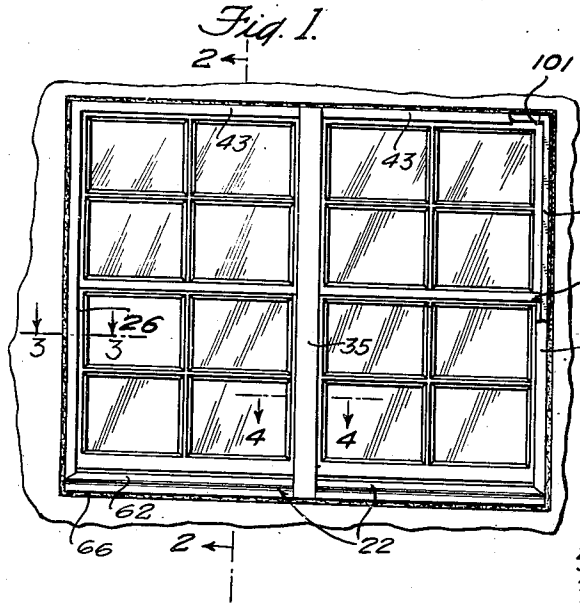
Dec. 8, 1942. E. PEREMI ET AL 2,304,062

WINDOW CONSTRUCTION

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Fig. 1.



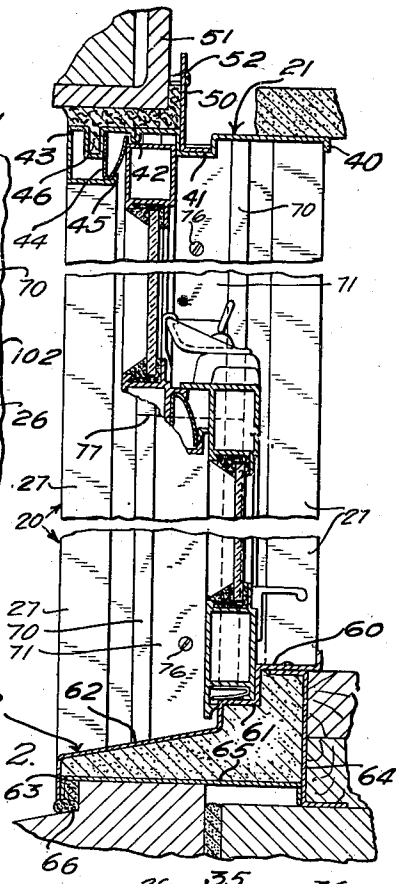
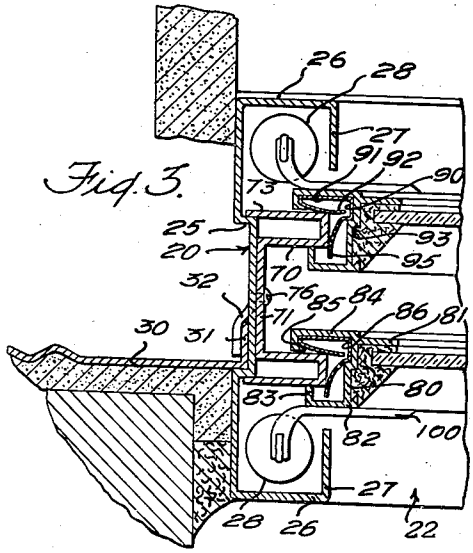


Fig. 2.

Fig. 3.



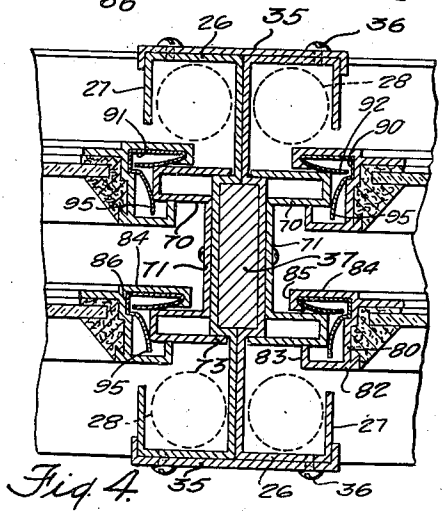


Fig. 4.

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Fig. 5.

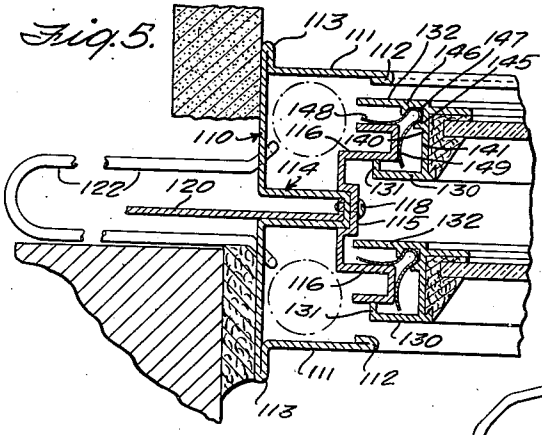


Fig. 6.

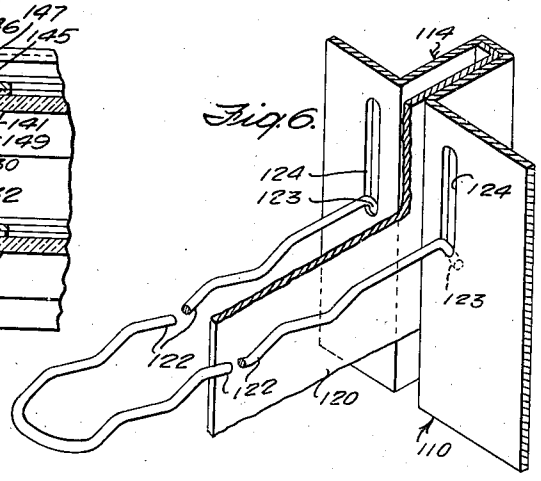


Fig. 7.

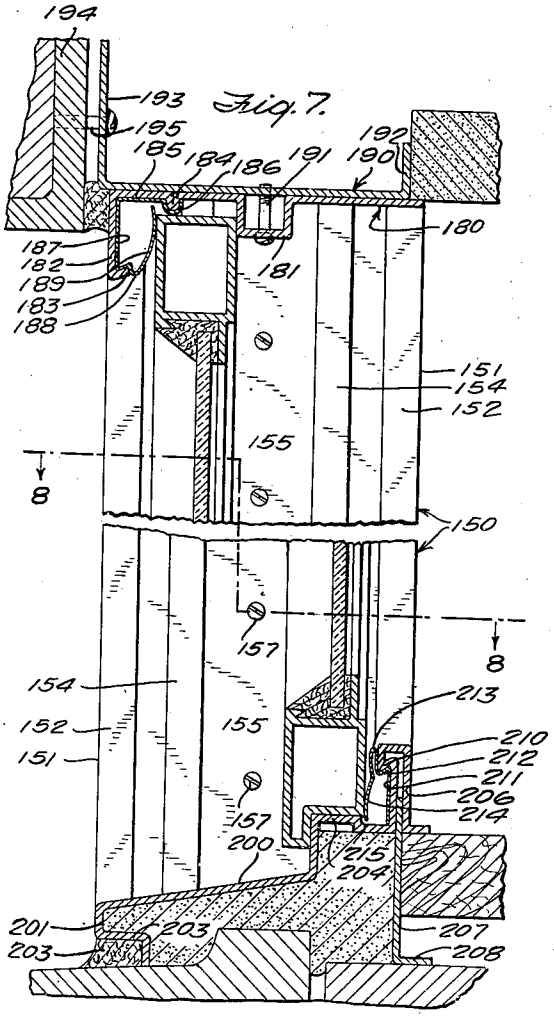
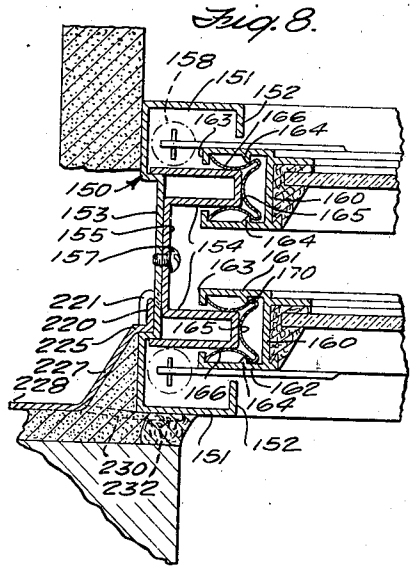


Fig. 8.



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WINDOW CONSTRUCTION

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Application December 5, 1938, Serial No. 243,932

12 Claims. (Cl. 189—72)

This invention relates to windows of the sliding or double hung type. One of the objects of the invention is to provide a frame and sash construction in which the frame has a pair of guide rails for each sash, the sashes being provided with resilient sliding contact members adapted to slide upon the guide rails and to seal the windows against leakage and prevent rattling. The resilient engagement is such that while the windows are at all times maintained tight against the weather, the sashes slide freely, so that there is no chance of sticking or binding. Other objects of the invention are to provide an improved construction for permitting removal of the sashes, improved means for permitting access to the counterbalance pockets, improved means for securing the frames in the window openings of the building, and an improved construction whereby jamb members of adjacent window units may be secured together to form multiple units provided with reinforced mullions. Other objects and advantages will appear from the following description of certain embodiments of the invention chosen to illustrate the principles thereof.

In the accompanying drawings:

Figure 1 is a front elevation of a portion of a wall with a two unit window mounted therein, a corner thereof being broken away to show a detail of sash construction.

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

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

Figure 4 is a horizontal section on line 4—4 of Fig. 1;

Figure 5 is a horizontal section of a modified construction of window;

Figure 6 is a perspective view showing a portion of the jamb member of Fig. 5 illustrating a form of bonding loop for interlocking with the masonry wall;

Figure 7 is a vertical section of another modified form of the invention;

Figure 8 is a horizontal section on line 8—8 of Fig. 7.

Referring to the drawings in detail and particularly to Figs. 1 to 4, the window frame shown comprises jamb members 20, a header member 21 and a sill 22. Each jamb is in the form of a channel, the back of which is provided with an inward off-set 25. Each side flange 26 of the channel is provided with a wide overhanging lip 27, the lips 27 on the opposite flanges being directed towards one another. The lips 27 enclose pockets for receiving counterbalancing means, such for instance as the drum type spring counterbalances indicated at 28. When the jamb member is to be mounted directly in a masonry wall, as shown, for example, in Figure 3, bonding means are attached to the back of the channel, so as to project into the masonary. Such a bonding means is shown at 30, and comprises a corrugated strip of metal embedded in the masonry and having a flange 31 at its end adapted to be attached to the back of the channel in any suitable manner, as for instance by being inserted behind a tongue 32 bent out from the back of the channel. When two adjacent window units are to be mounted together, as shown in Fig. 1, then the two jamb channels are placed back to back, as shown in Figure 4, and are secured together by means of cover channels 35 which fit over the adjacent flange portions of the jamb channels and may be secured in position in any suitable manner, as by means of screws or rivets 36. In this way a very solid mullion is secured and a smooth finish is provided between the two window units. If the window is high and extra strength is desired, a reinforcing bar 37 may be enclosed in the space formed by the off-sets in the backs of the two jamb channels.

The header member 21 shown in Fig. 2 is of metal, rolled or otherwise suitably shaped to form, and is preferably provided with a turned-over bead 40 at its inner edge, with a central downwardly projecting rib 41, with a narrow fold or rib 42 and with an outer folded-over portion 43 which protects the outer margin of the sash from the weather and serves as a means for carrying a resilient sealing member 44 for engagement with the top rail of the upper sash. For the purpose of holding the sealing member 44, the horizontal fold of the portion 43 terminates in a lip 45 which engages the outer bend of the sealing member. The header is also provided with a rib 46 against which the back of the sealing member rests. The rib 42 constitutes a guard and limiting device for the free edge of the sealing member which engages the bead when the sash is moved down, and serves to retain the sealing member under initial tension. The edge of the bead 42 also forms a stop to limit the upward movement of the sash. An angle iron 50 (or series of angle brackets) is preferably secured at its lower end in the inside of the rib 41, its projecting flange being secured in the masonry or attached to a lintel 51, in any suitable manner as by means of screws 52.

The sill 22 comprises a member formed into two steps 60 and 61 and having an inclined por-

tion 62 forming an apron which terminates at its outer edge in a downwardly turned flange 63. The sill is completed by a pair of angle plates 64 and 65 secured to the upper step 60 and to the flange 63, respectively. If desired, the sill may be filled with cement for reinforcing purposes. The overhanging portion of the flange 63 forms a pocket 66 for caulking.

For guiding the sliding sashes the jamb members are provided with spaced guide ribs 70 which are preferably united into a single unit by a web 71. The web 71 is secured to the inner face of the off-set portion 25 of the main jamb channel member and the extremities of the outer legs 73 of the sash guide ribs 70 preferably embrace and fit against the ends of the off-set 25. The webs 71 are removably secured by any suitable means, such as screw 76. The guide members 70 and web 71 are preferably formed in two halves divided along a horizontal line near the middle of the window as indicated at 77 in Fig. 2, so that either half may be removed, thereby permitting the sash to be removed.

The sashes comprise top, bottom and meeting rails which may be of any suitable construction and provided, where necessary, with sealing strips. The side rails of the sashes are channel shaped and carry resilient sealing and guiding members adapted to slide upon the guide ribs 70. As shown in Figs. 3 and 4, the sashes are shown as made of extruded metal and comprise an undercut putty seat 80, a glass supporting flange 81, a front flange 82 towards the outside of the window terminating in an overhanging lip 83 and rear flange 84 towards the inside of the window, terminating in an overhanging lip 85. There is a groove 86 in the bottom of the sash channel adjacent to the flange 84. The resilient sealing and guiding member comprises a strip of bent resilient sheet metal or other suitable material which has a base portion 90 seated in the groove 86 and a flange 91 seated against the inside of the flange 84. The flange 91 terminates in a reversely bent resilient tongue 92 preferably having a raw or unreinforced edge which is received behind and protected by the shoulder 93 formed at the edge of the base 90 adjacent to the wall of the channel 86 towards the outside of the window. The unreinforced edge of the tongue 92 is longitudinally flexible so that it will conform to any irregularities of the rib and form a tight seal therewith at all times. Springing from the shoulder 93 of the base 90 of the resilient strip is a second resilient, flexible edged tongue 95 which is adapted to engage the inner edge of the guide rib 70. The resilient tongue 92 engages the inner side wall of the guide rib and serves to hold the sash in such position that the edge of the lip 83 bears against the outer surface of the guide rib. A three line engagement is thus secured between the sash and the guide rib, one line of engagement, namely, that of the edge of the lip 83 being engagement of one rigid part against another, while the other two lines of engagement are with the resilient tongues 92 and 95. While there are thus three points of sealing against the weather, nevertheless a limited movement of sash, both in the plane of the glass and transversely thereto, is permitted, so that there can be no binding, and the sash will slide easily at all times and under all conditions. The sealing strips are preferably similarly placed in both upper and lower sashes so that in each instance the engagement between the lip 83 of the sash is on the side of the guide rib towards the outside of the building. Thus the wind pressure on both sashes is sustained by the contact of these rigid members. As the flexible sealing and guiding strip is contained in the edge of the sash and moves therewith, it is never exposed to the elements or to tampering with, as may occur where the resilient strip is mounted in the jamb and is always partly uncovered by the sash.

In the construction shown, each sash is provided with a bracket 100 for engaging with the counterbalancing means 28. End plates 101 and 102 (see Fig. 1) are preferably removably secured to each end of each sash stile channel by any suitable means such as screws, not shown. The weather strips are thus secured in place from accidental displacement and protected from ingress of dirt and moisture.

Referring to the construction in Figs. 5 and 6 the jamb here shown comprises a bent or rolled metal channel member 110 having flanges 111 preferably terminating in bent-over edges 112, there being outwardly projecting ribs 113 formed at each edge of the base of the channel. Near the center, the bottom of the channel is bent inwardly to form a supporting leg 114 adapted to carry the web 115 connecting a pair of sash guiding ribs 116. The web 115 is preferably off-set to fit over the edge of the leg 114, and may be removably secured thereto in any suitable manner as by screws 118. The web and sash guiding member is preferably formed in two horizontal halves as described in connection with the guide rib members shown in Figs. 1 to 4. For reinforcing the jamb and assisting in securing it in the masonry wall, a flange plate or angle 120 may be used, its flanged end being secured in the bottom of the leg 114. To interlock the jamb with the masonry, a bonding loop 122 may be employed, this loop being shown as comprising a rod bent into loop form and corrugated and having hooked ends 123 which hook into slots 124 formed in the back of the jamb 110. The hooked ends 123 are preferably bent at an obtuse angle to the rods as shown so that by hooking them partly or wholly into the slots a range of adjustment between the jamb and the rods built into the masonry is obtainable.

The sashes are shown as formed of extruded metal shapes having means for receiving and holding the glass, each stile having an outer flange 130 terminating in a lip 131 adapted to bear against the outer wall of a sash guiding rib 116, and an inner straight flange 132. In the angle between the flange 132 and the base 140 are formed a pair of ribs 145 and 146 which are adapted to engage and retain the bent portion 147 of a resilient sealing and guiding member which is provided with two resilient tongues 148 and 149 adapted to engage respectively with the side and inner edge of the sash guiding rib 116. The pressure of the tongue 148 against the inner face of rib 116 serves to draw the edge of lip 131 against the outer face of rib 116 so that a three point sealing engagement between the sash and guide rib is provided. Two of the points of engagement are yielding, while the third is rigid metal to rigid metal so that while the sash is tightly sealed against the weather, it is free to slide at all times without jamming or rattling.

Figures 7 and 8 show a modified construction of window in which each jamb is formed of a channel 150 at each edge of which is a flange 151 terminating in a lip 152. The central part of the channel is off-set as indicated at 153 and

the sashes are guided by two guide ribs 154 connected by a web 155. The member comprising the ribs and web is removably secured in place in any suitable manner, as by screws 157, and is divided horizontally in two parts as mentioned heretofore in connection with the other forms of the invention. The removal of the guide rib members permits removal of the sashes and also provides access to the counterbalancing means indicated at 158. The sash stiles are of channel form and each comprises a base 160 carrying glass and putty retaining means and inner and outer flanges 161 and 162 which have lips 163 at their edges and lugs 164 placed a short distance from the base 160. Sash sealing and guiding members of resilient material are mounted in the stiles and in the form shown comprise a curved base adapted to contact with the inner end of a guide rib 154 and two inwardly bowed tongues 166 adapted to engage the sides of the guide rib. Relatively acute bends 170 connect the tongues with the curved base 165, these bends interlocking beneath the lugs 164 and the edges of the tongues being retained behind the lips 163. 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 165. All of these contacts are weather tight but yielding so that the sash floats freely and slides easily without binding or jamming.

The header of the window shown in Fig. 7 comprises a non-ferrous or non-corrosive member 180 which is bent to provide a parting bead 181 and at its outer edge is formed into a flange 182 which terminates in a reentrant lip 183. Near the flange 182 the member 180 is bent to form a bead 184. A resilient metal sealing member is provided for engagement with the top rail of the sash. This sealing member comprises a base 185 having a hook-shaped flange 186 at one edge adapted to engage over the bead 184, the resilient member also having a flange 187 lying inside of the flange 182. Flange 187 is formed at its outer edge with a bend 188 adapted to engage under the reentrant lip 183 to assist in holding the sealing member in its recess. The edge portion of the sealing member beyond the bend 188 is bent upwardly to form a resilient tongue 189 which bears against the outer face of the top rail of the sash so as to seal the joint at that point. The top rail of the sash also bears against the portion 186 over the bead 184 and the inner face of the sash is held in close engagement with the face of the parting strip 181 by reason of the pressure of the tongue 189. A three point sealing engagement with the top rail of the sash is thus secured. When the sash is moved down, the edge of the tongue 189 is limited in its movement by the bead 184 which protects the edge and maintains the tongue under initial tension.

The non-ferrous or non-corrosive header member 180 is preferably attached to and reinforced by an angle member 190 which need not be of non-ferrous metal, the members 180 and 190 being secured together in any suitable manner as by screws or rivets 191. The member 190 may be provided with a flange 192 at its inner edge which will act as a plaster stop and also add strength to the head of the frame. At its outer edge, the member 190 is preferably provided with a wide flange 193 which may be secured to the lintel 194 by screws or rivets 195 or otherwise mounted in the wall.

The sill of the window is formed of bent or extruded metal, preferably non-ferrous or non-corrosive metal, and comprises an apron portion 200 which is downwardly flanged at its outer edge at 201, and is then provided with an inward off-set 202 which forms a pocket for caulking 203. Back of the apron 200 the sill is formed into a shouldered seat 204 upon which the bottom rail of the lower sash seats. Inwardly of the seat 204 the sill member is formed into a hollow flange 206, into which fits the edge of a member 207 which preferably terminates in a flange 208 adapted to rest on the masonry. The member 207 constitutes a supporting leg for the sill, and it may be adjusted to project into the hollow flange more or less as the construction of the wall may require. It may be held in adjusted position in the hollow flange 206 in any suitable manner, as by welding, riveting or the like. The hollow flange 206 is preferably formed to provide an overhanging hooked portion 210 which engages and holds the resilient metal sealing member for the bottom rail of the sash. Such resilient sealing member comprises a base 211 having an off-set portion 212 at its upper edge adapted to hook under the overhanging hooked portion 210 of the hollow flange. The sealing member is bent to form a fold 213 engaging the outside of the portion 210, and a resilient tongue 214 adapted to engage the inner face of the bottom rail of the sash. When the sash is raised the lower edge of the tongue 214 engages behind the offset 215 of the shouldered seat 204, the edge of the tongue being thus at all times protected and the tongue being held under initial tension.

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 Fig. 8 may be employed. This member comprises a flange 220 adapted to be secured to the jamb channel 150 in any suitable manner, as by being fitted under tongues 221 bent out from the back of the offset portion 153 of the channel member 150. Adjacent to the flange 220 the reinforcing member has a shoulder 225 which seats against the end of the offset portion 153. The reinforcing member has an inclined web 227 which is preferably inclined at a considerable angle such as approximately 45° 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 151 of the jamb 150, by suitable means such as screws or rivets 232.

The construction shown in Figures 7 and 8 is not claimed herein. Portions thereof are claimed in applicants' copending continuation in part application Serial No. 307,758, filed December 6, 1939.

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 a double hung window construction, a frame having a header member of sheet metal construction having a centrally disposed parting strip, a narrow rib comprising a fold in said metal outwardly disposed from said parting strip and a downwardly directed rib intermediate said fold and the outer edge of said header member, said header member terminating at its outer edge in a downwardly directed flange having a horizontal flange on the end thereof extending inwardly beyond the plane of said rib, said horizontal flange terminating in an upwardly turned lip.

2. In a double hung window construction, a frame having a header of sheet metal formed to provide a parting strip and means between said parting strip and the outer edge of the header for imprisoning a V-shaped resilient weather stripping member, said means including a rib comprising a fold in said header member, a longer rib situated outwardly therefrom and a folded-over portion at the outer edge of said header member terminating in an upwardly turned lip in combination with a V-shaped resilient member having its base portion seating against said longer rib, the vertex of the V being held by said upwardly turned lip, and the flexible leg of the V comprising a resilient tongue limited in movement inwardly of the window by said fold in said header.

3. In a sliding window, a sash including a stile having resilient weather sealing means entrapped therein, said stile including a base having a groove therein adjacent the inner edge of said stile, a flange extending from the inner edge of said stile terminating in an overhanging lip, having a portion on the end thereof turned inwardly towards said base, a flange on the outer edge of said base, said flange terminating in an overhanging lip, and a resilient weather sealing member held in said stile, said weather sealing member comprising a base held in said groove, a resilient tongue extending laterally from one edge of said base, a flange portion engaging said inner flange of said stile and an inwardly turned resilient tongue, the angle between said flange and tongue being held by said inwardly turned lip of said inner stile flange.

4. In window construction, a channel shaped jamb member of sheet metal having an inwardly projecting supporting leg situated intermediate its edges and an outwardly projecting folded bead at either edge, and flanges extending inwardly of the window from the inner edges of said folds.

5. In window construction, a window frame having a jamb, said jamb having an inward offset portion forming a channel in the back thereof, a flanged plate attached to the jamb at the bottom of said channel and adapted to extend therefrom into the building wall and a metal bonding loop secured to said jamb on either side of said plate and adapted to extend into the wall around said plate.

6. In a double hung window, a frame including a jamb member and sashes including channeled stiles, said jamb being provided with an inward off-set, guide means for said sashes comprising spaced rigid ribs joined by an intermediate web, said web being secured to said inward off-set and said ribs extending into said channeled stiles, and having positive contact with the outer channeled walls of said stiles and resilient sheet metal weather stripping members in said stiles and sliding in contact with said ribs.

7. A double hung window construction including a frame having a jamb, a rigid guide rib on said jamb, a sliding sash having a channeled stile into which said guide rib extends, a flange on said stile extending inwardly of said channel and engaging said guide rib on the outer side thereof, and a resilient metallic weather strip in said channeled stile engaging said guide rib along a plurality of angularly related spaced lines.

8. In a double hung window, a jamb having a three sided sash guide thereon and a channeled shaped sash stile having an inwardly extending flange on the outer channel wall, a resilient sealing weather strip member mounted in said stile, said flange contacting said sash guide on the outer side thereof and said weather strip engaging said guide on its other two sides and tending to force said sash in a direction to hold said flange in contact with said guide and in a direction away from the jamb in the plane of the window.

9. In a double hung window, a frame including jamb members and sashes including channeled stiles, guide means for said sashes comprising three sided ribs secured to said jambs and extending into said channeled stiles, resilient sheet metal weather stripping members in said stiles, the outer legs of said channeled stiles being in positive sliding engagement with the sides of said guide ribs towards the outside of said window and the resilient sealing weather stripping being in resilient contact with the other two sides of said guide ribs.

10. In a metal window construction, a mullion comprising two jamb members placed back to back, said jamb members having centrally situated inwardly offset portions thereon, a reinforcing bar enclosed in the space formed by said offset portions and three-sided sash guides mounted on the jamb faces and secured to said offset portions, the outer sides of said sash guides cooperating with said offset portions.

11. In a window sash, a stile having a resilient metallic tongued weather strip mounted therein, said stile including a base portion, a long flange on the inner edge of the said base portion, a flange on the outer edge thereof and lips mounted on the inside edge of each flange to secure said tongues of said resilient weather stripping member from free unlimited movement with relation to said stile, said tongues having bearing surfaces acting in directions at right angles to each other.

12. A double hung window, a frame including a jamb member and sashes including channeled stiles, said jamb member having an inwardly projecting supporting leg situated intermediate its edges, an outward projecting folded bead at either edge and flanges extending inwardly of the window from the inner edge of said folds, said leg having mounted thereon guide means for said sashes comprising spaced rigid ribs joined by an intermediate web, said web being secured to said leg and said ribs extending into said channel stiles and having contact with the outer channel walls of said stiles and resilient sheet metal weather stripping members in said stiles and sliding in contact with said ribs.

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