Feb. 7, 1928. 1,658,317

S. A. WIGHT ET AL

WINDOW CONSTRUCTION

Filed April 23, 1926 3 Sheets-Sheet 1

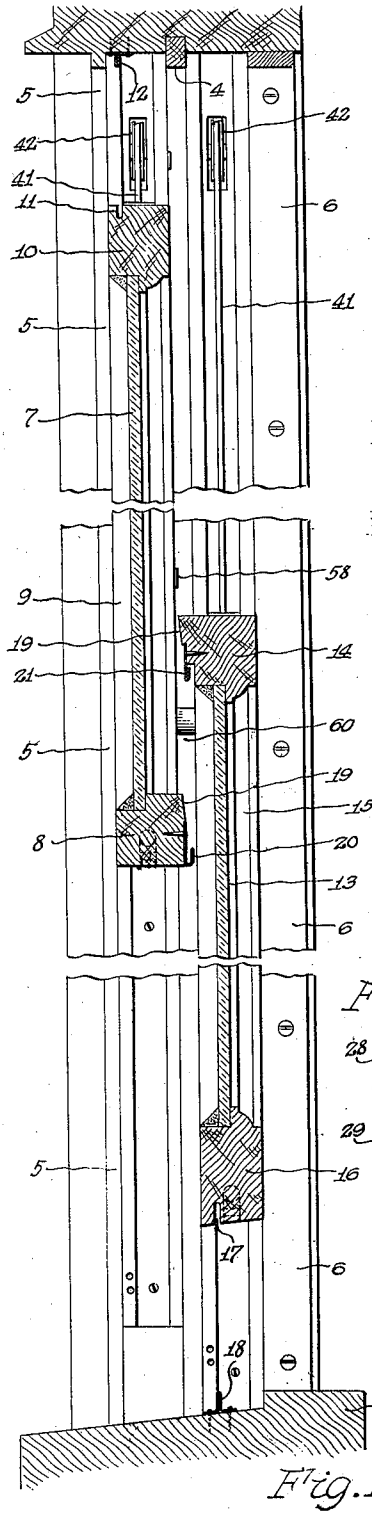


Fig. 1.

Fig. 2.

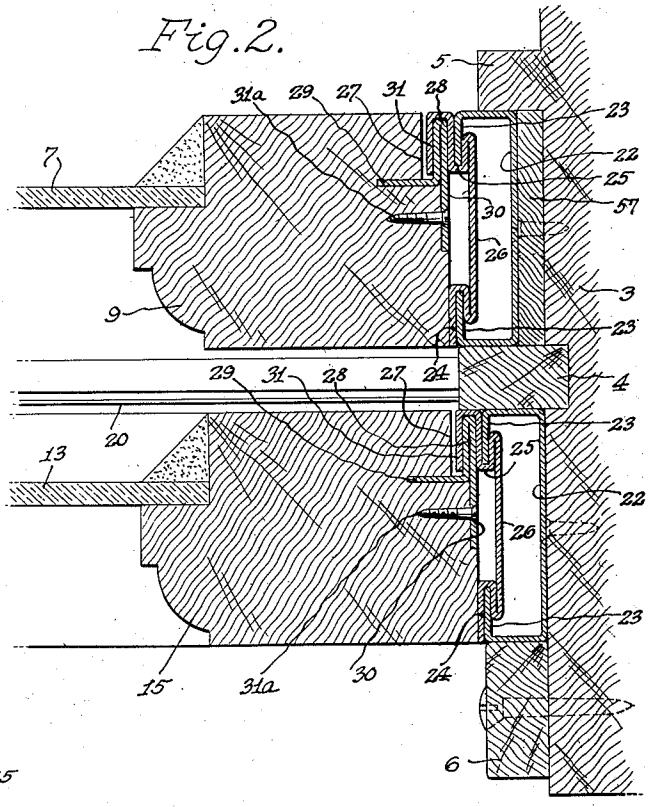


Fig. 3.

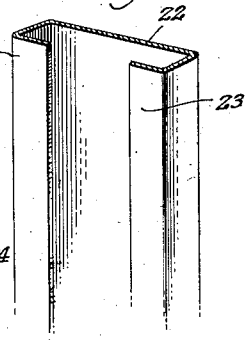


Fig. 4.

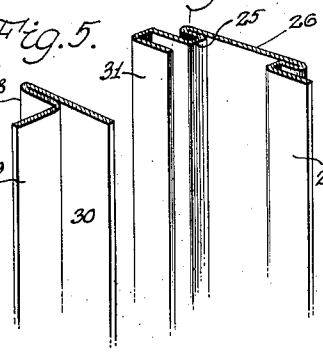


Fig. 5.

Inventors

Samuel A. Wight,

Edward H. McFarland,

By Richard W. Barker

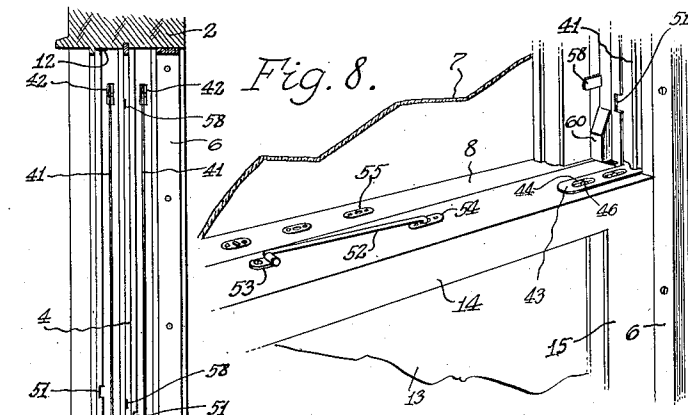
Attorneys

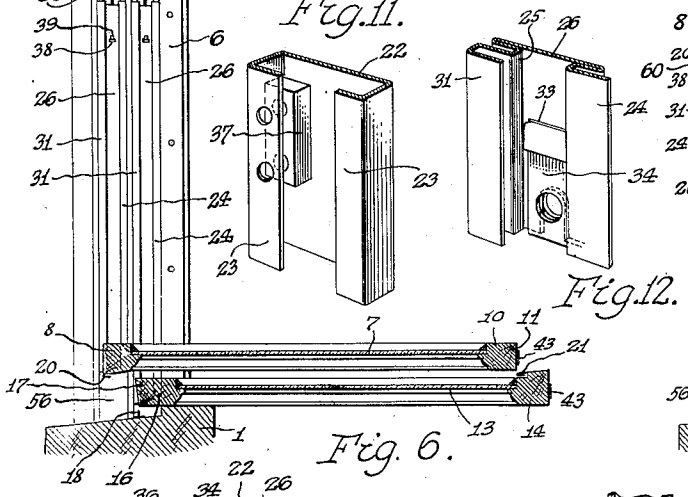
Feb. 7, 1928. 1,658,317

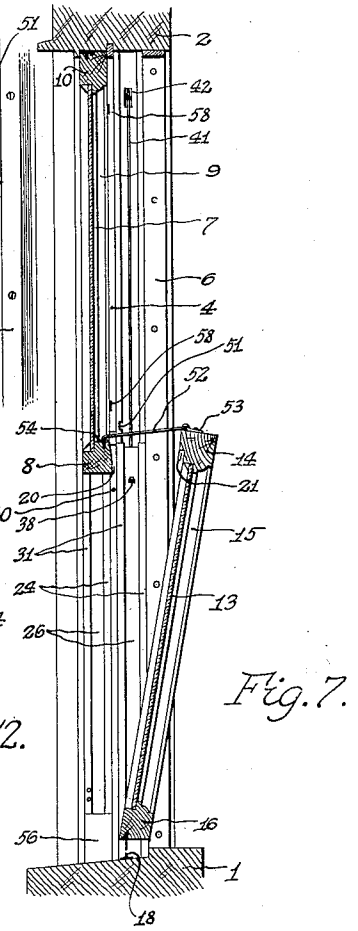
S. A. WIGHT ET AL

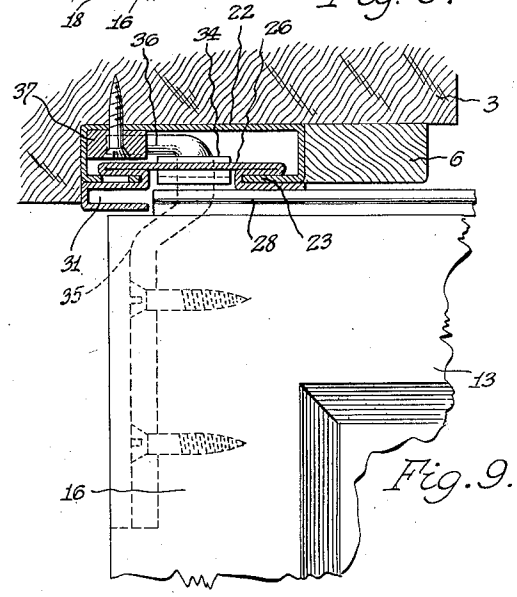
WINDOW CONSTRUCTION

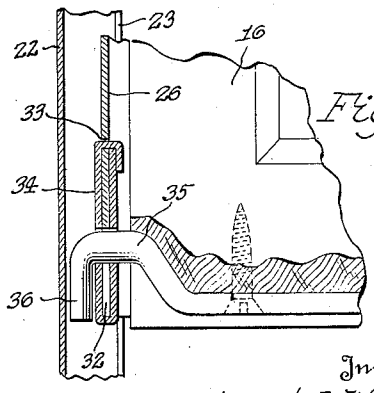
Filed April 23, 1926 3 Sheets-Sheet 2











Inventor
Samuel A. Wight
Edward H. McFarland,
By
Attorneys

Feb. 7, 1928. 1,658,317

S. A. WIGHT ET AL

WINDOW CONSTRUCTION

Filed April 23, 1926 3 Sheets-Sheet 3

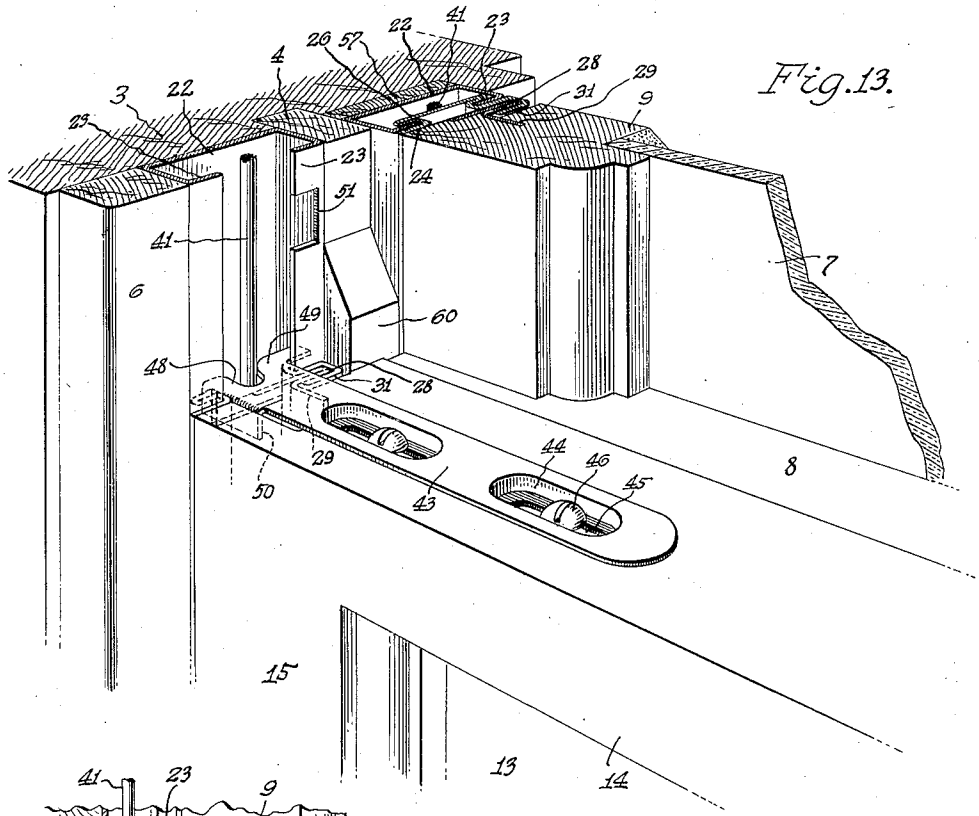


Fig. 13.

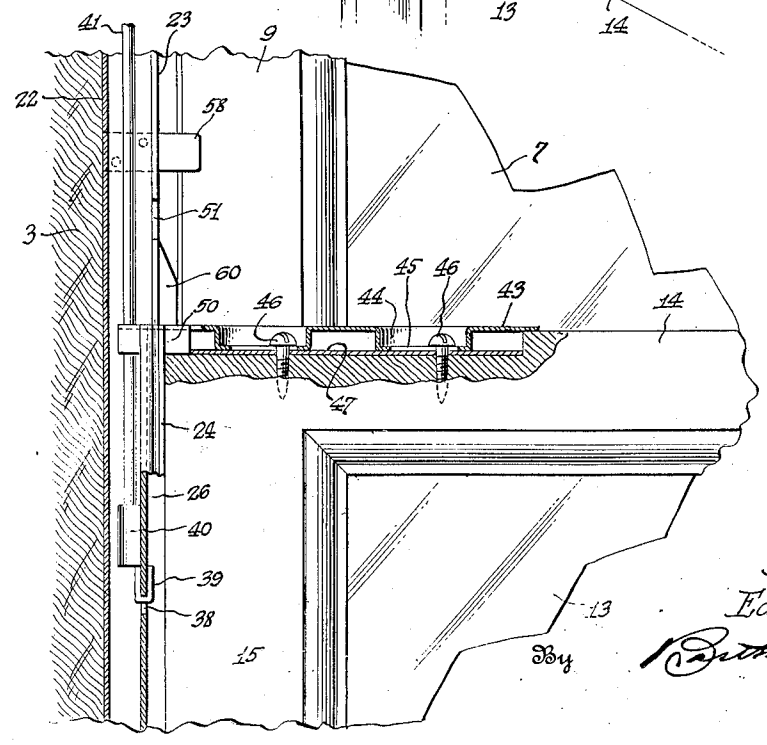


Fig. 14.

Inventors
Samuel A. Wight,
Edward H. McFarland,
By Burchett & Burchett
Attorneys

Patented Feb. 7, 1928. 1,658,317

UNITED STATES PATENT OFFICE.

SAMUEL A. WIGHT AND EDWARD H. McFARLAND, OF DETROIT, MICHIGAN.

WINDOW CONSTRUCTION.

Application filed April 23, 1926. Serial No. 104,062.

This invention relates to window construction and has special reference to that class of windows in which slidable sashes are arranged to be swung inwardly relative to a window frame for ventilating purposes and to facilitate cleaning both sides of the sashes.

Our invention aims to provide a window frame and swingable sashes with novel weather strips which will exclude the elements when the sashes are closed and not interfere with swinging of the sashes inwardly for cleaning purposes. It is in this connection that the upper sash of the window frame is of less width than the lower sash so that it may be bodily swung inwardly, between the parting strips of a window frame, to occupy substantially a horizontal position after the lower sash has been swung to such a position.

Our invention further aims to provide novel slide members between a window frame and its sashes with the slide members arranged for easy adjustment as the sashes are raised or lowered, and provision is made for securing the sashes to the slides so that there can be no accidental inward swinging of the sashes due to wind pressure or other causes.

Our invention still further aims to furnish the swingable sashes of a window frame with novel pieces of hardware by which the sashes can be safely held for vertical adjustment or safely held after being swung to a desired position for ventilating purposes.

Other features of our invention will hereinafter appear as the same is described by the aid of the drawings, wherein

Figure 1 is a vertical sectional view of the window construction, partly broken away, showing the sashes in vertical adjusted positions;

Fig. 2 is an enlarged horizontal sectional view of a portion of the window construction;

Fig. 3 is a perspective view of a portion of a frame guide member;

Fig. 4 is a similar view of a portion of a sash slide member;

Fig. 5 is a similar view of a portion of a sash weather strip;

Fig. 6 is a vertical sectional view of a window frame showing the sash swung inwardly to substantially horizontal positions;

Fig. 7 is a similar view showing the lower sash adjusted relative to the upper sash for ventilating purposes;

Fig. 8 is a perspective view of the meeting rails of the sashes showing the hardware used for angular adjustment of the lower sash;

Fig. 9 is a horizontal sectional view showing one of the pivotal connections of a sash which is illustrated in a horizontal position relative to a frame;

Fig. 10 is a vertical transverse sectional view of a pivotal connection shown in Fig. 9, with the sash in a vertical position;

Fig. 11 is a perspective view of a stop member associated with the pivotal connection of a sash;

Fig. 12 is a similar view of a pivot bearing;

Fig. 13 is a perspective view of the meeting rails of sashes showing one of the sash fasteners, and

Fig. 14 is a longitudinal sectional view of the sash fastener shown in Fig. 13.

In the drawings, the reference numeral 1 denotes a sill, 2 a lintel and 3 stiles which cooperate with the sill 1 and the lintel 2 in forming a window frame. The lintel 2 and the stiles 3 are provided with parting strips 4, outer retaining strips 5 and inner retaining strips 6.

Slidable in the window frame is an upper sash 7 having a meeting rail 8, side rails 9, and a top rail 10. The top rail 10 has a longitudinal groove 11 near its outer edge and a weather strip 12 secured to the lintel 2 is adapted to extend into the groove 11, when the upper sash 7 is closed, and seal the connection between the top rail 10 and the lintel 2.

Slidable in the frame is a lower sash 13 having a meeting rail 14, side rails 15, and a bottom rail 16. This bottom rail has a longitudinal groove 17 into which may extend a weather strip 18 carried by the sill 1. The weather strips 12 and 18 may be conveniently made T-shaped in cross section and of non-corrodible sheet metal.

The meeting rails 8 and 14 of the sashes 7 and 13 respectively, are provided with the usual complemental contacting edges 19, but in addition thereto we provide the meeting rail 8 of the upper sash 7 with the hook shaped weather strip 20 into which extends a tongue shaped weather strip 21 carried by the meeting rail 14 of the lower sash 13.

The weather strips 20 and 21 may be made of sheet metal and arranged to interlock when the sashes are closed so as to cooperate with the contacting edges 19 of the weather strips in sealing the connection between the upper and lower sashes at the meeting rails thereof.

The strips 4, 5 and 6, cooperate in providing the stiles 3 with ways and considering the ways for the lower sash 13, reference will be had to Figs. 1 to 4 inclusive. Suitably mounted in the stile ways are frame guide members 22 substantially box or channel shaped in cross section, said guide members being fitted between the strips 4 and 6 throughout the length of the stile ways. These guide members present confronting flanges 23 and slidably engaging said flanges are the channel slide portions 24 and 25 of sash slide members 26. The slide portions 24 and 25 are formed by bending the longitudinal edges of each slide member 26 for a return bend into each of which may extend the flange 23 at each edge of the guide member 22, so that the slide member may move longitudinally of the guide member, but cannot become laterally displaced relative to said guide member. The slide members 26 are substantially the same length as the rails 15 of the lower sash 13, and said side rails 15 have the outer edges thereof cut away, as at 27 to provide clearance for weather strips 28 attached to the rails 15. The weather strips 28 may be made of sheet metal so that a flange 29 of each strip may extend into the rail 15, while another flange 30 is secured to the rail 15 by screws 31^a or other fastening means. The weather strip 28 is therefore rigidly held by the sash rail 15 and it is adapted to enter a channel weather strip 31 as a continuation of the slide portion 25 of each sash slide member 26. The interengagement of the weather strips 28 and 31 is best shown in Fig. 2 where it will be noted that the weather strip 31 abuts the parting strip 4 and is firmly braced thereby, so that when the weather strip 28 enters the weather strip 31 there is no danger of the outer weather strip being distorted. Furthermore the shape of the weather strip 31 is such as to frictionally engage the weather strip 28, yet permit of the weather strip 28 being swung out of the weather strip 31 incident to swinging the lower sash 13 for cleaning or ventilating purposes.

Before considering the counter balance for the lower sash 13, reference will be had to Figs. 9 to 12 inclusive for the pivotal support of the lower sash 13 relative to its slide members 26.

In the lower end of each slide member 26 there are slots 32 and 33 and fastened to the slotted lower end of the slide member is a pivot bearing 34, best shown in Figs. 10 and 12. This pivot bearing is made of sheet metal and builds up the slide member 26 so that there will be a substantial bearing for a hook shaped pintle 35 mounted in the lower face of the bottom rail 16 at the end thereof. The hook shaped pintles 35 have crank portions 36 within the guide members 22 and these crank portions are engageable with stop members 37 mounted in the guide members 22 and adapted to limit the swinging movement of the lower sash. The slots 32 and 33 facilitate assembling the pivot bearing 34, and the pintle 35 in the bearing permits of the sash 13 being lowered to substantially a horizontal position, as shown in Fig. 6, where the lower sash may rest on the inner edge of the sill 1. In such position the pintle crank 36 engages under the stop member 37, as best shown in Fig. 9. Since the stop member is a fixture within the guide member 22 there is no danger of the bottom rail 16 of the lower sash shifting upwardly after the lower sash is in a horizontal position.

Reference will now be had to the hanging of the lower sash 13, which is best shown in Figs. 1, 6 and 14. The slide members 26, adjacent the upper ends thereof, have slots 38 and engaging in said slots are the hook ends 39 of clips 40 on the ends of sash cords or cables 41. These sash cords extend upwardly between the slide members 26 and the guide members 22 and are trained over sheaves 42 mounted in the stiles 3 whereby the sash cords 41 may be provided with sash weights (not shown). The sheaves 42 are of a conventional form which permit of sash weights or other counterbalance devices readily operating in wells formed in or adjacent the stiles 3 of the window frame.

On the meeting rail 14 of the lower sash 13 are slide fasteners 43 which are positioned at the ends of the meeting rail and are operatable by hand. The meeting rail 14 is grooved or cut away to provide clearance for depressed finger grip portions 44 of each fastener and these finger grip portions are slotted, as at 45 whereby screws 46 or the like may be mounted in the meeting rail 14 for slidably holding each fastener and limiting the sliding movement thereof. Wear plates 47 may be mounted in the meeting rail 14 to insure easy movement of the fasteners 43, and the outer ends of said fasteners extend into the guide members 22 and are shaped to interlock therewith. The outer end of each fastener has a notch 48 providing clearance for the adjacent sash cord 41 and the end of the fastener has a lateral lug 49 adapted to engage behind one of the flanges 23 of the guide member 22, and a depending flange 50 adapted to slidably engage the other flange 23 of the guide member 22. This is best shown in Figs. 13 and 14 and with the outer end of the fastener 43

in engagement with the guide member 22 it is impossible to swing the lower sash inwardly for any purpose whatsoever.

In order that each fastener may be shifted out of engagement with its guide member 22 the guide member flange 23 adjacent the lateral lug 49 is provided with a notch 51, and considering the lower sash 13 as closed, the notch 51 is a short distance above the meeting rail 14, so that it becomes necessary to raise the lower sash 13 until the fasteners 43 are opposite the notches 51. Then the fasteners can be shifted inwardly on the meeting rail 14 and the lower sash swung inwardly, either to the horizontal position shown in Fig. 8 or to the angular position shown in Fig. 7.

In addition to the fasteners on the meeting rail 14 of the lower sash 13 there is a swiveled hook 52, as shown in Figs. 7 and 8. This hook has a swiveled bearing 53 and a keeper 54 by which the hook may be retained longitudinally of the meeting rail 14, and said hook is preferably positioned closer to one end of the meeting rail 14 than the other end of said rail so that it will not interfere with any sash lock used on the meeting rail 14 for locking said meeting rail to the meeting rail 8 of the upper sash 7. The free end of the hook 52 is swingable out of the keeper 54 into engagement with one or the other of a series of keepers 55 carried by the meeting rail 8 of the upper sash 7. It is by virtue of the keepers 55 and the hook 52 that the lower sash 13 may be placed in a tilted position to provide an opening at the bottom of the upper sash 7 for ventilating purposes. The angularity of the lower sash 13 will cause air to be deflected upwardly and inwardly, and this is particularly desirable when the window construction is used in a hospital.

Again considering the upper sash 7, this sash is very similar to the construction of the lower sash, that is, it has slide members 26 operatively engaging guide members 22; fasteners 43 on the top rail 10, and pintles 35 by which the meeting rail 8 has its ends hingedly connected to the slide members 26. By reference to Fig. 6, it will be noted that the stiles 3 are provided with bottom abutments 56 to limit the downward vertical movement of the upper sash, so that said sash will be correctly positioned to swing inwardly to substantially a horizontal position above the lower sash, without the meeting rail 8 of the upper sash contacting with the bottom rail 16 of the lower sash 13. The upper sash is hung or counterbalanced similar to the lower sash, but in order that the upper sash may be swung inwardly, between the parting strips 4, it is necessary that the side rails 9 of the upper sash 7 be of less width than the side rails 15 of the lower sash 13. This is best shown in Fig. 2, and to compensate for this narrow width of the upper sash 7, a liner 57 may be placed in the stile way behind the guide member 22, or the guide member 22 may be made of a greater depth. We prefer to make both of the guide members 22 similar and use the liner 57 with the guide members of the upper sash. Of course it becomes necessary to properly set the sheaves 42 for hanging the upper sash with the liners 57 slotted to provide clearance for the sheaves.

It may not be necessary to use the fasteners 43 on the top rail 10 of the upper sash 7, because we may use a plurality of retaining members 58 between the parting strip 4 and the guide members 22 of the upper sash with the retaining members 58 stationary, so that the upper sash cannot be swung inwardly except when it is in its lowermost vertical position. Then the top rail 10 will be below the lowermost retaining member 58. It is equally as necessary to withdraw the fasteners 43, if the same are used, in order that the upper sash may be swung inwardly.

We desire to direct attention to the parting strips 4 of the stiles 3, since the side rails 9 of the upper sash 7 are of a less width than the side rails 15 of the lower sash 13. The upper portions of the parting strips 4 protrude sufficiently from the stiles 3 to separate the guide members 22 for the upper and lower sashes, and the lower portions of the parting strips may protrude a greater distance, as at 60, to further brace the guide members 22 of the upper sash and particularly the weather strips 31 of the slide members of the lower sash. This is best shown in Figs. 2 and 13, and it is to be remembered that the upper sash, when lowered is swingable inwardly and passes between the lower portions of the parting strips 4. The weather strips 28 of both sashes can readily move out of the weather strips 31 and the weather strips 28 serve as wear plates for the rails 9 and 15 when sliding into and out of engagement with the slide members 26 held by the guide members 22.

From the foregoing it will be observed that the upper and lower sashes may be adjusted in the usual manner to afford upper and lower openings for ventilating purposes; that the lower sash 13 may have its upper portion swung outwardly so that the lower sash is positioned at an angle to the plane of the upper sash and may be so held for ventilating purposes, and that the upper sash may be lowered and then both sashes swung to substantially a horizontal position for the maximum degree of ventilation or for cleaning purposes.

The drawings illustrate a window construction which has been put into practice, but it is to be understood that the structural elements are susceptible to such variations

and modifications as fall within the scope of the appended claims.

What we claim is:—

1. In a window construction wherein upper and lower sashes are slidable in a frame and swingable inwardly for cleaning and ventilating purposes; means supporting said sashes for movement relative to said frame, said means comprising channel shaped guide members in the frame providing confronting flanges, slide members having return bend portions longitudinally of both edges thereof slidably engaging the flanges of said guide members, said slide members having a channel strip at one edge thereof, complemental strips on said sashes extending into said channel strips, and pivotal connections between the lower ends of said slide members and said sashes so that said sashes may have the upper portions thereof swung inwardly relative to said frame.

2. In a window frame, upper and lower sashes, guide and slide members supporting said sashes for vertical adjustment, pintles supporting the lower portions of said sashes so that the upper portions of said sashes may be swung for angular adjustment, said pintles being disposed in the planes of said sashes and adapted to assume substantially horizontal positions, and means in said guide members engageable by said pintles to define pivotal movement of said sashes except when in defined positions in the lower part of said frame.

3. In a window frame, upper and lower sashes, guide members in said frame, slide members in said guide members supporting said upper and lower sashes, hook shaped pintles pivotally connecting the lower portions of said upper and lower sashes to said slide members for swinging movement relative to said frame, and stop members in said guide members and under which said pintles engage to define the pivotal movement of said sashes.

In testimony whereof we affix our signatures.

SAMUEL A. WIGHT.
EDWARD H. McFARLAND.