HORIZONTALLY SLIDABLE SASHLESS WINDOW

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The present invention relates to a window construction and more specifically to a window construction in which the window panes are horizontally slidably between opened and closed position and in which said panes are without any sash.

In horizontally slidable sashless windows of known type, the two glass panes are in direct overlapping contact with each other at the central part of the window frame in the closed position of the glass panes. It has been found that, especially under heavy rain, water will flow between the two contacting glass panes under capillary attraction and thus windows of this type are not water tight.

In cold climate, it is necessary to provide a double window construction and in the conventional or known types of horizontally slidable sashless windows of double construction, the sill of the window frame is normally made from wood, provided with spaced grooves themselves lined with guiding rails for receiving the bottom edge of the sashes. However, the space of the sill between the window panes of the inner and outer window units is exposed to rain and snow and also to water of condensation flowing down from the inside faces of the glass panes.

Accordingly, the object of the present invention resides in the provision of a horizontally slidable sashless window construction provided with means to obviate the above noted disadvantages.

A more specific object of the present invention resides in the provision of a window construction of the character described having improved sealing means at the overlapping edges of the glass panes, and which occupy a minimum of space and have a minimum width in order to obstruct to a minimum the visibility of the window.

Another important object of the present invention resides in the provision of a window construction of the character described having improved sealing means between the window frame and the glass panes.

Another object of the invention resides in the provision of a window construction of the character described having an improved member serving as a slider track for the glass panes of a double window construction which completely protects the sill in the space between the two window units, and which also provides means for adjustably ventilating the dead space between the inner and outer glass panes.

Yet another object of the present invention resides in the provision of an improved and simple lock for positively locking the window panes in closed position.

Yet another object of the invention resides in the provision of means whereby all the window glass panes can be easily and quickly removed from the window frame for cleaning or storing.

The foregoing and other important objects of the present invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIGURE 1 is a plan section of the window assembly of the invention;
FIGURE 2 is a vertical cross section of the same assembly;
FIGURE 3 is a partial plan section of the window panes in closed position and locked by the locking device of the invention shown in plan view;
FIGURE 4 is an enlarged partial cross section of an outer edge of a window pane provided with handle and sealing means; and
FIGURE 5 is a partial enlarged cross section of the sill track element.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, reference numeral 1 indicates a window frame preferably made of wood and comprising a lintel 2, a sill 3 and jambs 4. The outer faces of the window frame are preferably provided with longitudinal grooves 5 for connection of adjacent window frames one to another by means of keys or for anchoring within a window opening in conventional manner.

A pair of spaced parallel longitudinally extending deep grooves 6 are made in the lintel 2, open at the inside face 7 thereof and receive with a tight fit double track members 8 which slidably receive the top marginal portion of the glass panes 9, 10, 11 and 12. Each double track member 8 is preferably made of a plastic material and is of a tubular cross section with turned lips 13 engaging the sides of the glass panes while the edge of the glass panes slidably contact a strip 14 which is spring urged against said edge by means of leaf springs 15 spacedly disposed along the length of the lintel and engaging the bottom of the track members. Thus the glass panes can be lifted against the action of springs 15 to remove the glass panes as will be described hereinafter.

The inside face of each jamb 4 is provided with a pair of spaced vertically extending grooves 16 which are offset on both sides of the window assembly for receiving the combined handle and sealing members 17 secured to the outer side edge of the respective glass panes.

As shown in FIGURE 4 each member 17 comprises a rigid U-shaped portion 18 enclosing the marginal portion of the glass pane with the interposition of a soft flexible packing 19; a right angle handle portion 20 depends from the inside leg of the U portion 18 for manipulating the glass pane. Moreover the bight portion of the member 17 carries a flexible cylindrical sealing member 21 adapted to contact the bottom face of the groove 16 for sealing the glass pane in closed position.

As shown in FIGURE 2, the handle 20 and U-shaped portion 18 terminate short of the inside face of the lintel 2, in order to be able to lift the glass panes for removing the same. However the height of U portion 18 and the sealing member 21 extend to the top and bottom horizontal edges of glass pane to completely seal the window in closed position.

The vertical inside edges of the glass panes are each provided with a cover strip 22 of a U-shaped cross section respectively overlapping the marginal vertical portions of the glass panes and each provided with an inclined lip 23 overlapping each other in the closed position of the glass panes as shown in FIGURE 1. The cover strips 22 extend short of the inside face of the lintel 2 in order to be able to lift the window panes, and extend downwardly to the bottom track of the glass panes except that their internal legs are cut out in the region of the lock member as shown in FIGURE 3.

The sill 3 has a top face 24 which is downwardly inclined toward the outer side of the window frame with a shoulder 25 adjacent the inside of the window frame. A sill track element 26 made of a plastic material covers the major part of the top face 24 over the entire length of the sill 3. The track element 26 provides two pairs of guiding channels 27, each of U-shaped cross section and opening upwardly for receiving the lower marginal portions of the glass panes 3 to 12. In each pair the guiding channels 27 are closely adjacent and parallel to each other and they are provided with inwardly directed lips 28 contacting the side faces of the glass panes. The two
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3. pairs of guiding channels are integrally connected by a web member 29 spaced upwardly from the top face 24 of the sill 3 and downwardly inclined towards the outside of the window frame. Each guiding channel 27 is provided with downwardly directed legs 30 resting on the top face of the window sill. The inside guiding channel has at its upper edge an inwardly directed lip 31 overlying the top of the shoulder 28. The bottom of each guiding channel 27 is provided with drain holes 32 while the legs 30 are provided with drain holes 33. Thus water which may accumulate within the channels 27 is drained through the bottom of said channels and downwardly along the top face 24 of the sill through drain holes 33. Also, these drain holes provide for ventilation of the space between the sill track element 26 and the sill 3. Thus water cannot accumulate within the guiding channels or on the top of the sill 3 and the latter will remain in dry condition and will last for years.

The window glass panes rest directly in the bottom of the channel 27 and slide smoothly therein and sealing is effected by lips 28 contacting the sides of the glass panes. It is easy to remove the glass panes from engagement with the window frame to repair, clean or store the same. The inside glass pane 9 is first lifted against action of leaf springs 15 so as to clear the sill guiding channel 27 and then moved inwardly and downwardly to disengage the top guiding channel. The other glass panes 16, 11 and 12 are then successively removed in that order and in the same manner.

A simple locking device is used to lock the window panes in closed position. An elongated metal latching member 34 is provided with notches 35 and 36 on the outside and inside faces respectively. Intermediate the notches 35 and 36, the latching member 34 has a downwardly extending pin 37 removable engaging a hole made in the track element 26 between the pair of guiding channels 27 and at the center of the window frame that is between and opposite the overlapping inside vertical marginal portions of the closed glass panes as shown in FIGURE 3. Pin 37 constitutes a pivot for member 34. The other end of latching member 34 engages in the forked end portion of a lever 38 and is pivoted therein at 39. The lever end of lever 38 is provided with a plastic protective shoe 40 engageable with the outside glass pane of the pair of glass panes. In the unlatching position, the lever 38 is in the same plane as latching member 34 with its shoe 40 contiguous with shoulder 41 of member 34, and the two are parallel to the glass panes and between the same having a width less than space separating the two glass panes. Thus, the two glass panes can be slid between opened and closed position.

To lock the glass panes in closed position, the lever 33 is simply pivoted in clockwise direction to thereby pivot latching member 34 in clockwise direction so its notches 35 and 36 will respectively engage the side edges of the glass panes. The shoe 40 will engage the inside face of the outer glass pane of the pair as shown in FIGURE 3. In the locking position, the latching member 34 forces the two glass panes slightly away from each other but the overlapping lips 23 of cover strips 22 remain in engagement. To unlock the glass panes the lever 39 is simply pivoted in counter clockwise direction as shown by the arrow 42 in FIGURE 3 and the latching member 34 pivots also in counter clockwise direction as shown by arrow 43 and the two members take a position between the two glass panes and parallel thereto to enable moving motion of the glass panes.

When removing the glass panes from the window frame once the inside glass pane has been removed as noted above, the locking device is simply removed by lifting it so as to remove its pin 37 from engagement with the bottom of the sill track element 26. All the guiding tracks and sealing members are made preferably of a plastic material of the same basic composition but different softness; the vinyl material known as Geon 8750 and manufactured by the B. F. Goodrich Company, is highly suitable as it has been found to be long lasting when exposed to atmospheric conditions. In accordance with the invention, the double window construction may also be provided with means for adjustably ventilating the dead air space between the outer and inner set of glass panes 11 and 12 and 9 and 10 respectively, the shoulder 28. The bottom of channel 27 is provided with a longitudinally extending channel 44 disposed adjacent the inner guiding channel 27 of the outer pair of guiding channels and extending the entire length of the sill track element 26. This channel 44 is provided with inwardly turned lips slidably engaging side grooves in an elongated slider element 45. The bottom of channel 44 is provided at the two ends of the sill 26 with ventilating openings or slots 46 made in the bottom of the channel 44 and adapted to be partially or completely closed by the slider elements 45 which are manually moved along channel 44.

When one or the two slots 46 are opened, air from the exterior can enter the dead space between the outer and inner set of glass panes, the latter being in closed position, through the drain holes 33 and slots 46. If desired, the drain holes 33 can be formed as notches having a substantial length.

This adjustable ventilation of the space between the inner and outer set of glass panes has been found to be very useful to prevent formation of frost on the inside surfaces of the outer set of glass panes, and also to prevent the formation of excess humidity in the dead space, especially when the window construction is installed in a newly built house, the building materials of which still contain a high humidity percentage.

While a preferred embodiment in accordance with the present invention has been illustrated and described, it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a horizontally slideable, principally window construction, a window frame made of wood, two spaced pairs of glass panes arranged within said window frame for horizontal opening and closing movements, the panes of each pair coating to close the window independently of the other pair, said window frame comprising a sill having a top face downwardly inclined towards the outside of the window frame, a sill track element of plastic composition covering the major part of the top face of said sill and consisting of two pairs of channel members parallel to one another, and extending the entire length of said sill, the channel members of each pair being contiguous for receiving the associated pair of glass panes, said sill track element further including a web extending between the two pairs of channel members and integrally connected to the upper edges of said adjacent channel members of each pair whereby said web is spaced above the top face of said sill, said channel members being provided with downwardly extending legs resting on said top face of said sill and spacing the bottom of said channel members from said top face, the bottom of said channel members and the said downwardly extending legs being provided with drain holes, said web having ventilating slots made therethrough, and saidlable closures connected to said web for adjustably closing said slots to provide adjustable ventilation of the space enclosed by said two spaced pairs of glass panes.

2. In a window construction as claimed in claim 1 further including a locking device for locking said glass panes in closed position, said locking device comprising an elongated latching member and an elongated lever pivoted intermediate its ends to one end of said latching member, said lever and latching member both having a width smaller than the space separating the two glass panes of one pair and disposed between the same, said latching member having near its other end a downwardly
extending pin removably engaging a hole made in said sill track element between the two channel members associated with said glass panes for pivotal movement of said latching member, lateral notches made in the inner and outer side faces of said latching member on each side of said pin and respectively engageable with the overlapping side edges of the two glass panes in the closed position of the latter, said lever pivotable for engagement of one of its ends with one glass pane to maintain the latching member in an inclined position with the notches in engagement with the respective side edges of the glass panes, said lever in its unblocking position taking a position aligned with the latching member to take a position in the space separating the two glass panes and allow sliding opening and closing movement of said glass panes. 3. In a window construction as claimed in claim 1, wherein said web is provided with an integrally formed channel and said slots are made at the bottom of said channel, said channel having inwardly directed lips and said slider elements having lateral grooves engaged by said lips for guiding said sliders in their opening and closing movements.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,371,724</td>
<td>Young</td>
<td>Mar. 20, 1945</td>
</tr>
<tr>
<td>2,583,251</td>
<td>Bowers</td>
<td>Jan. 22, 1952</td>
</tr>
<tr>
<td>2,769,386</td>
<td>Silvernail</td>
<td>Nov. 6, 1956</td>
</tr>
<tr>
<td>2,804,954</td>
<td>Gillespie</td>
<td>Sept. 3, 1957</td>
</tr>
<tr>
<td>2,813,312</td>
<td>Love et al.</td>
<td>Nov. 19, 1957</td>
</tr>
<tr>
<td>2,842,226</td>
<td>Axelrod</td>
<td>July 8, 1958</td>
</tr>
<tr>
<td>2,877,511</td>
<td>Viola</td>
<td>Mar. 17, 1959</td>
</tr>
<tr>
<td>2,949,647</td>
<td>Migneault et al.</td>
<td>Aug. 23, 1960</td>
</tr>
<tr>
<td>3,009,215</td>
<td>Frleigh</td>
<td>Nov. 21, 1961</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>104,705</td>
<td>Australia</td>
<td>Aug. 11, 1938</td>
</tr>
<tr>
<td>824,580</td>
<td>Great Britain</td>
<td>Dec. 2, 1959</td>
</tr>
</tbody>
</table>