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(54) **METHOD FOR MOUNTING A SHUTTER TO A WINDOW OR DOOR CASING AND DRILLING JIG FOR IMPLEMENTING THE METHOD**

(57) A drilling jig (1; 20; 23) for mounting a shutter (32) to a frame (31) of a window casing (30), comprising: a support structure (2) defining a rest surface (3); a mask unit (4) slidable on the support structure (2) according to two slide directions (X, Y) mutually orthogonal and parallel to the rest surface (3) and provided with guide surfaces (5) perpendicular to the rest surface (3) to support and guide a tool for making a mark or a hole on the face (32a) of the shutter (32); stop bodies (6, 7, 8, 9) projecting from the rest surface (3) to define two stop surfaces (6a, 7a) that can be arranged in contact with two reference surfaces (31b, 31c) delimiting an opening (33) in the frame (31) to define a first operative position for the jig (1; 20; 23); a control unit (10) to prevent the slide of the mask unit (4). The mobility of mask unit (4) allows to align the guide surfaces (5) to corresponding reference surfaces (36a) of the flap (36; 39) of a hinge (34) when the jig (1; 20; 23) is arranged in the first operative position, the hinge pin (35) of hinge (34) is associated to frame (31), and the flap (36; 39) is coupled to the hinge pin (35) in the position assumed when the shutter (32) closes the opening (33).

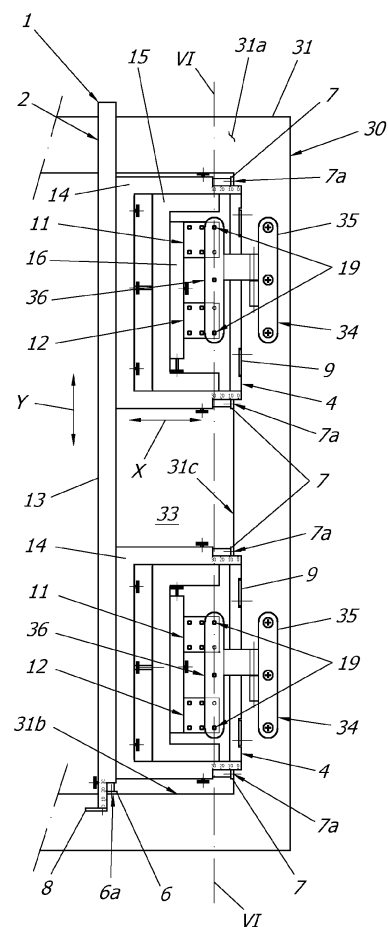


Fig. 4

Description

Field of application

[0001] The present invention is generally applicable to the technical field of the window or door casings in buildings. More particularly, the object of the invention is a drilling jig for mounting a shutter to the frame of a window or door casing.

State of the Art

[0002] In the present description, the term "window or door casing" shall be construed as meaning any frame that delimits an aperture in a building's wall that is intended to be closed by an element, such as a window or a door, that is movably associated to the frame. In turn, the above movable element will be generally indicated using the term "fixture".

[0003] Moreover, for the sake of conciseness, the terms "window casing" will be used to indicated any of the above frames, unless it is clear that another element is meant.

[0004] As known in the construction industry, a window casing in a building comprises a frame that perimetally delimits a through opening, to which a fixture is associated.

[0005] According to a known execution, the fixture is a shutter rotatably connected to the frame through hinges.

[0006] When the shutter is of the kind that stops light when it closes the opening, the hinge pin of the corresponding hinge is fixed to the side of the frame facing towards the outside of the building, while the respective flap that is rotatably associated to the hinge pin is fixed to one side of the shutter, generally the one facing outwards of the building.

[0007] The hinge pin and the flap are each provided with through holes that allow them to be fixed, respectively, to the frame and to the shutter by means of screws, nails or other similar fixing devices.

[0008] Generally, the mounting of the shutter to the frame is done by hand, starting by fixing the hinge pins to the frame, then hinging the flaps to the hinge pins and, finally, fixing the shutter to the flaps.

[0009] The latter operation has the drawback that it is quite difficult to be done, because it requires that the shutter be hold in the right position with respect to the frame during the operation of fixing the screws, the nails or the other fixing devices, to the shutter. Therefore, the above mentioned operation often requires the intervention of two operators, one of whom keeping the shutter in position while the other fixes the shutter to the flaps.

[0010] Moreover, when the flaps are fixed to the surface of the shutter facing to the outside of the building, the above mentioned operation is further complicated due to the need to accomplish the fixing operation from the outside.

[0011] A known technique envisages the provision of a suitable scaffolding outside of the building to allow the operator to work from outside. Nevertheless, that known technique has the drawback of involving a higher cost for labor and a longer assembly time.

[0012] According to a different known technique, the operator remains inside of the building when fixing the shutter to the flap, so as to avoid to provide the above mentioned scaffolding. Compared to the previous technique, that second known technique has the drawback of requiring the operator to lean out on the outside, hence assuming a position that is uncomfortable and potentially dangerous.

Summary of the invention

[0013] The present invention aims at overcoming at least in part the above mentioned drawbacks of the known art.

[0014] In particular, it is an aim of the of the invention to simplify the operation of fixing a shutter to the frame of a window casing compared to the corresponding operation in the known techniques above described.

[0015] In particular, it is an aim of the invention that the above mentioned operation can be performed in a quick and precise way.

[0016] It is a further aim of the invention to allow a single operator to perform the above mentioned operation.

[0017] Further, it is an aim of the invention to avoid the need to provide external scaffoldings, while at the same time allowing to perform the above mentioned operation in safety.

[0018] The above mentioned aims are achieved by a drilling jig according to claim 1, as well as by a method for mounting a shutter to the frame of a window casing according to claim 13.

[0019] Further detail features of the invention are specified in the related dependent claims.

[0020] According to a first aspect, the invention envisages using a drilling jig, placed against the frame's surface to which the shutter is intended to rest against, the jig being provided with adjustable guide elements that are configured so that, once the flaps are associated to the frame, the guide elements can be aligned with the holes of each flap. Subsequently, the jig is placed against the shutter and the guide elements are used as a reference for executing or marking the holes on the shutter that will receive the nails, the screws or the other devices that will be used afterwards for fixing the flaps to the shutter.

[0021] That allows the operator to fix the flaps to the shutter in the correct position without having to associate the shutter to the frame in advance.

[0022] Consequently and advantageously, that renders the shutter easier and quicker to be mount, hence allowing to limit the labor time and reducing the corresponding cost for each shutter or, in the alternate, increasing the number of shutters that can be mounted by

a single operator in a given time, compared to what can be achieved through the known mounting techniques.

[0023] Still advantageously, in fixing the flaps to the shutter, the operator can arrange the shutter in any chosen position, based on his needs for comfort and ease of operation.

[0024] Still advantageously, the operator may perform the entire operation of fixing the flaps to the shutter with no need to handle the shutter, nor to lift it.

[0025] The above mentioned aims and advantages, together with others that will be mentioned hereinafter, will be more evident from the following description of some preferred embodiments of the invention, illustrated for exemplary and non limiting purpose with the help of the attached drawings.

Brief description of the drawings

[0026]

Fig. 1 represents the drilling jig of the invention, in plan view.

Fig. 2 represents the jig of Fig. 1, in lateral view.

Fig. 3 represents a detail of the jig of Fig. 1, in enlarged view.

Fig. 4 represents the jig of Fig. 1 in association with a frame of a window casing, in plan view.

Fig. 5 represents the jig of Fig. 1 associated in association with a shutter, in plan view.

Fig. 6 represents a portion of the jig in the configuration of Fig. 4, in lateral view and in which only the frame is sectioned according to plane VI-VI of Fig. 4.

Fig. 7 represents the same view of Fig. 6, in which the jig is also sectioned according to plane VI-VI of Fig. 4.

Fig. 8 represents a portion of the jig in the configuration of Fig. 5, in lateral cross-sectioned view according to plane VIII-VIII of Fig. 5.

Figs. 9 and 10 represent the jig of Fig. 1, in view from above and sectioned according to, respectively, planes IX-IX and X'-X' of Fig. 1.

Fig. 11 represents detail A of the jig of Fig. 1, in enlarged view.

Fig. 12 represents a detail of a variant embodiment of the drilling jig of Fig. 1, in plan view.

Fig. 13 represents a further variant embodiment of the jig of the invention, in plan view.

Fig. 14 represents a shutter associated to the frame of a window casing, in partial view.

Figs. 15 and 16 represent the shutter of Fig. 14, sectioned according to, respectively, planes XV-XV and XVI-XVI.

Fig. 17 partially represents a variant embodiment of the jig of Fig. 1, according to a detailed view.

Detailed description of some preferred embodiments

[0027] The invention concerns a method for mounting

a shutter to a frame of a window casing.

[0028] Figs. 14-16 represent, for exemplary purpose, a frame **31** of a window casing **30**. The frame **31** comprises a side **31a** that preferably corresponds, in operating conditions, to the side of the frame **31** facing towards the outside of a building. The frame **31** has an opening **33** that is perimetally delimited by mutually orthogonal reference surfaces **31b**, **31c** that are orthogonal, or substantially orthogonal, to the side **31a**.

[0029] In Figs. 14-16 a shutter **32** can also be seen that is rotatably associated to the rest surface **3** of the frame **31** in order to close the opening **33** either partially or completely. Preferably but not necessarily, the shutter **32** is suited to prevent light from passing through the opening **33**, and is made for example in wood or in another material.

[0030] In the above mentioned figures, the shutter **32** is represented in an operative position where it is arranged to close the opening **33**.

[0031] Generally, the shutter **32** comprises an inner portion **32d** that projects from the surface of the shutter **32** intended to be arranged in contact with the side **31a** of the frame **31** and that is positioned inside the opening **33** when the shutter **32** is arranged in the operative position, as can be seen in Fig. 15. The above inner portion **32d** has a plan-view profile that is delimited by perimeter edges **32e**, that are indicated in dashed lines in Fig. 14 and that, in operative position, are arranged to face the reference surfaces **31b**, **31c** of the frame **31**.

[0032] In order to prevent the shutter **32** from interfering with the frame **31** when in operative position, the inner portion **32d** has a dimension in plan view that is smaller than that of the opening **33** and the shutter **32** is mounted in such a way that the above mentioned perimeter edges **32e** are arranged at a distance from the reference surfaces **31b**, **31c** of the frame **31** faced thereof, in order to define a mutual play whose dimension is in general of some millimeters.

[0033] The shutter **32** is associated to the frame **31** by means of hinges **34**, each one of which comprises a hinge pin **35** fixed to the frame **31** and a flap **36** rotatably coupled to the hinge pin **35** by means of a pivot **37** that, preferably but not necessarily, defines a vertical rotation axis for the flap **36**. The flap **36** is fixed to a side **32a** of the shutter **32**, preferably the one facing towards the outside, by means of fixing means. Preferably, the above mentioned fixing means comprise screws **38** arranged through corresponding holes belonging to the flap **36** and screwed to the shutter **32**. However it is clear that, in variant embodiments of the invention, whatever suitable fixing means may be employed, even if it differs from the screws **38**.

[0034] The method of the invention for mounting the shutter **32** to the frame **31** envisages the following operations.

[0035] First of all, the hinge pin **35** of the hinge **34** is associated to the side **31a** of the frame **31** in the prescribed position, corresponding to the one in which the

hinge **34** rotatably supports the shutter **32** to the frame **31** in the above mentioned operative position. Generally, the operation just mentioned is performed by an operator that is different from the one that mounts the shutter **32**, hence the latter operator finds the frame **31** already provided with the hinge pins **35**. In this aspect, the above mentioned operation is to be considered as being optional for the method of the invention. Similarly, the manner the hinge pins **35** are fixed to the frame **31** does not in any event limit the present invention. For example, it is clearly evident that the invention is equally applicable to the case in which the hinge pin **35** is unremovably fixed to the frame **31**, for example where the frame **31** is a masonry contour / frame and the hinge pin **35** has a part that is embedded in a hole of the masonry contour or frame.

[0036] The operator then provides a drilling jig, a possible embodiment of which is exemplary shown in Figs. 1 and 2, where the jig is indicated in the overall with **1**. The jig **1** is provided with a rest surface **3** and with two first stop surfaces **6a**, **7a** projecting from the rest surface **3** according to a direction orthogonal to the rest surface **3**.

[0037] The above mentioned drilling jig **1** may be positioned in a first operative position in which the rest surface **3** is arranged in contact with the side **31a** of the frame **31** and the two first stop surfaces **6a**, **7a** are arranged in contact with, respectively, the above mentioned reference surfaces **31b**, **31c** of the frame **31**. The flap **36** is firstly coupled with the hinge pin **35**, then it is arranged in the position that corresponds to the above mentioned operative position of the shutter **32**.

[0038] At that point, one or more guide surfaces **5** belonging to the drilling jig **1** and perpendicular to the rest surface **3** are put into alignment to corresponding reference surfaces **36a** of the flap **36**, as represented in Figs. 4 and 6. It is underlined that the above mentioned reference surfaces **36a** belong to the flap **36**, in such a way that they can be identified even when the flap **36** is separated from the hinge pin **35**.

[0039] Preferably but not necessarily, the above mentioned reference surfaces **36a** are the edges of corresponding holes of the flap **36**, thus bringing the advantage to increase the precision achieved when mounting the latter to the shutter **32**, as it will be better explained in the following. Still more preferably, the above mentioned holes are the same holes that are intended to receive the above mentioned screws **38**, thus bringing the advantage of allowing a particularly quick mounting, as it will be better explained in the following.

[0040] Subsequently, the drilling jig **1** is positioned in a second operative position, as indicated in Figs. 5 and 8, where it is arranged so that the rest surface **3** is in contact with the side **32a** of the shutter **32** and the two first stop surfaces **6a**, **7a** are arranged in positions that correspond to those occupied by, respectively, the reference surfaces **31b**, **31c** with respect of the shutter **32** when the shutter **32** is arranged in the operative position.

[0041] In this regard, it is noted that generally, when

the shutter **32** occupies the corresponding operative position, one or more of its edges project outwardly with respect to the opening **33**, in such a way as to be arranged against the side **31a** of the frame **31**, as it can be seen in Figs. 15 and 16. Therefore, the reference surfaces **32b**, **32c** of the shutter **32** that delimit the above mentioned edges are not aligned to the reference surfaces **31b**, **31c** of the frame **31**.

[0042] The positioning of the drilling jig **1** with respect to the shutter **32** in the above described second operative position can be obtained with the help of second stop surfaces **8a**, **9a** belonging to the drilling jig **1** and projecting from the rest surface **3**, that are distanced from the first stop surfaces **6a**, **7a** by distances that correspond to those existing between the two reference surfaces **31b**, **31c** of the frame **31** and, respectively, two mutually orthogonal reference surfaces **32b**, **32c** that delimit the shutter **32** and that arranged parallel to, respectively, the two reference surfaces **31b**, **31c** of the frame **31** when the shutter **32** is in operative position.

[0043] The above mentioned distances, that are measured in a direction parallel to the side **31a** of the frame **31** when the shutter **32** is in operative position, are defined beforehand based on the geometry of the shutter **32** and on the required play between the reference surfaces **31b**, **31c** of the frame **31** and the surfaces of the shutter **32** that directly face the reference surfaces **31b**, **31c** when the shutter **32** is operative position. In that way, the positioning of the drilling jig **1** with respect to the shutter **32**, as described above, can be achieved through positioning the second stop surfaces **8a**, **9a** in contact with, respectively, the two reference surfaces **32b**, **32c** of the shutter **32**.

[0044] Clearly, in variant embodiments of the invention, the above mentioned positioning can be achieved in a different way as the one above described, for example by using markings, on the shutter **32** or on the drilling jig **31**, that are suitable to allow a correct mutual positioning.

[0045] After the drilling jig **1** is arranged in the above mentioned second operative position, a mark or a hole is made on the side **32a** of the shutter **32** in correspondence of each guide surface **5** by means of a tool such as, for example, a pencil or whatever instrument capable to make a mark, and using the guide surface **5** as a support and as a guide for the tool itself. Alternatively, the tool may be provided with a sharp edge, for example in the case of a drill bit, suitable to impress a mark on the side **32a**, for example a groove or a hole.

[0046] Subsequently, after removing the drilling jig **1** from the shutter **32**, the flap **36** is removed from the hinge **34** and is arranged in contact with the side **32a** of the shutter **32** in such a position that the reference surfaces **36a** are aligned with, respectively, the above mentioned marks or holes.

[0047] The flap **36** is then fixed to the shutter **32** through the fixing means previously cited.

[0048] It is understood that the above mentioned meth-

od allows to precisely fix the flap **36** to the shutter **32** in the correct position without the need to lift the shutter **32** and hold it in the operative position. For example, in order to fix the flap **36**, the operator may arrange the shutter **32** resting on a support, for example a worktable or an easel, or in any other position preferred by the operator according to needs for comfort and/or ease of operation.

[0049] Moreover, the above mentioned fixing operation may be performed by a single operator, with no need that a second operator holds up the shutter **32**, nor to provide scaffolding outside of the building. As a consequence, the overall labor time is limited with respect to the time involved using the known mounting techniques.

[0050] Moreover, advantageously, the operator may perform the entire operation of fixing the flaps to the shutter with no need to handle the shutter, nor to lift it.

[0051] As regards the guide surfaces **5** of the drilling jig **1**, preferably each one of them is defined by a corresponding through aperture **19**, indicated in Fig. 3. Advantageously, the through aperture **19** allows to optimally guide the tool used in the marking, for example a drill bit, hence achieving the best marking precision.

[0052] Moreover, preferably and as previously anticipated, each reference surface **36a** of the flap **36** is a corresponding hole of the flap **36** itself. That brings the advantage of facilitating the fixing of the flap **36** to the shutter **32**. In fact, each hole of the flap **36** may be used for pre-fixing the flap **36** to the shutter **32**, so that the flap **36** is held during the application of the fixing screws **38**.

[0053] Still preferably, the above mentioned holes of the flap **36** are the same fixing holes to which the screws **38** are being associated. Advantageously, that allows to reduce the overall time for mounting, because the operations of positioning the flap **36** and fixing it to the shutter **32** occur simultaneously.

[0054] Preferably, the through apertures **19** that define the guide surfaces **5** of the drilling jig **1**, for example the holes, are at least two and are arranged to be aligned to two corresponding holes of the flap **36**. Advantageously, that helps achieving a better precision of positioning and fixing of the flap **36** to the shutter **32**.

[0055] Often, the flap **36** comprises three of the above mentioned fixing holes. In that latter case, once the two screws **38** have been associated to the two fixing holes corresponding to the two guide holes of the jig **1**, an additional screw **38** may be associated to the third fixing hole, that often acts itself as a guide.

[0056] As regards more particularly the drilling jig **1**, in Fig. 1 it can be seen that it comprises a support structure **2** that defines a rest surface **3**, preferably plane, suited to be arranged in contact with the side **31a** of the frame **31** and the side **32a** of the shutter **32**.

[0057] The drilling jig **1** also comprises two mask units **4**, each of which is slidably connected to the support structure **2** according to two mutually orthogonal slide directions **X** and **Y** that are parallel to the rest surface **3**. Each mask unit **4** is provided with the above mentioned guide surfaces **5**, that are developed perpendicular to

the rest surface **3**.

[0058] As it will be described in detail in the following, the guide surfaces **5** of each mask unit **4** can be aligned to the flap **36** of a corresponding hinge **34**. In that way, due the provision of two mask units **4** the jig **1** may be used to mark the references of two flaps **36** that belong to two hinges **34**, as it can be seen in Fig. 4.

[0059] Evidently, variant embodiments of the invention not represented in the drawings may envisage a different number of mask units, for example a single mask unit or more than two of them.

[0060] As regards the guide surfaces **5**, each one of them is preferably concave in order to, advantageously, optimally guide the tool when marking the shutter **32**. Preferably and as previously anticipated, each guide surface **5** is a corresponding through aperture **19** and, more preferably, a hole whose axis is perpendicular to the rest surface **3** and has a preferably circular cross section.

[0061] Still preferably, the above mentioned through hole has such a diameter as to be suited to precisely house a drill bit having a diameter that is smaller or, at most, equal to the holes for the fixing screws **38**.

[0062] Still preferably, each mask unit **4** comprises a plurality of the above mentioned through apertures **19**, so as to allow to quickly align them to the holes of the flap **36** and to allow more flexibility of use of the jig **1**, in order to render the jig suitable to be used with flaps **36** having holes of different interaxis. The jig **1** that is represented in the figures comprises twelve through apertures **19** for each mask unit, aligned in four parallel rows each having three apertures. Evidently, both the number and the pattern of the through apertures **19** may be chosen based on the manufacturer's needs.

[0063] The jig **1** also comprises first stop bodies **6**, **7**, associated to the support structure **2**. The above mentioned first stop bodies **6**, **7** can be arranged in a position in which it projects from the rest surface **3** in a direction perpendicular thereof, in order to define at least the two above mentioned first stop surfaces **6a**, **7a** that can be positioned in contact with, respectively, the two above mentioned mutually orthogonal reference surfaces **31b**, **31c** delimiting the opening **33** of the frame **31** when the rest surface **3** is arranged in contact with the side **31a** of the frame **31**.

[0064] Preferably, and as it can be seen more in detail in Fig. 3, each mask unit **4** comprises two corresponding first stop bodies **7**, intended to be arranged to rest against the reference surface **31c** of the frame **31**. Advantageously, the provision of two first stop bodies **7** facilitates the precise positioning of the corresponding mask unit **4** with respect to the frame **31**.

[0065] It is implicit that, in order to achieve the actual adjustment of the mask units **4** with respect to the frame **31** when the jig **1** is in contact with the frame, each first stop body **6**, **7** is associated to the support structure **2** in such a way that the adjustment of the mask units **4** according to the direction perpendicular to the reference surface **31b**, **31c** of the frame **31** intended to be arranged

in contact with the stop body **6, 7** keeps the position of the same stop body **6, 7** unchanged with respect to the support structure **2** according to the same direction. This is rendered apparent by the figures, for example by comparing Fig. 4 with Fig. 1. From said comparison it can be seen that the movement of the mask units **4** with respect to the support structure **2** according to the second slide direction **X** implies an equal change in the distance between the mask units **4** and the first stop bodies **7** that are in contact with the reference surface **31c** of the frame **31**.

[0066] It is hereby pointed out that the above feature applies as well, with the due and obvious adaptations, to the second stop bodies **8, 9** intended to be arranged in contact with the shutter **32** and that will be disclosed in the following, as it can be seen by comparing Fig. 1 with Fig. 5.

[0067] The jig **1** further comprises a control unit **10** that is operable to prevent the mask unit **4** from sliding according to the two slide directions **X** and **Y**. Advantageously, the control unit **10** allows to fix the configuration of the drilling jig **1** after adjusting the position of the mask unit **4**, while positioning the jig **1** against the shutter **32**.

[0068] It is understood that the drilling jig **1** as above described allows to carry out the functions indicated in the description of the method of the invention, in particular the positioning with respect to the frame **31** by means of the first stop surfaces **6a, 7a** and the alignment of the guide surfaces **5** to the reference surfaces **36a** of the flap **36**, that is performed by sliding the mask unit **4** with respect to the support structure **2**.

[0069] Therefore, the above mentioned jig achieves the same aims and advantages of the method above described.

[0070] Preferably, the jig **1** also comprises second stop bodies **8** and **9**, similar to the first stop bodies **6** and **7**, that define corresponding second stop surfaces **8a, 9a** that can be positioned in contact with, respectively, the reference surfaces **32b, 32c** of the shutter **32**.

[0071] In particular, each second stop surface **8a, 9a** is arranged at a distance from the corresponding first stop surface **6a, 7a** according to a direction perpendicular to the reference surface **31b, 31c** with which the first stop surface **6a, 7a** is intended to be arranged in contact.

[0072] As previously already described, the distance between each first stop surface **6a, 7a** and the corresponding second stop surface **8a, 9a** is defined based on the geometry of the shutter **32** and the play of the shutter with respect to the opening **33**.

[0073] Preferably and as it can be observed in Fig. 3, each mask unit **4** comprises two second stop bodies **9** with the purpose to facilitate a precise positioning of the jig **1** with respect to the shutter **32**.

[0074] Preferably, the first stop bodies **6** and **7** are removably associated to the support structure **2** according to corresponding directions that are parallel to the rest surface **3** and perpendicular to the corresponding reference surfaces **31b, 31c**.

[0075] Advantageously, the possibility to move the stop bodies as just described allows to modify the distance between the first stop surface **6a, 7a** and/or the corresponding second stop surface **8a, 9a** in order to adapt the drilling jig **1** to shutters **32** having different geometries and/or to achieve different mounting plays.

[0076] Variant embodiments of the invention not represented in the drawings may envisage that the second stop bodies **8** and **9** are movable as above described, in addition to, or instead of, the movable first stop bodies **6** and **7**. In such a case, the directions of motion are perpendicular to, respectively, the reference surfaces **32b, 32c** of the shutter **32** against which the second stop bodies **8, 9** are arranged.

[0077] Preferably, the above mentioned mobility of the stop bodies **6, 7, 8, 9** is achieved by associating them to the support structure **2** through sliding guides, whose kind is per-se known.

[0078] Preferably and as it can be seen more in detail in Fig. 11, the jig **1** is provided with a graduated scale **24** arranged in correspondence of each one of the above mentioned movable stop bodies **6** and **7** to allow to immediately determine the distance of the corresponding first stop surfaces **6a, 7a** with respect to the corresponding second stop surfaces **8a, 9a**, hence facilitating their adjustment.

[0079] Preferably, the above mentioned graduated scale **24** is impressed on the element of the above mentioned sliding guide that is fixed with respect to the support structure **2** of the jig **1**, and comprises a plurality of notches, each one of which is associated to a number that indicates the above mentioned distance when the corresponding first stop surface **6a, 7a** is aligned to the corresponding notch.

[0080] Variant embodiments of the invention, not represented in the drawings, may envisage that the above mentioned notches are impressed on that element of the sliding guide that is movable with respect to the support structure **2**, or on both elements of the guide.

[0081] Fig. 17 shows the same detail of Fig. 11 in relation to a variant embodiment of the jig **1**. The above variant embodiment differs from the previous one in that the adjustment of one of the movable stop bodies **7** with respect to the support structure **2** is achieved by means of two sliding bodies **41, 42** that are connected in series, each one of which allows to move the stop body **7** according to the same direction of adjustment that, in this case, coincides with the second slide direction **X**.

[0082] The two sliding bodies **41, 42** are slidably connected to one another according to the direction of adjustment. In particular, a first sliding body **41** is slidably connected to the support structure **2** and allows adjusting the position of the stop body **7** based on the geometry of the shutter **32** and, more in particular, to the distance between the corresponding reference surfaces **32b, 32c** and the perimeter edge **32e** of the inner portion **32d**. A second sliding body **42**, to which the stop body **7** is associated, is slidably connected to the first sliding body

41 and allows to adjust the position of the stop body **7** based to the required play between the reference surfaces **32b**, **32c** and the perimeter edge **32e**.

[0083] Advantageously, the variant just described facilitates the adjustment of the stop body **7**.

[0084] Preferably, the first sliding body **41** is mounted to be freely slidable on the support structure **2** of the jig **1** and can be fixed to it through stop means of a per-se known kind and that may comprise, for example, a clamp **43**.

[0085] Still preferably, the second sliding body **42** is slidably mounted on the first sliding body **41** and is coupled to it through screw means **44** whose rotation axis is parallel to the direction of adjustment, in such a way that the rotation of the above mentioned screw means causes the movement of the second sliding body **42**, hence of the corresponding stop body **7**, with respect to the first sliding body **41**, hence with respect of the support structure **2** according to the direction of adjustment. Advantageously, the coupling of the second sliding body **42** to the first sliding body **41** through the above mentioned screw means facilitates a precise adjustment.

[0086] Preferably, the above mentioned screw means of the second sliding body **42** comprise a threaded bar, indicated in dashed lines in Fig. 17, of which an end **44a** can be accessed from the outside and is shaped in such a way that it can be rotationally operated by the operator, manually or acting through a tool such as a screwdriver, an Allen key, or similar.

[0087] Still preferably, the above threaded bar is arranged through the second sliding body **42** and through the support structure **2** and can be accessed from the outside through a through hole provided on the stop body **7**.

[0088] Preferably, the variant of the jig **1** just described has two graduated scales **41a**, **42a** to facilitate the determination of the position of, respectively, the two sliding bodies **41**, **42** in order to further facilitate their adjustment by the operator. In the example of Fig. 17, the first graduated scale **41a** belongs to the support structure **2** and the first sliding body **41** has a first reading notch **41b** that can be looked up on the first graduated scale **41a**. The second graduated scale **42a** belongs to the first sliding body **41** and the second sliding body **42** has a corresponding second reading notch **42b** that can be looked up on the second graduated scale **42a**.

[0089] Preferably, the first sliding body **41** and the second sliding body **42** are both housed in a cavity belonging to the support structure **2**. The above cavity is in communication with the outside through an opening **45**, through which the second graduated scale **42a** and both reading notches **41b**, **42b** can be read.

[0090] It is clear that an adjusting system similar to those described above can be used as well for adjusting one or more of the other stop bodies **6**, **7**, **8**, **9**. In particular, the above mentioned adjusting system is preferably used on each first stop body **6**, **7**, in order to, advantageously, facilitate the adjustment of the jig **1** according

to both slide directions **X**, **Y**.

[0091] Still preferably, each stop body **6**, **7**, **8**, **9** is movably associated to the support structure **2** according to a direction that is perpendicular to the rest surface **3**, so that it can be arranged in a position in which it does not project with respect to the rest surface **3**. Advantageously, that allows to arrange those first stop bodies **6**, **7** that are intended to be arranged against the reference surfaces **31b**, **31c** when the jig **1** is arranged against the frame **31**, as represented in Fig. 6, or those second stop bodies **8**, **9** that are intended to be arranged against the reference surfaces **32b**, **32c** when the jig **1** is arranged against the shutter **32**, as represented in Fig. 8, so that they project from the rest surface **3**, while the other stop bodies can be retracted so that they do not interfere with the correct positioning of the jig **1**.

[0092] Preferably and as it can be seen for example in Fig. 2, the above mentioned mobility of the stop bodies **6**, **7**, **8**, **9** is achieved by configuring them as corresponding wings rotatably connected to the support structure **2** by means of corresponding pivots whose axes are parallel to the rest surface **3**.

[0093] According to a variant embodiment of the invention, not represented in the drawings, one or more stop bodies **6**, **7**, **8**, **9** may be configured as corresponding pegs, the pegs being slidably connected to the support structure **2** according to corresponding directions that are perpendicular to the rest surface **3**, for example slidably housed in corresponding holes of the support structure **2**.

[0094] As previously anticipated, the jig **1** preferably comprises at least two guide surfaces **5**, bringing the advantages already mentioned above.

[0095] In particular, the jig **1** is configured in such a way that, when it is arranged against the frame **31**, the two guide surfaces **5** are mutually aligned according to a direction that is parallel to the direction of mutual alignment of the reference surfaces **36a** on the flap **36**.

[0096] Moreover, preferably and as it can be seen in Fig. 3, the mask unit **4** comprises two mask bodies **11**, **12**, each one of which comprises at least one corresponding guide surface **5**. The two mask bodies **11**, **12** are mutually slidable so that they can change the distance between the guide surfaces **5**. Advantageously, thanks to the possibility to modify the distance between the two guide surfaces **5**, the drilling jig **1** can be used with flaps **36** having different interaxis between the fixing holes.

[0097] Preferably and as it can be seen in particular in Fig. 3, each mask body **11**, **12** comprises six guide surfaces **5**, aligned according to the second slide direction **X** in two rows each having three apertures, the two rows being mutually distanced according to the first slide direction **Y**.

[0098] Preferably, the control unit **10** can be operated to also prevent the mutual sliding between the above mentioned two mask bodies **11**, **12**, so that the distance between the guide surfaces **5** is hold while the jig **1** is transferred from the frame **31** to the shutter **32**.

[0099] Still preferably, the mask bodies **11**, **12** are

made in a material that is transparent, or anyway such as to allow the operator to see the flap and the corresponding holes through the mask bodies **11**, **12**. Advantageously, that facilitates the operator in aligning the guide surfaces **5** to the reference surfaces **36a** of the flap **36** when the latter is arranged on the outside of the jig **1**, i.e. when it is arranged behind the mask bodies **11**, **12** with respect to the operator, as represented in Figs. 4-8.

[0100] According to a variant embodiment of the invention, partially represented in Fig. 12, the jig therein indicated in the overall by **20** differs from the previous one in that each mask body **11**, **12** has the shape of a lattice. For example, the lattice comprises thin elements **21** made in metal or in another suitable material, mutually intersecting in correspondence of the guide surfaces **5**, wherein the guide surfaces **5** may be defined by corresponding elements **22** having annular or tubular shape.

[0101] In both variants of jigs **1** and **20** above described, the support structure **2** preferably comprises a support bar **13** developed according to a first one of the above mentioned two slide directions, that is indicated con **Y**.

[0102] The above mentioned support bar **13** defines a portion of the rest surface **3** that is intended to be arranged in contact with the side **31a** of the frame **31**, as seen in Fig. 6. More precisely, an end of the support bar **13** carries the first stop body **6** intended to be arranged in contact with one reference surface **31b** of the frame **31**, while the opposite end is arranged in contact with the side **31a** of the frame **31**. Preferably, the first end of the support bar **13** also carries the second stop body **8** intended to be arranged in contact with a reference surface **32b** of the shutter **32**, as it can be seen in Fig. 5.

[0103] Preferably, the support bar **13** is telescopic, to allow adapting its length to the dimension of the opening **33**.

[0104] The support structure **2** also comprises a first frame **14** slidably connected to the support bar **13** according to the first slide direction **Y** and defining another portion of the rest surface **3**.

[0105] The support structure **2** further comprises a second frame **15** that is slidably connected to the first frame **14** according to the second slide direction **X** and that supports the mask unit **4**.

[0106] It is understood that the support structure **2** configured as above described allows adjusting the position of the mask unit **4** according to the two slide directions **Y** and **X** by acting on the corresponding frames **14** and **15**.

[0107] Preferably, the aforementioned slides of the frames **14** and **15** are allowed by connecting the frames to, respectively, the support bar **13** and the second frame **15** through corresponding linear guides, in themselves known. For example and as it can be seen in the sections of Figs. 7 to 10, each linear guide may comprise a projection and a recess conjugated to one another, one of the which belonging to the corresponding frame **14**, **15**, the other belonging to the support member of such frame, namely to the support bar **13** or to the second frame **15**,

respectively.

[0108] As regards the control unit **10**, preferably it comprises a plurality of clamps **17**, **17'**. For convenience, the numerical references are indicated in the figures only for some of the above mentioned clamps. The clamps **17**, **17'** are operable to prevent the first frame **14** from sliding with respect to the support bar **13** and the second frame **15** from sliding with respect to the first frame **14**. In particular, each clamp **17**, **17'** is preferably used to prevent the slide of a corresponding one of the above mentioned linear guides.

[0109] Preferably, each clamp **17**, **17'** is rotatably operable by the operator in a direction or in the other in order to, respectively, tightening or loosening it so as to, respectively, prevent or allow the mutual slide between the corresponding parts. Still preferably, the above mentioned rotation may be obtained by acting on a shaped surface of the clamp **17**, **17'**, for example a knurled cylindrical surface.

[0110] Preferably, one or more clamps **17** each comprises a threaded part, connected to one of the two mutually movable parts of the linear guide, to which a friction element is screwed that carries the above mentioned knurled shaped surface, so that rotating the shaped surface in one of the two opposite directions causes the movement of the friction element in a direction parallel to the axis of rotation of the clamp **17** until pressing a surface against the other movable part of the linear guide, hence preventing the slide.

[0111] As it can be seen in Figs. 3 and 9, other clamps **17'** may comprise a threaded bar **17a** having a first end that is rotatably associated to one of the two mutually movable parts, for example to the support structure **2**, in a freely rotatable manner, and the opposite end that is screwed to the other one of the above mentioned movable parts, for example to the first frame **14**, by means of a nut screw **17b**, in such a way that the distance between the two parts can be adjusted by rotating the threaded bar **17a**. Moreover, the threaded bar **17a** carries the above mentioned shaped surface.

[0112] According to a variant embodiment, not represented in the drawings, the configuration comprising a threaded bar and a nut screw just described is used to adjust the mutual distance between the two mask bodies **11**, **12**.

[0113] As regards the mask unit **4**, preferably it comprises a third frame **16** slidably mounted on the second frame **15** and supporting the two mask bodies **11**, **12**. Advantageously, the slide of the third frame **16** allows to more precisely adjust the position of the guide surfaces **5**.

[0114] Preferably, the slide of the third frame **16** with respect to the second frame **15** occurs according to the first slide direction **Y**.

[0115] Still preferably, the two mask bodies **11**, **12** are slidably associated to the third frame **16** according to the first slide direction **Y**. As it will be described more in detail in the following, that configuration renders the drilling jig **1** particularly suited for the use in cases where the ref-

erence surfaces **36a** of each flap **36** are mutually aligned according to a direction that is parallel to the axis of the pivots **37** of the hinges **34**.

[0116] As regards the guide surfaces **5**, preferably and as previously anticipated, each one of them belongs to a corresponding opening **19**, preferably a hole, that develops through the mask unit **4** according to a direction that is perpendicular to the rest surface **3**.

[0117] Preferably and as it can be seen in detail in Figs. 7, 8 and 10, the drilling jig **1** also comprises a tubular element **18** inserted in each through aperture **19** in order that one of its ends can be positioned projecting from opening **19** itself and inside a corresponding hole **36a** of the flap **36**, as it can be seen in Fig. 7. Advantageously, the tubular element **18** facilitates the alignment of the corresponding opening **19** with the hole of the reference surface **36a** of the flap. Still advantageously, the tubular element **18** comprises a through hole acting as a guide for the tip of a tool, for example a drill bit, used for subsequently drill or mark the shutter **32**.

[0118] Still preferably, the tubular element **18** is slidably inserted in the through aperture **19** so that, advantageously, its projecting end can be retracted inside the opening **19** when not in use.

[0119] Still preferably, the tubular element **18** has a length that is bigger than the depth of the opening **19**, for example bigger than the thickness of the corresponding mask body **11**, **12**. That ensures that at least one of the two opposite ends of the tubular element **18** is always projecting beyond a corresponding end of the opening **19**. Advantageously, the above mentioned projecting end may be pressed to cause the tubular element **18** to slide until arranging the other end so that it projects beyond the opposite end of the opening **19**, thus bringing the advantage to allow using the drilling jig **1** on both sides, as it will be explained more in detail in the following.

[0120] Still preferably, the tubular element **18** has a color that differs from that of the mask bodies **11**, **12** and of the flap **36**, so that it can be easily seen.

[0121] The figures show a tubular element **18** arranged in each one of the through apertures **19**. However, it is clear that the number of tubular elements **18** may be smaller than that represented in the figures and, for example, may limit to two tubular elements **18** only that are associated to, respectively, two through apertures **19** of the two mask bodies **11**, **12**. Each one of the above mentioned two tubular elements **18** may be removed from the corresponding through aperture **19** and inserted in another through aperture **19** of the same mask body **11**, **12**, depending on the geometry of the flap **36**.

[0122] Preferably, the drilling jig **1** is configured so that the distance between the rest surface **3** and the surfaces of the mask bodies **11**, **12** facing opposite to the rest surface **3** is equal to the distance between the side **31a** of the frame **31** and the side **32a** of the shutter **32** when the latter is in operative position. As a consequence of that, when the drilling jig **1** rests against the side **31a** of the frame **31**, the surfaces of the mask bodies **11**, **12** are

arranged, with respect to the side **31a**, in the position corresponding to the position of the side **32a** of the shutter **32** when the latter is in operative position and, hence, the flaps **36** that are in contact with the mask bodies **11**, **12** are arranged in the position corresponding to the operative position of the shutter **32**, to advantage of the positioning precision of the guide surfaces **5**.

[0123] Preferably, the drilling jig **1** is entirely contained between two mutually parallel planes that are co-planar to, respectively, the rest surface **3** and the above mentioned surfaces of the mask bodies **11**, **12** arranged opposite to the rest surface **3**, except that the stop bodies **6**, **7**, **8**, **9** can still be arranged to project beyond the rest surface **3** as previously described. The absence of any projection beyond the above mentioned parallel planes allows an optimal positioning of the jig **1** in contact with the frame **31** and with the shutter **32**, as well as of the flaps **36** in contact with the jig **1**.

[0124] Still preferably, the jig **1** is geometrically symmetrical with respect to a plane that is parallel to the rest surface **3**, in such a way that the jig **1** is actually provided with two mutually opposite rest surfaces **3**. Advantageously, the symmetry just described allows to use the jig **1** on both sides, depending on whether it is used for mounting a right shutter or a left shutter.

[0125] In the case just described, the stop bodies **6**, **7**, **8**, **9** are preferably configured so that they can be arranged projecting on both sides of the jig **1**, depending on which one of the two rest surfaces **3** is used.

[0126] For the same reason, preferably the tubular elements **18** are configured in such a way that they can be arranged projecting from each one of the two opposite ends of the corresponding through apertures **19**.

[0127] As previously anticipated, the above described drilling jigs **1** and **20** are particularly suited to be used when the reference surfaces **36a** of each flap **36** are mutually aligned according to a direction that is parallel to the axis of the pivot **37** of the hinge **34**, like in the case shown in Fig. 4. Actually, the possibility to adjust the distance between the mask bodies **11**, **12** of each mask unit **4** according to the slide direction **Y** allows to adapt the interaxis between the corresponding guide surfaces **5** to the interaxis of the holes **36a** of each flap **36**.

[0128] Fig. 13 represents a variant embodiment of a drilling jig, that is indicated therein in the overall with **23** and that is particularly suited for use with a different flap, being represented in dashed line and indicated by **39**, whose reference surfaces **39a**, for example corresponding holes, are aligned according to a direction that is orthogonal to the axis **40** of the hinge pivot, instead of being parallel to the axis like in the previous case.

[0129] For simplicity, each component of the jig **23** of that variant embodiment is indicated by the same numeral of the component that performs the same function in the jigs **1** and **20**.

[0130] The jig **23** according to that variant differs from jigs **1** and **20** of the previous embodiments substantially in that the two guide surfaces **5** are aligned according to

the first slide direction **X** instead of the second slide direction **Y**. Similarly, the two mask bodies **11**, **12** of each mask unit **4** are aligned, and mutually slidable, according to the second slide direction **X** instead of the first slide direction **Y**. Evidently, that allows to adjust the interaxis between the corresponding guide surfaces **5** according to the direction of alignment of the reference surfaces **39a** of the flap **39**, so as to adapt it to the interaxis of the reference surfaces **39a**.

[0131] Operatively, for executing the method of the invention previously described, any one of the jigs **1**, **20** and **23** above described is arranged in the first operative position, by arranging the rest surface **3** against the side **31a** of the frame **31** that supports the hinge pins **35** of two or more hinges **34**.

[0132] In particular and as shown in Fig. 4, the above mentioned positioning is achieved by arranging the support bar **13** parallel to the direction of alignment of the two hinge pins **35**, that generally is a vertical direction. The above mentioned positioning also comprises arranging the first stop surfaces **6a** and **7a** projecting from the rest surface **3** and against the reference surfaces **31b** and **31c** of the opening **33**.

[0133] After associating the flaps **36** to the hinge pins **35** and arranging them in a position corresponding to the operative position of the shutter **32**, the two mask units **4** are driven according to the first slide direction **Y** through corresponding sliding guides belonging to the first frames **14** until arranging them so that they face, respectively, the two flaps **36**.

[0134] Subsequently, an operation of fine adjusting is performed in order to align two guide surfaces **5** of each mask unit **4** to the reference surfaces **36a** of the corresponding flap **36**, through acting on the sliding guides of the second frames **15**.

[0135] Finally, each guide surface **5** is arranged in alignment to a corresponding reference surface **36a** by acting on the sliding guides of the third frames **16** and by modifying the interaxis between the corresponding mask bodies **11**, **12** of each mask unit **4**. A satisfactory condition of alignment may be verified by inserting the tubular elements **18** in the holes of the flaps **36**, as per Figs. 6 and 7.

[0136] Evidently, the above mentioned operations may be performed according to sequences that are different from the above described, yet allowing to align the guide surfaces **5** to the reference surfaces **36a**.

[0137] After locking the configuration of the jig **1**, **20**, **23** through the control unit **10**, the first stop bodies **6** and **7** and the tubular elements **18** are moved so that they don't project beyond the rest surface **3**.

[0138] Thereafter, the jig may be moved in the second operative position, by arranging the rest surface **3** in contact with the side **32a** of the shutter **32** that is intended to receive the flaps **36**, and then by arranging the second stop surfaces **8a** and **9a**, positioned projecting with respect to the rest surface **3**, in contact with, respectively, the reference surfaces **32b** and **32c** of the shutter **32**.

[0139] After that, it is possible to proceed with the op-

eration of drilling / marking the side **32a** as previously described, and then with the operation of fixing the flaps **36** to the shutter **32**.

[0140] The jig may then be used for mounting another shutter that is symmetrical to the first one, not represented in the drawings, provided the jig is rotated by 180° around the first slide direction **Y**, in order to use the rest surface **3** that is opposite to that that was used for mounting the first shutter **32**.

[0141] From what has been described above, it is understood that the jig of the invention achieves the preset aims.

[0142] In particular, since the jig allows to fix the flaps to the shutter without the need to hold the shutter in contact with the frame, the above mentioned operation may be performed by a single operator.

[0143] Moreover, the possibility of adjusting the jig allows to fix the flaps to the shutter quickly and precisely.

[0144] Moreover, the use of the jig prevents both needs of providing scaffoldings on the outside of the building, and leaning on the outside, so that the above mentioned operation can be performed in full safety.

[0145] The invention is susceptible of changes and variant, all falling within the inventive concept that is specified in the attached claims. In particular, the elements of the invention may be replaced by other elements technically equivalent thereof.

[0146] In particular, the geometry of the mask unit **4** and, more particularly, of the mask bodies **11**, **12**, as well as the number and/or the pattern of the through apertures **19** may change according to the preferences of the manufacturer and/or to the needs of the user to whom the jig is addressed.

[0147] Moreover, the materials may be chosen according to the needs, yet without departing from the scope of the invention.

[0148] Moreover, one or more elements of a specific embodiment of the invention that are technically compatible with another specific embodiment of the invention may be used in the latter embodiment in addition to, or to replace, elements of the latter embodiment.

[0149] Where the technical elements specified in the claims are followed by reference signs, those reference signs are included for the sole purpose to improve the understanding of the invention and, therefore, they do not imply any limitation on the scope of protection claimed.

Claims

1. Drilling jig (1; 20; 23) for mounting a shutter (32) to a frame (31) of a window or door (30) through a hinge (34) comprising a hinge pin (35) to be associated to a side (31a) of said frame (31) and a flap (36; 39) suited to be rotatably associated to said hinge pin (35) and to be associated to a side (32a) of said shutter (32), said drilling jig (1; 20; 23) comprising:

- a support structure (2) defining a rest surface (3);
 - a mask unit (4) slidably connected to said support structure (2) according to two mutually orthogonal slide directions (X, Y) that are parallel to said rest surface (3), said mask unit (4) being provided with guide surfaces (5) perpendicular to said rest surface (3), said guide surfaces being suited to support and guide a tool for making a mark or a hole on said side (32a) of said shutter (32) when said drilling jig (1; 20; 23) is positioned with said rest surface (3) in contact with said side (32a) of said shutter (32);
 - a plurality of stop bodies (6, 7, 8, 9) associated to said support structure (2) and that can be arranged so as to project from said rest surface (3) in a thereby perpendicular direction to define at least two first stop surfaces (6a, 7a) that, when said rest surface (3) is arranged in contact with said side (31a) of said frame (31), can be positioned in contact with two respective mutually orthogonal reference surfaces (31b, 31c) belonging to said frame (31) and delimiting an opening (33) belonging to frame (31) to define a first operative position for said drilling jig (1; 20; 23);
 - a control unit (10) operable to prevent said mask unit (4) from sliding according to said two slide directions (X, Y);
 - said mask unit (4) being movable according to said two slide directions (X, Y) in such a way that said guide surfaces (5) can be aligned to corresponding reference surfaces (36a) belonging to said flap (36) when: said drilling jig (1; 20; 23) is arranged in said first operative position, said hinge pin (35) is associated to said side (31a) of said frame (31) and said flap (36) is coupled to said hinge pin (35) in the position that said flap (36) assumes when said shutter (32) is in an operative position where it closes said opening (33).
2. Drilling jig (1; 20; 23) according to claim 1, **characterized in that** said stop bodies (6, 7, 8, 9) define at least two second stop surfaces (8a, 9a) that can be arranged in contact two respective mutually orthogonal reference surfaces (32b, 32c) that delimits said shutter (32) and that are intended to be positioned parallel to, respectively, said two reference surfaces (31b, 31c) of said frame (31) when said shutter (32) closes said opening (33).
 3. Drilling jig (1; 20; 23) according to any preceding claim 1 or 2, **characterized in that** one or more of said stop bodies (6, 7, 8, 9) are movably mounted on said support structure (2) according to a direction of movement perpendicular to said rest surface (3) so as they can be arranged in a position where they do not project from said rest surface (3).
 4. Drilling jig (1; 20; 23) according to any preceding claim from 1 to 3, **characterized in that** one or more of said stop bodies (6, 7, 8, 9) are movably mounted on said support structure (2) according to a direction of movement that is parallel to said rest surface (3) and perpendicular to the corresponding reference surface (31b, 31c).
 5. Drilling jig (1; 20; 23) according to any preceding claim from 1 to 4, **characterized in that** said mask unit (4) comprises two mask bodies (11, 12), each one of which comprises a corresponding one of said guide surfaces (5), said two mask bodies (11, 12) being mutually slidable to allow changing the mutual distance between said guide surfaces (5).
 6. Drilling jig (1; 20; 23) according to claim 5, **characterized in that** said support structure (2) comprises:
 - a support bar (13) developing according to a first slide direction (Y) of said slide directions (Y, X);
 - a first frame (14) slidably connected to said support bar (13) according to said first slide direction (Y);
 - a second frame (15) supporting said mask unit (4) and slidably connected to said first frame (14) according to a second slide directions (X) of said slide directions (Y, X).
 7. Drilling jig (1; 20; 23) according to claim 6, **characterized in that** said control unit (10) comprises a plurality of clamps (17, 17') operable to prevent sliding of said first frame (14) with respect to said support bar (13) and of said second frame (15) with respect to said first frame (14).
 8. Drilling jig (1; 20; 23) according to any preceding claim 6 or 7, **characterized in that** said mask unit (4) comprises a third frame (16) supporting said two mask bodies (11, 12) and slidably mounted on said second frame (15).
 9. Drilling jig (1; 20; 23) according to any claims from 5 to 8, **characterized in that** said mask bodies (11, 12) are in a transparent material.
 10. Drilling jig (1; 20; 23) according to any claims from 5 to 9, **characterized in that** said rest surface (3) is arranged at a distance, with respect to the surfaces of said mask bodies (11, 12) that are opposite to said rest surface (3), equal to the distance between said side (31a) of said frame (31) and said side (32a) of said shutter (32) when said shutter (32) is in said operative position.

11. Drilling jig (1; 20; 23) according to any preceding claim from 1 to 10, **characterized in that** each one of said guide surfaces (5) is a surface that delimits a corresponding through aperture (19) developing through said mask unit (4) according to a direction perpendicular to said rest surface (3). 5
12. Drilling jig (1; 20; 23) according to claim 11, **characterized in that** it comprises a tubular element (18) slidably inserted into said aperture (19) so that one of its ends can be positioned to project from said aperture (19) and inside a corresponding hole of said flap (36; 39), and so that said one of its ends can be retracted inside of said aperture (19), said tubular element (18) being provided with a through hole to guide the tip of said tool. 10
13. Method for mounting a shutter (32) to a frame (31) of a window or door (30) through a hinge (34), said hinge (34) comprising a hinge pin (35), connected to a side (31a) of said frame (31), and a flap (36; 39) that can be rotatably coupled to said hinge pin (35), said method comprising the following steps: 20
- providing a drilling jig (1; 20; 23) provided with a rest surface (3) and with two first stop surfaces (6a, 7a) projecting from said rest surface (3) according to a direction orthogonal to said rest surface (3); 25
 - arranging said drilling jig (1; 20; 23) in a first operative position so that said rest surface (3) is in contact with said side (31a) of said frame (31) and that said two first stop surfaces (6a, 7a) are in contact with two respective mutually orthogonal reference surfaces (31b, 31c) belonging to said frame (31) and delimiting an opening (33) in said frame (31); 30
 - coupling said flap (36; 39) to said hinge pin (35) in a position corresponding to the position assumed by said flap (36; 39) when said shutter (32) is in an operative position where it closes said opening (33); 40
 - aligning one or more guide surfaces (5), belonging to said drilling jig (1; 20; 23) and perpendicular to said rest surface (3), to corresponding reference surfaces (36a) belonging to said flap (36; 39); 45
 - arranging said drilling jig (1; 20; 23) in a second operative position so that said rest surface (3) is in contact with a side (32a) of said shutter (32) and that said two first stop surfaces (6a, 7a) are arranged with respect to said shutter (32) in the same positions of, respectively, said reference surfaces (31b, 31c) when said shutter (32) is mounted on said frame (31); 50
 - making marks or holes on said side (32a) at the level of, respectively, each one of said guide surfaces (5) by means of a tool, using said guide surfaces (5) to support and guide said tool; 55
 - arranging said flap (36; 39) in contact with said side (32a) so as to align said reference surfaces (36a) to, respectively, said marks or holes;
 - fixing said flap (36; 39) to said shutter (32).
14. Method according to claim 13, **characterized in that** said flap (36; 39) comprises holes that are delimited by edges, and that said operation for aligning said one or more guide surfaces (5) to corresponding reference surfaces (36a) of said flap (36; 39) comprises using said edges as said reference surfaces (36a).
15. Method according to any claims 13 or 14, **characterized in that** said drilling jig (1; 20; 23) comprises second stop surfaces (8a, 9a) projecting from said rest surface (3) and at distances from said first stop surfaces (6a, 7a) corresponding to the distances between said two reference surfaces (31b, 31c) of said frame (31) and, respectively, two mutually orthogonal reference surfaces (32b, 32c) that delimit said shutter (32) and that are intended to be arranged parallel to, respectively, said two reference surfaces (31b, 31c) of said frame (31) when said shutter (32) is in said operative position, said operation of arranging said drilling jig (1; 20; 23) in said second operative position comprising positioning said second stop surfaces (8a, 9a) in contact with, respectively, said two reference surfaces (32b, 32c) of said shutter (32).

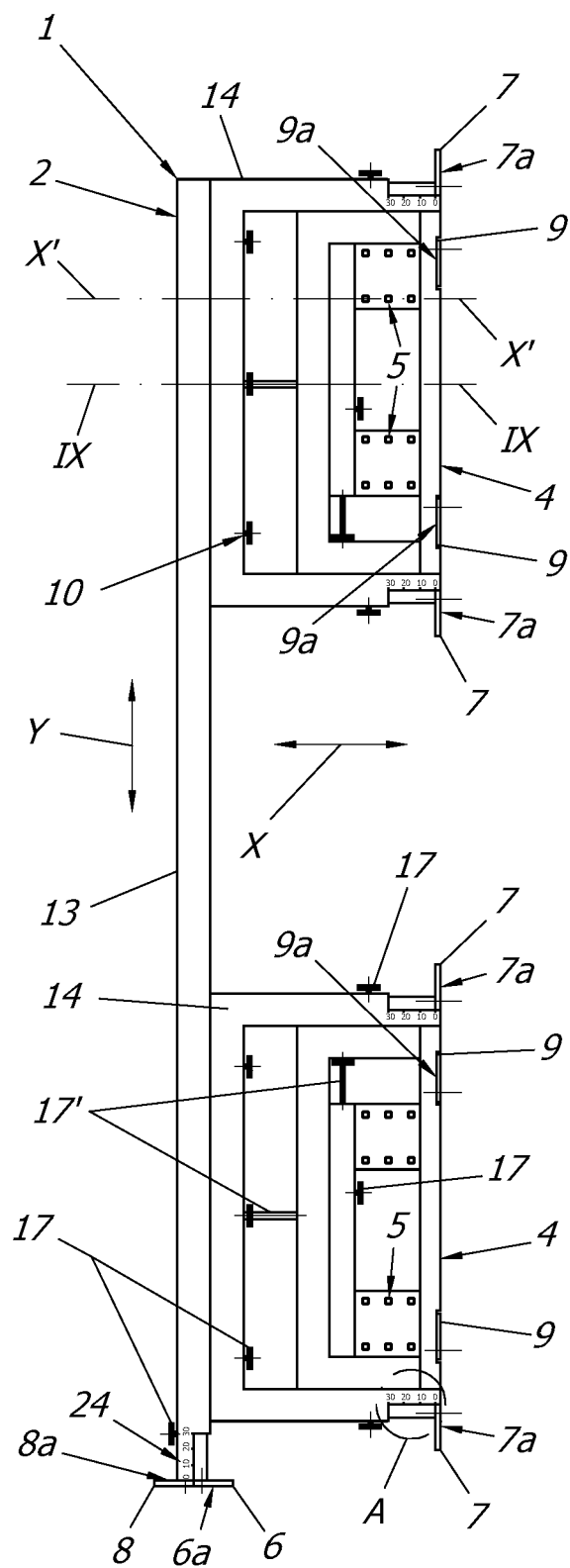


Fig. 1

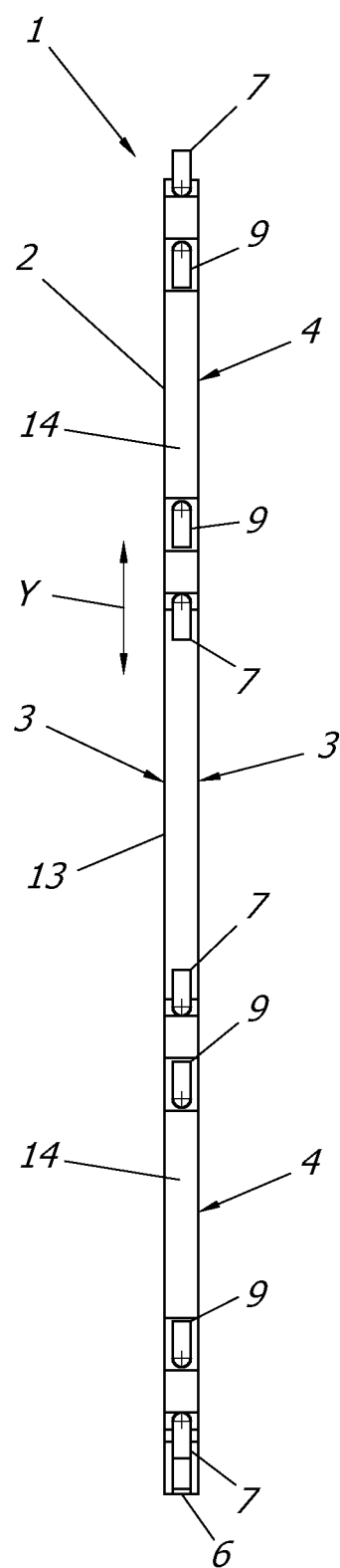
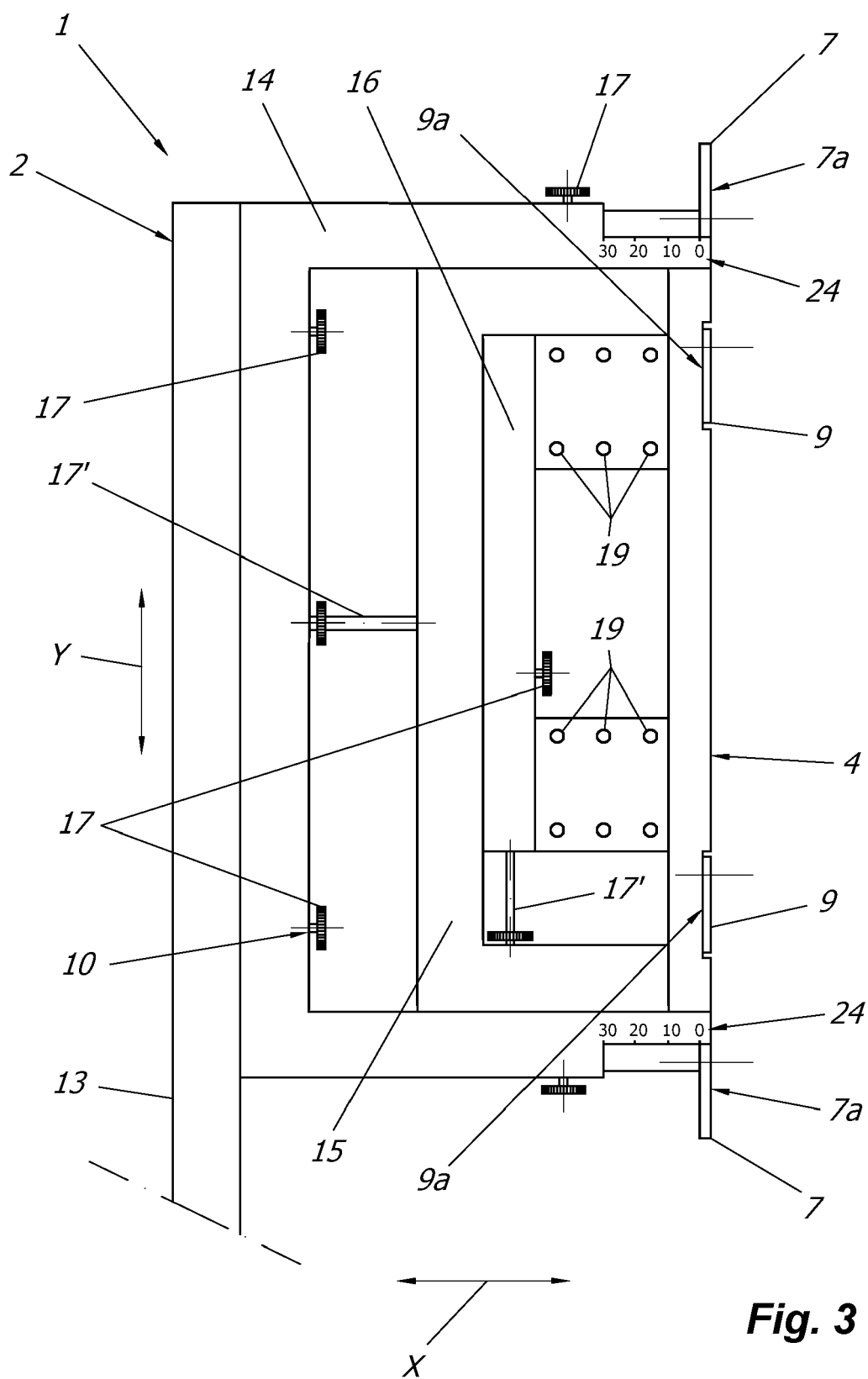


Fig. 2



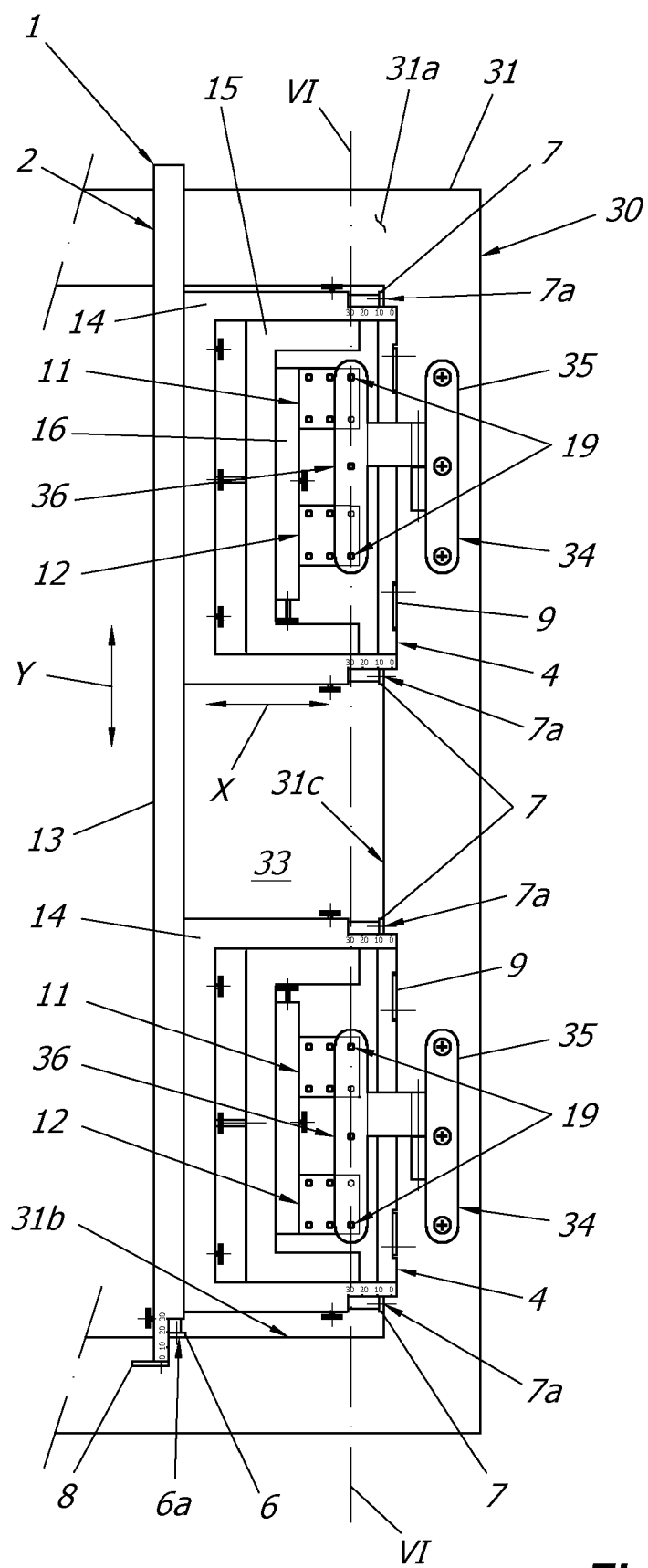
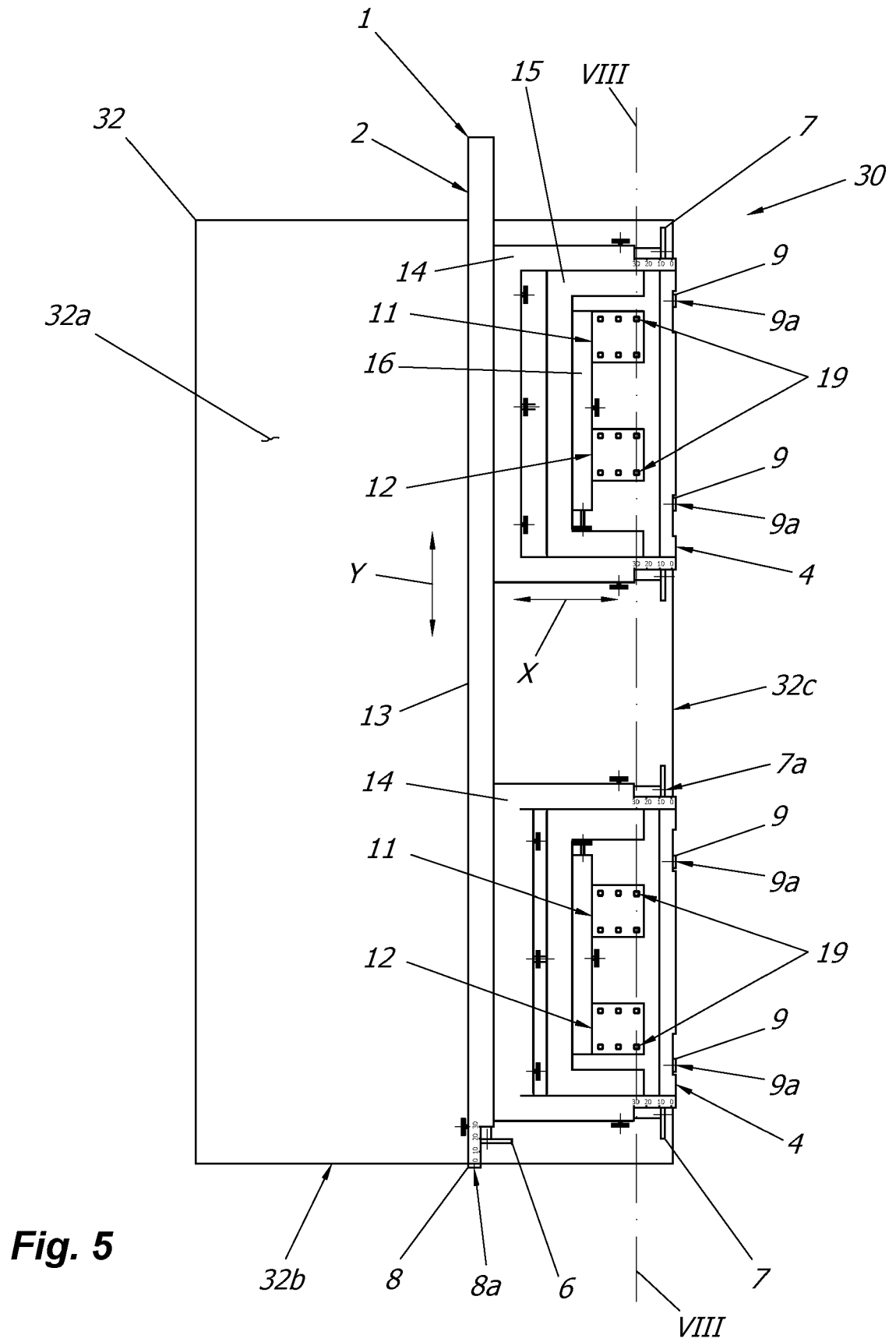


Fig. 4



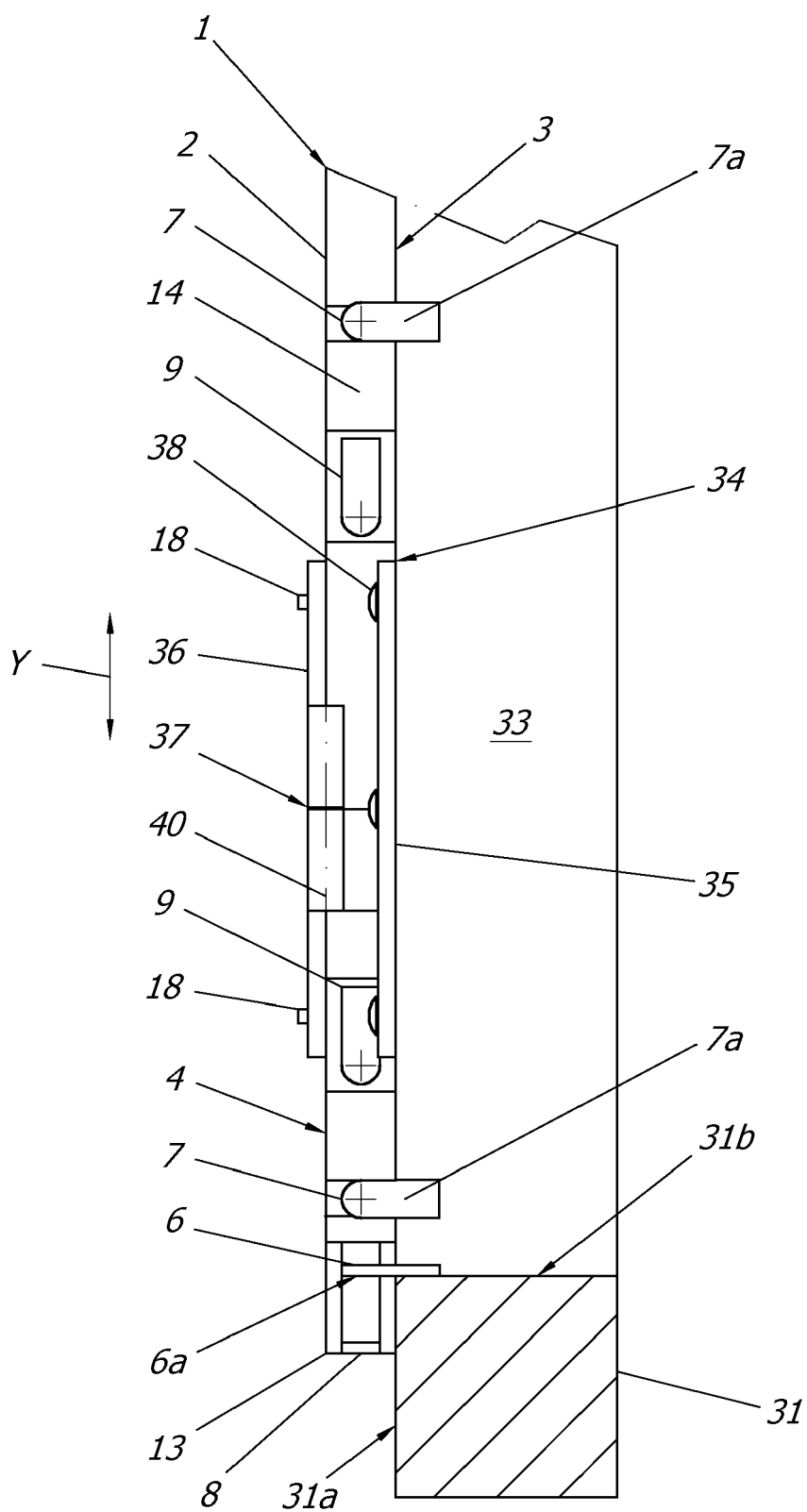


Fig. 6

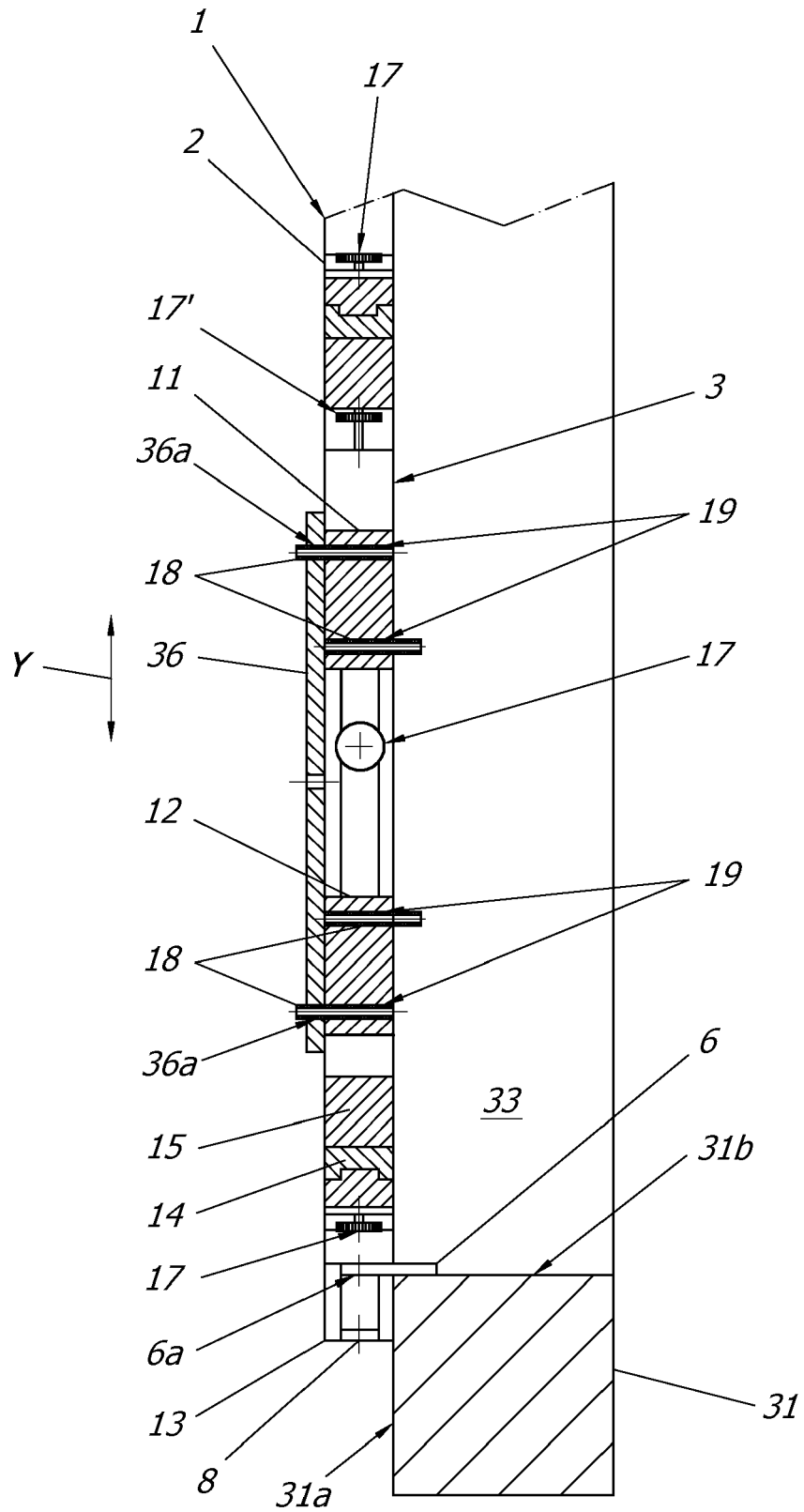


Fig. 7

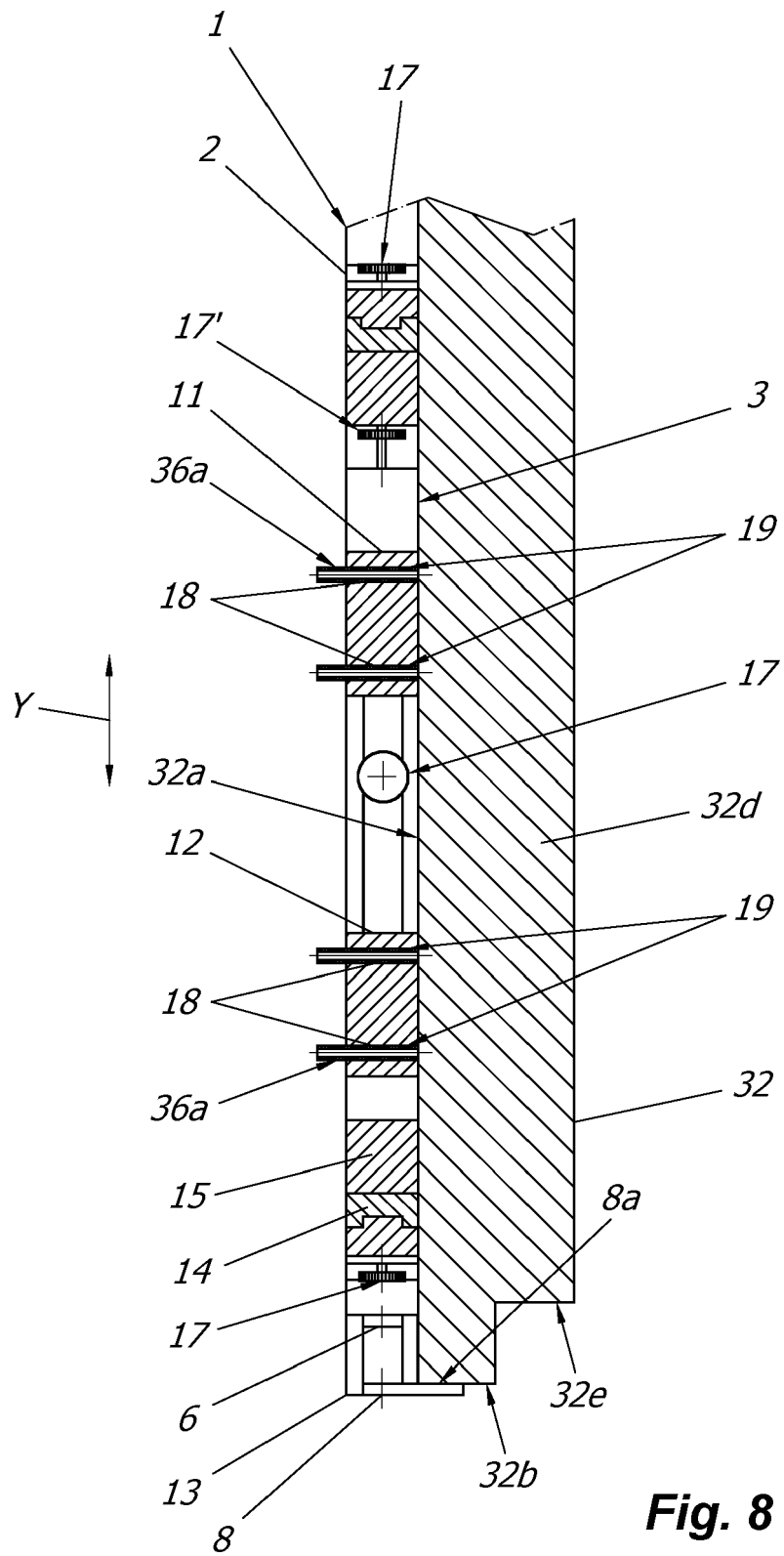


Fig. 8

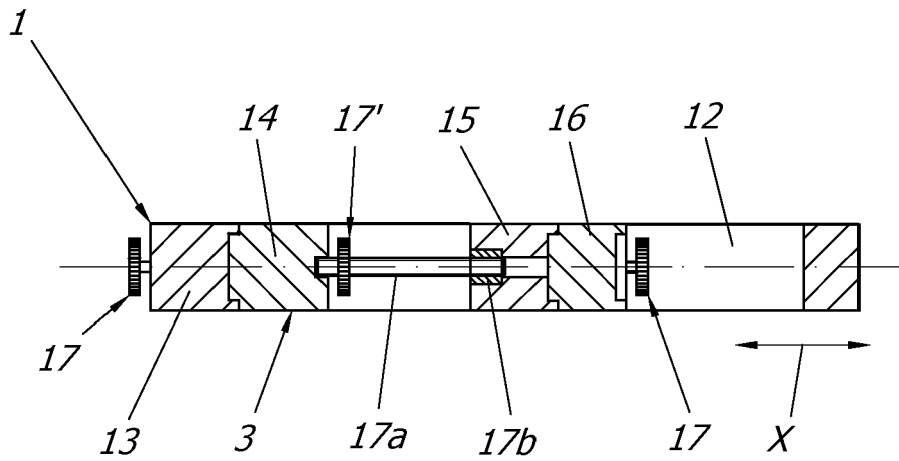


Fig. 9

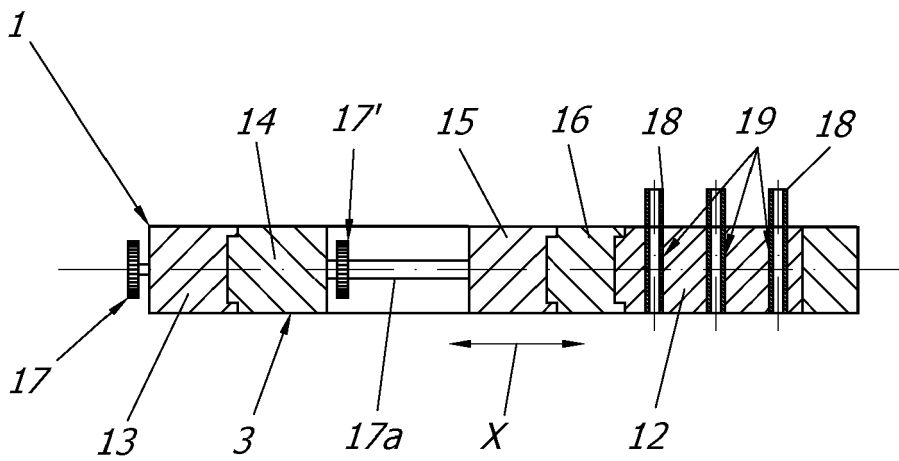


Fig. 10

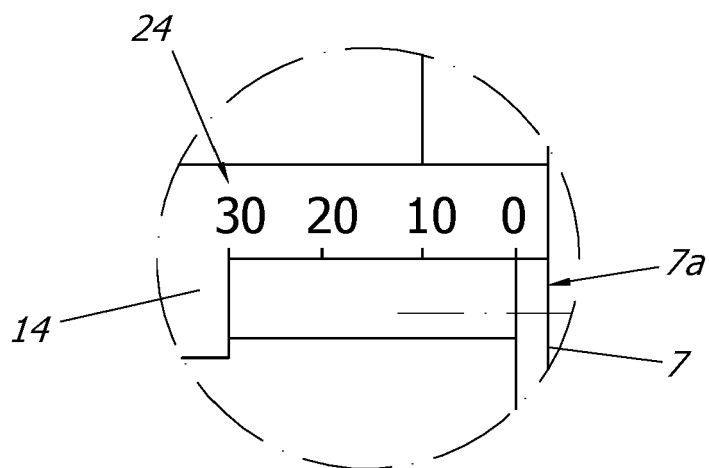


Fig. 11

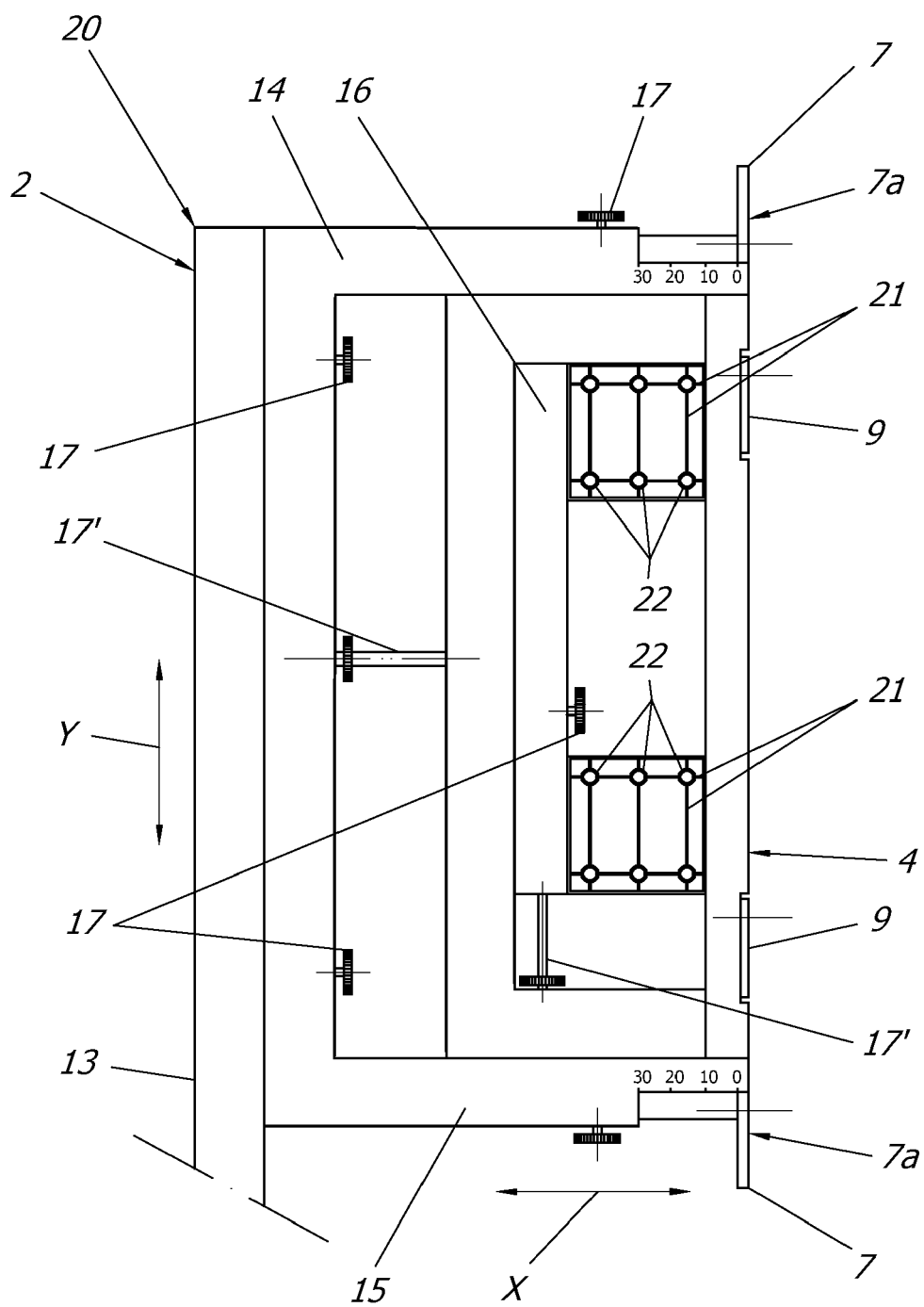
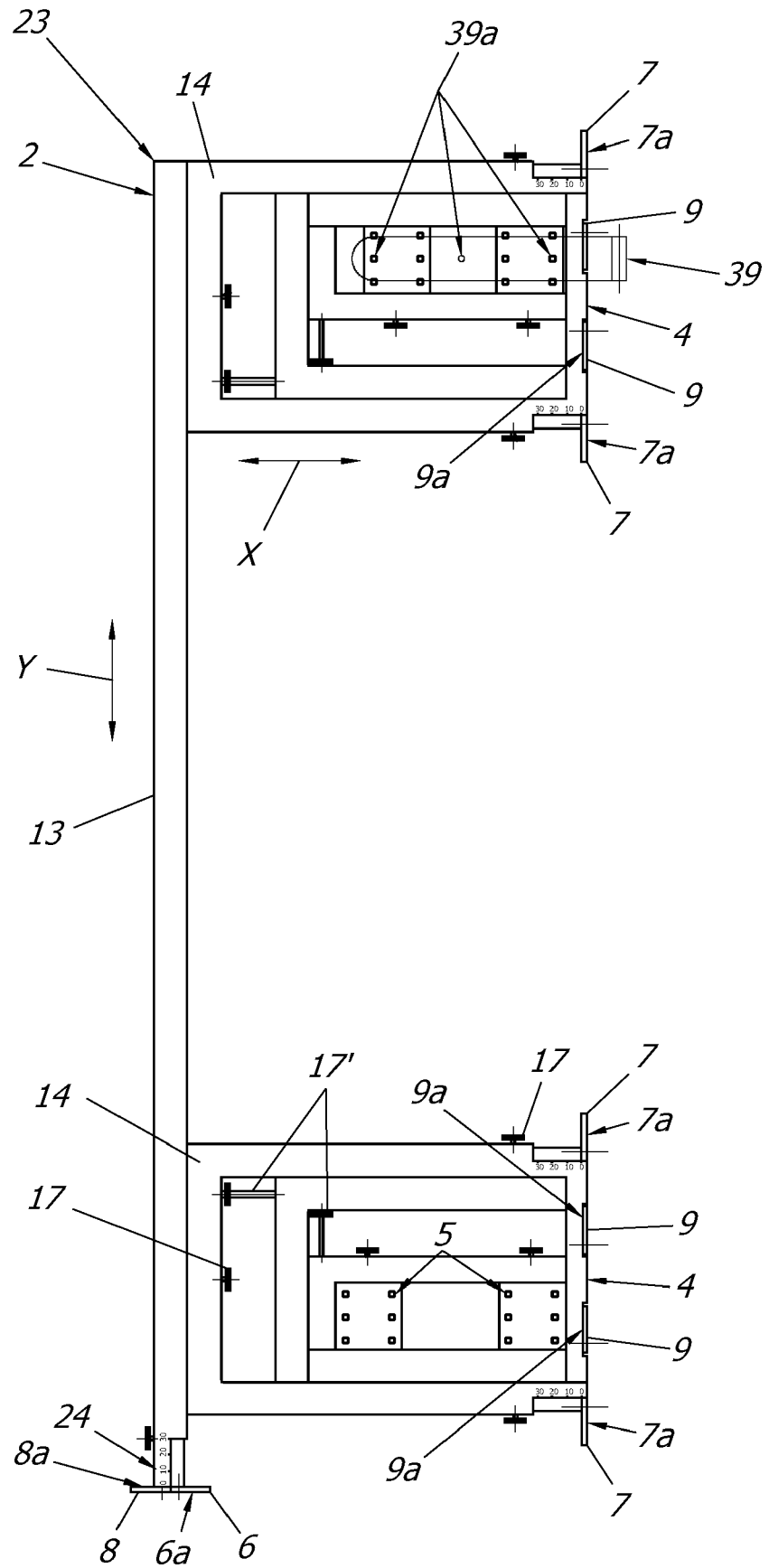


Fig. 12



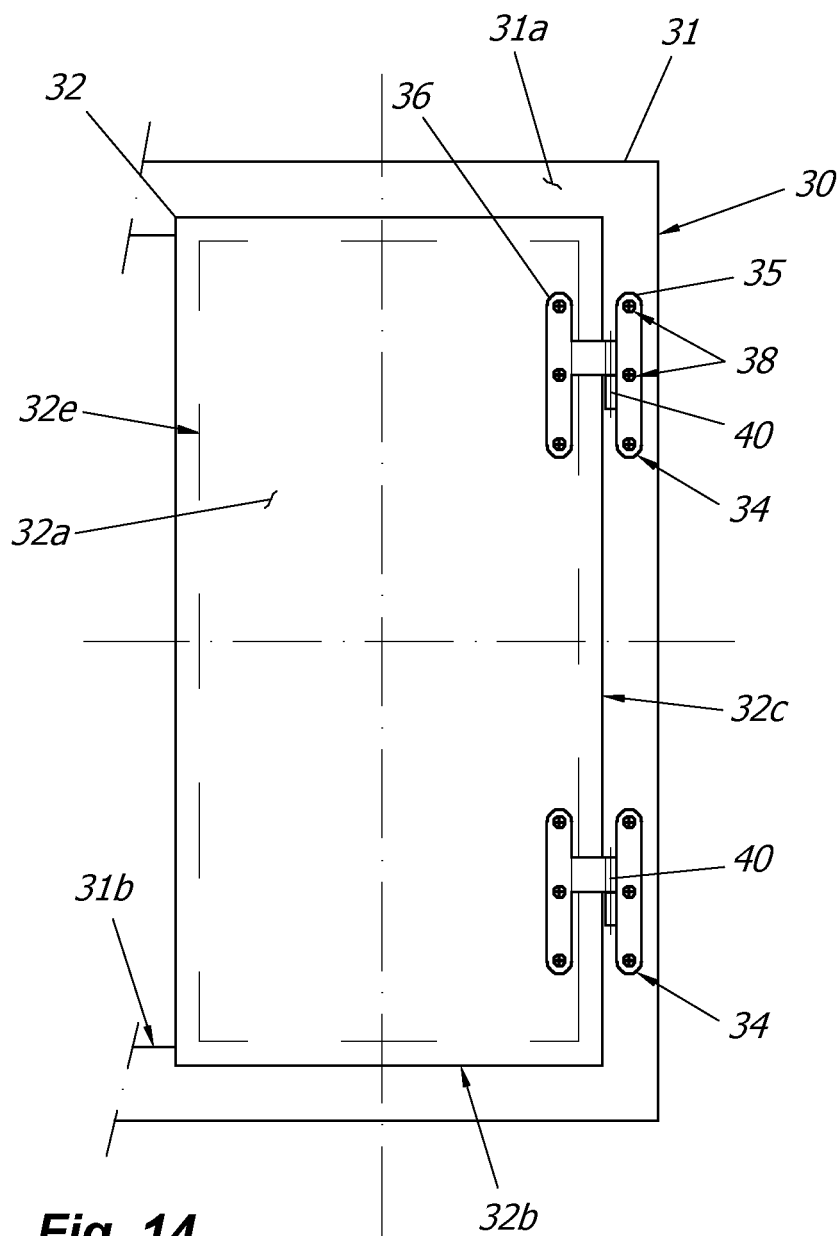


Fig. 14

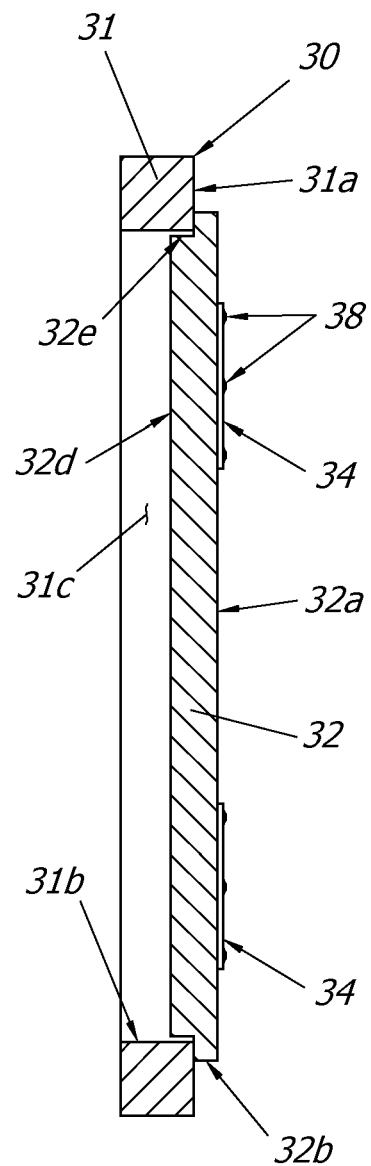


Fig. 15

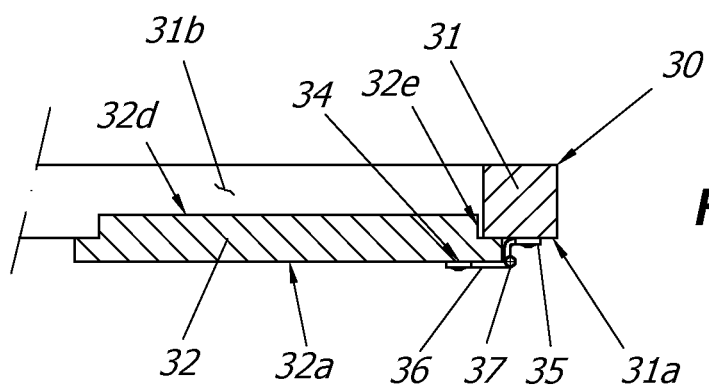


Fig. 16

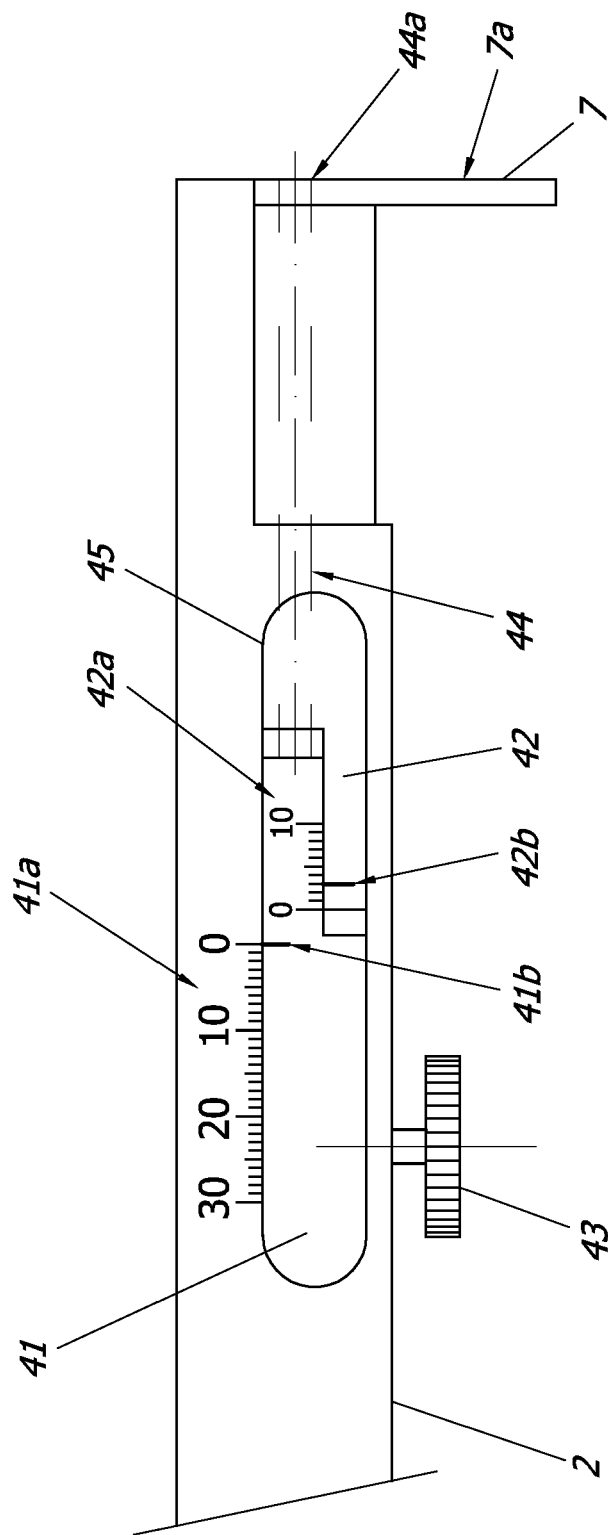


Fig. 17



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A	figures 1-8 *	6-8	

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	* column 2, line 54 - column 3, line 11 *		
	* column 3, lines 46-58 *		
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	* figures 1-5 *		

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 November 2020	Examiner Klemke, Beate
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82