Dec. 8, 1942. E. PEREMI ET AL 2,304,063

WINDOW CONSTRUCTION

Filed Dec. 6, 1939 2 Sheets-Sheet 1

Fig. 1.

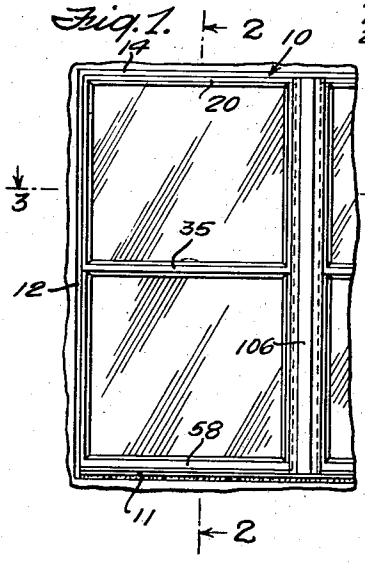
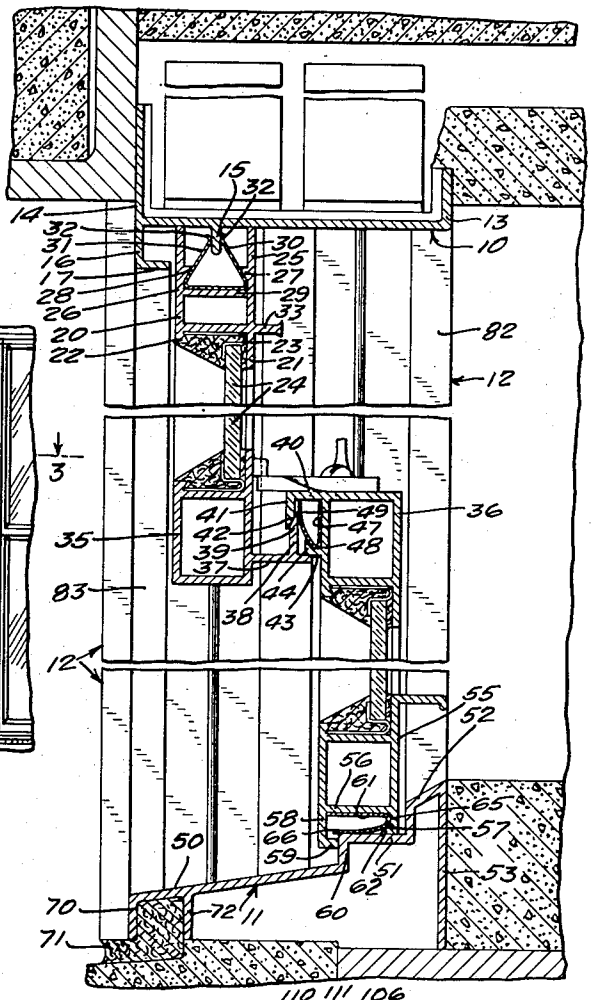


Fig. 2.



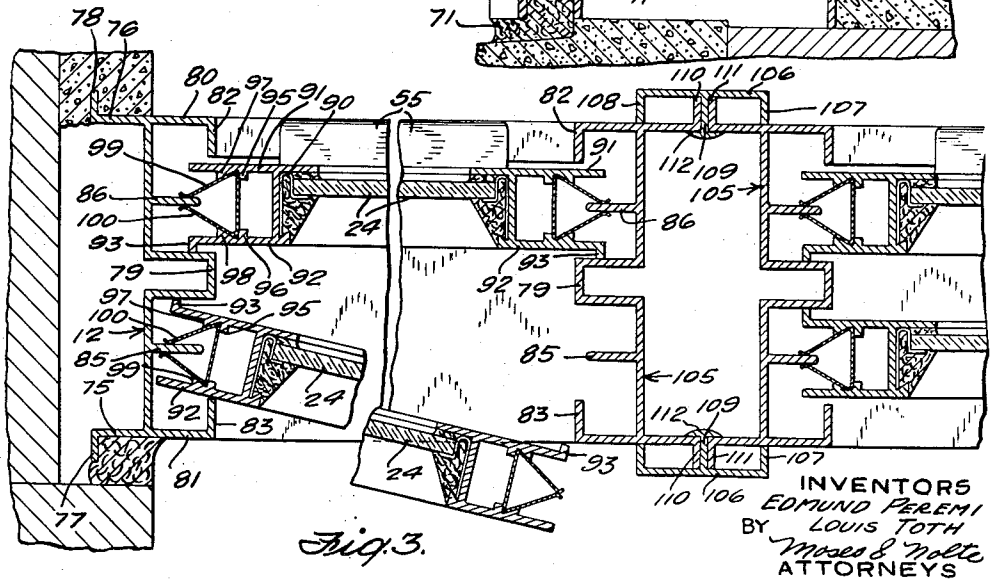


Fig. 3.

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Fig. 4.

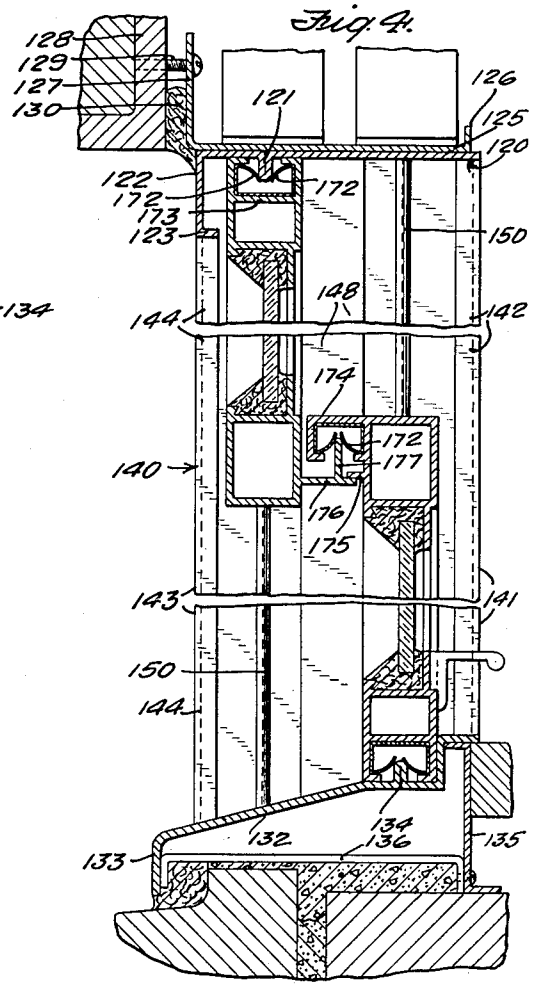
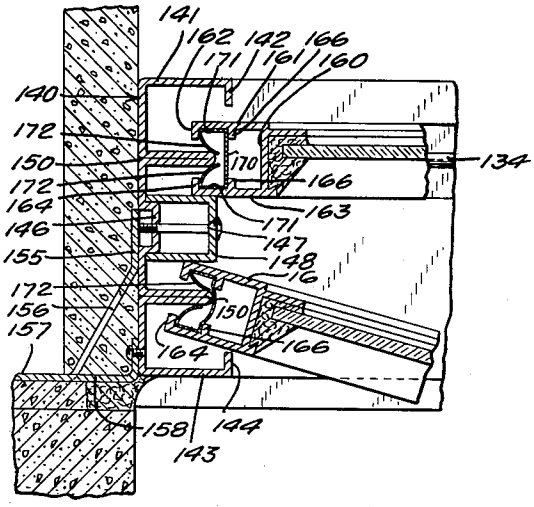


Fig. 5.



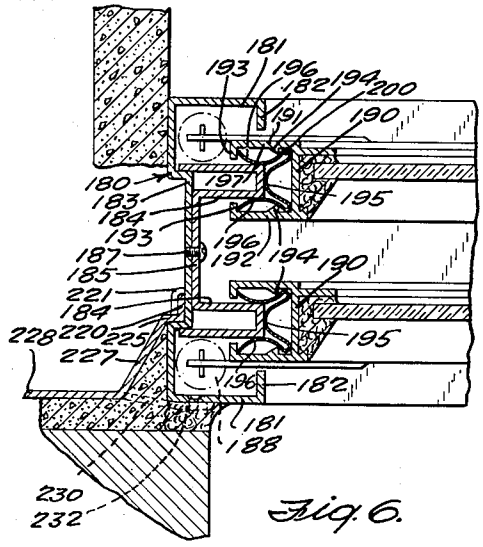


Fig. 6.

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UNITED STATES PATENT OFFICE

2,304,063

WINDOW CONSTRUCTION

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Application December 6, 1939, Serial No. 307,758

9 Claims. (Cl. 189—72)

This invention relates to window construction and more particularly relates to double hung or sliding type windows.

One of the objects of the invention is to provide new and improved types of double hung windows having improved weather stripping to secure absolute tightness from the weather, and at the same time insure easy sliding operation.

It is a further object of the invention to provide a double hung window construction in which the mounting of the sashes will allow for lateral movement, permitting removing of the sash without requiring removal or displacement of any part of the jambs.

It is a further object of the invention to provide an improved mullion construction for multiple windows.

Other objects and advantages of the invention will appear from the following description of certain preferred embodiments of the invention chosen to illustrate the principles thereof.

In the accompanying drawings:

Figure 1 is a fragmentary front elevation of a multiple window embodying the invention;

Figure 2 is a vertical section on line 2—2 of Figure 1;

Figure 3 is a horizontal section on line 3—3 of Figure 1;

Figure 4 is a vertical section of a window showing a modified form of the invention;

Figure 5 is a horizontal section of a window showing a jamb applicable to either the forms of Figure 2 or Figure 4 and showing sashes of the type shown in Figure 4; and

Figure 6 is a horizontal section of another modified form of sash and jamb, the form of jamb shown being also applicable to receive sashes of the form shown in either Figure 2 or Figure 4.

Referring to the drawings in detail and particularly Figures 1 through 3, the window frame shown comprises a header 10, sill 11 and jambs 12. The header 10 includes a channel-shaped member having upwardly extending flanges 13 and 14 at its inner and outer edges, the flange 13 being on the inside of the window, and being the shorter of the two. Intermediate these flanges is a downwardly extending rib 15, and extending downwardly from the outer edge of the header and preferably in the same plane as the flange 14 is a flange 16 which terminates in an inwardly turned portion 17 and acts as a weather guard for the upper portion of the window. The upper sash rail is arranged to engage with the header and includes a hollow extruded portion 20 having pane carrying members on one side thereof including the flange 21 on the inner side thereof, and the undercut flange 22 on the outer side thereof, which is arranged to key with the putty. If desired, pane clips 23 may be used throughout the glazing to improve the stability of the window pane 24.

Extending upwardly from the hollow member 20 are the header engaging flanges 25 and 26 having lugs 27 and 28 respectively mounted on their inner sides.

Mounted upon the top horizontal wall 29 of the hollow rail member 20 and secured beneath the lugs 27 and 28 is a triangular shaped resilient non-corrosive sheet metal weather strip, the legs of the weather strip 30 and 31 terminating in outwardly turned edges 32. It will be seen that when the window is thrust into its highest upward position the flanges 25 and 26 will engage the face of the header 10 and the downwardly extending rib 15 will enter between the legs 30 and 31 of the weather strip. Sufficient spring pressure is provided in the weather strip to insure a tight weather proof sealing on either side of the rib 15. The edges 32 are flared sufficiently to permit the rib 15 to enter between them, but are preferably curved no more than is required for this purpose and should not for instance be beaded over. Thus the longitudinal flexibility of the edges is largely preserved and a better sealing contact is obtained throughout the length of the rib 15 than would be the case if the edges were so formed as to have longitudinal rigidity. The top rail member 20 of the upper sash is preferably formed with an inwardly projecting flange 33 constituting a continuous sash pull. The flange also serves the additional function of reinforcing the top rail member since it changes the center of gravity of the rail and relieves the intensity of direct stresses and strains on the rail.

The meeting rail assembly comprises the upper and lower hollow extruded rails 35 and 36, respectively. The upper meeting rail 35 includes an inwardly extending flange 37 having an upwardly extending web 38 near the inner end thereof terminating in the bevelled edge 39. The lower meeting rail includes an outwardly extending flange 40 terminating in a downwardly extending web 41 having a bevelled edge 42 adapted to engage with the bevelled edge 39 when the window is closed. The rail 36 has an outwardly extending flange 43 terminating in an upwardly turned lip 44 the bottom of which engages the flange 37 on the top thereof when the window is closed. The lower flange 43 forms with the upper flange 40 a pocket in which a V-shaped resilient metal

weather strip is mounted having a base 47, a vertex 48 held behind the lip 44 and a freely movable tongue portion 49 held from unlimited movement when the window is in open position by the web 41 and engaged in tight sealing relation with the upper meeting rail by the web 38 when the window is closed.

As shown in Figure 2 the sill comprises a single metallic extruded portion having an apron 50 and a step portion 51 and terminating at its inner side in upwardly sloped portion 52 having a downwardly extending flange 53 which can be secured to or supported upon the wall structure. The sloped portion 52 is particularly adapted to receive condensation from the inside of the window and to direct it off harmlessly to the outside of the building.

The lower sash rail which engages the sill includes the inner wall 55 having a lower web 56, a downwardly extending flange 57 terminating in an outwardly turned lip 62. The flange 57 engages directly with the step portion of the sill when the window is closed and a downwardly extended outer flange 58 having an inwardly turned flange 59 which engages the riser 60 of the step portion of the sill when the window is in closed position.

To insure absolute tightness of the window with the sill a V-shaped metallic weather strip member is provided having a base 61 which engages the bottom web 56 of the rail. The vertex 65 of the V is held under the outwardly turned lip 62. The other arm 66 of the V is a freely movable tongue held from unlimited movement when the window is open by the flange 59 and engaged by the top of the step portion 60 of the sill when the window is closed.

The sill also includes a downwardly extending flange 70 at its outer extremity beneath which a caulking pocket 71 may be provided and also has an intermediate leg 72 which rests on the masonry, supporting the sill and providing a back for the caulking pocket.

Referring to Figure 3 the jamb 12 is shown as a channel shaped member having outwardly extending inner and outer flanges 75 and 76 terminating in inwardly and outwardly extending portions 77 and 78 which are adapted to key with the masonry. The jamb also includes the parting strip 79 formed therein and on the inner and outer side thereof, flanges 80 and 81 having outwardly and inwardly extending stop beads 82 and 83 respectively. Intermediate each of the flanges 80 and 81 and the parting strip are situated the guide ribs 85 and 86 respectively for engagement with the sash rail in the manner to be described.

The sash rail of the inner sash includes the web 90 having the pane engaging portions on one side thereof similar to those described in connection with the top rail, and having an inner flange 91 extending from the inner side of the web. The flange 92 terminates in an outwardly turned lip 93 which bears against the parting strip 79 and provides firm sealing contact between rigid members. The flanges 91 and 92 will be in reverse position on the opposite side of the parting strip as shown by the partially removed sash in the lower portion of Figure 2. Each of the flanges 91 and 92 contains on its inner side the ridges 95 and 96 and outwardly of said ridges the undercut ribs 97 and 98. Mounted between the flanges 91 and 92 is a triangular shaped metallic weather strip having the two base angles of the triangle held respectively between the ridge 95 and the undercut rib 97 and the ridge 96 and the undercut rib 98. The legs 99 and 100 of the triangles extend toward the jamb 12 and engage on either side of the guide ribs 85 and 86 in sealing sliding relationship.

It will be observed that considerable lateral movement of the sash between the jamb members is possible and as shown in the lower part of Figure 3 the sash may be removed by sliding it toward one jamb which will cause disengagement of the legs of the weather strip at the opposite side of the sash from the flange on the opposite jamb and also carry the flanges 91 and 92 clear of the stop bead 83 whereby the sash may be removed.

Where it is desired to mount a series of multiple windows a mullion 105 may conveniently be provided by combining two of the heretofore described jamb members 12 as shown in Figure 3. The two jamb members forming the mullion may be secured together by any convenient means, but we have found it convenient to use a channel member, having a base 106 and flanges 107 and 108 which form the sides of the channel having a further flange 109 extending in the same direction between said flanges 107 and 108. The flange 109 extends between the outwardly extending flanges of the two jamb members 110 and 111 which are comparable to the outwardly extending flange 78 of the jamb 12, and terminates in the holding portion 112 which may take any convenient form. The channel member which holds the two jambs in place as a mullion may be conveniently fashioned by extruding in one piece.

Referring now to Figures 4 and 5 the modification of the invention shown in these figures includes a header member of rolled sheet metal 120 preferably of non-ferrous or non-corrosive metal which is folded between its ends to provide a rib 121 for engagement with the top rail of the upper sash and formed at its edge toward the outside of the window with a flange 122 terminating in an inwardly directed lip 123. The header member 120 may be mounted upon and reinforced by an angle plate 125 which may be of iron or non-ferrous metal and which is preferably provided with an inner flange 126 and with a wide outer flange 127 which may be imbedded in the masonry or attached to lintel 128 in any suitable manner as by screws or rivets 129. The angle plate 125 may, if desired, be spaced from lintel 128 so as to provide a pocket for caulking material 130.

The sill of the window may be of any suitable form. For instance, as shown in Figure 4, it comprises a plate of non-ferrous or non-corrosive metal having an inclined apron 132 which terminates at its forward edge in a downwardly projecting flange 133. Near its inner edge the sill has a folded rib 134 for engagement with the bottom rail of the lower sash. This non-corrosive metal sill plate is preferably supported and reinforced by a flanged plate 135 and braces 136, which may be made of iron or of non-corrosive metal as desired.

The window jambs are preferably of the form shown in Figure 5 and each comprises a channel member 140 preferably made of non-ferrous or non-corrosive metal, said channel being provided with an inner flange 141 having a lip 142, and with an outer flange 143 having a lip 144. Substantially centrally of the bottom of channel 140 an inwardly projecting rib 146 is provided, and fitted over this and secured in any suitable man-

ner, as by screws 147, is a channel shaped parting strip 148. A pair of sash receiving channels is thus provided. Formed in the bottom of each of these sash receiving channels is an inwardly projecting sash guide rib 150 which is preferably of considerable width so that it projects well out from the bottom of the main channel member 140, and nearly as far as the lips 142 and 144.

For reinfohcing the jam channel 140, a reinforcing plate 155 is preferably provided which is secured to the back of the channel 140 in any suitable manner, as by welding or by means of screws or rivets, and which comprises an angle web 156 and a flange 157, the latter being preferably parallel to the plane of the window. Braces 158, which may be punched out of web 156, connect the flange 157 with the back of the jamb near the flange 143 so as to hold the angle web 156 rigidly spaced from the channel at the proper angle. A very strong construction is thus provided which renders the jamb rigid and is adapted to interlock and bond the masonry.

The sashes comprise stiles which may be extruded from aluminum, or bronze or other suitable metal, each stile having a base 160 suitably formed to hold a pane of glass and carrying an inside flange 161 terminating in a lip 162 and an outside flange 163 having a lip 164. Inwardly projecting from the flanges 161 and 163 are intermediate ribs 166 which are located at a distance from the base 160 of the sash stile. Mounted between the flanges 161 and 163 in the space defined between the lips and ribs on the flanges is a resilient metal sash guiding and sealing strip which may desirably be formed of non-corrosive metal such as bronze or stainless steel, and which comprises a transverse base 170 supported on the ribs 166, side flanges 171 extending from the base to just below the lips 162 and 164 and inwardly directed resilient tongues 172 which are adapted to bear against the sash guiding rib 150 with sufficient pressure to form a weather tight seal. The faces of the sash stiles adjacent to the parting strip 148 normally bear against the parting strip so as to form close metal to metal contact, and the seal thus effected, in addition to the seals effected by engagement of the tongues 172 with the guide rib 150, form a triple barrier against the weather. The sash, however, being held in position only by engagement with the resilient tongues, cannot bind, jam or rattle. The construction described permits removal of a sash either by sliding the resilient sealing member endwise out of its recess in the sash stile, or if desired, the sash may be taken out without removing any part by simply forcing the sash laterally in the plane of the glass to an extent sufficient to permit one stile of the sash to clear the lip 142 past the edge of the guide rib 150, whereupon the sash may be removed. Owing to the space between the base 160 of the sash stile channel and the base 170 of the guiding and sealing member, the latter can be sprung sufficiently to permit the necessary lateral movement of the sash, as clearly shown at the lower part of Figure 5.

The top rail of the upper sash comprises a hollow extruded section, preferably having a partition 173 across the same which supports a resilient metal weather sealing member similar to that used in the stiles of the sash, and which is adapted to engage the rib 121. When the sash is moved down so that the tongues 172 leave contact with the rib, the edges of the tongues spring together, thus closing the space in the channel below them against the entrance of dirt. The bottom rail of the lower sash is preferably of similar section to the top rail of the upper sash and carries a similar weather sealing member which engages with the rib 134.

The meeting rail of the lower sash is preferably formed to provide a laterally projecting channel member 174 which is adapted to hold a weather sealing member of the same shape as those used elsewhere in the sashes. This meeting rail is also provided with a laterally projecting narrow flange 175. The meeting rail of the upper sash is provided with a laterally projecting flange 176 adapted to engage under the flange 175 when the meeting rails meet, the flange 176 carrying an upwardly projecting rib 177 adapted to project between the tongues 172 of the sealing member so that a three point seal is provided at the meeting rails. The channel 174 and resilient sealing member are preferably carried on the meeting rail of the lower sash as shown, so that they will face downwardly and will not collect water and the springing together of the edges of the tongues 172 when the rib 177 is withdrawn from contact therewith by the opening of the window also helps to exclude dust, etc. It will be seen that the sealing members may be of like cross section throughout and that they are held in position on the sash members by the flanges of the sash, thereby dispensing with the use of screws or other fastening means. The weather sealing means may also be removed without dismounting any part of the frame or destroying the sealing means themselves.

In Figure 6 a further modification of the window of this invention is shown in which each jamb is formed of a channel 180 at each edge of which is a flange 181 terminating in a lip 182. The central part of the channel is off-set as indicated at 183 and the sashes are guided by two guide ribs 184 connected by a web 185. The member comprising the ribs and web is removably secured in place in any suitable manner as by screws 187, and is divided horizontally near the center of the window into two parts to facilitate removal. The removal of the guide rib members permits removal of the sashes and also provides access to the counterbalancing means indicated at 188. The sash stiles are of channel form and each comprises a base 190 carrying glass and putty retaining means and inner and outer flanges 191 and 192 which have lips 193 at their edges and lugs 194 placed a short distance from the base 190. Sash sealing and guiding members of resilient material are mounted in the stiles and in the form shown comprise a curved base 195 adapted to contact with the inner end of a guide rib 184 and two inwardly bowed tongues 196 adapted to engage the sides of the guide rib. Relatively acute bends 200 connect the tongues with the curved base 195, these bends interlocking beneath the lugs 194 and the edges of the tongues being retained behind the lips 193. The sash guiding members are thus firmly retained in the sash stiles. In this construction it is seen that there are three points of sealing engagement between the sealing and guiding members and the sash guide rib, namely the two contacts between the sides of the rib and the tongues and the one contact between the end of the rib and the center of base 195. All of these contacts are weather tight but yielding so that the sash floats freely and slides easily without binding or jamming.

For reinforcing the jamb members of the frame and assisting in securing the frame in the wall, a reinforcing member of the form shown in Figure 6 may be employed. This member comprises a flange **220** adapted to be secured to the jamb channel **180** in any suitable manner, as by being fitted under tongues **221** bent out from the back of the offset portion **183** of the channel member **180**. Adjacent to the flange **220** the reinforcing member has a shoulder **225** which seats against the end of the offset portion **183**. The reinforcing member has an inclined web **227** which is preferably inclined at a considerable angle to the plane in the back of the jamb channel. The inclined web **227** preferably carries a web **228** parallel to the plane of the window, this web being of any desired width to give the necessary strength and for engagement with the masonry. The inclined web **227** is preferably braced in position by means of braces **230** formed integral with or attached to the web **228** and secured to the flange **181** of the jamb **180**, by suitable means such as screws or rivets **232**.

This application comprises in part subject-matter divided from applicants' applications for patent, No. 243,931 and No. 243,932, filed December 5, 1938.

While we have illustrated and described in detail certain preferred forms of our invention, it is to be understood that changes may be made therein and the invention embodied in other structures. We do not, therefore, desire to limit ourselves to the specific construction illustrated, but intend to cover our invention broadly in whatever form its principle may be utilized.

We claim:

1. In window construction, the combination of a window frame and a sliding sash mounted therein, said frame including jambs having sash guiding ribs projecting therefrom, said sash having channeled stiles and resilient sheet metal sealing and guiding members mounted in said stiles, said guiding members each comprising a base and a pair of resilient tongues carried by said base, said resilient tongues engaging opposite sides of said guide ribs, the side walls of the channeled stiles having pairs of spaced inwardly extending projections thereon engaging portions of said resilient sealing and guiding members for retaining them in position in the stiles.

2. In window construction, the combination of a window frame and sliding sash mounted therein, said frame including jambs having inwardly projecting sash guiding ribs thereon, said sash having channeled stiles each including a base and side flanges projecting therefrom, said flanges having inwardly projecting ribs thereon spaced from said base, and a resilient sheet metal sash guiding and sealing member mounted in each stile, said sash guiding and sealing member having its base supported on said inwardly projecting flanges and spaced from the base of the stile, the base of said sash guiding and sealing member carrying resilient tongues engaging opposite sides of a sash guiding rail, the inner edge of said sash guiding rail being spaced from the base of said sash guiding and sealing member.

3. In window construction, the combination of a window frame and a sliding sash mounted therein, said frame including a jamb having an inwardly projecting sash guide rib thereon, said sash including a channeled stile having outwardly projecting side flanges, pairs of inwardly projecting ribs on the inner faces of said flanges, and a resilient sheet metal sealing and guiding member mounted in said stile, said member being of generally triangular shape having its base angles received between said spaced ribs, said member having outwardly extending converging resilient tongues, the outer edges of which are flared and receive between them said guide rib on the jamb and engage the opposite sides of said guide rib in sealing and sliding contact.

4. In a double hung window, the combination of a jamb and a sash mounted for sliding relation therein, said jamb comprising metallic channel shaped members having inside and outside flanges extending inwardly of the jamb, said flanges defining with the back of said jamb the channel shaped member, an inwardly extending rib located intermediate said flanges, a parting strip removably mounted on said rib, and folds between said parting strip and each of said flanges forming guide ribs, said sashes comprising hollow stiles having mounted therein resilient weather strips which cooperate with said guide ribs in sealing relationship and hold said sashes in sliding relationship against said parting strip.

5. In window construction, a frame including sash guiding ribs, a window sash including hollow metallic stile members, said members having flanges extending from each edge of the base thereof, said flanges having pairs of oppositely disposed inwardly extending rib portions on the inner sides thereof, and resilient metallic weather strip member entrapped between said pairs of ribs, said weather strip members having resilient tongues engaging the guide ribs on the frame.

6. In a window construction a jamb and a sash, said sash having channel shaped stiles comprising a base and flanges extending outwardly therefrom, said jamb having a parting strip, said flanges on said stiles having pairs of inner ridges and double tongued weather strips, the bases of which are mounted between said ridges, one of said flanges of said channel shaped stile terminating in an outwardly overturned portion, said sash being mounted so that said overturned portion slides in contact with said parting strip, said weather strip supplying supporting contact between said sash and said jamb and said overturned portion guiding the lateral motion of the sash with respect to the jamb.

7. In a window construction, a frame including sash guiding ribs, a window sash including hollow metallic rails, said members having flanges extending from each edge of the base thereof, said flanges carrying inwardly turned lips, oppositely disposed inwardly extending rib portions on said flanges intermediate said lips and said base and resilient weather strip members entrapped between said ribs and said lips, said members comprising a base portion mounted against said inwardly extending ribs of said flanges, side wall portions extending outwardly to said lip portions and resilient tongues extending inwardly from said lip portions, said tongues normally engaging said sash guiding ribs on said jamb and being held from outward movement toward said jamb when not so engaged by contact with each other.

8. In a window, in combination, a frame and a sash mounted for sliding movement therein, said frame comprising metal jamb members of channeled construction having bases, inner and outer flanges and a rib intermediate said flanges extending into the window opening from said bases,

said sash having channeled stiles and said flanges on said jambs normally overlapping said stiles when the window is in mounted position, said stiles having two-tongued resilient weather stripping members entrapped therein, said tongues being adapted to engage opposite sides of said rib on said jamb to maintain sliding relation between said sash and said jamb, said sash also being laterally movable in said jamb for a distance equal to more than the overlap of said flanges, whereby said sash may be removed from the frame by lateral movement to clear said flanges and rib on the side opposite to the direction of movement and then swinging the sash out of the frame.

9. In a window, in combination, a frame and a sash, said sash being mounted for sliding movement in said frame, said frame comprising jamb members of channeled construction having inner and outer flanges extending inwardly of the window opening, and a rib intermediate said flanges extending inwardly of the window opening, said sash having hollow stiles open at their outer lateral edges, said frame flanges extending inwardly of said window opening past the outside edges of said stiles when said window is in normal mounted position, said stiles having resilient metal weather stripping entrapped therein, said weather stripping engaging said ribs on said jamb to maintain sliding relation between said jamb and said sash, said stiles and weather strips being laterally slidable on said ribs to a point where, when said sash is slid laterally toward one jamb, said weather strip and said stile on the opposite side of the sash will clear said flanges and said rib of the opposite jamb upon being swung out of the plane of the window, whereby said sash may be removed from the frame by a combined sliding and swinging movement.

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Disclaimer

2,304,063.—*Edmund Peremi*, Manhasset, and *Louis Toth*, Flushing, N. Y. WINDOW CONSTRUCTION. Patent dated Dec. 8, 1942. Disclaimer filed June 16, 1951, by the assignee, *General Bronze Corporation.*

Hereby enters this disclaimer to claims 1, 2, 5, and 7 of said patent.

[*Official Gazette July 24, 1951.*]