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(54) **Device for blocking a shutter of a window**

(57) A device for blocking a shutter of a fixture rotatable around a vertical axis. The device comprises a shoe intended to be mounted in a sliding manner along a rail of a horizontal profile of the shutter and an arm hinged against said shoe on one side and provided with constraint means on the other, so as to be hinged in a rotating manner with respect to a framework of the fixture. Said arm is intended to be hinged with respect to the

framework at an axis for hinging the shutter against said framework, the arm having such length that the hinging between the arm and the shoe projects from said rail of the shutter during its opening movement, the shoe having a longitudinal extension sufficient to remain engaged into the rail when the hinging between the shoe and the arm is outside said rail, means for blocking the sliding of the shoe along the shutter of the fixture being present and thus fixing the shutter at a preset position.

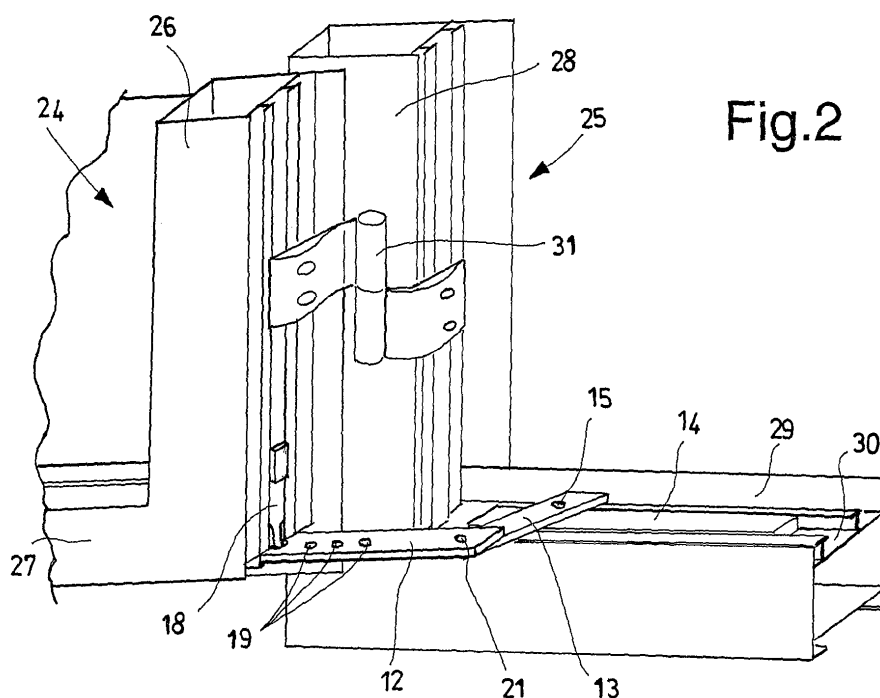


Fig.2

Description

[0001] The present invention refers to an innovative device for blocking the shutter of a fixture, in particular a hinged shutter, which is rotatable around a vertical axis.

[0002] It is known in the field to make devices for blocking the shutters of windows, intended to stop the shutter in a desired position, for example, to avoid the wind being able to take it into the closed position when this is not wanted.

[0003] These blocking devices can comprise an arm made from steel, at one end hinged to an anchor block that can be fixed to the framework of the fixture, and at the other end hinged to a shoe which is able to slide along a rail formed on a profile of the shutter.

[0004] The sliding shoe has suitable blocking means, like a locking pin or a friction element, which are manually actuated by the user of the window to block the shutter in a desired position.

[0005] These prior art devices, however, enabled the shutter to be blocked, only in a limited range of angular positions. The hinging between the arm and the shoe was indeed always constrained in the rail of the shutter and, due to the interference between arm and fixed framework of the fixture, it was not possible to move the shutter to a completely open position, with the shutter rotated by an angle of around 180° with respect to the closed position. Moreover, the arm of the blocking device had a certain extension in length, and when the shutter was open, it remained visible for a considerable portion of the width of the fixture. Apart from being an aesthetic problem, the arm could also be a hindrance to the users of the window, due to its substantial bulk.

[0006] Moreover, such a device is particularly expensive, due to the high consumption of material necessary to manufacture the arm with a certain length.

[0007] Another similar system and with similar drawbacks is, for example, described in US 2007/0029818.

[0008] US 6237190 describes a built-in system through the sliding of an arm within the thickness of the shutter. Such a system, however, has great kinematic limitations in the range of movement and it also requires shutters with suitable inner spaces. Thus, it cannot be applied to pre-existing fixtures.

[0009] In US 6237190 the rotating arm is also fixed near to the axis of the hinges and this produces very high stress on the mechanism and also affects manoeuvrability and maximum opening angle.

[0010] The general purpose of the present invention is to avoid the aforementioned drawbacks by making a blocking device for shutters of a fixture which allows the shutter to be fixed in any open position, even near to a complete 180° open position.

[0011] Another purpose of the invention is that of making a closing device which has a limited bulk.

[0012] Another purpose of the invention is that of making a device for blocking the shutter which has a limited impact on the aesthetics of the fixture also when the shutter is open.

ter is open.

[0013] Another purpose of the invention is that of making a blocking device which does not hinder the user when the shutter is open.

[0014] Another purpose of the invention is that of making a blocking device which is cost-effective and which has a simple structure.

[0015] In view of such a purpose it has been thought to make, according to the invention, a device for blocking a shutter of a fixture, rotatable around a vertical axis, the device comprising a shoe intended to be mounted in a sliding manner along a rail of a horizontal profile of the shutter and an arm hinged against said shoe on one side and provided with constraint means on the other, so as to be hinged in a rotating manner with respect to a fixed framework of the fixture, characterized in that said arm is intended to be hinged with respect to the framework at an axis for hinging the shutter against said framework, the arm having such a length that the hinging between the arm and the shoe, in use, projects from said rail of the shutter during its opening movement, the shoe having a longitudinal extension sufficient to remain engaged in the rail when the hinging between shoe and arm is outside of said rail, means for blocking the sliding of the shoe along the shutter of the fixture being present and thus fixing the shutter at a preset position.

[0016] In order to clarify the explanation of the innovative principles of the present invention together with its advantages with respect to the prior art, hereafter, with the help of the attached drawings, possible example embodiments applying such principles shall be described. In the drawings:

- figure 1 represents a perspective view of a device for blocking the shutter, according to the present invention;
- figure 2 represents a perspective view of a device according to the invention applied to a fixture;
- figure 3 represents a section view of a horizontal profile of the shutter of the fixture to which the device, according to the invention, is applied;
- figure 4 represents a section view of a horizontal profile of the framework of the fixture to which the device, according to the invention, is applied;
- figure 5 represents a view of the blocking means for blocking the sliding of the shoe of the device, according to an alternative embodiment of the invention;
- figure 6 represents a view of the blocking means for blocking the sliding of the shoe according to a further alternative embodiment of the invention;
- figures 7 to 10 represent four different positions that the shutter and the blocking device take on in the opening phase of the fixture.

[0017] With reference to the figures, figures 1 and 2 show a device 11 for blocking the shutter of a fixture and part of the fixture to which the device is applied.

[0018] The fixture, for example, a window made from

aluminium, comprises a framework 25 to be fixed onto a wall, onto which a shutter 24 is hinged with vertical axis hinging 31 (see figure 2).

[0019] The shutter comprises a vertical profile 26 that is hinged to the vertical profile 28 of the framework 25.

[0020] The device for blocking the shutter 11, clearly shown in figure 1, is mounted between the two horizontal profiles 27 and 29, of the shutter 24 and of the framework 25, respectively.

[0021] The blocking device 11 comprises an arm 13 hinged to an end with a shoe 12, through the hinging 21.

[0022] The arm is intended to be constrained through hinging to a horizontal profile of the framework, in the example in the figure, to the lower profile 29 of the framework 25.

[0023] The shoe 12 is intended to be fitted in a rail formed on a horizontal profile of the shutter 24, preferably the lower profile 27 of the shutter. The shoe 12 can slide inside the rail, indicated with reference numeral 60 in figures 7 to 10.

[0024] The arm 13 has constraint means to be hinged to the profile 29 of the framework. Advantageously, the constraint means comprise a shaft-shaped body 14, able to be fixed in a rail 30 formed on the profile 29 of the framework. The arm 13 is hinged through the hinging 15 to the shaft 14, which has suitable holes 16, 17 for fixing it to the profile 29 of the framework, for example, through screws. The hings 21 and 15 have vertical axes, similarly to the hinging 31 between shutter and framework.

[0025] It should be understood that the shaft 14 can be fixed to the framework by using any prior art of the field, such as eccentrics, suitable for being blocked through rotation in the undercuts formed by the rail 30, or other equivalent techniques.

[0026] Figure 4 shows a section of the shaft 14 constrained in the rail 30 formed on the framework 25.

[0027] The shoe 12 has longitudinal ribbings 22 and 23 on opposite sides, intended to be engaged in undercuts formed by the side walls 32 and 33 which form the rail for the sliding of the shoe. The section view of figure 3 clearly shows the walls 32, 33, which are normally present on the aluminium profiles of the fixtures, which form the rail with undercuts. The shoe can come out from the rail only by slipping out from its open end.

[0028] In figure 3 the glass of the shutter, fixed to the profile 27 is indicated with the reference numeral 34.

[0029] The hinging 21, in an embodiment of the invention, is arranged at the ends of the shoe 12 and of the arm 13, respectively.

[0030] The arm 13 is intended to be mounted with the hinging 15 close to the axis of the hinging 31, and has such a length that the hinging 21 comes out from the rail formed along the lower profile of the shutter 24, during the opening movement of the fixture.

[0031] The shoe 12 has such a length that it remains engaged in the rail of the lower profile 27 of the shutter even when the hinging 21 has come out from the rail.

[0032] As shall be seen, this particular characteristic of the closing device allows the shutter to be blocked in any open position, even in positions near to a rotation of 180° of the shutter with respect to the framework.

[0033] The blocking device 11 comprises means for blocking the sliding of the shoe 12 with respect to the shutter, with the purpose of fixing the shutter into a desired position.

[0034] In a preferred embodiment, the means for blocking the shoe 12 comprise a ratchet 18, intended to be slidably mounted along the vertical profile 26 of the shutter near to the corner of the shutter.

[0035] The ratchet 18 has a lower projection 20 suitable for being engaged in corresponding holes 19 formed in the shoe 12, as clearly shown in figure 1.

[0036] The shoe 12 has an elongated shape and it can have, for example, six holes 19, corresponding to six open positions of the shutter. It should be understood that even a greater number of holes can be foreseen, according to the requirements.

[0037] The ratchet 18 is mobile between a retracted position from the shoe 12 and an engaged position for blocking its sliding with respect to the shutter 24. In the embodiment shown in the figures with the blocking device arranged on the lower side of the fixture, the ratchet is raised so as to allow the shutter to be moved to a desired open position.

[0038] The ratchet can be provided with a suitable protrusion so as to facilitate its manoeuvring by the user. Moreover, the ratchet could be a spring ratchet with a chamfered tip so as to allow it to disengage from the holes 19 in the case of a force of a certain intensity applied to the shutter, so as to stop the structure from being damaged.

[0039] In the case of a window-door, having the device for blocking the shutter arranged at a height near to the floor, the ratchet can be controlled at a distance through a suitably long shaft mounted along the vertical profile of the shutter 24.

[0040] Figure 5 shows an alternative embodiment of the means for blocking the sliding of the shoe with respect to the profile 27 of the shutter. It should be considered that the blocking device is made in a totally analogous way as that previously described except for the blocking means of the shoe represented in fig. 5.

[0041] In the alternative embodiment, the shoe 112 of the device comprises a threaded hole inside of which a screw 142 is engaged, able to be manoeuvred through the knurled handle 140 by the user of the fixture. A friction element 141, suitable for going into abutment against the walls 32, 33 that define the sliding rail of the shoe, is arranged between the handle 140 and the profile 27 of the shutter. When rotating the handle 140, the lugs of the walls 32, 33 that form the undercut remain clamped between the shoe and the friction element, thus blocking the sliding of the shoe with respect to the shutter. The clamping screw can be replaced by a suitable eccentric of the prior art.

[0042] This particular arrangement allows the shutter to be blocked in any position, and not in a limited number of discrete positions like in the first embodiment. Moreover, there is the advantage of preventing damage to the structure in the case in which there is a very strong force against the shutter, since the friction can allow a certain sliding in the case of high intensity forces.

[0043] Figure 6 shows a further alternative embodiment of the means for blocking the sliding of the shoe 212. Also in this case, it should be understood that all the parts of the device that are not shown are similar to those described previously for the first preferred embodiment of the invention.

[0044] In this case, a screw 242 is received in a through-hole present in the arm 213 and in a corresponding threaded hole present in the shoe 212. Between the arm 213 and the shoe 212 there is a friction disc 241.

[0045] The screw 242 can be manoeuvred through the handle 240, to which it is fixedly connected.

[0046] When rotating the handle, the friction disc 241 is clamped between the arm and the shoe, so that the angular position between the two pieces is fixed and thus the sliding of the shoe along the profile of the shutter is also blocked. The clamping action could also be carried out through an eccentric system, made per se according to the prior art.

[0047] Figures 7 to 10 show four positions in sequence that show the shutter being opened and the positions taken up by the blocking device.

[0048] Figure 7 shows the first rotation step to open the shutter. The shutter 27 rotates in the initial portion with the same direction as that of the rotation of the arm 13 of the blocking device. The hinging 21 is again inside the rail 60 formed along the lower profile 27 of the shutter.

[0049] Figure 8 shows a subsequent position in which the shutter is rotated by almost 90° degrees with respect to the closed position. In this position the hinging 21 is at the open end of the rail 60 near to the hinging 31. The arm 13 does not interfere with the framework of the fixture, in particular with the vertical profile 28 (shown in figure 2). The hinging 21 thus disengages from the rail 60 before the arm 13 can interfere with the framework. This allows the shutter to rotate freely until it is complete open, as shown in figure 10 where the shutter manages to open even beyond 180°. Figure 9 shows an intermediate position with the shutter open by about 145°.

[0050] It has been proven to have been particularly advantageous to make the arm 13 of the device with a length which is less than that of the shoe 12.

[0051] Moreover, advantageously the length of the arm is less than twice the thickness of the fixture, i.e., in a direction that is perpendicular to the plane of the framework.

[0052] The installer of the blocking device selects the position of the hinging 15 of the arm near to the hinging 31 of the shutter against the framework, so that the circumference described by the open end of the rail 60 is intersected by the circumference described by the pos-

sible rotation of the hinging 21. The intersection between the two circumferences happens in a point which corresponds to a position of the arm which does not interfere with the framework of the fixture.

[0053] This allows the hinging 21 to come out from the rail 60 in the opening step of the shutter, thus allowing the shutter itself to reach any opening angle.

[0054] At this point, it should be obvious how the purposes of the present invention have been achieved.

[0055] In particular, a device for blocking the shutter has been made, which allows the shutter to be fixed in angular positions even close to the complete 180° open position. Moreover, the blocking device is not very bulky, since the length of the arm is relatively limited compared to the dimensions of the fixture. This allows production costs of the material to be reduced, as well as, allowing any hindrance of the user of the fixture to be limited, since the device remains positioned in a circumscribed manner near to a corner of the framework.

[0056] The aesthetic impact of the blocking device in the open shutter position is thus also reduced compared to devices of the prior art.

[0057] Of course, the description above of an embodiment applying the innovative principles of the present invention is given as an example of such innovative principles and therefore should not be taken to limit the scope of protection claimed hereby.

[0058] For example, the blocking device could be applied to the upper part of the fixture, and not to the lower part as described previously.

[0059] The fixing of the fixed shaft 14 can be possibly carried out by using suitable thicknesses, so as to be able to adjust the height of the hinging point of the rotatable arm 13 of the device in a suitable manner according to the requirements.

[0060] Moreover, the device can be used having the function to stop the shutter in pre-established opening points by merely positioning some blocks against the sliding of the shoe in the rail, according to a known system.

[0061] Moreover, in the case of frameworks which do not have rails with undercut lugs, in which the shoe of the device can be inserted, a sliding rail for the shoe can be foreseen to be applied at the edge of the mobile shutter of the fixture, equipped with suitable undercut guiding ribbings. The sliding rail can be applied to the profile of the shutter with any prior art, for example, through screwing.

[0062] According to a further variant, the shoe that is able to slide in the rail of the shutter is not hinged at one of its ends to the rotatable arm, as described previously, but it could extend in length even beyond the hinging point (indicated with reference numeral 21 in the figures). In this case, there could be holes 19 on both sides of the hinging to the rotatable arm, so that the shutter can also be blocked in angular positions which again do not foresee that the hinging 21 comes out of the rail 60.

[0063] The system according to the invention is advantageously mounted "externally" on the sill or on the upper

crossmember of the shutter. This allows the shutter block to be manoeuvred, to stop the shutter at any open angle, by manually acting upon it. This is the case both for the latch variant, and for the blocking variants on the sliding guide or on the joints.

[0064] Moreover, the device has the possibility of being installed directly applied onto pre-existing shutters (doors, windows, jalousie windows, etc.), in their current state, possibly only adding the sliding rail if the shutter does not have one.

[0065] The device according to the invention makes it possible to position the fixed hinging point of the rotating arm on the lower or upper horizontal framework, with the possibility of spacing such a point away from the hinge of the shutter. This characteristic, apart from playing an important part in the dynamics of the forces involved (the closer to the main hinging point, the greater the lever effect and, thus, the tensions involved with safety problems), it also affects the manoeuvrability and the extent to which the shutter opens.

Claims

1. Device for blocking a shutter of a fixture rotatable around a vertical axis, the device comprising a shoe (12) intended to be mounted in a sliding manner along a rail (60) of a horizontal profile (27) of the shutter and an arm (13) hinged against said shoe (12) on one side, and provided with constraint means on the other, so as to be hinged in a rotating manner with respect to a fixed framework (29) of the fixture **characterised in that** said arm (13) is intended to be hinged with respect to the framework at an axis for hinging the shutter (24) against said framework (25), the arm (13) having such length that the hinging (21) between the arm (13) and the shoe (12), in use, projects from said rail (60) of the shutter during its opening movement, the shoe (12) having a longitudinal extension sufficient to remain engaged into the rail (60) when the hinging (21) between the shoe and the arm is outside of said rail, means for blocking the sliding of the shoe (12) along the shutter of the fixture being present and thus fixing the shutter (24) at a preset position.
2. Device according to claim 1, **characterised in that** said means for constraining the arm (13) against the framework (29) of the fixture comprise a body (14) fixable against the framework hinged on which is an end of said arm (13).
3. Device according to claim 1, **characterised in that** said means for blocking the sliding of the shoe (12) comprise a ratchet (18) sliding along a vertical profile of the shutter, adapted to move between a position of engagement with respective holes (19) provided for on the shoe (12) to prevent its sliding, and a position at which it is withdrawn by the shoe.
4. Device according to claim 1, **characterised in that** said means for blocking the sliding of the shoe comprise a friction element (141, 241) adapted for command blocking of the sliding of the shoe (112) along the profile (27) of the shutter or the possibility of rotating the arm (213) with respect to the shoe (212) or with respect to the framework of the fixture.
5. Device according to claim 1, **characterised in that** the arm (13) is shorter than the shoe (12).
6. Method for mounting a device according to claim 1, on a fixture comprising a fixed framework (25) and a shutter (24) hinged against the framework rotatable around a vertical axis, said shutter being provided with a rail (60) along its horizontal profile (27), the method comprising the steps of inserting the shoe (12) of the blocking device into said rail (60) along the horizontal profile of the shutter and mounting the arm (13) of the device onto the framework (29) of the fixture with a hinging (15) in proximity to the hinging axis of the shutter (24) against the framework (25) in such a manner that, rotating the shutter (24) for opening, the hinging (21) between the arm (13) and the shoe (12) projects from the rail (60) of the shutter.
7. Fixture comprising a fixed framework and a shutter hinged against the framework rotatable around a vertical axis, **characterised in that** it comprises a device for blocking the shutter according to one of claims 1-5 mounted onto the fixture implementing the method according to claim 6.
8. Fixture according to claim 7, **characterised in that** the arm (13) is at least twice shorter than the thickness of the fixture measured in a direction orthogonal with respect to the plane of the framework.
9. Fixture according to claim 7, **characterised in that** in an initial shutter opening step, the shutter (24) and the arm (13) rotate in the same direction.
10. Fixture according to claim 7, **characterised in that** the sliding rail of the shoe of the blocking device is made in a separate piece fixed against the edge of the shutter of the fixture.

Fig.1

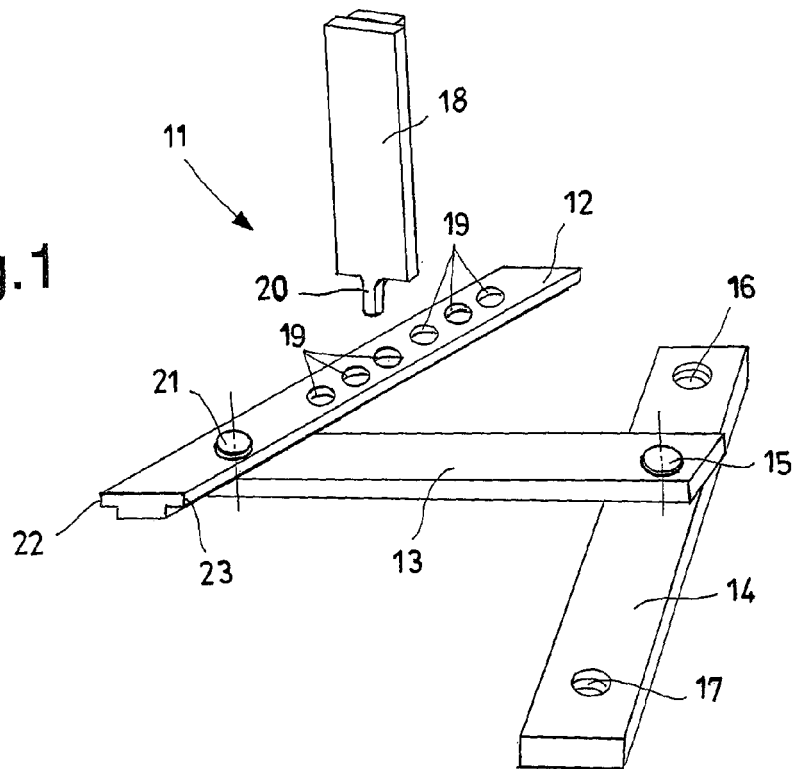
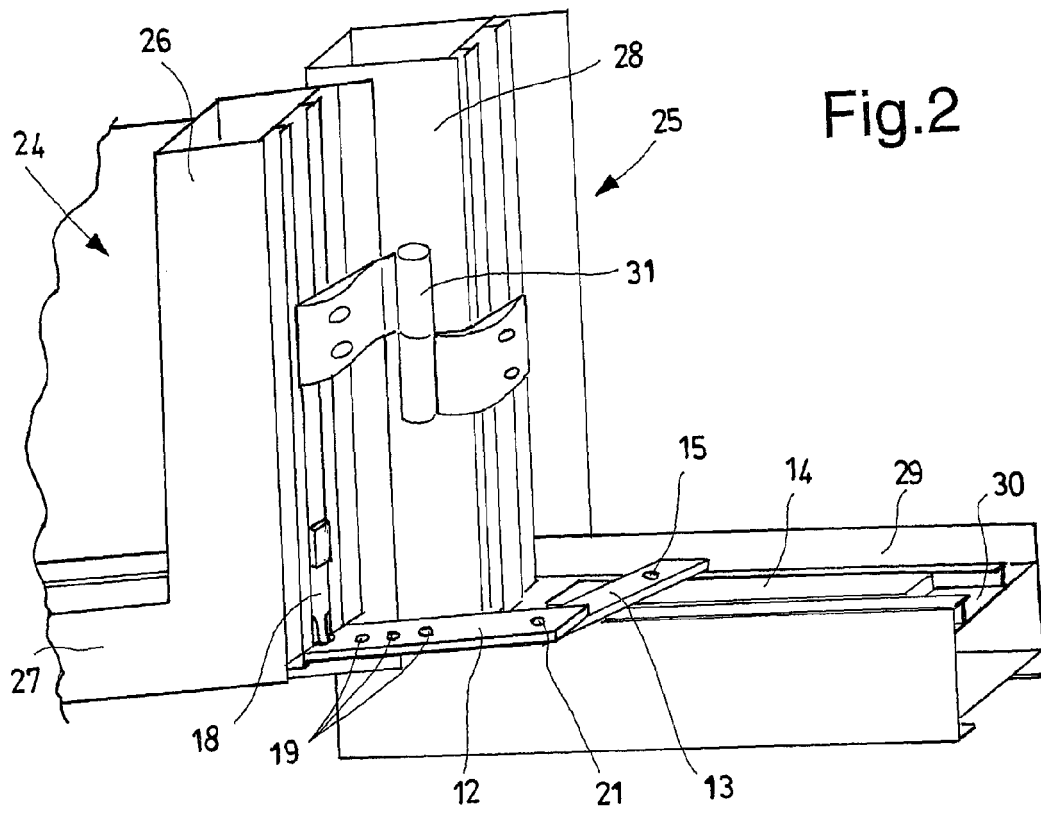


Fig.2



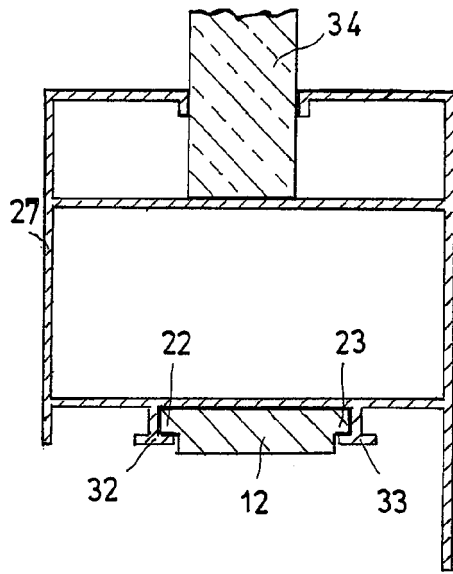


Fig.3

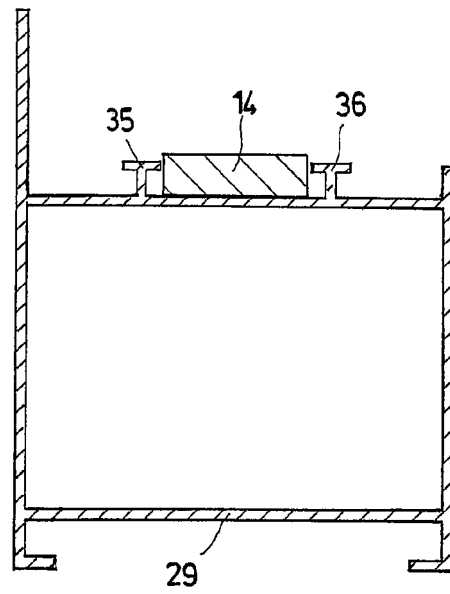


Fig.4

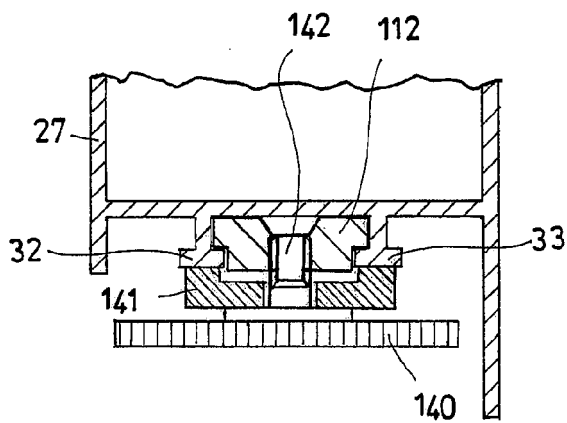


Fig.5

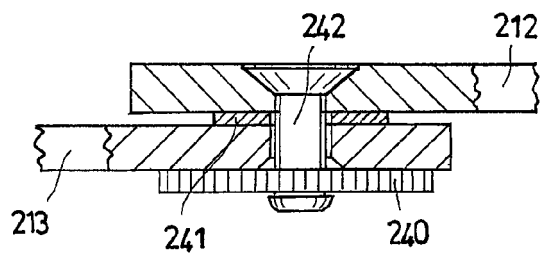


Fig.6

Fig.7

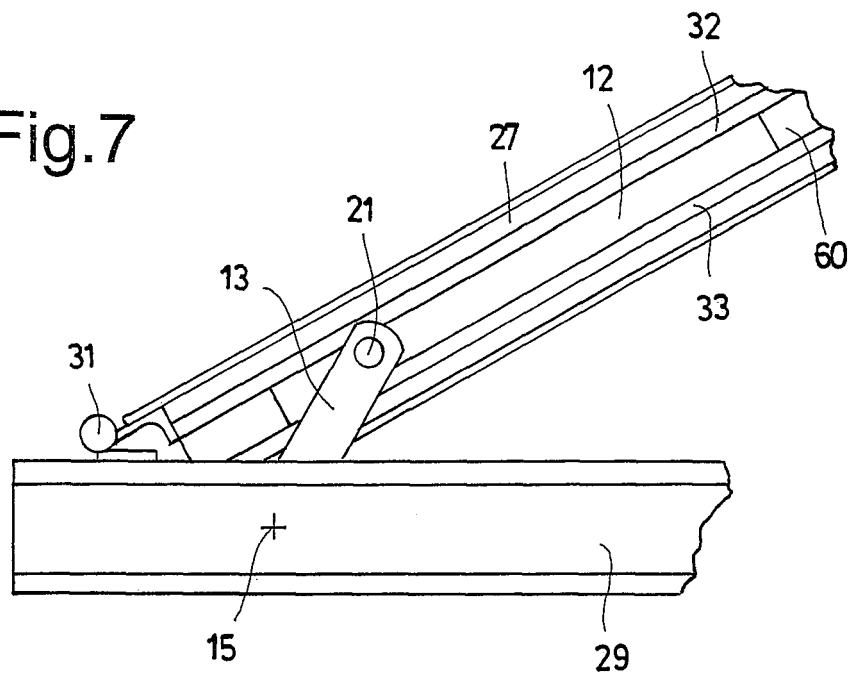
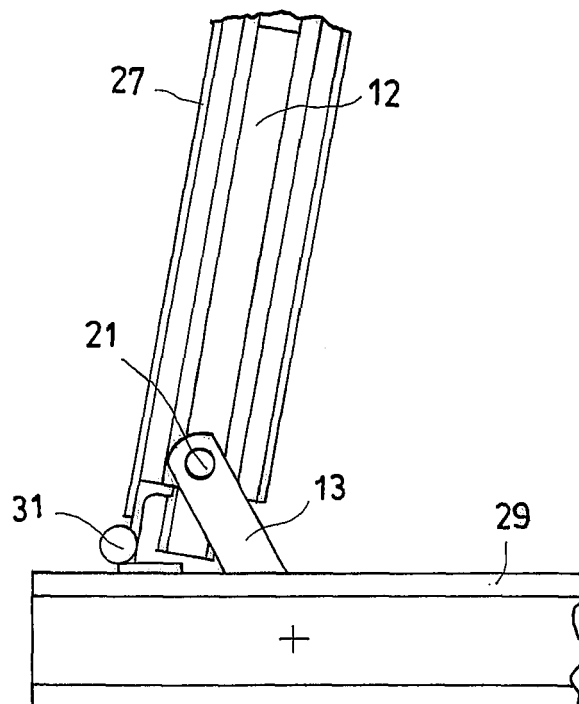
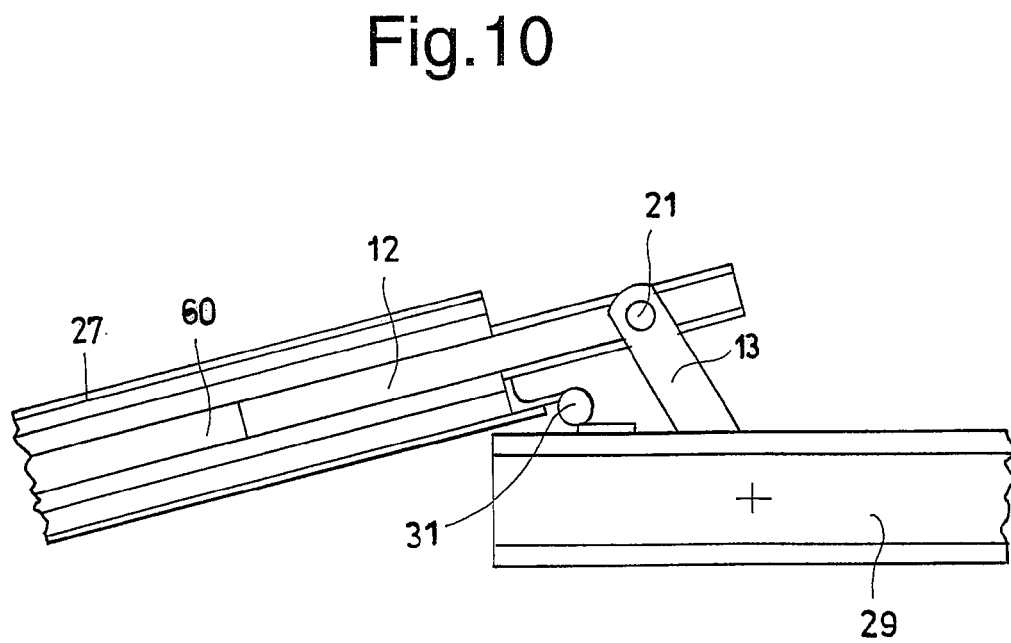
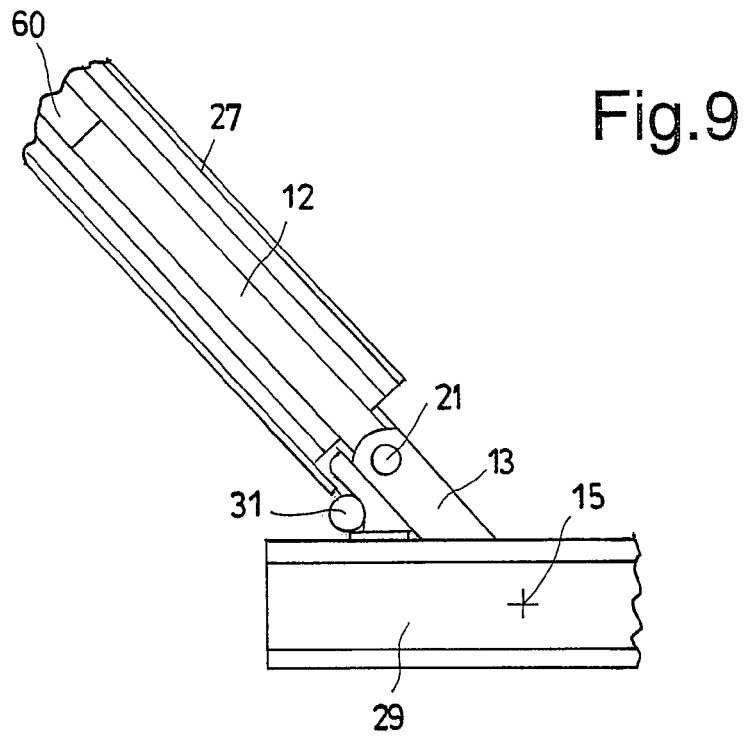


Fig.8







EUROPEAN SEARCH REPORT

Application Number
EP 09 16 5674

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 237 190 B1 (GRUMM DARREN M [US] ET AL) 29 May 2001 (2001-05-29)	1,2,4-10	INV. E05C17/32
A	* column 2, line 64 - column 3, line 50; claim 1; figures 1-5 *	3	
A	----- US 2007/029818 A1 (MANZELLA FRANCIS [US] ET AL) 8 February 2007 (2007-02-08) * the whole document *	1-10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E05C
Place of search		Date of completion of the search	Examiner
Munich		29 October 2009	Balice, Marco
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document 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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 5674

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-10-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6237190	B1	29-05-2001	NONE
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US 2007029818	A1	08-02-2007	NONE
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REFERENCES CITED IN THE DESCRIPTION

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