Sept. 11, 1934. H. L. GRAVES 1,973,565

WINDOW MOUNTING

Filed Aug. 26, 1932

Fig. 1.

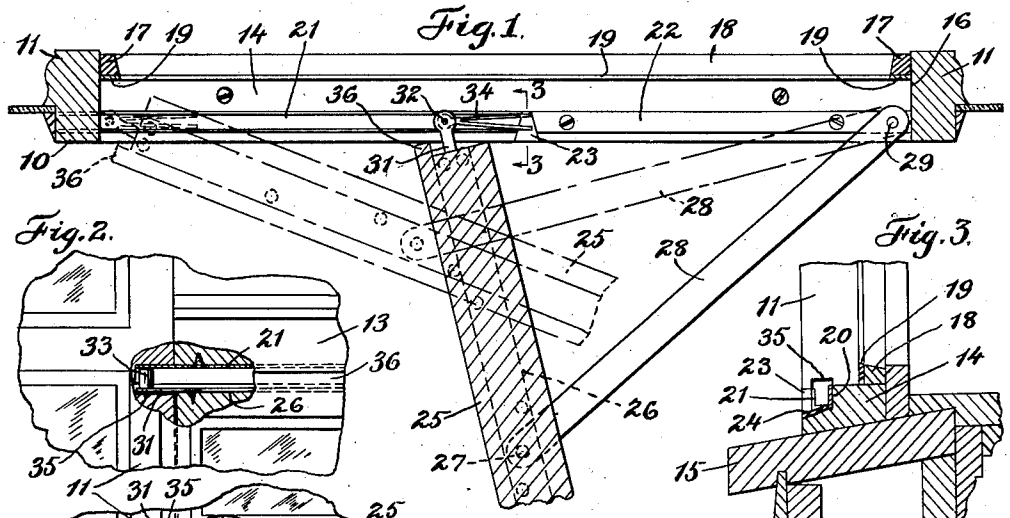


Fig. 2.

Fig. 3.

Fig. 6

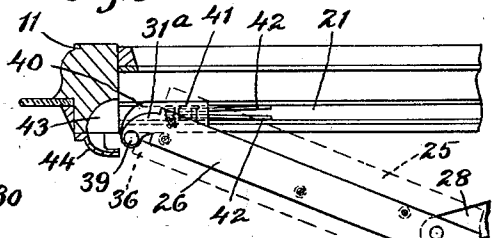


Fig. 4.

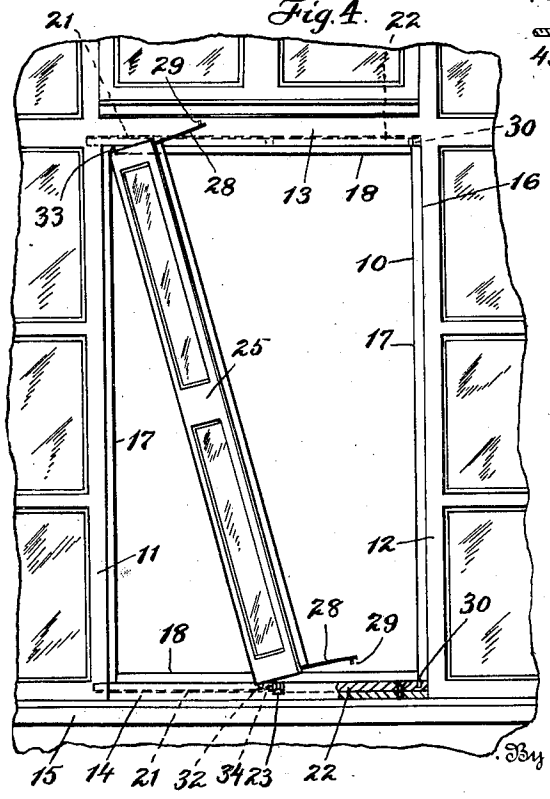


Fig. 7.

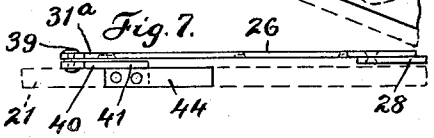
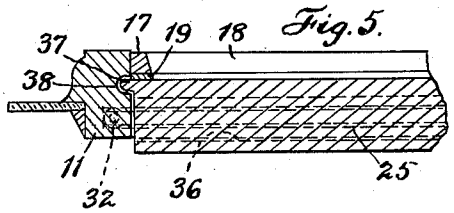


Fig. 5.



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1,973,565

WINDOW MOUNTING

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4 Claims. (Cl. 20—42)

This invention relates to casement windows and doors of the sliding-hinge type. The swinging sashes of such windows are easier to operate and to clean on the outer side than the ordinary sliding sash, but their general adoption has been hindered by the fact that such windows heretofore could not be made weathertight without troublesome and costly expedients.

An object of the present invention is to provide a simple and inexpensive mounting, which is mainly or wholly concealed when the sash is closed, according to which the window joints are substantially sealed against the passage of air and moisture. Further objects are to facilitate removal of the sash, to provide for drainage of water from the lower guide and to furnish an improved stop device.

Of the accompanying drawing, Fig. 1 is a horizontal section of a window having a sash mounted according to this invention and shown in open position.

Fig. 2 is a front elevation, partly broken away and in section at the vicinity of the upper and lower hinges.

Fig. 3 is a detail transverse vertical section on line 3—3 of Fig. 1.

Fig. 4 is a front elevation, partly in section, illustrating the manner of removing the sash.

Fig. 5 is a partial horizontal section showing a modification.

Fig. 6 is a partial horizontal section showing a second modification.

Fig. 7 is a partial edge view of the lower mounting assembly in the latter modification.

The sash and frame are here shown as adapted for wooden construction, but the invention also applies to metal windows. The sash could swing on either a vertical or a horizontal axis, and is shown in the former way. The side toward which the sash swings in its opening movement is considered the front, which is generally the outer side of the building. The window is here illustrated as a panel or section in a larger window whose marginal portions can be fixed in the building wall, but its frame could obviously be fixed directly in said wall without the marginal lights and their supporting rails.

Referring at first to Figs. 1 to 4, 10 is a window frame comprising vertical or side jambs 11, 12, an upper horizontal or head jamb 13 and a lower horizontal jamb or sill member 14. The latter in the case of a wooden frame is preferably made as a separate member overlying and screwed to the main sill member 15 between the side jambs, and adapted to be shortened in depth by planing off its under side to avoid sticking of the sash due to swelling or distortion of parts after the window has been installed. 16 is the sash opening defined by the frame 10. 17 and 18 are vertical and horizontal flange strips to whose front sides are glued felt packing strips 19 as shown in Figs. 1 and 3 to form a rear stop for the sash and provide a weathertight joint between the frame and the sash on the inner side of said sash when the latter is closed.

The upper and lower jambs 13 and 14 are each formed with a rectangular groove 20 (Fig. 3) located toward the front side of said member and extending from end to end thereof. In each groove is cemented a channeled metal guide or track 21 for the slidable hinge member of the sash and a solid metal bar 22 mounted in alignment with said track and slightly spaced therefrom to provide track drainage, said bar at one end acting as a stop for the sliding hinge and at the other end as a pivotal support for the sash link. Said track and bar are further secured by screws in their groove. Between the inner ends of the track and bar is an opening 23, wedge-shaped in plan, horizontally open on the front side and partly formed in the wood of the lower sill or jamb member 14 by cutting away the latter with an outwardly and downwardly-sloping bottom, said bottom and the rear side of the opening being faced with a putty-like cement lining 24 (Fig. 3) to seal the crevices. This opening 23 provides a channel or outlet to the front of the sill for water which may collect in the channeled track 21 and which would tend to cause corrosion if allowed to remain, said channel being upwardly open as shown, to permit easy removal of any obstructing matter.

25 is the window sash to whose upper and lower edges are screwed respective plates 26 each having a permanent pivotal connection at 27 with a flat guiding link-bar 28 to whose other end is fixed a pivot pin 29 removably mounted in a hole 30 in the bar 22 to facilitate removal of the sash from its frame. Each of the link bars 28 is a spring structure slightly bowed or bent toward the jamb 13 or 14 with which it engages to furnish a tension for retaining the pivot pins 29 in their holes in the bars 22 when the sash is swung open.

One end of each of the plates 26 is formed with a hinge member 31 projecting beyond the vertical edge face of the sash 25, the lower and upper hinge members being provided with respective pivots or hinge pintles 32 and 33 which are thereby fixedly secured upon and spaced or offset

from the sash body at its hinged edge, in the plane of the sash.

The lower hinge pintle 32 occupies a hole in one end of a complemental hinge member 34 slidably mounted in the channeled track 21 and made in the form of a V-shaped spring shoe whose legs engage the track sides with some tension to furnish a friction. While the spring shoe and track could be respectively provided with a projection and a series of holes or notches in accordance with familiar practice to hold the window open in various positions, it is preferred to omit such feature in order that the opened sash may automatically blow shut by excessive wind pressure in case of a storm. In the full-open position of the sash, one leg of the shoe 34 is stopped by abutting against the inner end of the bar 22 before the sash has reached a position at right angles to the frame, in order to make it easier to close said sash. While a similar spring shoe could be provided in connection with the upper hinge member 31, it is preferred to omit it in that case and make the upper hinge pin 33 of sufficient diameter for direct guiding engagement with the corresponding track 21.

When the sash is closed, its projecting hinge members 31, the pintles 32 and a portion of the spring shoe 34 are received in respective horizontal pockets or recesses 35 formed in the jamb 11 at the upper and lower corners of the sash opening and the corresponding ends of the tracks 21 are also extended into these pockets.

The described offset hinge construction permits the use of a front sealing lip or flange 36 on all four edges of the sash to overlap the front face of the window frame 10 and supplement the seal formed between the rear side of the sash and the felt-packed frame flanges 17 and 18, and thus to provide substantially weathertight window joints when the sash is closed. Fig. 1 shows how the offsetting of the hinge axis avoids interference between the sealing flange 36 and the horizontal frame jambs when the window is open. It will be evident that when the window is shut the described sash mountings, being located within the thickness of the frame, are covered and substantially concealed by the sash, and when said sash is open, no portion of its body projects within the window opening. In Fig. 1, a partly-closed position of the sash and link is indicated in broken lines.

Fig. 4 illustrates how the sash can be removed from its frame without unscrewing any parts of the mounting from either frame or sash as has been required in prior structures of this class.

The sash is first swung open, the link pivots 29 are then removed from their bearing holes 30 in the bars 22 by springing the links 28, said links are swung forwardly on the sash to clear the frame and the sash is then tilted in a direction parallel with the plane of the window opening to move its upper end toward the jamb 11 until hinge pin 33 comes out of the upper track 21, the spring shoe 34 at the same time being tilted upwardly in the lower track, whereupon the upper end of the sash can be swung outwardly and the sash lifted to clear the lower hinge pin 32 from the spring shoe. The sash is now free from the frame and can be turned and carried in through the window opening. This removal can be performed by an operator on the inside.

Fig. 5 represents a modification wherein the supplementary sealing at the hinged edge of the sash is effected by means of a tongue or ridge 37 on the rear vertical edge corner of the sash projecting laterally into a complemental groove 38 in the jamb or stile 11 when the sash is closed, the other three edges of the sash having front sealing lips or flanges 36 overlapping the frame as in the preceding embodiment. This construction is particularly adapted for a relatively-narrow stile because the absence of the front sealing lip on the hinged edge permits the amount of offset of the pivot 32 from said edge to be reduced by an amount corresponding to the width of said front sealing lip.

In the modification shown in Figs. 6 and 7, each of the plates 26 attached to the horizontal edge faces of the sash 25, which is here represented in broken lines, is formed with an outwardly-curved projection 31^a constituting a hinge member and permanently connected by a pivot pin 39 with a complemental curved hinge member 40 formed on a sliding shoe 41. The top plate of this shoe overlies the track 21, and to a fin on its under side are attached a pair of spring friction plates 42 running in the channel of the track. The axis of the hinge pin 39 in this case could coincide with the rear corner of the sealing flange 36 on the sash, but to provide some tolerance affording sufficient flange clearance at all times, said axis is preferably spaced a slight distance laterally from the edge of the sealing flange as indicated in Fig. 6. Pockets 43, open both laterally toward the sash opening and to the front of the frame, are formed in the stile or jamb 11 to accommodate these hinges when the sash is closed, and each of said pockets may, if desired, be covered by a detachable metal cap 44. In this modification, all parts of the sash mounting are substantially covered or concealed by the sash in its closed position except for a forwardly-projecting part of each hinge, which may be substantially concealed by the cap 44 as described.

I claim:

1. In window construction, the combination of a window frame having channel tracks on opposite members thereof, a swinging sash having pivots slidable on said tracks and freely separable from the latter when the pivot axis is tilted with the sash in an open position, and a spring slide in one of said tracks, engaging the corresponding pivot and adapted to tilt with the latter and emerge from the track in the course of such separation.

2. In window construction, the combination of a frame having a sash opening, tracks on said frame, and a sash having a mounting in said opening including slidable pivot connections between the tracks and sash, and spring link connections tending to a bowed shape pivoted to the sash and frame and normally retained in connected relation by the bowing tendency of the links, all of said connections being freely separable when the sash is open to permit the removal of the latter without disconnecting members of the mounting from the frame or sash.

3. A window frame having a sash opening and provided on opposite sides of said opening with guideways in the plane of the frame which at one end extend inward into the side members of the frame, thus providing pivot receiving recesses, and a swinging sash having hinge connections at the side of the sash which is next to the side of the frame carrying the recesses, such connections being rigid with the sash and projecting out past the side thereof and provided at their ends with pivots which ride in the guideways and move into the recesses when the sash is closed.

4. A window frame having a sash opening and provided on opposite sides of said opening with guideways in the plane of the frame which at one end extend inward into the side members of the frame, thus providing pivot receiving recesses, a swinging sash provided along the side which opposes the side of the frame having the recesses with an overlap for such side of the frame, and hinge connections at the side of the sash which has the overlap, such connections being located in the plane of the sash rigid therewith projecting out past its edge and provided at their ends with pivots which ride in the guideways and move into the recesses when the sash is closed.

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