July 29, 1941. E. PEREMI ET AL 2,250,723

WINDOW CONSTRUCTION

Filed May 20, 1939

Fig. 1.

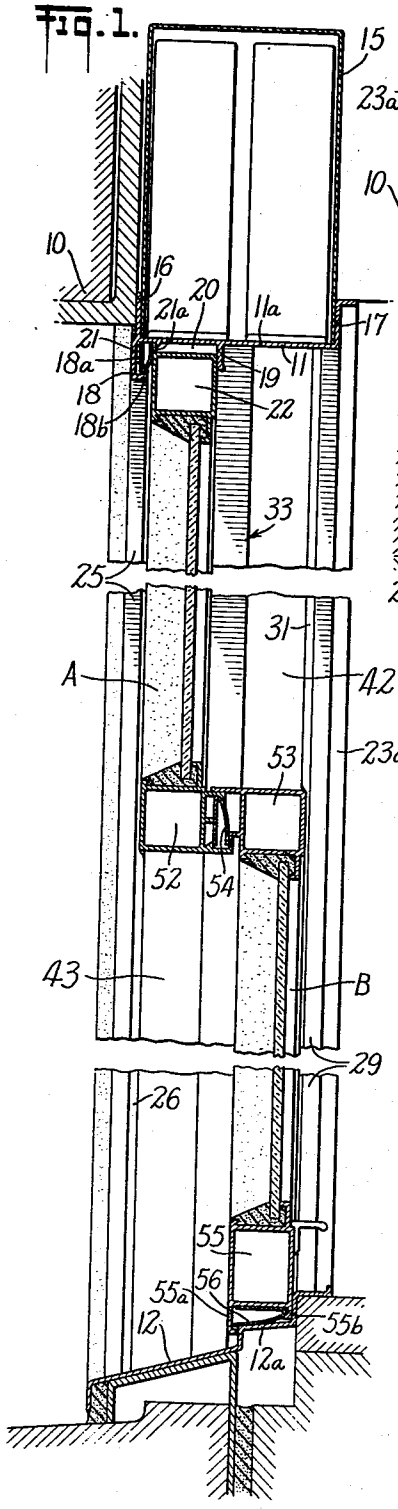


Fig. 2.

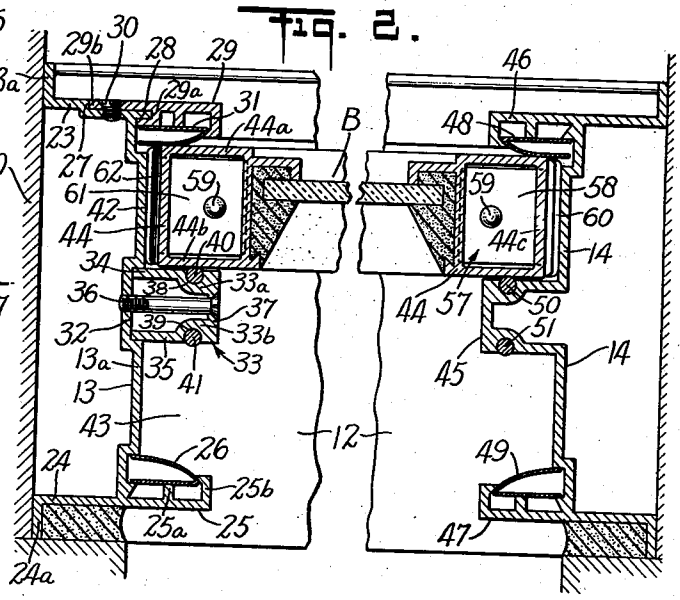


Fig. 5.

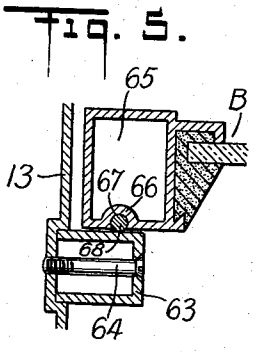


Fig. 3.

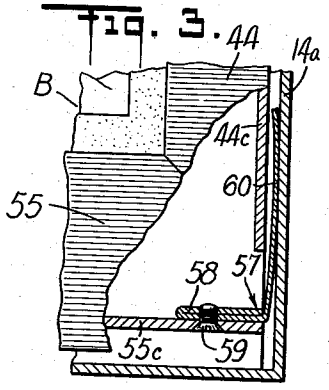
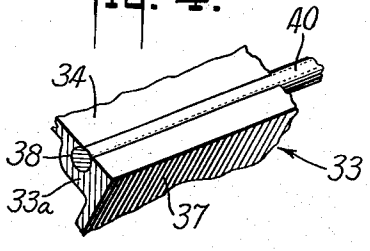


Fig. 4.



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WINDOW CONSTRUCTION

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5 Claims. (Cl. 189—72)

This invention relates to window construction, and particularly to a construction for a metal window.

It is among the objects of this invention to provide a metal window wherein the sash may easily be installed in or removed from the window frame, and wherein the spaces between the side bars of the sash and the frame are effectively sealed by means which prevent rattling of the sash in the frame. It is another object of the invention to provide a window of the above nature wherein the relatively movable surfaces of the frame and sash which normally tend to engage one another have interposed therebetween bearing and lubricating members which prevent the scoring and destruction of these contacting surfaces, which would otherwise result from the sliding engagement therebetween.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the drawing, wherein there are shown two embodiments of our invention,

Figure 1 is a sectional elevation of a double hung window incorporating our invention;

Figure 2 is a horizontal section of the window shown in Figure 1, portions thereof being broken away;

Figure 3 is a fragmentary elevation, partly in section, of a portion of the window;

Figure 4 is a fragmentary sectional perspective of a portion of our window; and

Figure 5 is a fragmentary horizontal section of a modified form of a portion of our window.

Similar reference characters refer to similar parts throughout the various views of the drawing.

Referring now to Figure 1, the opening formed by the sliding structure 10 is framed by an upper frame member 11, a lower frame member 12, a side frame member 13 (Figure 2) and another side frame member 14, these frame members being joined at their abutting ends in any suitable manner to form an integral frame disposed in the building structure to receive upper and lower window sashes A and B respectively (Figure 1) of a double hung window.

Upper frame member 11 is suitably secured to the bottom of a cover channel 15 suitably disposed above the window frame in the building structure, the cover channel being adapted to house sash balances of a conventional nature. Frame 11 is preferably an extruded section of a non-ferrous metal, such as aluminum, and accordingly comprises a web portion 11a from which extend upwardly flanges 16 and 17, and from which extend downwardly a pair of spaced stop beads 18 and 19 which form between them a sash channel 20. Outer bead 18 has formed integrally therewith a plurality of projections 18a and 18b, which form a suitable chamber to receive and hold a resilient metal weather strip 21, one side 21a of which is arranged to bear against the outer upper edge of the upper sash bar 22 of sash A. When in its uppermost position, upper sash bar 22 fits within sash channel 20 so that its upper inner edge engages stop bead 19 by reason of the resiliency of weather strip 21. Upper sash bar 22 is thus firmly held within its channel 20 against stop bead 19, the weather strip not only effectively sealing the interior against the weather, but also comprising an effective anti-rattle device.

As hereinbefore noted, upper frame member 11 is an extruded section and therefore flanges 16 and 17 and stop beads 18 and 19 are, together with the body 11a of the frame member, integral.

As is better shown in Figure 2, side or mullion frames 13 and 14 are also extruded sections, also preferably of a non-ferrous metal, such as aluminum, for example. Frame 13 is generally U-shaped and thus comprises a web of body portion 13a from which extend legs 23 and 24, having respective flanges 23a and 24a, which may be attached to building structure 10 in any suitable manner. A stop bead 25 is preferably formed integrally with the frame, and extends therefrom generally in the plane of leg 24. Bead 25 includes projections 25a and 25b, which form with portions of web 13 a suitable chamber for retaining a weather strip 26 preferably formed of a resilient metal. The other leg 23 of frame 13 is provided with a shoulder 27, and a projection 28, which together comprise a suitable seat for a detachable stop bead 29 provided with a groove 29a adapted to fit over projection 28, and a leg 29b which rests against shoulder 27. A screw 30 may be used, if desired to hold stop bead 29 in place. Bead 29 has formed thereon projections similar to those provided on bead 25, which suitably retain a weather strip 31 similar to weather strip 26.

The web 13a of frame 13 has preferably formed centrally therein a channel or groove 32 in which is disposed a stop bead or parting strip generally indicated at 33. Preferably bead 33 is also extruded from non-ferrous metal such as aluminum, and may be substantially U-shaped in cross

section so that its legs 34 and 35 fit in channel or groove 32 in frame web 13a. Preferably, bead 33 is secured to frame web 13a as by a suitable number of screws 36 which extend through the web 37 of the bead and are threaded into the bottom of channel 32.

The opposite outer edges 33a and 33b of bead 33 are preferably thickened as shown, and grooves or slots 38 and 39 are formed respectively in these thickened portions. These slots are formed at the same time the bead is extruded. It will be noted that these grooves are preferably circular, although not necessarily so, and the openings thereof in the opposite legs 34 and 35 of stop bead 33 are narrower than the diameters of the slots.

As shown in Figure 4, slot 38 carries a circular bearing member 40, which is preferably formed of a non-ferrous alloy such as an alloy which includes zinc and antimony, for example, or any other alloy characterized by non-abrasive and lubricating properties. As an alloy which includes zinc and antimony is characterized by these properties, we find it an excellent one for our purposes, but do not necessarily wish to be confined or limited thereto.

Referring back to Figure 2, a similar bearing member 41 is disposed in groove 39, and thus bearing members 40 and 41, or rather those portions thereof which extend from their respective slots, lie within the channels 42 and 43 formed by the central disposition of stop bead 33 with respect to side beads 25 and 29, these channels being adapted to receive the side sash bars of the window sashes.

Thus, lower sash B includes a side sash bar 44 (Figure 2), which is slidably disposed in channel 42, its inward surface 44a engaging weather strip 31, and its outward surface 44b lying adjacent leg 34 of stop bead 33, and in engagement with sealing and lubricating wire or element 40. By reason of the resiliency of weather strip 31, the window sash is biased toward bearing and lubricating member 40, and as this member 40 is preferably softer than the metal of the sash bar, sliding operation of the sash bar perfects the sealing engagement between it and member 40 without the sash bar being scored or otherwise impaired. Thus, the inner and outer surfaces of side sash bar 44 are effectively sealed respectively by weather strip 31 and member 40. In a similar manner, upper sash A (Figure 1) which slides in channel 43 (Figure 2) is maintained in operative position and is suitably sealed by weather strip 26 and bearing and lubricating element 41.

Mullion or frame 14 is also preferably an extruded non-ferrous metallic section similar in many respects to frame 13, but differing therefrom in that it includes a central stop bead 45, an inner stop bead 46, and an outer stop bead 47, all of which preferably are integral with the other portions of the frame. These several beads are substantially similar to those extending from frame 13, and thus include weather strips 48 and 49, and bearing and lubricating elements 50 and 51, the disposition and action of which are the same as described with respect to those on frame 13. Thus, frame 14 includes channels similar to channels 42 and 43 in frame 13 for the reception of sashes A and B of the double hung window. By reason of the detachability of beads 29 and 33 on frame 13, installation of sashes A and B in the frames or removal thereof is easily effected. Thus beads 29 and 33 may be removed, and upper sash A may be slipped into place in channel 43 in frame 13, and a corresponding channel in frame 14. Bead 33 may then be secured in place to hold sash A in operative position. Thereafter sash B may be slipped into its channels in frames 13 and 14 and held therein by the attachment of stop bead 29 to the outer edge or leg of frame 13.

As viewed in Figure 1, sash A includes a lower sash bar or meeting rail 52 which registers with an upper sash bar or meeting rail 53 of lower sash B. Suitable projections formed on meeting rails 52 and 53 are provided for securing a weather strip 54 in place, which, upon engagement of the meeting rails, effectively seals them against the entrance of weather.

Lower sash B includes a lower sash bar 55 preferably extruded from a non-ferrous metal such as aluminum, and includes a pair of flanged projections 55a and 55b which together hold in proper operative position a weather strip 56, the lower side of which is adapted to engage a surface 12a of lower frame member 12, when lower sash B is in its closed position. It will now be seen that when sashes A and B are closed, their upper, lower and side sash bars 22, 55 and 44, respectively, all engage weather strips, and thus the window is effectively sealed about its periphery. Weather strip 54 between meeting rails 52 and 53 of the sashes completes the sealing.

As hereinbefore noted, bearing and lubricating members 40 and 50 in beads 33 and 45 engage the rear surfaces of the side sash bars of lower sash B to facilitate sliding operation of the sash, the peculiar lubricating property of the zinc-antimony alloy, of which the members preferably are formed, effectuating this condition. Members 41 and 51 in the rear surfaces of beads 33 and 45 respectively, similarly facilitate sliding operation of upper sash A.

Further to perfect the seal, we provide, as is shown in Figure 3, a supplemental sealing strip generally indicated at 57. Strip 57, which is also preferably formed of the zinc-antimony alloy, includes a doubled over bottom flange 58, which is secured as by a screw 59 to the bottom surface 55c of lower sash bar 55, see also Figures 1 and 2. Sealing strip 57 (Figure 3) also includes an upwardly extending flange 60 which is disposed between the web 14a of side 14 and the outer side 44c of the sash side bar 44. A similar strip 61 (Figure 2) is disposed in the outer side of sash B, and thus has a flange 62 lying in channel 42 between frame web 13a and the sash side bar. As flanges 60 and 62 of supplemental weather strips 57 and 61 respectively are resilient, and are biased outwardly of the sides of the sash, they not only are effective as weather seals, but also act to hold the window sash B in proper operative position. By reason of the fact that these supplemental weather strips are formed of the zinc-antimony alloy referred to, they readily slide against the non-ferrous frames 13 and 14 without scoring the frames.

It may now be seen that we have provided a metal window which is thoroughly and effectively sealed against the weather, and this with a minimum of weather stripping, and which, by reason of the use substantially throughout of extruded metallic sections, attains a structural simplicity and useful rigidity, well adapted to all types of metal windows. By the use of the alloy bearing and lubricating strips, operation of the window sashes is easily effected without damaging the non-ferrous frames or sash bars.

Under certain circumstances, it may be desir-

able that the sash carry the bearing and lubricating strip, rather than the stop bead. To this end we provide the structure shown in Figure 5, wherein the side or mullion frame 13 has detachably secured thereto a bead 63 as by screws 64. Sash B, in this instance, has a sash side bar 65 provided with a thickened portion 66 in which a groove 67 is formed. Groove 67 carries a sealing and lubricating element 68 similar in structure and purpose to element 40, shown in Figure 2, element 68 riding against the front surface of bead 63 as the window sash slides up and down.

It will be obvious, of course, that the other sash side bars are similarly provided with lubricating strips.

It is of course to be understood that in so far as the removability of the sash is concerned, the invention is applicable to window constructions wherein the sash and frame are formed entirely of metal, or wherein portions of each, or both, may be formed partly of metal and partly of wood. As to preventing rattling of the sash, the material of the frame and sash is not important. In so far as the lubricating of the relatively movable parts of the frame and sash is concerned, it is of course important that the adjacent relatively movable surfaces are of such metal that the friction created by such relative movement will cause a scoring or abrasion of said surfaces.

Accordingly, it will appear that we have provided a window that accomplishes the objects hereinabove set forth in a thoroughly practical and efficient manner.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawing, is to be interpreted as illustrative and not in a limiting sense.

We claim:

1. As an article of manufacture, a parting strip for a double hung window comprising a substantially U-shaped member having a pair of thickened portions, said thickened portions having longitudinal grooves or slots cut therein adapted to receive and support outwardly facing sealing and lubricating elements.

2. In a double hung window, in combination, a frame member, a stop bead extending substantially at right angles from said frame member, a resilient weather strip secured to said stop bead and coextensive longitudinally therewith, a second stop bead secured to said frame member and forming with said first-mentioned stop bead a sash guiding channel, a metallic sash slidably mounted in said channel, and a non-resilient metallic sealing and lubricating member mounted in said second stop bead and adapted to support in sliding engagement said sash forced thereagainst by said weather strip.

3. In a double hung window, in combination, a frame member having spaced stop beads extending therefrom which define a sash guiding channel adapted to slidably support a sash, a metallic sash slidably disposed in said channel, a resilient weather strip disposed between one of said beads and said sash and adapted to bias said sash toward the other of said stop beads, and a metallic sealing and lubricating member of substantially greater horizontal cross section than said weather strip disposed between said second stop bead and said sash and adapted to support said sash as biased thereagainst by said weather strip, said member being fabricated from a material softer than that of said sash and adapted to be worn away and thereby amplify its sealing relationship therewith.

4. In a double hung window, in combination, a frame member having spaced stop beads extending therefrom which define a sash guiding channel adapted to slidably support a sash, a sash slidably disposed in said channel, a resilient weather strip disposed between one of said beads and said sash and adapted to bias said sash toward the other of said stop beads, an elongated non-resilient metallic sealing and lubricating member immovably secured to said second stop bead and in sliding engagement with said sash for supporting said sash as biased thereagainst by said weather strip, and a resilient member having sealing and lubricating properties interposed between said sash and said frame member for biasing said sash transversely thereof.

5. In a double hung window, in combination, a frame member having spaced stop beads extending therefrom which define a sash guide, a channel adapted to slidably support a sash, a metallic sash slidably disposed in said channel, means disposed between one of said beads and said sash for biasing said sash in one direction only normal to the plane of said sash and toward the other of said stop beads, and a sealing member having sealing and lubricating properties fabricated from an alloy including zinc and antimony disposed between the other of said stop beads and said sash and adapted to support said sash as biased thereagainst by said means, the surface of said member in engagement with said sash being adapted to increase upon continued sliding movement of said sash thereagainst.

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