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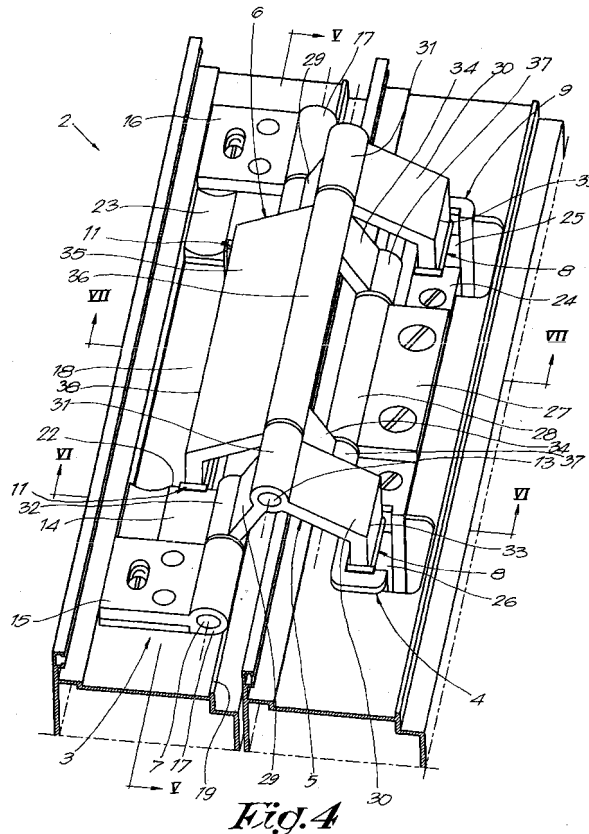
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(54) **Hinge and door or side-hung window in which such a hinge is applied**

(57) Hinge for a door or side-hung window with two blades (3, 4) and two arms (5, 6), whereby the first and second blade (3, 4) are each connected, by means of a hinge pin (7, 10), to one far end of the first and the second arm (5, 6) respectively, which are each provided with a slide (8, 11) on their other far ends, provided such that it

can move in a guide (9, 12) in the second, the first blade (5, 4) respectively; and whereby both the above-mentioned arms (5, 6) are mutually hinge-mounted by a third hinge pin (13), characterised in that the above-mentioned guides (9, 12) extend in a direction which is inclined in relation to the direction perpendicular to the plane of the blade (3, 4) concerned.



Description

[0001] The present invention concerns a hinge for a door or side-hung window, more particularly a hinge of the type which is hidden in the closed position of the door or side-hung window.

[0002] Hinges are already known which mainly consist of two blades and two arms, whereby the first blade is hinge-mounted, by means of a first hinge pen, to one far end of the first arm which is provided with a slide on its other far end, which is provided such that it can move in a guide in the second blade, and whereby the second arm is hinge-mounted with one far end, by means of a second hinge pen, to the second blade, and is provided with a slide on its other far end, which is provided such that it can move in a guide in the first blade, and whereby both aforesaid arms are mutually hinge-mounted between the first and the second hinge pen by means of a third hinge pen.

[0003] The above-mentioned second blade is hereby designed to be attached to a jamb of a door or window leaf, whereas the first blade is designed to be attached to a jamb of the casing of the door or window concerned.

[0004] A disadvantage of such known hidden hinges is that they cannot be applied to doors or side-hung windows which are equipped with a stop lip on the hinge side of the leaf section, as this stop lip, in this case, when the door or window is opened, will strike against the fixed window section concerned, as a result of which the door or window cannot be opened at an angle of 180° and/or as a result of which the door or window can be damaged.

[0005] A possible remedy to this disadvantage consists in making the above-mentioned arms somewhat longer, as a result of which, when the door or window is opened, the stop lip is at once moved further away from the fixed window section.

[0006] This solution is disadvantageous, however, in that also the above-mentioned guides in the blades have to be made longer, such that the recesses which have to be provided in the sections for the guides have to be made deeper, as a result of which either thicker sections have to be used, or the sections are considerably weakened.

[0007] When a relatively narrow leaf section is nevertheless used in that case, the guide will extend through the entire leaf section, as a result of which providing a glass panel or the like is made more difficult or impossible.

[0008] The present invention aims to remedy the above-mentioned and other disadvantages.

[0009] To this end, the invention concerns a hinge which mainly consists of two blades and two arms, whereby the first blade is hinge-mounted, by means of a first hinge pen, to one far end of the first arm which is provided with a slide on its other far end, which can move in a guide in the second blade, and whereby the second arm is hinge-mounted with one far end, by means of a second hinge pen, to the second blade, and is provided with a

slide on its other far end which is provided such that it can move in a guide in the first blade, whereby both above-mentioned arms are mutually hinge-mounted between the first and the second hinge pen by means of a third hinge pen, and whereby the above-mentioned guides extend slantingly in relation to the above-mentioned blades.

[0010] The above-mentioned guides preferably lean over in the sense of rotation of the leaves.

[0011] An advantage of a hinge according to the present invention is that orienting the above-mentioned guides slantingly results in a small additional linear movement of the leaf section in the sense of rotation while the door or window is being opened, as a result of which the stop lip of said leaf section of the window section is removed, such that the door or side-hung window can be opened unhindered.

[0012] The present invention also concerns a door or side-hung window in which the above-described hinge is applied, whereby the above-mentioned guides extend in a direction which is inclined in relation to the plane of the door or the side-hung window.

[0013] In order to better explain the characteristics of the present invention, the following preferred embodiment of a hinge and a door or side-hung window in which such a hinge according to the invention is applied, is given as an example only without being limitative in any way, with reference to the accompanying drawings in which:

figure 1 represents a side-hung window according to the invention;

figure 2 represents a section according to line II-II in figure 1 to a larger scale;

figure 3 represents a section similar to that of figure 2, but in another position of the side-hung window;

figure 4 is a view in perspective according to arrow F4 in figure 3;

figures 5 to 7 represent sections according to lines V-V, VI-VI and VII-VII in figure 4;

figure 8 represents a variant of figure 4;

figure 9 represents a section according to line IX-IX in figure 8.

[0014] Figure 1 represents a side-hung window 1 whereby, in this case, two hinges 2 according to the invention are applied.

[0015] As is represented in figures 2 to 4, such a hinge 2 mainly consists of two blades 3 and 4 and two arms 5 and 6, whereby the first blade 3 is hinge-mounted, in this case by means of two first hinge pens 7, to one far end of the first arm 5 which is provided with a slide 8 on its other far end, which is provided such that it can move in a guide 9 in the second blade 4, and whereby the second arm 6 is hinge-mounted with one far end, by means of a second hinge pen 10, to the second blade 4, and is provided with a slide 11 on its other far end which is provided such that it can move in a guide 12 in the first blade 3, and whereby both aforesaid arms 5 and 6 are mutually

hinge-mounted between the first and the second hinge pen 7 and 10 by means of a third hinge pen 13.

[0016] The first blade 3 hereby consists of a fixing plate 14 onto which is fixed a proper blade 15, 16 of the hinge 2 on both far ends, which proper blades 15 and 16 are provided with a bush 17 in which the aforesaid first hinge pens 7 can be fixed.

[0017] Between both above-mentioned proper blades 15 and 16 is provided a recess 18 in the fixing plate 14 which is defined by the above-mentioned guide 12 on the hinge side 19.

[0018] The first hinge pens 7 are situated at a mutual distance B in each other's extension in this embodiment.

[0019] As is represented in figure 5, this guide 12 consists of a flat plate 20 which is provided with a standing edge 21 on either side, which edges 21 are provided with diagonal edges 22 directed towards each other on their free far ends.

[0020] The above-mentioned flat plate 20 extends in a direction away from the hinge side 19 of the hinge 2 at an angle A, as is represented in figure 2, in relation to a perpendicular through the plane of the above-mentioned first blade 3, which angle is larger than 0° and smaller than 5°. According to the invention, the angle A preferably amounts to some 1.5° in the sense of rotation of the hinge 2.

[0021] Further, the fixing plate 14 preferably comprises a U-shaped groove 23 which runs parallel to the longitudinal axis of the different hinge pens 7, 10 and 13, and which is situated at a distance from the first hinge pen 7, equal to the distance between the first and the third hinge pen 7 and 13.

[0022] The second blade 4 consists of a fixing plate 24 which is provided with a guiding element 25, 26 on both its far ends, built in exactly the same manner as the above-mentioned guide 12, and which together form the guide 9.

[0023] Between both guiding elements 25 and 26 is fixed a proper blade 27 of the hinge 2 on the fixing plate 24 by means of screws or the like, which proper blade 27 is provided with a bush 28 through which the above-mentioned second hinge pen 10 is provided in a rotating manner.

[0024] This hinge pen 10 has a length which is maximally somewhat shorter than the above-mentioned distance B, and in a closed position of the hinge 2 it is situated on one and the same longitudinal axis as and between the above-mentioned first hinge pens 7.

[0025] The above-mentioned first arms 5 of the hinge 2 in this case each consist of two parts 29 and 30 which are mutually fixed by a bush 31 in which the above-mentioned third hinge pen 13 is provided.

[0026] The parts 29 of the above-mentioned arms 5 are each provided with a bush 32 on their free far ends in which one of the hinge pens 7 is each time provided.

[0027] The second parts 30 of both arms 5 are each provided with the above-mentioned slides 8 on their free far ends, which are provided such in the above-men-

tioned guide 9 that they can move, and they have a buckle 33.

[0028] The second arm 6 in this case consists of two parts 34 and 35 which are each fixed to a bush 36 with one far end, which bush is positioned between the above-mentioned bushes 31 and through which the above-mentioned hinge pen 13 is provided.

[0029] In the given embodiment, the first part 34 of this second arm 6 consists of two slats provided at a mutual distance from each other and which each comprise a bush 37 on their free far end.

[0030] These bushes 37 are situated in the extension of the above-mentioned bush 28 on either side, and they are pushed over the above-mentioned second hinge pen 10.

[0031] The second part 35 of the above-mentioned arm 6 is provided with the above-mentioned slide 11 on its free far end, which is provided in the above-mentioned guide 12 such that it can move, and it has a buckle 38 similar to the above-mentioned buckle 33 in the second part 30 of the arm 5.

[0032] The working of the above-described hinge 2 is simple and as follows.

[0033] In the closed position of the hinge 2, as is represented in figure 2, the above-mentioned first and second hinge pens 7 and 10 are situated in each other's extension on the hinge side 19 of this hinge 2, whereby the second parts 30 and 35 of the above-mentioned arms 5 and 6 extend mainly diagonally, at an angle A, to the blades 3 and 4 of the hinge 2, and whereby the slides 8 and 11 are situated at a maximum distance from the respective blades 3 and 4 in the guides 9 and 12 concerned.

[0034] Also in this closed position of the hinge 2, the third hinge pen 13 is situated in the above-mentioned groove 23 in the fixing plate 14.

[0035] When the hinge 2 is opened, the arms 5 and 6 and consequently also the hinge pens 7 and 10, are turned away from each other, whereas the blades 3 and 4 simultaneously rotate in relation to the arms 5 and 6 concerned around the hinge shafts 10, 7 respectively.

[0036] The rotation of the whole is hereby guided in a required path by means of the above-mentioned slides 8 and 11, which are each moved in their guide 9 and 12 concerned, towards the hinge side 19.

[0037] As is represented in figures 4 to 7, the hinge pens 7 and 10 are situated, in an open position of the hinge 2, next to each other, whereas the third hinge pen 13 is situated in a position free of any contact with the blades 3 or 4 of the hinge 2.

[0038] When the hinge 2 is closed again, the slides 8 and 11 are moved in a direction away from the hinge side 19, and the first and second hinge shafts 7, 10 are again situated in each other's extension, whereas the third hinge shaft 13 assumes its position in the groove 23 in the fixing plate 14 again.

[0039] Figures 8 and 9 represent a variant in which the hinge pens 7 are held, on either side of the bush 32 of the arm 5, in a bush 16 of the proper blade 15 of the hinge

2, which makes it possible to make the hinge 2 more solid.

[0040] Naturally, also the second hinge pin 10 can be provided in such a manner.

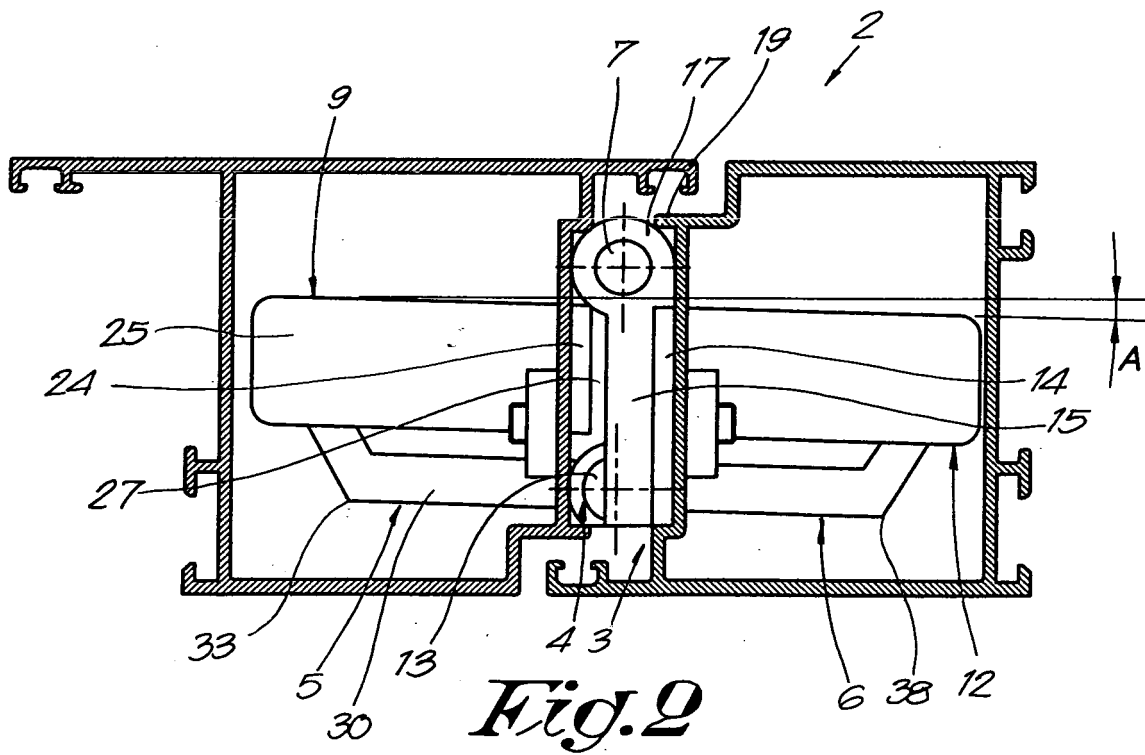
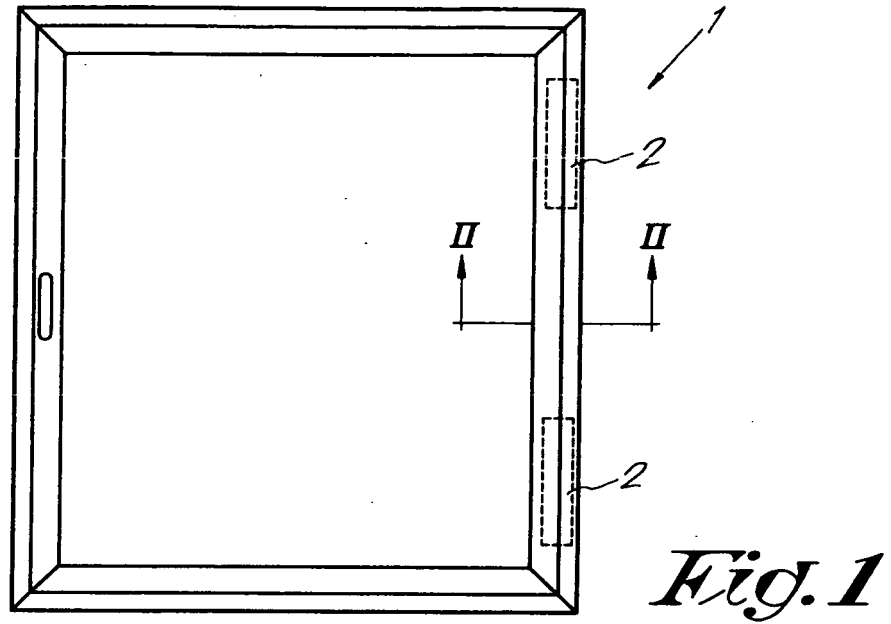
[0041] The present invention is by no means limited to the above-described embodiments, represented in the accompanying figures; on the contrary, such a hinge and/or door or side-hung window in which such a hinge according to the invention is applied can be made in all sorts of variants while still remaining within the scope of the invention.

Claims

1. Hinge for a door or side-hung window, which mainly consists of two blades (3, 4) and two arms (5, 6), whereby the first blade (3) is hinge-mounted, by means of a first hinge pen (7), to one far end of the first arm (5) which is provided with a slide (8) on its other far end which is provided such that it can move in a guide (9) in the second blade (4); whereby the second arm (6) is hinge-mounted with one far end, by means of a second hinge pen (10), to the second blade (4), and is provided with a slide (11) on its other far end which is provided such that it can move in a guide (12) in the first blade (3); and whereby both aforesaid arms (5, 6) are mutually hinge-mounted between the first and the second hinge pen (7, 10) by means of a third, hinge pen (13), **characterised in that** the above-mentioned guides (9, 12) extend in a direction which is inclined in relation to the direction perpendicular to the plane of the blade (3, 4) concerned.
2. Hinge according to claim 1, **characterised in that** the angle A between the sliding direction of the guides (9, 12) and the direction perpendicular to the plane of the blade concerned (3, 4) is smaller than 5°.
3. Hinge according to claim 2, **characterised in that** the above-mentioned angle A amounts to some 1.5°.
4. Hinge according to claim 1, **characterised in that** the above-mentioned guides (9, 12) lean over in the direction of the sense of rotation of the hinge (2).
5. Hinge according to claim 1, **characterised in that** in a closed position of the hinge (2), the second hinge pen (10) is situated in the extension of the second hinge pen (7).
6. Hinge according to claim 5, **characterised in that** it comprises two coaxial first hinge pens (7) which are situated at a mutual distance B.
7. Hinge according to claim 6, **characterised in that**, in a closed position of the hinge (2), the second hinge pen (10) is situated between the above-mentioned

first hinge pens (7).

8. Door or side-hung window in which a hinge according to any one of the preceding claims is applied, which hinge (2) mainly consists of two blades (3, 4) and two arms (5, 6), whereby the first blade (3) is hinge-mounted, by means of a first hinge pen (7), to one far end of the first arm (6) which is provided with a slide (8) on its other far end, which is provided such that it can move in a guide (9) in the second blade (4); whereby the second arm (6) is hinge-mounted with one far end, by means of a second hinge pen (10) to the second blade (4), and is provided with a slide (11) on its other far end which is provided such that it can move in a guide (12) in the first blade (3); and whereby both the above-mentioned arms (5, 6) between the first and the second hinge pen (7, 10) are mutually hinge-mounted by means of a third hinge pen (13), **characterised in that** the above-mentioned guides (7, 12) extend in a direction which is inclined in relation to the plane of the door or side-hung window (1).



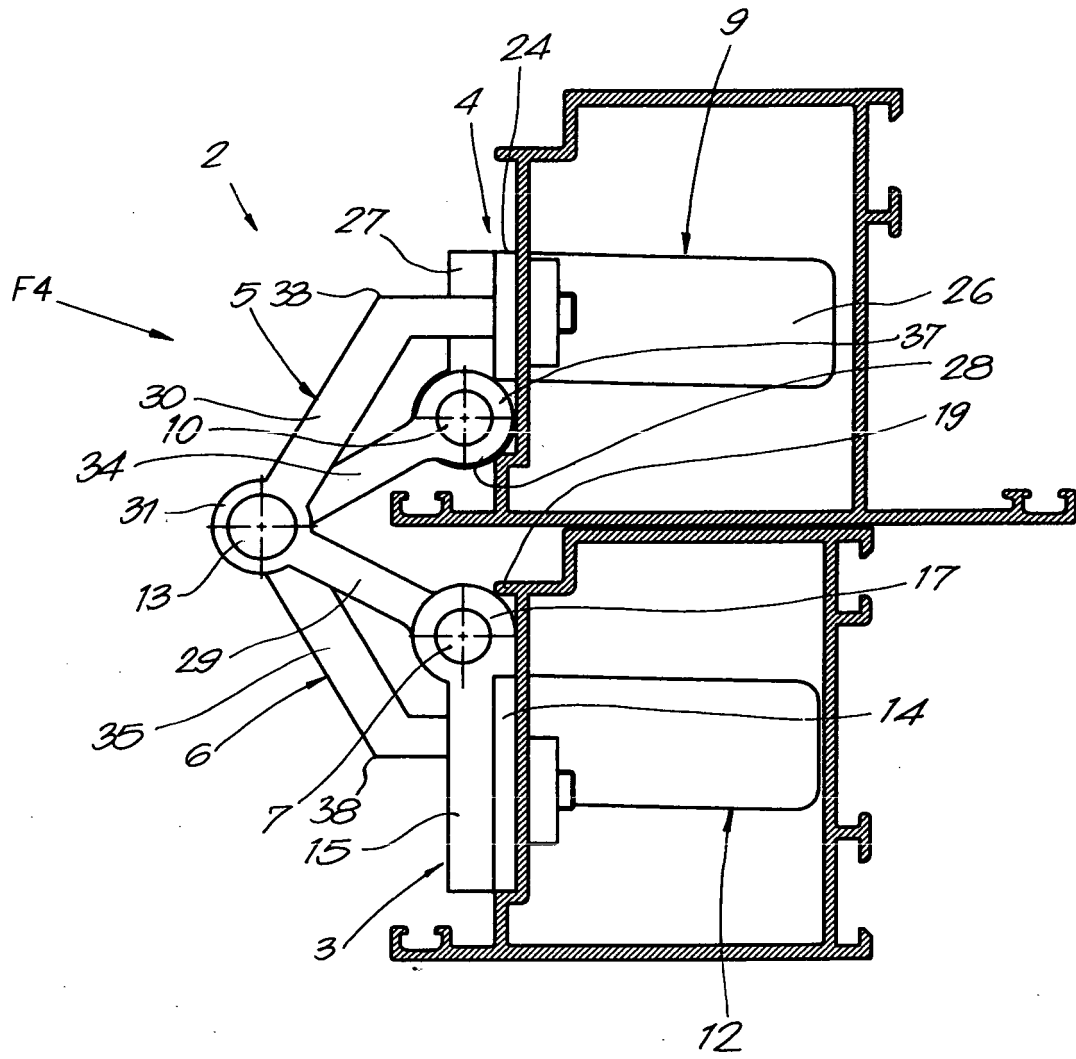


Fig. 3

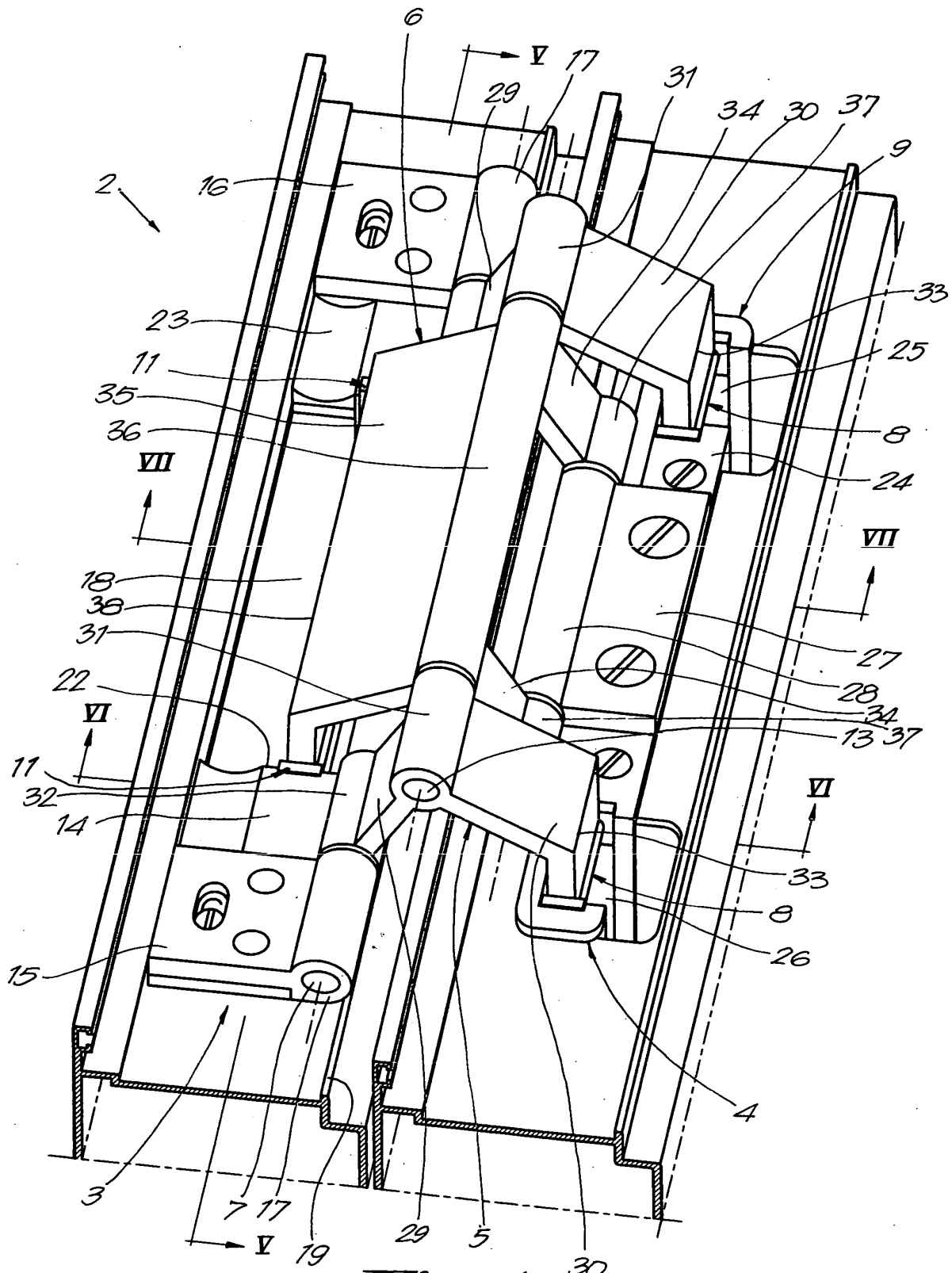
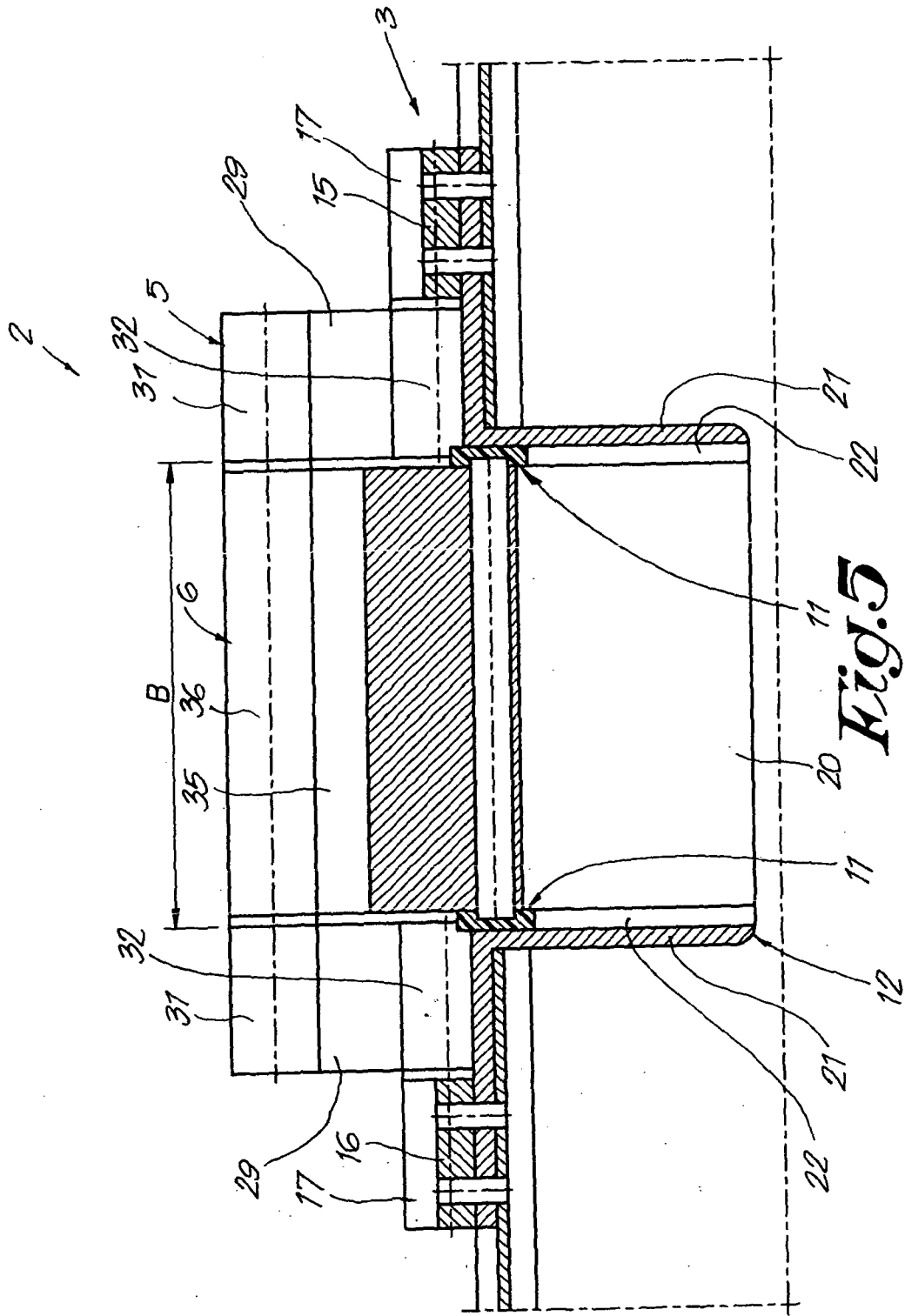


Fig. 4



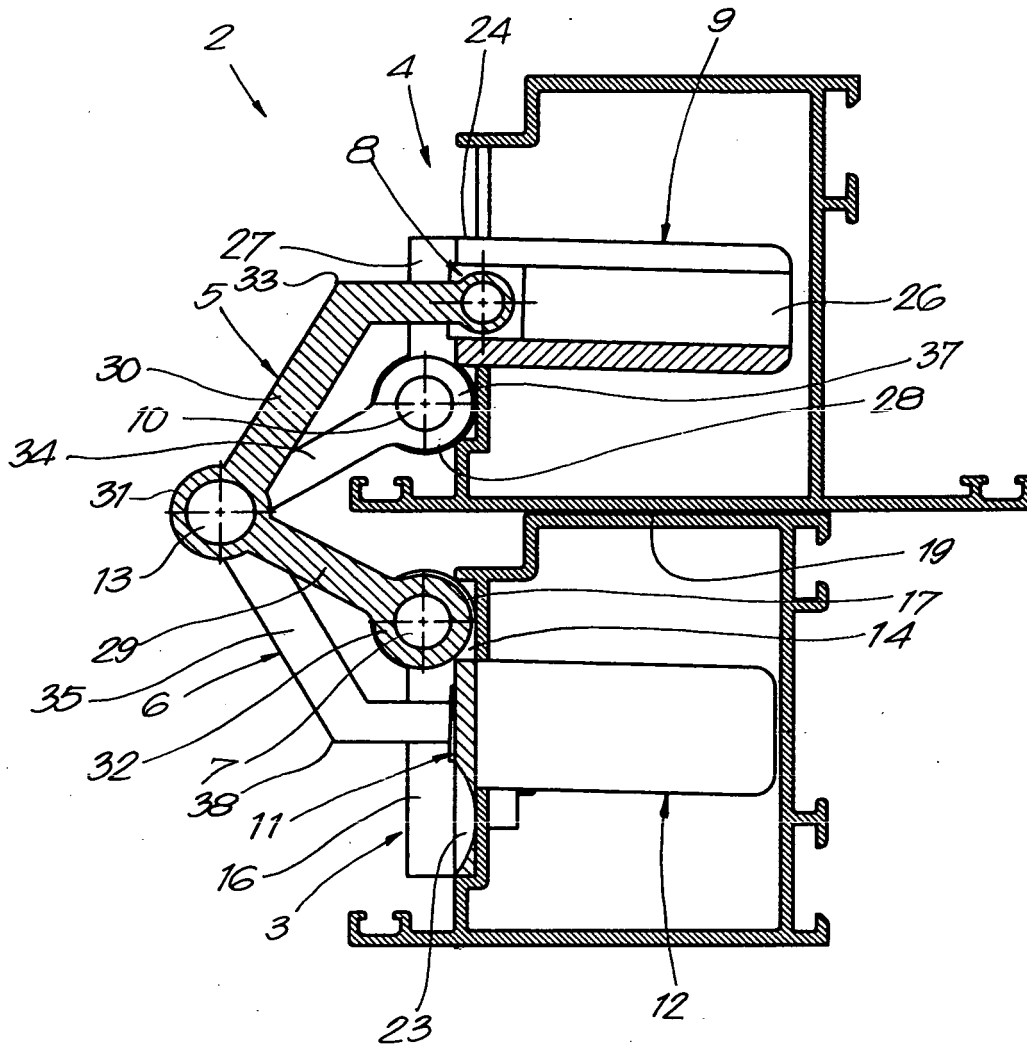


Fig. 6

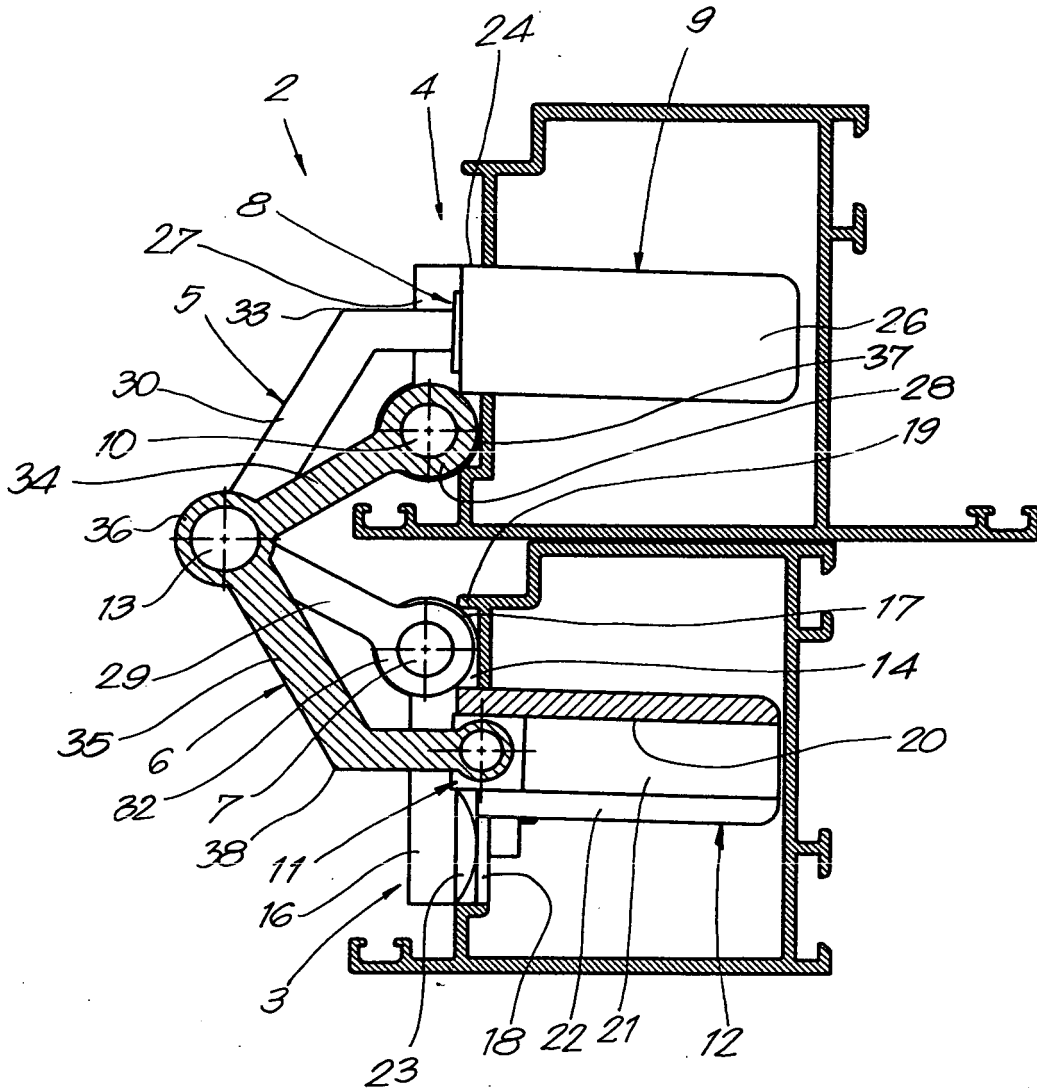
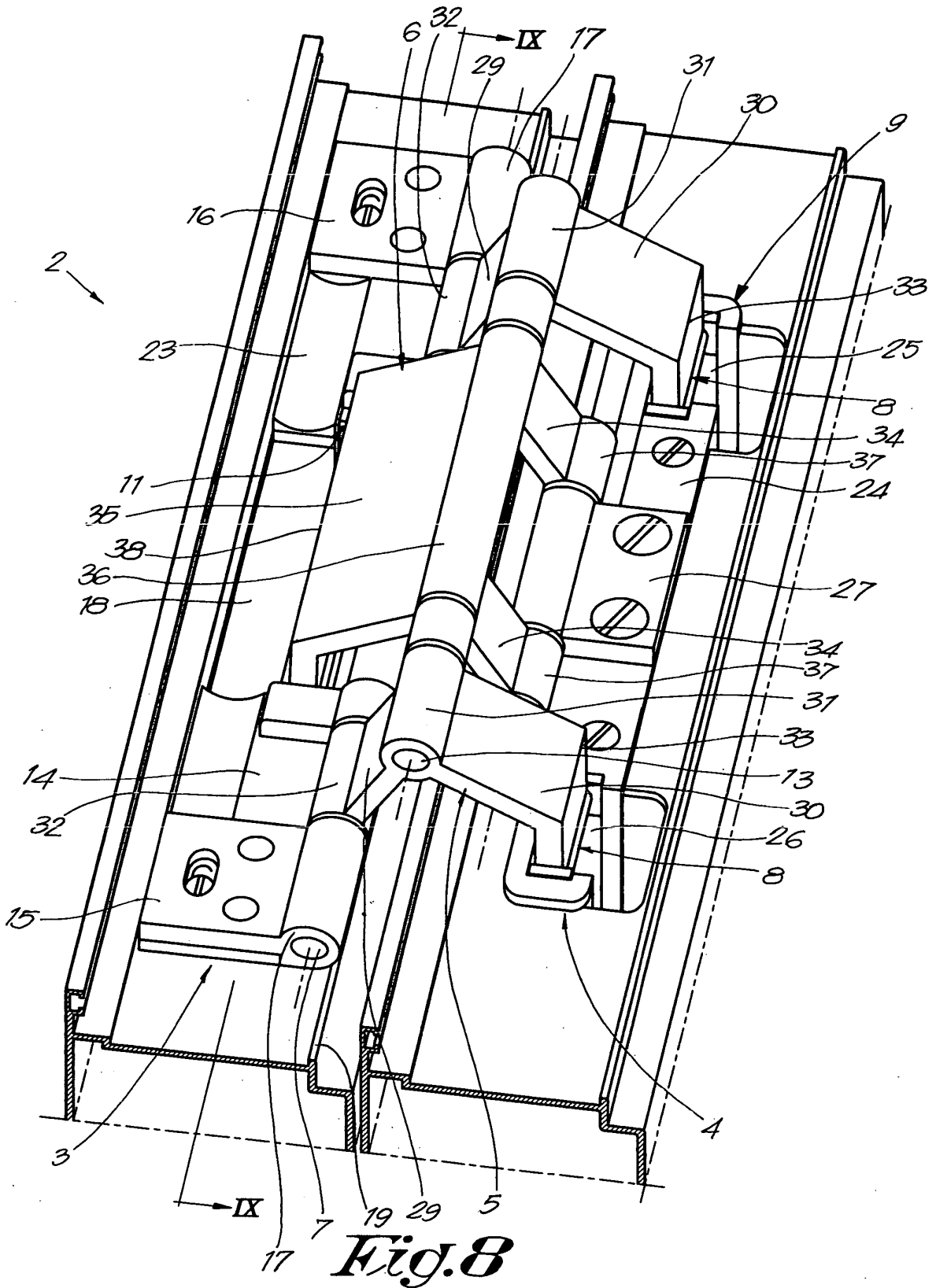


Fig. 7



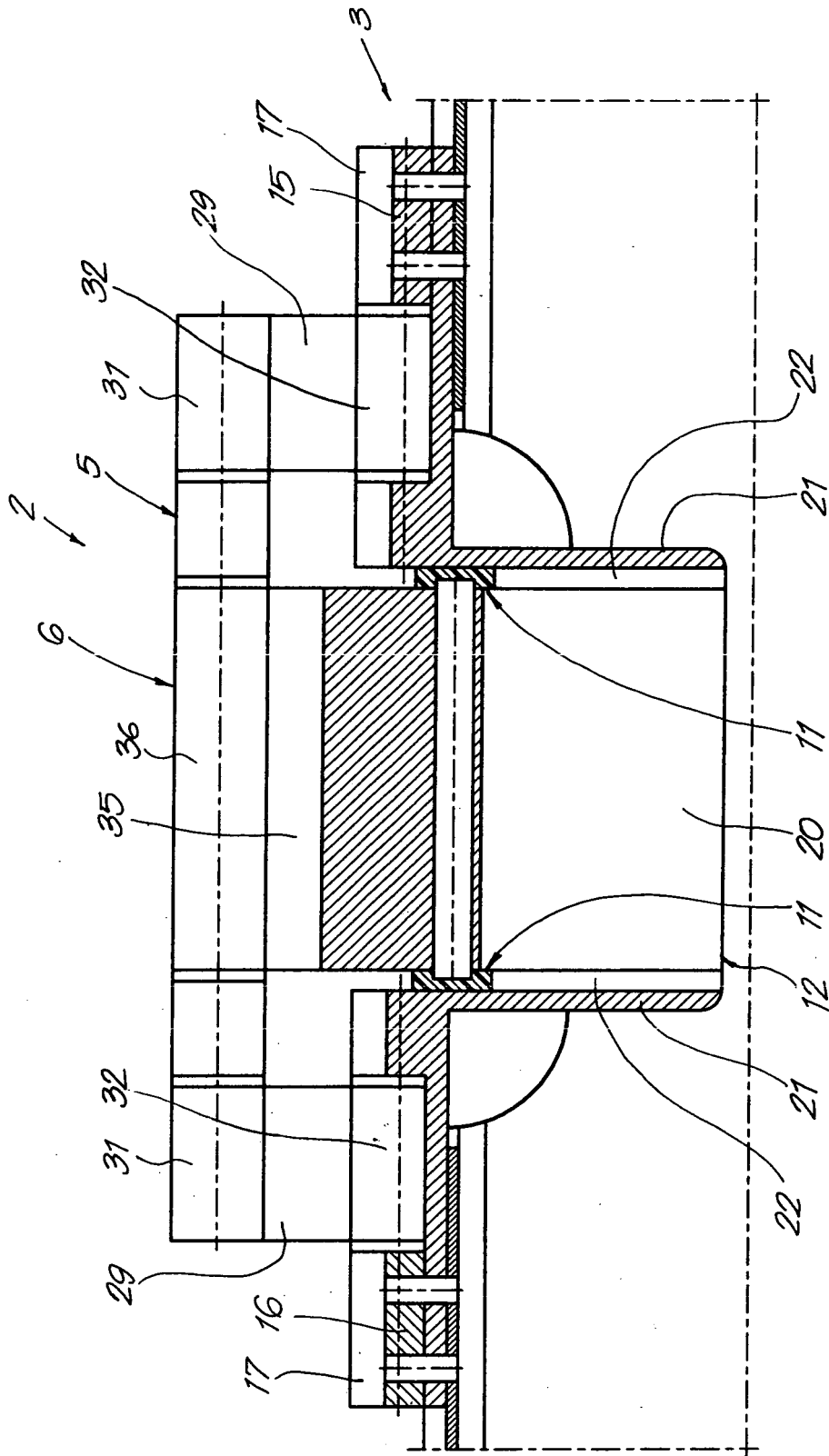


Fig. 9