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(54) Sliding window.

(57) SLIDING WINDOW comprises of upper fixed wing (3), and lower movable casement (2). By means of the handle (4) and angle bars (31) and (35) which are installed on the support plates (28), the wing (2) is releaved to be moved vertically to be parallally moved for 8 mm, inwardly, or to be open to a "VENT" position.

The wing (2) may be lifted by means of tension spring (20), a pulley block (25) and the weight (23), which moves in the hollow frame 1.

By means of a gasket (12) and the groove (9) on the frame 1, the window may be sealed. There are hollows (15,16) arranged along the opposite sides of the gasket body. On a sferical angled part of the gasket there are elastic angled parts (13), which rest on a sferical groove (8) surface in wing 2.

There is a rubber gasket (11) fitted in a groove (2b) in wing 2. The gasket engages a projecting part of a bent metal sheet (10), which is fixed to a inclined frame surface (1). Instead of using gasket (12), squared gasket (17) with the elastic angled attachements (18) which is fixed onto an inclined outlet (1b), beneath a groove 2c, on wing 2, can be used.

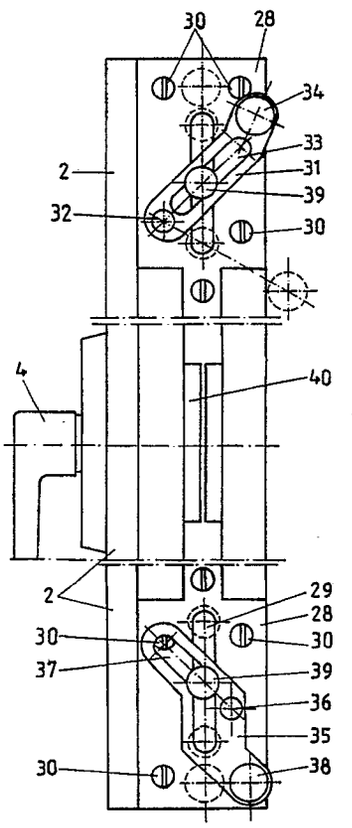

Fig. 25

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SLIDING WINDOW

This particular invention contained in this patent application, belongs to the construction industry.

It may be manufactured of wood, plastics, or metal, in the factories in which ordinary windows are made without new investments in the equipment.

- The essence of this invention is as follows: window casement moves vertically in order to open and close the window, and does not come inside the room, i.e. the room space is not being reduced. Since the casement may be axially moved in relation to the window frame, fresh air penetration may be regulated by the handle position. When the handle is in position I, the window is completely closed and the outside air can not penetrate into the room. When the handle is moved for 45° forwards to the position II, the casement is axially opened 8 mm in relation to the frame.

There is a special gasket, which enables the air to penetrate into the room, while the water drips down through the tube gasket and goes out. When the handle is in the position II, the casement moves up and down and remains in each position.

If you have to wash the bottom casement, the handle is moved into the position III, and the casement around the horizontal axis is opene to vent position, and therefore you may wash the window from the inside.

The advantages of the sliding window are as follows.

a) TOTAL SEALING

b) Possible ventilation regulation

c) Easy lift of the casement/although it has thermo - insulating window - pane installed/.

d) possibility to wash the window from the inside.

e) On opening the window, the casement does not get into the room;

- it has a simple desing,
- angle bars, window-panes and lumber are unified,

Production technology is easy one.

The above mentioned characteristics make the sliding window, advanced generation product.

Currently, there are three different types of windows used:

- Construction "NARROW BOX"
- Construction " CESEMENT TO CASEMENT"
- Construction "SINGLE WINDOW"

Main common characteristics of the A/M windows are:

- The casement is being open along the vertical axis as well as along the horizontal axis if the window is open to the "VENT" position.
- When the window is open, the casement "COMES" inside the room, and therefore the room space is being reduced.
- The casement position can not be fixed and, therefore the air current may change the casement position (which means that the window may be suddenly closed and cause the window breakage).
- In case when there is no one in the room for a longer period of time, the windows have to be closed.
- In closed position on the A/M windows, there is a gap between the casement and window-pane through which the fresh air flows from the outside.

Depending on the air-flow rate within certain time unit along the 1 m of gap, these windows can be divided into 4 groups: A,B,C,D. According to the obtained values, the capacity of heating bodies depend.

Depending on wood quality, gaskets or angle-bars design , air volume is being changed by the outside climate influences, such as: building location, blust exposure, height of building, All these circumstances determine room heating.

- For each window dimension, there must be suitable angle-bar installed,
- Lumbar, as the main raw material, have to be of a certain quality, because the large dimensions of the window may cause the frame deterioration.
- Since there are different window dimensions, with different casement profiles, which determinate Window-pane dimensions, thermo-insulating part can not be produced in advance, since there is no standard dimension.
- Slide Window covered by this invention, is shown on the attached sketches which include 27 different pictures.

Picture 1 -
Shows axonometric perspective of sliding window which is opened to position "VENT".

Picture 2 -
Shows the inside (room) outlook of the window.

Picture 3 -
Shows the axonometric perspective of the SLIDING WINDOW, outside outlook,

Picture 4 -
Shows section "A", of the bottom part of the casement in a close position.

Picture 5 -
Shows section "A" of the bottom part of the casement in a semi open position.

Picture 6 -
Shows section "A" of the bottom part of the casement in an open position.

Picture 7 -
Shows section "B" of the bottom part of the casement in closed position.
Picture 8 -
Shows section "B" of the bottom part of the casement in a semi-open position.
Picture 9 -
Shows section "B" of the bottom part of the casement in open position.
Picture 10 -
Shows section "B" of the bottom part of the casement in closed position, as an alternative.
Picture 11 -
Shows section "B" of the bottom part of the casement in semi-open position as an allternative.
Picture 12 -
Shows section "B" of· the bottom part of the casement in open position.
Picture 13 -
Shows section "C" of the bottom part of the casement in closed position.
Picture 14 -
Shows section "C" of the bottom part of the casement in semi-open position.
Picture 15 -
Shows section "C" of thebottom part of the casement in open position.
Picture 16 -
Shows section "D" in the upper part of the frame, with the bottom casement lifted.
Pictures 17, 17A, 17B, 17C, 17D
show the outlook and specific semi-spheric rubber gasket.
Pictures 18, 18A, 18B,
shows the outlook of rubber gasket, which is used in An alternative way.
Picture 19 -
Shows the tension spring appearance
Picture 20 -
Shows joint of weight with the window via pulley block and tension spring.
Picture 21 and 21A
Shows front and side outlook of the casement upper angle-bar.
Picture 22 and 22 A
Shows front and side outlook of the casement lower angle-bar.
Picture 23 -
Shows front outlook of the upper angle-bar as an alternative performance.
Picture 24 -
Shows front oulook of the lower angle bar as an alternative performance.
Picture 25 -
Shows the assembly of metal angle-bar on the lower casement.
Picture 26 -
Shows the asembly of the metal angle bar as an alternative performance.
Picture 27 -
Shows the side section of lower casement outlook from the metal angle bar side.

The main part of SLIDING WINDOW design is frame 1, with two casement installed:
upper casement 3, as a fixed part, and lower casement 2, which can be freely moved in 3 different directions depending on 4 different positions which open/close/ the window.

Frame 1 - is installed together with casements 2 and 3 in a determined place on the wall 44. Besides, frame 1 has hollows in a vertical line. Weights 23, are installed into the A/M hollows, which help the window to be lifted along the vertical plane and to eliminate the casement weight from both sides of the windows (Casements are hung by the springs (20) on spheric elements 38, on metal angle bar (35) of the lower casement 2; After the weight 23 is installed, hollow space is closed with an adequate cover (6) which stops the weight 23 to fall off; Therefore, cover 6 is used as a guide of the weight 23, on it s way up and down.

There are edge lettices /2A/ on the bottom casement which fasten thermo-insulating pane on the windows. Upper casement has got 3 edge lettices /3A/ to fasten thermo-insulating pane 7A, too.

There is an arc groove/8/on the bottom casement (2) into which the soft rubber seal part /12/ rests on closing the window.

Along the bottom casement sides 2, there is a countersunk notch in which metal angle-bars are fasten, such as: sliding rail (43), with gear transmission (41) counter sunk into the groove (40) which is placed on the casement (2) ;
Then upper angle-bar (31), which is set up on the supporting plate 28, and lower angle bar (35) which is set up on the supporting plate 28 too.

There is a longitudal flute (1A) installed into the sliding window frame 1, through which a spheric element (38) on lower angle bar, moves up and down, the A/M element is linked to the weight (23) via tension spring (20) and pulley block.

Cranked handle 4 has got:
Different directions of motion, while the bottom casement 2 has 4 available motions depending on cranked handle movement. When the chranked handle 4 is moved for 45° from the closed position to upper position - bottom casement 2 moves axially away from the frame 1 for 6 mm. Releaving circled notch on semi-spherical gasket 12, is air penetration enabled water, because of sudden pressure drop, drips down the tube 14 on the gasket 12 and flows out via sheet metal (10).

The A/M function is very important for the room ventilation in case when one is away from

home for longer period of time (eg.for holidays).
The window which is left in the A/M position can not be opened from the outside, since there is gasket 12 which is clamped into the groove 9 on the frame 1.

If you move cranked handle 4 from its initial closed position, for 90° upwards, bottom casement 2 moves away from the frame 1 for 12 mm, detaching off gasket 12. This stops the casement to slide off, upwards, to open the windows. It is easy to lift up the casement, i.e. it is not "heavy" since it could be balanced by the weight 23 and therefore it remains in any open-closed position.

If you move cranked handle 4 from its initial - closed position for 180°, upwards, bottom casement 2 is capable to open to "VENT" position.
Edge-support 5 unables casement to slip out.
This means that it is possible to wash the window pane 7 from the outside, which was not the case with ordinary windows, and therefore they had not been used in building construction before.

Before we go over with further explanation of metal angle-bar functions, we shall give some comments on section "B" , of the bottom casement shown on pictures 7,8,9,10,11 and 12, which can be constructed in two possible ways. With the first construction form (pictures 7,8,9) the bottom casement 2 comprises of arc groove 8, gasket 12 and squared groove 2 B with the gasket 11 inside, which leans on sheet metal 10.
Gasket 11 stops moisture and water to overrun sheet metal 10, either from the atmosphere or gasket tube 14. With the second construction form of the bottom casement there is no arc groove 8, squared groove 2B gasket 11 and 12 not sheet metal 10.
Instead of the A/M parts, there is a prismatic groove 2C, while there is an outlet 1B on the frame 1.
You may regulate sealing or room ventialtion by pressing or releasing elastic arc installment 17 of rubber gasket 17. This has already been explained before.

Metal angle-bars for the casement 2 comprise of adjusting rail (43), with circled gear-transmission (41), which have one squared slot (42) to make cranked handle (4) installed. Besides, there is left and right upper (31) and down (35) angle bar. All these elements are installed into the casement itself.
Both angle-bars (32) and (35) are mounted on the same supporting plates (28), which have slots (29) along the vertical axis on plate center.

Upper angle-bar (31) is linked to the support plate (28) via adjustable arbor (32); It comprises of a slot (33), and a cylindric element (34) on free top. Also, lower angle-bar (35) is linked to the support plate (28) via adjustable arbor (36); it has got an angle slot (37), as well as cylindric element (38) with a counterbore for the tension spring (20).

It should be mentioned that upper angle-bar (31) and lower angle-bar may have another constructive form, which differs only in a way of shortening slots (33) and (37) to half of lenght; This can be noticed on posistions (33) A and (37) A on pictures (23) and (24).

If you move cranked angles 4, gear transmission (41) is rotating, moving the adjustable rail (43) away; adjustable rail has metal rollers (39) on its ends, which slide form their initial close position to the final open position, through the slots (29), on the support plates (28); which are screwed to the casement (2) sides. Metal rollers (39) slide through the slots (33) and (37) on the upper angle-bar (31), and angle-bar (35), which limit their motion.
Cylindric elements (34) and (38) on the upper and lower angle bars slide through the groove 1A on the window frame 1.

The weight (23) is clasped by the other end of tension spring to the cylindric element (38) of the lower angle-bar (35), via hook (24) and tension spring (20), which comprises of a loop (21), clamps (22) and pulley block (25). Pulley block (25) is installed into the carrier (27) via pulley axle, which is screwed to the upper frame side (1). Such frame consists of two weights (23), used for the left and right side to neutralize weight of casement (2).

If you move cranked handle (4) to the mid-position (90°) in regards to the initial closed position, cylindric elements (34) and (38) inside the goove 1A on the frame 1, move the casement (2) away from the frame for 15 mm enabling the casement to slide upwards, i.e. it is possible to open the window.

If you move cranked handle 4 into its final open position which is 180° displaced in regards to its initial closed position, upper angle-bar (31) with cylindric element (34), come to the position on the frame 1, in which there is a slot made to enable cylindric element (34) to come out of the groove 1A. Lower angle-bar (35), remains in the same position, i.e. cylindric element (38) remains in groove 1A, and enable casement (2) to be open to "VENT" position. In such position, the ouside window pane 7 may be washed from the room inside.

Metal angle-bar is very simple construction and of one unique dimension for each type of the window.
The window can be produced in all modules according to the construction standard.

Semi-spherical gasket 12 is manufactured of dense rubber, while the tube 14 is used for water and moisture to be drained. Gasket 12 have an elastic joint 13, made of soft, sponge rubber used as a cover for circled orifice (15) and (16).

Orifices (15) and (16) are not symetrically ar-

ranged flace to face ;
Orifices (15) are arranged away from the gasket arc extention, while the orifeces (16) are arranged closer to the are extention top. Such arrangement enables room ventilation, water and condensated moisture draining, between the casement (2) and window frame (1), if the window is in a semi-open possition.

If the bottom casement (2) is performed in a different way, squared gasket (17) is used. On the upper side of the gasket (17), there are three are extentions (18), with the gaps (19) between them.
When you close the window, the extention 18, are leaning on the gaps (19). horizontally, forming a flat sealing surface.

Window-panes (7) and (7A), have the unique dimensions, and therefore it is possible to manufacture the same, in advance for the storages and for the market too.
Lumber, as the main component, have only one standard thickness (60 mm), which makes transport, storing, drying, and treatment in a technological procedure easier.

Claims

1. SLIDING WINDOW for the buildings of different sizes has the following disinguishing features:
   It has got a frame with a fixed casement (B) and a movable casement (2), having thermo-insulating window-panes (7) installed into the casement 2 and 3.
   Cranked-hanles (4) provided to open or close the window, are connected to the gear-transmission (41) which are than linked with upper and down movable rail (43). At each end of the rails (43) there are metal rollers (39) connected to the support plates (28) to open casement (2).
   There are end supports (5), right beneath the handles (4) on the bottom casement sides which are fixed to the frame (1).
   Further on the frame groove (9) is provided with a gasket (12), on which the casement sides leans if the window is in the closed position.

   Thereupon there are side frame hollows (1) covered by flaps (6) with tension springs proveded, which go over pulley blocks (26); At the tension spring ends (20) there are loops (21) at which the weights (23) are hung via hooks (24);
   The other end of the tension spring (20) is connected to the cylindric elements (38), of the lower angle bars (35) on the bottom casement (2) in order to lift or drop the window down.

2. SLIDING WINDOW according to claim 1, has got the following features:
   - On both bottom casement sides (2) there are moveable rails (43) with the bottom and upper support plates (28) which are screwed (30) to the casement (2).
     Further on there are vertical notches (29) in the middle part of the upper plate (28) used for the rail rollers (39) to be installed in.
   - Upper plates (28) have vertical arbors (32) with the upper angle-bars (31) installed reversally while the other end of angle-bar (31) is placed around the cylindric element (34).

   On the lower plated (28) around the arbors (36) there are angle-bars (35) which carry the cylindric elements (38) at the ends. The cylindric elements have grooves for tension springs loops (21) to be set up Plate central parts, (28) are manufactured under the obtuse angles with angled notches (28a) to clatch the rollers (39) on the rail (43).

3. SLIDING WINDOW according to clim 2 is featured by the following characteristics:
   - Angle-bars are clasped onto the - upper support plates (28) via arbors (32) while lower angle-bars (35), with eliptical notches (37a) spreads over bend parts only, are fixed via arbors (36) to the lower support plates (28).

4. SLIDING WINDOW according to claims 2 and 3, are featured by the following characteristics:
   Lower angle-bars (35) are installed onto the lower support plates (28) via arbors (36). These angle-bars (35) comprises of the bodies, fractured under the obtuse angle, with the angled notches (37) provided for the rollers (39) to be fitted in; The po ition of the upper angle-bars (31) is the same as if it were for claim 3.

5. SLIDING WINDOW according to claims 2,3,4, is featured by the following characteristics:
   - There are rather small eliptical notches (33a) on the upper angle -bars (31);

   While there is an eliptical notch (37a) put up on the front side of the lower angle-bar.

6. SLIDING WINDOW according to claim 1,2 is characterized by the following:
   There are vertical grooves (1a) arranged on both sides of the casement (2) provided for cylindric elements (38) of the lower angle-bars (35). to be installed in.
   From the inside of the frame (1) there is a groove (9) provded with the gasket (12) having

placed on two-side elatic part at the angled part , which faced to the oppsite seides on the angled groove edge (8) of the casement (2).
There is a hollow in the central part of the gasket (12) shaped as tube . Also there are circled hollows (15) and (16), having the hollows (16) arranged closer to the elastic part (13).

7. SLIDING WINDOW according to claims 1-6 have the following features:
On the outer inclined frame 1, close to the groove (9) with a gasket (12); there is an inclined metal sheet (10) which is provided with angled bent inside part which protrudes the frame sides 1.

- On the opposite side of the metal sheet 10 there is a squared groove (2b) on the bottom casement in which the rubber gasket (11) is set up . The metal sheet (10) is designed for the water drainage.

8. SLIDE WINDOW according to claims 1-7 have the following features:

- At the bottom casement (2) there is a prismatic groove (20) on the frame inside part (1); there is an outlet (13) right beneath the groove (2c), with an inclined part fixed to the squared gasket (17).
- There are elastic angled attachments (18) on the outer side of the gasket (17), with the top ends turned towards the groove center (2c) having the gaps (19) installed, enabling the total sealing between the outlet (1b) and inclined part of the casement groove (12c).

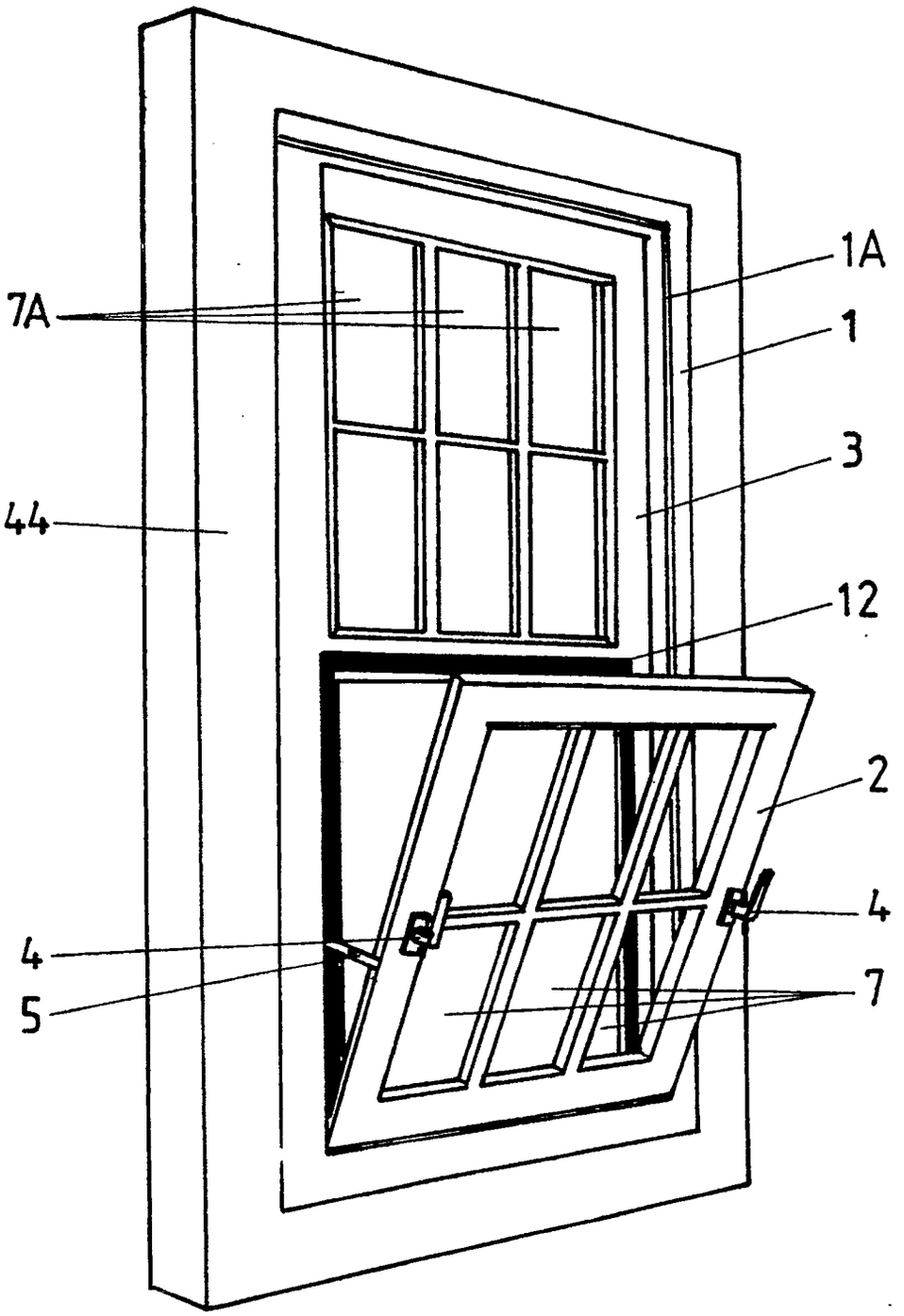

Fig. 1

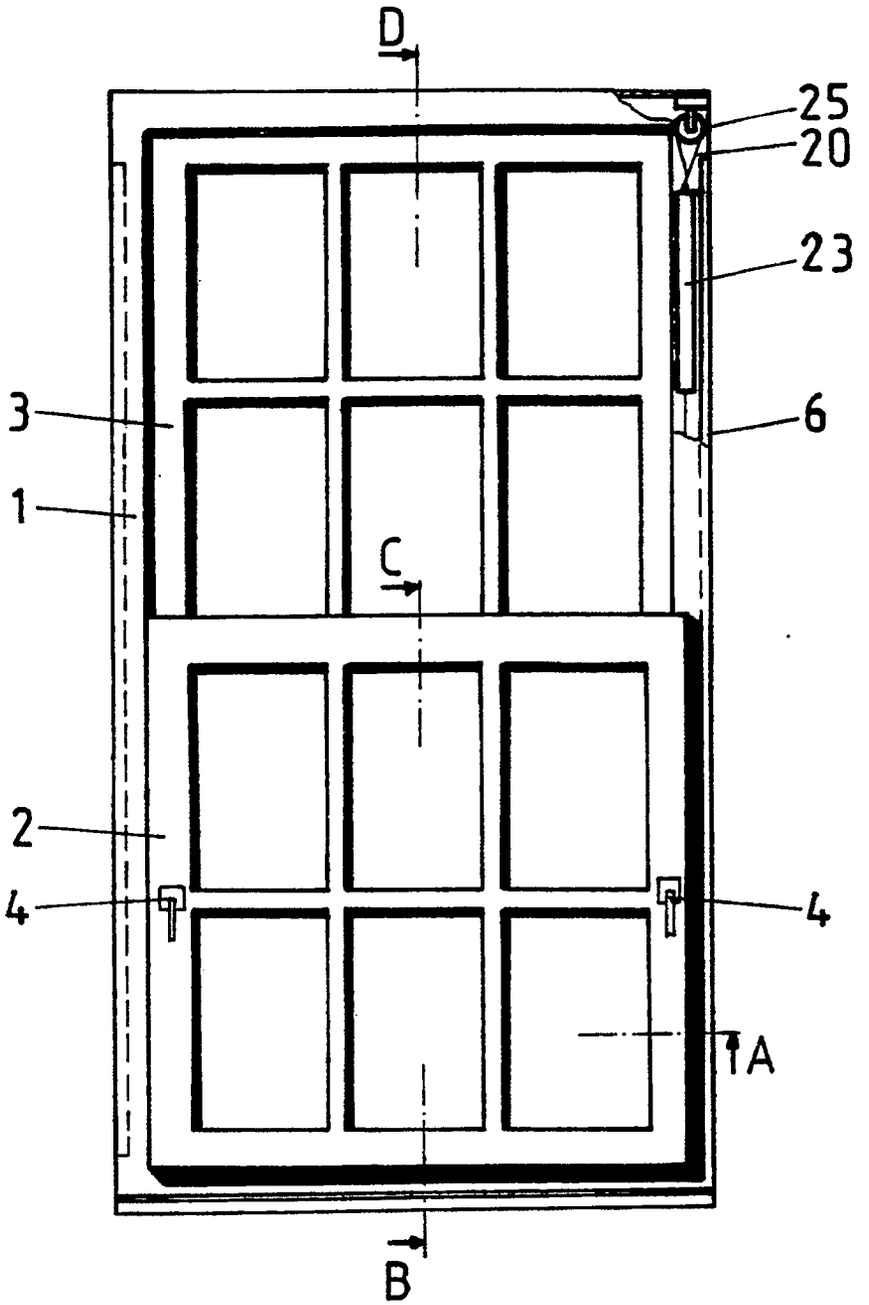

Fig. 2

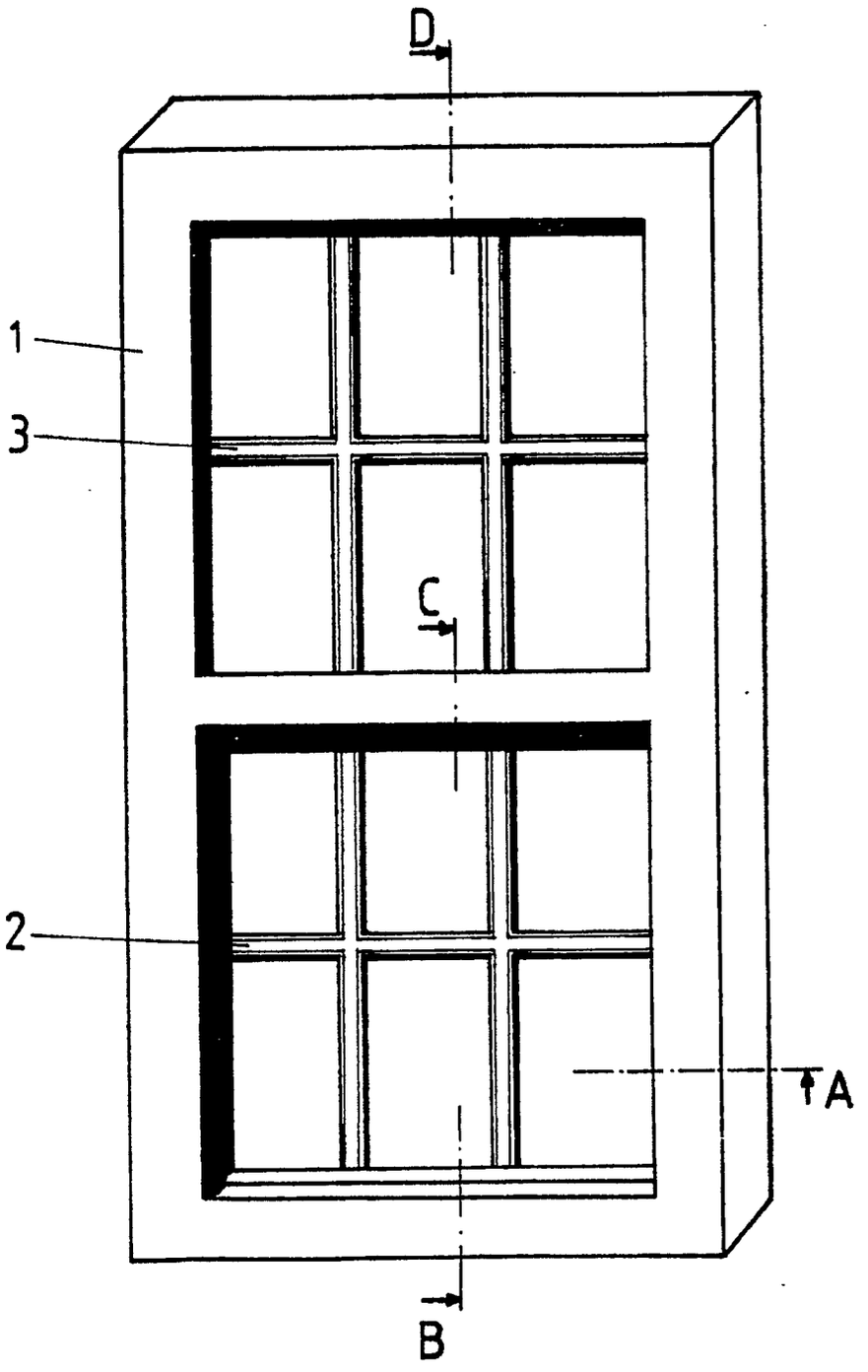

Fig. 3

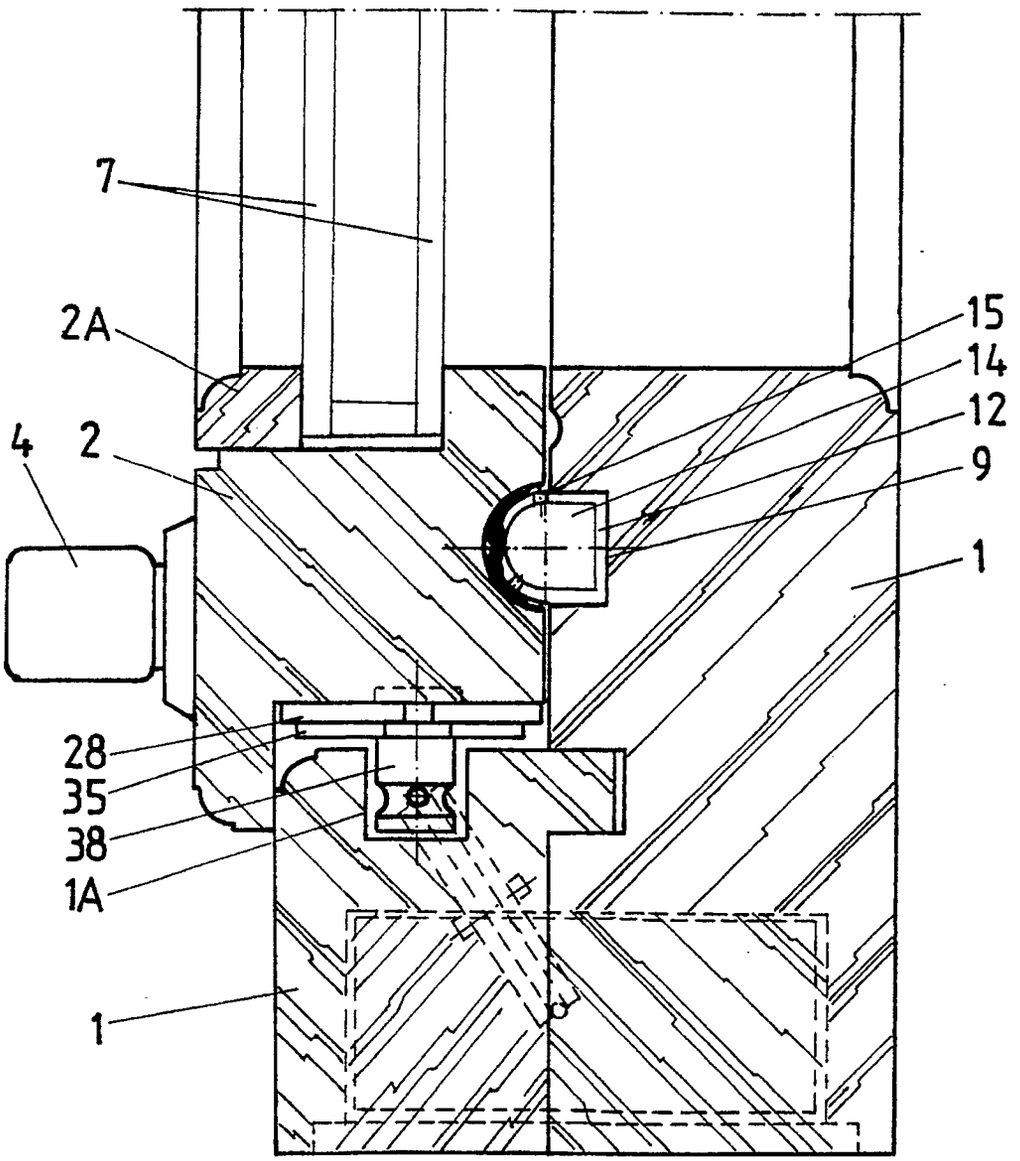

Fig. 4

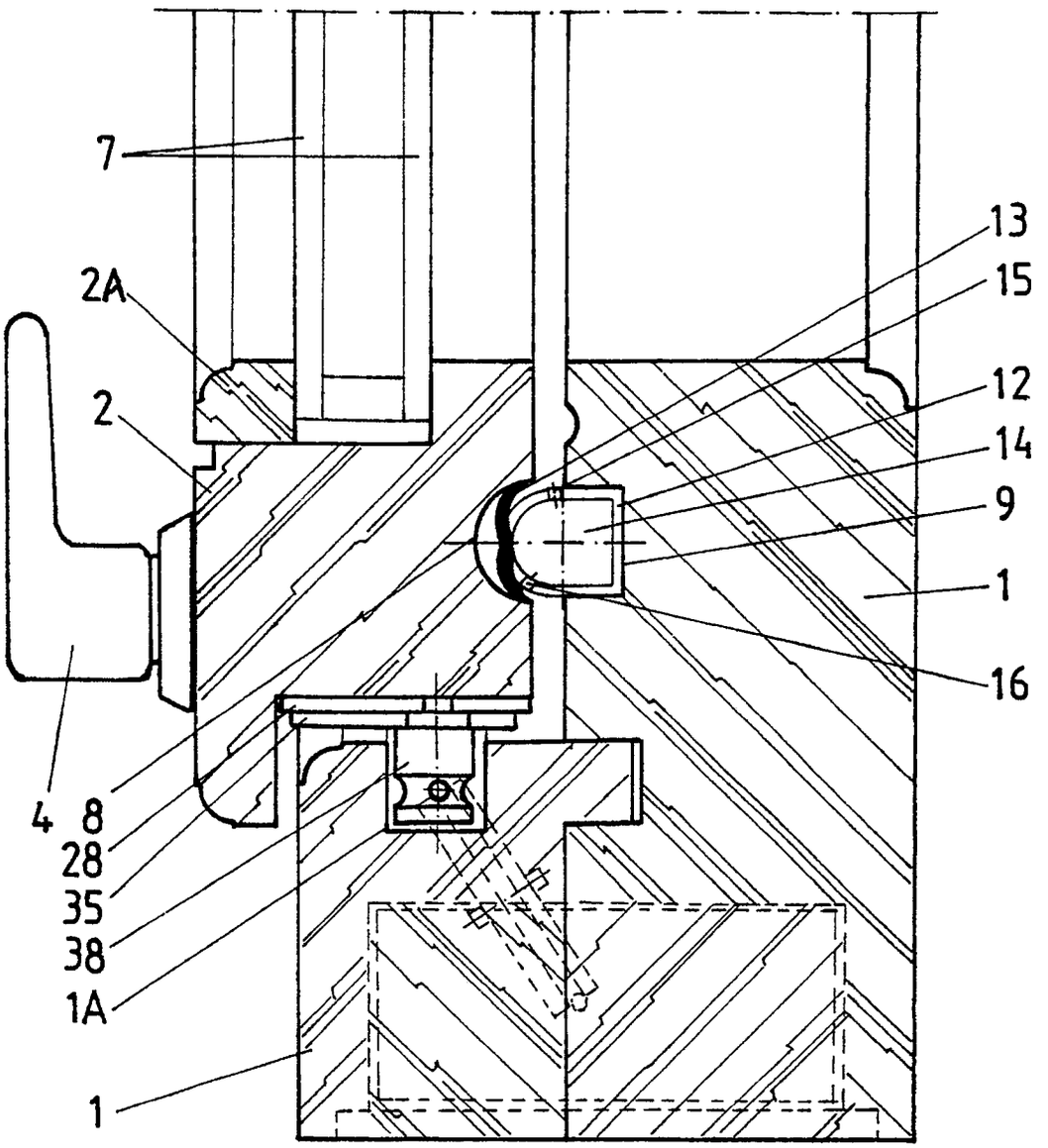

Fig. 5

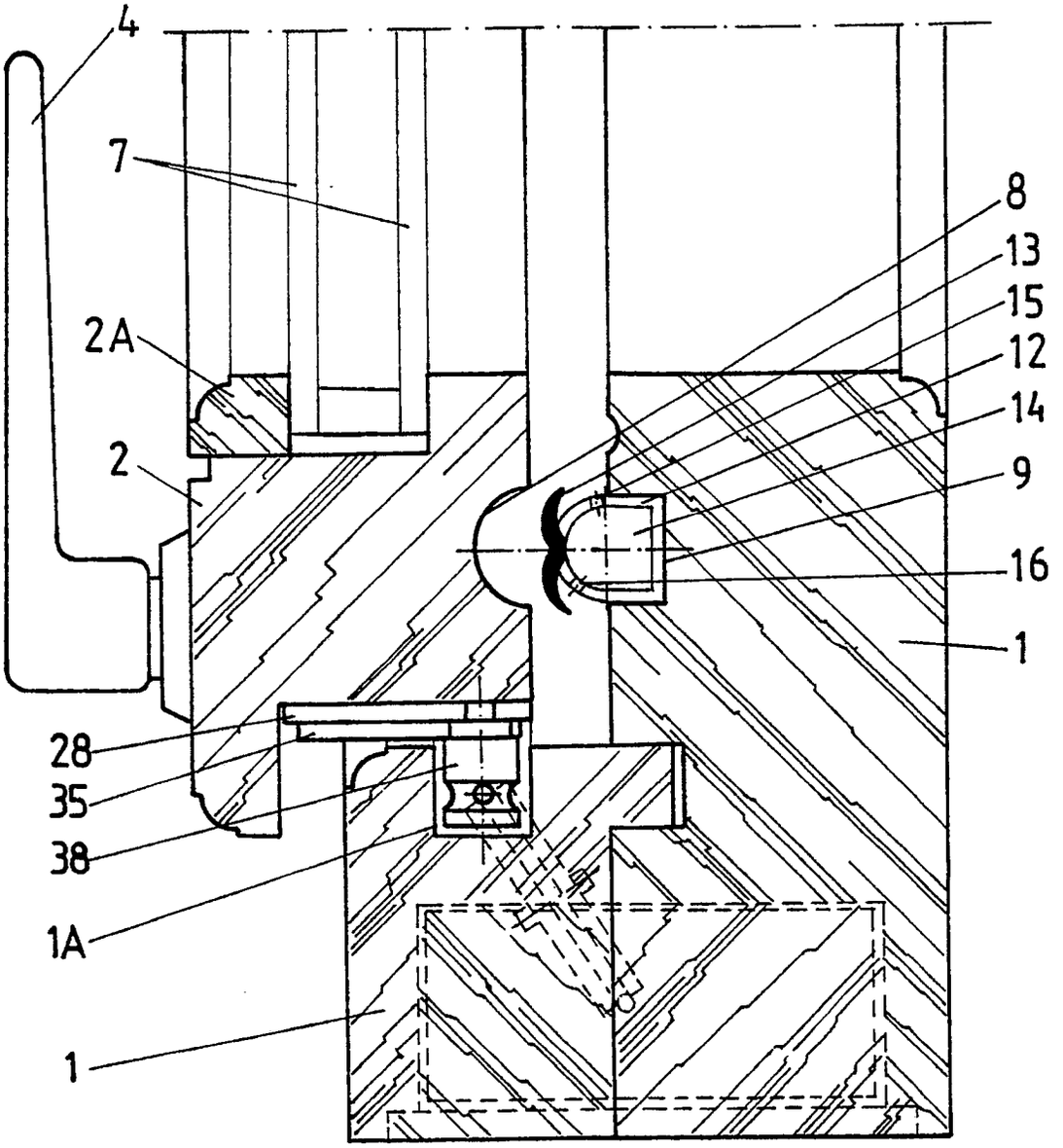

Fig. 6

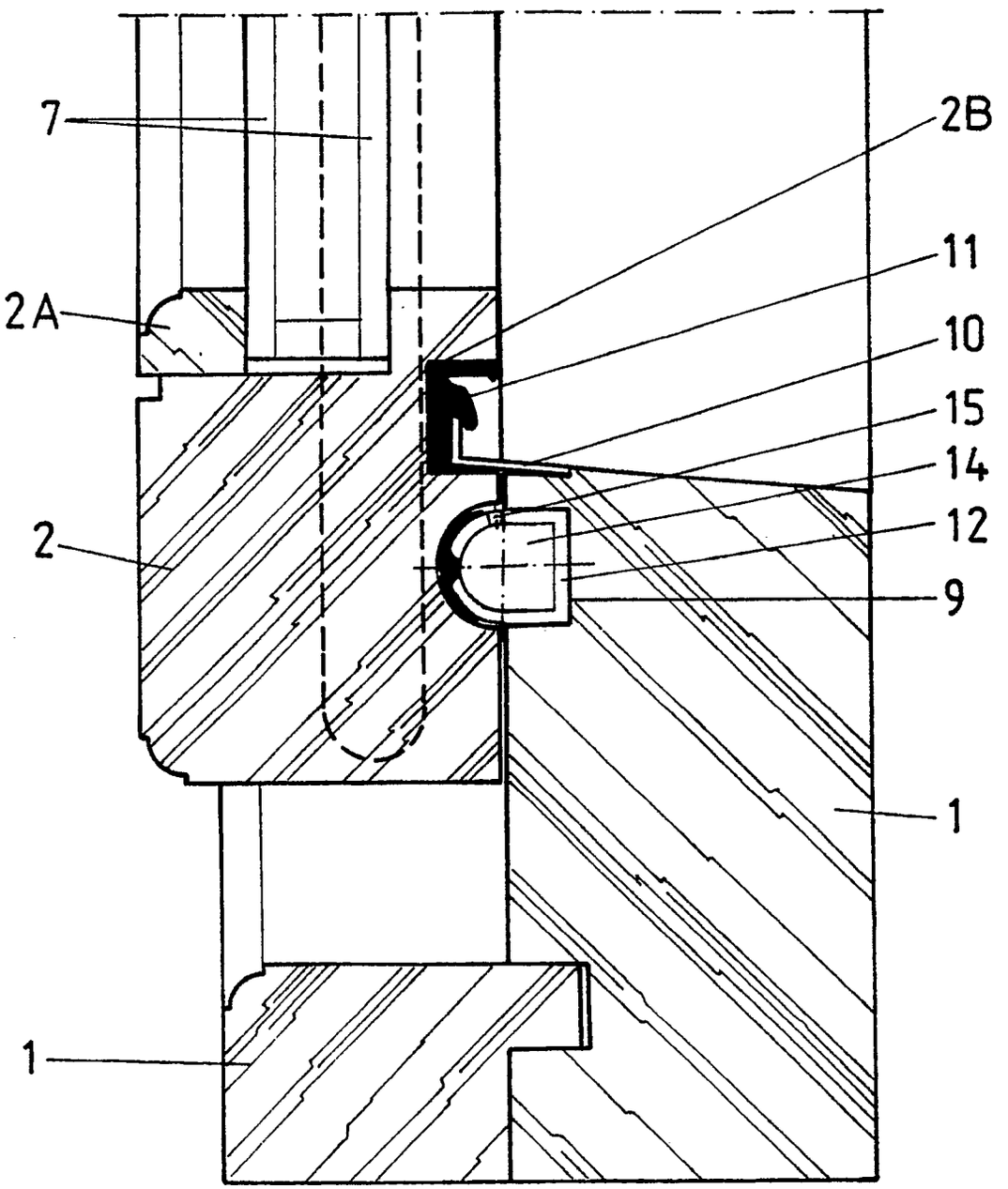

Fig. 7

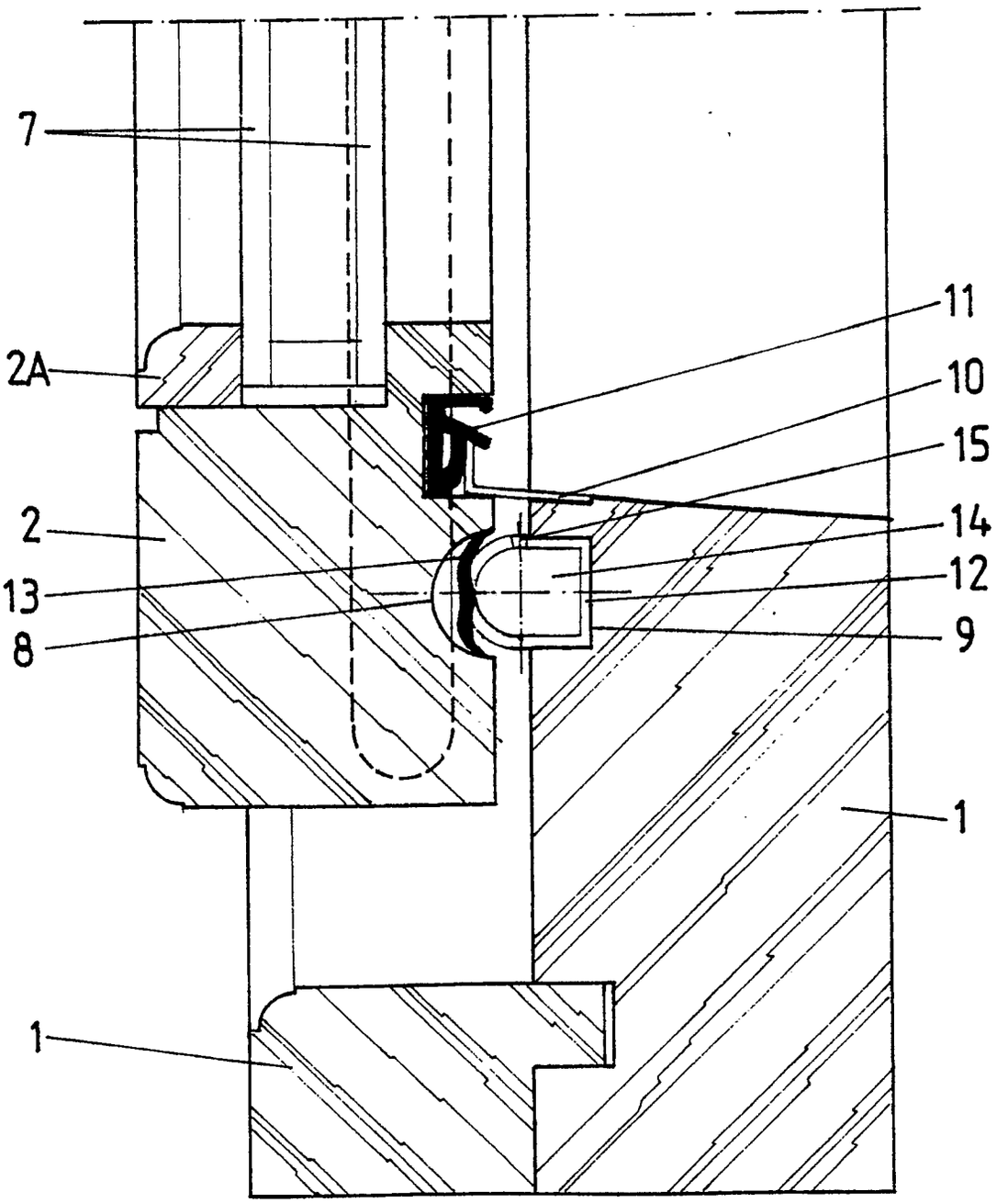

Fig. 8

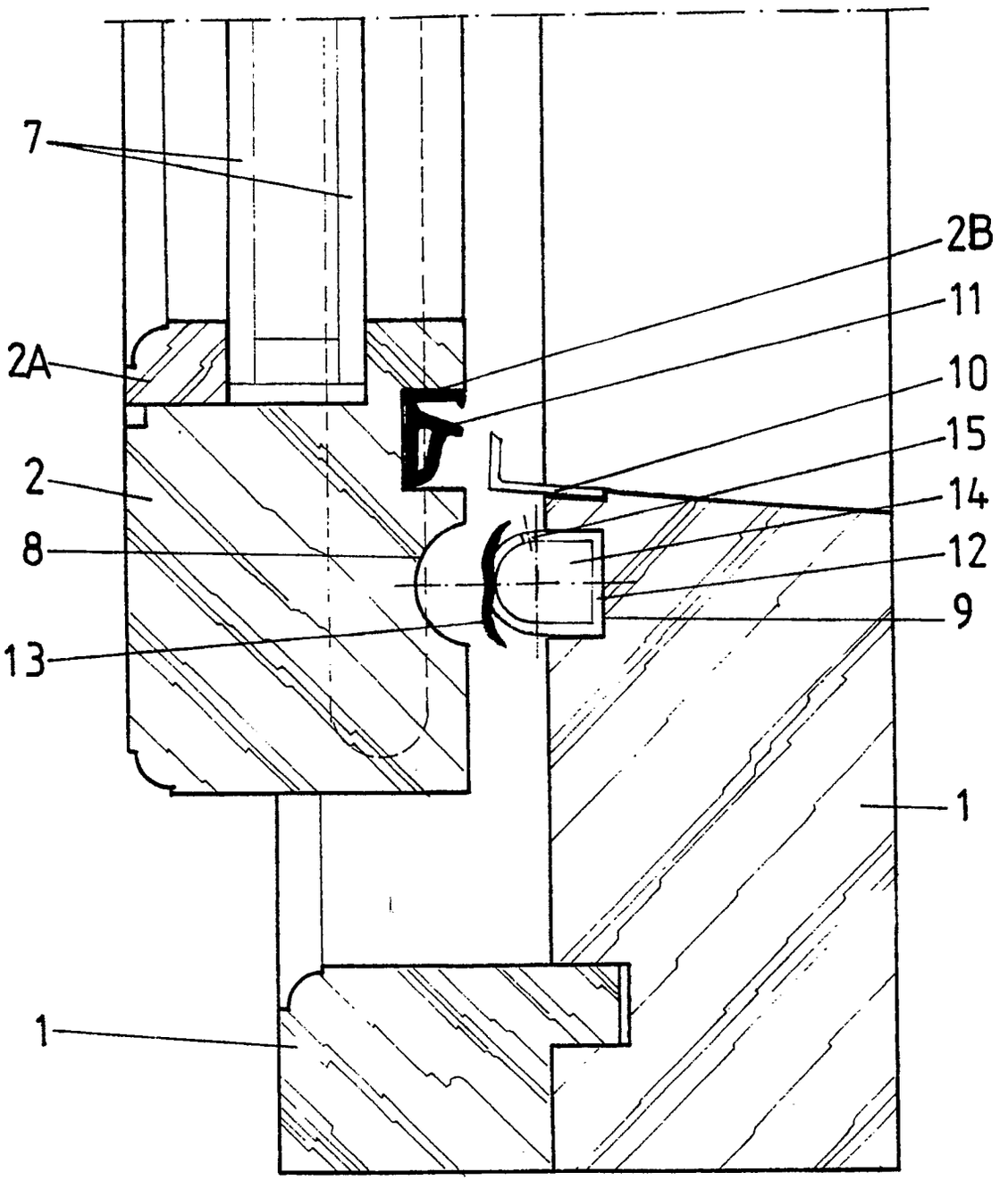

Fig. 9

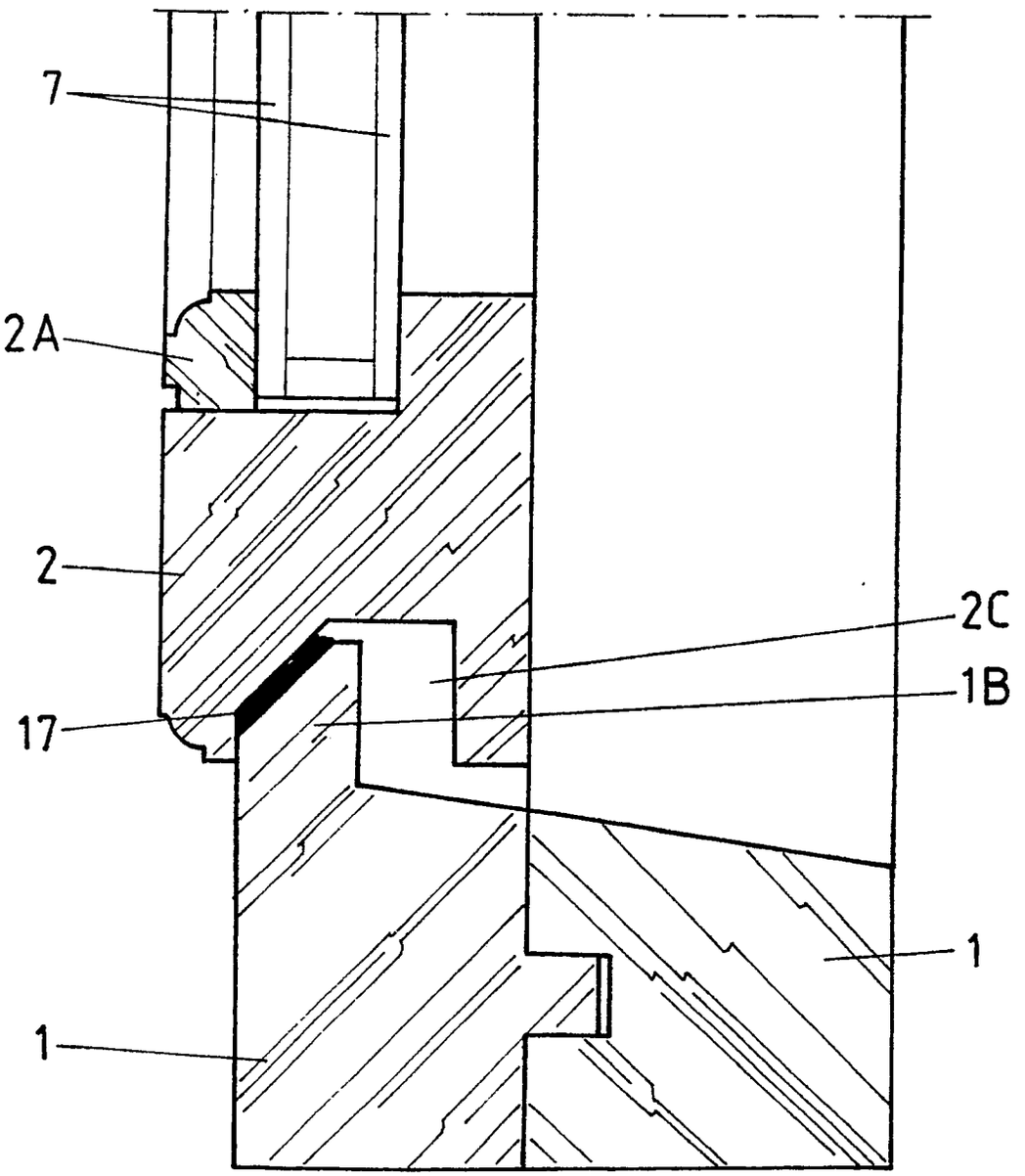

Fig. 10

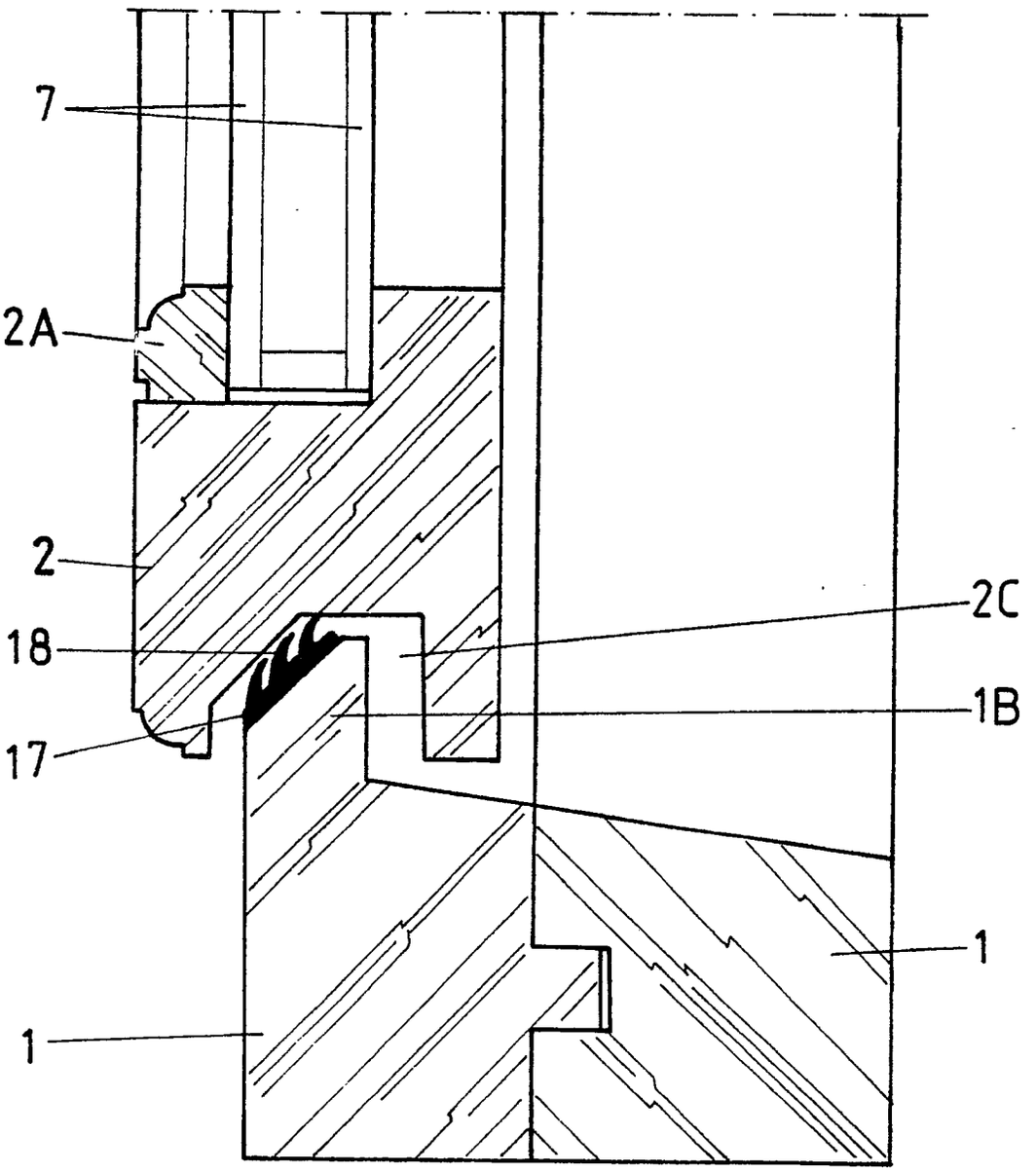

Fig. 11

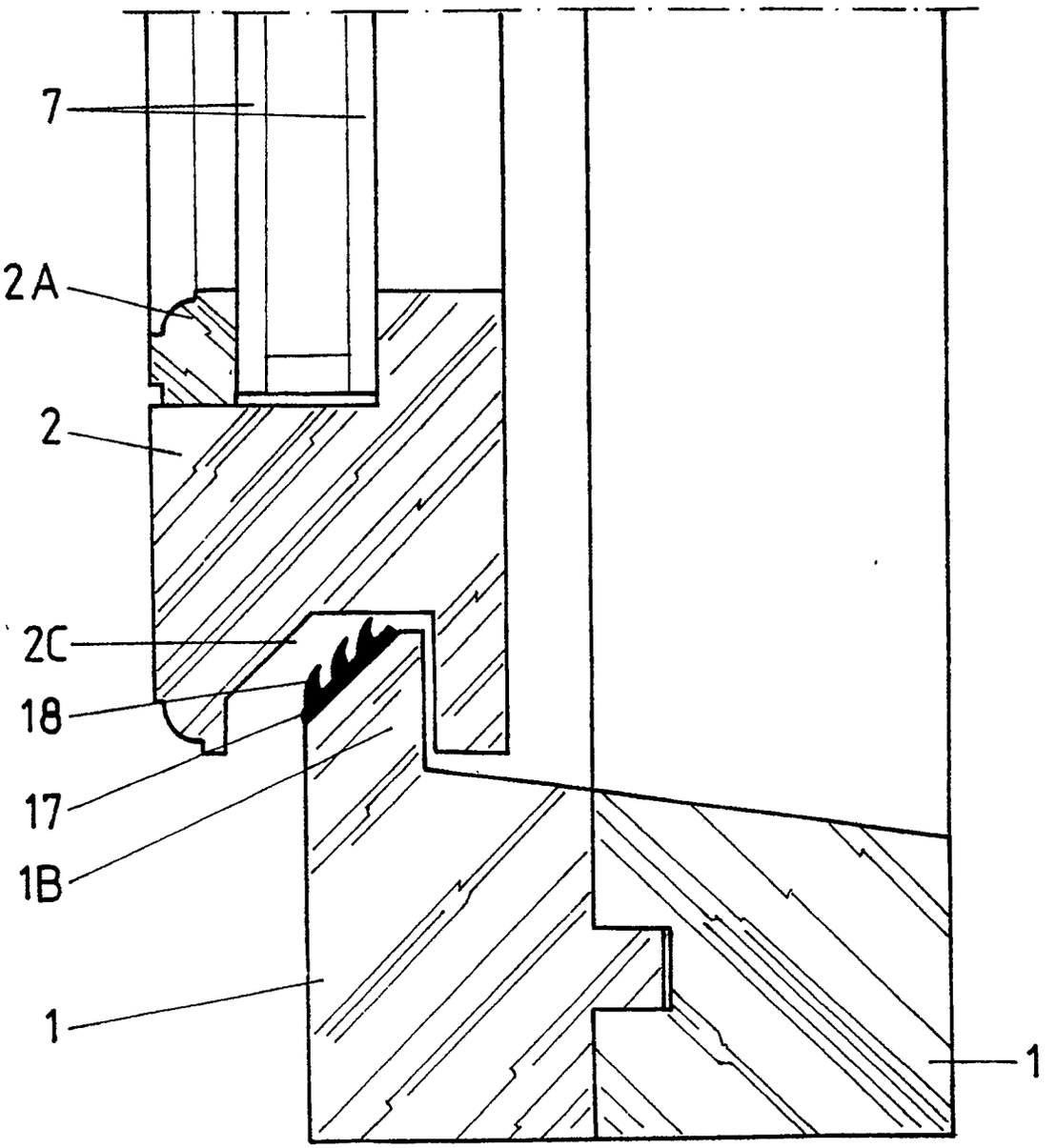

Fig. 12

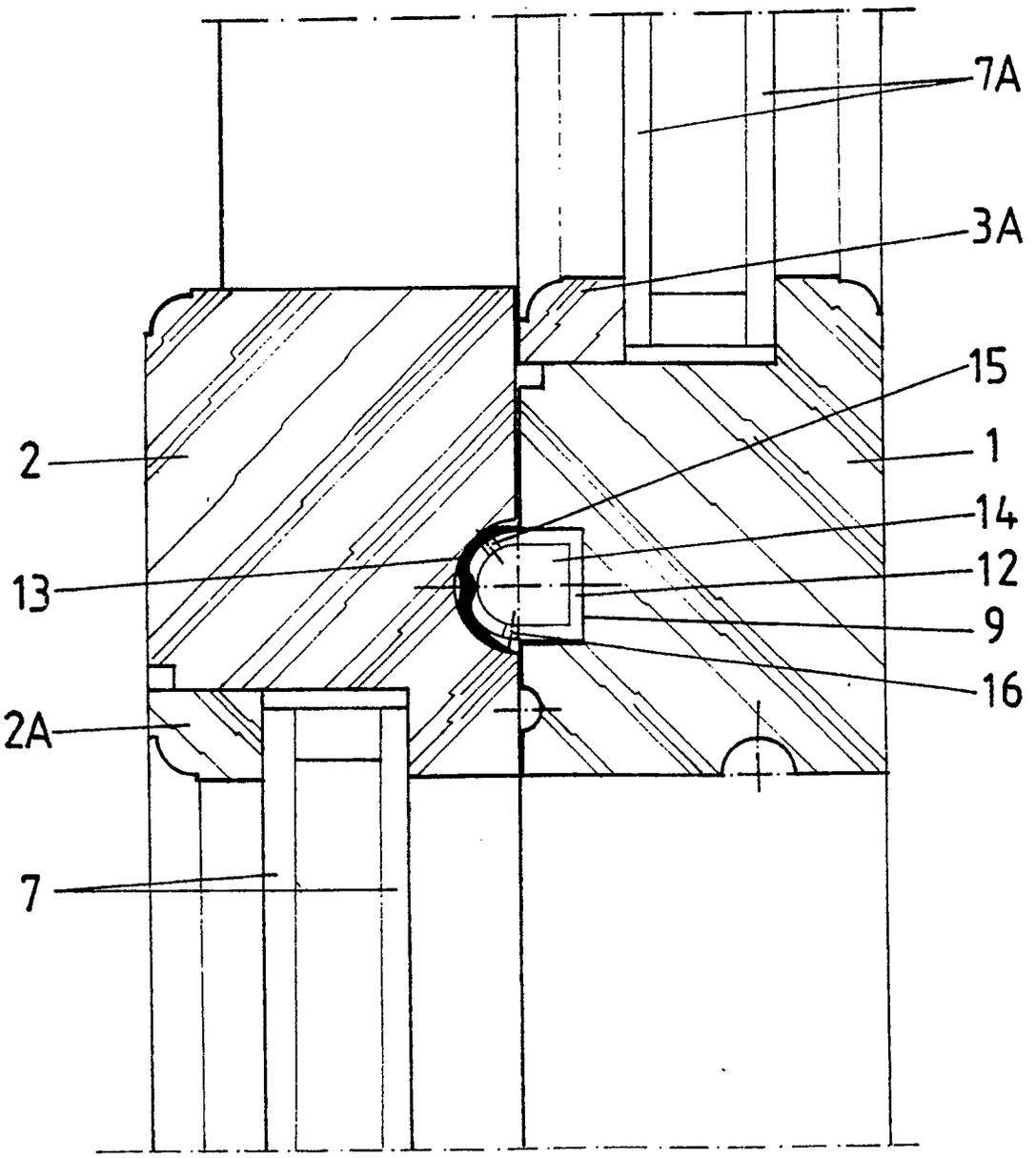

Fig. 13

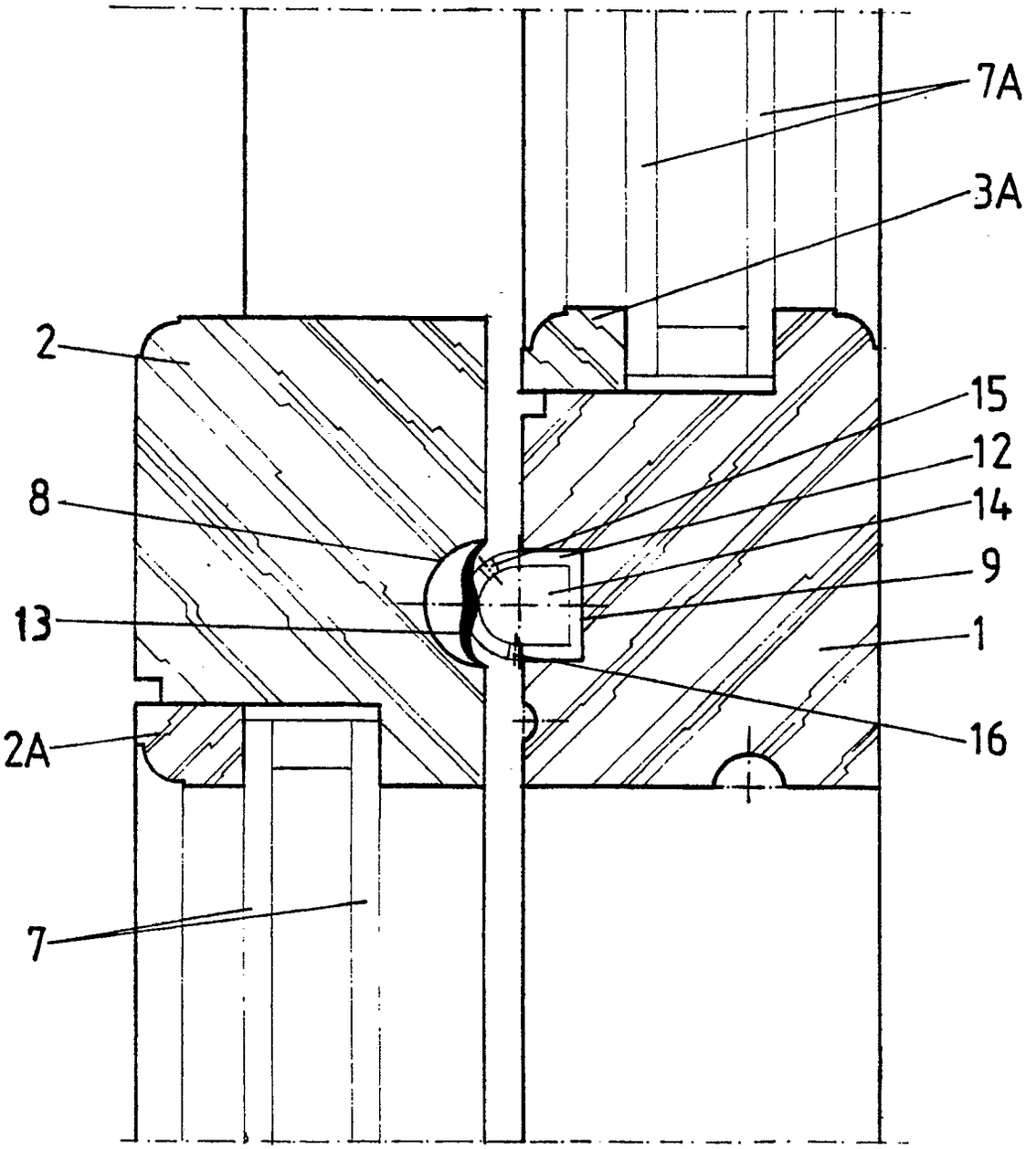

Fig. 14

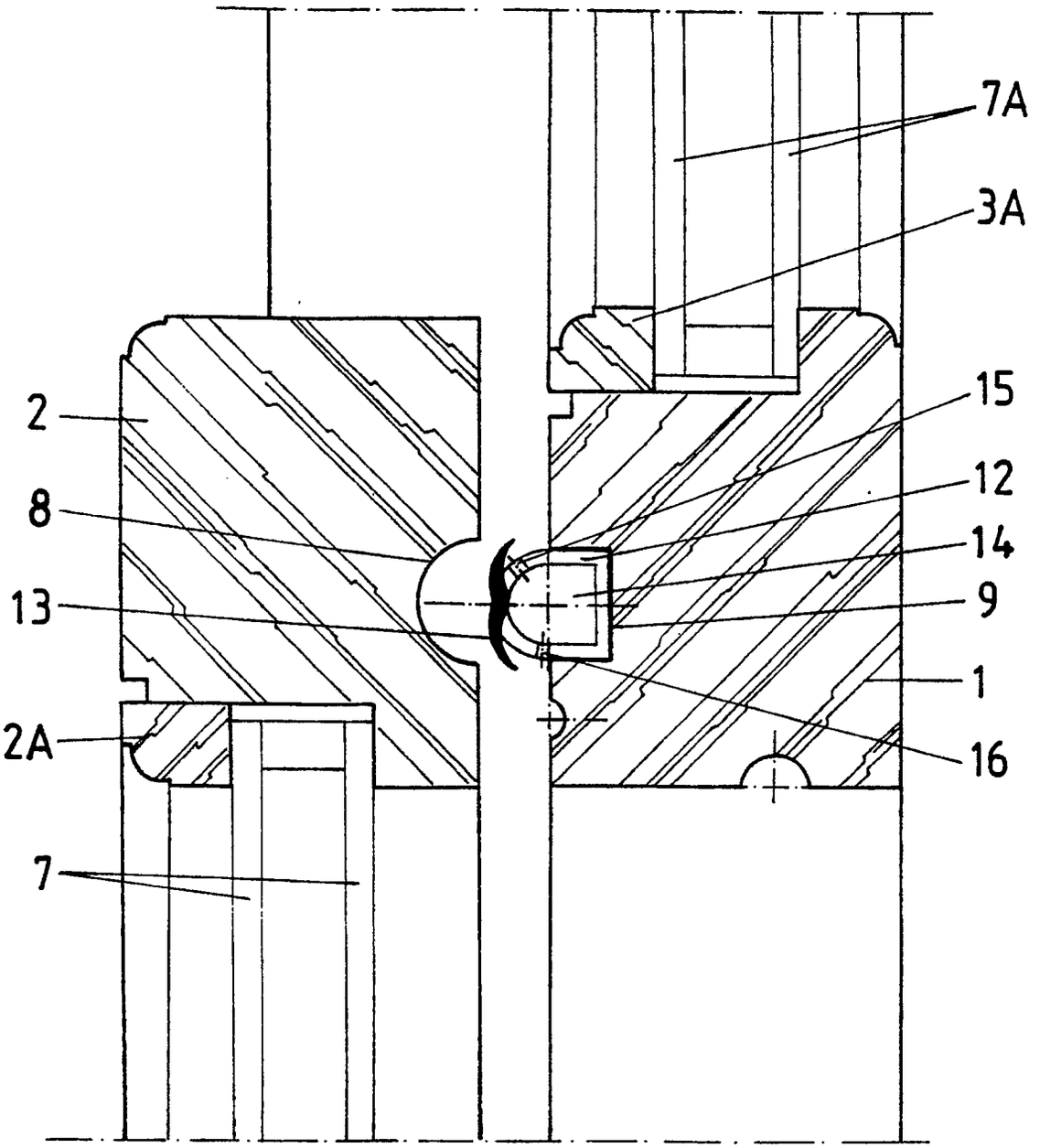

Fig. 15

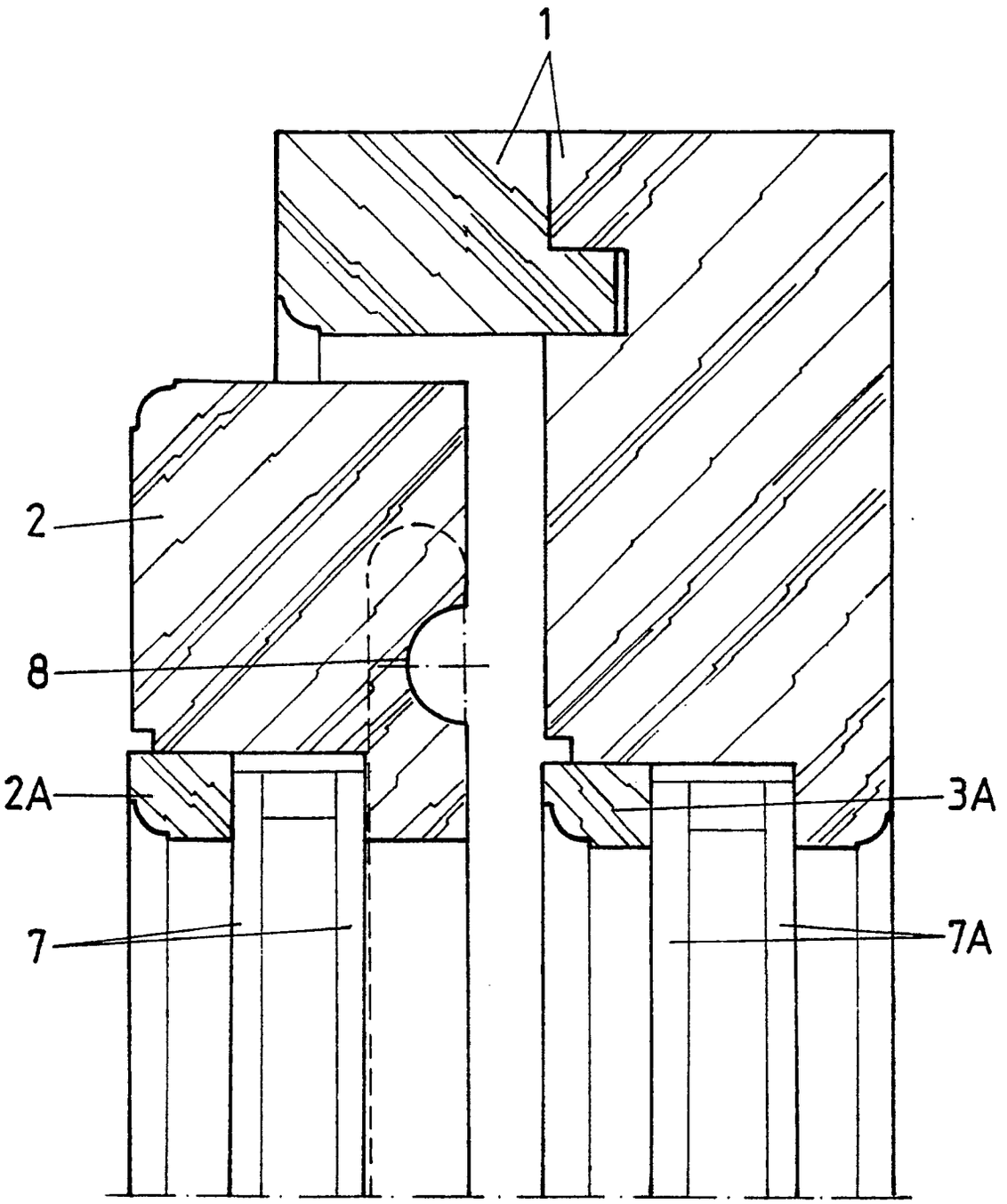

Fig. 16

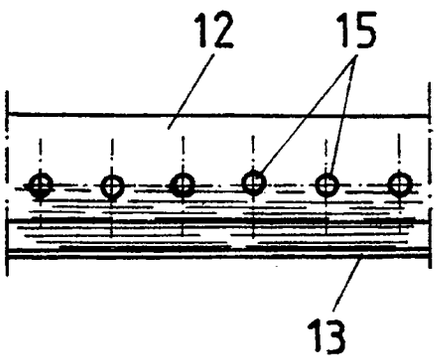

Fig.17

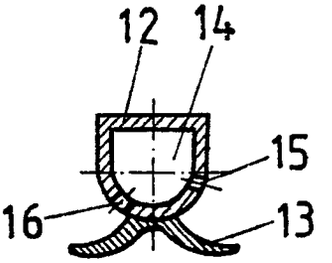

Fig.17A

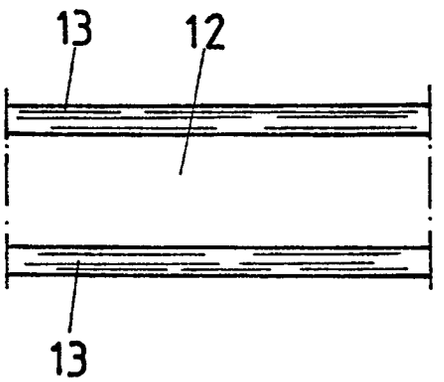

Fig.17B

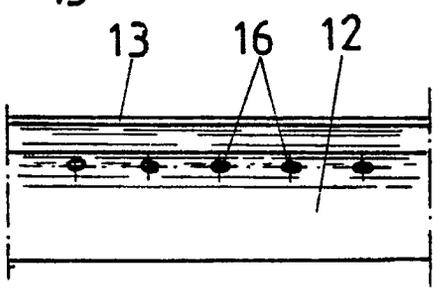

Fig.17C

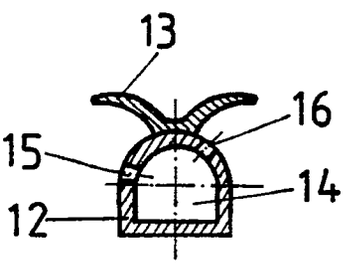

Fig.17D

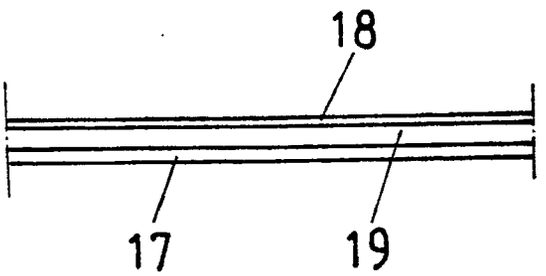

Fig. 18

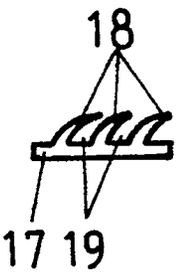

Fig. 18A

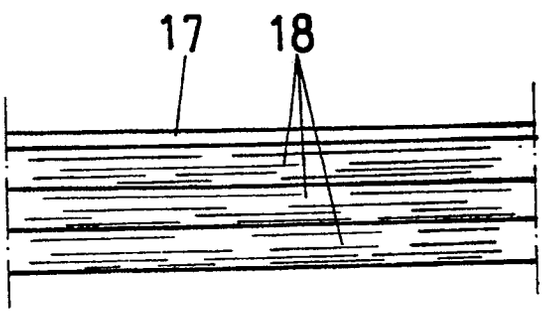

Fig. 18B

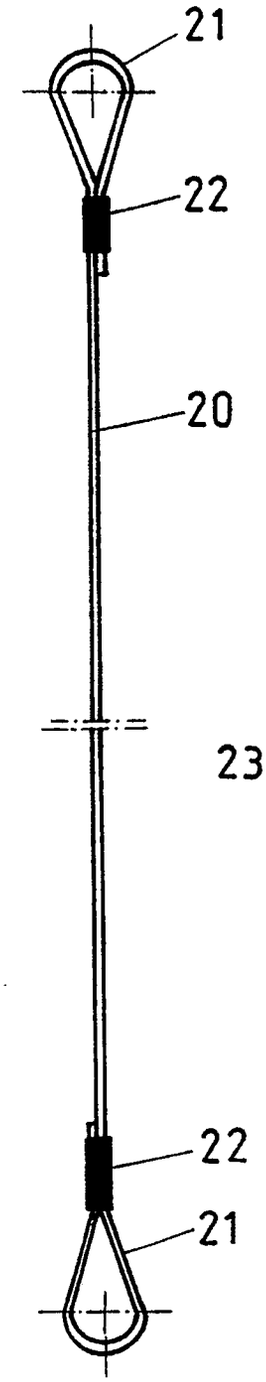

Fig. 19

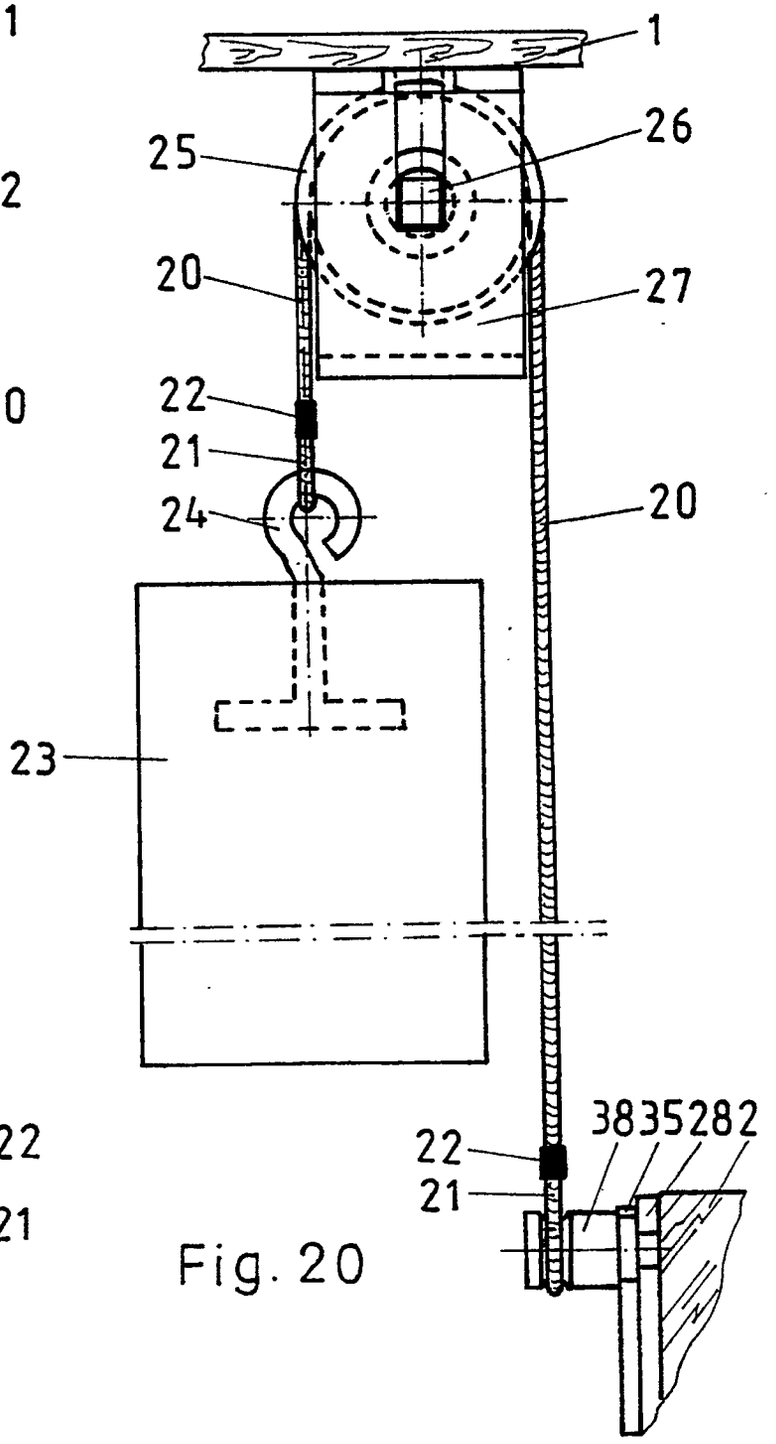

Fig. 20

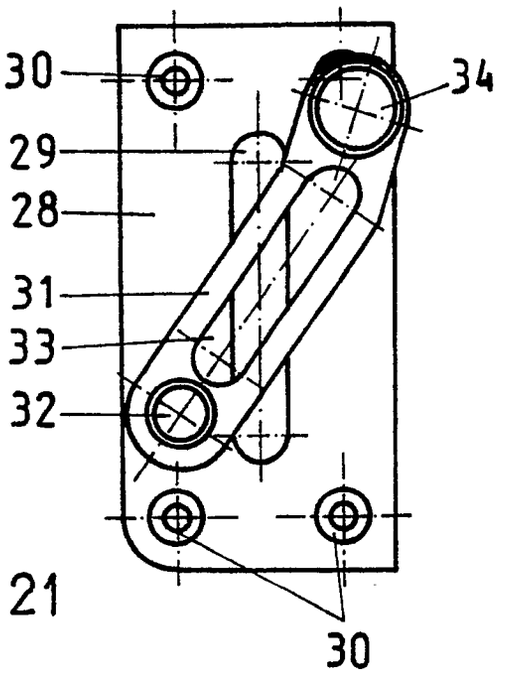

Fig. 21

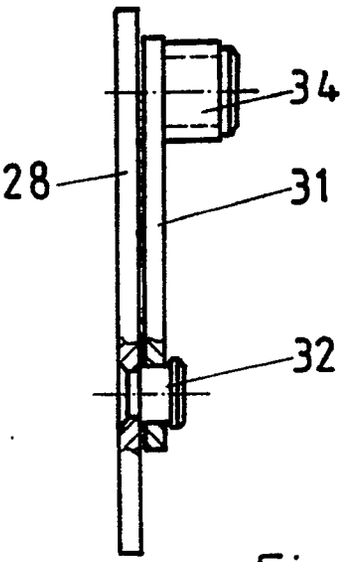

Fig. 21A

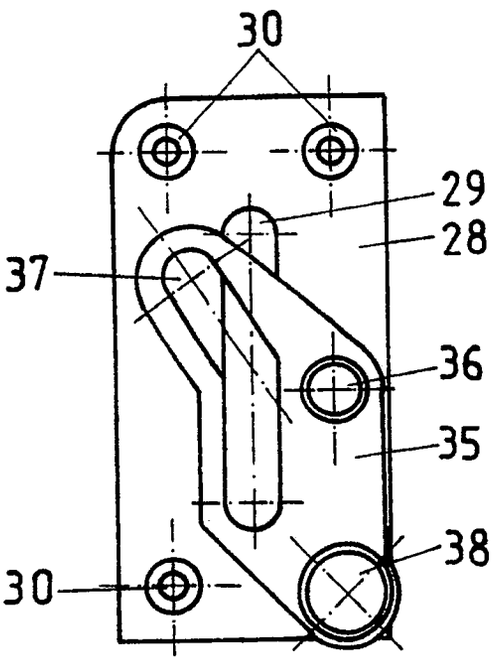

Fig. 22

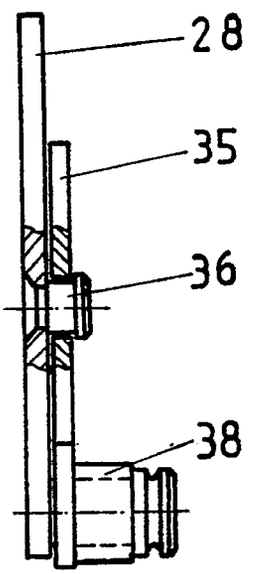

Fig. 22A

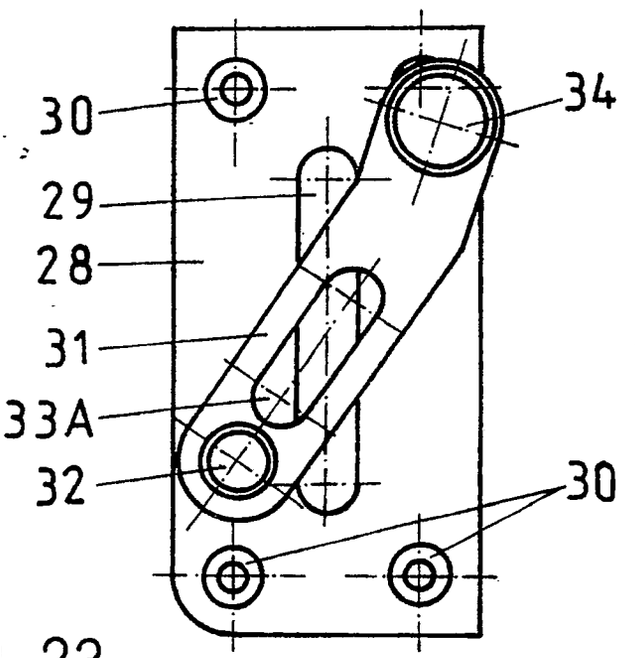

Fig. 23

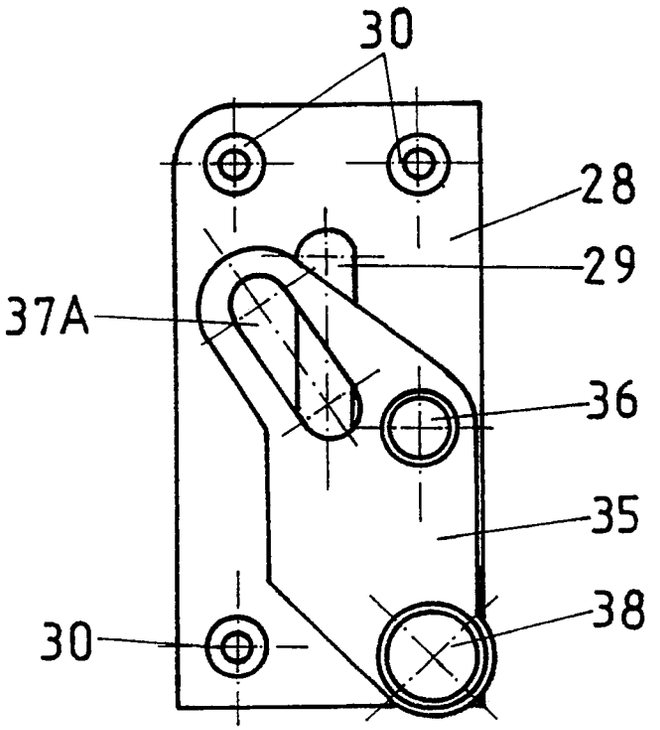

Fig. 24

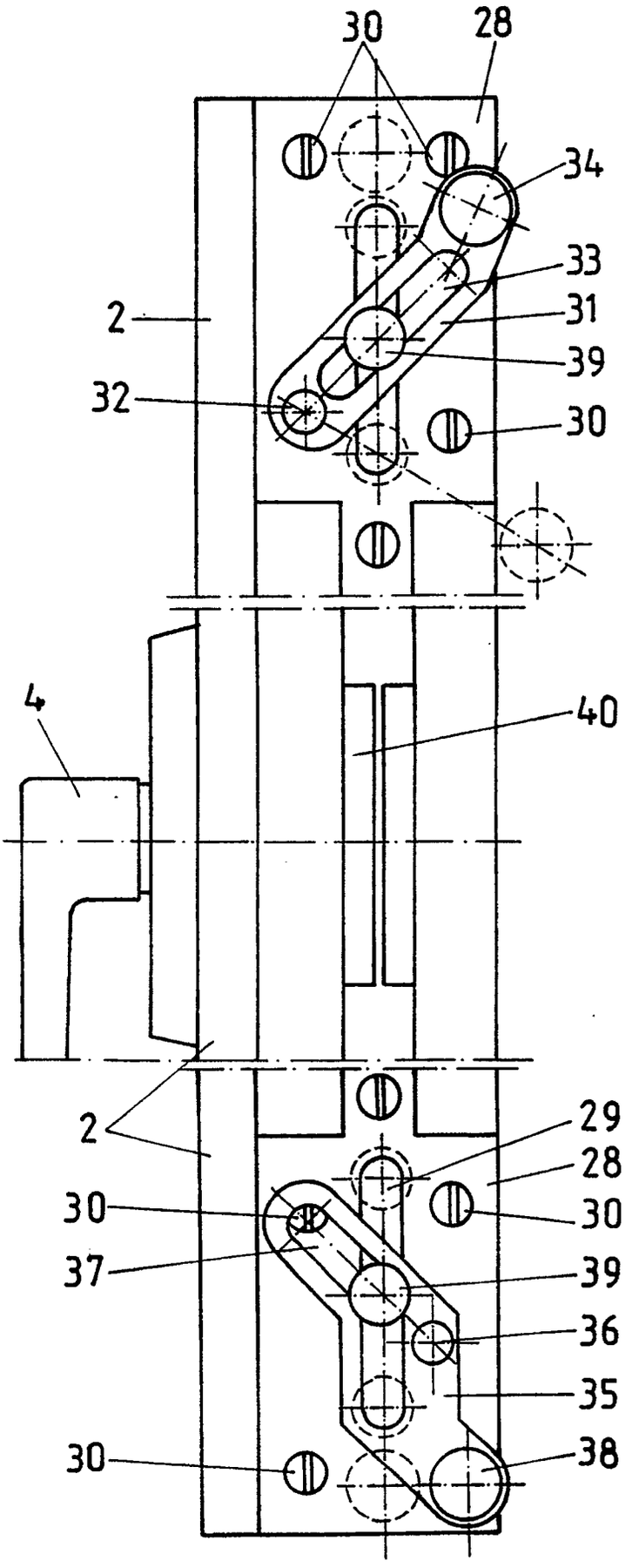

Fig. 25

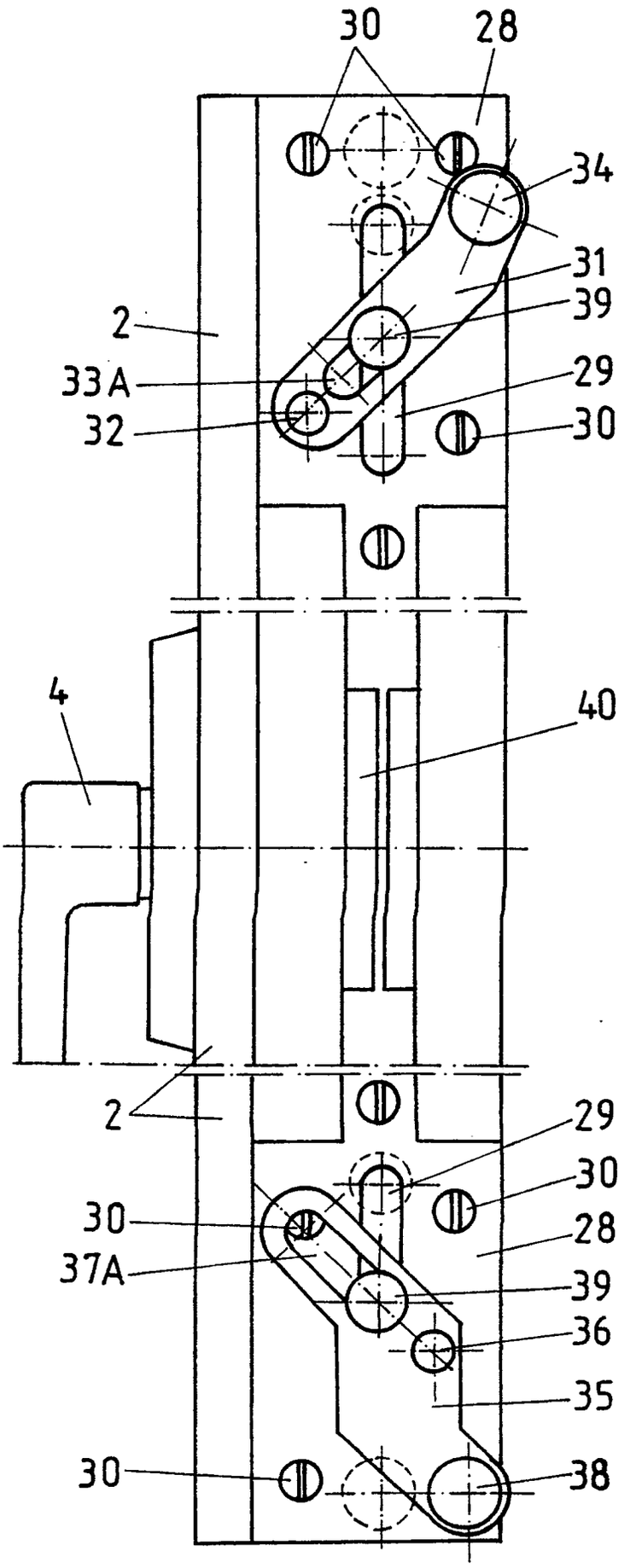

Fig. 26

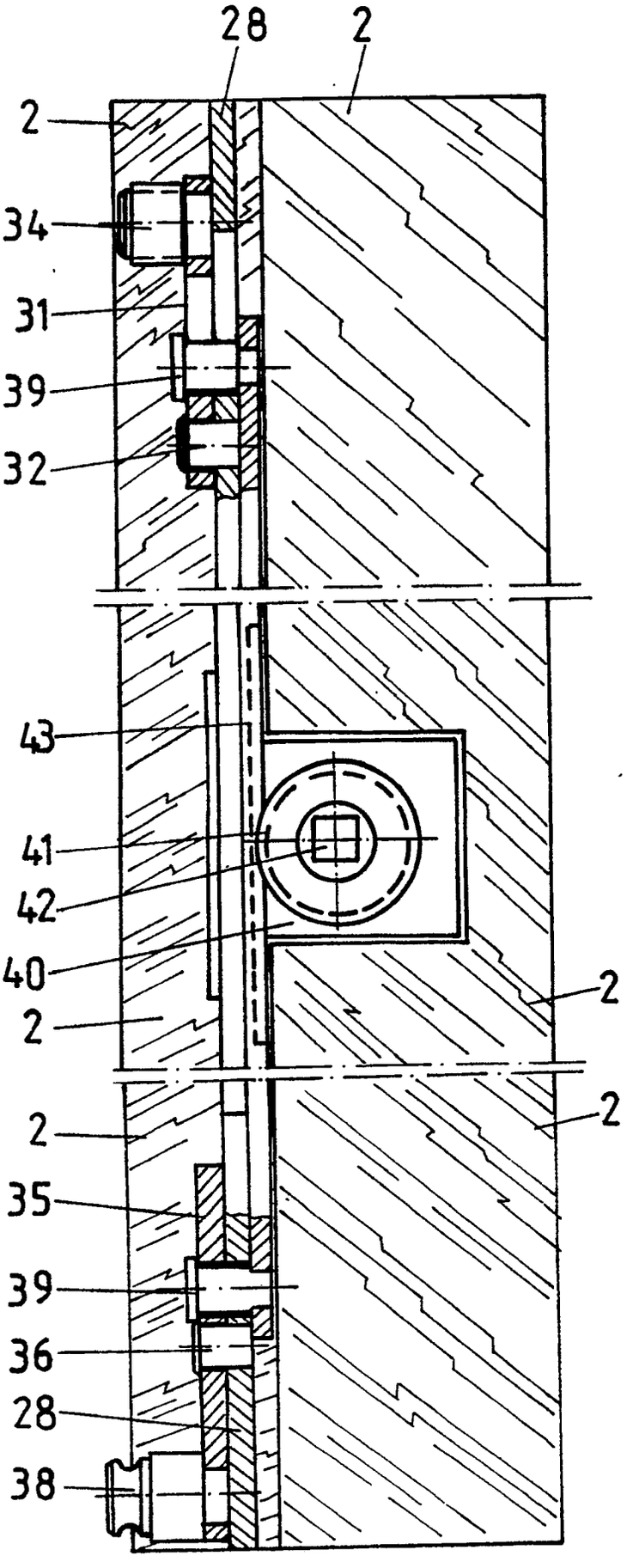

Fig. 27

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 12 5467

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	FR-A-2 210 212 (GRETSCH-UNITAS) * page 5, line 3 - page 7, line 32 * * figures 1-7 *	1-5	E 05 D 15/22 E 05 D 15/20
Y	DE-C-7 201 39 (WAGNER) * page 1, line 1 - line 7 * * page 1, line 36 - page 2, line 6 * * figures 1-4 *	1-5	
A	FR-A-2 339 045 (ELTREVA) * page 4, line 22 - line 29 * * page 5, line 9 - line 17 * * figures 3,4 *	1,2,6	
A	DE-A-2 145 140 (GRETSCH-UNITAS) * page 10, line 12 - line 15 * * figures 5-7 *	1,2	
A	EP-A-0 036 189 (ROBERING) * page 6, line 22 - page 7, line 15 * * page 8, line 25 - page 9, line 9 @ figures 1-3 *	6	
A	GB-A-1 127 308 (REEVES) * page 1, line 47 - line 58 * * page 1, line 78 - line 85 * * figures 1-4 *	6	
A	DE-A-3 107 987 (STARK) * page 6, line 8 - page 7, line 4 * * figure 2 *	7	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E 05 D A 47 K E 06 B
A	EP-A-0 017 033 (VITO IRMEN) * claims 1,4 * * figure 3 *	8	
A	US-A-2 935 771 (HATCHER) * column 2, line 45 - line 52 * * figures 2,3 *	8	

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	16 April 91	VAN KESSEL J.J.

CATEGORY OF CITED DOCUMENTS

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