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(54) **Scissor-type mechanism for a tilting window**

(57) Scissor-type mechanism for a tilting window comprising a scissor base with a base piece and an actuating lath which can be shifted in respect to this base piece, and at least two arms whereby the scissor-type mechanism comprises three arms, to wit a connecting arm attached at the base piece hingeing as well as shift-able, an auxiliary arm which, on one hand, is hingeably

attached between the extremities of the connecting arm and, on the other hand, is hingeably connected to base piece and an actuating arm which, on one hand, is hingeably attached on the actuating lath by means of a pivot which can be shifted in a slot in the base piece and, on the other hand, is coupled to the auxiliary arm by means of at least one catch pin protruding through an opening in this auxiliary arm.

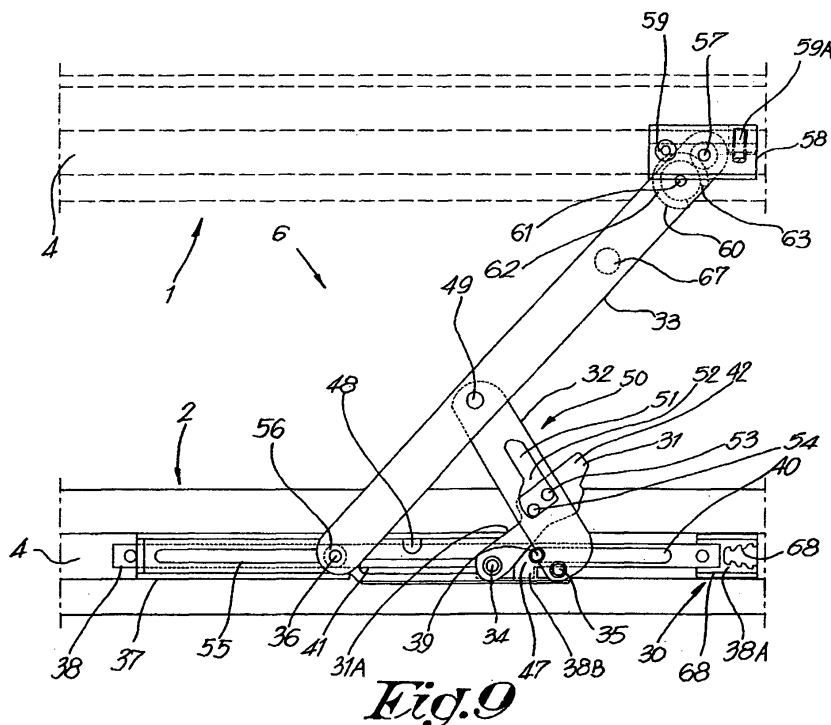


Fig. 9

Description

[0001] The invention relates to a scissor-type mechanism which is particularly suitable for application with tilting windows.

[0002] Thus, the invention relates to a scissor-type mechanism comprising a scissors base with a base piece and an actuating strip which can be shifted in respect to this base piece, and at least two arms.

[0003] The invention aims at such scissor-type mechanism whereby, with a minimum of force and also with relatively heavy windows, the opening of the scissor-type mechanism and, thus, the tilting of the wing is guaranteed, however, whereby the mounting on a window still remains simple.

[0004] According to the invention, this aim is achieved in that the scissor-type mechanism comprises three arms, to wit a connecting arm attached at the base piece hinging as well as shiftable, an auxiliary arm which, on one hand, is hingeably attached between the extremities of the connecting arm and, on the other hand, is hingeably connected to the base piece and an actuating arm which, on one hand, is hingeably attached on the actuating lath by means of a pivot which can be shifted in a slot in the base piece and, on the other hand, is coupled to the auxiliary arm by means of at least one catch pin protruding through an opening in this auxiliary arm, whereby the extremity of the actuating arm cooperates with a guide provided on the base piece, in such a manner that, when the actuating lath is shifted into one direction in respect to the base piece, the actuating arm bumps with its extremity against the guide and is forced to rotate, and therefore, by means of the catch pin, rotates the auxiliary arm which, in its turn, rotates the connecting arm.

[0005] Preferably, the guide is directed inclined in respect to the longitudinal direction of the base piece, and the extremity of the actuating arm is beveled, too.

[0006] In a particular form of embodiment, the extremity of the actuating arm is beveled in a step-shaped manner and shows at least two, and preferably three, cams which successively come into contact with the guide.

[0007] On the actuating arm, two catch pins can be present which protrude in the opening in the auxiliary arm.

[0008] The invention also relates to a tilting window equipped with a scissor-type mechanism as described above.

[0009] With the intention of better showing the characteristics of the invention, hereafter, as an example without any limitative character, a preferred form of embodiment of a scissor-type mechanism according to the invention for a tilting window is described, with reference to the accompanying drawings, wherein:

Figure 1 represents a front view of a tilting window provided with a scissor-type mechanism according to the invention;

Figure 2, at a larger scale, represents the part indicated by F2 in Figure 1;

Figures 3 and 4 represent cross-sections according to the respective lines III-III and IV-IV, however, exclusively of the transmission mechanism from a closing system of Figures 1 and 2;

Figure 5 represents a cross-section according to line V-V in Figure 2;

Figure 6, at a larger scale, represents the part indicated by F6 in Figure 1, however, exclusively of the scissor-type mechanism in closed position;

Figure 7 represents a view according to arrow F7 in Figure 6, however, with a part of the wing;

Figure 8 represents a cross-section according to line VIII-VIII in Figure 7, drawn at a larger scale;

Figure 9 represents a view similar to that of Figure 7, however, for the open position and with a part of the fixed frame in dashed line;

Figure 10 represents a view according to arrow F10 in Figure 6, at a larger scale and with a part of the fixed frame;

Figure 11 represents a cross-section according to line XI-XI in Figure 10;

Figures 12 to 17 represent views which are analogous to that of Figure 9, however, at a larger scale and with only one arm of the scissor-type mechanism, for different positions of this arm;

Figure 18 represents a cross-section according to line XVIII-XVIII in Figure 1;

Figure 19 represents a cross-section, similar to that of Figure 4, however, for an embodiment variant.

[0010] In the represented example, the tilting window is a tilting-down window substantially consisting of a fixed frame 1, at which a wing 2, by means of hinges 3 at the bottom, is provided tiltable around a horizontal geometrical tilting axis.

[0011] With this tilting-down window, the wing 2 tilts towards the inside and the side towards which the wing 2 tilts, thus, hereafter is called the inner side or front side.

[0012] At its side directed towards frame 1, the wing 2 is provided with a groove 4 over its entire circumference, which groove substantially has the form of a reversed T and is formed between two ribs 5 with extremities which are bent and directed towards each other, such that laths, which, whether shiftable or not, are provided in the groove 4, are retained in the groove 4 by said ribs 5.

[0013] The tilting window is provided with a closing system consisting of a built-in scissor-type mechanism 6 according to the invention provided between the upper edge of the wing 2 and the upper edge of the fixed frame 1, and an actuating mechanism 7.

[0014] The actuating mechanism 7 consists of a handle 9 which is attached beneath the tilting window, within reach of a user, for example, on the wall, and a coupling 10 between the handle 9 and the scissor-type mechanism 6.

[0015] The coupling 10 is composed of a first part 11 which is provided with its upper extremity on the front side of the fixed frame and with its lower extremity is

connected to the handle 9; a second part 12 which is mounted on the edges of the wing 2 and is connected to the scissor-type mechanism 6; and, at a distance of maximum 10 cm, and preferably maximum 5 cm, to the tilting axis of the wing 2, a transmission mechanism 13 which is provided between both said parts 11 and 12 in order to transmit the movement of the first part 11 towards the second part 12.

[0016] The first part 11 consists of a rod 14 which is shiftably provided in bows 15 which are attached on the wall and on the frame 1.

[0017] The transmission mechanism 13 consists of a driving piece 16 and a catch piece 17.

[0018] The driving piece 16 is formed by a substantially L-shaped profile, one leg 18 of which surrounds the upper extremity of the rod 14, is fixed thereon by clamping screws 18A and is situated against the front side of the frame 1, and the other leg 19 extends along the interior edge of the frame 1.

[0019] On its side directed towards the wing 2, leg 19 is provided with two bent and parallel ribs 20 which together border a groove 21, whereby these ribs 20 are directed upwardly inclined towards the front side of the frame 1. These ribs 20 extend over the entire width of the leg 19.

[0020] With its upper extremity, the lower rib 20 connects to a downwardly directed rib 22.

[0021] The catch piece 17 is formed of a substantially rectangular element which is shiftably provided in the groove 4 of the wing 2, opposite to the driving piece 16, and which is connected to the part 12 of the coupling 10, provided on the wing 2, for example, by means of a coupling 23.

[0022] At its side directed towards the frame 1, this catch piece 17, at the bottom and near its edge situated at the exterior side of the wing, is provided with a pivot 24 which is seated in said groove 21. In the middle and at the top, the catch piece 17, at said side, is provided with a reinforcement rib 25.

[0023] In an edge of the catch piece 17, a leaf spring 26 is clamped in a recess, said spring pushing against the walls of the groove 4 of the wing 2.

[0024] The second part 12 of the coupling 10 mounted on the wing 2 consists of two flat rods or laths 27 and 28 of synthetic material, which are shiftably provided in the grooves 4 of a lateral edge and of an upper edge of the wing 2, respectively, and which, at the height of the corner, are interconnected by means of a non-rigid corner connection 29, known in itself and schematically represented in Figure 1 by means of a dashed line, said corner connection, for example, comprising a chain which is shiftably guided between two connecting extremities in a tubular profile attached on the wing 2.

[0025] At the underside, the lath 27 is attached to the catch piece 17 by means of said coupling 23. To this aim, this lath 27 has a toothed part at one extremity, for example, at its lateral edges, said part fitting into a complementary toothed part, for example, at the walls of a cavity

at a thickened part of the catch piece 17, such that a solid coupling in the longitudinal direction of the lath 27 is obtained.

[0026] The lath 28 is connected to the scissor-type mechanism 6 by means of a similar coupling 30.

[0027] The scissor-type mechanism 6 according to the invention substantially consists of three mutually connected arms, to wit the actuating arm 31, the auxiliary arm 32 and the connecting arm 33, which, at one extremity, are hingeably provided around pivots, 34, 35, 36, respectively, which are provided on a hinge basis consisting of a base piece 37 and an actuating lath 38 shiftable therein.

[0028] The base piece 37 has the form of a reversed gutter, bent edges of which are provided in the groove 4, at the upper edge of the wing 2, below the extremities of the ribs 5. This base piece 37 is fixed on the wing 2 by means of a safety screw 39 which is screwed into the wing 2 through the base piece 37 and loosely through a longitudinal slot 40 in the actuating lath 38.

[0029] This actuating lath 38 is provided underneath the gutter of the base piece 37 in a manner shiftable in its longitudinal direction and thus parallel to the longitudinal direction of the base piece 37 and protrudes with its both extremities out of the base piece 37. One extremity is connected to the lath 28 of the actuating mechanism 7 by means of said coupling 30 and has an end piece 38A which is provided with a toothed part cooperating with a toothed part on the extremity of the lath 28.

[0030] The pivot 34 on an extremity of the actuating arm 31 is attached to the actuating lath 38, at the location of a widened part 38B thereof. The pivot 34 can be shifted in a longitudinal slot 41 in the base piece 37. This slot 41 is situated closer to the inner side of the wing 2 than the slot 40 situated in the middle of the actuating lath 38.

[0031] Said widened part 38B comes out of the base piece 37 towards the outside, such that the actuating lath 38, at the height of the widened part 34A, is guided through the inside of the wing 2. In this manner, the forces which are exerted onto the pivot 34 and which are responsible for wearing the slot 40 in the base piece 37, are deviated towards the groove 4 in the wing 2, which is more resistant against these forces. In fact, the slot 40 only serves for letting the pivot 34 pass, such that it can drive the arm 31, and not as much for guiding this pivot 34.

[0032] At its extremity 42 distal from the pivot 34, the actuating arm 31 is widened, and at the side which, in open position of the scissor-type mechanism 6, is distal from the connecting arm 33, thus, with a wing 2 opening towards the inside, as in the example, this is at the inside, it is beveled in a step-like manner, such that three catch pins or cams 43, 44 and 45 are formed which successively are situated closer to the pivot 34 and which, when the scissor-type mechanism 6 opens, successively cooperate with a guide directed towards the frame 1 and being inclined in the same sense as the extremity 42, said guide being formed by the inclined edge 46 of a stop 47 which is provided at one extremity of the base piece

37.

[0033] More towards the outer side of wing 2, opposite to slot 41, a second stop 48 is provided on the base piece 37, which stop, during closing, forces the actuating arm 31 to choose the desired course, by coming into contact with an edge 31A of this actuating arm 31.

[0034] At one extremity, by the pivot 35, the auxiliary arm 32 is hingeably connected to the base piece 27 and, at its other extremity, by a hinge pivot 49, is coupled to a part of the connecting arm 33 situated between said extremities. The pivot 35 is sanding, for example, next to the safety screw 39 on top of the part of the base piece 37 forming the stop 47.

[0035] In its central part, the auxiliary arm 32 comprises an opening 50 which is more or less L-shaped, with a groove 51 in the longitudinal direction of the auxiliary arm 32 and, at the side of the pivot 35, a wider part 52 adjoining thereto. Two catch pins 53 and 54, which are provided on the widened extremity 42 of the actuating arm 31, extend through this opening 50.

[0036] The pivot 36 of the connecting arm 33 protrudes through a longitudinal slot 55 in the base piece 37. The connecting arm 33, which connects the frame 1 and the wing 2, is fixed with one extremity, by means of the pivot 36, on a foot 56 which, above the actuating lath 38, is shiftably seated in the base piece 37 and which can not pass through the slot 55.

[0037] At its extremity most distal from the slot 40, the base piece 37, at the underside and at opposite sides of the slot 55, is provided with an inclined part 37A, as represented in detail in Figure 8. As a consequence of these inclinations 37A, the underside of the base piece is inclined towards the actuation lath 38. The slot 55 is provided in a wider slot, and the pivot 36, between the bottom of this slot and the actuating arm 33, is surrounded by a spring 36A which pushes the connecting arm 33 away from the base piece 37.

[0038] When the pivot 36 is situated at the end of the slot 55, as represented in Figure 8, this is in the closed position of the scissor-type mechanism 6, then the foot 56 is situated against the inclined parts 37A, as a result of which the connecting arm 33, by the intermediary of the pivot 36, is drawn against the base piece 37. The spring 36A then is compressed. Due to this spring 36A, the connecting arm 33 will be removed from the base piece 37 when the pivot 36 moves in the slot 55, and the inclined parts 37A are reduced in height or are omitted, such during the opening of the scissor-type mechanism 6. As a consequence thereof, the scissor-type mechanism 6 also will function well with small windows.

[0039] The other extremity of the connecting arm 33 is hingeably connected to the frame 1 by means of a pivot 57 standing on a base 58. This base 58 is placed, with a turning movement, into the groove 4 at the underside of the upper side of the fixed frame 1, such that it engages with one edge under a rib 5 of the groove 4, and, by tightening an inclined pressing clamp 59, is clamped, as represented in detail in Figure 11. By means of a drilling

screw 59A, the base 58 is retained at its place.

[0040] The pivot 57 has a thickened head around which the extremity of the arm 33 is removably provided. This arm 33 is retained on the head of the pivot 57 by a locking wheel 60 which is provided next to the pivot 57 on the arm 33, turnable around a pin 61, and which protrudes with one edge 62 into a groove provided at a part of the pivot 57 protruding at the underside beyond the arm 33.

[0041] As in particular becomes clear from Figure 10, the edge 62 is provided with an interruption 63 which is such that, when it is situated opposite to the pivot 57, the edge 62 no longer prevents the removal of the arm 33 from the pivot 57. A not-represented spring, provided around the pin 61, pushes the locking wheel 60 into that position in which the interruption 63 is situated at a distance from the pivot 57. By turning the locking wheel 60 manually until the interruption 63 is situated opposite to the pivot 57, the arm 33 can be removed from the pivot 57, such that the scissor-type mechanism 6 is freed from the fixed frame 1, and the wing 2 can be tilted entirely, for example, for being cleaned. As soon as the locking wheel 60 is no longer held, it will turn under the influence of the spring back into its original locking position.

[0042] Said reinforcement rib 25 prevents that, when the wing 2, after a complete tilting, is swung back and closed again, the pivot 24 would be situated above the groove 21.

[0043] At the part 12 of the coupling 10, one or more closing pins 64 can be provided which cooperate with stops 65 which are attached to the frame 1. Such closing pin 64, for example, is provided at the connection end of the corner connection 29 coupled to the lath 28. Also at the other side of the scissor-type mechanism 6, such closing pin 64 is provided, which cooperates with a stop 65 on the frame 1, and to this aim, the lath 28 is prolonged beyond the scissor-type mechanism 6 by means of a rod 66 which, by means of a coupling analogous to said coupling 30, is connected to the actuating lath 38 of the scissor-type mechanism 6. The rod 66 itself also can connect, by means of a corner connection, to a rod along an upright edge of the wing.

[0044] Also on the scissor-type mechanism 6, and in particular on the underside of the connecting arm 33, there is a closing pin 67 which, however, does not cooperate with a stop on the fixed frame 1, but with two ribs 68 of a small closing block which is provided on the end piece 38A of the actuating lath 38.

[0045] The working of the tilting window and the pertaining closing system comprising the scissor-type mechanism 6 according to the invention is as follows.

[0046] When the tilting window is closed, as represented in Figures 1 and 7, the scissor-type mechanism 6 is closed and the handle 9 is in its highest position. The closing pins 64 engage behind the pertaining stops 65, and the closing pin 67 is situated between the ribs 68.

[0047] In order to open the tilting frame, the handle 9 is drawn downward. By the intermediary of the rod 14,

the driving piece 16 is moved downward. As the catch piece 17 protrudes with its pivot 24 into the groove 21 of the driving piece 16, it is also moved downward, causing the lath 27 to be drawn downward, too. By means of the corner connection 29, the lath 28 and the actuating lath 38 of the scissor-type mechanism 6 then are moved along the wing 2, to the right hand side as seen in Figures 6, 7, 8, and 12 to 17.

[0048] By the movement of the laths 27 and 28, the closing pins 64 are freed from the stops 65, and the closing pin 67 is brought beyond the ribs 68, such that the connecting arm 33 no longer is blocked, whereas simultaneously, by the movement of the actuating lath 38, also the actuating arm 31 of the scissor-type mechanism 6 is moved to the right.

[0049] At the beginning of the movement of the actuating lath 38, the actuating arm first will be able to move freely over a certain distance until, as represented in Figure 12, it comes into contact with the edge 46 of the stop 47. During this first movement, the groove-shaped part 51 of the auxiliary arm 32 is parallel to the shifting direction of the arm 31, as a result of which the catch pins 53 and 54 of the actuating arm 31 can move freely in this groove-shaped part 51. During this first movement, the position of the other arms 32 and 33 of the scissor-type mechanism 6 thus will remain undisturbed, and consequently the tilting window still will remain closed.

[0050] During the further displacement of the actuating lath 38, the cam 43 slides over the edge 46 of the stop 47, and the actuating arm 31 is rotated outward until, as represented in Figure 13, the first cam 34 comes to the end of edge 46 and the second cam 35 at that moment comes into contact with this edge 46.

[0051] The form of the edge 47 provides for that the actuating arm 31 is forced to rotate, which can be necessary with relatively heavy windows, whereby the natural lever of the scissor-type mechanism 6 is not sufficient for pushing the window open.

[0052] By rotating the actuating arm 31, also the auxiliary arm 32, due to the guiding of the catch pins 52 and 53 in the opening 50, is turned outward around its pivot 35, and moreover also the connecting arm 33, due to the hinge connection 49, is turned outward around its shiftable pivot 36, such that the wing 2 opens towards the inside.

[0053] As the base 58 is a fixed point of the frame 1, the shiftable pivot 36 hereby moves to the right in the slot 55.

[0054] Considering the limited available space between the frame 1 and the wing 2, the distance D between the pivot 34 of the actuating arm 31 and the contact point of the cam 43 with the stop 47, measured perpendicular to the shifting direction of the actuating lath 38, is chosen as large as possible, such that a maximum lever effect is obtained for turning the actuating arm 31, as a consequence of which also heavier tilting windows can be pushed open by the user without major effort.

[0055] When the actuating lath 38 is pulled even further

to the right, then, as represented in Figures 14 and 15, first the second cam 44 and thereafter also the third cam 45 will slide over the edge 46, and the arms 31, 32 and 33, in the same manner as during the previous shifting, will continuously be spread further until, as represented in Figure 28, the center of gravity G of the wing 2 comes beyond the vertical line through the hinges 3, and the wing 2, due to its own weight, is inclined to tilt further open automatically, as a result of which a further opening of the tilting window becomes possible without an additional lever effect of the scissor-type mechanism 6.

[0056] When the pivot 34, as represented in Figure 9, reaches the end of the slot 41, the tilting window is opened to its maximum.

[0057] The form of the ribs 20 is chosen such that the pivot 24, during the tilting open of the wing 2, on one hand, can move unhampered in the groove 21 and, on the other hand, maximally transmits the forces between the driving piece 16 and the catch piece 17 in vertical direction.

[0058] For closing the tilting window, the reversed manner of working is performed, and the actuating lath 38 is pushed back to the left by the actuating mechanism 7. It is clear that in this case, the scissor-type mechanism 6 is operated in the reversed sense.

[0059] When, at the end of the closing movement, as represented in Figure 16, the tilting window is almost completely closed and the lever effect on the actuating arm 31 is minimum, the further closing of the tilting window is enhanced in that the stop 48, during the further shifting of the actuating arm 31, pushes against the edge 31A and thereby pushes the arm 31 inwards up into the completely closed position, as represented in Figure 17. During this last movement of the actuating arm 31, also the closing pins 64 and 67 of the tilting window are locked.

[0060] The upper side of the base piece 37 of the scissor-type mechanism 6 is somewhat beveled in order to allow for that the outwardly turning extremities of the arms 31, 32 and 33 also can move vertically, even in a limited manner, in order to allow for the vertical movement H of the pivot 57 during the tilting of the wing 2. To the same end, the arm 33 is manufactured of spring steel in order to be able to bend along sufficiently with low tilting windows which are characterized by a large movement H.

[0061] In case of large tilting windows, it is possible to provide, beyond the already described scissor-type mechanism 6, one or more similar scissor-type mechanisms which are operated together with the first scissor-type mechanism 6 in order to obtain a better distribution of forces.

[0062] The scissor-type mechanism 6, the lath 28 and the corner connection 29 are connected to each other and slid into the groove 4 in the upper edge of the wing 2. The base piece 37 of the scissor-type mechanism 6 is attached by means of one single safety screw 40. The lath 27 with the catch piece 17 is slid, starting from the underside, into the groove 4 on an upstanding edge of the wing 2, and the lath 27 is connected to the corner

connection to During mounting, the catch piece 17 is kept in its place by the clamping force of the leaf spring 27.

[0063] In order to allow guaranteeing, during mounting, the just position of the catch piece 17, this latter can be provided at its underside with a small hook which can be broken away. When this small hook rests against the underside of the wing, the catch piece is situated at the correct distance to the tilting axis. With the first movement of the catch piece 17, this small hook breaks off.

[0064] The downwardly directed rib 22 of this catch piece 17 prevents a faulty coupling to the driving piece 16.

[0065] The window does not necessarily have to be provided with an inwardly tilting wing 2. The tilting window also may have an outwardly tilting wing 2. It is clear that in such case, the terms anterior or front side' in the foregoing description must be replaced by exterior or back side'.

[0066] In the represented example, the frame 1 and the wing 2 are manufactured of aluminum profiles, however, it is clear that they may also be manufactured of profiles of another material, such as steel or synthetic material or of wooden beams. In Figure 19, in fact a cross-section of a part of a window is represented consisting of profiles of synthetic material reinforced with metal profiles. The grooves 4 then are situated in the edges of wing 2, however, countersunk.

[0067] On account of the small force it requires, the scissor-type mechanism 6 described in the foregoing is particularly suited for being used in a closing system with an actuation mechanism 7, as described in the foregoing, however, it is clear that this scissor-type mechanism also can be used with other actuating mechanisms and, for example, with actuating mechanisms comprising a handle provided on the wing or the fixed frame.

[0068] The present invention is in no way limited to the form of embodiment described as an example and represented in the figures, however, a scissor-type mechanism according to the invention and a tilting window equipped with such a mechanism can be realized in various forms and dimensions, without leaving the scope of the invention.

Claims

1. Scissor-type mechanism for a tilting window comprising a scissor base with a base piece (37) and an actuating lath (38) which can be shifted in respect to this base piece (37), and at least two arms (31,32,33), **characterized in that** it comprises three arms (31,32,33), to wit a connecting arm (33) attached at the base piece (37) hingeing as well as shiftable, an auxiliary arm (32) which, on one hand, is hingeably attached between the extremities of the connecting arm (33) and, on the other hand, is hingeably connected to base piece (37) and an actuating arm (31) which, on one hand, is hingeably attached on the actuating Lath (38) by means of a pivot (34)

which can be shifted in a slot (41) in the base piece (37) and, on the other hand, is coupled to the auxiliary arm (32) by means of at least one catch pin (53,54) protruding through an opening (50) in this auxiliary arm (32), whereby the extremity of the actuating arm (31) cooperates with a guide (46) provided on the base piece (37), in such a manner that, when the actuating lath (38) is shifted into a direction in respect to the base piece (37), the actuating arm (31) bumps with its extremity against the guide (46) and is forced to rotate, and therefore, by means of the catch pin (53,54), rotates the auxiliary arm (32) which, in its turn, rotates the connecting arm (33).

2. Scissor-type mechanism according to claim 1, **characterized in that** the guide (46) is directed inclined onto the longitudinal direction of the base piece (37) and that also the extremity of the actuating arm (31) is beveled.

3. Scissor-type mechanism according to claim 2, **characterized in that** the extremity of the actuating arm (31) is inclined in a step-shaped manner and shows at least two, and preferably three, cams (43,44,45) which successively can come into contact with the guide (46).

4. Scissor-type mechanism according to claim 1 or 2, **characterized in that** on the actuating arm (31), two catch pins (53,54) are provided which protrude into the opening (50) in the auxiliary arm (32).

5. Scissor-type mechanism according to claim 4, **characterized in that** the opening (50) in the auxiliary arm (32), which is more or less L-shaped, consists of a groove (51) and, at the side of the hingeable attachment of the auxiliary arm (32) at the base piece (37), of a wider part (52).

6. Scissor-type mechanism according to any of the preceding claims, **characterized in that** at the base piece (37) at the side reversed from the slot (41) through which the pivot (34) extends, a stop (48) is provided which cooperates with a lateral edge (31A) of the actuating arm (31) and which, over a distance from the shifting of this actuating arm (31), can prevent the tilting thereof.

7. Scissor-type mechanism according to any of the preceding claims, **characterized in that** it comprises a base (59) upon which a pivot (57) is provided, around which an extremity of the connecting arm (33) can be rotated, which pivot (57) is provided with a groove around its entire circumference, whereas next to this pivot (57), a locking wheel (60) is fixed on the connecting arm (33) in a rotatable manner and which has an edge (62), which protrudes into the groove, however, is provided with an interruption (63), such

that, when the interruption (63) is situated opposite to the pivot (57), the connecting arm (33) can be freed from the pivot (57) .

8. Scissor-type mechanism according to any of the preceding claims, **characterized in that** the actuating lath (38) has an end piece (38A) at one extremity, said end piece being provided with at least one rib (68), whereas, on the connecting arm (33), a closing pin (67) is provided which, with closed scissor-type mechanism (6) and for a position of the closing lath (38), engages behind this rib (68) in order to prevent the scissor-type mechanism (6) from opening. 5
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9. Scissor-type mechanism according to any of the preceding claims, **characterized in that** it is mounted between a fixed frame (1) and a wing (2), and the base piece (37), by means of a safety screw (39) extending through said base piece (37) and a slot (40) in the guide lath (38), is screwed into the wing (2). 15
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10. Scissor-type mechanism according to any, of the preceding claims, **characterized in that** the connecting arm (33), hinging as well as shiftably, is connected to the base piece (37) by means of a pivot (36) which protrudes through a slot (55) in the base piece (37) and is connected to a foot (56) which is shiftably seated between the actuating lath (38) and the base piece (37), whereby at the end of slot (55), where the pivot (36) is situated in the closed position of the scissor-type mechanism (6), the base piece (37), at the side directed towards actuating lath (38), comprises at least one inclined part (37A) directed towards the extremity inclined towards the actuating lath (38) and cooperating with the inclined part (37A), whereas the pivot (36) is surrounded by a spring (36A) pushing the connecting arm (33) away from the base piece (37). 25
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11. Tilting window, **characterized in that** it comprises a scissor-type mechanism (6) according to any of the preceding claims. 45
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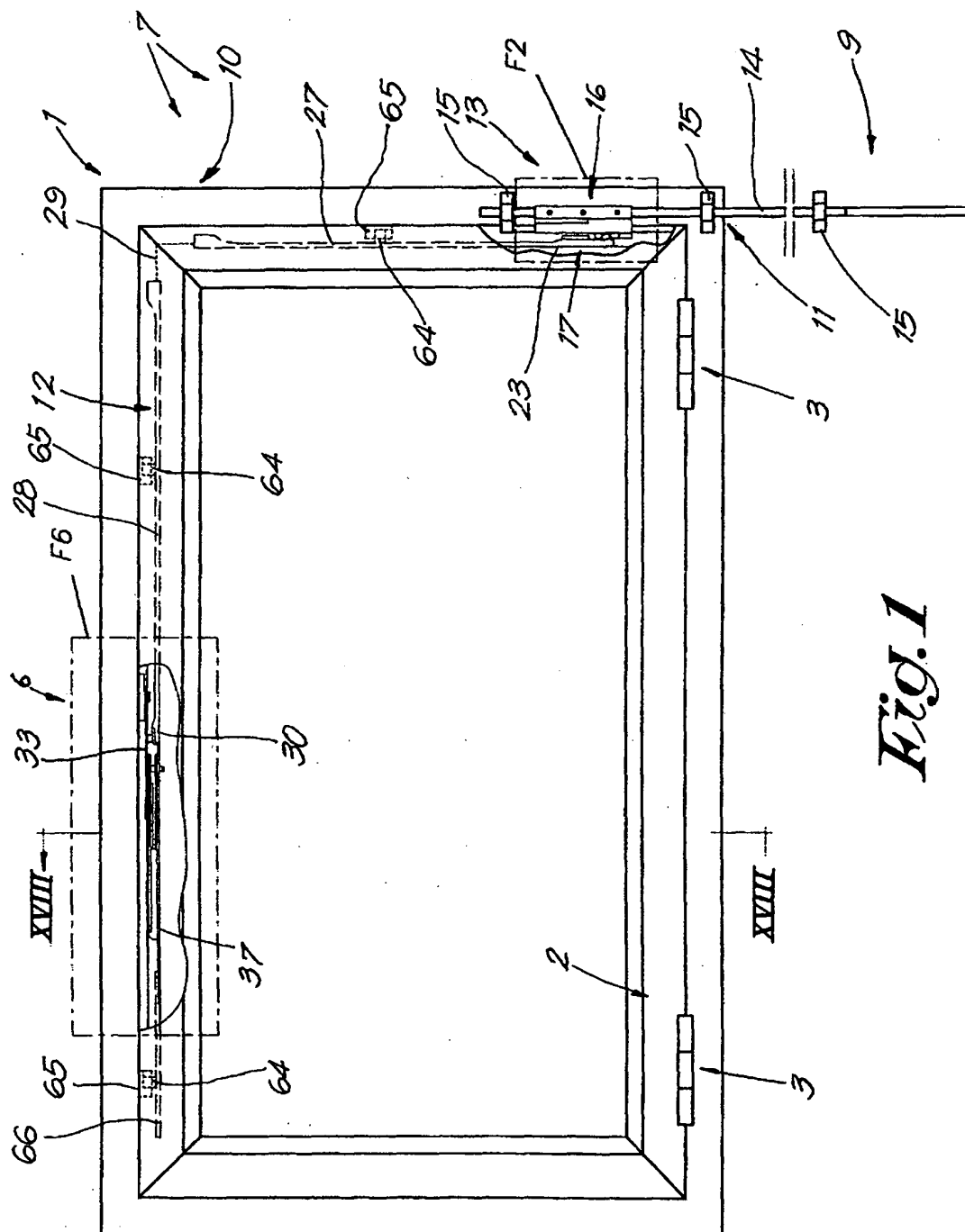


Fig. 1

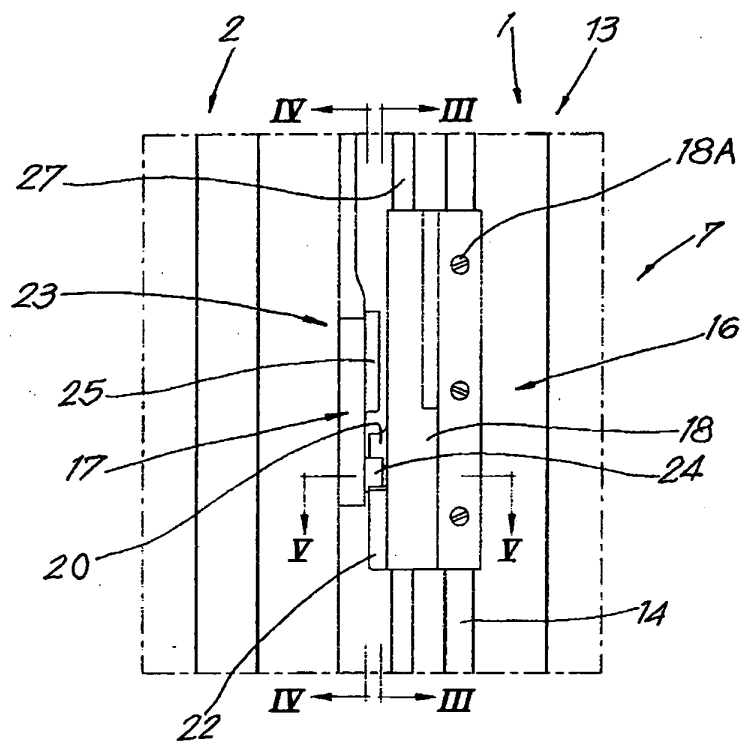
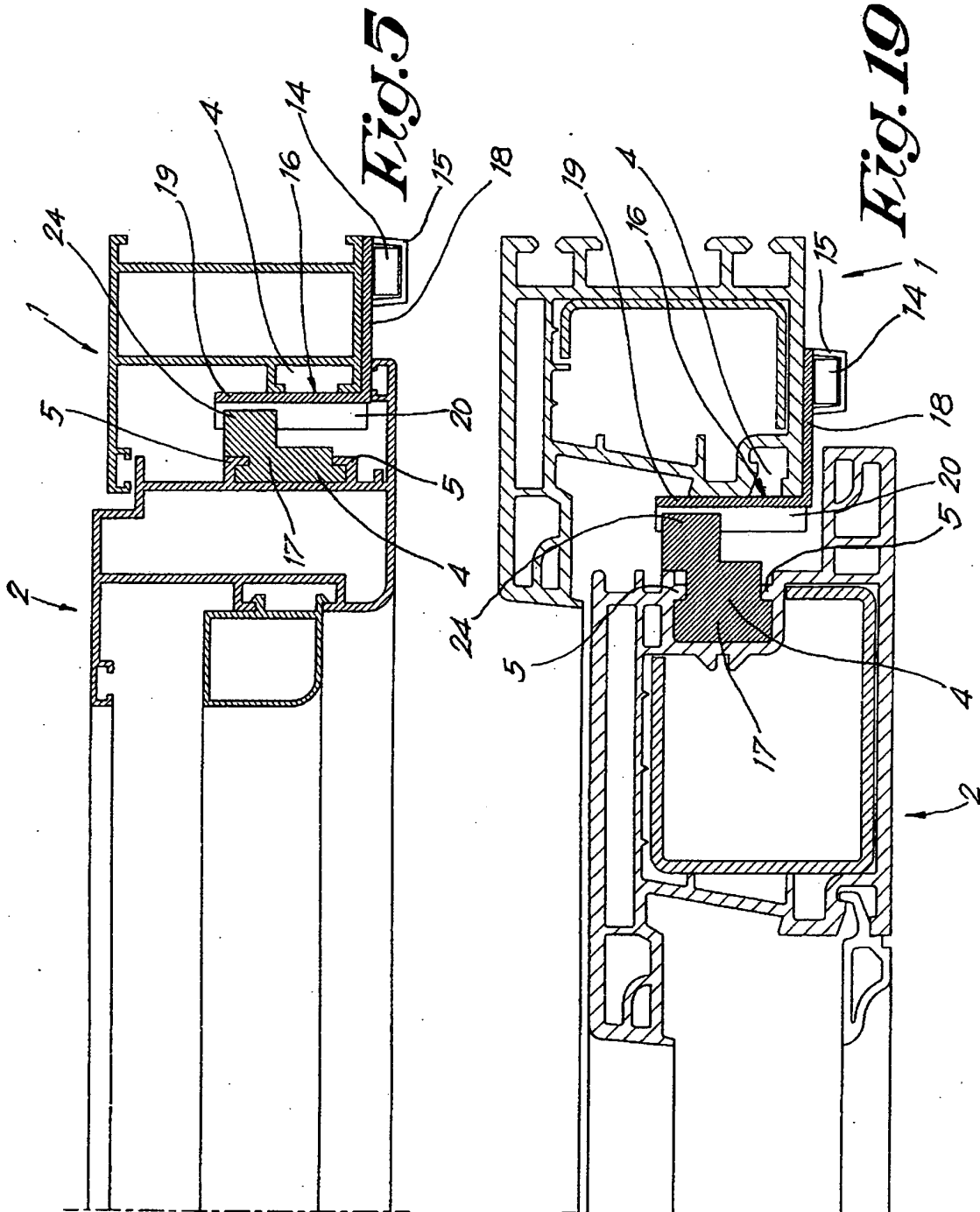
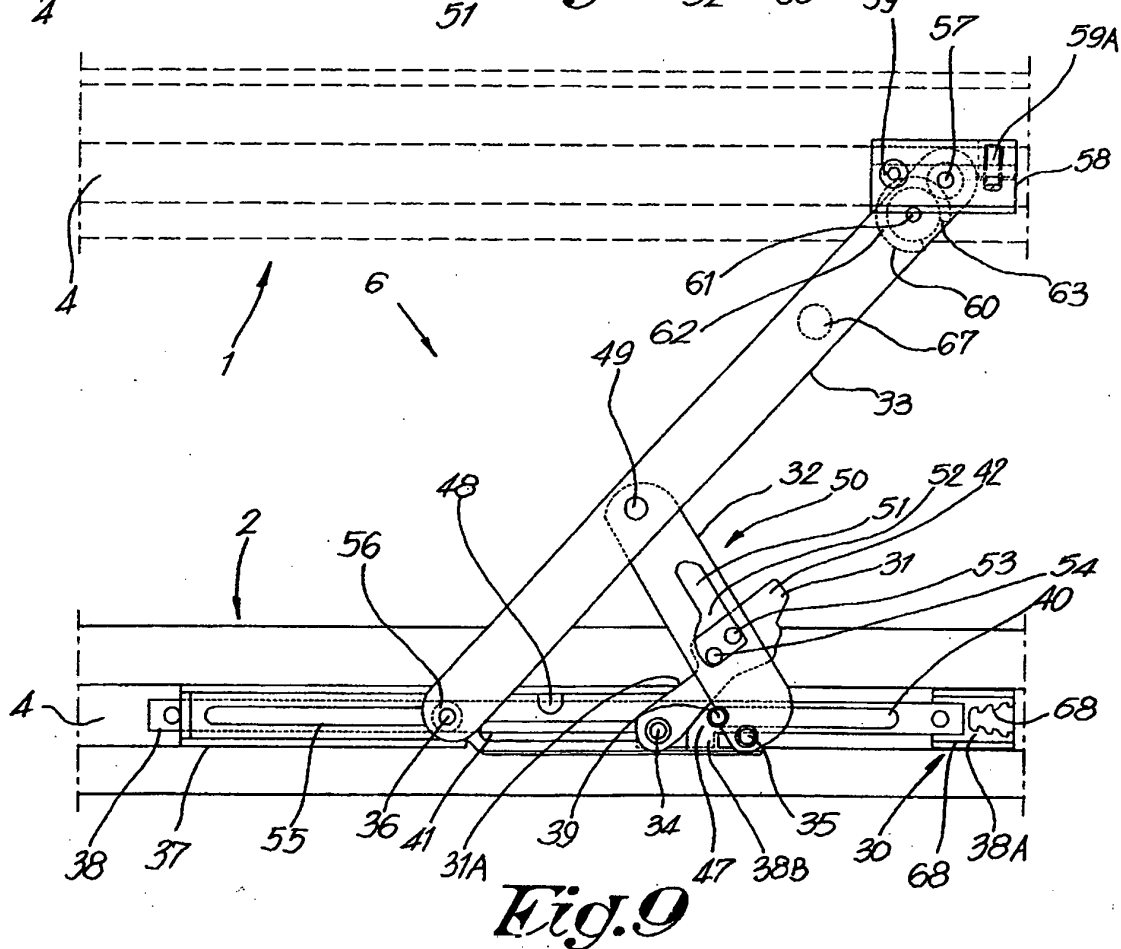
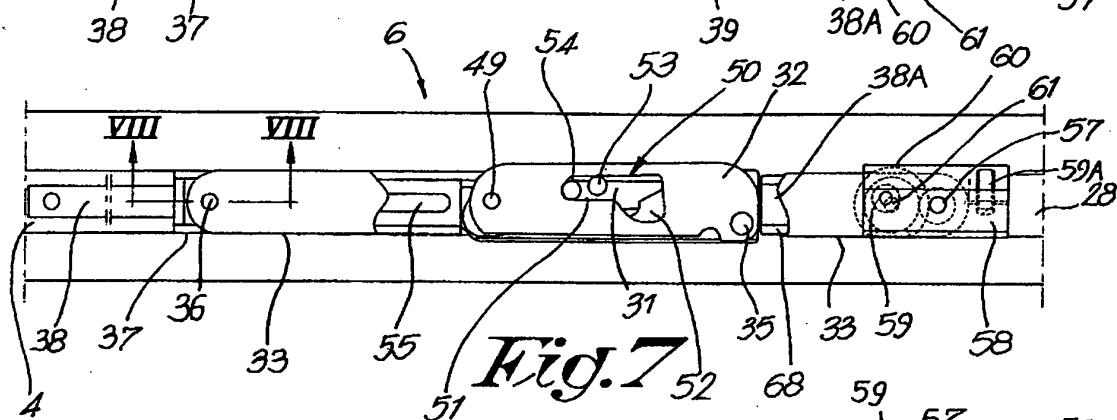
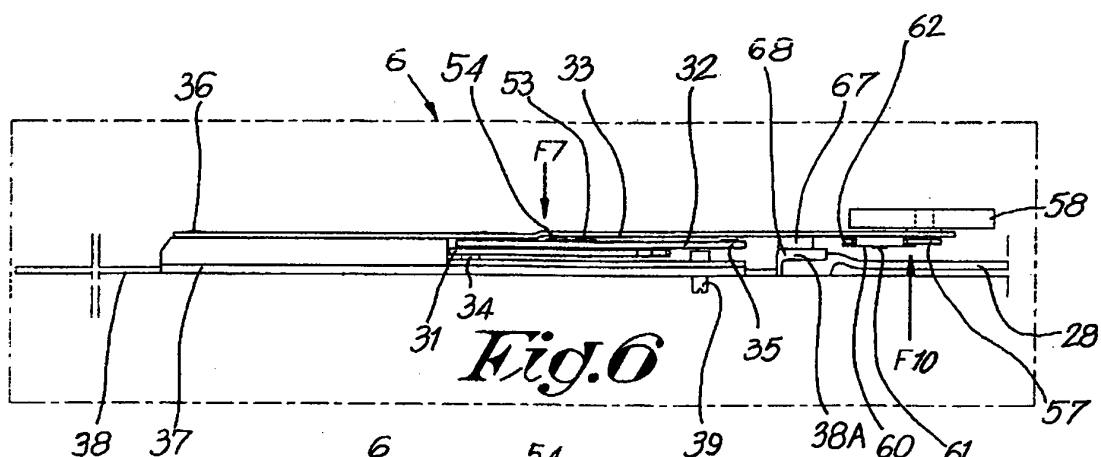
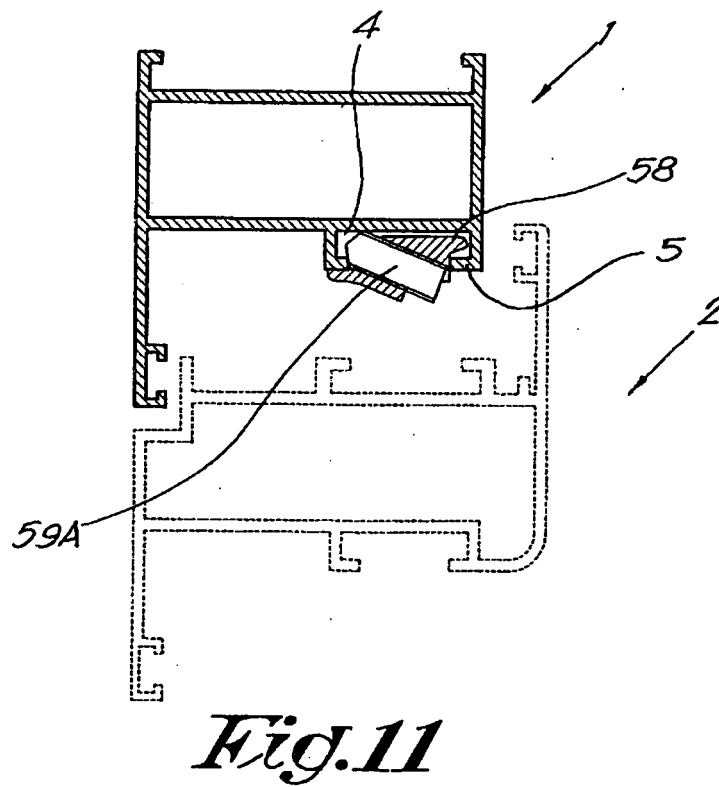
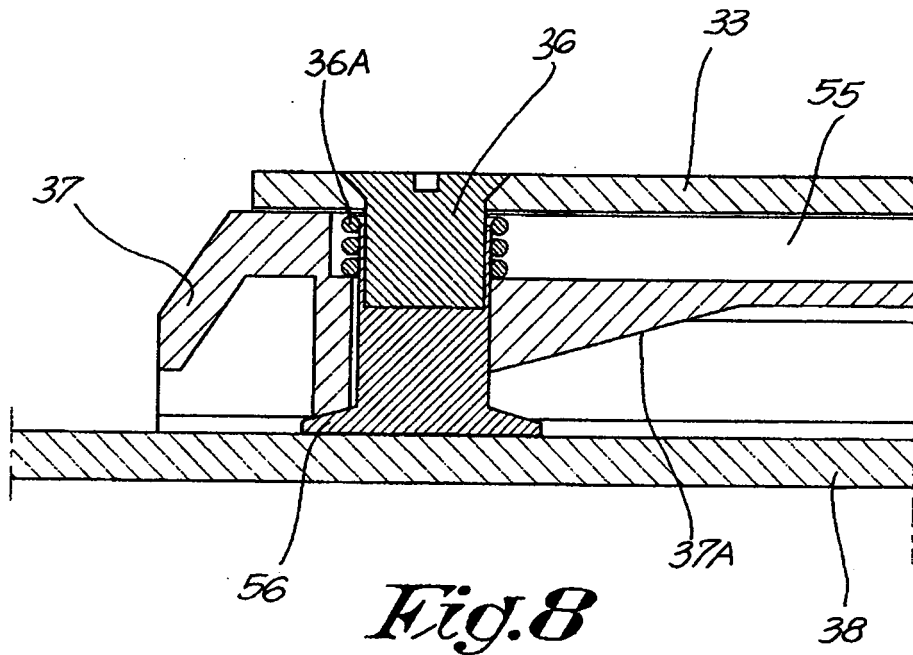
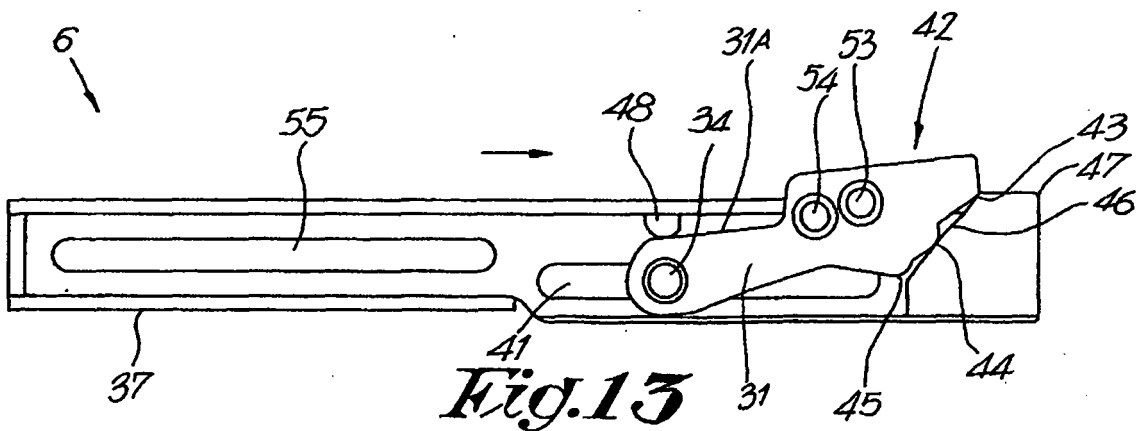
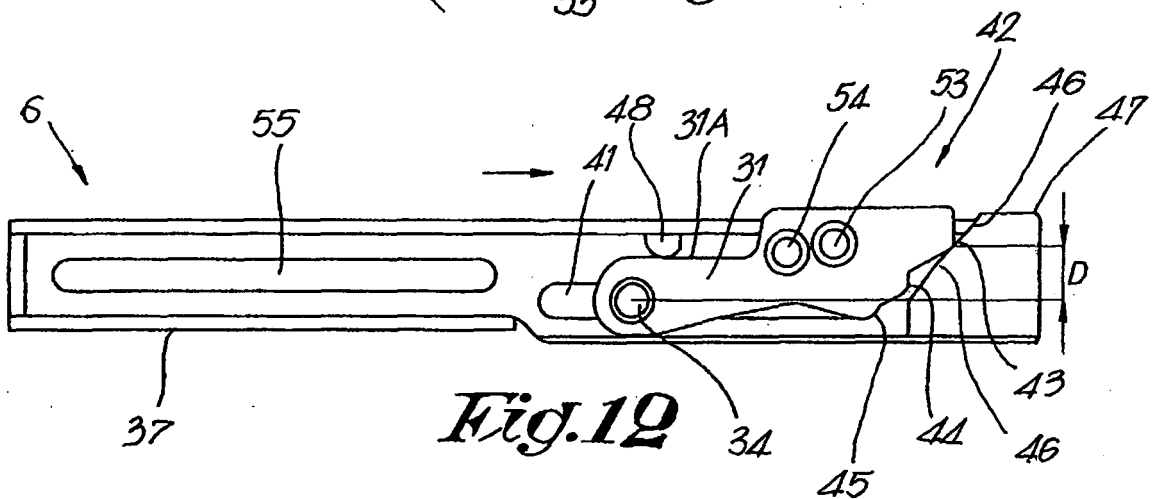
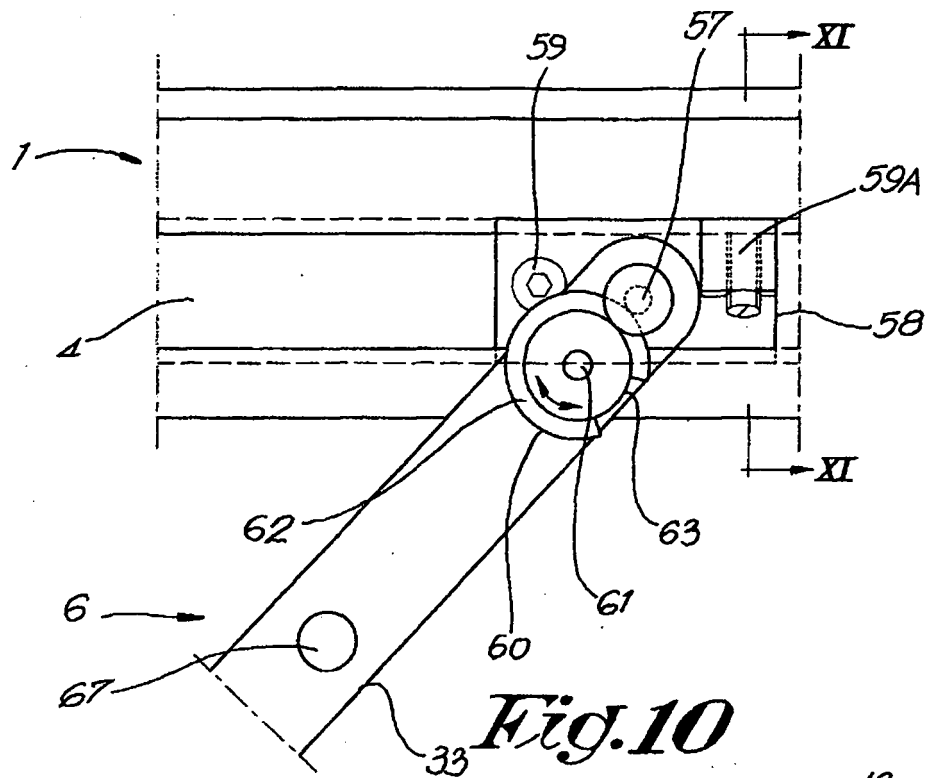


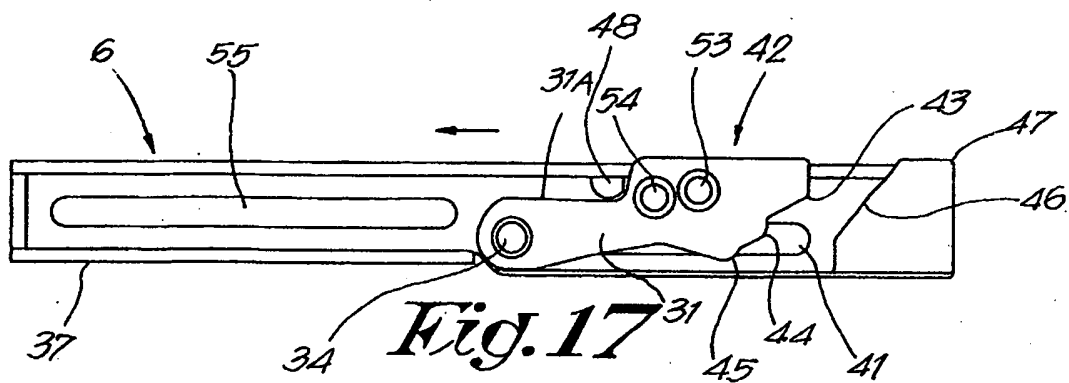
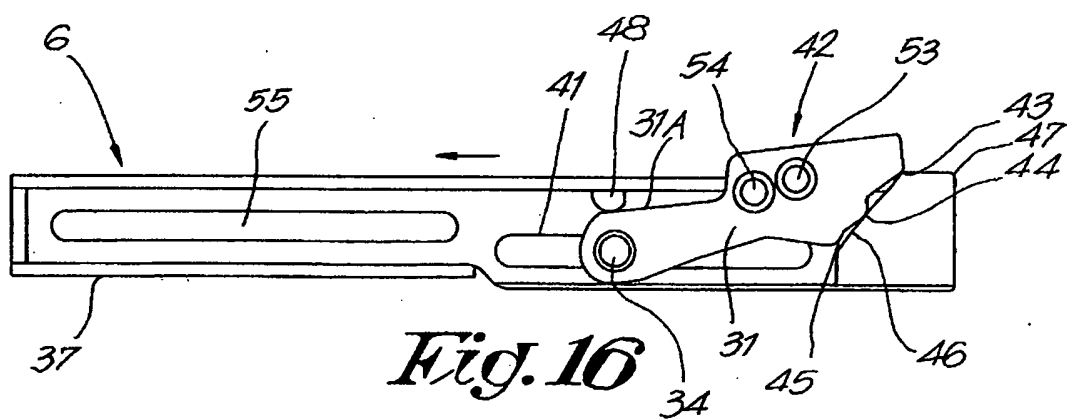
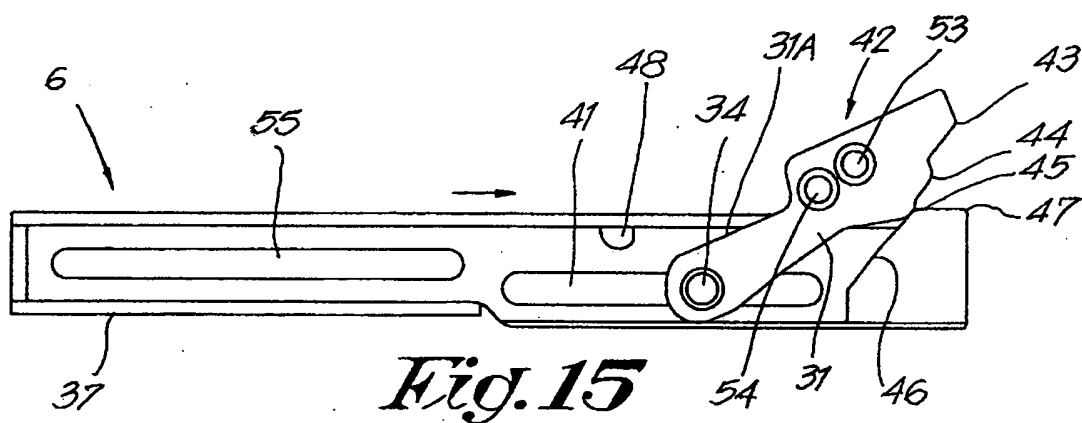
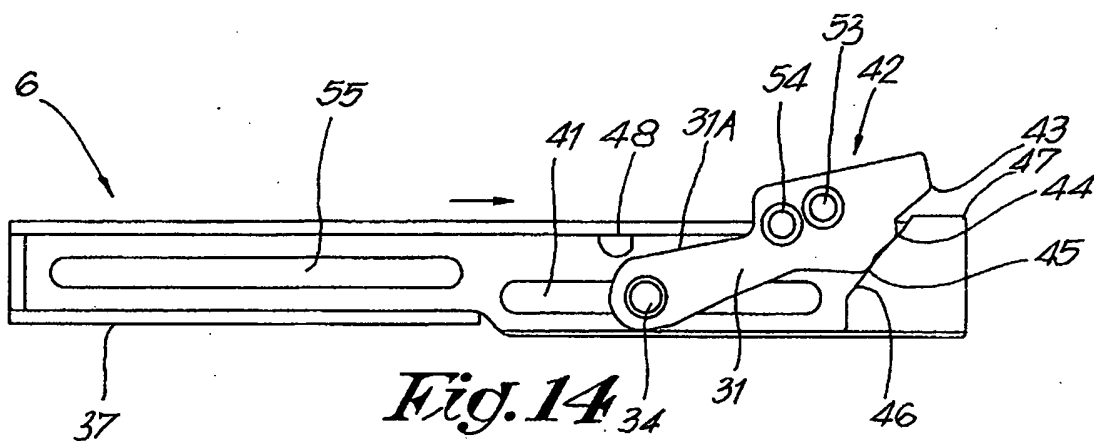
Fig. 2











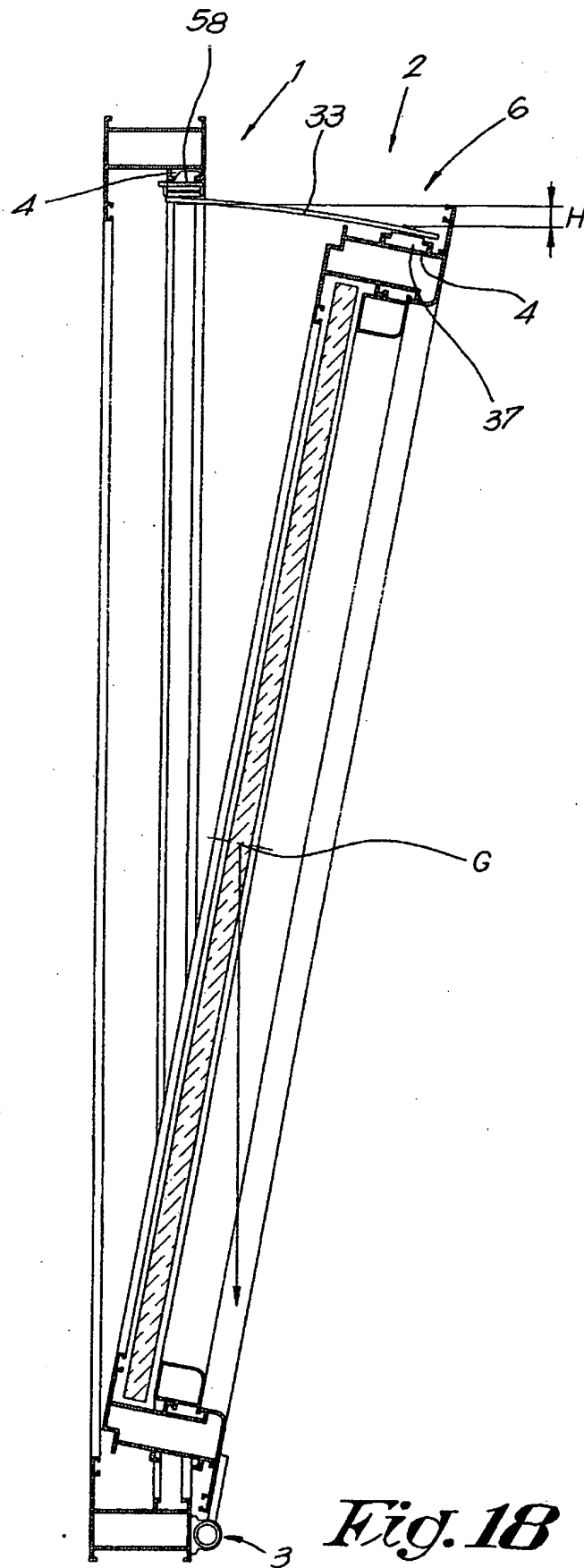


Fig. 18