Feb. 23, 1960 H. G. BAKER, JR 2,925,859

WINDOW FRAME

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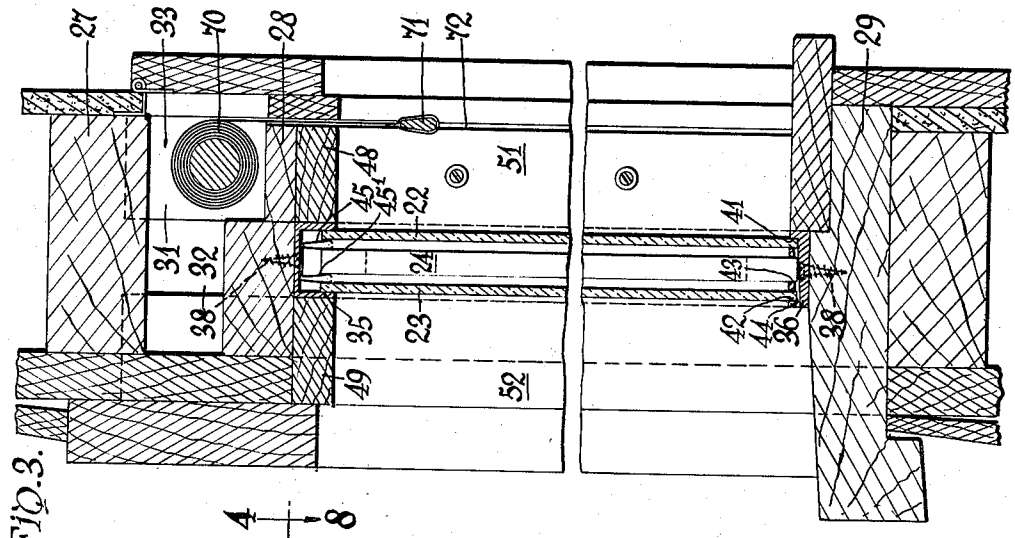


FIG. 3.

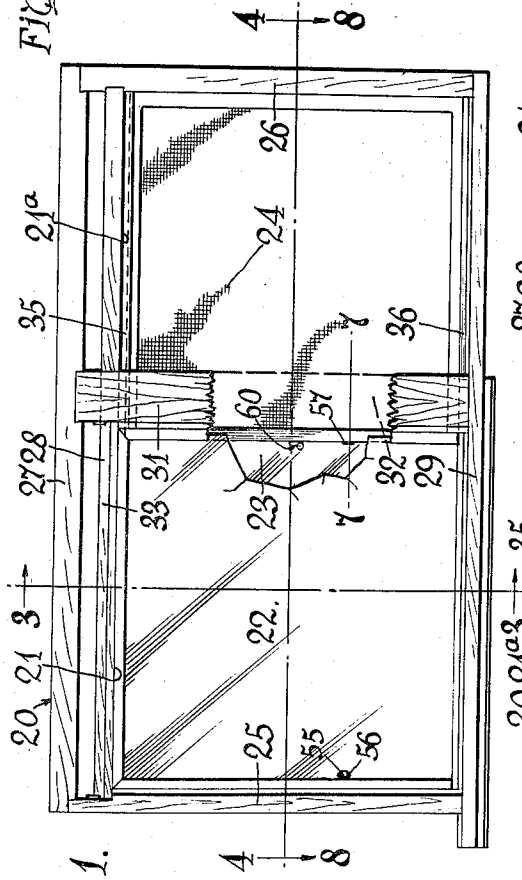


FIG. 1.

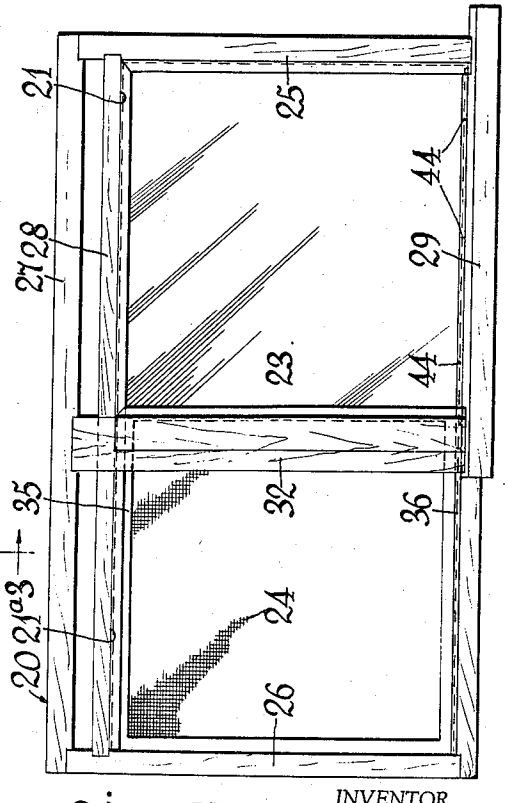


FIG. 2.

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Fig. 4.

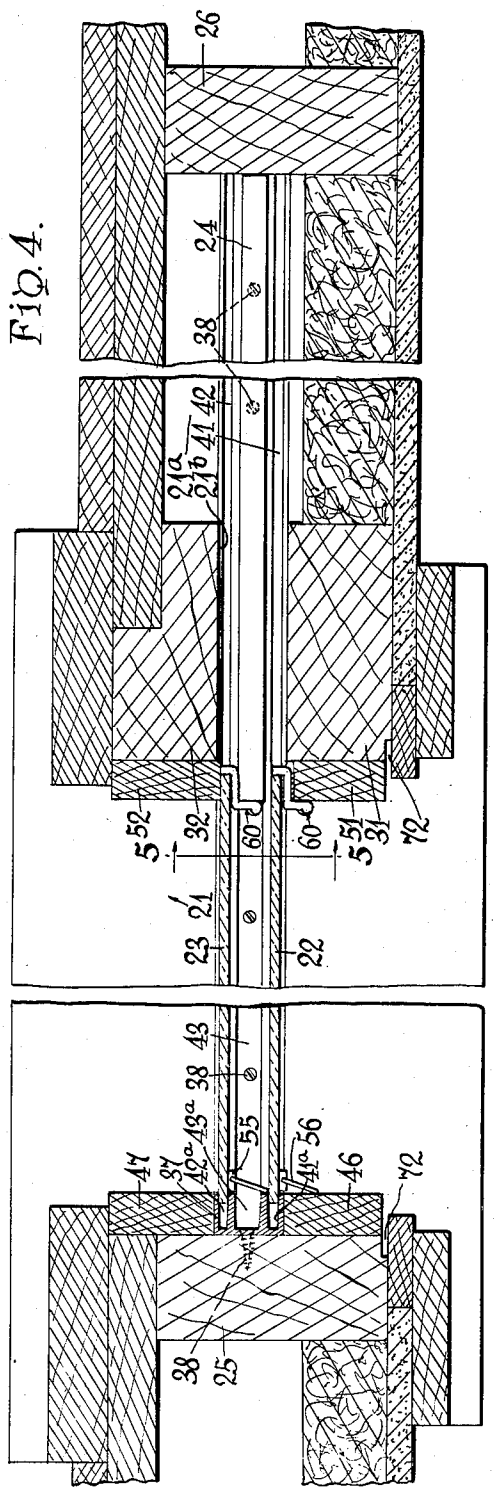


Fig. 6.

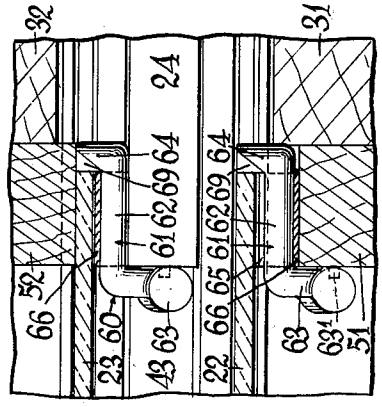


Fig. 7.

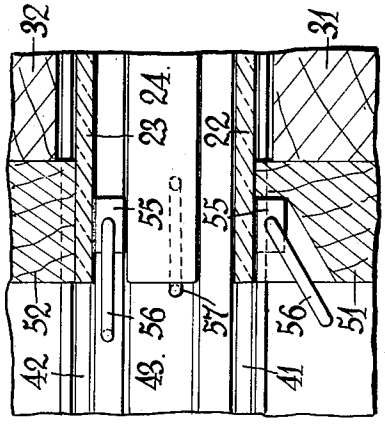
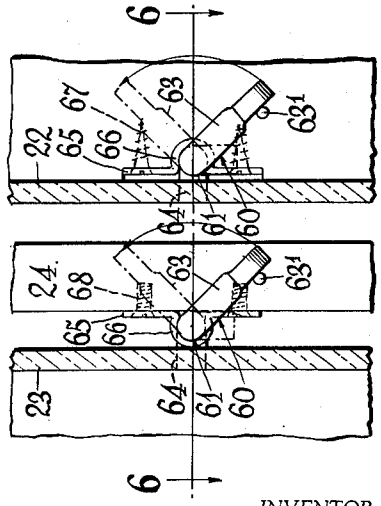


Fig. 5.



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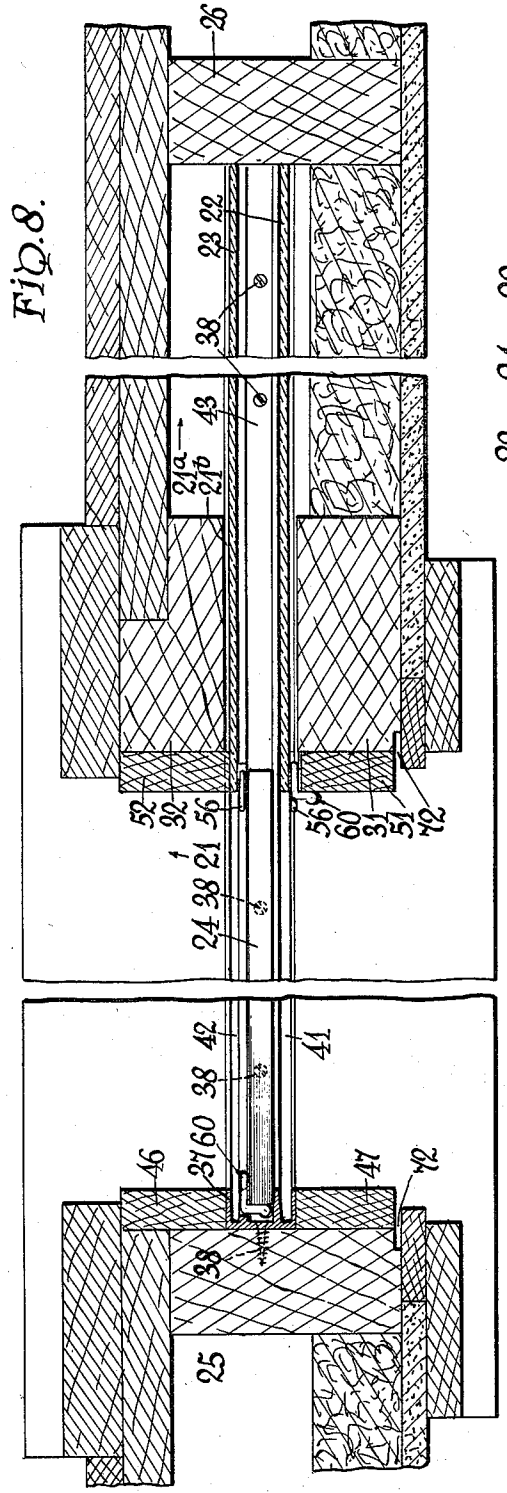


Fig. 8.

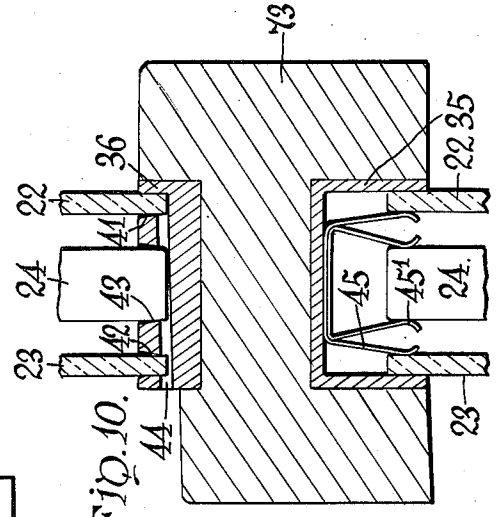


Fig. 10.

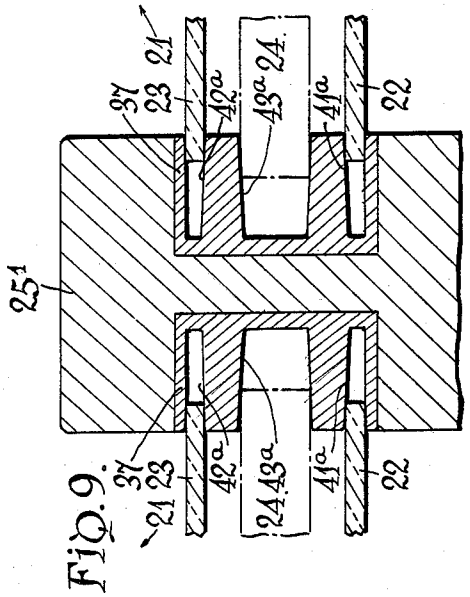


Fig. 9.

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WINDOW FRAME

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Application June 11, 1957, Serial No. 664,944

9 Claims. (Cl. 160—37)

My invention relates to improvements in window frames and more particularly to window frames in which glass sections and a screen are mounted for lateral sliding movement in the frame and are selectively movable from a position closing the window frame opening to a position laterally adjacent the window frame opening and within a wall.

Prior window frames of this type have been costly to manufacture, have been difficult to operate and lock and have not adequately sealed the window frame opening against air leakage and the elements, or the sealing means have been complicated and costly, have not provided space to allow installation of heat and cold resisting insulation to that portion of the window frame within the wall, and have not been designed nor adapted to use frameless glass windows thereby to provide the frame with a maximum size of usable opening.

The objects of my invention are to overcome the objections to prior windows of the type described; to provide such a window with component parts which are adapted to be produced and assembled by mass production methods at a low cost per unit; to provide such a window with tracks for guiding and removably retaining a like pair of glass sections and a screen section in selected positions and for sealing the window opening against entrance of air and the elements when the glass sections are positioned to close the window opening; to provide simple and effective lock means for locking the glass sections in the position in which they close and seal the window opening, thereby preventing adventitious or surreptitious opening movement of the glass sections; to provide glass sections which do not require frames; to provide the glass sections and the screen with means for moving them from or to selected positions; and to provide a window frame of the character described with a single window opening, double window openings in side-by-side relation and superposed pluralities of single or double window openings, each provided with a frameless pair of glass sections and a screen section slidably mounted therein for movement from a position closing the window opening to a position within and concealed by the adjacent wall.

Referring to the drawings:

Figure 1 is an elevational view of the inner side of my window frame showing its glass sections locked in their window opening sealing position and its screen section slid into a storage opening at the far end of the frame.

Figure 2 is an elevational view showing the outside of the window frame depicted in Figure 1.

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 1 and shows how my frame is installed in a wall.

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 1 and also shows how my frame is installed in a wall.

Figure 5 is an enlarged fragmentary sectional view taken on the line 5—5 of Figure 4 showing the locking means for the glass sections.

Figure 6 is a horizontal sectional view of the glass locking means taken on the line 6—6 of Figure 5.

Figure 7 is a horizontal sectional view showing the means for moving the glass and screen sections to selected positions.

Figure 8 is a horizontal sectional view similar to Figure 4 but showing the screen section positioned to close the window opening and the glass sections slid into the storage opening at the far end of the frame.

Figure 9 is a fragmentary horizontal sectional view indicating how my window frame may be formed with a vertical central member and duplicate pairs of glass sections and a pair of duplicate screen sections to provide a pair of window openings located in contiguous side-by-side relation.

Figure 10 is a fragmentary vertical sectional view indicating how my window frame may be formed with a horizontal central member and superposed duplicate glass and screen sections to provide single or double superposed window openings.

In order to simplify the drawings a window frame 20 having a single window opening 21 closable by either or both of like inner and outer spaced glass sections 22 and 23 or a screen section 24 located therebetween has been illustrated but it will be apparent, to those skilled in the art, that my construction is also adaptable to provide double window frames having a pair of window openings in side-by-side relation and that either of the single or double frames may be formed with a number of superposed window openings in a manner to be described.

As shown in Figures 1 and 2 the rectangular frame 20 is formed with spaced and parallel upright end members 25 and 26 secured to the ends of horizontally disposed spaced and parallel top, intermediate and sill members 27, 28 and 29 respectively. The members 27 and 28 are suitably notched to receive a pair of vertically disposed spaced inner and outer members 31 and 32 which vertically divide the frame 20 to provide it with the desired window opening 21 and a glass and screen section storage opening 21*a* adjacent to the opening 21. The members 31 and 32, due to their spacing, provide a space 21*b* (Figure 4) through which the glass and screen sections may pass.

The sill 29, as is usual in window frames, is of greater breadth than the members 25, 26, 27, 31 and 32 which, to provide the frame 20 with the desired structural strength and to save the cost of fabricating specially dimensioned members, are preferably formed of sections of standard members known as "2 x 4's." The member 28 may also be formed of a section of 2 x 4 but is preferably formed of a piece of less thickness and as shown in Figures 1 and 3 is rabbeted between the end member 25 and the member 31, that is to say for the width of the opening 21 to provide a recess 33 for a purpose to be hereinafter described.

As shown in the drawings the frame 20 is provided with strip or track sections 35, 36 and 37, the tracks 35 and 36 being of a length to extend between the end members 25 and 26 and being of a width to fit between the members 31 and 32, are alined in superposed relation and secured to the lower side of the member 28 and to the upper side of the sill 29 about midway between their side edges by suitable screws 38. The strip 37 extends vertically between the tracks 35 and 36 and being coplanar therewith is secured to the end member 25 by several of the screws 38. The track 36 throughout its length is formed with spaced parallel inner and outer grooves 41 and 42 to slidably receive the lower edge portion of the glass sections 22 and 23 and midway between the grooves 41 and 42 is formed with a similar but wider groove 43 to slidably receive the lower edge portion of the screen section 24. To provide drainage for

the grooves 41, 42 and 43 the track 36 is provided with a plurality of drainage holes 44 which communicate with the several grooves (Figures 2, 3 and 10). The strip 37 is formed with grooves 41*a* and 42*a* similar to and alined with the grooves 41 and 42 to sealingly receive the vertical edge portion of the glass sections 22 and 23 and with a groove 43*a* alined with the groove 43 to receive the vertical edge portion of the screen 24.

In order to provide a maximum of usable glass area in a window of a given size and to save the cost of providing frames for the glass sections they are preferably formed without frames but have their edges suitably prepared to slide easily in the tracks and to sealingly engage against one side of the grooves.

Accordingly the outermost side of the grooves 41 and 41*a* and the outermost side of the grooves 42 and 42*a* are coplanar and parallel to the plane of movement of the glass to allow the outer and lower edge portions of the associated glass to sealingly seat thereagainst and the interior side surfaces of the inverted channel-shaped track 35 are flat and coplanar with the flat sides of the grooves 41, 41*a*, 42 and 42*a* to allow the upper edge portions of the glass section to sealingly engage thereagainst. The opposite sides of the grooves 41, 41*a*, 42 and 42*a* are inclined in a manner tending to force each glass into sealing engagement with the flat side of its groove and the coplanar flat surface of the track 35. The track 35 is provided with a resilient channel-shaped strip 45 formed and arranged as shown in Figure 3 to resiliently engage and hold the glass sections in their sealing engagement. Still referring to Figure 3 it will be seen that the track 35 is also provided with another channel-shaped resilient strip 45' formed and arranged to resiliently engage the upper edge portion of the screen section thereby to hold it centered between the glass sections.

Suitable stop members 46 and 47 are rigidly secured to the member 25 in abutting relation to the sides of the strip 37, stop members 48 and 49 are rigidly secured to the member 28 in abutting relation to the track 35, an inner stop member 51 is detachably secured as by screws to the member 31 and an outer stop member 52 is rigidly secured to the member 32. The stops 51 and 52 may be duplicates of and alined with the stops 46 and 47 in which case the inner edge of each stop would be slightly spaced from the surface of the adjacent glass section and could be provided with a suitable strip to seal the space, however it is presently preferred that the stops 51 and 52 be formed so that their inner edges sealingly engage the adjacent glass thereby preventing air and the elements from entering the space 21*a* or the building when the glass sections are in their closed position (Figure 4).

In the event it becomes necessary to remove the glass or screen sections, the stop 51 is removed and the section to be removed is positioned so that its sides clear the strip 37 and the member 31 whereupon the section is slid upwardly in the track 35 to clear the track 36 and then may be tilted and withdrawn from the track 35 and the opening 21. To replace a section the foregoing procedure is reversed.

As shown in Figure 8 the outer edge of the glass sections are flush with the stops 51 and 52 when not in use and the outer edge of the screen section 24 is also flush with the stops 51 and 52 when not in use (Figure 7) so that the window opening defined by the tracks and the stops is entirely free. In order to withdraw the flush glass sections and move them to the position in which they close the opening 21, they are each provided with a clear plastic block 55 cemented to their inner surface adjacent their outer edge and each block is provided with a finger piece 56 preferably in the form of a ring pivotally anchored to its block.

The outer edge of the frame of the screen section is also provided with a finger piece 57 preferably in the form of a U-shaped loop whose bight portion may rest against the outer edge of the frame and whose legs are slidably mounted in the screen frame and have their inner ends formed to limit its outward movement to the distance required to provide finger space for the user.

A pair of locking means 60 each operable to lock one of the glass sections in its window opening sealing position and to unlock its glass section for movement to its other position is best seen in Figures 5 and 6. These locking means are made the same to save the cost of providing different locks and each include a manually operable Z-shaped locking member 61 having a straight body portion 62 terminating in inner and outer legs 63 and 64 bent to extend at 90 degrees to the axis of the portion 62 and at an included angle of 135 degrees from each other. The body portion 62 is snugly journaled in a central loop portion 66 of a mounting bracket 65 to slightly resist rotation therein.

Still referring to Figures 5 and 6 the inner edge of the stop 51 midway between its ends is formed to receive one of the locking members 61 and its bracket 65 which is secured thereto by wood screws 67. The other locking means 61 has its bracket reversed and secured upon the outer surface of the outer edge of the screen frame by metal screws 68. With the bracket thus arranged and the legs 63 in their unlocked position the locking means do not interfere with free movement of the glass and screen sections.

Assuming that the glass and screen sections are positioned as shown in Figure 6 and the legs 63 and 64 of the locking means are in their unlocked position, indicated by dot and dash lines in Figure 5, a 90 degree swinging movement of the outer legs 64 causes a like swinging movement of the inner legs 63 to their glass locking position across the rear edge of the glass so that the glass sections are locked against adventitious or surreptitious movement. The inner leg 63 is formed with a cam surface 69 formed and arranged to gradually engage the inner edge of the associated glass in a manner to cause its outer edge to move into sealing engagement with the walls of the associated groove in the strip 38 by and during the locking movement. A stop pin 63' is provided for each locking means and is arranged to limit the locking movement of the outer leg to that required. No stop is required for the unlocking movement of the locking means since during this movement the leg 63 of the outer means swings against and is stopped by the screen frame 24 and the leg 63 of the inner means swings against and is stopped by the stop 51. The frictional engagement of the loop 66 with the portion 62 is such that the locking means is frictionally held in place.

The frame 20 is adaptable to other wall constructions but has been shown as formed for installation in building walls formed of 2 x 4 studs, to the outer side of which sheathing, siding, shingles or similar materials and to the inner side of which plastered or otherwise finished inner walls are secured in the usual manner.

Referring to Figures 4 and 8 it will be noted that the overall dimension of the spaced members 31 and 32 is greater than the dimension of the end members 25 and 26 and that to provide nailing space for the sheathing to the frame the member 32 has its outer surface adjacent to the opening 21*a* rabbeted as shown in Figures 4 and 8, and to allow the sheathing to extend over and close the space between the members 27 and 28 has its top end formed as shown in Figure 2. The frame opening 21*a*, having its outer side covered by the sheathing and siding, does not show and since the opening 21 is trimmed by outer trim members in the usual manner the exterior appearance of my window simulates the appearance of conventional windows with the exception that the opening of my window is not reduced in usable area by the unframed glass sections when they are closed. The frame opening 21*a* also has its inner side covered by the inner wall finishing material and my frame is constructed to allow

this opening to be insulated in the same manner as the adjacent wall, if desired (Figures 4 and 8).

The inner side of the opening **21** is also trimmed by the usual trim members to simulate the appearance of a conventional window, however when it is desired to provide the window opening with a roller shade the top trim member is hinged as shown in Figure 3 to allow access to the recess **33** in which a roller shade **70** may be mounted in the usual manner. To guidingly receive and retain the sides of the shade and its free end reinforcing member **71**, each side of the opening **21** is slotted as at **72** (Figures 3, 4 and 8).

When it is desired to provide double windows in side-by-side relation a vertical member **25'** (Figure 9) replaces the member **25** and the structure above described is duplicated at the other side of member **25'** and when a plurality of superposed single or double windows are desired a horizontal member **73** (Figure 10) is secured between each vertically adjacent duplicate pair of the openings **21** and **21***a*.

It should be understood that the herein shown and described forms of my window are intended to exemplify the principles of my invention and that various modifications and rearrangements of its component parts may be made within the scope of the appended claims.

I claim:

1. An improved window of the character described comprising a rectangular window frame formed of horizontally disposed, spaced and parallel top and bottom members, having their end portions connected together by vertically disposed spaced and parallel end members and connected intermediate their end portions by a pair of spaced parallel vertical members dividing the frame into communicating window and storage openings, said pair of vertical frame dividing members having their adjacent surfaces spaced to snugly receive a pair of track members therebetween and their remote surfaces arranged and formed to allow securing the inner and outer walls of a building thereto in a manner enclosing and concealing the storage opening, a lower track secured upon the bottom member and extending between the frame dividing members and from one end member to the other end member, said lower track being formed lengthwise with a pair of spaced narrow inner and outer glass section receiving grooves and a wider screen section receiving groove therebetween, an unframed glass section slidably mounted directly in the inner groove, a similar unframed glass section slidably mounted directly in the outer groove, a lightly framed screen section slidably mounted in the wider groove, said glass and screen sections each being independently slidable to and from a position closing the window opening and to and from a position within the storage opening, an inverted rigid channel shaped track secured to the lower side of the top member in coplanar coextensive relation to the lower track, and a pair of nested inner and outer inverted resilient channel shaped elements coextensive with the rigid channel track and secured thereto intermediate its side walls, the depending side walls of said outer resilient channel each acting to resiliently maintain the upper edge portion of one glass section in slidable sealing engagement with the adjacent side wall of the rigid channel, and the depending side walls of said inner resilient channel each acting to resiliently maintain the upper edge portion of the screen frame in slidable sealing engagement therewith and alined with the screen groove in the bottom track.

2. An improved window frame as set forth in claim 1 wherein the innermost and outermost walls of the glass receiving grooves of the lower track are each vertical and coplanar with one inner vertical wall of the rigid channel and the opposite walls of said grooves are upwardly and inwardly inclined thereby to supplement the action of the depending legs of the outer resilient channel element in resiliently maintaining the upper and lower edge portions of each glass section in slidable sealing engagement with the coplanar surfaces of the upper and lower tracks.

3. An improved window frame as set forth in claim 1 wherein a vertically disposed grooved strip member is secured to the end member of the window opening, said strip member being alined with and extending between the bottom and top track members and being formed with grooves formed like and alined with the grooves of the bottom track, thereby to receive and force the outer side edge portions of the screen and glass sections into sealing engagement with the strip when said sections are positioned to close the window opening.

4. An improved window as set forth in claim 3 wherein one of a pair of inner and outer stop means is secured to one of the spaced vertical frame dividing members to engage the adjacent surface of one of the glass sections, thereby to seal a space between the frame dividing members and the glass sections, and the inner of said stops is detachably secured and removable to allow removal and replacement of the glass and screen sections.

5. An improved window as set forth in claim 1 wherein the exposed outer end of the glass and screen sections each carry means formed and arranged to allow free movement of said sections independently of each other, said means including a finger-piece usable for sliding said sections through the window opening from and to their different positions.

6. An improved window as set forth in claim 1 wherein a manually operable lock is carried by the screen section and is operable to engage and lock the outer glass section in its window closing position and a manually operable lock carried by a stop secured to the inner of the vertical frame dividing members is operable to engage and lock the inner glass section in its window closing position.

7. An improved window as set forth in claim 6 wherein each lock includes a Z-shaped locking element having operating and locking arms angularly related to each other and to their body portion, and the body portion is pivotally mounted to a bracket formed, arranged and secured, whereby swinging movement of the operating arm causes the locking arm to move from an unlocked position to a locked position across the inner edge of its glass section.

8. An improved window as set forth in claim 7 wherein the locking arm is formed with a cam-shaped surface operable by and during locking movement of said arm to engage and move its glass section, thereby to force its outer edge portion into sealing engagement with a sealing strip.

9. An improved window as set forth in claim 1 wherein the storage space of the frame is formed to provide space for the application of insulating material thereto adjacent the inner storage space closing wall, and an insulating material secured in said space.

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