

CONTROL DEVICE FOR AN OUTWARDLY PIVOTING LEAF OF A DOOR OR A WINDOW

The invention relates to a control device for the opening or closing of an outwardly pivoting leaf of a door or window, comprising an operating handle, such as a crank or the like, arranged on the sash-frame and actuating translation means formed by a rack inserted into the fillister of the lower rim of said sash-frame.

This invention will find its usefulness more in particular for doors or windows opening in the English way.

It is a frequent custom to use outwardly opening doors or windows, namely in countries in which the climate is particularly humid during certain periods of the year. Humidity does indeed favour the development of flying insects and, very often, the doors or windows of a house are lined with a mosquito net arranged on the inner side of said doors or windows. In most cases, these mosquito nets are generally formed by a curtain the distance between the wires forming the weft of which is so determined as to ensure a perfect air circulation through same. These curtains are generally removable and can be removed during winter. Said curtains generally comprise a frame which is preferably incorporated into the sash-frame. Hence, it is not possible to reach the leaf, for said frame of the mosquito net is interposed between the user standing inside and the leaf located outside.

This type of outwardly opening door or window has another disadvantage which mainly resides in the cleaning of the outer face of the glazed surface. When the window is located at a certain height from the floor, it is uneasily accessible and it proves necessary to provide for means to clean the glazed surface of this window from inside.

For this purpose is known, from the document US-A-4,241,541, a device allowing to simultaneously confer to the leaf a rotary motion about a vertical axis passing through one of its stiles and a translation motion, parallel to the plane of the sash-frame, of the rotation spindle of this leaf. The combination of both these motions allows to sidely offset the leaf relative to the sash-frame and to thus obtain a space located on the rotation side, which al-

lows to make the outer face of the glazed surface accessible.

The device described in the prior document comprises a crank arranged on the lower rail of the sash-frame. This crank is connected to a worm the axis of which is inclined by about thirty degrees with respect to the horizontal line, so that the window-sill does not hinder the rotation of the crank. The worm engages into a gear-wheel with an inclined toothing, freely rotatably mounted onto a vertical spindle. Onto this same vertical spindle is pivotally mounted an actuating arm comprising, at its end, a roller moving in a rail arranged horizontally and in the lower part of the leaf. The gear-wheel driven by the worm engages into a second gear-wheel freely rotatably mounted onto a spindle integral with the actuating arm. Onto this second gear-wheel is fixed a second arm connected by means of a connecting rod to the rear end of the leaf.

Thus, by driving the worm in rotation under the action of the crank, the co-operation of both gear-wheels with inclined toothing will allow, on the one hand, to confer to the actuating arm a rotary motion about its axis and, on the other hand, to confer to the second arm a combination of two rotary motions. This combination consists in a first rotation of the axis of the second gear-wheel about the axis of the gear-wheel engaged in the worm and a second rotation of the bent arm about the axis of the second gear-wheel. From these simultaneous motions conferred, on the one hand, to the actuating arm and, on the other hand, to the second arm, results a rotary motion of the leaf about its vertical axis passing through one of its stiles and a translation motion of this rotary spindle of the leaf in a plane parallel to the sash-frame. This device also comprises a folded arm allowing to connect the leaf to the sash-frame and the function of which mainly consists in distributing the forces applied, by means of the crank, onto the actuating arm and onto the second arm so as to facilitate this simultaneous rotation and translation of the leaf.

It should be appreciated that this device, described in the prior document, has a number of disadvantages which mainly reside in the complexity of the mechanism allowing to control the opening and the

closing of the leaf. This complexity make this device unreliable. In addition, the manufacturing of some components of this control device for the leaf is particularly delicate, which results into a substantial increase of the manufacturing cost. This also applies
5 to the manufacturing of the gear-wheels the toothing of which is necessarily inclined because of the worm the axis of which forms, for mechanical and comfort reasons, an angle of about thirty degrees with respect to the horizontal line.

From the document US-A-1,724,011 is also known a control device for
10 the opening and the closing of an outwardly pivoting leaf, according to another embodiment. THus, this control device comprises an operating handle aarranged on the lower rail of the sash-frame and actuating a mechanism formed by a gearing system co-operating with a rack. This latter acts on levers actuating, on the one hand, a
15 locking system for the leaf and, on the other hand, the rotation of an actuating arm connected to this latter.

Therefore, said mechanism, under the movements of the user onto the handle, allows to control the rotation of the leaf about an axis substantially offset towards outside with respect to the plane of
20 the sash-frame.

This document also refers to means allowing to offset the leaf with respect to its sash-frame, for the purpose of making possible the access to the outer glazed surface. However, these means are manually released and cannot be actuated by the control device for the
25 opening of the leaf.

Besides this disadvantage, this known control device has, in addition, the disadvantage of being particularly cumbersome, since it is installed on the window-sill, on the inner side of the leaf, and not in the fillister of the sash-frame. In addition, its complexity
30 makes it unreliable and particularly fragile in case of a direct movement onto the leaf, hence the necessity of a secondary locking system.

Furthermore, from the document US-A-3,117,351 is known a control device for an outwardly pivoting leaf according to the preamble of
35 claim 1 or 2, device comprised of a rack inserted into the fillis-

ter of the lower rail of the sash-frame and made integral, at one of its ends, with the rear stile of the leaf. The actuating means, arranged on the inner side of the window, allow to transfer to said rack a rectilinear movement causing the translation of the leaf in
5 a direction parallel to the plane of the sash-frame. As regards the rotation of the leaf, same is achieved by means of a connecting rod made integral, at the level of its ends, with the lower rail of the sash-frame and the leaf, respectively.

In fact, this control device, according to the document US-A-
10 3,117,351, confers to the front stile of the leaf, at the beginning of the opening, a path the tangent of which is parallel to the plane of the sash-frame. This means that, at the beginning of the opening, the leaf moves in a way substantially parallel to the plane of the sash-frame, which results into an abnormal compression
15 of the seal arranged in the fillisters of the front stiles of this sash-frame and this leaf. Now, these constant strains onto the seal result into a rapid deterioration of same.

The object of this invention is to cope with these troubles.

The invention, as characterized in the claims, solves the problem
20 which consists in providing an operating device for the opening and the closing of an outwardly pivoting leaf of a door or window, comprising an operating handle, such as a crank or the like, arranged on the sash-frame and actuating translation means formed by a rack inserted into the fillister of the lower rim of said sash-frame,
25 these translation means driving means for the rotation of the leaf formed by an actuating arm connected to same and co-operating with second translation means in the form of a slide connected, either directly, according to a second embodiment corresponding to claim 1, or by means of a secondary arm, according to a first embodiment
30 corresponding to claim 2, to the leaf, in order to confer to the rotation spindle of same a translation parallel to the plane of the sash-frame.

The advantages obtained thanks to this invention mainly consist in that the components of the control device are of a reduced complex-
35 ity, which improves their reliability. Another advantage resides in

the suppression of gear-wheels with an inclined toothing, so as to substantially facilitate the manufacturing of these various components. It should also be appreciated that the various moving components being part of this control device, according to the invention, have an operating principle identical to that of a differential gear, which allows to improve the distribution of the forces applied to these various moving components and to facilitate the operation of the leaf. Namely, this control device allows to confer to the front stile of this leaf a path the tangent of which, at the beginning of the opening, is perpendicular to the plane of the sash-frame, which, finally, avoids a too heavy strain onto the seal.

Other particular features are defined in the depending claims 3 through 10.

The invention is described below more in detail, with reference to drawings showing only one embodiment.

Figure 1 is a partial and perspective view of a window provided with the control device according to the invention.

Figure 2 is a detailed and cross-sectional view of the hinged joint connecting the control device to the rear part of the leaf.

Figure 3 is a detailed and cross-sectional view of the connection between the actuating arm and the leaf.

Figure 4 is an elevation and cross-sectional view according to line IV-IV of Figure 5 of the control device carried out according to a first embodiment.

Figure 5 is a plan and partly cross-sectional view according to line V-V of Figure 4.

Figure 6 is a plan and partly cross-sectional view according to line VI-VI of Figure 4.

Figure 7 is an elevation and cross-sectional view according to line VII-VII of Figure 8 and corresponding to a second embodiment of the control device according to the invention.

Figure 8 is a plan and partly cross-sectional view according to line VIII-VIII of Figure 7.

Reference is made to Figures 1 through 6.

The door or window 1, to which applies the control device 2, according to the invention, comprises a leaf 3 coming to be applied, from outside, onto a sash-frame 4. Thus, the opening of leaf 3 can occur only by outwardly pivoting. Figure 1 shows a window 1 comprising also a mosquito net 5 integral with the sash-frame 4 and arranged on the inner side of leaf 3.

The object of the control device 2 is to be able to cause the opening and closing of leaf 3 from the inner side of the window 1 and without it being necessary to retract the mosquito net 5. For this purpose, the control device 2 comprises an operating handle 6, represented by a crank in Figure 1. This operating handle 6 is arranged on the sash-frame 4, approximately in the median part of the lower rim 7 of said sash-frame 4. This operating handle 6 is connected to a mechanism 8 housed in the fillister 9 of this lower rim 7 or, in the absence of a mosquito net, in an appropriate fillister of leaf 3, this mechanism 8 allowing to actuate leaf 3. The function of said mechanism 8 is, on the one hand, to confer to leaf 3 an outwardly pivoting about a vertical rotation axis passing through its rear stile 10 and, on the other hand, to apply to this rotation axis of leaf 3 a translation parallel to the plane of the sash-frame 4.

For this purpose, according to a feature of the invention, the mechanism 8 of the control device 2 comprises rotation means 11 for the leaf 3, driven by translation means 12 actuated by the operating handle 6.

The mechanism 8, comprising the rotation means 11 and the translation means 12, is arranged in a housing 13 inserted into the fillister 9 of the lower rim 7 of the sash-frame 4. This housing 13 is comprised of a cover 14 and a base 15 and has a longitudinal edge 16 apparent on the inner side of the window 1, in the lower corner 17 formed by the sash-frame 4 and the window-sill 18. In the median part of the longitudinal edge 16 of the housing 13 is arranged an operating handle 6. This latter is integral in rotation with a shaft 19 freely rotatingly mounted into the housing 13, by means of bearings 20, 21. This shaft 19 is located in a plane perpendicular

to the plane of the sash-frame 4 and forms an angle of about thirty degrees relative to the horizontal line, so that the window-sill 18 does not hinder the rotation of the operating handle 6.

The shaft 19 is provided with a driving gear-wheel 22 with straight 5 tothing 23 into which engage the translation means 12. These latter are formed by a rectangularly shaped rack 24 housed in the housing 13, the longitudinal median plane 25 of the rack 24 being arranged parallel to the plane of the sash-frame 4. This rack 24 comprises, on its longitudinal edge 26, a wing 27 forming an angle 10 of about thirty degrees relative to the horizontal line and comprising a toothed sector co-operating with the tothing 23 of the driving gear-wheel 22. Thus, because of this co-operation of the driving gear-wheel 22 and the rack 24, it is possible to confer to this latter a longitudinal movement parallel to the plane of the 15 sash-frame 4. In order to guide this movement of the rack 24, same comprises, in the proximity of its end 28 oriented towards the side of the rear stile 10 of the leaf 3, a vertical spindle 29 located in the longitudinal median plane 25 and the ends 30, 31 of which co-operate with grooves 32, 33 made in the cover 14 and the base 20 15, respectively, of the housing 13. The longitudinal axis of these grooves 32, 33 is arranged horizontally and in the longitudinal median plane 25 of the rack 24. This latter is also guided, in its longitudinal movement, at its end 34 oriented towards the stile 35 of the leaf 3, by a roller 36 co-operating with the groove 32 made 25 in the cover 14 of the housing 13.

Onto this rack 24 are mounted the rotation means 11 for the leaf 3. Same are formed by an actuating arm 37 one end 38 of which is pivotally mounted onto the vertical spindle 29. The other end 39 of this actuating arm 37 is provided with a roller 40 moving in a 30 guiding rail 41 horizontally arranged on the lower rail 42 of the sash 43 of the leaf 3. This actuating arm 37 has, in the proximity of its end 38, a "S"-shaped configuration 44, which allows to side-ly offset the rotation axis of this actuating arm 37 with respect to its longitudinal axis 45. Advantageously, the actuating arm 37 35 is arranged under the rack 24.

According to a first embodiment, the mechanism 8 has also the function of conferring to the rotation axis of the leaf 3 a translation perpendicular to the plane of the sash-frame 4, in order to disengage said frame 3 from same.

- 5 For this purpose, the rotation means 11, formed by the actuating arm 37, co-operate with second translation means 46 connected to the leaf 3 by a secondary arm 47. Thus, because of this arrangement, when opening the window 1, it is possible to simultaneously confer a projection to the sash 43 of the leaf 3 towards outside
10 the sash-frame 4 and a translation to the rotation axis of the leaf 3 parallel to the plane of the sash-frame 4.

Thanks to this feature of the invention, it is avoided to deteriorate the seal arranged on the fillister of the sash-frame 4 or of the sash 43 of the leaf 3 by successive frictions during the trans-
15 versal movement of the rotation spindle of this leaf 3, namely at the beginning of the opening and at the end of the closing of the window 1.

Advantageously, the second translation means 46 are formed by an approximately rectangularly shaped slide 48 arranged in parallel
20 and under the rack 24. In order to confer to this slide 48 a horizontal movement in the longitudinal median plan 25 of said rack 24, said slide 48 comprises, in its rear part 49 oriented towards the rear stile 10 of the leaf 3, an elongated opening 50 co-operating with the vertical spindle 29 integral with the rack 24. It should
25 be appreciated that the actuating arm 37 is mounted onto the spindle 29, between the slide 48 and the rack 24. This slide 48 also comprises, at its end 51, a spindle 52 projecting with respect to the lower face 53 of said slide 48 and co-operating with the groove 33 made in the base 15 of the housing 13.

- 30 The slide 48 is also provided with a toothed sector 54 co-operating with a toothing 55 arranged on the periphery 56 of the end 38 of the actuating arm 37. This toothing 55 is arranged in the form of an arc of a circle the centre of which is located on the rotation axis of the actuating arm 37. This co-operation of the toothing 55
35 of said actuating arm 37 and the toothed sector 54 of the slide 48

has the function of conferring to this latter a longitudinal movement in a direction depending on the direction of rotation of the actuating arm 37.

In order to simultaneously facilitate the movement of the rack 24
5 and the slide 48 in the housing 13, it is necessary to reduce the area of contact, namely between the base 15 of said housing 13 and the lower face 53 of the slide 48. For this purpose, in the lower face 53 of this latter are made longitudinal recesses 57, which allows to form transversal journals 58 and longitudinal journals 59
10 with a reduced surface.

Since the slide 48 is arranged under the actuating arm 37 and the rack 24, this slide 48 also plays the role of a wedge, namely in its front part 60 onto which rests the rack 24. It is indeed absolutely necessary to keep this latter in an approximately horizontal
15 position for the roller 36, arranged at the end 34 of the rack 24, to co-operate with the groove 32 of the cover 14.

According to a first embodiment, the secondary arm 47 is formed by a connecting rod 61 one end 62 of which is integral with the spindle 52 arranged at the end 51 of the slide 48. The other end 63
20 of this connecting rod 61 is connected by means of a hinged joint 64 to the leaf 3 and this in the proximity of the rear stile 10. This connecting rod 61 is slightly bent in a horizontal plane, so as to form a wing 65 arranged in parallel to the plane of the sash-frame 4 when the leaf 3 is closed and a wing 66 coming to be engaged into the housing 13 and allowing to have access to the
25 spindle 52.

Thus, during the opening of the window 1, a counterclockwise rotation is conferred to the actuating handle 6, this rotation causing the driving of the rack 24 by means of the driving gear-wheel 22.
30 Afterwards, this rack 24 drives into a translation motion the actuating arm 37 which, because of its toothing 55 co-operating with the toothed sector 54 of the slide 48, simultaneously starts, in addition to the translation motion, a rotary motion about the vertical spindle 29. Furthermore, the rotation of this actuating arm
35 37 causes a longitudinal movement of the slide 48. This longitudi-

nal movement of the slide 48 is repercutted, by means of the secondary arm 47 and the hinged joint 64, onto the leaf 3. This results into a projection of the sash 43 of the leaf 3 towards outside of the sash-frame 4, immediately followed by a combined rotary motion
 5 of the leaf 3 and translation motion, parallel to the plane of the sash-frame 4, of the rotation spindle of this leaf 3.

According to another embodiment, not shown in the various Figures, the secondary arm 47 is formed by a slide block connected to the slide 48 and free translating in a direction perpendicular to the
 10 plane of the sash-frame 4. One end of this slide block is fixed to the leaf 3, in the proximity of the rear stile 10. The connection between the slide 48 and the slide block is formed by guiding rails or the like arranged, perpendicularly to the plane of the sash-frame 4, on the slide 48, the slide block having members allowing
 15 to co-operate with these guiding rails. Thus, according to this embodiment, the slide block has a rectangular shape and comprises longitudinal edges engaged into the guiding rails arranged on the slide 48, the distance between which is determined according to the width of the slide block. Furthermore, the connection between the
 20 slide block and the leaf 3 is necessarily formed by a hinged joint 64, so as to allow the rotation of the leaf 3.

According to another feature of the invention, in maximum opening position of the window 1, the side edge 67, of the segment 68, connecting the end 38 to the "S"-shaped portion 44 of the actuating
 25 arm 37, comes to strike against the transversal front edge 69 of the toothed sector 54 of slide 48.

In order to facilitate the access to the external face 70 of the glazed surface 71, the hinged joint 64, forming the connection between the connecting rod 61 or the slide block and the leaf 3, is
 30 of the removable type. For this purpose, the connecting rod 61 or the slide block comprises an end 72 coming to be located under a member having the shape of an angle 73 inserted into the leaf 3 and comprising, in its horizontally arranged wing 74 an opening 75. The openings 75 and 76 of the member having the shape of an angle 73
 35 and the end 72, respectively, are arranged on one and the same ver-

tical axis and serve as a passageway for a removable fastening member 77. It is important for this latter to ensure the positioning in the horizontal plane of the connecting rod 61 or of the slide block with respect to the leaf 3, the positioning in a vertical direction being ensured by the position of the member having the shape of an angle 73 on the leaf 3 and its co-operation with the fastening member 77.

Reference is made to Figures 1, 2, 3, 7 and 8.

According to another embodiment, the rotation means 11, formed by the actuating arm 37, co-operate with second translation means 146 directly connected to the leaf 3.

This arrangement substantially simplifies the mechanism 8 while allowing to ensure both the rotation of the leaf 3 and the translation of the rotation spindle of same in a plane parallel to the plane of the sash-frame 4.

Advantageously, the second translation means 146 are formed by a slide 148 having an approximately rectangular shape, arranged parallel to and under the rack 24. In order to confer to this slide 148 a horizontal movement in the longitudinal median plane 25 of said rack 24, said slide 148 comprises, in its rear part 149 oriented towards the rear stile 10 of the leaf 3, an elongated opening 150 co-operating with the vertical spindle 29 integral with the rack 24. It should be appreciated that the actuating arm 37 is mounted onto the spindle 29, between the slide 148 and the rack 24. This slide 148 also comprises, at its end 151, a spindle 152 projecting with respect to the lower face 153 of said slide 148 and co-operating with the groove 33 made in the base 15 of the housing 13.

The slide 148 is also provided with a toothed sector 154 co-operating with a toothing 55 arranged on the periphery 56 of the end 38 of the actuating arm 37. This toothing 55 is arranged in the form of an arc of a circle the centre of which is located on the rotation axis of the actuating arm 37. The function of this co-operation between the toothing 55 of said actuating arm 37 and of the toothed sector 154 of the slide 148 is to confer to this latter

a longitudinal movement in a direction depending on the direction of rotation of the actuating arm 37.

In order to simultaneously facilitate the movement of the rack 24 and the slide 148 in the housing 13, it is necessary to reduce the contact area, namely between the base 15 of said housing 13 and the lower face 153 of the slide 148. For this purpose, longitudinal recesses 157 are made in the lower face 153 of this latter, which allows to form transversal journals 158 and longitudinal journals 159 with a reduced surface.

Since the slide 148 is arranged under the actuating arm 37 and the rack 24, this slide 148 plays also the role of a wedge, namely in its front part 160 onto which rests the rack 24. It is indeed absolutely necessary to keep this latter in an approximately horizontal position for the roller 36, arranged at the end 34 of the rack 24, to co-operate with the groove 32 of the cover 14.

The connection between the slide 148 and the leaf 3 is formed by a hinged joint 64, so as to allow the rotation of the leaf 3 about a vertical axis passing through this hinged joint 64. For this purpose, this latter is located as close as possible to the rear edge 78 of the leaf 3, so that the fillister of the sash-frame 4 does not hinder the rotation of said leaf 3.

During the opening of the window 1, the operation of the control device 2, according to this second embodiment, is as follows:

By actuating the operating handle 6, a longitudinal movement is conferred, by means of the driving gear-wheel 22, to the rack 24. This latter drives the actuating arm 37 which, because of its toothing 55 co-operating with the toothed sector 154 of the slide 148, pivots about the vertical spindle 29. This results into the rotation, towards outside, of the leaf 3. The slide 148 is brought to move parallelly to the plane of the sash-frame 4, which results into conferring to the rotation spindle of the leaf 3 a translation parallel to said plane of the sash-frame 4.

In fact, these combined rotary and translation motions of the leaf 3 occur simultaneously. It is obvious that, to close the window 1 again, all the components of the control device 2 move in the oppo-

site direction.

The hinged joint 64 is comprised, on the one hand, of an eyelet 172 integral with the slide 148 and, on the other hand, of a member having the shape of an angle 73 inserted onto the lower rail 42 of the sash 43 of leaf 3. The eyelet 172 is located at the rear end 180 of the slide 148 and is projecting with respect to the external longitudinal edge 181 of same.

The member having the shape of an angle 73 is provided, in its horizontal wing 74, with an opening 75 coming to be positioned on one and the same vertical axis as and above the opening 176 of the eyelet 172, the openings 75 and 176 serving as a passageway for a fastening organ 77. This latter is preferably removable, so as to be capable of undoing the integrality of the leaf 3 with the slide 148 and thus facilitating the access to the external face 70 of the glazed surface 71 by rotation of said leaf 3 about the axis of the roller 40 integral with the end 39 of the actuating arm 37 and moving in the guiding rail 41.

An advantage of the invention is to allow the reversal of the use of each component of the mechanism of the control device for either of the results obtained and such as described, for each of these components, in the first embodiment.



C L A I M S

1. Control device (2) for the opening and closing of an outwardly pivoting leaf (3) of a door or window, comprising an operating handle (6), such as a crank or the like, arranged on the sash-frame (4) and actuating translation means (12) formed by a rack (24) inserted into the fillister (9) of the lower rim (7) of said sash-frame (4), control device (2) characterized in that said translation means (12) drive rotation means (11) for the leaf (3) formed by an actuating arm (37) connected to this latter and co-operating with second translation means (146) in the form of a slide (148) connected to the leaf (3) in order to confer to the rotation spindle of this latter a translation parallel to the plane of the sash-frame (4).

2. Control device (2) for the opening and closing of an outwardly pivoting leaf (3) of a door or window, comprising an operating handle (6), such as a crank or the like, arranged on the sash-frame (4) and actuating translation means (12) formed by a rack (24) inserted into the fillister (9) of the lower rim (7) of said sash-frame (4), control device (2) characterized in that said translation means (12) drive rotation means (11) for the leaf (3) formed by an actuating arm (37) connected to this latter and co-operating with second translation means (46) in the form of a slide (48) connected, by means of a secondary arm (47), to the leaf (3) in order to confer to the rotation spindle of this latter, on the one hand, a translation parallel to the plane of the sash-frame (4) and, on the other hand, a projection towards outside of this latter.

3. Control device (2) according to claim 1 or 2, characterized in that the rectangularly shaped rack (24) comprises, on one longitudinal edge (26), a wing (27) forming an angle of about thirty degrees relative to the horizontal line and having a toothed sector co-operating with the toothing (23) of the driving gear-wheel (22) mounted onto a shaft (19) actuated by the operating handle (6), said rack (24) being housed in a housing (13) comprised of a cover (14) and a base (15) and arranged parallel to the plane of the sash-frame (4).



4. Control device (2) according to claim 3, characterized in that the rack (24) comprises, at its one end (28) oriented towards the side of the rear stile (10) of the leaf (3), a vertical spindle (29) the ends (30, 31) of which co-operate with grooves (32, 33) made in the cover (14) and the base (15), respectively, of the housing (13) and, at the other end (34) oriented towards the front stile (35) of the leaf (3), a roller (36) co-operating with the groove (32) made in the cover (14) of the housing (13).

5. Control device (2) according to one of the claims 1 through 3, characterized in that the actuating arm (37), forming the rotation means (11) for the leaf (3), has its one end (38) pivotally mounted onto the vertical spindle (29) of the rack (24) and comprises, at its opposite end (39), a roller (40) moving in a guiding rail (41) horizontally arranged on the lower rail (42) of the sash (43) of the leaf (3).

6. Control device (2) according to claim 1 or 2, characterized in that the approximately rectangularly shaped slide (48, 148) is arranged parallel to and under the rack (24) and comprises, on the one hand, in its rear part (49, 149) oriented towards the rear stile (10) of the leaf (3), an elongated opening (50, 150) in which moves the vertical spindle (29) integral with the rack (24) and, on the other hand, at its end (51, 151), a spindle (52, 152) projecting with respect to the lower face (53, 153) of said slide (48, 148) and co-operating with the groove (33) made in the base (15) of the housing (13).

7. Control device (2) according to claim 6, characterized in that the slide (48, 148) comprises, in its rear part (49, 149), a toothed sector (54) co-operating with a toothing (55) arranged on the periphery (56) of the end (38) of the actuating arm (37), in order to confer to said slide (48, 148) a longitudinal movement parallel to the plane of the sash-frame (4).

8. Control device (2) according to claims 2 and 6, characterized in that the secondary arm (47), connecting the second translation means (46) to the leaf (3), is formed by a slide block moving perpendicularly to the plane of the sash-frame (4), by means of guiding rails



arranged onto the slide (48), said slide block being connected, at one end and, by means of a hinged joint (64), to the leaf (3) and allowing to confer to same an outward projection with respect to the sash-frame (4).

5 9. Control device (2) according to claims 2 and 6, characterized in that the secondary arm (47) is formed by a connecting rod (61) one end (62) of which is integral with the spindle (52) arranged at the end (51) of the slide (48), the other end (63) of this connecting rod (61) being connected by means of a hinged joint (64) to the
10 leaf (3).

10. Control device (2) according to claim 1, characterized in that the slide (148) comprises, at its rear side (180) an eyelet (172) being projecting with respect to the external longitudinal edge (181), said eyelet (172) co-operating with a member having the
15 shape of an angle (73) inserted onto the lower rail (42) of the sash (43) of leaf (3) in order to form a hinged joint (64).



A B S T R A C T

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- 5 A control device (2) for the opening and closing of an outwardly pivoting leaf (3) of a door or window, comprising an operating handle (6), such as a crank or the like, arranged on the sash-frame (4) and actuating translation means (12), these latter driving rotation means (11) for the leaf (3) co-operating with second trans-
- 10 lation means (46) connected to this latter and allowing to confer a translation, parallel to the plane of the sash-frame (4), to the rotation spindle of this leaf (3).