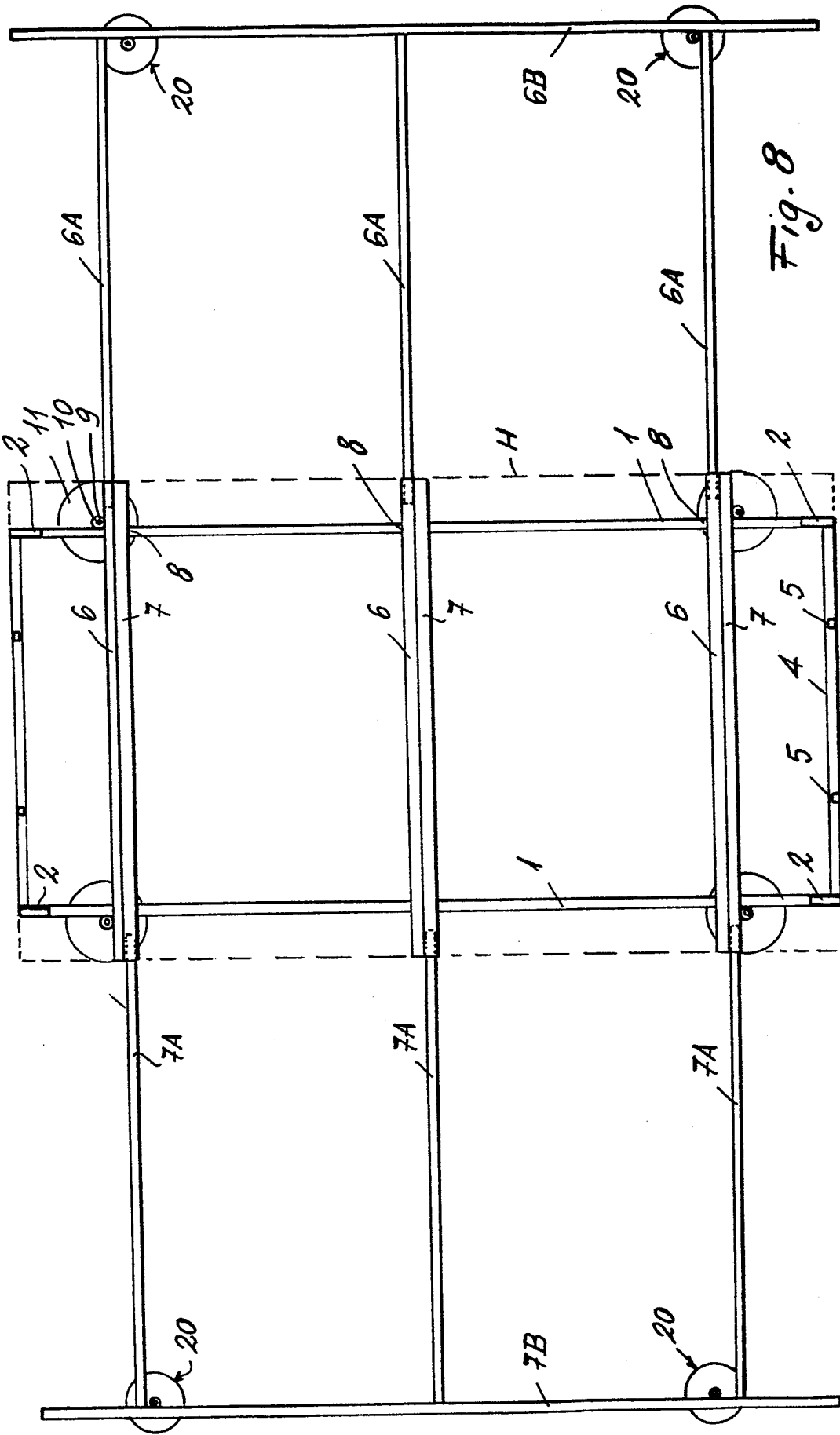


Fig. 8

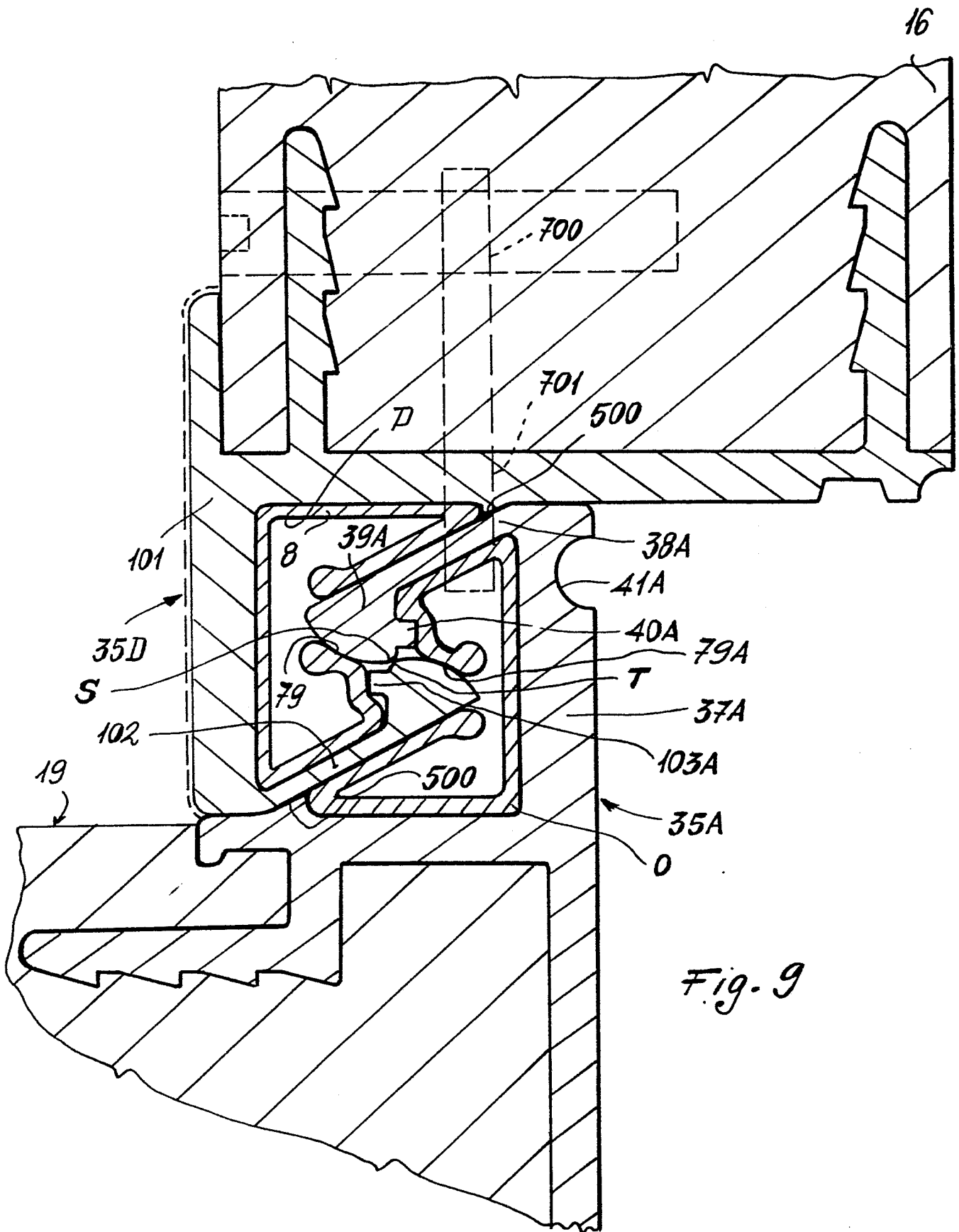


Fig. 9

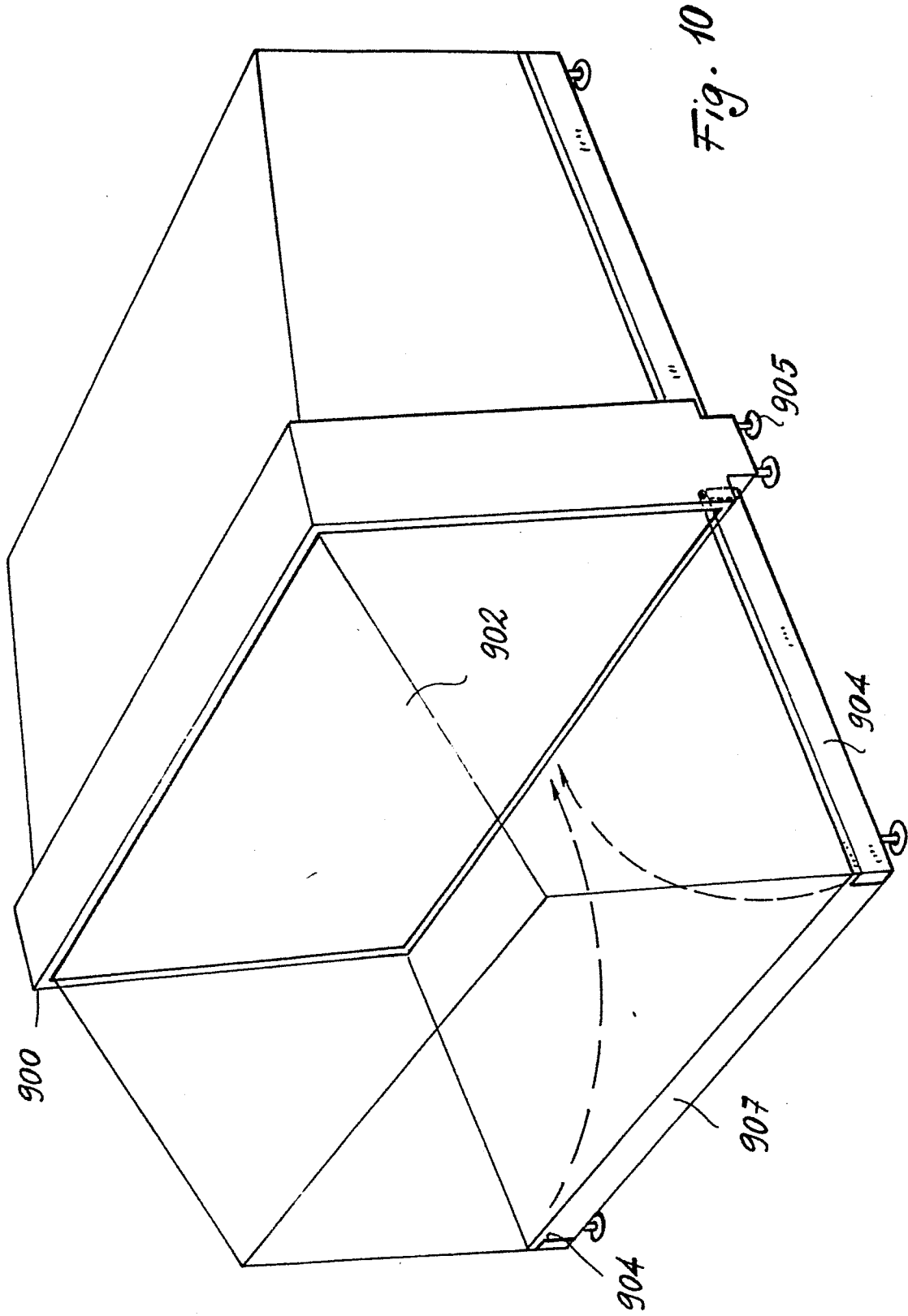


Fig. 10