July 8, 1958 J. POOLE, JR 2,841,834

SLIDING WINDOW SASH STRUCTURE

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Fig. 1

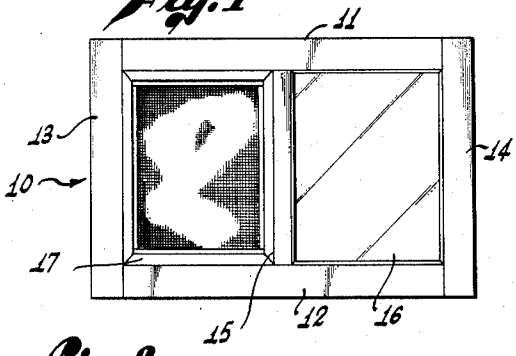


Fig. 2

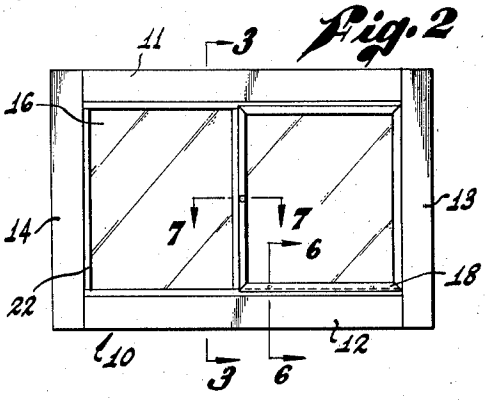


Fig. 3

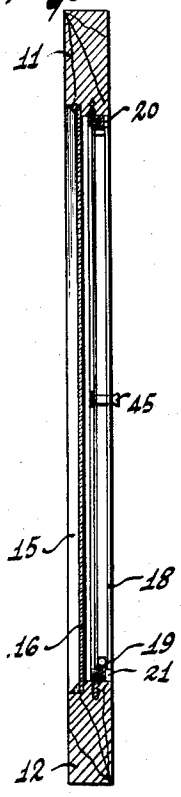


Fig. 4

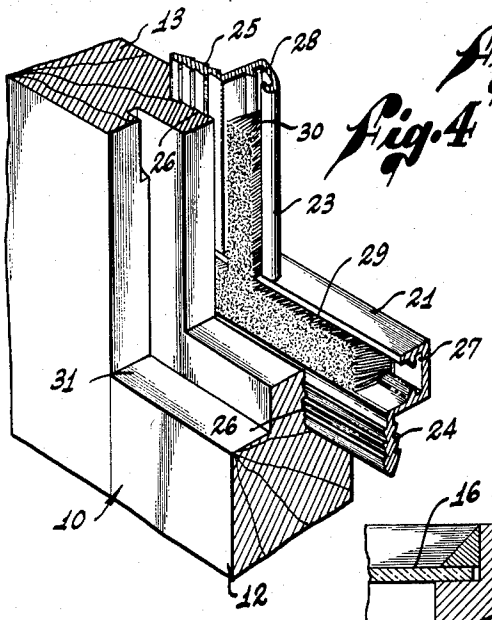


Fig. 6

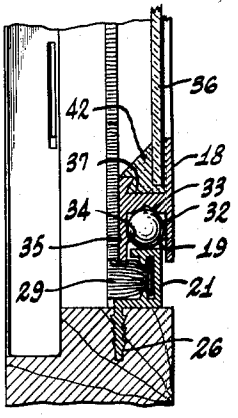


Fig. 5

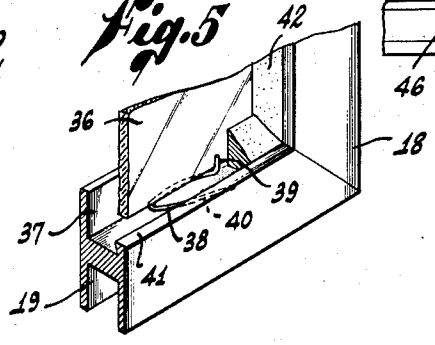
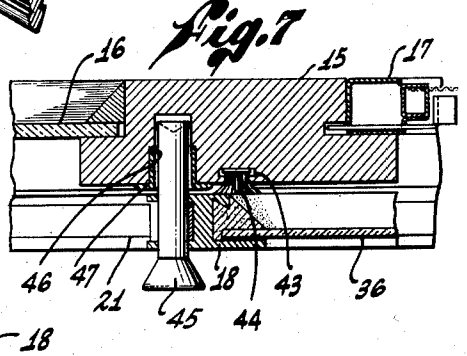


Fig. 7



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SLIDING WINDOW SASH STRUCTURE

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7 Claims. (Cl. 20—52)

This invention relates generally to sliding windows, and more particularly, to a sliding window in which a channeled sash slides on ball bearings between upper and lower tracks mounted in a wooden frame by means of longitudinally toothed blades, and provided with channels for holding weatherstripping.

The type of window to which this invention applies is preferably one in which a frame is divided in the center by a vertical muntin to provide two separate window sections, one having an immovably installed pane of glass, and the other a screened opening; a second pane is mounted in a sliding sash adapted to slide on tracks to a closed position back of the screen section or an open position back of the permanently glazed section. It will be obvious that this combination may be repeated in a single frame; for example, it is common to employ four sections in a single frame having a height of about seven feet and a width of five to six feet, so as to provide a window extending almost the full ceiling height in an average home. The invention will be discussed in connection with the two section window only, but it will be understood that it could be repeated in any multiples, by employing larger frames or smaller sections. Such units are preferably manufactured as fully assembled units comprised of frame, sash, track, screen, and glazing. The window assembly can be installed at the construction site with a minimum of labor by simply placing the frame in position over the opening, leveling it, and nailing in place. The most practical mode of construction is to employ a wooden frame with vertical stiles and horizontal rails about one and one-half inches thick and three to five inches wide, with a vertical muntin of lesser thickness in the center dividing the frame into two sections. The sliding sash moves on tracks, wooden or metal, mounted in the frame on the back edges of the inner sides thereof.

Most such sliding windows used in the past have been open to the objection that they were not weather tight around the edges of the sliding sash. Even when closed, most of such windows permitted rain and dust to drift through small clearances above and below the window and at the jamb, or between the back of the vertical muntin and the sliding sash. Attempts to add weatherstripping along the sliding sash usually had the undesirable result of interfering with easy sliding of the sash. Weather-stripping attached by adhesive soon came loose, and that which was tacked or screwed in place eventually caused trouble at the holes made for the fastening means. The use of metal tracks and jambs or entire metal linings for wooden frames proved expensive to manufacture and assemble and remained open to the objection that water and dirt were able to penetrate at the line of joinder between the wooden frame and its inner lining of metal. Attempts to overcome these difficulties with rubber gasketing, or with relatively complex window assemblies involving several parts assembled with nails or screws, have not been successful on account of the costliness of most solutions advanced.

It is a major object of the present invention to provide a light weight but rigid sliding window assembly which is substantially weather tight around the edges of the sliding sash in its closed position.

It is also an object of this invention to provide said weather-proof closure by tracks and jambs which are mounted in the frame of the window in a weather tight manner without the use of gaskets, or even of nails or screws.

It is a further object of the invention to provide a sealing weatherstrip along said track and jambs which is firmly mounted without the use of nail or screw fasteners or adhesive materials.

These and other objects of the invention are best disclosed by the following description of a specific embodiment of the invention illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of a two-section unit of a sliding window, as it appears from the outer side;

Figure 2 is an elevational view of the two-section window of Figure 1 as seen from the inner side;

Figure 3 is a vertical sectional view taken at a vertical transverse section of the window of Figure 2 as seen in the direction of the arrows 3—3;

Figure 4 is a perspective view of a cutaway portion comprising a corner of the frame and its track and jamb liner strips;

Figure 5 is a perspective view of a cutaway corner portion of the sliding sash showing its structure and the manner in which the glass pane is mounted;

Figure 6 is a fragmentary vertical sectional view taken in the direction of and at the point indicated by the arrow 6—6 in Figure 2; and

Figure 7 is a fragmentary horizontal sectional view taken through the locking means as indicated by the arrows 7—7 at Figure 2.

In Figure 1 a wooden frame indicated generally by the arrow **10** is seen as viewed from the exterior of the building in which it is mounted. Frame **10** is comprised of upper and lower rails **11** and **12**, vertical stiles **13** and **14**, and a centrally positioned vertical muntin **15**. Muntin **15** divides frame **10** into two equal sections, the right section being glazed with an immovable pane of glass **16** and the left section being screened by screen **17** which may be of any standard or convenient type, for example, a demountable screen in an aluminum frame.

Figure 2 shows the window as viewed from the inside of the building, and reveals a sliding sash **18** positioned back of screen **17** in its closed position, and adapted to be slid to a position inside of pane **16** so as to open the screened section of the window. The sectional view of Figure 3 reveals sliding sash **18** in a plane back of fixed pane **16**; Figure 3 also reveals that muntin **15** is only about half as thick as rails **11** and **12** and stiles **13** and **14**, so that sash **18** may readily pass from one side of the frame **10** to the other behind the muntin **15**.

It is seen from Figures 3 and 5 that sash **18** is provided around its entire periphery with a recessed channel **19**. The edges of this channel **19** are adapted to overlap upper and lower tracks **20** and **21**, illustrated in greater detail in the perspective view of Figure 4. The vertical members of sash **18** mate in tongue and groove fashion with vertical jamb members **22** (seen in Figure 2) and **23** (seen fragmentarily in Figure 4). Channel **19** extends around the entire periphery of sash **18** and is deep enough to permit the ready removal thereof, by lifting to provide clearance over lower track **21**.

Preferably frame **10** is constructed of substantial milled lumber members which impart strength and rigidity to the window assembly and make it readily nailable in place on the building frame. The track members **20** and **21** and jambs **22** and **23** are preferably corrosion-

resistant metal strips of unique cross sections, for example rolled or extruded aluminum. Tracks 20 and 21 and jambs 22 and 23 are preferably mounted in a wooden frame 10, as illustrated in Figure 4, by means of continuous blades 24 and 25, which are tightly received in a slightly undersized slot 26 in the inner edge of the wooden frame 10. Preferably, blades 24 and 25 are longitudinally grooved to present, in transverse cross section, barbed teeth which readily enter slot 26 but resist withdrawal or loosening during subsequent years of use or possible distortion of frame 10.

As seen in Figure 4, the outside faces of both tracks and jambs are channeled to hold strips of a metal-backed weather-stripping 29 and 30 as seen at 27 and 28.

Also as seen in Figure 4, the outside face of window frame 10 is recessed as indicated at 31 to receive an immovable pane 16 or a demountable screen 17.

The manner in which sliding sash 18 slides upon lower track 21 and makes contact with weather-stripping 29 is illustrated in Figure 6. Two or more ball bearings 32, preferably stainless steel, are mounted at various points along the lower horizontal member of sash 18 in the channel 19 thereof, preferably seated in a recess 33 and retained in position but permitted to rotate by means of small bosses 34, which may be produced in aluminum or other suitable metals by center punching at 35. Sash pane 36 is received in channel 37 on the inner sides of the horizontal and vertical members of frame 18. Before puttying, pane 36 is held in position by means of small spring clips 38 which are provided with one upturned end 39 to seat against the glass and one spring end 40 which snaps into position under an overhanging edge 41 of pane-receiving channel 37. After placement of pane 36 by means of the clips 40 a weather tight seal is made by puttying in the usual manner as indicated at 42.

In order to complete the weather and dust sealing of sash 18 in its closed position, the inside face of vertical muntin 15 is slotted as indicated at 43 and provided with a strip of weather-stripping 44, as seen in Figure 7. The weather-stripping 44 is preferably mohair pile attached to a metal backing strip, but other fiber mats, rubber or the like present alternative species of the invention.

Sash 18 is held in position by a retractable locking pin 45, which seats in a hole 46, preferably lined with liner 47, in the inside face of muntin 15. When it is desired to open sash 18, pin 45 is withdrawn from hole 46, so that sash 18 may be slid to the left (as seen in the plan view of Figure 7) to a position back of immovable pane 16. Preferably, pin 45 slides in some kind of a friction bushing to prevent unintentional withdrawal.

It will be seen from the foregoing description, that when sash 18 is in its closed position it is sealed around its entire periphery by weather-stripping, such as weather-strips 29, 30, and 44, and that the manner of mounting tracks 20 and 21 and jambs 22 and 23 in frame 10 is such that a substantially impenetrable seal is formed exterior to the weather-stripping without the aid of gaskets and without the presence of nails and screws which might provide openings for the eventual penetration and decay of frame 10 by moisture. Also, the entry of dirt and moisture is resisted by the manner in which the channel members of sash 18 overlap an adjoining jamb when closed.

While a particular preferred form of the invention has been shown in detail, it will be understood that it is merely illustrative, and that the invention is not limited to the particular form or arrangement of parts herein described and shown, except as defined and limited by the following claims. For example, the invention applies to windows in which opaque materials, such as fiber board, are used instead of glass for "glazing" both the sliding sash and the immovable opening; the claims are not to be restricted as to the type of panel or glazing used.

I claim:

1. A weather resistant sliding window assembly which includes: a frame for a window opening; a pair of parallel inwardly projecting tracks disposed along opposite sides of said window opening, the sides of said tracks having longitudinally extending weather-strip receiving openings; a sliding panel for closure of said window opening, said panel being provided with channels adapted to receive said tracks; rotatable balls in at least one of said channels for rolling contact with one of said tracks, and weather-stripping material in said weather-strip receiving openings, said weather-stripping material being in contact with one of each pair of said channeled edges of said sliding panel to provide weather resistant sealing contact.

2. A weather resistant sliding window assembly which includes: a frame for a window opening; a pair of parallel inwardly projecting tracks disposed horizontally along opposite sides of said window opening; a sliding panel for closure of said window opening, said panel being provided with channels adapted to receive said tracks; weather-stripping material along the lateral outside edge of each of said tracks, said weather-stripping material being in contact with the edge of the lateral outside one of the pair of said channeled edges of said sliding panel to provide weather resistant sealing contact; and a jamb of tapered cross section disposed along at least one vertical side of said window opening and adapted to be received in a vertical channeled edge of said window, said jamb being provided with weather-stripping along its lateral outside edge to contact the vertical edge of said sliding panel.

3. A window assembly which includes: a frame for a window opening; a sliding sash adapted to slide back of said opening, the upper and lower edges of said sash being channeled; upper and lower tracks mounted on the inside of said frame and adapted to be received in the upper and lower channels of said sash along its path of movement, said tracks having longitudinally extending weather-strip receiving openings along their outer sides; weather-stripping along the lateral outside edges of said upper and lower tracks and adapted to contact the edges of said channels along the upper and lower edges of said sash; and blades extending the length of said upper and lower tracks and forming a part thereof, and received in substantially weather tight contact in the inside edges of said frame, said blades having longitudinally extending grooves therein forming generally wedge-shaped teeth on the sides of said blades.

4. A window assembly which includes: a frame having two adjoining openings, one opening being glazed with an immovable pane; a sliding sash adapted to slide back of said openings, the upper and lower edges of said sash being channeled; upper and lower tracks mounted on the side of said frame and adapted to be received in the upper and lower channels of said sash along its path of movement, said tracks having weather-strip receiving openings extending longitudinally along their outer sides; weather-stripping along the lateral outside edges of said upper and lower tracks and adapted to contact the edges of said channels along the upper and lower edges of said sash; walls in said frame defining narrow slots along the inside edges thereof; and blades extending the length of said upper and lower tracks and received in substantially weather tight contact in said slots, said blades having longitudinally extending grooves therein forming generally wedge-shaped teeth on the sides of said blades that engage the sides of said slots.

5. A window assembly which includes: a frame having two adjoining openings, one opening being glazed with an immovable pane; a sliding sash adapted to slide back of either of said openings, the periphery of said sash being channeled; upper and lower tracks mounted on the

inside of said frame and adapted to be received in the upper and lower channels of said sash along its path of movement, said tracks having longitudinally extending weather-strip receiving openings along their outer sides; vertical jambs mounted inside said frame at each end of said sash tracks, said jambs projecting to be received in the vertical edge channels of said sash, and having longitudinally extending weather-strip receiving openings; weather-stripping along the lateral outside edges of said upper and lower tracks and of said vertical jambs; balls in the lower channel of said sash for rolling contact with said lower track; and blades extending the length of said upper and lower tracks and said vertical jambs and received in substantially weather tight contact in the inside edges of said frame, said blades having longitudinally extending grooves therein forming generally wedge-shaped teeth on the sides of said blades that engage said frame.

6. A weather resistant sliding window assembly which comprises: a wooden frame comprised of upper and lower rails, vertical stiles at each end, and a centrally positioned vertical muntin of reduced thickness to divide the frame into two openings; a metal strip liner mounted in the inner edges of said wooden frame in a plane back of said muntin, said metal strip liner being comprised of upper and lower track members along said rails, and vertical jamb members along said stiles, said track and jamb strips being formed with longitudinal blades received in slots in the inner edges of said rails and stiles, and said blades being provided with longitudinal teeth to tightly engage the walls of said slot; walls in said track and jamb members defining a longitudinal weatherstrip channel opening toward the outside of said frame, said channel being provided with inwardly projecting longitudinal shoulders on each side; a matted fiber weatherstrip material mounted on a backing strip, said backing strip being adapted to fit snugly within said weatherstrip channel under said longitudinal shoulders; a sliding sash adapted to slide between said upper and lower tracks to positions

behind either of said openings in said frame, said sliding sash being formed of channel beam members, channeled on the outside edges to receive said track members and said jamb members and to make contact with said weather-stripping along the lateral edges of said track and jamb members; hard surfaced and corrosion-resistant balls rotatably mounted in the track receiving channel of the lower member of said sliding sash frame and adapted to roll on said lower track; a locking pin passing through a bore in the vertical side member of said sliding sash frame, which is back of said muntin when said sliding sash frame is closed over said window opening; and a metal sleeve mounted in a hole back of said muntin opposite position of said lock pin adapted to receive said locking pin when said sliding is in a closed position.

7. A window assembly as described in claim 6 which includes: walls forming a vertical groove on the inside surface of said muntin, said groove being provided with internally projecting longitudinal shoulders; and a strip of matted fiber weatherstrip material mounted on a backing strip held in said muntin groove by said longitudinal shoulders, whereby said sash is contacted by weather-stripping around its entire periphery when in closed position.

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