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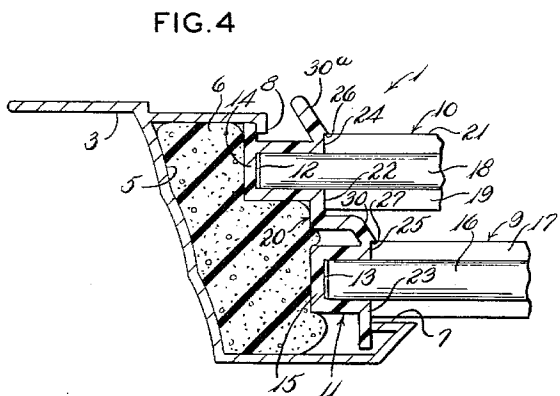
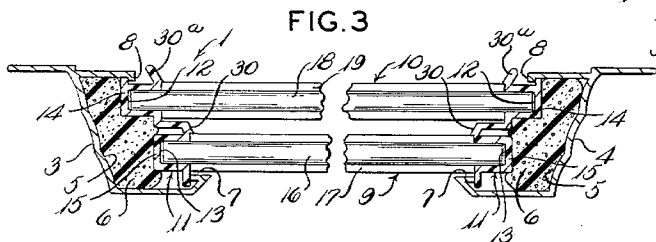
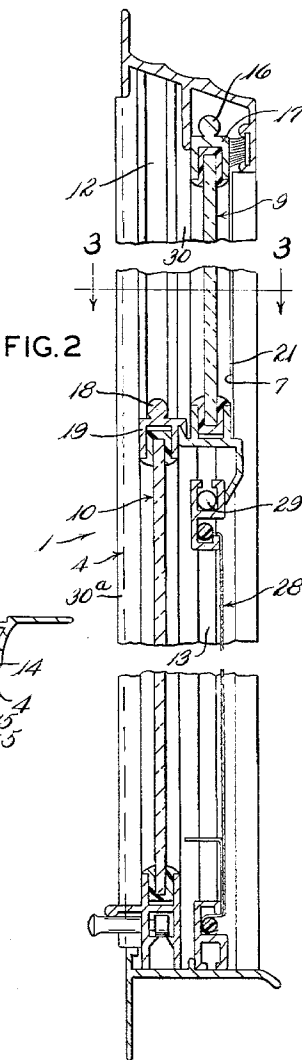
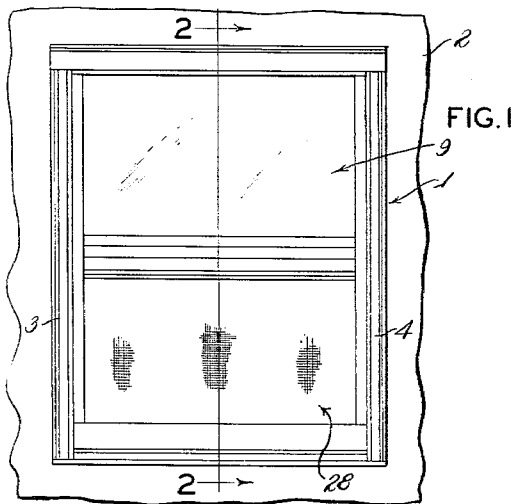
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3,199,154

TILT WINDOW ASSEMBLY

Filed Aug. 8, 1962

2 Sheets-Sheet 1



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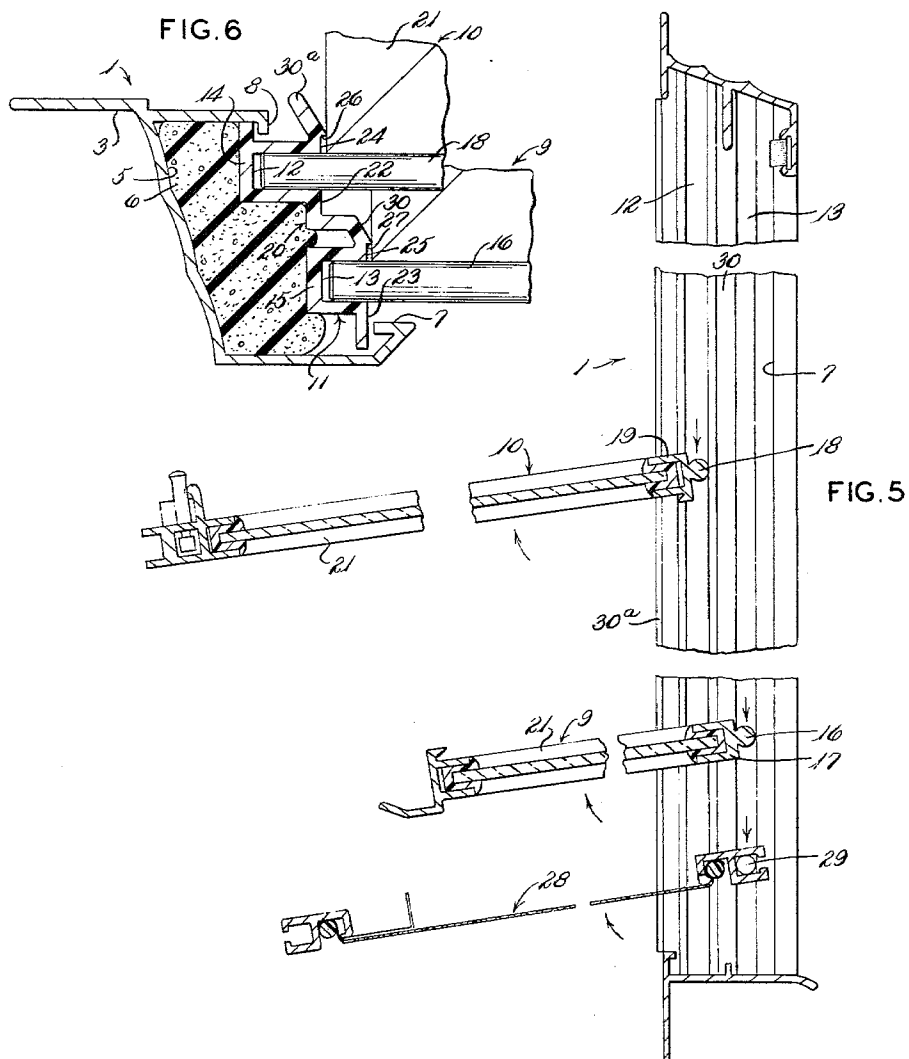
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TILT WINDOW ASSEMBLY

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2 Sheets-Sheet 2



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3,199,154

TILT WINDOW ASSEMBLY

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The present invention relates to sash, or window assemblies, and especially to so-called storm or auxiliary windows, or to replacement sash, or window units wherein the window assembly has tiltable and slidable sashes therein, and to the support means for such sashes.

In nearly all window assemblies, it usually is quite difficult to reach the outer surfaces of the window sashes for cleaning actions, or for replacement of the window sash when the window therein is broken, or for other reasons, as desired. Hence it is desirable to provide tiltable and/or removable sashes in homes and similar buildings. Tiltable windows are especially desirable as they are accessible for cleaning when still positioned in the window assembly whereby their handling during washing is facilitated.

It thus is an important and general object of the present invention to provide a new and improved window assembly having tightly positioned but tiltable sashes therein to facilitate access to the sashes for any desired purpose.

Another object of the invention is to provide a novel and improved window assembly where the window sashes are releasably and slidably positioned therein and where one sash is wider than the other but where both sashes can be conveniently tilted out from the remainder of the assembly so that the sashes can be cleaned, repaired, or the like.

Another object of the invention is to provide a novel and improved window assembly where the window sashes are releasably and slidably positioned therein and where one sash is wider than the other but where both sashes can be conveniently tilted out so that the sashes can be cleaned, repaired, or the like.

Further objects of the invention are to provide novel and improved track members for slidably and removably receiving and positioning framed window sashes therein; to provide special laterally movable track members in a window assembly for slidably and releasably engaging edge rails of a window sash; to provide inclined portions on the track members for window sashes to facilitate engagement of the window sash therewith; to provide track members in a window assembly which are continually resiliently urged laterally inwardly in the window assembly to engage the sashes and form an air tight seal therewith by a minimum overlap connection with the inner face of the sash; and to provide window sashes that can be readily moved vertically and which can be swung out, or tilted about the upper margin of the sash, which remains engaged with the window assembly, and be conveniently handled while exposed for washing or other purposes.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

For a better understanding of the present invention, attention now is particularly directed to the accompanying drawings, wherein:

FIG. 1 is an elevation of a window assembly embodying the principles of the invention and incorporated in a so-called storm window unit;

FIG. 2 is a vertical section of the window assembly of FIG. 1, with portions of the sashes being broken away;

FIG. 3 is a fragmentary horizontal section taken on

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lines 3-3 of FIG. 2 with the upper sash lowered below such line;

FIG. 4 is a fragmentary enlarged section of the sash engaging and positioning means of the window assembly;

FIG. 5 is a broken away vertical section of the window assembly unit of the invention showing the pivotal movement of the window sashes; and

FIG. 6 is a fragmentary horizontal section, like FIG. 4, of the structure as shown in FIG. 5.

When referring to corresponding members shown in the drawings and referred to in the specification, corresponding numerals are used to facilitate comparison therebetween.

This invention relates to a window assembly comprising an upper and a lower sash each having a pair of vertically extending side rails thereon, the lower sash being wider than the upper sash, vertically extending side stiles having laterally inwardly open channel portions therein, a track having a pair of parallel laterally inwardly open sash engaging recesses thereon received in each of the side stiles for lateral movement in the channel portion thereof, and compressible means positioned in the channel portions and urging the tracks laterally inwardly, the sashes having laterally extending pivot pins extending therefrom and engaging said track recesses, the tracks engaging the sash side rails to position the sashes for controlled sliding and pivotal movement but being movable laterally outwardly to compress the compressible means and permit removal of the sashes, the tracks each having laterally narrow shoulders thereon for engaging the sashes in the window assembly but also to facilitate removal, or pivotal movement of the sashes.

Attention now is particularly directed to the details of the structures shown in the accompanying drawings, and a window assembly of the invention is indicated as a whole by the numeral 1. The window assembly 1 is adapted to be attached to a suitable building 2 and it normally forms a storm, or auxiliary outer window assembly therein.

The window assembly 1 includes a pair of vertically extending side stiles 3 and 4 that are suitably secured to the building 2. The side stiles 3 and 4 may be made from suitable material and preferably are made from extruded metal, such as aluminum, so that the special contours and shapes shown can readily be formed in the side stiles for receiving and positioning components of the window assembly therein. The side stiles 3 and 4 each have a laterally inwardly open channel portion 5 provided therein, and resilient means, such as a foam rubber or polyurathane, or some other type of a compressible plastic strip body 6 is received therein. This foam or cellular plastic body 6, in its normal uncompressed form, substantially fills the channel portion 5 in the side stiles and usually extends the length thereof. The side stiles 3 and 4 each have an axially outer leg that terminates in a reversely extending stop or flange 7 and an axially inner leg that has an axially outwardly extending short flange 8 thereon for purposes described in detail hereinafter.

So as to position an upper and a lower window sash 9 and 10, respectively, in the window assembly, a track member 11 is received and retained in the laterally inner section of each of the channel portions 5. The tracks are of such a width as to engage the stops 7 and 8 provided integrally with the side stiles 3 and 4 at the margins of the channel portion 5. These track members 11 may be made from any suitable material, and preferably are formed from relatively light gage, low friction, substantially rigid plastic material so that the track members have some longitudinal flexibility even though they are provided with sash engaging means, such as pairs of op-

posed, laterally inwardly open recesses 12 and 13 usually formed by laterally outwardly extending U-shaped ribs 14 and 15 in the track. These recesses 12 and 13 are adapted to engage and slidably and pivotally position the sashes 9 and 10 by engaging a pivot pin or rod 16 usually formed integrally with the upper sash rail 17 of the upper sash 9, and a pivot pin or rod 18 usually formed integrally with the meeting rail 19 of the lower sash 10. FIG. 4 of the drawings shows that the rods 16 and 18 project laterally beyond the remainders of the sashes, and that the upper sash is narrower than the lower sash, for the reason set forth hereinafter.

The track 11 naturally is made of proper size and shape so as to be complementary to the shapes and sizes of the upper and lower sashes 9 and 10, respectively, to the channel portions 5. Hence the axially inner recesses 12 and the ribs 14 defining such recesses are spaced laterally further apart than the corresponding recesses 13 and 15 which are of proper size so as to receive the ends of the rod or pin 16 provided on the upper marginal member of the sash 9. As the recesses 12 are laterally outwardly offset with the relation to the recesses 13, a generally L-shaped connecting section 20 is provided on the track 11 intermediate these recesses 12 and 13 to form the connecting means extending therebetween. Usually the rods or pins 16 and 18 extend substantially the full depth of these recesses 12 and 13, as indicated in the drawings, whereby a good sliding engagement, as well as a pivotal connection, is established between the sashes 9 and 10 and the tracks 11, as described hereinafter in more detail.

It will be seen that the resilient member 6 is made of such size and volume as to normally urge the tracks 11 outwardly in a resilient manner. The tracks 11 are also adapted to engage the vertically extending members, or side rails 21 of the sashes 9 and 10 by flat sections 22 and 23 formed in the tracks adjacent the axially outer portions of each of the recesses 12 and 13, respectively, as shown in the drawings. Corresponding flat sections 24 and 25, FIG. 4, are provided in the tracks 11 by novel and important means of the present invention and which comprise axially outwardly directed, laterally narrow shoulders 26 and 27 formed in each of the tracks. These shoulders 26 and 27 are adapted to engage the axially inner corners or edges of the side rails 21 on the window sashes 9 and 10 and provide substantially air tight, or sealed connections therewith. The flat sections 22 and 23 and 24 and 25 likewise resiliently engage the sides of the sashes to aid in providing sealed slidable connections between the sashes and positioning means so that the sashes can have controlled vertical sliding movement in the window assembly of the invention. The pins 16 and 18 are received in the recesses 13 and 12, respectively, and are so spaced from the shoulders 27 and 26 as to aid in obtaining a good tight engagement of the sashes with the shoulders.

It will be recognized that the positioning of the tracks 11 in a resilient manner permit laterally outwardly directed forces to be applied to the tracks whereby the sashes 9 and 10 can be relatively easily released from the shoulders 26 and 27 and be pivotally swung axially inwardly of the window assembly 1 about the pivot rods 16 and 18 of the sashes. Naturally when one starts such pivotal action, the lower sash 10 is swung outwardly first, and then the upper sash 9 is lowered at least slightly vertically in the window assembly to free it for pivotal action so that it can be swung out forwardly, or axially inwardly of the window assembly, when desired.

The drawings also show that a screen 28 is provided in the assembly and normally is positioned in the same vertical plane as the upper window sash 9. Such screen 28 has pivot pins or rods 29 secured thereto to extend laterally therefrom at the upper margins thereof and likewise engaged with the same set of recesses 13, 13 as the upper sash. Hence normally such screen had to be swung for-

wardly or axially inwardly in the window assembly before the upper sash can be lowered. However, it will be realized that the screen 28 may be omitted from the assembly when desired.

If more than just pivotal movement of the window sashes is desired, it will be realized that additional laterally outwardly compressive forces applied to the tracks 11 will permit at least one of the pivot rods or pins 16 or 18 to be sprung out of engagement of the tracks 11, after which the entire sash can be removed from the window assembly.

Reassembly of the window sashes into the units is obtained substantially automatically, particularly when the pivot rods 16 and 18 are still engaged with the tracks. Such action is obtained by individually swinging the different sashes, and first the upper sash 9, axially outwardly of the window assembly on the rod 16. This will bring the side rails 21 of the upper sash into engagement with diverging portions 30 provided on the tracks 11 between the recesses 12 and 13. The sash 10, when swung up towards a vertical position about the rod 18, contacts diverging or wedging surfaces 30a on the tracks 11 to force them outwardly until the sashes 9 and 10 can snap in behind the shoulders 26 and 27 provided on the tracks. Should the entire sash be removed from the assembly, then one must thread one end of the rod 16 into engagement with a recess 12 and then exert laterally outwardly directed forces on probably both of the tracks 11 to snap the other end of the rod 16 into engagement with its associated recess 12. Then the remainder of the sash can readily be snapped into position.

It will be realized that the sashes 9 and 10 may be of the same or different vertical heights and that they may have any suitable latches, screen means, or other members associated therewith, as desired.

When referring to axially inner and axially outer portions of the window assembly 1, the surface provided adjacent the inside of the building 2 in which the window assembly is positioned is considered the axially inner surface.

It will be realized that the securing, or pivot pins or rods 16 and 18 provided on the window sashes usually will be formed integrally with the sash rails with which they are associated, as such sash rails normally are made from metal as extrusions of suitable materials, such as aluminum. Such pins or rods 16 and 18 are narrower in diameter than the thicknesses of the sashes which are provided with parallel vertically extending sash or side rails 21 with flat lateral surfaces thereon that will engage with the flat positioning portions of the tracks 11 in the window assembly for sliding engagement and support action thereby.

While the drawings show that the tracks 11 are positioned in engagement with the stops 7 and flange 8 of the channels 3, or side stiles in the assembly, such tracks may be pushed slightly laterally outwardly when the window sashes 9 and 10 are operatively positioned therein. However, the entire window assembly can be initially formed to position the tracks in the manner shown in FIG. 3, for example, when the window sashes will snugly engage with the corresponding portions of the tracks 11 in the manner indicated in the drawings and provide the desired air tight or sealed fit between the vertical margins of the sashes and the associated track means.

It particularly should be noted that the shoulders 26 and 27 are quite narrow in a lateral direction, for example, about $\frac{1}{16}$ of an inch, so that only a slight pressure need be applied to the track in order to spring margins of the sashes out of engagement with the shoulders. At the same time, the right angular relationship between these shoulders and the associated flat portions in the strips provide a secure positioning of the sashes for sliding action and at the same time furnishes the desired sealed connection or positioning of the sash. Window

assemblies built in accordance with the principles of the invention have been tested to show that very satisfactory sealed, sliding positioning of the sashes is obtained.

It will be realized that in some instances the provision of the pivotal action of these window sashes may not be desired in order to produce securely positioned, but readily removable sashes in the window assembly. By the use of the pivotal means shown, it is more convenient to handle the sashes for cleaning action, for example, without completely removing them from the window assembly. Hence, a well positioned, easily controlled, sash is provided in the window assembly.

It should be noted that the laterally inwardly extending portions of the connecting sections 29 in the tracks 11 produce rear stops against which, or past which the lower sash 10 cannot move axially outwardly in the window assembly. Likewise, the stops 7 provided on the side stiles 3 and 4 will prevent any undesired axially outward movement of the upper sash 9 when positioned in the window assembly.

It should be realized that the tracks 11 of the invention may be made from any suitable material, and that these tracks can be positioned for lateral outward movement in the window assembly by any suitable means so long as such tracks are resiliently urged laterally inwardly in the window assembly.

While the window assembly of the invention is shown extending in a vertical direction, it may extend laterally, if desired. Hence terms such as "upper" and "lower" sash are also meant to include "left" and "right" sashes having horizontal sliding action.

From the foregoing it will be seen that a novel and improved type of a window sash and positioning means therefor has been provided in a window assembly. This window sash can be provided with controlled pivotal movement in the assembly, when desired, for cleaning or other action, or the entire sash can be readily removed therefrom, as desired. In all events, the window will have a sealed sliding engagement with its positioning means but because of the relatively narrow lateral overlap provided between axially inner portions of the window positioning means and the window sash, such sashes can be conveniently and readily disengaged from their positioning tracks. Hence it is believed that the objects of the invention have been achieved.

While one complete embodiment of the invention has been disclosed herein, it will be appreciated that modification of this particular embodiment of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

What I claim is:

1. In a window assembly, an upper and a lower sash each having a pair of vertically extending side rails, said lower sash being wider than said upper sash, a pair of vertically extending side stiles having laterally inwardly open channel portions and an axially outer stop portion therein, a plastic track having a pair of parallel laterally outwardly extending ribs thereon to provide a pair of recesses on the laterally inner surfaces of said plastic track received in each of said side stiles in the channel portion thereof, the axially inner of said recesses in each of said tracks being laterally outwardly offset from the other of said recesses in the same track and connecting thereto by a laterally inwardly extending section, compressible means positioned in said channel portions and urging said plastic tracks laterally inwardly to engage said side stiles, said plastic tracks receiving said sashes thereon for controlled sliding movement, said plastic tracks having laterally narrow axially outwardly facing shoulders about $\frac{1}{16}$ " long at the axially inner margin of each of said recesses to engage a corner of said sash rails and aid in forming a sealed slidable connection therewith, said plastic track having flat surfaces thereon immediately

adjacent both edges of said recesses, said side rails of said sashes having flat laterally outer surfaces engaging said flat surfaces of said plastic track to aid in positioning said sashes, said sections of said tracks forming a stop for said lower sash to retain it against axial outward movement, said stops of said side stiles forming stops for said upper sash to prevent axial outward movement thereof, said plastic tracks being movable laterally outwardly to compress said compressible means and permit removal of said sashes from the axially inner portion of the window assembly.

2. In a window assembly, an upper and a lower sash each having a pair of vertically extending side rails, said lower sash being wider than said upper sash, a pair of vertically extending side stiles having laterally inwardly open channel portions and an axially outer stop portion therein, a plastic track having a pair of parallel laterally outwardly extending recesses on the laterally inner surfaces thereof received in each of said side stiles in the channel portion thereof, the axially inner of said recesses in each of said tracks being laterally outwardly offset from the other of said recesses in the same track and connecting thereto by a laterally inwardly extending section, compressible means positioned in said channel portions and urging said plastic tracks laterally inwardly to engage said side stiles, said sashes each having at least one pair of aligned laterally outwardly extending pivot pins thereon received in said recesses for pivotal and sliding movement therein, said sashes also having horizontally extending metal sash rails, said pivot pins being formed integrally with one of said horizontally extending metal sash rails of each of said sashes, said plastic tracks having laterally narrow axially outwardly facing shoulders at the axially inner margin of each said recesses to engage a corner of said sash rails and retain said sashes thereon, said sections of said tracks forming a stop for said lower sash to retain it against axial outward movement, said stops of said side stiles forming stops for said upper sash to prevent axial outward movement thereof, said plastic tracks being movable laterally outwardly to compress said compressible means and permit pivotal movement of said sashes about said pivot pins.

3. In a window assembly, an upper and a lower sash each having a pair of vertically extending side rails; a pair of vertically extending side stiles each having a laterally inwardly open channel portion therein, a plastic track having a pair of parallel laterally outwardly extending recesses on the inner surface thereof received in each of said side stiles in the channel portions thereof, unitary compressible means positioned in each of said channel portions and urging said plastic tracks laterally inwardly, said sashes having metal rails with integral laterally protruding pivot pins provided at their vertically upper margins, said plastic tracks receiving said pivot pins of said sash side rails in said recesses to position said sashes for controlled pivotal movement thereabout, said plastic tracks engaging said sashes for controlled vertical sliding movement thereon and being movable laterally outwardly to compress said compressible means and permit removal of said sashes, said plastic tracks being constructed and arranged to provide laterally narrow, axially outwardly facing shoulders about $\frac{1}{16}$ " long at the inner margin of each of said recesses to engage corners of said sash rails and form a slidable connection with said sashes.

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