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(54) Automatic window shutter stop

(57) A window shutter stop consisting of a box-shaped structure (1) pivoted to a support square (3) and fitted with two curved elements designed to automatically hook the edge of the window shutter as it is opened; the stable and reciprocal hooking between said oscillating bracket (1) and the relevant support square (3) being assisted by a special slider (11) shaped like a parallelepiped block fitted between the same.

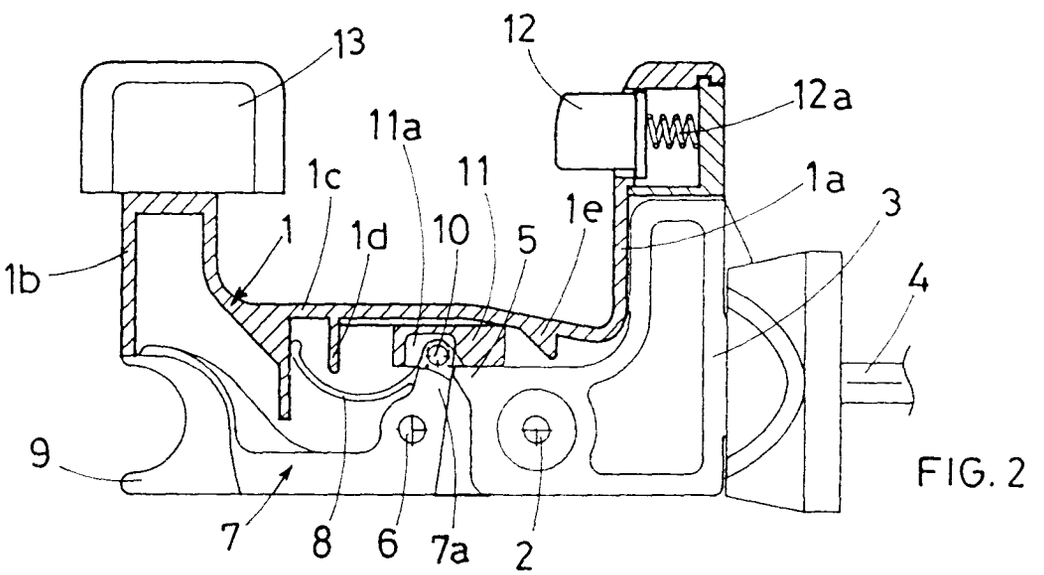

FIG. 2

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Description

This patent application concerns an automatic window shutter stop.

It is common knowledge that window shutter stops which are fixed to the external walls of the building and which automatically catch the lower edge of the window shutter when this is opened in full, have for years existed on the market. These window shutter stops are in fact fitted with a "U" shaped bracket with curved elements turned upwards which is pivoted, with respect to a horizontal pin, to a support square fixed to the wall by means of a sturdy screw; it is worth mentioning that the bracket in question is box-shaped thus permitting the same to house and conceal the square which allows the same to be fixed to the wall.

Before the "U" shaped bracket catches the window shutter, the same is in fact slanted forwards and downwards; in this way the rear edge of a shutter which is opened passes over the front curved element of the bracket without interfering with the same.

Said interference however occurs immediately afterwards with the rear curved element of the same bracket.

This interference causes the bracket to oscillate behind with respect to its horizontal pivoting pin, fixed on the support square; in this way as its rear curved element moves backwards the front curved element lifts.

This oscillation stops as soon as the bracket is in a perfectly horizontal position, against the upper surface of the relevant support square fixed to the wall; it is evident that when the bracket is in this horizontal position, the lower edge of the window shutter is held and locked between both curved elements of the bracket.

In this respect it should be noted that the above bracket can automatically and stably lock in this horizontal position; this feature is in fact indispensable to ensure the stable locking of the window shutter in fully open position.

If in fact the bracket were to oscillate freely downwards, the edge of the window shutter would be released from the obstacle created by the front curved element and the window shutter would thus be free to close, even simply by the force of the wind.

The automatic locking of this bracket above the relevant support square occurs when an upward turned tooth, fitted at the front end of the square, is hooked by the hooked end of a ratchet gear opposite the same.

The ratchet gear is in fact housed in the body of the "U" shaped bracket and is pivoted with respect to a horizontal pin positioned slightly forwards and parallel to the above pin which ensures pivoting between the "U" shaped bracket and square. In particular, hooking between the tooth of the square and said ratchet gear occurs at the end of the backward oscillation of the "U" shaped bracket when the ratchet gear, during its upward rise - together with the "U" shaped bracket - passes over and securely hooks the tooth of the support square.

It should be noted moreover that the thrust from the edge of the window shutter on the rear curved element of the "U" shaped bracket should be rather strong since attachment of the ratchet gear and the tooth of the square is opposed by an antagonist spring fitted on the ratchet gear.

It is thus evident that in order to release the window shutter from a bracket of this type it is necessary firstly to release the stable attachment between the "U" shaped bracket and the square which supports it; only in this way can the bracket in fact be returned to its slanted position, namely so that its front curved element does not prevent the window shutter from closing.

This operation can in fact be carried out by releasing the ratchet gear from the tooth of the support square; this may be done by means of a trigger fitted to the ratchet gear and which projects from the front section of the "U" shaped bracket immediately under the front curved element.

In particular, by pushing this trigger downwards, it is possible, by overcoming the antagonistic force of the spring, to rotate the ratchet gear towards the front of the bracket, and consequently free the same from the tooth at the end of the hooking square to the wall.

Although this type of window shutter stop is commonly used and practical - it does have the disadvantage of having a rather fragile structure.

More precisely, it has been ascertained, above all after fairly prolonged use of these stops, that the hooked end breaks off the ratchet gear fitted in the "U" shaped bracket, namely the one that directly ensures the attachment with the tooth provided on the front of the body of the supporting square.

The reason for this is the considerable bending strain that this hooked element of the ratchet gear undergoes, above all in certain conditions, as for example in the case of strong wind. It is evident in fact that when the window shutter is locked between the curved elements of the window shutter in question, the only thing that prevents oscillation towards the bottom of the "U" shaped bracket, and thus release of the window shutter, is the attachment between the hooked end of the ratchet gear and the tooth of the support square.

It is quite clear therefore that the hooked end of the ratchet gear can break when the window shutter is banged shut against the front curved element of the "U" shaped bracket, as occurs in the case of violent storms or strong wind.

It is also evident that when the ratchet gear of the "U" shaped bracket breaks the mechanism is seriously damaged in that it irreparably compromises the function of the window shutter stop, which will necessarily have to be replaced with a new part.

The purpose of this invention is to realise a window shutter stop having a similar basic structure to that of the above window shutter stops, without the risk however that the ratchet gear in the "U" shaped bracket, breaks.

In order to achieve this, the locking system between the box-shaped bracket and the relevant square has been re-designed, eliminating the reciprocally stopping elements subject to bending strain, but hooking the elements subjected to more supportable compression strain.

Thanks to this solution it is evident that this new fixing system is much sturdier than traditional window shutter stops and consequently able to sustain major strain transmitted by the window shutter.

For major clarity the description of the invention continues with reference to the enclosed drawing which is intended for purposes of illustration and not in a limiting sense, whereby figures 1, 2 and 3 illustrate by means of the same number of side views a window shutter stop of the type according to the invention whose oscillating bracket is cross-sectioned with a longitudinal median plane.

The three figures show the device in the three operating positions, namely in resting position before the edge of the window shutter has been caught and locked (figure 1), in the position during locking of the window shutter (figure 2) and in the position immediately after the stopping means between the bracket and the support square (figure 3) have been released. With reference to the enclosed figures, the window shutter stop according to the invention generally consists of an oscillating box-shaped bracket (1) provided with two curved elements (1a and 1b) joined by a horizontal wall (1c) and pivoted, with respect to a horizontal transverse pin (2), to a shaped square (3) provided at the rear end with a screw (4) used to fix the same to the wall.

It should also be noted that the front end of the square (3), housed in the box-shaped square (1) terminates at the top with a short nib (5) having a rectilinear upper wall (5a) and a lower sloping wall (5b).

It being provided that in the box-shaped bracket (1) an "L" shaped lever (7) having vertical wing (7a) turned upwards and subject to the thrust of a spring (8) fitted between said wing (7a) and a transverse section (1d) in the longitudinal wall (1c) of the bracket (1), is pivoted with respect to a second transverse pin (6).

The end of the horizontal wing (7b) of this "L" shaped lever (7) being provided with a trigger (9) projecting from the bracket (1) under the front curved element (1 b).

The end of the vertical wind (7a) of said lever (7) terminates with a transverse pin (10) which hooks into a notch (11a) realised below a special small parallelepiped block shaped slider (11).

This slider (11) being able to translate alternatively with respect to the longitudinal axis of the bracket (1) according to the positions of the relevant operating lever (7), while keeping parallel and in contact with the inner face of the longitudinal wall (1c) of the bracket (1).

With particular reference to figure 1, when the bracket (1) is slanted forwards, the lever (7) is entirely housed in the box-shaped bracket (1) so that the rear face of the slider (11) fitted at its end abuts against the lower sloping wall (5b) of the nib (5b) provided on the front of the supporting square (3). In particular, this figure illustrates that the rotation of the bracket (1) stops when its nib (5) touches against a counter-nib (1e) provided on the longitudinal wall (1c).

When, after it has been opened, the window shutter interferes with the rear curved element (1a) of the bracket (1), the bracket (1) generally swings back tending therefore to assume its operating position, as illustrated in figure 2.

During said backward oscillation and thanks to the thrust ensured by the interference of the window shutter, the block (11) fitted at the top of the lever (7) moves back briefly and passes over the nib (5) of the square (3) thanks to the thrust of the spring (8), so that it positions itself exactly between the inner face of the longitudinal wall (1c) of the bracket (1) and the upper rectilinear wall (5a) of the nib (5).

It is the very provision of said block (11) between bracket (1) and the square (3) as a spacer, which is the feature that prevents the bracket (1) from rotating freely downwards around its pivoting pin (2).

In other words, positioning the block (11) between the bracket (1) and the square (3) performs the same function - on the basis of a totally different logic however - which in traditional window shutters was performed by the attachment between the ratchet gear housed in the box-shaped bracket and the upward facing tooth provided at the front end of the supporting square.

By observing figure 2, it is evident that the thrust produced by the window shutter on the front curved element (1 b) of the box-shaped bracket (1) simply squeezes the slider (11) between the inner wall (1c) of the box-shaped bracket (1) and the nib (5) of the support bracket (3).

It is evident therefore that the block (11) which undergoes compression, is not subject to the risk of breakage due to bending.

With reference to figure 3, it is evident that in order to release the bracket (1) and the support square (3) it is necessary to lower the trigger (9), overcoming the force of the spring (8) that opposes the vertical wing (7a) of the "L" shaped lever (7). This operation in fact makes the slider (11) slide towards the front of the bracket (1) and therefore prevents its lower face from interfering with the rectilinear wall (5a) of the nib (5) of the square (3).

The number (12) refers to a piston having horizontal axis with relevant spring (12a) provided at the top of the rear curved element (1a) of bracket (1) which cushions the impact of the edge of the window shutter, while the number (13) refers to a cap which can be fitted into different positions on the top of the front curved element (1b) in order to regulate the centre to centre distance between the two curved elements of the device according to the invention.

Claims

1. An automatic window shutter stop of the type consisting of an oscillating box-shaped bracket (1) provided with two curved elements (1a and 1b) joined by a longitudinal wall (1c) and pivoted, with respect to a transverse pin (2), to the exterior of a shaped square (3) by means of a screw (4) which cooperates with an opposite "L" shaped lever (7) pivoted to a transverse pin (6) and subject to the thrust of a return spring (8), characterised in that the front end of said square (3) terminates at the top with a nib (5) having rectilinear upper wall (5a) and sloping lower wall (5b) and in that the top of the vertical wing (7a) of the lever (7) is provided with a transverse pin (10) hooked to the notch (11a) of a slider (11) which slides in contact with the longitudinal wall (1c) of the bracket (1) from an initial end of stroke position, at which its lower face adheres to the rectilinear wall (5a) of the underlying nib (5), to a second end of stroke position, at which said adherence no longer occurs allowing rotation downwards of the bracket (1) with respect to its pivoting pin (2).

2. An automatic window shutter stop according to claim 1, characterised in that the top of the rear curved element (1a) of bracket (1) is provided with a piston having horizontal axis (12) subject to the expulsive thrust of a spring (12a).

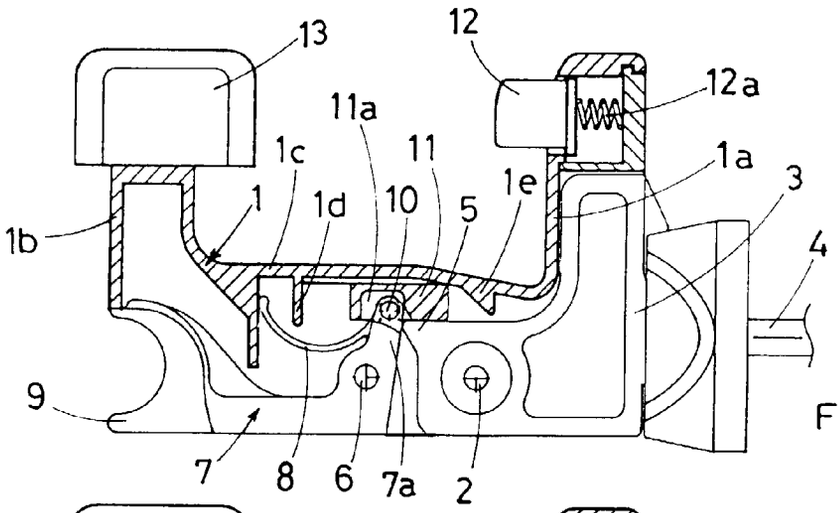

FIG. 2

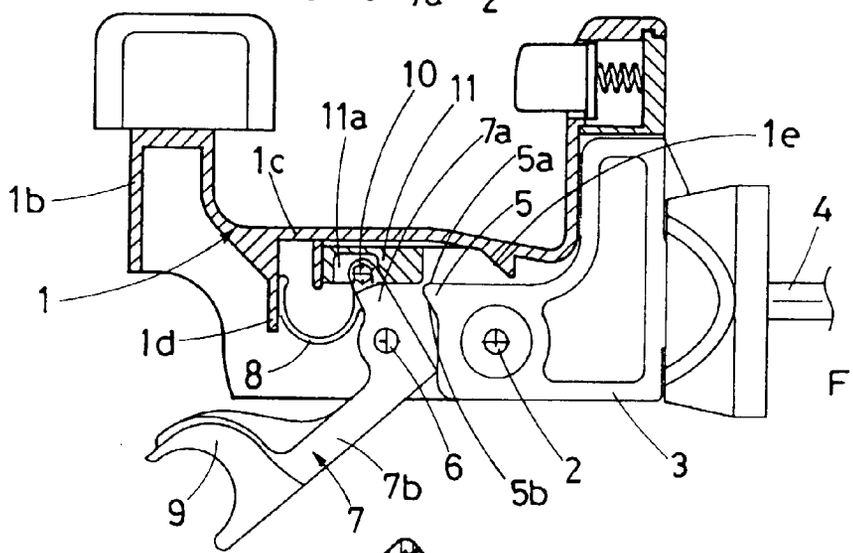

FIG. 3

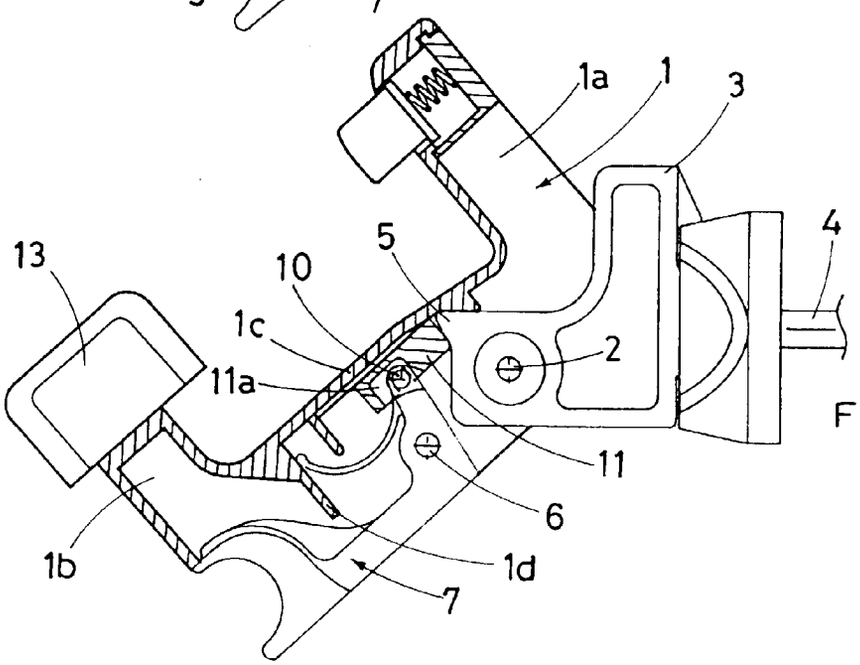

FIG. 1