The invention relates to horizontally sliding windows. An important object of the invention is to provide a window frame having means for normally breaking the surface contact between the adjacent overlapping window panes to facilitate the sliding of one pane along side of the second pane with a minimum of effort together with means for sealing a margin of one pane to the margin of the adjacent pane after the window panes have been shifted to closed position within the frame.

Another object of the invention is to provide a novel weatherstripping arrangement at the upper and side margins of the window panes.

Other objects and advantages will be apparent from the ensuing specification and appended drawing in which:

Fig. 1 is a side elevational view of the window and frame assembly partly broken in section;
Fig. 2 is a plan view taken on line 2—2 of Fig. 1;
Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;
Fig. 4 is a fragmentary detail view;
Fig. 5 is a fragmentary detail view of a modified form of construction.

The window frame may be of a conventional type consisting of opposed jamb 2 and 3, a sill 4 and a header 5 all of which may be pre-assembled as a unitary frame structure which can be mounted and anchored within an appropriate opening in the wall of a house or other building. It will be understood that the frame members could also be constructed as part of the permanent structural members of the building wall and need not necessarily be a pre-assembled unit.

The jams are provided with rectilinear grooves 6 and 7 which extend throughout the length of the jams and which are disposed in face to face and parallel fashion relative to each other. Each groove is also inclined from the vertical, as viewed in Fig. 3, for reasons which will be explained hereinafter. A plate referred to generally by the numeral 8 extends longitudinally throughout substantially the entire length of the sill and includes a shoe portion 9 and a downwardly turned longitudinal flange 10 which overhangs and preferably abuts the end face 11 of the sill. The plate also has a channel portion referred to generally by the numeral 12, extending throughout the length of the plate and consisting of opposed parallel upturned side wall flanges 13 and 14 and a bottom portion 15. The plate may, if desired, be formed as an extrusion from a material such as an aluminum alloy. The channel serves as a track within which the window panes 16 and 17 are free to slide. A cylindrical rod 18 is prased into the channel 12 so as to be fixed therein and the rod may be formed of a hard synthetic resin material. The longitudinal external surface of the rod which is exposed toward the mouth of the channel presents a bearing floor having longitudinally extending surfaces which are sloped downwardly and outwardly in opposite directions from a center line drawn throughout the length of the floor on which the lower edges of the window panes ride. The groove 19, which extends throughout the length of the header, is offset relative to the channel 12 when considering a vertical plane drawn therethrough and the inclined jamb grooves 6 and 7 communicate at their upper extremities with header groove 19 and at their lower extremities with channel 12. Thus the side margins of the window panes, when in closed position, are received in the respective jamb grooves—the upper margins in the header groove and the lower margins in the channel 12. Each pane thus lies in a plane slightly inclined from a vertical plane, whereby the innermost pane 17 rests by gravity at its upper margin against the outer margin of the outer pane 16. When the panes are in fully closed position as shown in Fig. 1, one pane overlaps the other and this overlapping condition always exists whether the pane 17 is open or closed. Thus pane 17 lies in a plane separate from but adjacent to the plane of pane 16 and the lower edges of the panes lie on opposite sides of a vertical plane drawn through the axis of the bearing rod 18. Since the distance between the flange walls 13 and 14 measured from the interior surface of each wall is greater than the combined thickness of the two panes and since the upper surface of the bearing rod is crowned or cylindrical, thereupon each pane, of its own weight by gravity slides down the oppositely sloped surfaces of the bearing rod until the outer lower margins 21 and 22 of each pane engage the respective side walls 13 and 14. This breaks the contact between the two panes and the panes are left in contact only at their upper margins. The frictional resistance which would be present if the panes were in contact with each other throughout their entire height is eliminated and one can easily slide pane 17 along the surface of the bearing rod and alongside of pane 16 by manually grasping said pane in the finger slot 23. The area of contact between the two panes at their upper margins is theoretically only a line contact and readily permits the horizontal sliding of the panes relative to each other.

A latching device generally referred to by the numeral 24 may have a base 25 anchored to the shoe portion of plate 8 and a lever 26 is mounted on a pivot pin 27 and is provided with a pad 28 at one end for engagement with pane 17 and when the two panes are in closed position as viewed in Fig. 1 it is desirable to eliminate the air crack normally existing between the two panes, it is only necessary to apply lateral pressure to pane 17 by lifting lever 26 at its free end thereby forcing the padded end of the lever against the pane, whereupon the lower edge of the pane which is preferably rounded, ride up over the sloped surface offered by the bearing rod until pane 17 lies flat against pane 16 and the two panes are in contact with each other throughout their entire height. It will be understood that there is sufficient clearance between the upper longitudinal edges of each pane and the base surface of the header groove 19 to permit the vertical upward movement of pane 17 when the latch is being closed. It is also desirable to anchor weatherstripping liner 30 within the header groove throughout the full length of said groove—the liner being channel shaped in cross section to accommodate the upper longitudinal edges of both window panes and permitting the panes to slide readily within the channel offered by the liner. The side walls of the liner however, may each be twisted at 31 near the region where the panes of glass overlap when in closed position so that each side wall of the liner will lie against the upper margin of each pane of glass in substantially air tight fashion whenever the two panes are in closed position as viewed in Fig. 1.
5. A window assembly comprising: a frame, said frame including a sill and a header; the header having a groove extending throughout its length; a plate having a channel formed therein, said plate extending along the length of the sill and said channel being disposed in face to face fashion with the header groove; the plate channel being parallel to the header groove but offset relative to a plane drawn vertically through the header groove; a rod fixed within the plate channel to provide a floor having bearing surfaces sloping downwardly and outwardly on both sides of a longitudinal center line of the channel; a pair of window panes having their upper longitudinal margins received in the header groove and their lower longitudinal margins received in the plate channel, the width of the channel being greater than the combined thickness of the window panes, whereby gravity causes one pane to rest on one side of the axis of the rod and the other pane to rest on the other side of the rod axis, said panes being normally spaced from each other along their lower longitudinal margins; latching means fixed to the plate and engageable with a face of one of the window panes for applying lateral pressure thereto and for moving the lower margin of said pane into contact with the face of the other pane.

6. A window assembly comprising a rectangular frame, said frame including a sill, a header and opposed side walls interconnecting the sill and header; said header having a groove extending throughout its length; a plate fixed to the sill and extending lengthwise thereof; a pair of side walls extending along the length of the plate in face to face fashion to provide a channel; a plastic rod curved in cross section and anchored between the side walls, said rod providing a floor having bearing surfaces sloping downwardly and outwardly on both sides of a longitudinal center line of the channel; a pair of window panes having their upper longitudinal margins received in the header groove and their lower longitudinal margins received between the side walls, the distance between said side walls being greater than the combined thickness of the window panes; each window pane lying in a plane inclined from the vertical; said rod having curved external longitudinal surfaces, one pane having its lower longitudinal edge normally resting on the rod against the face of one side wall and the other pane having its lower longitudinal edge normally resting on the rod against the face of the other side wall.

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