(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 916 794 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.05.1999 Bulletin 1999/20

(51) Int Cl.[6]: **E05D 15/10**

(21) Application number: **98610028.7**

(22) Date of filing: **18.08.1998**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **11.11.1997 DK 128097**
10.03.1998 DK 32698

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(54) A sliding window or door arrangement

(57) In a window or door arrangement for a building facade, a sliding window or a sliding door is mounted side by side with a fixed building element, e.g. a window or panel portion, such that in the closed position, the mobile sash of the sliding window or door (48) is flush with the fixed building element.

By means of displacement fittings comprising a trolley (54, 55) which is supported in a longitudinally displaceable way by a guide rail (53) fastened to the bottom member (52) of the frame structure and is connected by parallel carrier arms (56, 57) to the mobile sash (48), the mobile sash can move by translatory motion to a start location in the displacement plane for subsequent sideways displ-acement therein towards an open position, in which it overlaps the fixed building element.

Releasable retaining means (65, 70) assure that the sash (48) during the sideways displacement is retained in the displacement plane.

By the translatory motion between the closed position and the start location in the displacement plane, the sash (48) is secured against sideways displacement towards collision with the fixed building element.

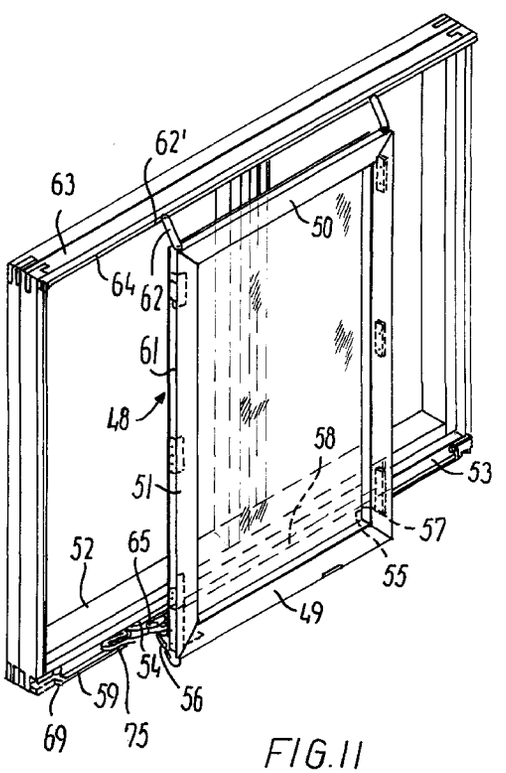

FIG.11

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Description

[0001] The present invention relates to a window or door arrangement for a building facade, comprising a frame structure, in which a sliding window or door is mounted side by side with a fixed building element, e.g. a window or panel part, said sliding window or door having a sash connected to the frame structure by displacement fittings in such a way that, in a closed position, the sliding window or door is flush with the fixed building element, but is displaceable by translatory motion to a location outside the closed position in a displacement plane extending parallel to the fixed building element, but in a distance therefrom, the sliding window or door being movable by sideways displacement in the displacement plane between said location and an open position overlapping the fixed building element, said displacement fittings comprising a stationary guide rail fixed with respect to the frame structure and having a length corresponding to the total width of the sliding window or door and the fixed building element, a trolley supported by said guide rail in a longitudinally displaceable manner, a bottom sash member of the sliding window or door being pivotally connected with said trolley through mainly parallel carrier arms, retaining means comprising a retainer arm being provided for retaining the sliding window or door in the displacement plane during said sideways displacement and releasing means for said retaining means comprising stop means stationary with respect to the guide rail and to act on the retainer arm.

[0002] In conventional designs of such window and door arrangements, the sliding window or door is also disposed in the closed position, in the displacement plane displaced in parallel with respect to the fixed building element. On one hand, this entails a dislocation in the facade between the sliding window or door and fixed building element, which for aesthetic reasons is undesirable, and on the other hand problems of assuring sufficiently effective sealing in the closed position, as when opened and closed, the sealing between the sash and frame of the sliding window or door is exposed to displacement loads causing both increased wear of the gaskets and difficulty in obtaining a sufficient sealing pressure while maintaining low friction in the opening/closing movement.

[0003] In a parallel-displacement fitting for sliding windows and doors of the above design, known from EP-B-0 103 725, these problems are solved in the way that in the closed position the sliding window or door is kept flush with the fixed building element without facade dislocations as the opening movement starts and the closing movement ends by said translatory motion of the sash between its location in the closed position and the displacement plane disposed in parallel with respect to said location, said translatory motion being essentially perpendicular to the displacement plane.

[0004] In this known fitting design which is mainly intended for mounting of sliding windows or doors having frame and sash structures of wooden profiles, the release of the retaining means activated at termination of the sideways displacement in the closing direction in the displacement plane is effected through a cooperation of said retainer arm, which is connected to the forward carrier arm in the closing direction between the sash and the trolley, with a fixed stop connected with the guide rail, that during said translatory motion, the trolley is forced to move back against the closing direction when the sash bottom member is moving to its closing position. As a consequence, at the end of closing movement, the sash occupies a tilting position, from which its top member must be brought in place to reach its closing position by manual operation, perhaps using appropriate fittings. For this purpose is required an active safeguarding of the sash bottom member by engagement between a stationary spring-loaded safety bolt connected with the guide rail and an engagement element connected with the sash, e.g. in the form of a knot projecting from the carrier arm connected to sash.

[0005] On the other hand, when the sliding window or door is to be opened, the sash must first be brought into the said tilting position by manual operation before the translatory motion towards the displacement plane is started by bringing the retainer arm of the retaining means out of engagement with the fixed stop on the guide rail. During the subsequent translatory motion there may be a risk of sideways displacement of the sash towards collision with the fixed building element, before the sash fully reaches the displacement plane.

[0006] The object of the invention is to remedy these functional inconveniences of the above known fitting design and to provide a window or door arrangement of the stated kind with such a functional performance of the termination of the closing movement and the start of the opening movement that a tilting position of the sash can be avoided, and at the same time the sash is secured against unintentional collision with the fixed building element.

[0007] Therefore, a window or door arrangement of the stated kind is according to the invention characterized in that said releasing means is disposed for affecting release of the retainer arm while retaining the trolley in an end position in the displacement plane during said sideways displacement of the sash in a closing direction from the open position towards said location, the displacement fittings further comprising a locking element which on release of the retainer arm in said end location is activated to engage locking means in connection with the guide rail in order to prevent or limit sideways displacement of the sash during said translatory motion.

[0008] This design of the releasing means of the retaining means results in a continuous movement of the trolley between its locations in the closed and open positions of the sliding window or door, such that occupation of a tilting position can be avoided by using a passive displacement fitting with a guide rail, a trolley and

swivel arms between the top members of frame structure and the sash. As the trolley is retained against movement during the translatory motion, there is at the same time obtained an active safeguarding against sideways displacement of the sash during movement between the closing position and the displacement plane such that the risk of collision with the fixed building element is avoided.

[0009] In particular in sliding doors or large and heavy windows, however, the sash top member is appropriately connected with a top member of the frame structure through further displacement fittings which are controlled synchronously with the displacement fittings connected to the sash bottom member.

[0010] As known per se from the above EP Publication, the retaining means can be designed such that said retainer arm has in one end a pin which is journalled to be rotationable and longitudinally displaceable in a longitudinal track in the trolley, said track having in one rear end with respect to the closing direction a short angular track section for arresting the pin connected with the retainer arm, said stop having an inclined stop face, facing backwards with respect to the closing direction, for said pin on the retainer arm.

[0011] In connection therewith, a preferred embodiment can be obtained in that an opposite end of the retainer arm is pivotally connected with the forward carrier arm with respect to the closing direction. Said stop means can thus be formed by an inlet wall portion at the rearward end with respect to the closing direction of a longitudinal track in a guideway element stationary with respect to the guide rail and forming a stop for the movement of the trolley in the closing direction.

[0012] A particularly preferred embodiment is, however, obtained in that said pin on the retainer arm is also in engagement with a longitudinal track provided in an arm pivotally connected with the trolley and having a centre of rotation at its forward end with respect to the closing direction, which arm being activated by release of the retainer arm to turn to a locking position in which said longitudinal track coincides with the longitudinal track in the trolley.

[0013] Whereas in the known design according to said EP publication the displacement fittings is positioned on the inside of the sliding window or door under a projecting cover profile, e.g. of aluminium, which to a considerable extent disfigures the appearance of window or door arrangement and furthermore makes the fittings unsuitable for a possible outer mounting, an appropriate design of the window or door arrangement according to the invention permits to a great extent an invisible mounting of the entire displacement fittings by providing said bottom member of the sash with an essentially horizontal wall portion under a glass or panel area retained in the sash and a downward front section under the horizontal wall portion, the displacement fittings being mounted under the horizontal wall portion and behind the front section.

[0014] The invention is explained further in the following with reference to the schematical drawing, in which

Fig. 1 is a plane view of a sliding window and an adjacent building element in the form of a fixed window portion,
Fig. 2 is a horizontal view, partly in section according to the line II-II in Fig. 1,
Fig. 3 is a sectional view according to the line III-III in Fig. 1,
Fig. 4 shows a design of active safety means at one carrier arm of the displacement fittings in the embodiment in Fig. 2,
Fig. 5 is a horizontal view of a first preferred embodiment of the window or door arrangement according to the invention,
Fig. 6 is a vertical sectional view of the embodiment in Fig. 5 with the sash in the closed position,
Fig. 7 is a vertical sectional view along the line VII-VII in Fig. 5,
Figs. 8-10 are horizontal views corresponding to Fig. 5 illustrating different phases of the termination of the closing movement of the sash,
Fig. 11 is a perspective drawing of another particularly preferred embodiment,
Figs 12 and 13 are perspective views on a larger scale of details of the embodiment in Fig. 11, and
Figs. 14-16 are horizontal views illustrating different phases of the closing movement of the sash in the embodiment in Figs. 11-13.

[0015] The window arrangement 1 in Fig. 1 has a frame structure 2 in which a sliding window with a sash 4 is mounted side by side with a fixed window part 3. The sash 4 can from a closed position, which is shown by a full line in Fig. 2 where it is flush with the fixed window part 3, be moved by sideways displacement in a displacement plane extending parallel to, but in a distance from the fixed window part 3 to a fully open, displaced position overlapping the fixed window part 3.

[0016] In Fig. 2 the location 4' of the sliding sash is shown by dotted line in the displacement plane outside its location in the closed position. In the location displaced in parallel, the sash 4 is ready for sideways displacement in the displacement plane towards the open position.

[0017] The sash bottom member 4 is, as shown in Figs. 2 and 3, connected with the bottom member of the frame structure 2 by means of parallel displacement fittings comprising a guide rail 5 which in the shown embodiment is fastened to the frame bottom member 2 along its outside and extends in the entire length of the bottom member, i.e. along both the sliding sash 4 and the fixed window part 3.

[0018] As shown in Figs. 2 and 3, a trolley 6 with sliders or rollers 6a is supported in a longitudinally displaceable way on the guide rail 5 and can thus be moved freely in the entire length of the guide rail 5 between the

location 4' shown in Fig. 2 and the fully open position of the sliding sash.

[0019] In the shown embodiment, the trolley 6 has essentially the same length as the width of the sliding sash 4 connected at its bottom member with the trolley 5 by parallel, pivoting carrier arms 7 and 8, each of which is in one end rotationally connected with the trolley 6 and in the other end with the sash bottom member 4.

[0020] When opened, the window sash 4 is first led from the closed position, which is shown by a full line in Fig. 2, towards the parallel-displaced location 4' shown by a dotted line by a translatory motion, the carrier arms 7 and 8 being turned at their rotatable connections with the trolley 6 and the sash 4. From the location 4' the sash 4 can then be displaced sideways in parallel with the fixed window part 3 by moving the trolley 6 along the guide rail 5 to the fully opened position where an opening corresponding to the width of the sash 4 is exposed.

[0021] The carrier arm 8 is rotatable in a bearing 9 on the sash bottom member 4 and is in fixed connection with a bar 10 which in or along the sash side member 11 is led up to another bearing (not shown) at the sash top corner, above which it is connected with an end of a swivel arm (not further shown) corresponding to the rotating arm 8. The opposite end of this further swivel arm is pivotally connected with a slider or a roller which is mounted in a longitudinally displaceable way on a rail (not shown) extending along the top side of the sash 4. In cases of broad sashes or doors, a corresponding carrier arm may be provided in the opposite corner, and the upper rail extends then just as the guide rail 5 along both the sliding window and the fixed window part 3. In the case of two swivel arms, these may expediently be mutually connected by a bar to assure their synchronous movement with each other.

[0022] An operating handle 10' positioned on the sash side member 11 is in a known manner connected with a bar embedded in the side member and has means for engagement with a striker plate in the frame side member for locking of the sash 4 in the closing position. The sash 4 is released for opening by turning of the operation handle 10' in the opposite direction of the locking position whereupon the sash 4 can be displaced outwards towards the location 4' in Fig. 2.

[0023] During the translatory movement a catch arm 8' firmly connected with the carrier arm 8 assures by engagement with a roller 8'' on the underside of the guide rail 5 that the sash 4 cannot be displaced sideways, whereby the risk of collision with the fixed window part 3 is avoided.

[0024] The catch arm 8' is in Fig. 4 shown in engagement with the roller 8'', and the carrier arm 8 is by dotted line shown in the position corresponding to the sash position 4' shown by the dotted line in Fig. 2 where the catch arm 8' has just left the engagement with the roller 8''. In this position the sash can therefore be displaced by the movement of the trolley 6 along the guide rail 5.

[0025] As shown in Fig. 4, at its guide edge against the roller 8'' up against the carrier arm 8, the catch arm 8' has a radius r a little larger than that of the roller, and transforms then into a circular arc with a larger radius R and centre in rotatable connection of the carrier arm 8 with the trolley 6 so that the carrier arm 8 guided by the catch arm 8' can turn until the sash is in the location 4' from where the sash can then be displaced along the fixed window part without colliding with it.

[0026] In order to retain the sash 4 in the displacement plane during this sideways displacement, a retainer arm 14 is in its one end rotationally connected with the sash bottom member 4 at a point between the pivoting connections of the carrier arms 7 and 8 with the sash bottom member whereas it in its other end as shown in Fig. 2 has a pin 15 longitudinally displaceable in a track 16 in the trolley 6, said pin being retained in a short angular track section by impact in the left end of the track.

[0027] The sash 4 is thus retained in the displacement plane as long as it is in locations between the location 4' displaced in parallel and the fully opened position.

[0028] When moving the sash 4 in the closing direction from the fully opened position towards the location 4', a knot 18 in firm connection with the guide rail 5 and with an oblique stop face facing rearwards with respect to the closing direction will press the pin 15 out of the angular track section 17 immediately before the sash reaches the location 4', whereby the pin 15 is again longitudinally displaceable in the track 16, and the sash is released to the translatory motion towards the closed position. During the movement of the sash towards the closed position, the catch arm 8' engages again the roller 8''.

[0029] In the shown embodiment, the carrier arms 7 and 8 are, as seen in Fig. 3, designed with such a crank that they may avoid a sash bottom member coinciding with the sash bottom member 4 on the fixed window part 3, if such a bottom member is used, e.g. in order that the fitting parts are not visible from the outside and in order to shield against the weather.

[0030] To secure a free passage of the pin 15 of the retainer arm 14 at the movement of the trolley 6 in the opening direction, the knot 18 may be spring-loaded, so that having passed the pin 15, it is moved back to the shown stop position where during the closing movement it forces the pin 15 out of the track section 17 and back in the track 16, as described below.

[0031] In the shown embodiment, the sash bottom member of the sash 4 is designed as an essentially T-shaped profile, e.g. of aluminium, with a wall portion 19 which is below the glass area of the sliding window, a front wall 20 with an upwards projecting wall portion 20a forming a glass strip, and a downwards projecting wall portion 20b which both in the closed position and during opening covers the displacement fittings with the guide rail 5, the trolley 6 and the carrier arms 7 and 8 such that to a wide extent, these parts are invisible from the outside.

[0032] In the embodiment shown in Figs. 5-7, the

glass area 21 of the sliding window is mounted in essentially T-shaped sash profiles comprising a bottom member 22 and side members 23.

[0033] The guide rail 25 fastened to the frame bottom member 24, which can be designed as a wood profile, is designed as an essentially L-shaped profile with a supporting portion 26 in abutment against the underside of the frame bottom member 24.

[0034] The trolley 27 is by means of rollers or wheels 28 supported in a longitudinally displaceable way on an upwards projecting rail 29 from the bottom wall 30 of the L-profile 25.

[0035] The carrier arms 31, of which only the forward carrier arm with respect to the closing direction is shown, are in one end connected pivotally with the sash by means of a bearing 32 connected with the lower portion of each sash side member 23. In the opposite end, the carrier arm 31 has an angular end portion 33 which is rotationally connected with the trolley 27.

[0036] The retainer arm 34 is in this embodiment in its one end pivotally connected with the carrier arm 31 at a point between the pivotal connections of the carrier arm with the sash and with the trolley 27. In the opposite end, the retainer arm 34 has, just as in the embodiment in Figs. 1-4, a pin 35 which is retained in a longitudinally displaceable manner in a longitudinal track 36 provided in the trolley 27, said track having at its rearward end with respect to the closing direction a short angular track section 37 which in this embodiment is directed a little obliquely forwards in the closing direction.

[0037] In the same way as in the embodiment in Figs. 1-4, the track section 37 serves for retaining the pin 35 of the retainer arm 34 during the sideways displacement of the sash in the displacement plane.

[0038] A guideway element 38 is fastened at the end of the guide rail 25 corresponding to the closing position, the end of which element facing rearwards in relation to the closing direction forms a stop for the movement of the trolley 27 in the closing direction by impact with a front edge of a lower portion 27a of the trolley 27, indicated by a line 27c in Fig. 5. In the guideway element 38, a longitudinal track 39 is formed having at its rearward end with respect to the closing direction an oblique inlet section, one wall 40 of which forms a stop face inclined backwards with respect to the closing direction for engagement by a portion 41 of the pin 35 on the retainer arm 34, said pin being downwards projecting from a top portion 27b of the trolley 27, said top portion being outwards projecting above the bottom portion 27a.

[0039] By movement of the trolley 27 in the closing direction, the downwards projecting pin part 41 will, when the trolley 27 approaches the shown end position, be caught by the stop face 40 at the inlet section of the guideway track 39 and thus as shown in Figs 8-10 be guided in the guideway track 39 at the same time as the top portion 27b of the trolley 27, in which the longitudinal track 36 is provided, is led above the guideway element 38 until the movement of the trolley, as shown in Fig. 9, is stopped on impact of the bottom portion against the end of the guideway element 38.

[0040] The safeguarding against sideways displacement of the sash of the sliding window with the risk of collision against the adjacent fixed window part is in the embodiment in Figs. 5-7 obtained in that a locking knot 42 on the end portion 33 of the carrier arm 31 is turned into engagement with a recess 43 in the side wall 44 of the guide rail 25 when the trolley, as shown in Fig. 8, has reached its end location on impact against the guideway element 38.

[0041] To provide an active safeguarding against unintentional movement of the trolley 27 in the opening direction, such that the trolley 27 is retained in said end location during the translatory motion of the sash towards the closed position, the locking knot 42 can be influenced by a spring-load, e.g as shown in the form of a hook element 45 mounted in the recess 43 and influenced by a spring 46 in the direction of the arrow 47. In cooperation with the guidance of the pin part 41 connected with the retainer arm 34 in the track 39 in the guideway element 38, this spring-load of the locking knot will in the relevant phase of closing movement provide an active resistance against and thus prevent movement of the trolley in the opening direction. The locking knot 42 and the shown hook element 45 are thus mounted in relation to each other that the locking knot 42 when being outside the location shown in Fig. 5 can without hindrance pass the hook element 45 both in the closing and opening direction.

[0042] In the same way as in the embodiment in Figs. 1-4, the opening of the sliding window is initiated in that the sash is led from the closed position shown in Fig. 10 out to the starting location shown in Fig. 8 for the sideways displacement plane. During this translatory motion where the sash side member 23 describes a circular movement around the connection point of the carrier arm 25 with the trolley 27, the downwards projecting part 41 of the pin 35 is led out of the guideway track 39 and the locking knot 42 is released from the locking engagement with the recess 43 in the side wall 44 of the guide rail 25.

[0043] In the particularly preferred embodiment shown in Figs. 11-16, the sash profiles in the sliding door 48 comprising a bottom member 49, a top member 50 and side members 51 can be designed in essentially the same way described above for the embodiment in Figs. 5-10.

[0044] In the same way, the guide rail 53 fastened to frame bottom member 52 can be designed essentially as described for the embodiment in Figs. 5-10.

[0045] The trolley comprises two bogie elements 54 and 55 which through carrier arms 56 and 57 are pivotally connected to the sash profiles in the side members 51 and are mutually connected through a bar 58 shown by a dotted line. Each of the bogie elements 54 and 55 is in essentially the same way as described for the embodiment in Figs. 5-10 supported on the guide rail 53 in

that non-shown wheels on the bogie elements drive on a rail 59 projecting upwards from the bottom wall of the L-shaped guide rail profile.

[0046] As shown in Figs. 11 and 12, the pivoting connection of each of the carrier arms 56 and 57 with the sash side members 51 is formed in the way that pipe sockets 60 mounted in sash side members form bearings for a shaft 61 connected to a carrier arm, e.g. 56, said shaft extending in the entire height of the sliding door 48 for connection with a control arm 62 in a passive displacement fitting at the sash top member 50 where the control arm 61 is connected with a slider 62' which is guided in a guide rail 64 fastened to the frame top member 63.

[0047] At the forward sash side member of the sliding door 48 with respect to the closing direction, one end of a retainer arm 65 is pivotally connected with the carrier arm 56 at a point between the pivotable connections of the carrier arm with the sash side member 51 and the bogie element 54 of the trolley. In the opposite end, the retainer arm 65 has a pin 66 which just as the embodiment in Figs. 5-10 is in engagement with a longitudinal track 67 in the forward end of the bogie element 54 with respect to the closing direction, and the track 67 has at its end facing rearwards in relation to the closing direction a short angular track section 68 which is directed a little forwards in the closing direction.

[0048] In its end corresponding to the end location of the sliding door 48, the guide rail has a projecting knot 69 with its one wall forming an oblique abutment face 70 facing rearwards with respect to the closing direction and corresponding to the abutment face 40 in the embodiment in Figs. 5-10 for a part of the pin 66 projecting downwards below the retainer arm 65.

[0049] The knot 69 is provided in an end stop member 71 which fits in the essentially L-shaped profile of the guide rail 53 and is fastened to the guide rail 53 such that its end edge 72 facing rearwards with respect to the closing direction forms a stop for the movement of the bogie element 54 in the closing direction.

[0050] At its upper edge, the end stop member 71 is provided with a locking projection 73 which by engagement with a recess 74 in the guide rail positions the end stop member 71 at the end corresponding to the end location hereof.

[0051] Unlike the embodiment in Figs. 5-10, where the two stop functions for the movement of the trolley in the closing direction and for hindrance of the return movement of the trolley in the opening direction, respectively, during the translatory motion of the sliding door between the displacement plane and the end location are carried out by the guideway element 38 and by the engagement between the locking knot 24 on the carrier arm 31 and the recess 43 in the guide rail 25, respectively, the two stop functions in the embodiment in Figs. 11-16 are integrated in one pair of cooperating elements, i.e. partly the end stop member 71 fastened to the guide rail 53, partly an arm 75 which is pivotally connected with the bogie element 54 at its end facing forwards with respect to the closing direction outside the end of the track 67.

[0052] A longitudinal track 76 is provided in the arm 75 and, just as the track 67, in engagement with the pin 66 on the retainer arm 65.

[0053] When the retainer arm 65, as appears from Figs. 14-16, is released on impact of the pin 66 against the oblique abutment face 70 on the knot 69 and the pin 66 is thus led out of the angular section 68, the arm 75 will as a consequence of the engagement of the pin 66 with the track 76 be turned to a locking position where the track 76 coincides with the track 67.

[0054] In this locking position, a locking knot 77 projecting outwards from the arm 75 will enter into engagement with the edge facing forwards with respect to the closing direction of the locking projection 73 on the end stop member 71 with its rearwards edge 72 with respect the closing direction forming at the same time a halt for the movement of the bogie element 53 and thus of the trolley in the closing direction.

[0055] Unlike the fitting design known from above EP Publication, the translatory motion is according to the invention carried out between the closed position of the sash of the sliding window and the start location for the sideways displacement in the displacement plane thus without moving the trolley which exactly permits an active safeguarding against displacement of the sash towards collision with the adjacent fixed window part.

[0056] The above described embodiments of the displacement fittings with the guide rail, the trolley, and the carrier arms may alternatively be mounted on the innerside of the window or door arrangement.

Claims

1. A window or door arrangement for a building facade, comprising a frame structure (1, 24; 52, 63), in which a sliding window (48) or door is mounted side by side with a fixed building element (3), e.g. a window or panel part, said sliding window or door having a sash (4, 22; 49-51) connected to the frame structure (1, 24; 52, 63) by displacement fittings in such a way that, in a closed position, the sliding window or door is flush with the fixed building element (3), but is displaceable by translatory motion to a location (4') outside the closed position in a displacement plane extending parallel to the fixed building element, but in a distance therefrom, the sliding window or door being movable by sideways displacement in the displacement plane between said location and an open position overlapping the fixed building element (3), said displacement fittings comprising a stationary guide rail (5, 25; 53) fixed with respect to the frame structure (1, 24; 52) and having a length corresponding to the total width of the sliding window (48) or door and the fixed build-

ing element (3), a trolley (6, 27, 54, 55) supported by said guide rail (5, 25; 53) in a longitudinally displaceable manner, a bottom sash member (4, 22; 49) of the sliding window or door being pivotally connected with said trolley through mainly parallel carrier arms (7, 8; 31; 56, 57), retaining means comprising a retainer arm (14, 34; 65) being provided for retaining the sliding window or door in the displacement plane during said sideways displacement and releasing means for said retaining means comprising stop means (18, 40; 70) stationary with respect to the guide rail and to act on the retainer arm **characterized** in that said releasing means (18, 40; 70) is disposed for affecting release of the retainer arm (14, 34, 65) while retaining the trolley (6, 27, 54, 55) in an end position in the displacement plane during said sideways displacement of the sash in a closing direction from the open position towards said location (4'), the displacement fittings further comprising a locking element (8', 42, 77) which on release of the retainer arm in said end location is activated to engage locking means (8', 43; 73) in connection with the guide rail (5, 25; 53) in order to prevent or limit sideways displacement of the sash (4) during said translatory motion.

2. A window or door arrangement according to claim 1, **characterized** in that said retainer arm (14, 34; 65) is provided in one end with a pin (15; 35, 41; 66) which is journalled in a longitudinal track (16, 36; 67) in the trolley to be pivotable and longitudinally displaceable, said track having in its near end with respect to the closing direction a short angular track section (17, 37; 68) for retaining the pin (15; 35, 41; 66) connected with the retainer arm (14, 34; 65), said stop (18, 40; 70) having an inclined stop face facing rearwards with respect to the closing direction, for abutment of said pin (15, 41; 66) on the retainer arm.

3. A window or door arrangement according to claim 2, **characterized** in that the retainer arm (14) is designed as a separate arm with respect to said carrier arms (7, 8) and has a second end pivotally connected with the sash bottom member (4).

4. A window or door arrangement according to claim 2 or 3, **characterized** in that said locking element is designed as a catch arm (8') connected with the carrier arm for engagement with a pin or roller (8'') on the guide rail (5).

5. A window or door arrangement according to claim 2, **characterized** in that an opposite end of the retainer arm (34, 65) is pivotally connected with the forward carrier arm (34, 65) with respect to the closing direction.

6. A window or door arrangement according to claim 5, **characterized** d in that said stop means is formed by an inlet wall portion (40) at the rearward end with respect to the closing direction, of a longitudinal track (39) for receiving and guiding the pin (41) connected with the retainer arm (34) during continuous movement of the trolley (27) in the closing direction, said track (39) being formed in a guideway element (38) stationary with respect to the guide rail (25) and forming a stop (27c) for the movement of the trolley (27a) in the closing direction.

7. A window or door arrangement according to claim 5, **characterized** in that said pin (66) on the retainer arm (65) is also in engagement with a longitudinal track (76) provided in an arm (75) pivotally connected with the trolley and having a centre of rotation at its forward end with respect to the closing direction, which arm (75) being activated by release of the retainer arm to turn to a locking position in which said longitudinal track (76) coincides with the longitudinal track (67) in the trolley.

8. A window or door arrangement according to claim 5, **characterized** in that said stop means is formed by a knot (69) projecting from the guide rail.

9. A window or door arrangement according to claim 6, 7 or 8, **characterized** in that said locking element is designed as an angular end portion (33) of the carrier arm (31) having a locking knot (42) for engagement with a recess (43) in the guide rail (25).

10. A window or door arrangement according to claim 9, **characterized** in that on impact of the trolley (27) against said stop (27c), said locking knot (42) is affected by a spring-load (45) which together with the guiding of the pin (41) connected to the retainer arm (34) in said track (39) provides a hindrance against movement of the trolley (27) in the closing direction.

11. A window or door arrangement according to claim 7 or 8, **characterized** in that said locking element is formed by a locking knot (77) projecting from said arm (75) for engagement with a locking projection (73) in the guide rail (53) when the arm occupies said locking position.

12. A window or door arrangement according to claim 11, **characterized** in that said locking projection (73) is formed by an end stop member (71) for said end position fastened to the guide rail (53) and providing at the same time a stop for movement of the trolley in the closing direction.

13. A window or door arrangement according to any of the preceding claims, **characterized** in that said

sash bottom member (4) is provided with an essentially horizontal wall portion (19) below a glass or panel area fastened in the sash and a front portion (20b) projecting downwards below the horizontal wall portion, and that said displacement fittings are mounted below the horizontal wall portion (19) and behind the front portion (20b).

14. A window or door arrangement according to claim 1, **characterized** in that a top member (50) of the sash (48) is connected with a top member (63) of the frame structure through further displacement fittings (62, 62', 64) which are controlled synchronously with said displacement fittings connected with the sash bottom member (49).

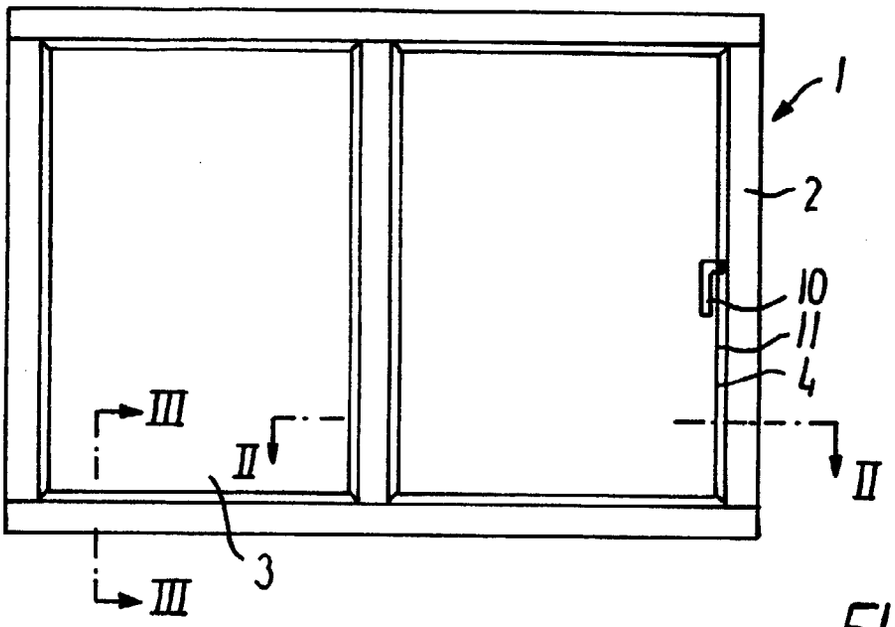

FIG.1

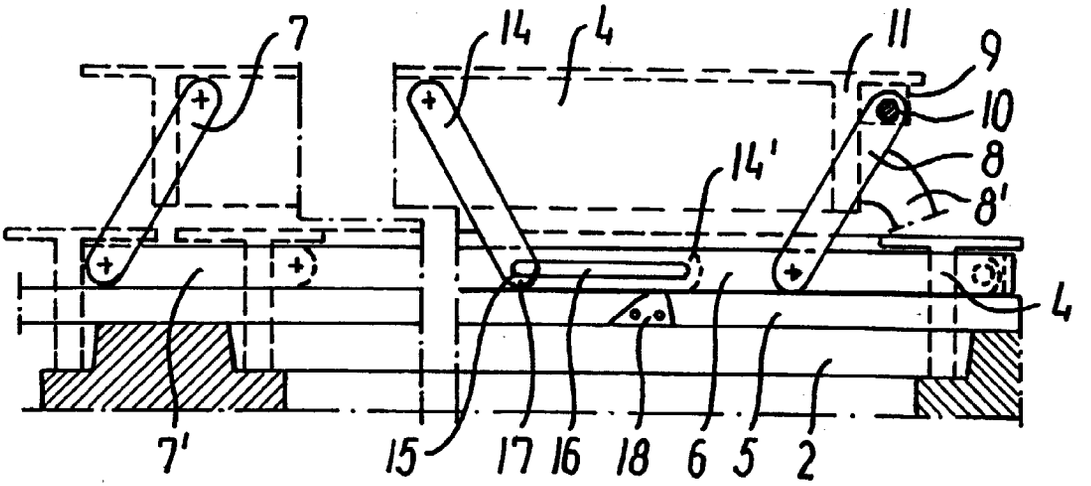

FIG.2

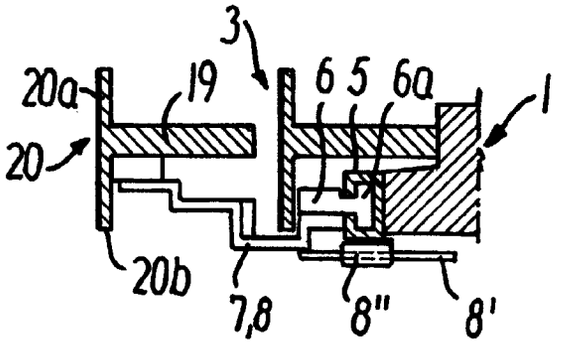

FIG.3

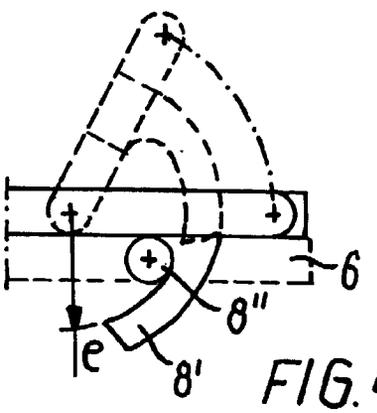

FIG.4

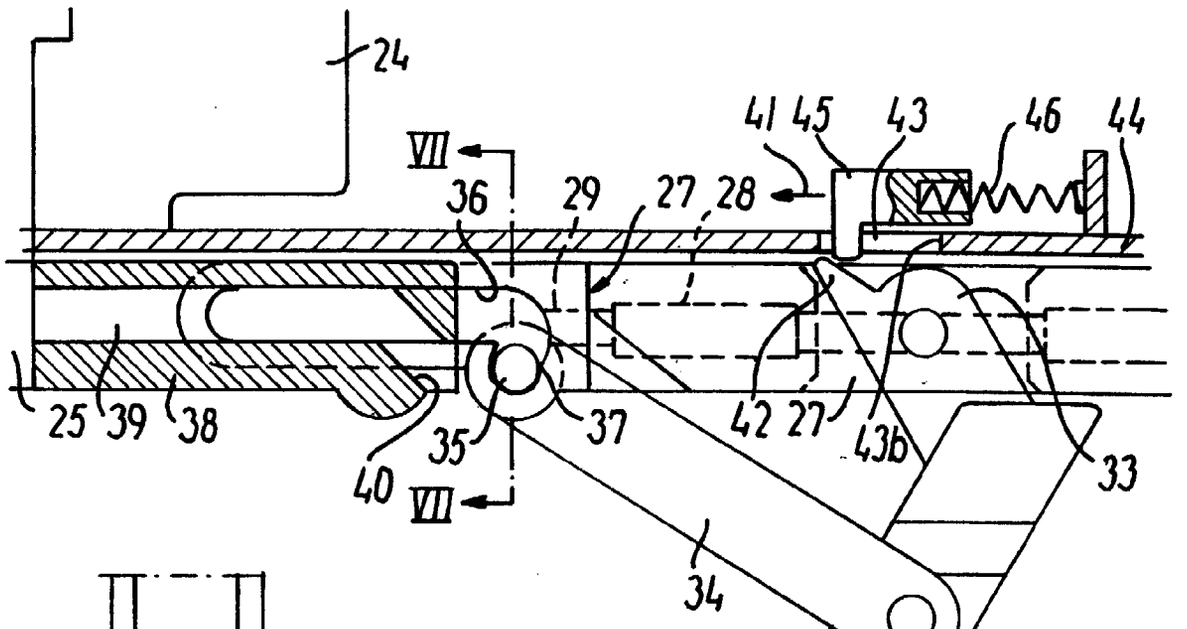

FIG.5

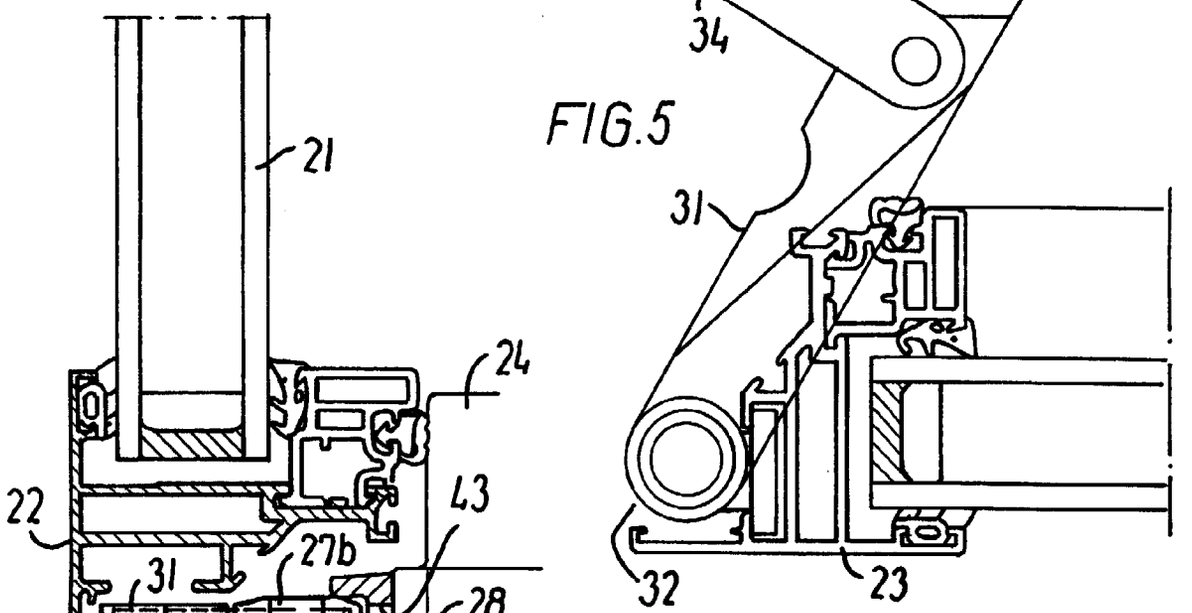

FIG.6

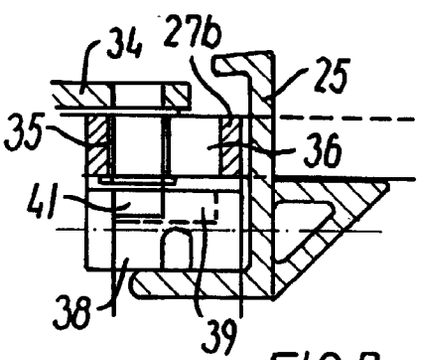

FIG.7

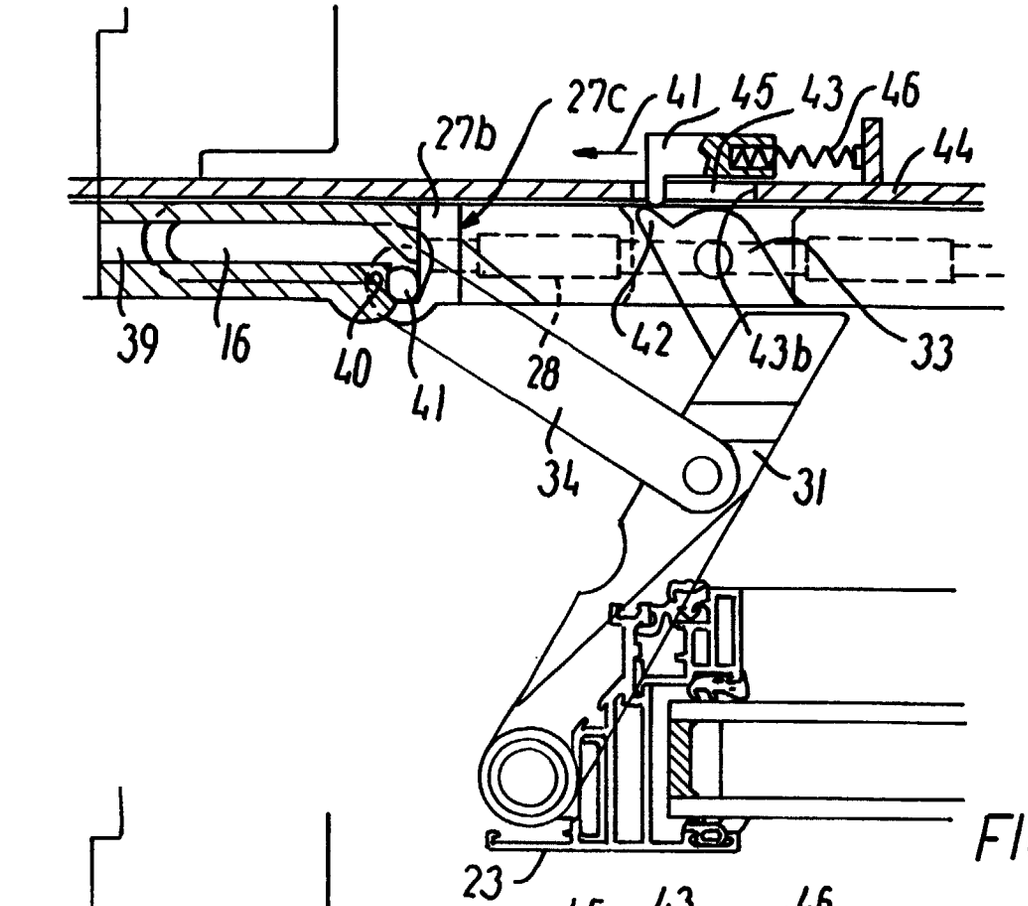

FIG.8

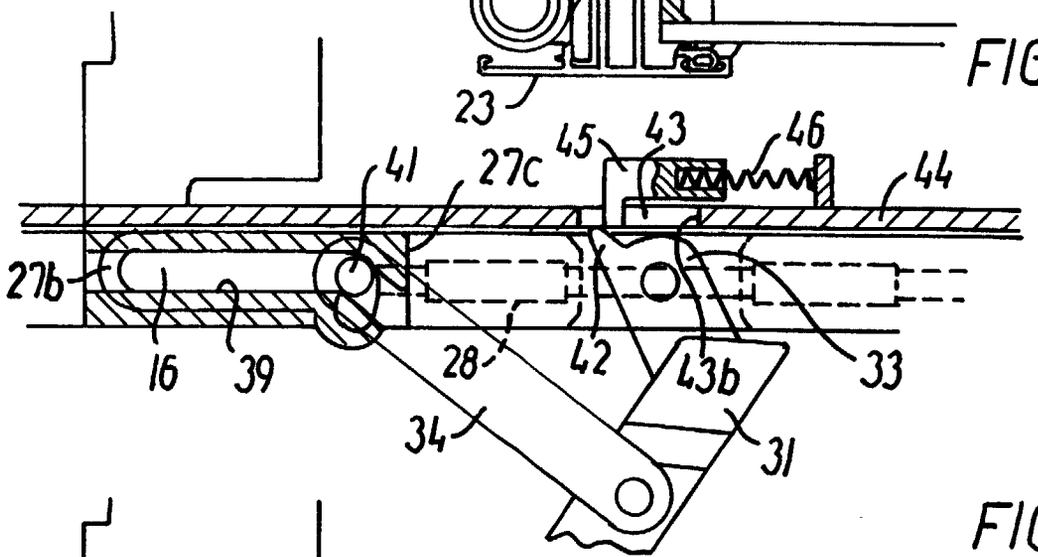

FIG.9

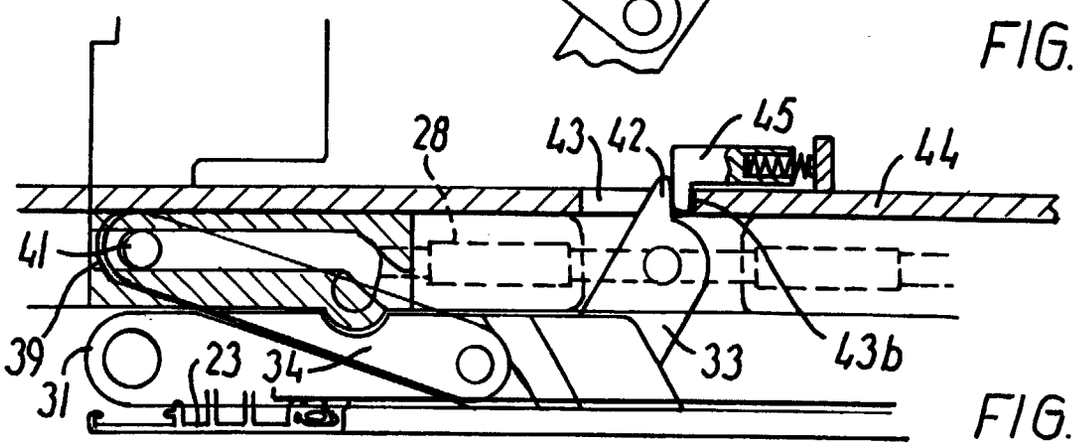

FIG.10

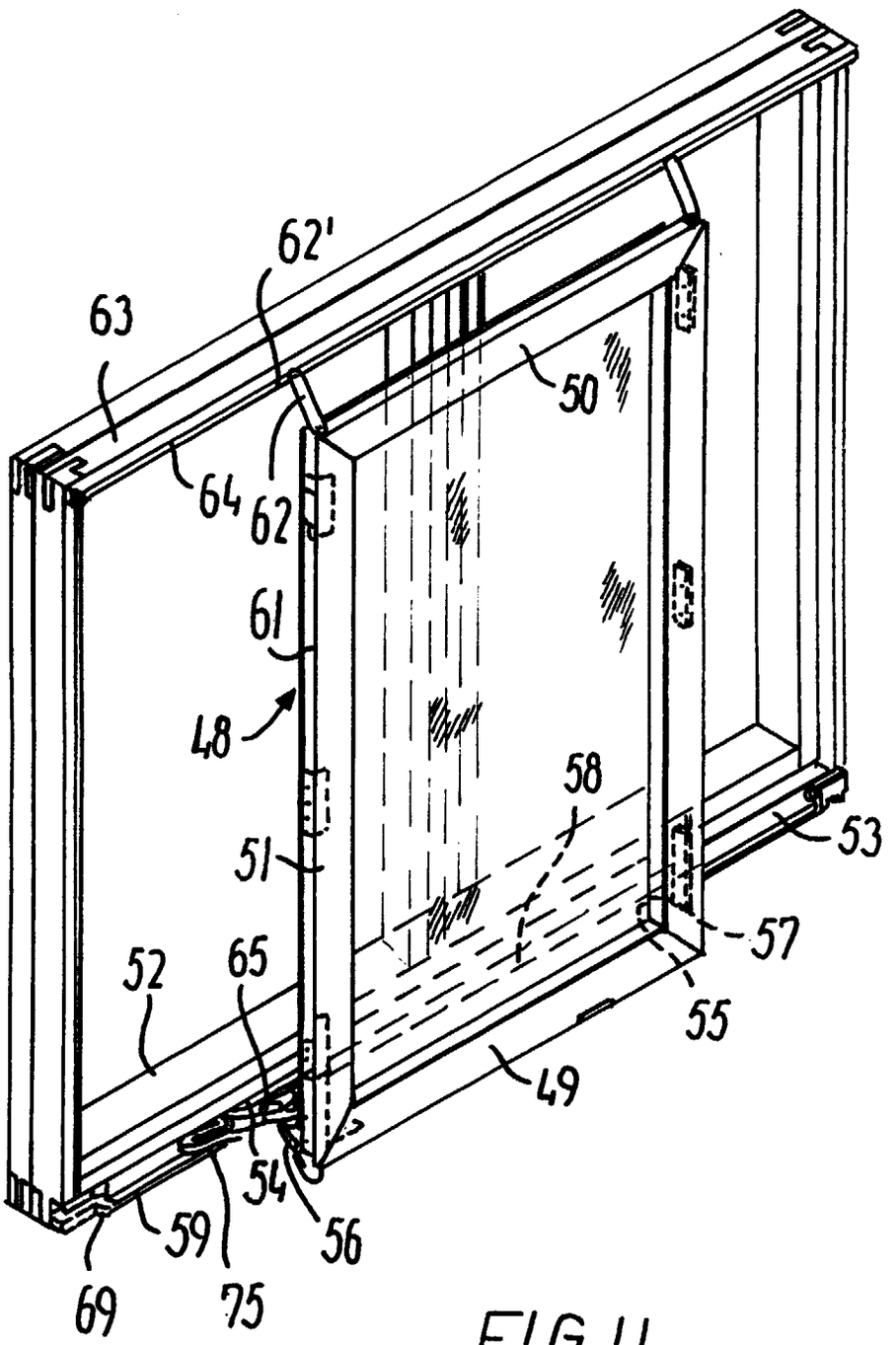

FIG.11

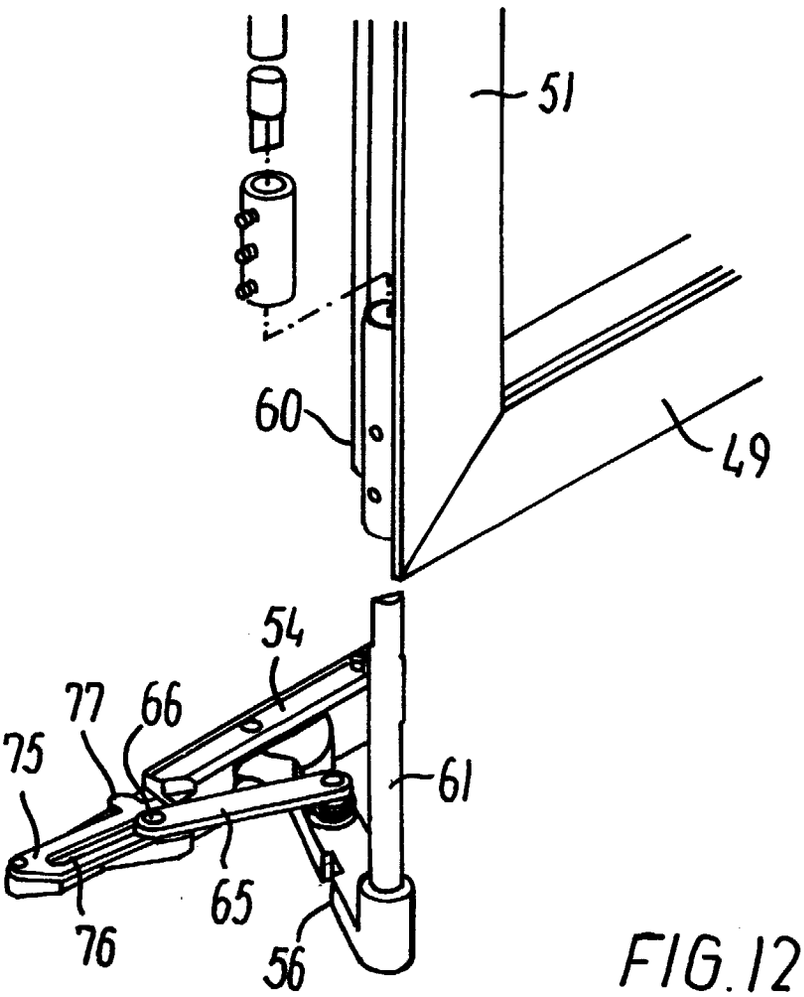

FIG. 12

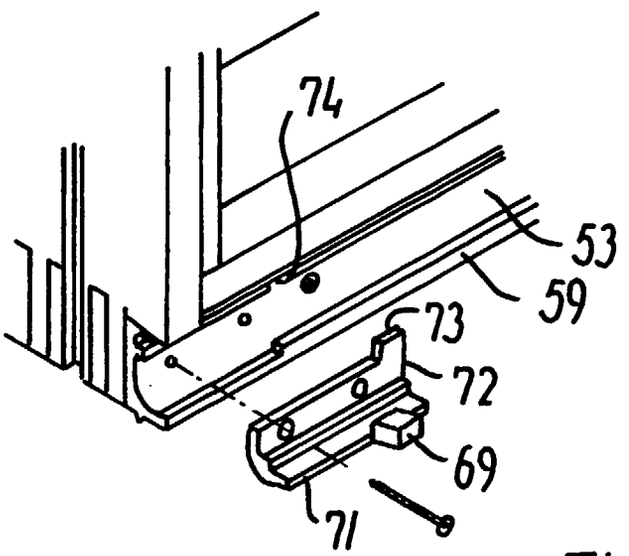

FIG. 13

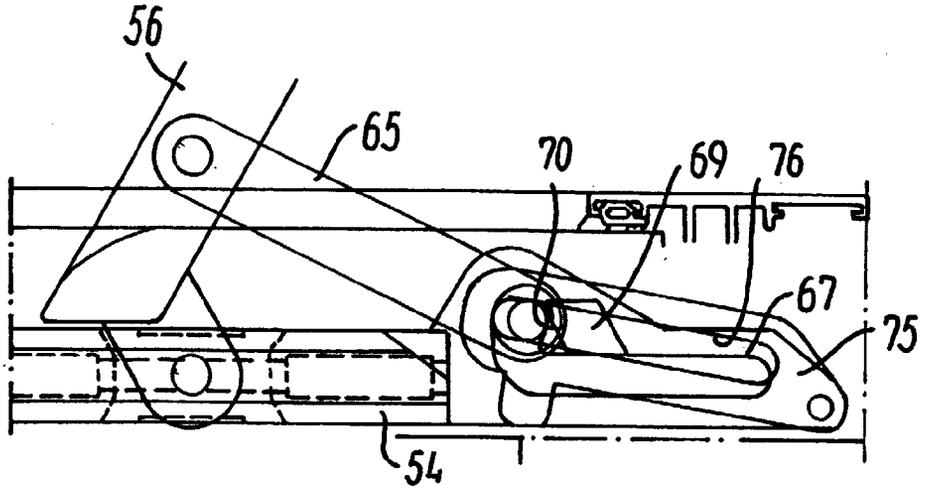

FIG. 14

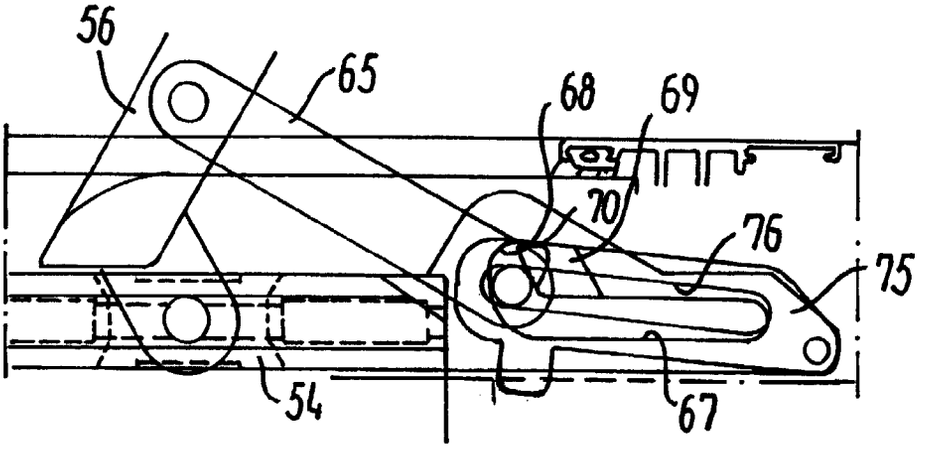

FIG. 15

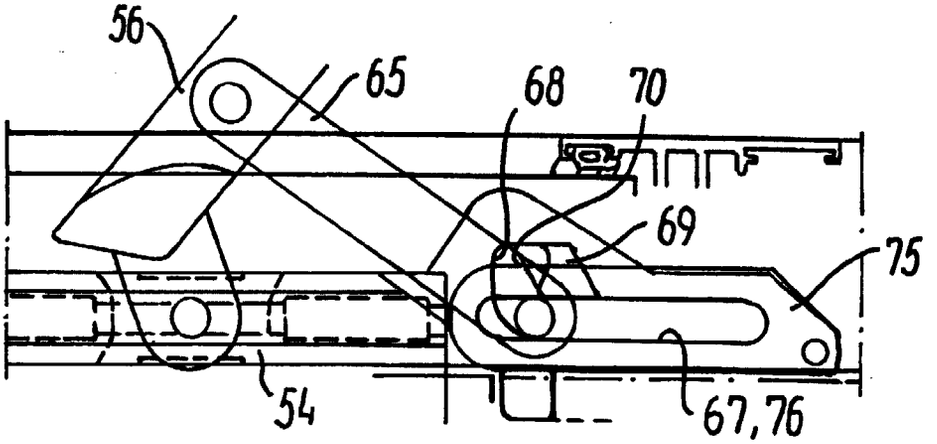

FIG. 16