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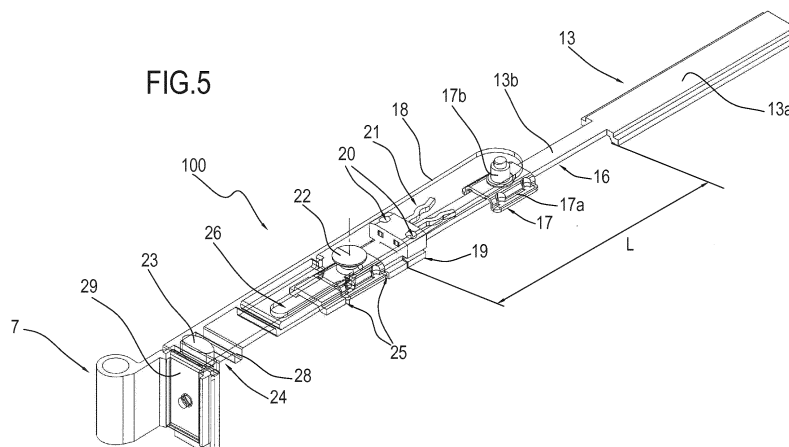
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(54) **Operating device for a tilt and turn door or window**

(57) Described is an operating device for a tilt and turn door or window (1), the door or window (1) comprising: a fixed frame (2) and a movable sash (3) connected to each other along a corresponding upright (4, 5) by a pair of hinges, a lower hinge (6) and an upper hinge (7), and both provided with a perimeter groove (8, 9); a control handle (10) mounted on the upright (11) of the sash (3) opposite to that connected to the fixed frame (2); operating means (12) mounted on the sash (3) and operatively connected, in use, to the handle (10) through the agency of drive rods (13) which are slidable inside the perimeter groove (9) of the sash (3) to allow the sash (3) to selectively pass from a closed to a tilted or turned open configuration; the operating means (13) comprise a drive rod (13a) operatively connected to the handle (10) and mounted and slidable in the groove (9) of an upper crosspiece (15) of the sash (3); the rod (13a) has a first portion

(16) of reduced width; this first portion (16) of reduced width is formed directly on the drive rod (13a) to obtain a closed stretch thereof and extending for a defined length (L); a slider (17) housed in the groove (9) of the upper crosspiece (15) of the sash (3) and slidable in the first, reduced-width portion (16) of the drive rod (13a) so as to obtain, in use, a predefined stroke for the slider (17) between at least two end positions corresponding to the closed configuration of the sash (3) and to the tilted open configuration of the sash (3); a single operating arm (18) pivoted at one end to the slider (17) and, at the opposite end, to the fixed frame (2) so that, in the tilted open configuration, the upper crosspiece (15) of the sash (3) can be moved away from the fixed frame (2) by the effect of a combined roto-translation between the single arm (18) and the slider (17) slidable along and inside the first reduced-width portion (16) of the rod (13a).



Description

[0001] This invention relates to an operating device for a tilt and turn door or window.

[0002] At present, doors or windows which can be opened by turning or tilting always comprise operating accessories which are mounted along the uprights and crosspieces of the fixed and movable frames and which are designed to allow the turned or tilted open configurations upon operation of a handle.

[0003] In the specific case of opening the door or window by tilting, these operating accessories allow the upper part of the sash to be moved away from the fixed frame by rotation about a lower horizontal axis defined by the lower hinge (especially structured for the purpose) and thanks to the closing constraints (locking bar) mounted on the bottom crosspiece.

[0004] Also for this style of opening, the door or window is equipped, at the top corner of the fixed frame and sash, with an operating element designed to support the top of the sash during its opening by tilting. This operating element, of special relevance to this specification, comprises the following:

- a slider for transmitting the movement of the handle and housed and slidable inside a groove of the sash crosspiece;
- an upper positioning block associated with the groove of the upper crosspiece and able to be fixed stably to the groove by fastening means; the block is configured to allow free sliding of the transmission slider located below the block itself;
- a connecting arm articulated, at a first end, to the movable portion of the upper hinge (for articulation between the fixed frame and the sash) and, at the other end, to the supporting element;
- a link rod which limits the opening angle of the sash in the tilted open configuration and which is articulated at the ends of it to an intermediate point of the arm and to the positioning block, respectively.

[0005] The connecting arm also has a downwardly protruding pin defining a constraining element which can be housed in a channel formed in a striker element slidable inside the groove and connected to the transmission slider.

[0006] It should be noted that the connecting arm is articulated to the block through the agency of a pin housed in a slot formed on the block in such a way as to allow a sort of reduced roto-translation of the end of the arm.

[0007] In substance, the operating element made in this way has four points of connection/articulation which allow the sash to be supported correctly in the two configurations it can adopt.

[0008] When the sash is opened by turning, the operating slider (controlled by the handle) keeps an operating position where it locks the pin of the arm inside the chan-

nel of the striker element: the sash thus rotates about a vertical axis (defined by the two hinges) and the weight of the sash is supported by the hinge points defined by the supporting element (at the point of it rigidly fixed to the sash) and by the end of the link rod which is pivoted directly to the supporting element.

[0009] When the sash is opened by tilting, the operating slider (in this case, too, controlled by the handle) slides and moves the striker element away from the pin in such a way as to release the connecting arm: the sash is thus free to rotate about a bottom horizontal axis by as much as an angle defined by the rotation of the arm having a translation in the slot of the block and a corresponding rotation of the limiting link rod.

[0010] In substance, the sash is fully open when the link rod reaches its maximum opening angle: this is a function of the length of the link rod and the position of the points of articulation between link rod and arm.

[0011] At this position, the weight of the sash is supported at the top by the two ends of the arm and by the link rod articulated to the block.

[0012] An operating device for doors and windows made in this way, however, has some disadvantages.

[0013] Indeed, the device has a large number of components, each of which must be suitably made, machined and/or shaped to obtain the precise slots and couplings for the other components.

[0014] The need for a crank mechanism between arm and link rod limits the opening angle of the sash and there is no way of adjusting the angle of opening.

[0015] The arm requires a number of accessory machining operations after it has been made, so as to allow application of the articulation pin and of the pin by which it is constrained to the striker.

[0016] All these factors considerably increase the overall cost of the device. It should also be noted that the multiplicity of pivot / articulation points raises the risk of some components breaking after prolonged use. To this must be added the fact that the structure of the operating device thus obtained is relatively long and cannot be used on doors and windows under a certain width.

[0017] This invention has for an aim to provide an operating device for tilt and turn doors or windows which overcomes the above mentioned drawbacks of the prior art.

[0018] More specifically, this invention has for an aim to provide an operating device for tilt and turn doors or windows which allows quick and easy adjustment of the angle of opening of the door or window in the tilted open configuration.

[0019] A further aim of the invention is to provide an operating device for tilt and turn doors or windows which is easier to install on the door or window because it has a limited number of components.

[0020] A further aim of the invention is to provide an operating device for tilt and turn doors or windows which is at once simple, inexpensive, dependable over time and applicable to a multiplicity of door and windows, irrespec-

tive of width.

[0021] These aims are fully achieved by the operating device for a tilt and turn door or window according to this invention, as characterized in the appended claims.

[0022] More specifically, the operating device for a tilt and turn door or window is applicable to a door or window comprising: a fixed frame and a movable sash connected to each other along a corresponding upright by a pair of hinges, a lower hinge and an upper hinge, and both provided with a perimeter groove; a control handle mounted on the upright of the sash opposite to that connected to the fixed frame; operating means mounted on the sash and operatively connected, in use, to the handle through the agency of drive rods which are slidable inside the perimeter groove of the sash to allow the sash to selectively pass from a closed to a tilted or turned open configuration; and constraining or striker means mounted on the fixed frame and able to be operatively coupled to the operating means to define at least the closed configuration of the door or window.

[0023] According to the invention, a part of the operating means comprises a drive rod operatively connected to the handle and mounted and slidable in the groove of an upper crosspiece of the sash.

[0024] Also according to the invention, the drive rod has a first portion of reduced width.

[0025] Also according to the invention, the first portion of reduced width is formed directly on the drive rod to obtain a closed stretch thereof and extending for a defined length.

[0026] Also according to the invention, the device comprises a slider housed in the groove of the upper crosspiece of the sash and slidable in the first, reduced-width portion of the drive rod so as to obtain, in use, a predefined stroke for the slider between at least two end positions corresponding to the closed configuration of the sash and to the tilted open configuration of the sash.

[0027] Also according to the invention, the device comprises a single operating arm pivoted at one end to the slider and, at the opposite end, to the fixed frame so that, in the tilted open configuration, the upper crosspiece of the sash can be moved away from the fixed frame in controlled manner by the effect of a combined roto-translation between the single arm and the slider slidable in the first reduced-width portion of the drive rod.

[0028] The structure of the device thus made has an extremely small number of components and does not necessitate further kinematic elements, such as the link rods, thanks to the presence of the slider and the reduced-width portion of the drive rod.

[0029] With this simple structure, it is possible to obtain the tilted configuration in a sure and precise manner and with variable sash opening angles.

[0030] It should be noted that the drive rod used in the device and configured for the purpose, is of a type also used for all the other drive rods present on the door or window.

[0031] Preferably, the drive rod is made of a synthetic

material, that is, a synthetic plastic material.

[0032] It should be noted that the drive rod and the slider are configured to move relative to each other as a function of the turned open or tilted open operating configurations of the door or window.

[0033] In light of this, the use of this type of drive rod makes it possible to form a channel of reduced width and length calculated to allow strokes of desired extent for the slider and to allow the drive rod to be moved, in any case, that is to say, to slide along the groove under the action of the handle to obtain, for example, the turned open configuration of the door or window without interfering with the slider: this guarantees smoothness of movement on a structure which is extremely light and has few components.

[0034] Preferably, the drive rod is coupled to a stroke limit stop carriage for the slider.

[0035] In light of this, the carriage is steplessly adjustable in sliding along the first, narrow-width portion of the selfsame rod.

[0036] Preferably, the carriage has stable fastening means acting between the carriage and the groove in order to stabilize the position adopted and corresponding to the tilted fully open configuration of the sash. Thanks to this carriage, the maximum opening angle can be adjusted steplessly and precisely even during and after installation of the device on the door or window.

[0037] Preferably, the carriage has an elastic element configured for front contact with a portion of the slider in such a way as to slow down and stably fix the slider stroke and in such a way as to define the fully open position of the sash and the maximum tilt position of the single arm.

[0038] The elastic element allows slowing down and fixing the slider stroke in the proximity of the carriage so as to avoid forceful impact between the components and bringing the sash to a gentle stop at the fully tilted open position.

[0039] These and other features of the invention will become more apparent from the following detailed description of a preferred, non-limiting embodiment of it, with reference to the accompanying drawings, in which:

- Figure 1 is a schematic front view of a tilt and turn door or window equipped with the operating device of the invention;
- Figure 2 is a side view, with some parts cut away in order to better illustrate others, showing an upper part of the door or window of Figure 1 in a tilted open configuration;
- Figure 3 shows the upper part of the sash and of the operating device of Figure 2 in a perspective view, with some parts cut away in order to better illustrate others;
- Figure 4 is an exploded perspective view showing the operating device of this invention in a partly tilted open configuration of the door or window;
- Figures 5 and 6 are, respectively, a perspective view with some parts transparent and a top plan view with

some parts cut away in order to better illustrate others, showing the operating device of Figure 4 and an upper hinge portion in a closed configuration or turned open configuration of the sash.

[0040] With reference to the accompanying drawings, in particular Figure 1, the operating device of the invention (denoted in its entirety by the numeral 100) is applied and used on a tilt and turn door or window 1. The door or window 1 comprises a fixed frame 2 and a movable sash 3 connected to each other along a corresponding upright 4 and 5 by a pair of hinges, a lower hinge 6 and an upper hinge 7, defining a point of rotation about a vertical axis.

[0041] The fixed frame 2 and the movable sash 3 are both provided with a perimeter groove 8 and 9 running all the way round the perimeter of both components (Figures 2 and 3).

[0042] The door or window 1 comprises a control handle 10 mounted on the upright 11 of the sash 3 opposite to the upright which is connected to the fixed frame 2 by the hinges 6 and 7.

[0043] The door or window 1 also comprises operating means 12 mounted on the sash 3 and operatively connected, in use, to the handle 10 through the agency of drive rods 13 which are slidable inside the perimeter groove 9 of the sash 3 to allow the sash 3 to selectively pass from:

- a closed configuration to a turned open configuration by rotation about a vertical axis Z, or
- to a tilted open configuration by rotation about a horizontal axis X. The door or window 1 comprises constraining or striker means 14 mounted on the fixed frame 2 and able to be operatively coupled to the operating means 12 to define at least the closed configuration of the door or window 1.

[0044] The operating means 12 and the constraining or striker means 14 are mounted on at least three sides of the fixed frame 2 and sash 3 (see Figure 1, dashed line) and, thanks to the drive movement transmitted by the rods 13 to the operating means 12, the door or window 1 is opened or closed.

[0045] According to the invention, a part of the operating means 12 comprises a drive rod 13a operatively connected to the handle 10 and mounted and slidable in the groove 9 of an upper crosspiece 15 of the sash 3 (see Figures 2 to 6).

[0046] Also according to the invention, the rod 13a has a first portion 16 of reduced width, (described in more detail further on in this specification).

[0047] Again according to the invention, the operating device 100 comprises a slider 17 housed in the groove 9 of the upper crosspiece 15 of the sash 3 and slidable along and inside the reduced-width portion 16 of the drive rod 13a.

[0048] Again according to the invention, the operating

device 100 comprises a single operating arm 18 pivoted, at one end of it, to the slider 17 and, at the opposite end, to the fixed frame 2 so that, in the tilted open configuration, the upper crosspiece 15 of the sash 3 can be moved away from the fixed frame 2 by the effect of a combined roto-translation between the single arm 18 and the slider 17 slidable along the first reduced-width portion 16 of the rod 13a.

[0049] It should be noted that the single arm 18 is configured as a means of limiting the angle of opening of the sash 3 in the tilted open configuration (Figure 2).

[0050] Preferably, the first reduced-width portion 16 of the rod 13a is formed in a stretch of it which is closed at the respective ends. That is to say, the rod 13a is a single part with a central narrow portion or corridor 13b.

[0051] The extension in length of the central narrow portion or corridor 13b is such as to obtain a predefined stroke for the slider 17 between at least two end positions corresponding to the closed (and turned open) configuration and to the tilted open configuration of the sash 3. In other words, the slider 17 is coupled to and slidable inside the first reduced-width portion 16 towards and away from the two ends of the central narrow portion 13b.

[0052] It should be noted that the drive rod 13a is made preferably (but not necessarily) of a synthetic material, in particular, a synthetic plastic material.

[0053] In light of this, the first reduced-width portion 16 is formed on the drive rod 13a (by blanking the rod 13a itself) in an intermediate stretch of the rod 13a in such a way as to keep a central corridor 13b of material configured to allow coupling to the slider 17 and other operating components (as described below) in combination with the groove 10.

[0054] It should be noted that the extension L of the first portion 16 is calculated taking into account the movements of the slider 17 and the rod 13a relative to each other.

[0055] In other words, the drive rod 13a and the slider 17 are configured to move relative to each other as a function of the operating configurations (turned open or tilted open) of the door or window 1. Preferably, in a turned open configuration of the door or window 1, the drive rod 13a slides in the groove 9, while the slider 17 is stationary (relative to the rod 13a) inside the first portion 16. Preferably, in a tilted open configuration of the door or window 1, the slider 17 slides along the first portion relative to the drive rod 13a when the latter is operated by the control handle 10.

[0056] In substance, the extension of the first portion 16 of the rod 13a must take into account the maximum length of the stroke of the slider 17 and the movement required of the rod 13a itself (with the slider 17 stationary) during changes of configuration of the door or window 1 effected using the handle 10.

[0057] It should be noted that the slider 17 comprises a base 17a for sliding along the groove 9 and the central corridor 13b of the rod 13a and a vertical upper pin 17b for rotatable connection to the end of the single arm 18.

[0058] In light of this, the slider 17 comprises the base 17a having a central slot at the bottom of it coupled in the central corridor 13b, whilst its outer lateral profile is shaped to match the cross section of the groove 9.

[0059] Preferably, the drive rod 13a is coupled to a stroke limit stop carriage 19 for the slider 17.

[0060] The carriage 19 is slidably adjustable along the first reduced-width portion 16 of the selfsame rod 13a.

[0061] It should be noted that the carriage 19 has stable fastening means 20 acting between the carriage 19 and the groove 9 in order to stabilize the position it adopts, corresponding to the tilted fully open configuration of the sash 3.

[0062] More precisely, the carriage 19 is a block coupled on the central corridor 13b and inside the groove 9. The block 19 may be moved steplessly and in the two directions parallel to the groove 9, along the reduced-width portion 16 of the rod 13a in order to determine the stroke limit stop of the slider 17.

[0063] Once the desired position has been reached, the carriage 19 may be fixed stably to the groove 9 by the fastening means 20 (for example, tap screws at the two ends of the carriage 19).

[0064] Preferably, the carriage 19 has an elastic element 21 configured for front contact with a portion of the slider 17 in such a way as to slow down and stably fix the slider stroke and in such a way as to define the fully open position of the sash 3 (maximum tilt) and the position of maximum opening for the single arm 18.

[0065] In light of this, the elastic element 21 is composed of a pair of elastic arms shaped in such a way as to form an "omega" to intercept the upper pin 17b during the sliding of the slider 17.

[0066] The first part of the arms offers a limited resistance to the movement of the pin 17b but allows the slider 17 to start slowing down.

[0067] Next, the two arms open to receive the pin 17b in the housing defined between the arms, thereby stopping the slider 17, (see Figures 5 and 6).

[0068] This system considerably dampens the impact when the tilted opening stroke limit is reached, reducing the stress that the system would otherwise be subjected to in the case of more forceful impact upon reaching the fully tilted open position.

[0069] Preferably, the drive rod 13a has a boss 22 for retaining the single arm 18.

[0070] The boss 22 protrudes and can be operatively coupled, by moving the drive rod 13a, to the single arm 18 in order to keep the single arm 18 parallel to the rod 13a in the closed or turned open configuration of the sash 3 under the action of the handle 10.

[0071] More specifically, the drive rod 13a has a second portion 25 of reduced width (similar in structure to the first portion 16) for coupling to the locking boss 22.

[0072] The single arm 18 has a bottom protrusion 26 defining a channel which is open at one end to allow the boss 22 in and out as a function of the operating configurations of the sash 3 (see Figures 3 to 6).

[0073] It should be noted that the bottom protrusion 26 of the single arm 18 comprises a pair of downwardly protruding bridges which have the shape of a U to allow the boss 22 to slide in and out from one side until abutting against the closed end of the bridges in such a way as to lock the single arm 18 so it is parallel to the drive rod 13a when the sash 2 is in the closed or turned open configuration.

[0074] This structure with reduced-width portions has a twofold advantage: it allows the drive rod 13a and the slider 17 (and the boss 22) to move relative to each other without interference and lightens the operating structure along the upright of the door or window.

[0075] Preferably, the device 100 comprises an auxiliary pin 23 coupled to the sash 3.

[0076] More specifically, the auxiliary pin 23 protrudes from the top corner of the sash 3 formed by the upright 5 connected to the hinges 6 and 7 and by the upper cross-piece 15.

[0077] The pin 23 is configured to be coupled to the single arm 18 when the sash 3 is in the closed and turned open configuration.

[0078] The single arm 18 has a corresponding slot 24 at the bottom of it for receiving the auxiliary pin 23 in such a way as to define a second stable supporting and locking point for the single arm 18 when the sash 3 is in the turned open configuration.

[0079] More specifically, the pin 23 has a body 23a by which it is stably coupled in the vertical groove 9 of the upright 5 of the sash 3 in such a way as to be interposed, in use, between the sash 3 and the upper hinge 7, when the sash 3 itself is in the turned open or closed configuration.

[0080] It should be noted that the head of the auxiliary pin 23 has an ellipsoid shaped cross section and, in use, can be coupled in the slot 24 defined by two vertical walls 27 and 28 protruding downwardly from the single arm 18.

[0081] The ellipsoid configuration of the auxiliary pin 23 allows coupling by friction between the two walls 27 and 28 (without slack).

[0082] This feature allows combining two support points for the sash 3 which are close to each other (hinge 7 and auxiliary pin 23), thus relieving weight loads from the rest of the single arm 18 and slider 17 especially in the turned open configuration.

[0083] Preferably, the single arm 18 has a vertical tab 29 defining the end of it which is connected to the fixed frame 2 and associated with a tab of the portion of the upper hinge 7.

[0084] This invention also provides a door or window with the features described earlier on, combined with the device 100 described up to here.

[0085] A device structured in this way thus achieves the preset aims with an extremely limited number of components and low production costs. The use of a drive rod which can be suitably shaped by simple blanking operations allows its total lengths and the length of the operating portions to be adapted quickly and precisely.

[0086] The combination of the single arm interposed between a hinge and a slider slidable directly in the rod reduces the number of kinematic drive components of the device.

[0087] The presence of a stroke limit stop which can be adjusted steplessly along the reduced-width portion allows the angle of opening by tilting to be adjusted at any time and very precisely: thus, it is also possible to calibrate opening angles as a function of outside temperatures and to set a tilted open position for micro-ventilation.

[0088] The constructional simplicity of this device makes it possible to use this system on any doors or windows, irrespective of their width and, in particular on very small doors or windows.

[0089] The presence of an elastic element on the stroke limit stop considerably dampens the impact when the tilted opening stroke limit is reached, reducing the stress that the system would otherwise be subjected to in the case of more forceful impact upon reaching the fully tilted open position.

Claims

1. An operating device for a tilt and turn door or window (1) comprising at least :

- a fixed frame (2) and a movable sash (3) connected to each other along a corresponding upright (4, 5) by a pair of hinges, a lower hinge (6) and an upper hinge (7), and both provided with a perimeter groove (8, 9);
- a control handle (10) mounted on the upright (11) of the sash (3) opposite to that connected to the fixed frame (2);
- operating means (12) mounted on the sash (3) and operatively connected, in use, to the handle (10) through the agency of drive rods (13) which are slidable inside the perimeter groove (9) of the sash (3) to allow the sash (3) to selectively pass from a closed to a turned open configuration by rotation about a vertical axis (Z) or to a tilted open configuration by rotation about a horizontal axis (X);
- constraining or striker means (14) mounted on the fixed frame (2) and able to be operatively coupled to the operating means (12) to define at least the closed configuration of the door or window (1);

characterized in that a part of the operating means (12) comprises:

- a drive rod (13a) operatively connected to the handle (10) and mounted and slidable in the groove (9) of an upper crosspiece (15) of the sash (3); the rod (13a) having a first portion (16)

of reduced width; the first portion (16) of reduced width being formed directly on the drive rod (13a) to obtain a closed stretch thereof and extending for a defined length (L);

- a slider (17) housed in the groove (9) of the upper crosspiece (15) of the sash (3) and slidable in the first, reduced-width portion (16) of the drive rod (13a) so as to obtain, in use, a predefined stroke for the slider (17) between at least two end positions corresponding to the closed configuration of the sash (3) and to the tilted open configuration of the sash (3);
- a single operating arm (18) pivoted at one end to the slider (17) and, at the opposite end, to the fixed frame (2) so that, in the tilted open configuration, the upper crosspiece (15) of the sash (3) can be moved away from the fixed frame (2) by the effect of a combined roto-translation between the single arm (18) and the slider (17) slidable along and inside the first reduced-width portion (16) of the rod (13a).

2. The device according to claim 1, wherein the slider (17) comprises a base (17a) for sliding along and inside the first reduced-width portion (16) comprising a central corridor (13b) of the drive rod (13a); the slider (17) having a vertical upper pin (17b) rotatable with the end of the single arm (18).

3. The device according to claim 1 or 2, wherein the drive rod (13a) is coupled to a stroke limit stop carriage (19) for the slider (17); the carriage (19) being slidably adjustable along the first reduced-width portion (16) of the selfsame rod (13a), the carriage (19) having stable fastening means (20) acting between the carriage (19) and the groove (9) in order to stabilize the position its adopts, corresponding to the tilted fully open configuration of the sash (3).

4. The device according to claim 3, wherein the carriage (19) has an elastic element (21) configured for front contact with a portion of the slider (17) in such a way as to slow down and stably fix the slider stroke and in such a way as to define the position of maximum tilt for the sash (3) and the position of maximum opening for the single arm (18).

5. The device according to any of the preceding claims, wherein the drive rod (13a) has a boss (22) for retaining the single arm (18); the boss (22) protruding and being able to be operatively coupled, by moving the drive rod (13a), to the single arm (18) in order to keep the single arm (18) parallel to the rod (13a) in the closed or turned open configuration of the sash (3) under the action of the handle (10).

6. The device according to any of the preceding claims, comprising an auxiliary pin (23) coupled to the sash

(3), protruding from the top corner of the sash (3) formed by the upright (5) connected to the hinges (6, 7) and by the upper crosspiece (15); the pin (23) being configured to be coupled, when the sash (3) is in the closed and turned open configuration, to the single arm (18) which has a corresponding bottom slot (24) for receiving it in such a way as to define a second stable supporting and locking point for the single arm (18) when the sash (3) is in the turned open configuration.

7. The device according to any of the preceding claims, wherein the drive rod (13a) has a second portion (25) of reduced width for coupling to the locking boss (22), the single arm (18) having a bottom protrusion (26) defining a channel which is open at one end to allow the boss (22) in and out as a function of the operating configurations of the sash (3).
8. The device according to any of the preceding claims, wherein the auxiliary pin (23) has an ellipsoid shaped cross section which, in use, can be coupled in a space defined by two vertical walls (27, 28) protruding downwardly from the single arm (18).
9. The device according to any of the preceding claims, wherein the single arm (18) has a vertical tab (29) defining the end of it which is connected to the fixed frame (2) and associated with a tab of the portion of the upper hinge (7).
10. The device according to any of the preceding claims, wherein the drive rod (13a) is made of a synthetic material.
11. The device according to any of the preceding claims, wherein the drive rod (13a) and the slider (17) are configured to move relative to each other as a function of the turned open or tilted open operating configurations of the door or window (1).
12. A tilt and turn door or window (1) comprising at least:

- a fixed frame (2) and a movable sash (3) connected to each other along a corresponding upright (4, 5) by a pair of hinges, a lower hinge (6) and an upper hinge (7), and both provided with a perimeter groove (8, 9);
- a control handle (10) mounted on the upright (11) of the sash (3) opposite to that connected to the fixed frame (2);
- operating means (12) mounted on the sash (3) and operatively connected, in use, to the handle (10) through the agency of drive rods (13) which are slidable inside the perimeter groove (9) of the sash (3) to allow the sash (3) to selectively pass from a closed to a turned open configuration by rotation about a vertical axis (Z) or to a

tilted open configuration by rotation about a horizontal axis (X);

- constraining or striker means (14) mounted on the fixed frame (2) and able to be operatively coupled to the operating means (12) to define at least the closed configuration of the door or window (1);

characterized in that it comprises an operating device according to any of the claims from 1 to 11.

FIG.1

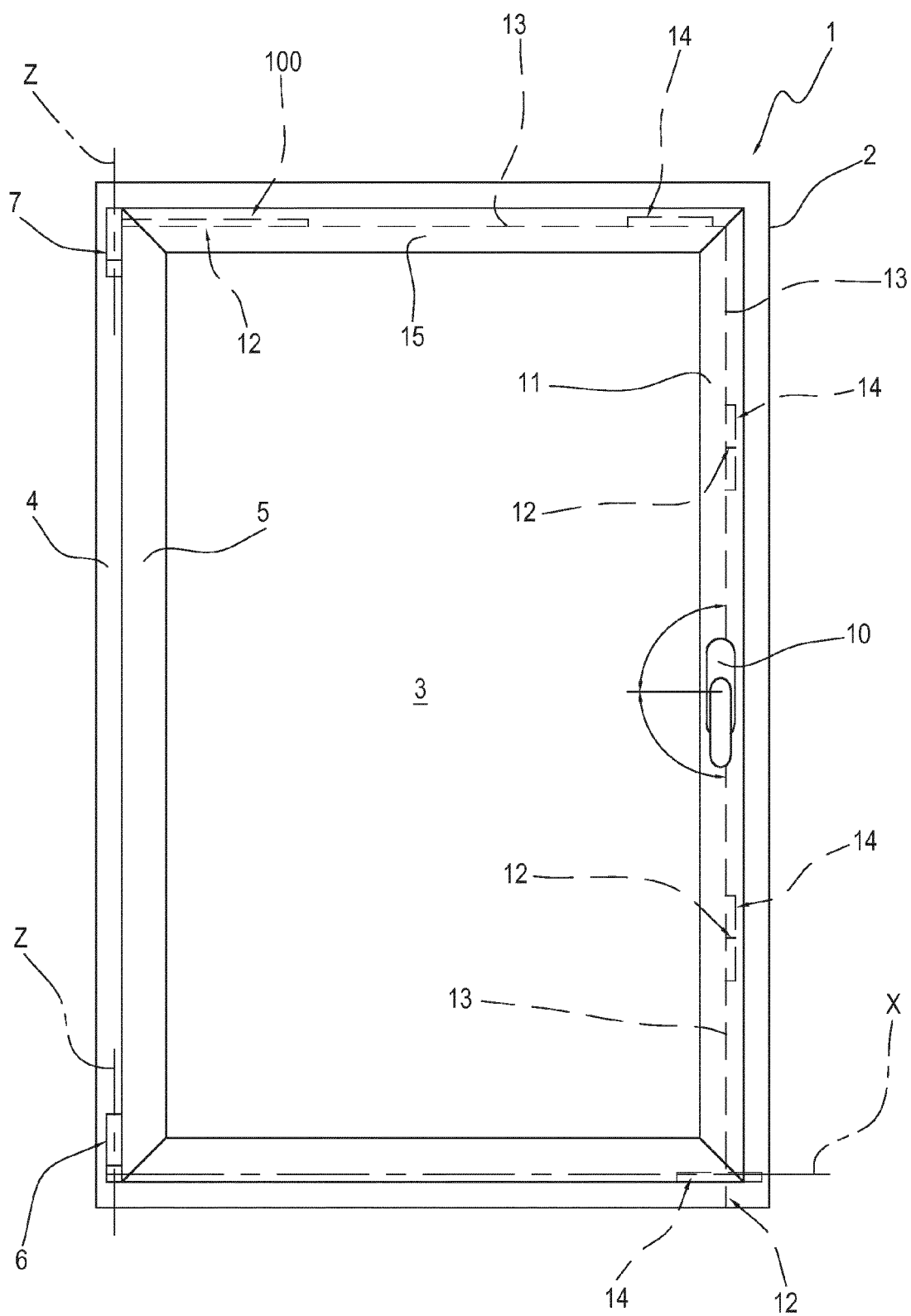


FIG.2

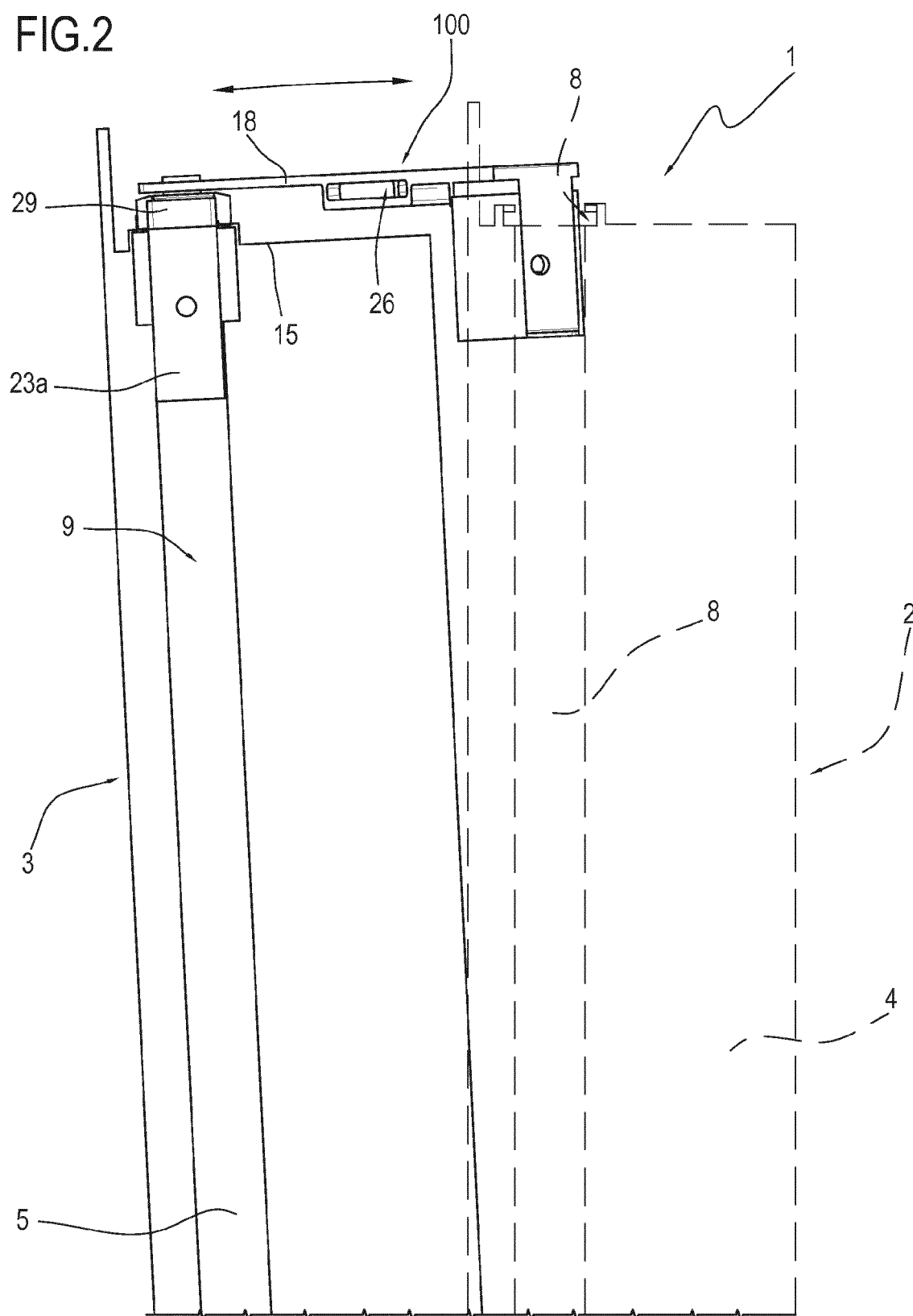


FIG.3

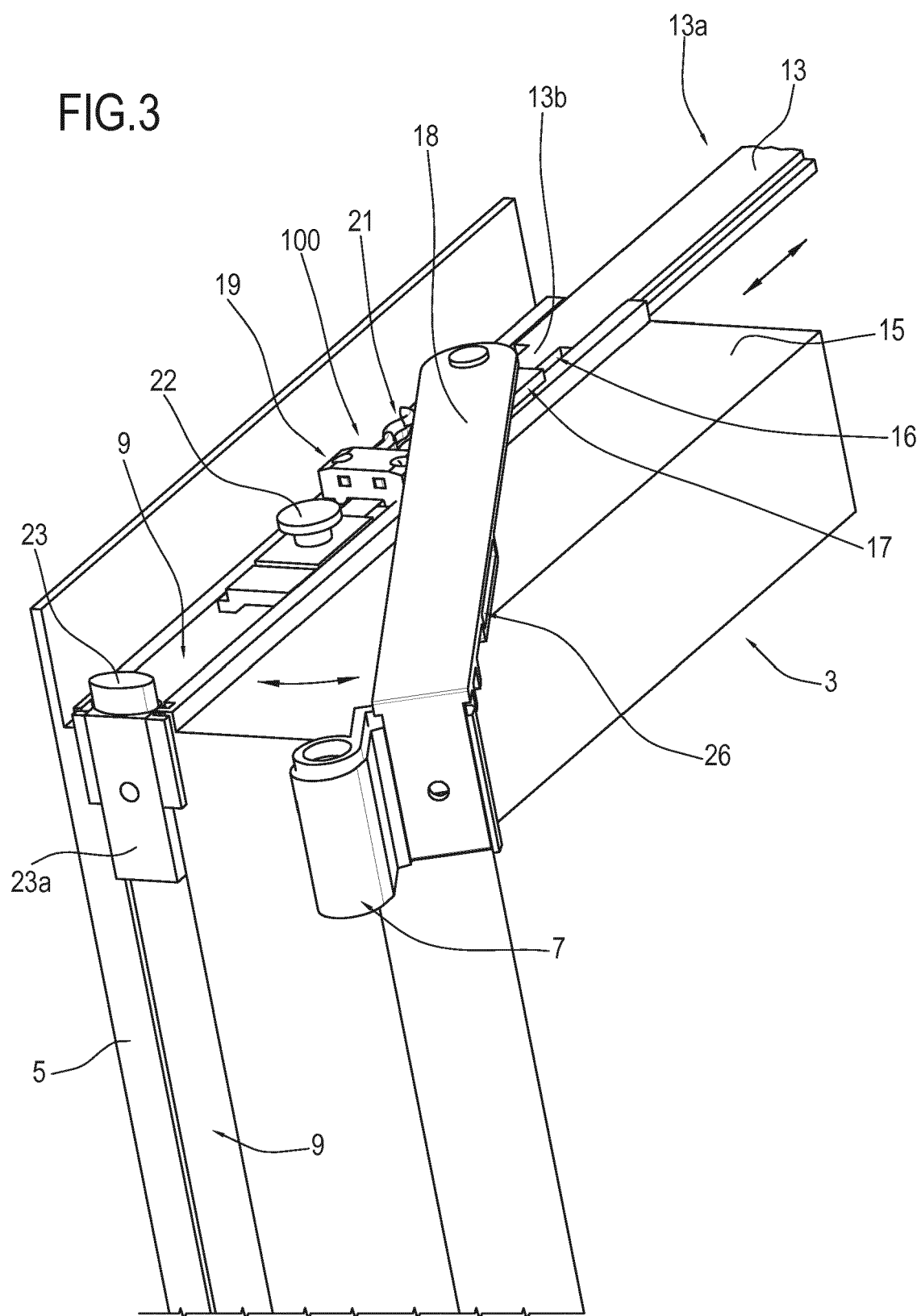
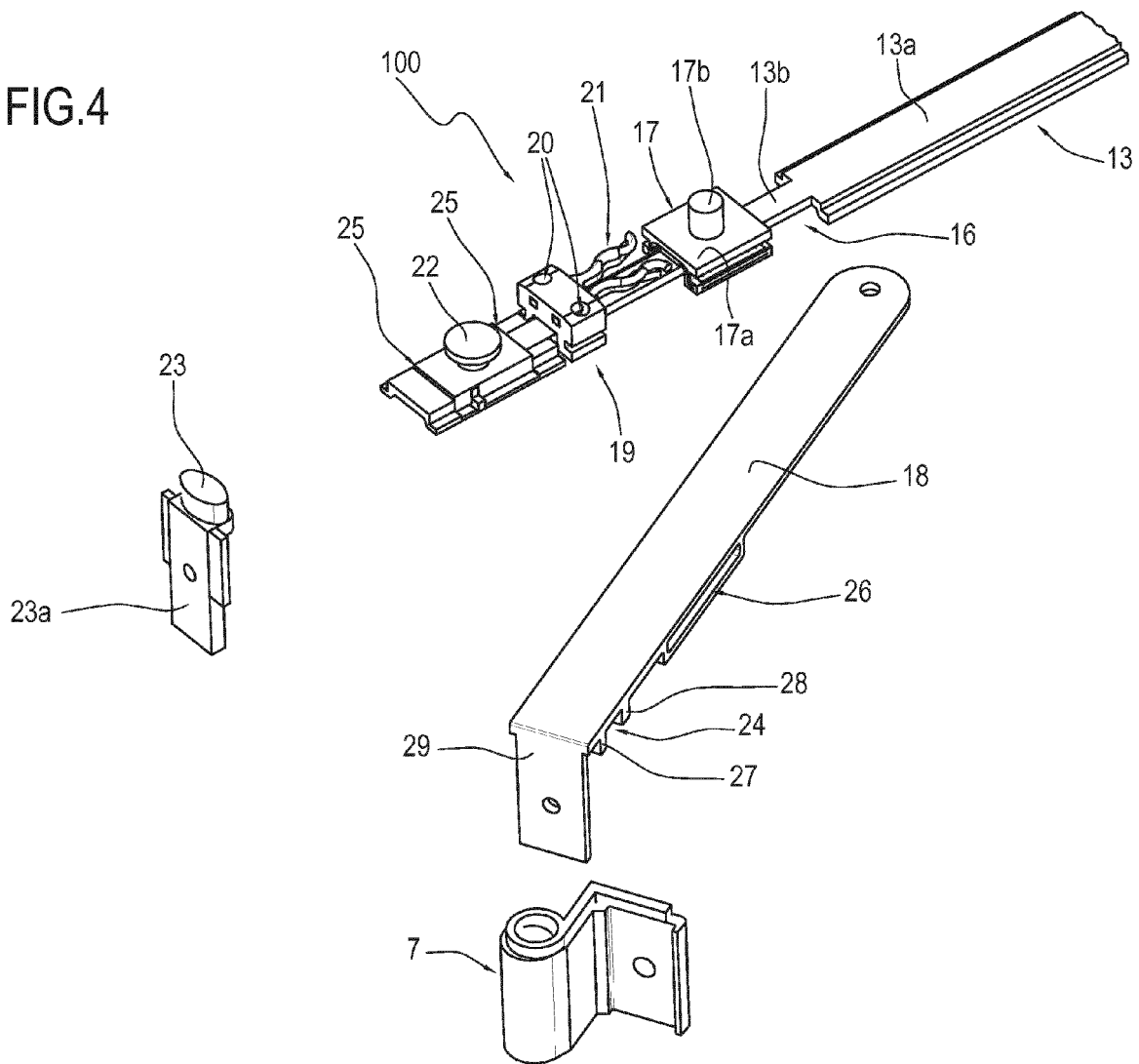
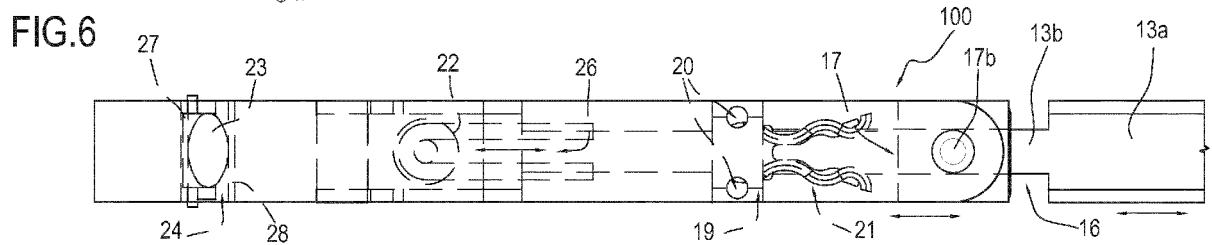
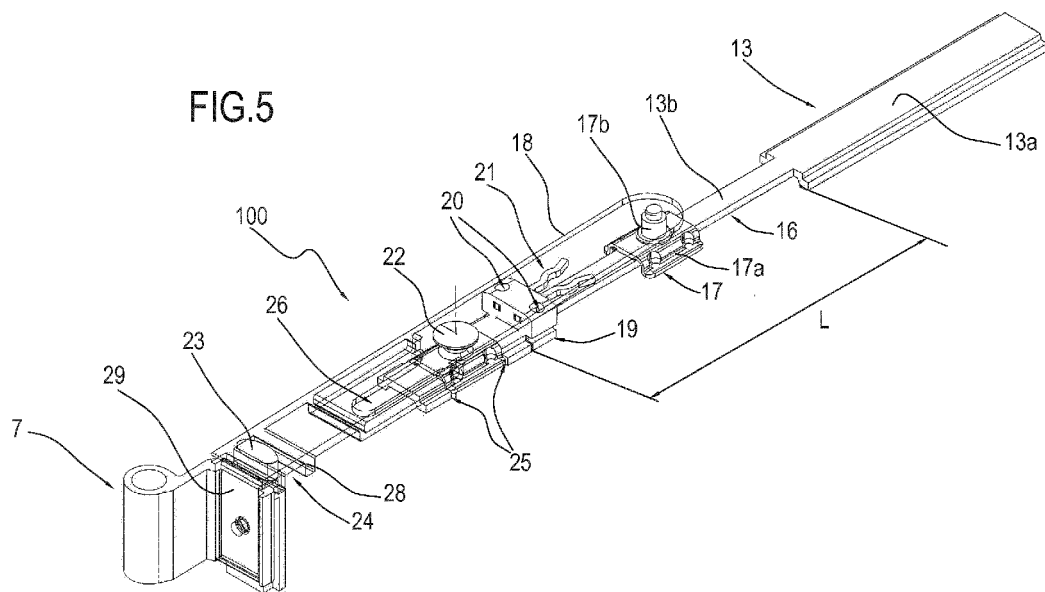


FIG.4







EUROPEAN SEARCH REPORT

 Application Number
 EP 14 17 5032

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Place of search		Date of completion of the search	Examiner
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T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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