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FASTENING DEVICE

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This invention relates to fastening devices and in particular to a releasable fastening device for latching horizontally sliding windows and doors.

Windows employing horizontally sliding sashes have found increasingly wide acceptance in recent years. In one such window, a pair of sashes, each having a width equal to slightly more than half the distance between the vertical sections of the window frame, slide in adjacent tracks mounted on the sill of the window. When closed, one end of each sash fits tightly against the corresponding vertical section of the frame. In another form of the window, one of the sashes is replaced by a fixed pane of glass and a single track is provided for the remaining sash. I have invented a latch which is particularly suitable for use with windows of this type.

It is an object of my invention to provide a latch for securely locking windows having horizontally sliding sashes.

It is another object of the invention to provide a latch for windows having horizontally sliding sashes which permits the window to be unlatched and opened in a single motion.

Still another object is to provide a latch which is inexpensive to manufacture, easy to install and which requires a minimum number of parts.

Horizontally sliding windows or doors for which my latch is particularly suited are generally provided with a flange that projects inward from the vertical frame of the window toward the sash. The sash, which is guided by a track extending parallel to the flange, slides on the outside of the flange. When fully closed, the outer end of the sash and the flange form a weather tight seal.

The fastening device which I have invented comprises a recessed housing member adapted to be secured to the end of the sash adjacent the flange and a latching member which includes a lever portion and a pressure plate portion. One end of the lever portion is pivoted within the recessed housing member, the other end of the lever portion comprising a catch which fits into an aperture in the flange when the sash is fully closed. The pressure plate portion of the latching member extends from the lever portion at a location intermediate the catch and the pivoted end. A spring is positioned between the pressure plate portion and a housing support plate extending normally from the sash. The purpose of the spring is to force the catch into the aperture when the sash is fully closed and to keep the latching member pressed securely against the end of the sash when it is open.

The housing member is positioned vertically and therefore the latching member is angularly displaced about a vertical axis when a horizontal force is applied to the pressure plate in a direction parallel to the sash. Thus, the force applied to the pressure plate releases the catch from the flange aperture and, in addition, pushes the sash open.

The above objects of and the brief introduction to the present invention will be more fully understood and fur-

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ther objects and advantages will become apparent from a study of the following description in connection with the drawing wherein:

FIG. 1 is a view of a typical horizontally sliding window employing my latch.

FIG. 2 is a perspective view of the latch with the sash in an open position.

FIG. 3 is a perspective view of two of the components comprising the latch, and

FIGS. 4a and 4b are cross-sectional views of the latch with the sash in the closed position and with the latch in the locked and unlocked positions respectively.

Referring to FIG. 1, there is shown a view from the inside of a building of a typical steel or aluminum window employing a horizontally sliding sash 10 and a fixed pane 11. The sash 10 slides in tracks affixed to the sill 12 and to the frame (not shown) above the sash. With the sash in the partially open position shown, the outer end of the sash is positioned behind the flange 13 to produce a weather-tight seal. The latch 14 is attached to a plate 15 extending at right angles from the sash 10. To open the sash, the latch is pressed toward the right thereby releasing the catch and opening the sash in the same motion.

FIG. 2 is a detailed cutaway view showing the sash 10 in the partially open position. The latch 14 consists of a latching member 16 which is inserted in a recessed housing member 17 in the manner indicated by the dashed lines of FIG. 3. The bosses 18 on the upper and lower ends of latching member 16 are positioned in the ends 19 of housing member 17 to permit the latching member to turn about an axis 20 through bosses 18. The assembly is fastened to plate 15 (FIG. 2) by means of two screws 21, the axis 20 defining a vertical direction as indicated by the dashed line. With sash 10 in the position shown in FIG. 2, catch 22 is pressed firmly against the sash by the action of a spring 23 (see FIG. 4b) positioned between the latching member 16 and plate 15.

When the sash 10 is translated toward the left by pressing on plate 15 it slides behind flange 13. As the sash reaches the flange, catch 22 strikes the edge 13a of the flange and is pressed outward, catch 22 then being forced into the aperture 24 by the action of spring 23. The latch is released by pressing on the pressure plate 25 in the direction shown by the arrow thereby rotating catch 22 outward about axis 20 until it is withdrawn from aperture 24.

Details of the latch are shown in the cross-sectional views of FIGS. 4a and 4b which are taken in the direction 4—4 of FIG. 2. These views illustrate the latch in the closed and open positions respectively.

As illustrated in FIGS. 4a and 4b, the pressure plate 25 extends from the lever portion 26 of latching member 16 in a direction which is almost perpendicular to lever portion 26 but is slightly inclined toward catch 22. A projection 27 located on the rear side of pressure plate 25 holds one end of spring 23, the other end being pressed against plate 15. A cover portion 28 conceals and protects spring 23 and improves the appearance of the latch.

As is apparent from FIGS. 4a and 4b, a force F exerted on pressure plate 25 in the direction indicated by the arrow produces a moment about vertical axis 20 (FIG. 2) causing the catch to rotate outward in a horizontal plane about the axis 20 to the position shown in FIG. 4b. Since the angular displacement of the latch is relatively

small, the force F will have a sufficient component in a direction parallel to the direction of translation of the sash 10 to slide the sash open as well as to open the latch.

While my latch has been discussed principally in connection with horizontally sliding vertically positioned doors and windows, it shall be understood that the terms horizontal and vertical have been used only to define the relative positions of the elements and not to limit the orientation or direction of translation of members with which my latch may be used.

As many changes could be made in the above construction and many different embodiments could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A releasable fastening device for latching first and second vertically positioned mutually translatable members to each other, said first member having an aperture therein and said second member having a support plate extending perpendicular to said second member, said fastening device comprising

- (a) a recessed housing member adapted for securing to said support plate,
- (b) a latching member including a lever portion having one end non-translatably pivoted within said recessed housing member and having a catch at the other end thereof, said lever portion being angularly displaceable about a fixed vertical axis through said housing member, said latching member further including a pressure plate portion extending substantially perpendicular to said lever portion at a location intermediate said catch and said pivoted end,
- (c) spring means located between the pressure plate portion of said latching member and said support plate, said spring means forcing said catch into the aperture in said first member when said first and second members are brought together, and
- (d) a cover portion affixed to the end of the pressure plate portion of said latching member, said cover portion extending toward said support plate.

2. In combination,

- (a) a window frame having an apertured flange at one end,
- (b) a sash translatably mounted with said frame, said sash having a support plate extending perpendicularly therefrom,
- (c) a recessed housing member secured to said support plate,
- (d) a latching member including a lever portion having one end non-translatably pivoted within said recessed housing member and having a catch at the other end thereof, said lever portion being angularly displaceable about a fixed vertical axis through said housing member, said latching member further including a pressure plate portion extending substantially perpendicular to said lever portion at a location intermediate said catch and said pivoted end,
- (e) spring means located between the pressure plate portion of said latching member and said support plate, said spring means forcing said catch into the aperture in said flange when said sash is engaged with said flange, and
- (f) a cover portion affixed to the end of the pressure plate portion of said latching member, said cover portion extending toward said support plate.

3. A releasable fastening device for latching a vertically positioned translatable window sash to a window frame flange having an aperture therein, comprising

- (a) a support plate secured to said sash and extending perpendicularly therefrom,
- (b) a recessed housing member secured to said support plate,
- (c) a latching member including

(1) a lever portion having one end pivoted within said recessed housing member and having a catch affixed to one surface of said lever portion at the other end thereof, said housing member and said support plate preventing translation of said lever portion with respect to said housing member while permitting an angular displacement of said lever portion about a fixed vertical axis through said housing member,

(2) a pressure plate portion extending substantially perpendicularly from the surface of said lever portion opposite the surface secured to said catch, said pressure plate portion being secured to said lever portion at a location intermediate said catch and said pivoted end, and

(3) a cover portion affixed to the end of said pressure plate portion, said cover portion extending toward said support plate, and

(d) spring means located between the pressure plate portion of said latching member and said support plate, said spring means forcing said catch into the aperture in said flange when said sash is engaged with said flange.

4. A releasable fastening device for latching a vertically positioned translatable window sash to a window frame flange having an aperture therein, comprising

- (a) a support plate secured to said sash and extending perpendicularly therefrom,
- (b) a recessed housing member secured to said support plate,
- (c) a latching member including

(1) a lever portion having one end pivoted within said recessed housing member and having a catch affixed to one surface of said lever portion at the other end thereof, said housing member and said support plate preventing translation of said lever portion with respect to said housing member while permitting an angular displacement of said lever portion about a fixed vertical axis through said housing member,

(2) a pressure plate portion extending from the surface of said lever portion opposite the surface secured to said catch, said pressure plate portion being secured to said lever portion at a location intermediate said catch and said pivoted end and being inclined toward said catch, and

(3) a cover portion affixed to the end of said pressure plate portion, said cover portion extending toward said support plate, and

(d) a spring located between the pressure plate portion of said latching member and said support plate for forcing said catch into the aperture in said flange when said sash is engaged with said flange, said spring surrounding a projection on said pressure plate portion and being positioned thereby.

5. A releasable fastening device for latching a vertically positioned translatable window sash to a window frame flange having an aperture therein, comprising

- (a) a support plate secured to said sash and extending perpendicularly therefrom,
- (b) a recessed housing member having first and second ends of reduced areas secured to said support plate,
- (c) a latching member including

(1) a lever portion having one end provided with first and second bosses for pivoting within the first and second ends of said recessed housing member and having a catch affixed to one surface of said lever portion at the other end thereof, said housing member and said support plate preventing translation of said lever portion with respect to said housing member while permitting an angular displacement of said lever portion about a fixed vertical axis through said first and second bosses,

(2) a pressure plate portion extending from the

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surface of said lever portion opposite the surface secured to said catch, said pressure plate portion being secured to said lever portion at a location intermediate said catch and said pivoted end and being inclined toward said catch, and

(3) a cover portion affixed to the end of said pressure plate portion, said cover portion extending toward said support plate, and

(d) a spring located between the pressure plate portion of said latching member and said support plate for forcing said catch into the aperture in said flange

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when said sash is engaged with said flange, said spring surrounding a projection on said pressure plate portion and being positioned thereby.

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