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PATENT

FOR

IMPROVEMENTS ON WINDOW STAYS ✓

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A WINDOW STAY

BACKGROUND OF THE INVENTION

This invention relates to improvements in window stays.

A window stay is a piece of hardware by which a window sash can be hingedly mounted with a window frame. The term window stay is broadly used to indicate a hinge for hingedly mounting a sash in a window frame but not necessarily itself hold the window sash in an adjusted open position. In preferred forms of window stays, friction pivot joints are incorporated so that the stay can be capable of holding the window sash in an adjusted open position. Typically a window sash will be mounted in a window frame by a pair of window stays.

To enable a window stay to provide the necessary hinging action it is sometimes provided with a sliding carriage or shoe. The carriage can be required to be locked in one or more positions in the extent of travel along the mounting plate with which it is slidably engaged. Such a window stay can, for example, be of the type disclosed in our British patent specification 1565703 which is commonly referred to as a double action stay.

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As disclosed in patent specification 1565703 the sliding carriage can be locked in a first position whereby the stay can operate in a manner of a known 4 bar stay. However the carriage can also be released to slide along the mounting plate and be locked at one or more positions typically at least a position where the window sash is opened to or near its fullest extent so that the window sash lies in a plane which is at or near 90° to the plane of the window frame.

Typical problems with such an arrangement is the lack of a positive locking of the carriage or difficulty operating the locking mechanism as the user must not only operate the locking mechanism on each of the pair of stays but also apply a pushing action on the window stay.

Another problem which can arise with sliding carriages results from the carriage overlapping or projecting beyond the longitudinal edges of the mounting plate with which the carriage is slidably engaged. Thus a clearance must be left between the window frame and the mounting plate for the entire length of the mounting plate to ensure that free sliding of the carriage is not prevented. Thus the mounting plate must be correctly positioned in the frame so that the correct clearance is provided. It is, however, desirable for fitting purposes and correct orientation to locate a frame mounting plate of a window stay hard up against a flange of

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the window frame both along the one longitudinal side of the frame mounting plate and at an end thereof.

SUMMARY OF THE INVENTION

Broadly in one aspect of the invention there is provided a window stay of a type which includes a sliding means such as a shoe or carriage, the sliding means having locking means which enable the sliding means to be located and locked in at least one locking position on a stay element, said locking means having a latching portion which is engagable with at least one engagement part of said stay element and an actuating part which enables the latching portion to be disengaged from a said engagement part to enable a sliding means to slide along said stay element, there being re-latching means which causes the latching portion to re-engage with the or a said engagement part upon the sliding means reaching the or a locking position.

According to a second broad aspect of the invention there is provided a window stay of a type which includes a sliding means such as a shoe or carriage which is located for sliding movement along the stay element said stay element having a pair of opposing edges which are longitudinal relative to the direction in which the sliding means can move, there being at least one guide means located inward of said edge, the

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sliding means having an engagement part which engages within the guide means to be movable longitudinally along the guide means but during normal operation of the window stay unable to move transversely out of the guide means.

In the preferred form of the invention there is a guide means located inward of and parallel to each of said side edges.

Preferably the window stay according to the invention the stay element is a frame mounting plate and said sliding means pivotally mounts one end of an arm of the window stay, there being an end stop element with which the sliding means engages when the window stay is in the fully closed position said end stop including an arm engagement portion with which at least part of said arm engages when the window stay is in the fully closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

In the following more detailed description of the invention according to its preferred form, reference will be made to the accompanying drawings in which:-

Figure 1 is a perspective view of a window stay of a double action type with the stay shown functioning as a standard 4 bar stay and in its fully open position,

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Figure 2 is a similar view but with the carriage moved to a position where the stay is at a position corresponding to the fullest open position of a sash mounted by the stay,

Figure 3 is a partial perspective view of the window stay of Figures 1 and 2 (but with the short arm removed in the interests of clarity) and with the carriage locked in its end position where the stay can operate as a conventional 4 bar stay,

Figure 4 is a cross-sectional view of the arrangement shown in Figure 3,

Figures 5 and 6 are views similar to Figures 3 and 4 but with the carriage released for sliding movement,

Figures 7 and 8 are yet further similar views showing the carriage having undergone a short degree of sliding movement from the position in Figure 1, and

Figure 9 is a sectional perspective view of the end stop on the frame mounting plate.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following description of the invention, the window stay to which the invention has been applied is of a double action type as disclosed in our British patent specification 1565703. This stay thus includes a frame mounting plate 10, a sash mounting plate 11, a short arm 12 and a long arm 13.

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A carriage 14 is slidably engaged on frame mounting plate 10 and is coupled via the short arm 12 to the sash mounting plate 11. The short arm 12 is coupled to the carriage 14 and plate 11 via respective pivot joint 16 and 16'.

The long arm 13 is likewise pivotally attached at each end to mounting plates 10 and 11 via pivot 17 and 17'. In a preferred form of the invention pivot 16', 17 and 17' are of the type described and claimed in our New Zealand patent specification 230905. However other forms of friction or non friction pivot joints can be employed as will be appreciated by those skilled in the art.

An end stop 15 is fixedly attached to the end of the frame mounting plate 10 which is opposite to that having pivot joint 17.

To facilitate mounting of the plates 10 and 11 to a respective window frame and a window sash, the sash mounting plate 11 is provided with openings 19 and the frame mounting plate 10 with openings 20 for the reception of mechanical fasteners. An opening 20' in the end stop 15 enables a mechanical fastener to pass therethrough and via a corresponding opening 20 in the frame mounting plate 10 into the window frame. This mechanical fastening can be employed to in part or in total fix the end stop 15 to the frame plate 10.

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In the preferred form, however, as shown in Figure 9, the end stop 15 has a projecting clip 43 which engages in an aperture in the frame mounting plate 10. Also longitudinally extending feet 44 engage in the grooves 27 with which the carriage is slidably engaged (see later). The fitting of the end stop 15 essentially is a snap fit with the clip preventing longitudinal movement relative to frame plate 10 and the feet 44 preventing transverse movement. This fixed portion of the end stop is particularly important during installation of the stay to the window.

As with the double action stay of British patent specification 1565703, the carriage 14 is locked in its end position where it is furthestest from pivot 17 and a locking mechanism 18 is provided for this purpose.

Short arm 12 is mounted in a recess portion 21 of carriage 14, this recess portion being aligned with a recess portion 22 of the end stop 15. A wall 23 of the end stop 15 engages with the edge of short arm 12 when the stay is in the fully closed position to limit the extent of movement of arm 12 as it reaches to fully closed position.

End stop 15 also includes a stop surface 24 which engages with end 25 of the carriage 14 when the carriage is moved to its full extent of movement away from pivot 17.

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At this point of full extent of movement, carriage 14 is locked against sliding movement by the locking mechanism 18. As shown in Figures 3 and 4 the locking mechanism 18 comprises a substantially Z shaped lever having one leg 30 which forms an actuating or operating button while the other leg carries a projection 31 which in the locked position of the carriage 14 engages in an opening 35 in the frame mounting plate 10. The intermediate section 32 of the lever forms a pivoting section as will hereinafter be apparent.

Integrally formed with and projecting downwardly from button 30 is a spring part 33 the distal end of which engages on a cross piece 38 located in the cavity 39 of carriage 14 in which the locking mechanism 18 is located.

Also downwardly extending from button 30 and the associated spring part 31 is a release arm 34. In the end position of the sliding carriage 14 as shown in Figures 3 and 4, this release arm 34 is located opposite an aperture 36 in the frame plate 10. This aperture 36 is of a different shape and dimension to aperture 35 in which the projection 31 of the lock arm 18 engages for reasons which will hereinafter become apparent.

To release the locking mechanism 18 and enable the sliding carriage to slide along the frame mounting plate 10 a

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downward pressure is applied to the button 30 as shown in Figures 5 and 6. Such movement is possible due to the release arm 34 moving into aperture 36. The full extent of movement of the button 30 is limited by arm 31 of the locking mechanism 18 coming into engagement with the roof 40 of cavity 39. In such position, the distal end of button 30 engages with a clip piece 37 formed as an integral part of carriage 14 (see Figure 6). It will also be observed from Figure 6 that when the button 30 is depressed, the spring part 33 is deformed as a consequence of its distal end engaging with the cross piece 38.

Upon the carriage 14 being slid away from the end stop 15, the release arm 34 engages with the edge of aperture 36 which causes an upward force to be applied to the button 30 which releases the button (under the biasing effect of the spring part 33) from its engagement with the clip 37 (see Figure 8). The carriage can be continued to be slid along the frame mounting plate 10 because the different size and shape of the projection 31' means that it will not be able to engage in aperture 36 but simply slide thereover.

When the carriage reaches its full extent of sliding towards pivot 17 (see Figure 2) the projection 31' will, however, move into engagement within aperture 41 (see Figure 1). The lock mechanism 18 will thus assume the configuration shown in

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Figures 3 and 4. The carriage thus becomes automatically locked in the position shown in Figure 2.

To move the carriage 14 back to the end stop 15 the button 30 is once again depressed to the position shown in Figure 6 whereupon the carriage can be moved back towards end stop 15. Due to the interaction of the release arm 34 and edge of associated aperture 42 the lock mechanism is moved to the position shown in Figure 7 so that it is "cocked" ready for re-engagement of projection 31 with aperture 35 when the carriage 14 comes into engagement with the end stop 15 (that is surfaces 24 and 25 come into engagement). With the carriage back in this position the stay can continue to operate simply as a standard 4 bar stay.

Accordingly there is provided a locking arrangement which provides a positive and automatic lock of the stay carriage at its two extremes of travel. If required, further pairs of apertures could be provided along the length of the frame mounting plate to enable the carriage to be locked in intermediate positions between the two extremes. The locking mechanism is easy to operate and as depression of the clip 30 results in engagement with the clip 37, a user can operate each locking mechanism independently and then move the window sash.

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Extending along the length of the frame mounting plate 10 adjacent each longitudinal edge 28 are a pair of parallel grooves 27. Slidingly engaged within the grooves 27 are feet 26 of carriage 14. The grooves 27 are profiled with a return 27' which engages over part of the feet 26 such that the feet cannot move transverse to the grooves 27. That is they are captured only for sliding movement longitudinally within the grooves 27.

As a consequence of this arrangement, the longitudinal edges of the carriage 14 are located inward of the longitudinal edges 28 of the frame mounting plate. Thus the frame mounting plate 10 can be engaged hard up against a flange of the window frame without any interference to the free sliding movement of the carriage 14.

Figure 9 illustrates how the end stop 15 can be fitted to the frame plate 10 so that it overlaps the end of the plate 10. By placing the stay hard up against the window frame the correct mounting position can be determined. Also the end stop 14 assists in resisting negative wind pressure forces.

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CLAIMS

1. A window stay of a type which includes a sliding means (14), the sliding means having locking means (18) which enables the sliding means to be located and locked in at least one locking position on a stay element (10), said locking means having a latching portion (31) which is engagable with at least one engagement part (35) of said stay element (10) and an actuating part (30) which enables the latching portion to be disengaged from a said engagement part (35) to enable a sliding means (14) to slide along said stay element (10), there being re-latching means (33) which causes the latching portion (31) to re-engage with the or a said engagement part (35) upon the sliding means (14) reaching the or a locking position.
2. A window stay as claimed in claim 1 wherein there is provided retention means (37) to at least temporarily retain the locking means (18) such that said latching portion (31) is held out of engagement with the engagement part (35).
3. A window stay as claimed in claim 2 wherein there is provided release means (34) to cause the retention means (37) to release the locking means (18).

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4. A window stay as claimed in claim 2 or 3 wherein there is provided biasing means (33) to apply a biasing force to the locking means (18).
5. A window stay as claimed in any one of claims 2, 3 and 4 wherein the retention means includes a clip means (37) with which the actuating part (30) is releasably retained when the actuating part is moved to disengage the latching portion (31).
6. A window stay as claimed in claim 3 wherein the release means includes an arm (34) and a release clearance (36) into which the release arm can move when the actuating part (30) is moved to disengage the latching portion (31), said release arm (34) being engagable with the stay element (10) as the sliding means (14) is moved to cause release of the retention means (37) to occur.
7. A window stay as claimed in any one of the preceding claims wherein the engagement part is an aperture (35) in the stay element (10) and the latching portion (30) includes a projection (31) which is engagable in said aperture (35).
8. A window stay as claimed in any one of the preceding claims wherein there is provided an end stop element

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(15) with which the sliding means (14) engages when the window stay is in the fully closed position.

9. A window stay as claimed in claim 8 wherein the end stop (15) includes an arm engagement portion (23) with which at least part of said arm (12) engages when the window stay is in the fully closed position.
10. A window stay as claimed in any one of the preceding claims wherein the stay element (10) has a pair of opposing edges which are longitudinal relative to the direction in which the sliding means (14) can move, there being at least one guide means (27) located inward of said edge, the sliding means (14) having an engagement part (44) which engages within the guide means (27) to be movable longitudinally along the guide means but during normal operation of the window stay unable to move transversely out of the guide means.
11. A window stay as claimed in claim 10 wherein there is a guide means (27) located inward of and parallel to each of said side edges.
12. A window stay as claimed in claim 9 wherein the end stop is clipped to the stay element, said end stop having an opening (20') which aligns with an opening in the stay

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element (10) whereby a mechanical fastener can be engaged through the aligned openings.

13. A window stay as claimed in any one of the preceding claims wherein the frame element is a frame mounting plate (10), a first arm (12) is pivotally attached by one end to the sliding means (14), a second arm (13) longer than the first arm is pivotally attached by one end to the frame mounting plate (10) and the other ends of the arms are pivotally attached at spaced apart locations to a sash mounting plate (11).



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