

Description

My present invention comprises a stay for a window or the like.

The four bar window stay the subject of NZ-A-144922/146130/146886 has over the last almost two decades proved particularly successful in its basic and subsequently refined forms, in many countries of the world. The success of the patent 144922/146130/146886 four bar stay has derived inter alia from its simplicity of construction, the stay comprising long life sealed in friction bearings and having no externally exposed and thus damage prone moving parts, and from the stays operation whereby a window sash is in use lifted out of the window aperture, enabling the provision of a peripheral sealing flange about the entire sash whilst still facilitating access for cleaning. This form of four-bar stay however provides only a relatively limited angle of opening and, in particular, it is not possible, from a practical point of view at least, to construct four-bar stays of this type which provide for ninety degrees or thereabouts of window opening, from a closed position to a position wherein the window extends perpendicularly to the frame.

Pantograph-type window stays which provide for such angles of opening are known, but these suffer from a number of disadvantages. A typical form of such stays is shown in United States patent No. 3,345,777. They comprise externally moving parts and in particular at least one mechanically sliding pivot and track arrangement, and thus such stays are prone with time to clogging with grit, causing sticking of the mechanism, particularly at the fully open position, increased wear and tear, and so forth. The geometry of such stays is such that a strong negative pressure or 'pull in' is not provided at the top of the stay/window during closing, as is desired, and the additional top caps that are provided to assist in creating pull in are subject to bending and breakage. Such damage can result from, for example, jamming of a curtain in the window during closing. Additionally, pantograph-type stays do not generally provide for the removal of the top of the peripheral flange from the window early in the opening operation with such an action or movement as to avoid the tendency to dislodge or 'roll out' the sealing rubber or plastic weatherstrip that surrounds the window aperture. Further, pantograph-type stays as are available do not generally possess a high degree of inherent strength and are prone to flexing and bending particularly in a casement application for example. If the arms of the stay are formed of a size to overcome this and provide the required strength the stay will be too bulky to fit within a standard size window stay cavity. Another type of stay providing for 90 degree angles of opening but incorporating another form of mechanism of sliding pivot is disclosed in EP-A-0113559.

It is not practically possible to construct four bar stays that provide for ninety or approaching

ninety degrees of window opening. To do so it is necessary to place the sash mounting points of the arms of the stay so close together that the stay cannot properly support the window sash when it is opened. For stability it is important that the stay sash mounting points be spaced apart.

My present invention provides an improved or at least alternative form of window stay that provides for enlarged angles of window opening. The window stay of my invention possesses the significant advantages of the four-bar type stay referred to, while still providing for substantially ninety degrees of window opening.

In broad terms the invention may be stated to comprise a window stay for use in mounting a window sash to a window frame, comprising a lower arm adapted to be pivotally mounted to the frame of a window at its proximal end and to the sash of the window at its distal end, a first upper arm adapted to be pivotally mounted at its proximal end to the frame of the window at a point spaced from the mounting of the distal end of the said lower arm, a second upper arm pivotally connected at its proximal end to the distal end of the said first upper arm and adapted to be pivotally mounted at its distal end to the said window sash at a point spaced from the mounting of the distal end of the said lower arm, and an intermediate control arm extending between the said lower arm and the said first upper arm and pivotally connected to each at points spaced from the ends thereof so as to direct movement of said first upper arm during opening and closing the stay.

In preferred forms of the stay of the invention, that are conveniently manufactured and sold for fitting subsequently to a window, the stay includes a frame mounting member and a sash mounting member. The proximal ends of the lower and the first upper arms are pivotally connected to the frame mounting member and the distal ends of the lower and the second upper arms are pivotally connected to the sash mounting member. The frame and sash mounting members are adapted to be secured to the frame and sash of a window respectively. In other forms of stay of the invention however, the stay may comprise part of a preformed window assembly with the arms of the stay being directly pivotally connected to the frame and sash of the window without such frame and sash mounting members.

In the window stay of the invention at least a number and preferably each of the pivotal joints between the arms and window frame or sash and arms to other arms is of a suitable friction pivot joint construction.

Preferably such a friction pivot joint between two components such as two arms, or an arm and a frame or sash mounting member, comprises an aperture in a first of the components, an annular shoulder surrounding and projecting from the periphery of said aperture, an aperture in the second component whereby said second component is located about said shoulder, a bushing of a suitable self-lubricating and wear-resistant

material interposed between said shoulder and said component to prevent direct contact therebetween, and a fixing means for fixing the joint and applying friction creating pressure thereto extending through the joint and fixed beneath said shoulder or in the said first aperture.

The stay of my invention is suitable for use in both awning and casement applications. The geometry of the stay is such that it provides for good pull in at the top of the stay during closing. The sash mounting points of the stay may be properly spaced apart giving good sash stability when the sash is open whilst still providing for enlarged angles of opening. The stay possesses a high degree of inherent strength. The stay does not incorporate any moving slides or the like so that it is not prone to clogging with dirt and jamming.

A preferred form of the stay of the invention is illustrated, by way of example, in the accompanying drawings, wherein:

Fig. 1 is a view of the preferred form window stay in its fully extended or open position,

Fig. 2 is an end view in the direction of arrow A of the stay in its closed position, and

Fig. 3 is a cross-sectional view of a preferred form of friction pivot joint.

The preferred form stay illustrated in Figs. 1 and 2 is suitably formed from stainless steel. If the stay is formed of stainless steel or a like material the required strength for each of the arms may be achieved with components of lesser dimensions so that the overall bulk of the stay is reduced. The stay comprises a first upper arm 1 and a lower arm 2. The proximal ends of the arms 1 and 2 are adapted to be pivotally connected to the frame of a window, by way of suitable friction pivot joints 4 as will be further described, at points spaced from each other. In the preferred form of stay shown the proximal ends of the arms 1 and 2 are adapted to be connected to the frame via a frame mounting member in the form of a plate 3. The distal end of the lower arm 2 is adapted to be pivotally connected to the sash of the window by way of a similar friction pivot joint 4, in the preferred form via a sash mounting member in the form of a plate 5. The distal end of the first upper arm 1 is pivotally connected to the proximal end of a second upper arm 6, termed a compensating arm, by a further friction pivot joint 4. The other end of the second upper or compensating arm 6 is adapted to be pivotally connected to the sash of the window, in the preferred form via the sash plate 5, at a point spaced from the connection of the lower arm 2 and by way of a friction pivot joint 4 as shown. An intermediate arm 7, termed a control arm, extends between the lower arm 2 and the first upper arm 1. It is pivotally connected to each at points spaced from the ends thereof, by friction pivot joints 4 as shown. In Fig. 2 like reference numerals indicate like components. The control arm 7 is connected to the upper arm 1 at a point spaced further from the distal end thereof, where the upper arm 1 connects to the second upper arm 2, than from the proximal end of the

upper arm 1, where the upper arm 1 connects to the frame plate 3. The control arm 7 is connected to the upper arm 1 at a point that is laterally spaced from the longitudinal axis thereof towards the lower arm 2, as particularly shown in Fig. 1. The distance between the mounting points of the lower arm 2 and the upper arm 1 to the frame plate 3 is preferably greater than the distance between the mounting points of the lower arm 2 and second upper arm 6 to the sash plate 5.

Each of the frame and sash plates 3 and 5 is provided with mounting holes 8 whereby the stay may be mounted to a window frame and sash in use. When the bearings 4 employed are of the preferred form type described herein the frame and sash plates 3 and 5 can additionally or alternatively be secured to the frame and sash by screws or like fasteners passing through the bearings themselves. This is advantageous, particularly in casement window applications, as the frame plate is secured to the frame at the same point that loads are applied so that deformation of the frame plate is minimised.

In use the stay can be moved from its fully extended or open position, shown in Fig. 1 in hard outline, wherein the sash bar 5 and a sash mounted thereto extends substantially perpendicularly to the window aperture, to or towards its closed position (or vice versa) by pulling on handles suitably mounted to the window sash as is known in the art. The stay in almost its closed position is shown in phantom outline in Fig. 1, and the movement of the control arm/first upper arm, control arm/lower arm, and sash plate/lower arm pivot joints is as indicated by broken lines. During opening and closing movement the control or intermediate connecting arm 7 will in use tend to direct the movement of the first upper arm 1 giving correct general operation of the stay and in addition ensuring that as the stay is closed the top of the stay is properly moved to its fully closed position so that good pull in is provided. As the stay is closed the control arm 7 will tend to push the first upper arm 1 upwards.

Initially in movement of the stay from its fully open to its closed position, pulling on a sash mounted to the stay will cause the sash mounting plate to pivot in the direction of arrow B in Fig. 1, about the pivot joint 4 at the distal end of the lower arm 2, and the second and first upper arms 6 and 1 to be drawn upwardly. Subsequently further movement of the sash/sash mounting member will cause the lower arm 2 to pivot inwardly about its proximal end towards the frame mounting member 3 and the control arm 7 to move in a similar fashion, pivoting about its lower end pivot joint, in a combined opening scissor action, until both lie parallel and adjacent the frame mounting member when the stay is fully closed. In opening of the stay the above movement is reversed.

As will be appreciated, the stay of the invention does not comprise externally moving parts such as sliding pivots or the like. In addition the sash mounting points of the arms of the stay are

properly spaced apart so that the stay stably mounts a window sash. Nonetheless the stay provides for substantially full ninety degree opening of the window sash. The stay provides a 'lifting out' of the window sash type operation similar to that of the patent 144922/146130/146886, so that the sealing strip extending about the window aperture is not tended to be dislodged, and enabling full cleaning access. The stay provides good 'pull in' during final closing.

A preferred form of friction pivot joint is shown in Fig. 3.

A first component such as a frame or sash plate or first arm is indicated at 9. A second component is indicated at 10. An annular shoulder 11 is formed on the component 9 it surrounds and projects from the periphery of an aperture therein as shown. The component 10 comprises an aperture whereby the component 10 is located about the shoulder 11. A bushing 13 shaped as shown and formed of a suitable self-lubricating and wear resistant material such as nylon or the like is interposed therebetween so that there is no metal to metal contact between the components 9 and 10. A fixing means or button 14 extends through the joint is fixed beneath the shoulder 11 to fix the joint and apply friction creating pressure thereto so that a friction pivot is provided.

The body portion 14b of the button preferably comprises an enlarged lower peripheral rim part 14c which is engaged beneath the shoulder 11.

The button comprises top portion 14a extending generally radially and of a peripheral flange like formation which extends over the second component 10 via the bushing 13 as shown, and a body portion 14b of a generally cylindrical formation which extends through the joint and the shoulder or displacement and which is engaged beneath the shoulder 11 by crimping or the like from the position shown in Fig. 1 to that shown in Fig. 2. The body portion 14b of the button preferably comprises an enlarged lower peripheral rim part 14c which is engaged beneath the shoulder 11. The engagement of the button 14 into the joint and crimping of the rim portion 14c thereof is so effected as to cause friction creating pressure to be applied to the joint to the extent desired.

It is preferred but not essential that this form of friction pivot joint be employed as such joints can be formed without difficulty from stainless steel enabling the entire stay to be formed of reduced thickness components whilst still possessing the required strength, and thus weight savings to be achieved and enabling a six bar stay of the invention to be provided that can still be accommodated within a standard thirteen millimetre window frame stay cavity. Another advantage of the preferred pivot joint type is that when used it enables the stay components to be pressed together with all of the pivot joints of the stay being fixed, in a single pressing operation. This is an important advantage from a manufacturing point of view. Another advantage of the preferred form pivot joints is that because they include a central aperture the joints in the frame

and sash mounting plates can be 'screwed through' with mounting screws, as well as the mounting holes 8. The stay is then secured to the frame and sash of the window at the same point that loads are applied by the stay arms, particularly in casement applications, so that distortion of the frame and sash mounting plates is minimised.

The foregoing describes my invention including a preferred form thereof.

Claims

1. An enlarged opening angle window stay for use in mounting a window sash to a window frame, comprising a lower arm (2) adapted to be pivotally mounted to the frame of a window at its proximal end and to the sash of the window at its distal end, a first upper arm (1) adapted to be pivotally mounted at its proximal end to the frame of the window at a point spaced from the mounting of the proximal end of the said lower arm (2), a second upper arm (6) pivotally connected at its proximal end to the distal end of the said first upper arm (1) and adapted to be pivotally mounted at its distal end to the said window sash at a point spaced from the mounting of the distal end of the said lower arm (2), and an intermediate control arm (7) extending between the said lower arm (2) and the said first upper arm (1) and pivotally connected to said lower arm (2) and said first upper arm (1) at points spaced from the ends thereof and arranged to direct movement of said first upper arm (1) during opening and closing of the stay.

2. A window stay as claimed in claim 1, wherein the said intermediate control arm (7) is pivotally connected to the said lower arm (2) at a point generally intermediate of the length thereof.

3. A window stay as claimed in either of claims 1 and 2, wherein the said intermediate control arm (7) is pivotally connected to the said first upper arm (1) at a point spaced further from the said distal end thereof than from the said proximal end.

4. A window stay as claimed in any one of claims 1 to 3, wherein the said intermediate control arm (7) is connected to the said first upper arm (1) at a point that is laterally spaced from the longitudinal axis of the said first upper arm towards said lower arm.

5. A window stay as claimed in any one of the preceding claims, wherein the length of the said lower arm (2) is greater than the combined lengths of the said first and second upper arms (1, 6).

6. A window stay as claimed in any one of the preceding claims, wherein the length of the said first upper arm (1) is greater than the length of the said second upper arm (6).

7. A window stay as claimed in any one of the preceding claims, including a frame mounting member (3) and a sash mounting member (5), the proximal ends of the said lower and the said first upper arms (2, 1) being pivotally connected to the



properly spaced apart so that the stay stably mounts a window sash. Nonetheless the stay provides for substantially full ninety degree opening of the window sash. The stay provides a 'lifting out' of the window sash type operation similar to that of the patent 144922/146130/146886 stay, so that the sealing strip extending about the window aperture is not tended to be dislodged, and enabling full cleaning access. The stay provides good 'pull in' during final closing.

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The body portion 14b of the button preferably comprises an enlarged lower peripheral rim part 14c which is engaged beneath the shoulder 11.

The button comprises top portion 14a extending generally radially and of a peripheral flange like formation which extends over the second component 10 via the bushing 13 as shown, and a body portion 14b of a generally cylindrical formation which extends through the joint and the shoulder or displacement and which is engaged beneath the shoulder 11 by crimping or the like from the position shown in Fig. 1 to that shown in Fig. 2. The body portion 14b of the button preferably comprises an enlarged lower peripheral rim part 14c which is engaged beneath the shoulder 11. The engagement of the button 14 into the joint and crimping of the rim portion 14c thereof is so effected as to cause friction creating pressure to be applied to the joint to the extent desired.

It is preferred but not essential that this form of friction pivot joint be employed as such joints can be formed without difficulty from stainless steel enabling the entire stay to be formed of reduced thickness components whilst still possessing the required strength, and thus weight savings to be achieved and enabling a six bar stay of the invention to be provided that can still be accommodated within a standard thirteen millimetre window frame stay cavity. Another advantage of the preferred pivot joint type is that when used it enables the stay components to be pressed together with all of the pivot joints of the stay being fixed, in a single pressing operation. This is an important advantage from a manufacturing point of view. Another advantage of the preferred form pivot joints is that because they include a central aperture the joints in the frame

and sash mounting plates can be 'screwed through' with mounting screws, as well as the mounting holes 8. The stay is then secured to the frame and sash of the window at the same point that loads are applied by the stay arms, particularly in casement applications, so that distortion of the frame and sash mounting plates is minimised.

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1. An enlarged opening angle window stay for use in mounting a window sash to a window frame, comprising a lower arm (2) adapted to be pivotally mounted to the frame of a window at its proximal end and to the sash of the window at its distal end, a first upper arm (1) adapted to be pivotally mounted at its proximal end to the frame of the window at a point spaced from the mounting of the proximal end of the said lower arm (2), a second upper arm (6) pivotally connected at its proximal end to the distal end of the said first upper arm (1) and adapted to be pivotally mounted at its distal end to the said window sash at a point spaced from the mounting of the distal end of the said lower arm (2), and an intermediate control arm (7) extending between the said lower arm (2) and the said first upper arm (1) and pivotally connected to said lower arm (2) and said first upper arm (1) at points spaced from the ends thereof and arranged to direct movement of said first upper arm (1) during opening and closing of the stay.

2. A window stay as claimed in claim 1, wherein the said intermediate control arm (7) is pivotally connected to the said lower arm (2) at a point generally intermediate of the length thereof.

3. A window stay as claimed in either of claims 1 and 2, wherein the said intermediate control arm (7) is pivotally connected to the said first upper arm (1) at a point spaced further from the said distal end thereof than from the said proximal end.

4. A window stay as claimed in any one of claims 1 to 3, wherein the said intermediate control arm (7) is connected to the said first upper arm (1) at a point that is laterally spaced from the longitudinal axis of the said first upper arm towards said lower arm.

5. A window stay as claimed in any one of the preceding claims, wherein the length of the said lower arm (2) is greater than the combined lengths of the said first and second upper arms (1, 6).

6. A window stay as claimed in any one of the preceding claims, wherein the length of the said first upper arm (1) is greater than the length of the said second upper arm (6).

7. A window stay as claimed in any one of the preceding claims, including a frame mounting member (3) and a sash mounting member (5), the proximal ends of the said lower and the said first upper arms (2, 1) being pivotally connected to the



said frame mounting member (3) and the distal ends of the said lower and the said second upper arms (2, 1) being pivotally connected to the said sash mounting member (5), the said frame and sash mounting members (3, 5) being adapted to be secured to the frame and sash of a window respectively.

8. A window stay as claimed in claim 7, wherein the distance between the mounting points of the said lower and first upper arms (2, 1) on the said frame mounting member (3) is greater than the distance between the mounting points of the said lower and second upper arms (2, 6) on the said sash mounting member (15).

9. A window stay as claimed in any one of the preceding claims, wherein a number of the said pivotal connections and pivotal mountings comprise a friction pivot joint (4).

10. A window stay as claimed in claim 9, wherein each of said friction pivot joints (4) between two components such as two arms or an arm and a frame or sash mounting member comprises an aperture in a first of the components (9), an annular shoulder (11) surrounding and projecting from the periphery of said aperture, an aperture in the second of the said components (10) whereby said second component is located about said shoulder (11), a bushing (13) of a suitable self-lubricating and wear-resistant material interposed between said shoulder (11) and said second component (10) to prevent direct contact therebetween and a fixing means (14) for fixing the joint and applying friction creating pressure thereto extending through the joint and fixed beneath said shoulder (11) or in said first aperture.

11. A window stay as claimed in claim 10, wherein the said fixing means (14) for the joint comprises a body portion (14b) engaged beneath said shoulder (11) or in said aperture and a top portion (14a) extending over said second component about said second aperture.

12. A window stay as claimed in claim 11, wherein said body portion (14b) is of a generally cylindrical formation and said top portion (14a) is of a generally peripheral flange like formation.

13. A window stay as claimed in either of claims 11 and 12, wherein said bushing (13) extends between said first component (9) and said second component (10), the internal surface of said second aperture and said shoulder (11), and said second component (10) and said fixing means top portion (14a).

14. A window stay as claimed in claim 13, wherein said pivot joints (4) comprise a central axial aperture whereby a stay securing fastener may extend through same.

Patentansprüche

1. Fenstergestänge für einen vergrößerten Öffnungswinkel zur Verwendung bei der Montage eines Fensterflügels an einem Fensterrahmen, das folgende Bestandteile umfaßt: einen unteren Arm (2), der so ausgebildet ist, daß er in schwenk-

barer Weise mit seinem proximalen Ende am Rahmen eines Fensters und mit seinem distalen Ende am Fensterflügel befestigt werden kann, einen ersten oberen Arm (1), der so ausgebildet ist, daß er in schwenkbarer Weise mit seinem proximalen Ende am Rahmen des Fensters an einem Punkt befestigt werden kann, der vom Befestigungspunkt des proximalen Endes des unteren Arms (2) im Abstand angeordnet ist, einen zweiten oberen Arm (6), der in schwenkbarer Weise an seinem proximalen Ende mit dem distalen Ende des ersten oberen Arms (1) verbunden und so ausgebildet ist, daß er in schwenkbarer Weise mit seinem distalen Ende an dem Fensterflügel an einem Punkt befestigt werden kann, der vom Befestigungspunkt des distalen Endes des unteren Arms (2) im Abstand angeordnet ist, und einen dazwischenliegenden Lenkerarm (7), der sich zwischen dem unteren Arm (2) und dem ersten oberen Arm (1) erstreckt und mit dem unteren Arm (2) und dem ersten oberen Arm (1) an Punkten in schwenkbarer Weise verbunden ist, die von den Enden dieser Arme im Abstand angeordnet sind, und der so ausgebildet ist, daß er beim Öffnen und Schließen des Gestänges die Bewegung des ersten oberen Arms (1) steuert.

2. Fenstergestänge nach Anspruch 1, dadurch gekennzeichnet, daß der dazwischenliegende Lenkerarm (7) mit dem unteren Arm (2) in einem Punkt in schwenkbarer Weise verbunden ist, der im wesentlichen in der Mitte von dessen Länge angeordnet ist.

3. Fenstergestänge nach einem der Ansprüche 1 oder 2, dadurch gekennzeichnet, daß der dazwischenliegende Lenkerarm (7) mit dem ersten oberen Arm (1) an einem Punkt schwenkbar verbunden ist, der von dessen distalen Ende einen größeren Abstand aufweist als von dessen proximalen Ende.

4. Fenstergestänge nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß der dazwischenliegende Lenkerarm (7) mit dem ersten oberen Arm (1) an einem Punkt verbunden ist, der von der Längsachse des ersten oberen Arms seitlich zu dem unteren Arm hin im Abstand angeordnet ist.

5. Fenstergestänge nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Länge des unteren Arms (2) größer ist als die kombinierten Längen des ersten und zweiten oberen Arms (1, 6).

6. Fenstergestänge nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Länge des ersten oberen Arms (1) größer ist als die Länge des zweiten oberen Arms (6).

7. Fenstergestänge nach einem der vorhergehenden Ansprüche, das ein Rahmen-Montageelement (3) und ein Flügel-Montageelement (5) umfaßt, wobei die proximalen Enden des unteren und des ersten oberen Arms (2, 1) in schwenkbarer Weise mit dem Rahmen-Montageelement (3) und die distalen Enden des unteren und des zweiten oberen Arms (2, 1) in schwenkbarer Weise mit dem Flügel-Montageelement (5) verbunden sind, und wobei das Rahmen- und das

Flügel-Montageelement (3, 5) so ausgebildet sind, daß sie am Rahmen bzw. am Flügel eines Fensters befestigt werden können.

8. Fenstergestänge nach Anspruch 7, dadurch gekennzeichnet, daß der Abstand zwischen den Befestigungspunkten des unteren und des ersten oberen Arms (2, 1) an dem Rahmen-Montageelement (3) größer ist als der Abstand zwischen den Befestigungspunkten des unteren und des zweiten oberen Arms (2, 6) an dem Flügel-Montageelement (5).

9. Fenstergestänge nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß einige der Schwenkverbindungen und der Schwenkbefestigungen ein Reibungs-Schwenkgelenk (4) umfassen.

10. Fenstergestänge nach Anspruch 9, dadurch gekennzeichnet, daß jedes Reibungs-Schwenkgelenk (4) zwischen zwei Komponenten, wie z.B. zwei Armen oder einem Arm und einem Rahmen- oder Flügel-Befestigungselement eine Öffnung in der einen Komponente (9) und eine ringförmige Schulter (11), die den Rand dieser Öffnung umgibt und davon absteht, und eine Öffnung in der anderen Komponente (10) umfaßt, vermittels derer die zweite Komponente um die Schulter (11) herum angeordnet ist, und daß eine Büchse (13) aus einem geeigneten selbstschmierenden und abriebfesten Material zwischen der Schulter (11) und der zweiten Komponente (10) angeordnet ist, um einen direkten Kontakt zwischen diesen Teilen zu verhindern, und daß ein Befestigungselement (14) vorgesehen ist, um das Gelenk zu befestigen und einen Reibung erzeugenden Druck auf das Gelenk auszuüben, wobei sich diese Befestigungseinrichtung durch das Gelenk erstreckt und unter der Schulter (11) oder in der ersten Öffnung befestigt ist.

11. Fenstergestänge nach Anspruch 10, dadurch gekennzeichnet, daß das Befestigungselement (14) für das Gelenk einen Körperteil (14b) umfaßt, der unter die Schulter (11) oder in die Öffnung eingreift, und einen oberen Teil (14a), der sich über die zweite Komponente (10) um diese zweite Öffnung erstreckt.

12. Fenstergestänge nach Anspruch 11, dadurch gekennzeichnet, daß der Körperteil (14b) eine im wesentlichen zylindrische Form besitzt und daß der obere Teil (14a) im wesentlichen die Form eines Umfangsflansches aufweist.

13. Fenstergestänge nach einem der Ansprüche 11 oder 12, dadurch gekennzeichnet, daß die Büchse (13) sich zwischen der ersten Komponente (9) und der zweiten Komponente (10), der inneren Oberfläche der zweiten Öffnung und der Schulter (11) und der zweiten Komponente (10) und dem oberen Teil (14a) des Befestigungselementes erstreckt.

14. Fenstergestänge nach Anspruch 13, dadurch gekennzeichnet, daß das Schwenkgelenk (4) eine zentrale axiale Öffnung aufweist, so daß sich ein Gestänge-Befestigungsmittel durch das Gelenk hindurch erstrecken kann.

Revendications

1. Ferrage de fenêtre à grand angle d'ouverture à utiliser pour le montage d'un châssis de fenêtre dans un dormant de fenêtre et comprenant un bras inférieur (2) agencé de manière à pouvoir être fixé de façon pivotante par son extrémité proximale au châssis d'une fenêtre et par son extrémité distale au dormant de la fenêtre, un premier bras supérieur (1) agencé de manière à pouvoir être fixé de façon pivotante par son extrémité proximale au châssis de la fenêtre, en un point éloigné du point de fixation de l'extrémité proximale dudit bras inférieur (2), un deuxième bras supérieur (6) relié de façon pivotante à l'extrémité distale dudit premier bras supérieur (1) par son extrémité proximale et agencé de manière à pouvoir être fixé de façon pivotante par son extrémité distale audit dormant de fenêtre, en un point éloigné du point de fixation de l'extrémité distale dudit bras inférieur (2), et un bras intermédiaire de commande (7), s'étendant entre ledit bras inférieur (2) et ledit premier bras supérieur (1), qui est relié de manière pivotante audit bras inférieur (2) et audit premier bras supérieur (1) en des points éloignés des extrémités de ceux-ci et qui est agencé de manière à pouvoir commander le mouvement dudit premier bras supérieur (1) pendant l'ouverture et la fermeture du ferrage.

2. Ferrage de fenêtre selon la revendication 1, dans lequel ledit bras intermédiaire de commande (7) est relié de façon pivotante audit bras inférieur (2) en un point situé sensiblement à mi-longueur de celui-ci.

3. Ferrage de fenêtre selon l'une des revendications 1 et 2, dans lequel ledit bras intermédiaire de commande (7) est relié de façon pivotante audit premier bras supérieur (1) en un point plus éloigné de ladite extrémité distale de celui-ci que de ladite extrémité proximale.

4. Ferrage de fenêtre selon l'une quelconque des revendications 1 à 3, dans lequel ledit bras intermédiaire de commande (7) est relié audit premier bras supérieur (1) en un point écarté latéralement de l'axe longitudinal dudit premier bras supérieur et en direction dudit bras inférieur.

5. Ferrage de fenêtre selon l'une quelconque des revendications précédentes, dans lequel la longueur dudit bras inférieur (2) est plus grande que la somme des longueurs desdits premier et deuxième bras supérieurs (1, 6).

6. Ferrage de fenêtre selon l'une quelconque des revendications précédentes, dans lequel ledit premier bras supérieur (1) est plus long que ledit deuxième bras supérieur (6).

7. Ferrage de fenêtre selon l'une quelconque des revendications précédentes, comprenant une pièce (3) de fixation au châssis et une pièce (5) de fixation au dormant, les extrémités proximales dudit bras inférieur (2) et dudit premier bras supérieur (1) étant reliées de façon pivotante à ladite pièce (3) de fixation au châssis et les extrémités distales dudit bras inférieur (2) et dudit deuxième bras supérieur (6) étant reliées de façon



pivotante à ladite pièce (5) de fixation au dormant, lesdites pièces (3, 5) de fixation au châssis et au dormant étant agencées de manière à pouvoir être fixées respectivement au châssis et au dormant d'une fenêtre.

8. Ferrage de fenêtre selon la revendication 7, dans lequel la distance entre les points de fixation dudit bras inférieur (2) et dudit premier bras supérieur (1) à ladite pièce (3) de fixation au châssis est supérieure à la distance entre les points de fixation dudit bras inférieur (2) et dudit deuxième bras supérieur (6) à ladite pièce (5) de fixation au dormant.

9. Ferrage de fenêtre selon l'une quelconque des revendications précédentes, dans lequel certaines desdites liaisons et fixations à pivot comprennent un joint (4) à pivot de friction.

10. Ferrage de fenêtre selon la revendication 9, dans lequel chacun des joints (4) à pivot de friction entre deux éléments constitutifs, tels que deux bras ou un bras et une pièce de fixation au châssis ou au dormant, comprend une ouverture pratiquée dans un premier (9) des éléments constitutifs, un épaulement annulaire (11) entourant le pourtour de ladite ouverture et dépassant de celui-ci, une ouverture dans le deuxième (10) desdits éléments constitutifs par laquelle ledit deuxième élément constitutif est placé autour dudit épaulement (11), un coussinet (13) fait d'une matière appropriée autolubrifiante et résistante à l'usure, intercalé entre ledit épaulement (11) et

ledit deuxième élément constitutif (10) pour éviter un contact direct entre ceux-ci et un moyen (14) pour fixer le joint et y appliquer une pression engendrant une friction, lequel moyen de fixation traverse le joint et est fixé derrière ledit épaulement (11) ou dans ladite première ouverture.

11. Ferrage de fenêtre selon la revendication 10, dans lequel ledit moyen de fixation (14) destiné au joint comprend un corps (14b) en prise derrière l'épaulement (11) ou dans ladite ouverture et une tête (14a) dépassant dudit deuxième élément constitutif (10) autour de ladite deuxième ouverture.

12. Ferrage de fenêtre selon la revendication 11, dans lequel ledit corps (14b) possède une forme générale cylindrique et ladite tête (14a), une forme générale en collet périphérique.

13. Ferrage de fenêtre selon l'une des revendications 11 et 12, dans lequel ledit coussinet (13) s'étend entre ledit premier élément constitutif (9) et ledit deuxième élément constitutif (10), entre la surface interne de ladite deuxième ouverture et ledit épaulement (11) et entre ledit deuxième élément constitutif (10) et ladite tête (14a) du moyen de fixation.

14. Ferrage de fenêtre selon la revendication 13, dans lequel lesdits joints (4) à pivot comprennent une ouverture axiale centrale dans laquelle peut être introduit un moyen de verrouillage du ferrage.



* C L H S *