Aug. 30, 1938. C. E. EASTMAN 2,128,405

WINDOW

Filed Feb. 3, 1937 2 Sheets-Sheet 1

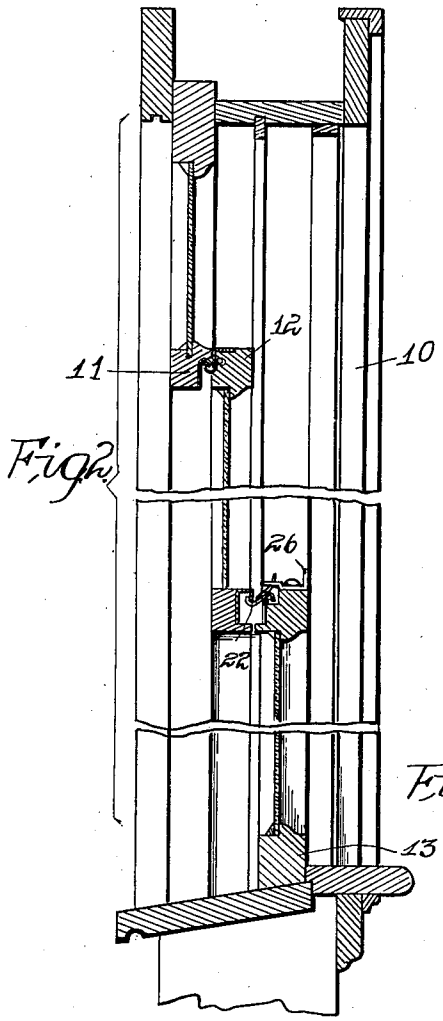


Fig. 2.

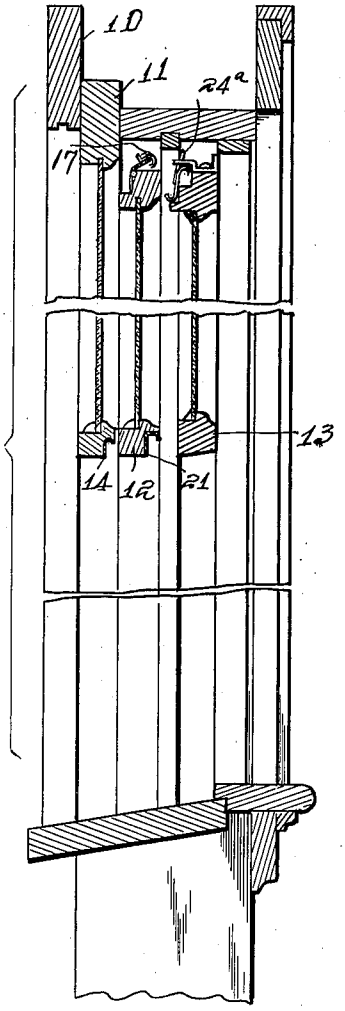


Fig. 3.

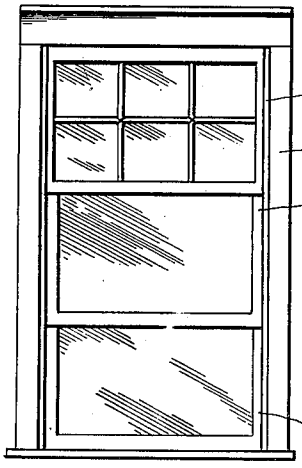


Fig. 1.

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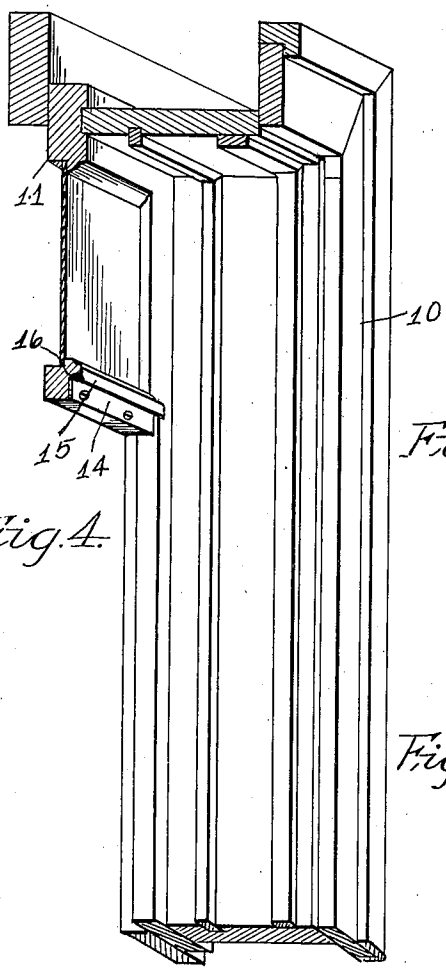


Fig. 4.

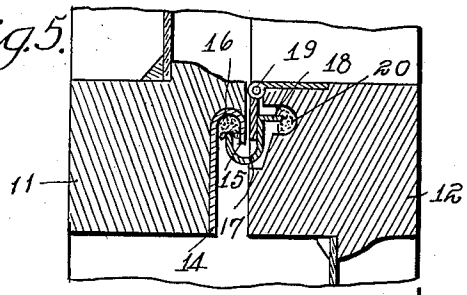


Fig. 5.

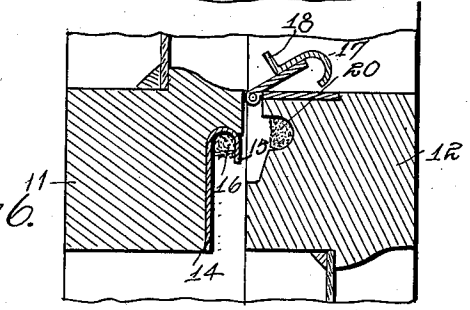


Fig. 6.

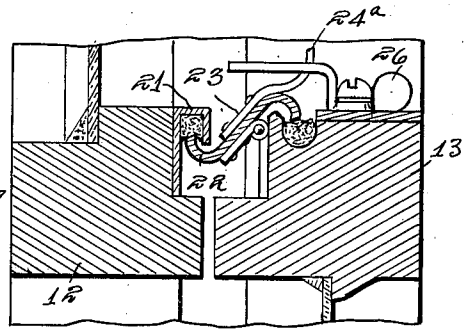


Fig. 7.

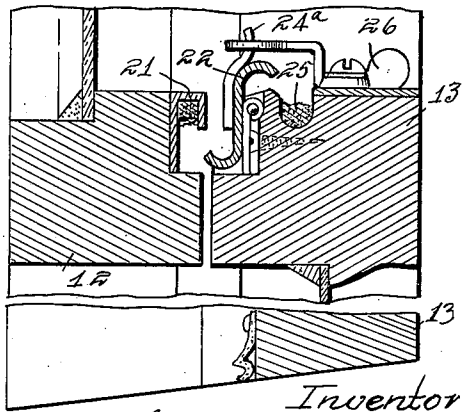


Fig. 8.

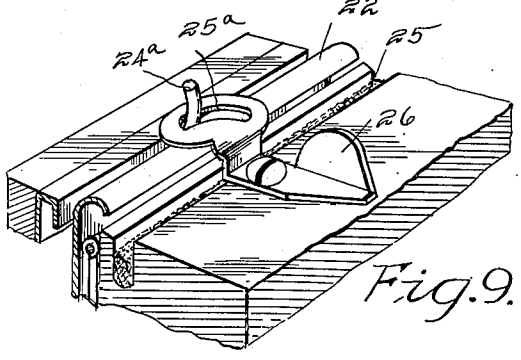


Fig. 9.

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Patented Aug. 30, 1938 2,128,405

UNITED STATES PATENT OFFICE

2,128,405

WINDOW

Charles E. Eastman, Des Moines, Iowa

Application February 3, 1937, Serial No. 123,820

9 Claims. (Cl. 20—52)

The object of my invention is to provide a window of simple, durable and inexpensive construction in which the entire outer surface of the window may be conveniently and easily reached for washing purposes and the like by an operator on the inside of the window.

A further object is to provide simple, durable and inexpensive means for latching the several window sashes in their normally closed positions and for readily and easily releasing them; and further in this connection it is my object to provide latches of this character which will form efficient weather strips and which, when in latched closed position, will not subject the window sashes to twisting strains.

In the accompanying drawings Figure 1 shows a front elevation of a window frame and sash illustrating the general arrangement of the sashes within the frame.

Figure 2 shows a vertical central sectional view with parts broken away, illustrating the sashes in closed position.

Figure 3 is a similar view illustrating all three sashes in an elevated position.

Figure 4 shows a sectional isometric view illustrating one corner of the window frame with the upper sash mounted therein.

Figure 5 shows an enlarged detail vertical sectional view illustrating the latch and weather-proofing device for connecting the middle sash with the upper sash.

Figure 6 shows a similar view illustrating the latch device in its open position for permitting the middle sash to move upwardly past the lower edge of the upper sash.

Figure 7 is a similar view illustrating the lower portion of the middle sash and the upper portion of the lower sash with my improved latch and weather-proofing device in closed position.

Figure 8 shows a similar view with the latch in its open position; and

Figure 9 shows a detail perspective view illustrating the manually operable means for operating the movable member of the lower latch and weather strip device.

Referring to the accompanying drawings I have used the reference numeral 10 to indicate generally the window frame, which is of ordinary construction. In my improved window I provide three or more window sashes. The upper one is indicated generally by the reference numeral 11 and is of ordinary construction and may be fixed in position or slidingly mounted. In the rear of the sash 11 I have provided a so-called middle sash 12 of ordinary construction and preferably having a vertical dimension of about one-third that of the window frame, and in the rear of the sash 12 is a third sash which I have designated as the lower sash and indicated by the reference numeral 13, which is also of ordinary construction and when closed occupies about the lower third of the window frame. Both the sashes 12 and 13 are capable of sliding up and down throughout the full length of the window frame and, as shown in Figure 3, each occupies about one-third of the vertical dimension of the window frame.

By the arrangement of the sashes as just described I have obviously provided a window in which an operator on the inside of the window frame may have access to the entire outer surface of all of the sashes for washing purposes, or otherwise. For instance, the outer surface of the upper sash may be reached from the inside of the window frame very readily and easily when the sashes are in the position shown in Figure 3. If the lower sash is moved to position to the bottom of the window frame and the middle sash is left in its elevated position, then an operator on the interior of the frame may have ready and easy access to the outer surface of said lower sash, and the middle sash may be moved to its downward limit with the lower sash also at its downward limit, and when in this position an operator may reach through the space between the upper sash and the other sashes and readily and easily have access to the outer surface of the middle sash.

When three sashes are employed, as in this case, it is necessary to provide some means for latching the middle sash against both upward and downward movement, and it is also desirable to provide latch devices of this character which may be readily and easily moved to position where they will not interfere with the up and down movements of the middle and lower sashes. It is also desirable to provide means for providing weather-tight connections between the various sashes when in their closed and latched positions. For this purpose I have provided on the lower edge of the upper sash a latch and weather-proofing strip 14, preferably made of metal and extended across the entire lower portion of the frame member on the upper sash and having its upper edge inclined rearwardly and downwardly at 15 to form an inverted trough, in which I have placed a weather strip 16, preferably made of flexible yielding material. On the upper portion of the middle sash I have provided a co-operating weather strip comprising a trough-shaped metallic strip 17 in the position shown in Figure 5, with an inwardly extended sealing edge portion 18.

This strip 17 is connected to the window sash 12 by a hinge 19 so that it may swing from position shown in Figure 5 upwardly and rearwardly to the position shown in Figure 6.

In the forward upper portion of the sash 12 I have provided a groove in which I have mounted a flexible weather strip 20, and when the hinged weather strip 17 is in the position shown in Figure 5, its sealing edge 18 yieldingly engages the weather strip 20 and thereby forms a weather-tight seal, and when the hinged strip 17 is moved to the position shown in Figure 6, it lies wholly in the rear of the upper sash so that the middle sash may be raised and lowered throughout its entire path of travel within the window frame. When the several window sashes are in the position shown in Figure 2 the operator does not have access to the strip 17, but in order to have access to it it is only necessary to move the middle sash downwardly below the upper sash, and then the operator may easily grasp the strip 17 and swing it upwardly and rearwardly.

For latching the upper edge of the lower sash to the lower edge of the middle sash and for forming a weather-proof connection, I have provided an inverted trough-shaped strip 21 secured to the inner surface of the lower part of the middle sash, and a trough-shaped strip 22 hinged at 23 to the upper outer portion of the lower sash 13, and this strip 22 is provided with a downwardly extended sealing edge 24, as shown in Figure 7, to engage a yielding weather strip 25 mounted in the sash 13. This hinged, sealed weather-proofing strip 22 may be swung to the position shown in Figure 8 so that the lower sash may freely slide up and down without engaging the strip 21.

For the purpose of manually operating the hinged latch and weather strip 22, I have provided a projection 24 fixed to the strip 22 and extended upwardly therefrom, and on the top of the sash 13 I have pivoted a latch device formed with a cam-shaped slot 25*a*, shown in Figure 9, through which the projection 24*a* is passed, and a handle 26 is formed on said device. The arrangement and shape of the cam-shaped slot is such that when the handle is turned to one limit of its movement, the strip 23 is held in the position shown in Figure 7, and when moved to its other limit, it is held in the position shown in Figure 8.

In practical use, and assuming that the window sashes are in the position shown in Figure 2 and that it is desirable to wash the outer surfaces of the sashes, then the operator moves the latch device 22 to the position shown in Figure 8, whereupon the middle sash may be moved downwardly, then the operator reaches over the top of the middle sash and moves the latch device 17 to the position shown in Figure 6, and when the latch devices are in this position the middle and lower sashes may be freely moved upwardly and downwardly throughout the full length of the window frame and an operator on the interior of the window may have easy and convenient access to the entire outer surface of each of the three sashes. In order to close and seal the sashes and form weather-proof connections, the operator then swings the strip 17 to the position shown in Figure 5 and raises the middle sash to its upper limit, as shown in Figure 2. He then moves the lower sash to the position shown in Figure 2 and moves the handle 26 to the position shown in Figure 7, whereupon the strip 22 is moved to the position shown in Figure 7, and when the said strips are in said positions both edges of both of the movable strips are held against the yielding weather strips and a weather-tight connection is thereby secured.

One of the outstanding advantages of my improved construction is that, when the latching and weather strips are in their closed positions no lateral strains or stresses are applied to the window sashes and the sashes may expand or contract throughout a comparatively wide range and, yet, a substantially perfect weather-proof seal is provided.

I claim as my invention:

1. An improved window, comprising a frame, an upper sash mounted in the frame, a middle sash slidingly mounted in the frame, a lower sash slidingly mounted in the frame in such manner that the middle sash may move upwardly to a position substantially in line horizontally with the upper sash and downwardly to a position substantially in line horizontally with the lower sash, and means for limiting the upward movement of the middle sash to position with its top substantially in line horizontally with the bottom of the upper sash, said means being capable of movement to position where it will permit the middle sash to move upwardly to position adjacent the top of the window frame, said limiting means being so positioned as to be readily accessible to an operator at the inside of the window when the middle sash has been moved downwardly below the upper sash.

2. An improved window, comprising a frame, an upper sash mounted in the frame, a middle sash slidingly mounted in the frame, a lower sash slidingly mounted in the frame in such manner that the middle sash may move upwardly to a position substantially in line horizontally with the upper sash and downwardly to a position substantially in line horizontally with the lower sash, means for limiting the upward movement of the middle sash to position with its top substantially in line horizontally with the bottom of the upper sash, said means being capable of movement to position where it will permit the middle sash to move upwardly to position adjacent the top of the window frame, and means applied to the top of the lower sash for securing the middle sash against downward movement.

3. An improved window, comprising a frame, an upper sash mounted in the frame, a middle sash slidingly mounted in the frame, a lower sash slidingly mounted in the frame in such manner that the middle sash may move upwardly to a position substantially in line horizontally with the upper sash and downwardly to a position substantially in line horizontally with the lower sash, means for limiting the upward movement of the middle sash to position with its top substantially in line horizontally with the bottom of the upper sash, said means being capable of movement to position where it will permit the middle sash to move upwardly to position adjacent the top of the window frame, and means applied to the top of the lower sash for securing the middle sash against downward movement, said means being manually releasable by an operator at the inside of the window.

4. A combined latch and weather-proofing device for sliding window sashes, comprising a strip designed to be fixed to the lower portion of an upper window sash and shaped to extend inwardly and downwardly therefrom, and a second co-acting strip designed to be secured to the top portion of an adjacent window sash and extended outwardly and upwardly therefrom so that its

upper edge will stand in front of and above the lower edge of the first mentioned strip, said last mentioned strip being capable of movement inwardly to position where it cannot engage the first mentioned strip.

5. A combined weather strip and sash latch, comprising a strip of material formed with an inverted trough shaped portion, a yielding weather strip thereon, a trough shaped strip of material having its outer edge shaped to enter said inverted trough and engage the flexible weather strip thereon, and a hinge for connecting it to a window sash and whereby it may be swung upwardly and rearwardly to position where it cannot engage the first mentioned strip.

6. A combined weather strip and sash latch, comprising a strip of material formed with an inverted trough shaped portion, a yielding weather strip thereon, a trough shaped strip of material having its outer edge shaped to enter said inverted trough and engage the flexible weather strip thereon, and a hinge for connecting it to a window sash and whereby it may be swung upwardly and rearwardly to position where it cannot engage the first mentioned strip, and a second yielding weather strip associated with the trough shaped strip of material and a projecting edge on the trough shaped strip of material shaped to engage the latter weather strip when the trough shaped strip is in its outwardly extended position.

7. A combined weather strip and sash latch, comprising a strip of material formed with an inverted trough shaped portion, a yielding weather strip thereon, a trough shaped strip of material having its outer edge shaped to enter said inverted trough and engage the flexible weather strip thereon, and a hinge for connecting it to a window sash and whereby it may be swung upwardly and rearwardly to position where it cannot engage the first mentioned strip, and a second yielding weather strip associated with the trough shaped strip of material and a projecting edge on the trough shaped strip of material shaped to engage the latter weather strip when the trough shaped strip is in its outwardly extended position, an upwardly extended projection on said hinged strip, and a manually operable cam device for engaging said projection and moving said strip from one of its positions to the other.

8. An improved window, comprising a frame, an upper sash mounted in the frame, a middle sash slidingly mounted in the frame, a lower sash slidingly mounted in the frame in such manner that the middle sash may move upwardly to a position substantially in line horizontally with the upper sash and downwardly to a position substantially in line horizontally with the lower sash, and a latch and weather strip carried by the middle sash and movable thereon from position projected toward the upper sash to thereby engage the upper sash and form a weather-tight joint between the upper and middle sashes and to a withdrawn position permitting the middle sash to move both upwardly and downwardly relative to the upper sash.

9. A combined latch and weather-proofing device for sliding window sashes, comprising a strip to be secured to the inner surface of a window sash and having a substantially inverted U-shaped groove, and a second strip to be secured to a second window sash and having a substantially U-shaped groove capable of entering the groove of the first mentioned strip, one of the strips being movably supported so that it may be moved to a withdrawn position where it will not engage the other strip when the sashes are moved up and down relative to each other, and movable to position where it will not engage the first mentioned strip when the said second sash is moved upwardly.

CHARLES E. EASTMAN.