

**Aug. 15, 1967**

S. ISLER ETAL

**3,335,523**

## WINDOW CONSTRUCTION

Filed March 17, 1965

3 Sheets-Sheet 1

**FIG. 1**

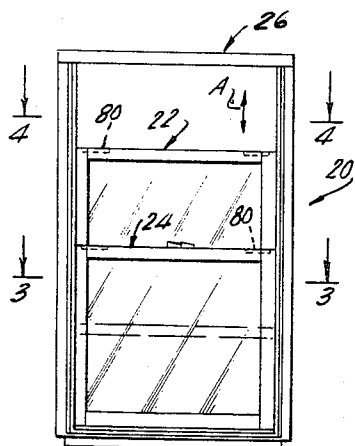


**FIG. 2**

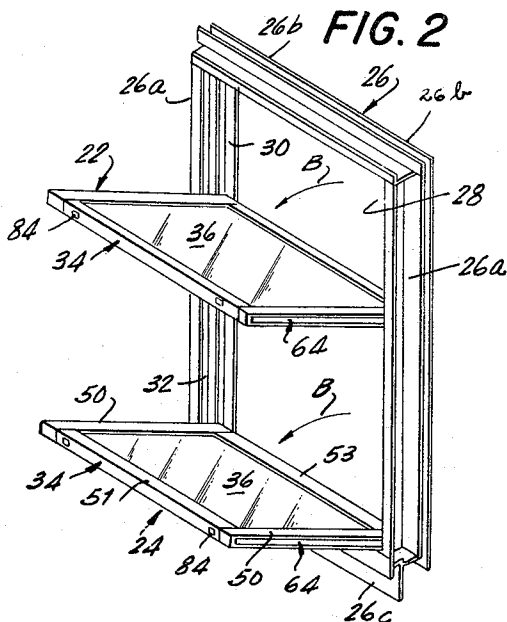


**FIG. 3**

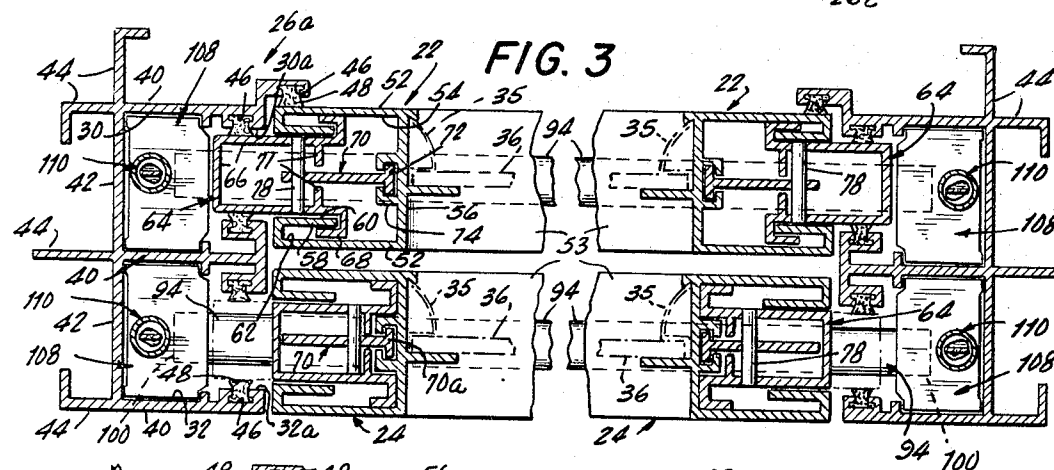
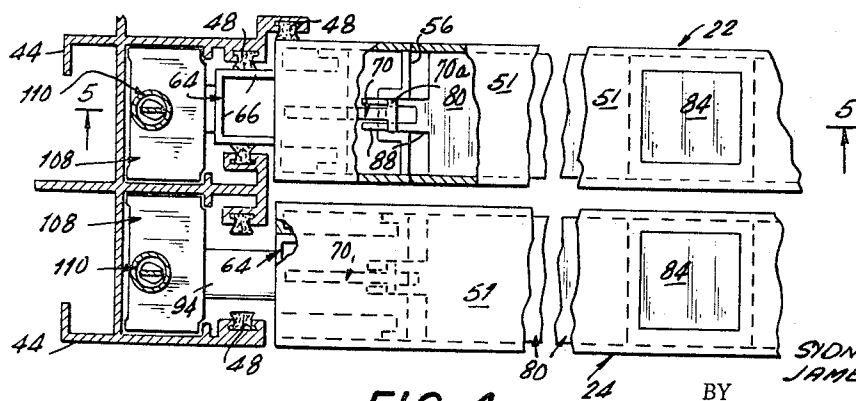


**FIG. 4**



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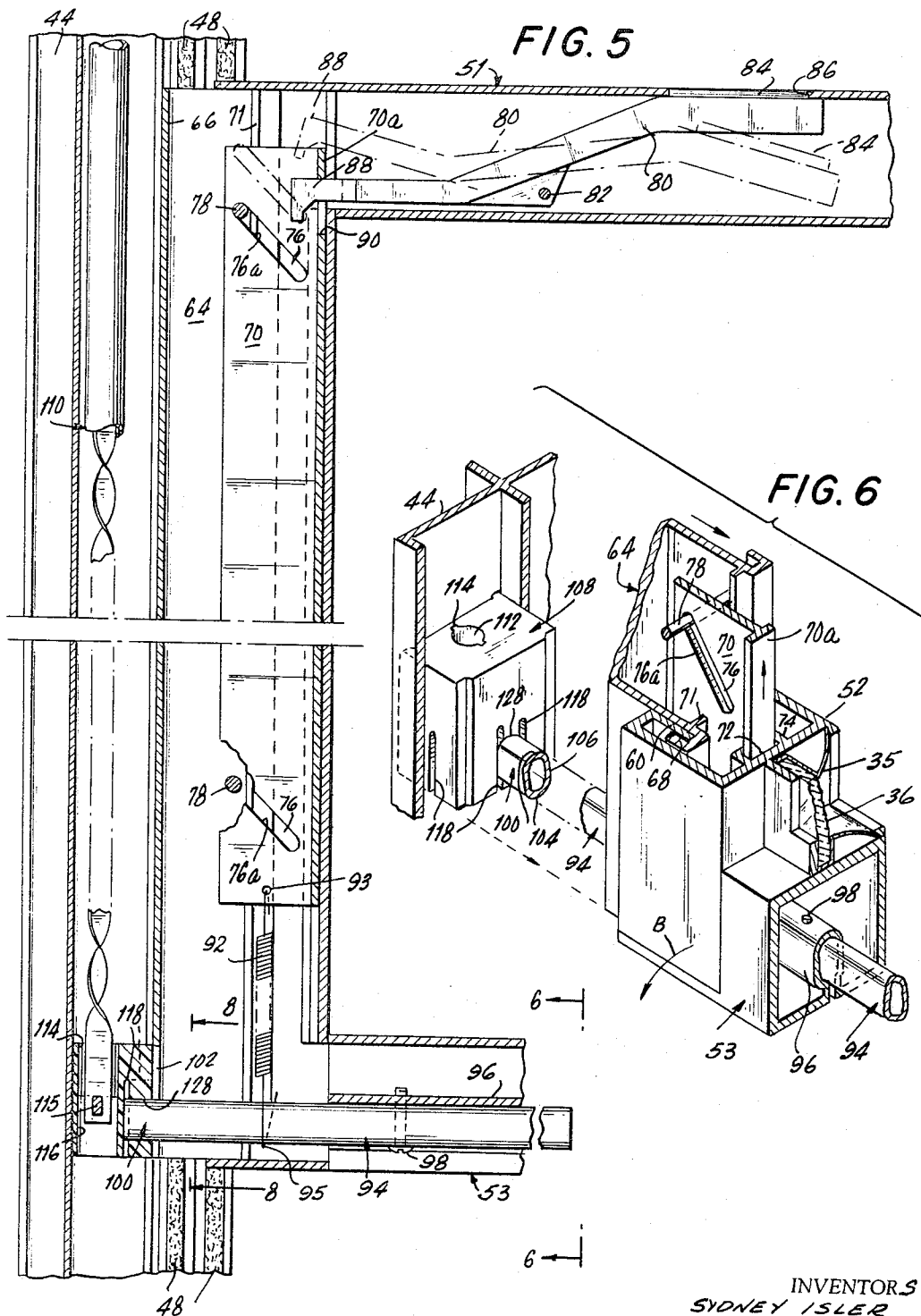
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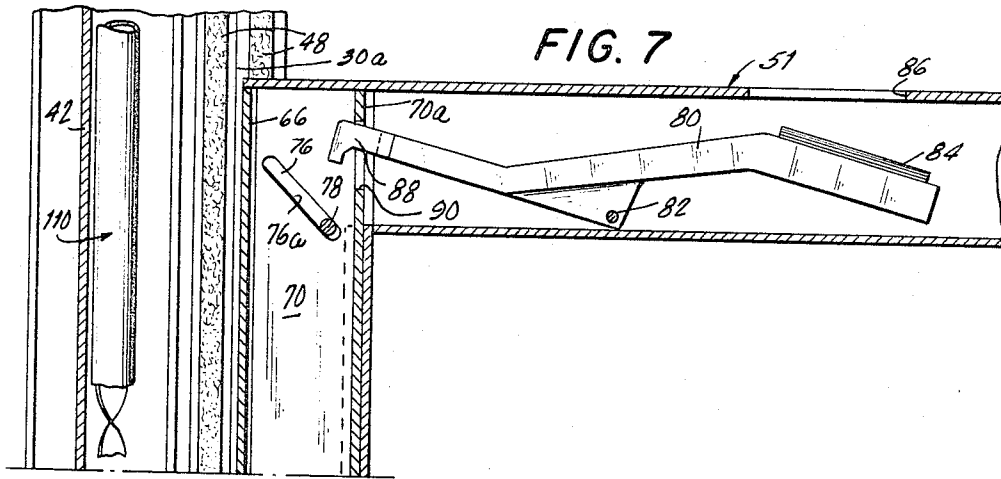
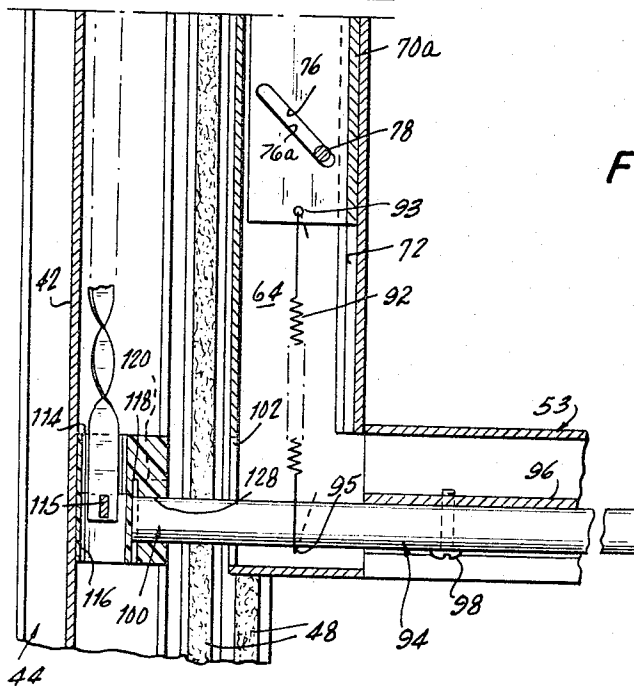
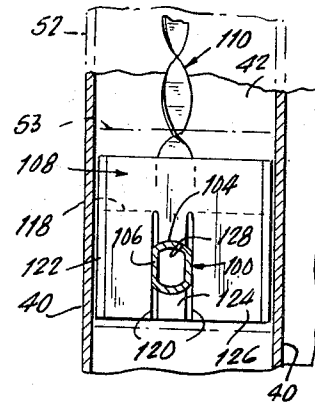
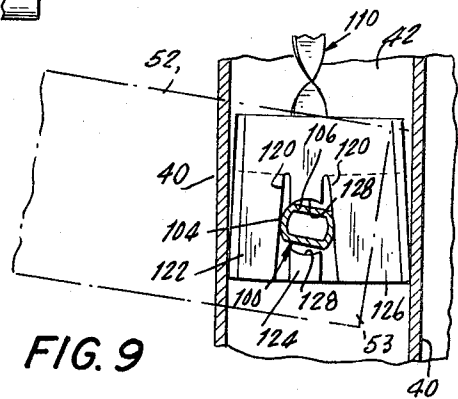
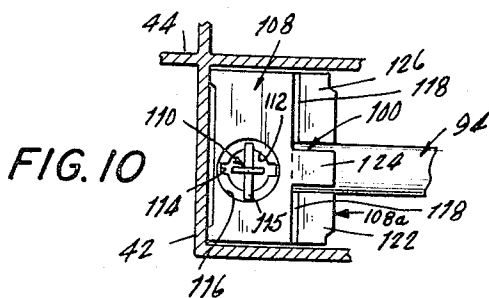


**FIG. 8**



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## WINDOW CONSTRUCTION

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The present invention relates generally to a window construction, and more particularly to certain constructional features for a window which in addition to normal vertical movement of said window within its window supporting frame also provides for pivotal movement of said window out of said supporting frame and into a position which more conveniently presents said window for cleaning and maintenance.

The prevailing construction for windows of the type contemplated herein calls for a conventional rectangular shape in the window and the mounting thereof for vertical movement within a corresponding generally rectangular supporting window frame. Restricted to this conventional degree of movement, the outside surface of the window pane mounted in a conventional manner in the window is understandably difficult to reach and thus is not readily accessible for cleaning. It is therefore necessary to clean this window surface using either a long-handled cleaning device if cleaning is attempted from inside the building construction, or else to assume a hazardous cleaning position on the outside of the building construction.

Broadly, it is an object of the present invention to overcome the above mentioned and other shortcomings of the prior art. Specifically, it is an object of the present invention to provide a window construction which mounts the window not only for conventional vertical movement within its window supporting frame, but which additionally permits pivotal window movement into a position extending out of said frame and which results in said window being conveniently presented for cleaning from a safe position within the building construction.

Another object of the present invention is to provide a window which is mounted both for vertical movement within its supporting frame and for pivotal movement into a convenient cleaning position, and which window is nevertheless as efficiently insulated and as an effective a weather-barrier as conventional windows having only vertical movement.

Another object of the present invention is to provide a window having a cleaning position in which said window extends substantially laterally out of its supporting frame, and in which there is a minimum of additional constructional features necessary to provide this added degree of movement.

A window demonstrating features of the present invention includes a conventional stationary window support frame of generally rectangular shape and having vertically oriented guide grooves in opposite sides thereof. Mounted for vertical movement within said guide grooves are at least two window units which each have a window frame including opposite vertical side members and a cross member connected therebetween. Guide members are operatively mounted in each of the window frame vertical side members and said guide members normally extend laterally therefrom into the guide grooves for guiding said window units in vertical movement in said support frame. Additionally provided are retracting means operatively connected to each of said guide members and effective to retract each of said guide members within said window frame vertical side members preparatory to pivotal movement of each window unit. Completing the window construction is an axle means mounted in the window cross member and extending from opposite sides thereof into the guide grooves of the window support frame for defining an axis normal to the vertical

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movement of the window units and about which axis each window unit is pivotal.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front elevational view of a window demonstrating features of the present invention, and more particularly illustrates the normal position of the window units thereof within a conventional support frame;

FIG. 2 is a perspective view of said window illustrating a further pivotal position of the window units thereof in which position the cleaning of said units is greatly facilitated;

FIG. 3 is a plan view, on an enlarged scale and with portions thereof broken away, taken on section line 3-3 through said window units of FIG. 1 and best illustrates the two operative positions of guide members mounted within each of said window units;

FIG. 4 is a view similar to FIG. 3, but taken on section line 4-4 of FIG. 1 and best illustrates the actuating mechanism associated with said guide means which provides said two operative positions thereof;

FIG. 5 is an elevational view, on an enlarged scale and taken on section line 5-5 of FIG. 4, and best illustrates the features of construction and mode of operation of said guide means of each window unit, said two operative positions thereof being illustrated in full and phantom line perspective;

FIG. 6 is a partial perspective view, on an enlarged scale and taken on section line 6-6 of FIG. 5, and best illustrates even further details in the mounting structure for the window unit;

FIG. 7 is a partial elevational view similar to FIG. 5 and illustrating the retracted position of said window guide means in full line perspective;

FIG. 8 is a partial elevational view of the window in its normal vertically oriented position within its support frame taken on section line 8-8 of FIG. 5;

FIG. 9 is a view similar to FIG. 8, but illustrating the condition of said structure of FIG. 8 when said window unit illustrated in phantom perspective is in its pivoted position; and

FIG. 10 is a partial view of said mounting structure of FIG. 8 as seen from beneath said structure and best illustrates the manner in which said window unit is mounted in said structure.

Reference is made to the drawings, and in particular to FIGS. 1, 2 in which there is shown a window, generally designated 20, which demonstrates features of the present invention. Window 20 includes top and bottom sashes or window units 22, 24 which are identically constructed and which are mounted for vertical movement in opposite directions, as depicted by the double headed arrow designated A in FIG. 1, within a support frame 26. As is generally the case, said support frame 26 is of generally rectangular shape defining a conventional window opening 28 for a building construction. Further, said support frame 26 includes opposite side jambs or members 26a integrated into a rigid window-mounting structure by top and bottom cross bracing members comprised of a header 26b and a sill 26c. As is further generally understood, the window support frame 26 is stationarily mounted in the wall of a building construction (not shown) and provided in the jambs or side members 26a thereof are adjacent vertical grooves 30, 32 for guiding said top and bottom window units 22, 24 respectively in their normal vertical movements within said support frame 26.

In accordance with the present invention, each of said identically constructed window units 22, 24 has additional constructional features providing a mode of operation which also permits pivotal movement in the direction depicted by the arrows designated B and which is about an axis normal to the usual vertical movement A of said window units. More particularly, each window unit 22, 24 includes a window frame, generally designated 34 in FIG. 2, which is of a similar generally rectangular shape corresponding to said shape of the support frame 26. Moreover, each window frame 34 employs clips 35 (see FIG. 6) or similar means for mounting a suitable glass (or perhaps even a transparent plastic) weather-barrier panel, generally designated 36 in FIG. 2. That is, panel 36 of each window unit 22, 24 functions as a weather-barrier for the window opening 28 while permitting light transmission and vision into and out of the building construction. Thus, in the operative position of said window units 22, 24 as depicted in FIG. 2, wherein said units are pivoted into positions extending out of said support frame 26 it will be appreciated that both surfaces of the glass panels 36 are made readily accessible, and that the cleaning of said panels is thereby greatly facilitated by said FIG. 2 operative position.

Having particular reference now to FIG. 2 in conjunction with the sectional views of FIGS. 3, 4, it will be noted that the construction of the jambs or side members 26a of the support frame 26 include spaced walls 40 and connecting walls 42 which define said previously referred to adjacent vertical grooves 30, 32. Traditionally, each jamb or side member 26a includes mounting fins or projections, herein collectively designated 44, which are integrated in a conventional manner with the brick or concrete of the building construction for stationarily mounting said window support frame 26 as a permanent part of said building construction. As is best shown in FIGS. 3, 4, at the respective openings into each of the vertical grooves 30, 32 the walls 40 are appropriately configured the length of said openings to define a plurality of shaped slots, collectively designated 46 in FIGS. 3, 4, which in practice mount weather-stripping 48 to insulate the window units 22, 24. More particularly, the vertical grooves 30, 32 have an outer section 30a, 32a recognizable by the presence of weather-stripping 48 therein, and in which outer groove sections said window frames 34 of each of the units 22, 24 are actually disposed and confined during their normal vertical movement A.

Still referring to FIGS. 2, 3 and 4 and additionally to FIGS. 5, 7, it will be noted that each unit window frame 34 is made-up of hollow, opposite side frame members 50, and upper and lower cross members 51 and 53 respectively. Since in all respects the window units 22, 24 are identically constructed, particularly as regards the side members 50 thereof, the description of one of said side members 50 is deemed adequate for a proper understanding of the present invention. Each such side member 50 includes spaced walls 52 closed at one end by a connecting wall 56 and defining a generally rectangular chamber 54. The walls 52 at their other end have a bent wall section 58. On one side of each wall section 58 there is thus a guide groove 62, and between said wall sections 58 an opening 60 into said chamber 54. As will subsequently be described in detail, a guide member is operatively mounted within each chamber 54 and extends through each chamber opening 60 into the outer sections of said vertical grooves 30, 32 in one operative position, and in another operative position said guide member is retracted within said chamber 54 preparatory to placing each window unit 22, 24 in its pivoted position as depicted in FIG. 2.

Still referring to FIGS. 3, 4, it will be noted that said guide member is a three-sided generally rectangular member, herein generally designated 64, which has its three contiguous walls 66 normally in a position extending laterally beyond the opposing wall sections 58 bounding

the opening 60 of said chamber 54. At its other open end, the side walls 66 of each guide member 64 are provided with bent wall sections 68 which extend into each of the guide grooves 62 for properly centering said guide member 64 in said chamber opening 60. In order for either of the window units 22, 24 to be placed into its pivoted FIG. 2 operative position, it is necessary to retract each of said guide members 64 within its associated chamber 54, in order that said outer sections 30a, 32a of said vertical grooves 30, 32 are cleared permitting this degree of movement of each of said window units 22, 24.

The structure producing retraction of each of said guide members 64, as best shown in FIGS. 3, 5, 7, includes a generally T-shaped bar 70 which has one leg appropriately disposed in a guide groove 72 defined by a suitable wall configuration 74 formed on the connecting wall 56 of the chamber 54. The other leg of the bar 70 extends between guide projections 71 essentially medially of the chamber 54 (see FIG. 3), and as best shown in FIGS. 5, 7 has an upper and lower inclined cam slot 76 provided in said extending leg thereof. Operating within each cam slot 76 is a horizontally oriented pin 78 which at both of its opposite ends is force fitted into a side wall 66 of said guide member 64. Housed in the upper cross member 51 of said window frame 34 is an actuating lever 80 pivotally mounted as at 82, and at one end presenting a button 84 through an opening 86 in said upper cross member 51. Lever 80 terminates at its other end in a bifurcated section 88 disposed through slots 90 in the short leg of said T-bar 70 and thereby straddling an upper section 70a of said leg for raising said T-bar 70 against the urgency of a spring 92 connected to the bar 70 at 93, and to a fixed point 95 to restrain movement of said bar. From what has been described, it should therefore be appreciated that by depressing button 84 on the lever 80 that this has the desired effect of raising the bar 70 which in turn forces or cams each pin 78 operating in a cam slot 76 inwardly along the slot inclined or cam surface more particularly designated 76a. Since the pins 78 are firmly secured in the side walls 66 of each guide member 64, it naturally follows that each guide member 64 is similarly cammed into a retracted position within said chamber 54 as is illustrated in phantom perspective in FIG. 5. This retracted position is also shown in full line in FIGS. 7 and 3, 4 (see unit 24).

Having particular reference now to FIGS. 5, 7 and also FIGS. 6 and 8-10, it will be seen that disposed transversely of the lower frame member 53 of each window frame 34 is a rod 94 serving as an axle for the pivotal movement B of each of the window units 22, 24. Rod 94 is fixedly mounted within each of said frame members 53 by being engaged by an appropriate configuration in a wall 96 of said cross member 53 and secured thereto by a plurality of screws 98 (only one of which is shown in the drawings). Rod 94 is of a length which projects opposite end sections, more particularly designated 100 herein, through openings 102 in the base of the front wall 66 of each guide member 64. While the entire length of said rod 94 may be provided with the non-circular configuration depicted in the drawings, at least each of the end sections 100 thereof is provided with such a configuration wherein upper and lower circular segments 104 are joined by straight wall segments 106, all as it best seen in FIG. 6. Operating within the vertical grooves 30, 32 is a mounting block 108 for each rod end section 100. A conventional window counterbalance mechanism herein generally designated 110, is anchored at one end in the upper portion of the window support frame 26 and at its other end is disposed in a vertical through bore 112 in said mounting block 108. As is best shown in FIG. 10, the free end of said counterbalance mechanism 110 has a cross piece 115 therein which is accommodated in a slot 114 selectively enlarging the bore 112 for an upper length portion, and which beyond this length portion opens into a counter bore 116 completely enlarging the bore 112. When said counter bore 116 is reached it is thus possible to give a half turn to

the free end of said mechanism 110 wherein the shoulder formed between said through bore 112 and counter bore 116 is engaged by the cross piece 115 to connect the mechanism 110 and rod mounting block 108.

As is further shown best in FIG. 10, mounting block 108 is provided with partial machined grooves 118 delineating a front section 108a from the main body of said mounting block. As best shown in FIGS. 8, 9 said block front section 108a is further provided with partial vertical machined grooves 120 delineating three sections in said front section 108a which in FIGS. 8, 9 are more particularly designated 122, 124 and 126. Each shaped end section 100 of the rod 94 is disposed in an opening 128 conforming in shape to said section, said opening 128 being provided medially of the middle block section 124. By comparing FIGS. 8 and 9, it will thus be seen that in the normal vertical position of each window unit 22, 24 that each mounting block 108 rides freely within the vertical grooves 30, 32 under the urgency of the counterbalance mechanism 110. However, pivotal movement of a window unit 22, 24 causes a turning of the rod 94 in the mounting block opening 128, and thus orients the long dimension of the end rod section 100 horizontally of each mounting block 108. In this position, the end rod section 100 causes a spreading apart of the block sections 122, 126, which spreading is permitted by the vertically machined grooves 120. This in turn places each block 108 into frictional engagement against the spaced walls 40 of the jambs or side members 26a of said window support frame 26. Thus, the lifting urgency of the counterbalance mechanism 110 is effectively counteracted in the pivoted FIG. 2 operative position of each of the window units 22, 24.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A window including a stationary support frame of generally rectangular shape and having vertical guide grooves in opposite sides thereof, at least one window unit mounted for vertical movement in said guide grooves and pivotal about an axis normal to said vertical movement into a position extending out of said support frame, said window unit including a window frame having opposite vertical side members and a cross member connected therebetween, a guide member operatively mounted in each window frame vertical side member and normally extending laterally therefrom into a guide groove for guiding said window unit in vertical movement in said support frame, retracting means operatively arranged for vertical movement within said window frame vertical side members adjacent each said guide member, cooperating cam means on each said retracting means and on an associated adjacent guide member operatively arranged so as to cam said guide member through retracting lateral movement within said window frame vertical side member in response to vertical movement of said retracting means, axle means mounted in said window cross member and extending from opposite sides

thereof into said window support frame for defining an axis normal to said vertical movement of said window unit and about which axis said window unit is selectively pivotal after retraction of said guide members, and means disposed in said guide grooves mounting said axle means and effective to frictionally engage said support frame upon pivotal movement of a window unit to maintain the pivoted position of said window unit.

2. A window including a stationary support frame of generally rectangular shape and having vertical guide grooves in opposite sides thereof, at least two window units mounted for vertical movement in said guide grooves and pivotal about an axis normal to said vertical movement into a position extending out of said support frame, each of said window units including a window frame having opposite vertical side members and an upper and lower cross member connected therebetween, a guide member operatively mounted in each window frame vertical side member and normally extending laterally therefrom into a guide groove for guiding each window unit in vertical movement in said support frame, retracting means operatively arranged for vertical movement within said window frame vertical side members adjacent each said guide member, cooperating cam means on each said retracting means and on an associated adjacent guide member operatively arranged so as to cam said guide member through retracting lateral movement within said window frame vertical side member in response to vertical movement of said retracting means, axle means mounted in said lower window cross member and extending from opposite sides thereof into said window support frame for defining an axis normal to said vertical movement of said window units and about which axis each window unit is selectively pivotal, and means disposed in said guide grooves mounting said axle means and effective to frictionally engage said support frame upon pivotal movement of a window unit to maintain the pivoted position of said window unit.

3. A window as defined in claim 2 including a pivotally mounted lever means operatively mounted in each said upper window cross member and in operative engagement with each retracting means such that in response to pivotal movement of said lever means said retracting means is actuated through vertical movement.

4. A window as defined in claim 3 including a return spring operatively connected to said retracting means so that vertical movement thereof in one direction is against the urgency of said return spring and in the opposite direction is facilitated by the bias of said return spring.

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