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IMPROVEMENTS IN WINDOW OR THE LIKE STAYS

This invention relates to a window stay for adjustable mounting of a window sash into a window frame.

A now common form of a window construction is to have an "overlap" type of sash. In such a construction the outer edge
5 or peripheral flange of the sash extends beyond the inner periphery of the window frame and accordingly it is necessary that the sash be mounted into a window frame by a pair of stays which operate such that during initial opening of the window the sash moves outwardly in order that it clears the frame and
10 remains clear during the entire opening operation. These so-called projected hung windows can be either top hung where the stays are disposed at the vertical sides of the sash and frame or can be side hung where the stays are disposed at the top and bottom (i.e. horizontal) sides of the sash and frame. An
15 example of a stay suitable for projected hung windows can be found in our U.K. Patent Specification 1163798.

The type of stays which are exemplified by U.K. Patent Specification 1163798 are formed by sash and frame mounting plates which are coupled by a pair of arms of different lengths.
20 The arms are coupled to the frame and sash mounting plates by pivots which in the case of the stay in Patent Specification 1163798 are of a wear-resistant friction type.

A development of this type of stay can be found in our European Patent Specification 0001487 A1 where the shorter arm is formed by a carriage mounted for sliding movement on the frame mounting plate. The carriage is elongate in form and is pivotally coupled by one end to an end of the sash mounting plate. The carriage is so mounted that when the stay is in the closed position it lies along the frame mounting plate. A pivoting arrangement is provided such that during initial opening of the stay the carriage is angularly displaced whereby it takes up a position where the end of the carriage which is pivotally coupled to the sash mounting plate moves away from the frame mounting plate. Once the full extent of angular displacement has been achieved (i.e. the edge of the sash is clear of the frame) the carriage can slide along the frame mounting plate to facilitate further opening of the window.

This type of stay is found to be a very effective way of mounting a projected top hung window and can also be successfully used with projected side hung windows, however, in the latter application problems can arise when the sash weight is high as the major portion of the weight of the sash is borne by the lowermost stay. The fact that the majority of the weight is borne by the lowermost stay places a high shear load on the carriage when it is angularly displaced to project from the frame mounting plate. This has tended to result in the operation of the stay being impaired. For example the carriages of the top and bottom stays are prone to bending which leads to "sagging" of the sash. To overcome this problem the stiffness of the carriage can be increased but this only results in an increase in the friction between the carriage and frame mounting plate which is undesirable as the carriage is designed for free sliding movement along the frame mounting plate.

These problems can also be present with other known stays where the lowermost stay must bear the major portion of the weight of the sash. This is particularly so when the stay incorporates a sliding carriage.

In its broadest aspect the present invention provides a window stay for the adjustable mounting of a window sash into a window frame comprising a mounting member comprising a frame mounting plate adapted for attachment to the frame, a cover plate located by
5 mounting means to be disposed substantially parallel to but spaced from said mounting plate to define a cavity therebetween, a sash mounting plate adapted for attachment to the sash, two arms of different lengths
10 each pivoted at one end to said sash mounting plate, the other end of the longer of said arms being pivoted to said frame mounting plate, the other end of the shorter of said arms being coupled to said frame mounting plate, the construction and arrangement being
15 such that when the stay is closed said arms are disposed within said cavity to be located between said frame mounting and cover plates with said sash mounting plate being located outside said cavity to be disposed adjacent said cover plate.

In the preferred form of the invention the shorter arm is in the form of an elongate carriage which is mounted for sliding movement along said frame mounting plate. The carriage is pivoted by one end to the said other end of the sash mounting plate and means are provided such that the carriage is angularly displaced relative to said frame mounting plate during initial opening and final closing operations of the stay.

The cover plate may be located between the arms and the sash mounting plate when the stay is closed and may have at least two recessed portions at its free edge to receive the pivot joints coupling the sash mounting plate to said arms.

In more fully describing the invention reference will be made to the accompanying drawings in which:-

Figure 1 is an elevational view of a right-hand stay in an open position,

Figure 2 is a similar view to that of Figure 1 but with the stay in the closed position,

Figure 3 is an end view of the left-hand stay shown in Figure 5,

Figure 4 is a cross-sectional view of a line A-A of Figure 2, and

Figure 5 is a side view of a left-hand version of the stay.

Throughout the following description reference will be made to a single stay in relation to a window sash and mounting frame but it will be appreciated that to mount any sash a pair of such stays are normally employed. The stays can be mounted by their frame mounting members to either the side members of the frame in a projected top hung application or can be mounted to be top and bottom members of the sash in a projected side hung application though it is the latter situation in which the stay of the present invention is most suited.

The frame mounting member is shown at 10 and the sash mounting plate at 11. The member 10 is generally channel-sectioned, and the flanges of the

channel-section provide the aforementioned frame mounting plate 17 and cover plate 20 respectively. Counter bored openings 12 are provided along length of each of plates 17 and 11 for the reception of fastening rivets, screws etc. by which said plate can be fastened to the respective frame F and sash S. Arm 13 is joined by one end thereof at or adjacent one end of plate 17 whilst the other end is coupled to the sash plate 11. Assuming the stays shown in the drawings are in the vertical position arm 13 is attached at or adjacent the lower end of plate 17 and inward from the lower end of plate 11.

One or both of the pivot joints 14 by which arm 13 is coupled to plates 17 and 11 is a wear-resistant friction joint preferably of the type described in either of our U.K. Patent Specifications 1163798 or 1304830.

Preferably the pivot joints 14 are of the type disclosed in Patent Specification 1304830. In this form the shank of a rivet, which is of circular cross-section, engages through a non-circular opening in plate 17 or 11. The head of the rivet is preferably located in a recess in arm 13 whilst the tail of the rivet is pressed onto the surface of plate 17 or 11 surrounding the non-circular opening. As can be seen in Figure 5 the openings in plates 17 and 11 are formed in dimpled portions 10a and 11a respectively. The pressed tail of the rivet is thus located in a recess. Due to the tail being pressed onto plates 17 and 11 and into a non-circular opening the rivet cannot rotate. As it is preferred that the rivet be of an aluminium material, as are also plates 17 and 11, it is desirable that no metal-to-metal contact occurs between arm 13 and both the rivet and mounting plates. This is achieved by a wear resistance self-lubricating plastics material such as nylon being provided in the manner disclosed in Patent Specification 1304830. Accordingly, arm 13 can pivot about the rivet but only engages the wear-resistant material.

The upper end of plate 11 is coupled by a pivot joint 15 to the sliding carriage 16. This carriage 16 is

preferably formed from nylon or other suitable plastics material and thus readily slides along the length of member 10. Alternatively, carriage 16 can be of metal construction with the surfaces thereof in contact with member 10 being formed by inserts or pads of plastics material (such as nylon). The carriage 16 thus moves along member 10 in a manner which can be termed free sliding. The actual construction and operation of carriage 16 is the subject of detailed description in our European Patent Specification 0001487 A1 and thus a further description of the carriage and its operation is not required for the purposes of the present specification.

The cover plate 20 is parallel to the frame plate 17 and is coupled thereto by cross member 18. The cover plate 20 is of the same width as the frame plate 17. An inwardly projecting lip or ridge 21 extends from plate 20 and is disposed directly opposite a similar lip or ridge 21' on the plate 17. These ridges 21 and 21', which form guide means, engage with carriage 16 in a manner described in our European Patent Specification 0001487 A1 and thereby maintain carriage 16 in its disposition during sliding movement along mounting member 10.

In the closed position of the stay as shown in Figures 2, 3, 4 and 5 the arm 13 and carriage 16 lie along the mounting member 10 and are located between plates 17 and 20. The sash mounting plate 11 is located outside of the channel and lies alongside the outer surface of the cover plate 20. The cover plate 20 has a recess 22 formed at its upper end (when the stay is viewed as shown in Figure 2) and spaced downwardly therefrom a second recess 23. A third recess 24 is provided at the lower end of the cover plate 20 and all three recess 22, 23 and 24 are located opposite openings 12 in the plate 17. The lower recess 24 is of such a size and shape that pivot 14 is not covered so as to permit rivetting during the formation of pivot 14. In the illustrated form the head of the rivet in pivot 14 is located in arm 13 but it

will be appreciated that the head could equally be formed in a recess in plate 17. The same applies with the pivot 14 joining plate 11 to arm 13 as the head of the rivet could equally be situated in a recess in the plate 11 rather than arm 13.

5 The upper two recesses 22 and 23 are provided not only to form access to counter bored openings 12 but also to receive the portion of the pivot joints 15 and 14 respectively. These pivot joints include in their
10 construction a spacer 25 located between plate 11 and the surface of carriage 16 and arm 13 respectively. In the case of the carriage the spacer 25 could be formed as an integral part of the plastics body of the carriage. These spacers 25 ensure that plate 11 is disposed away
15 from carriage 16 and arm 13 respectively so that there is sufficient clearance for the cover plate 20 to fit between the carriage 16 and arm 13 on the one hand and sash mounting plate 11 on the other hand. The relative
20 positions of the carriage 16, arm 13, plate 11 and plate 20 are more clearly illustrated in Figure 5 of the drawings.

By referring more specifically to Figure 5 of the drawings it will be seen that the carriage 16 is in contact with not only the frame mounting plate 17 but
25 also with the cover plate 20. This means that even when the stay is in the open position, as illustrated in Figure 1, the carriage is sandwiched between plates 17 and 20. This sandwiching of the carriage between the plates increases the load carrying capacity of the
30 carriage to the extent that in projected side hung applications the upper stay is capable of carrying its share of the weight of the sash.

The cover effect provided by plate 20 permits grease or other lubricating material to be applied in the
35 cavity between plates 17 and 20 and connecting flange 18 to assist the free sliding movement of carriage 16. As the lubricating material is located within the confines of plates 17 and 20 and flange 18 it is not wide open

to the ingress of dirt, grit etc. Plate 20 also covers any scratch marks or the like which may be formed on the inner surface of plate 17 caused by the sliding movement of the carriage along that surface.

The invention thus provides a window stay which incorporates a sliding carriage usable in either projected side or top hung applications. The enveloping effect provided by plates 17 and 20 increases the load carrying capacity of the stay especially in projected side hung applications where the uppermost stay is able to carry its share of the weight of the window sash.

The stay is open to modifications without departing from the scope of the invention as defined in the appended claims. For example, the sash mounting plate 11 can be of an angled cross-section as shown in Figure 4 where a flange 11b is illustrated in dotted detail. This additional flange 11b provides a greater strength than a flat plate of the type previously described. However, if it is made of a full length, i.e. substantially the length of the frame mounting member 10, it neatly covers the cavity in the channel between the plates 17 and 20. This cover provided by flange 11b effectively excludes dust and dirt from the lubricated carriage and channel whilst the window is closed.

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CLAIMS

1. A window stay for the adjustable mounting of a window sash into a window frame comprising a mounting member comprising a frame mounting plate adapted for attachment to the frame, a cover plate located by
5 mounting means to be disposed substantially parallel to but spaced from said mounting plate to define a cavity therebetween, a sash mounting plate adapted for attachment to the sash, two arms of different lengths each pivoted at one end to said sash mounting plate, the
10 other end of the longer of said arms being pivoted to said frame mounting plate, the other end of the shorter of said arms being coupled to said frame mounting plate, the construction and arrangement being such that when the stay is closed said arms are disposed within said
15 cavity to be located between said frame mounting and cover plates with said sash mounting plate being located outside said cavity to be disposed adjacent said cover plate.
2. A window stay as claimed in claim 1, wherein
20 the shorter arm is in the form of an elongate carriage which is mounted for sliding movement along said frame mounting plate.
3. A window stay as claimed in claim 2, wherein
25 the carriage is pivoted by one end to the said other end of the sash mounting plate and means are provided such that the carriage is angularly displaced relative to said frame mounting plate during initial opening and final closing operations of the stay.
4. A window stay as claimed in claim 2 or claim 3,
30 wherein the distance between the frame mounting plate and the cover plate is only slightly greater than the thickness of the carriage located therebetween, thereby permitting free sliding movement of said carriage.
5. A window stay as claimed in claim 4, wherein
35 the frame mounting plate and cover plate each incorporates



a guide means extending longitudinally therealong, said guide means co-operating with said carriage to maintain said carriage in position with the mounting member during its sliding movement therealong.

5 6. A window stay as claimed in any one of the preceding claims, wherein the cover plate is located between the arms and the sash mounting plate when the stay is closed and has at least two recessed portions at its free edge to receive the pivot joints coupling
10 the sash mounting plate to said arms.

7. A window stay as claimed in any one of the preceding claims, wherein the pivot joints coupling the arms to said sash mounting plate and the longer arm to
15 said frame mounting plate are friction joints of the type which are formed by a rivet joining the components of the joint, the head of the rivet being located in a recess and the tail being locked against rotational movement, there being wear resistance self-lubricating
20 plastics material, such as nylon, incorporated in the joint to prevent contact between the arm and mounting plate and the head of the rivet and adjacent shank portion from the arm or mounting plate as the case may be, said plastics material being under pressure created by said rivet.

25 8. A window stay as claimed in any one of the preceding claims, wherein the sash mounting plate is of angular cross-section with one flange thereof adapted for mounting to a sash and the other flange to extend at substantially right angles to the sash such that when the
30 stay is in the closed position said other flange spans across the cavity in the mounting member.

9. A window stay as claimed in claim 8, wherein the frame and sash mounting plates are of substantially the same length.

35 10. A window stay substantially as herein described with reference to the accompanying drawings.

The text of the specification has been reproduced by photocopying the applicants original typescript. It may contain a few amendments which are difficult to read. The original typescript containing these amendments may be inspected on the premises of the Patent Office

