

May 5, 1953

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2,637,381

JACKKNIFE WINDOW

Filed May 7, 1949

3 Sheets-Sheet 1

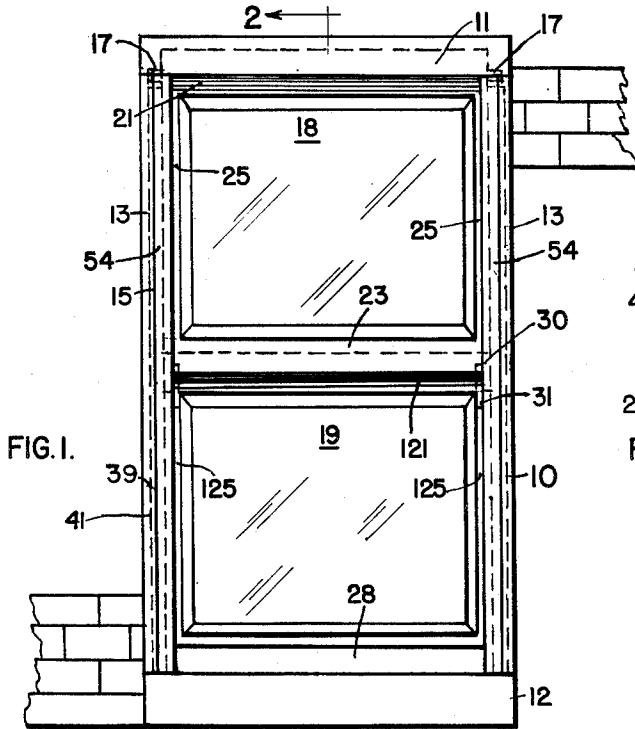


FIG. 1.

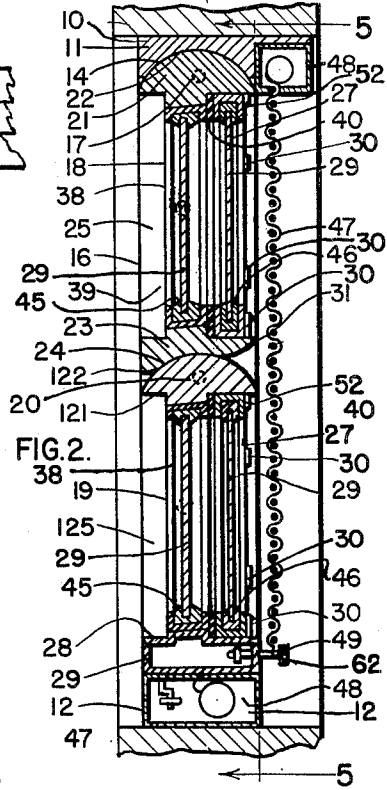


FIG. 2.

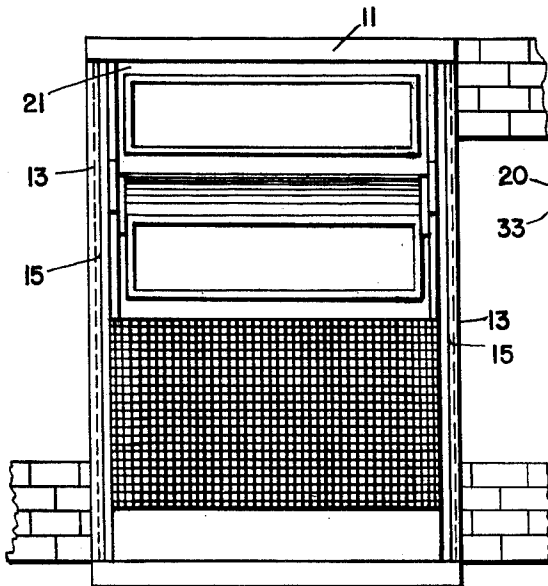


FIG. 4.

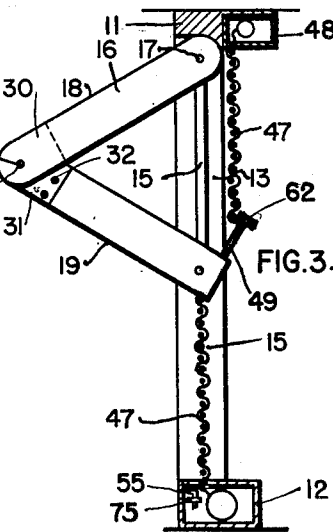


FIG. 3.

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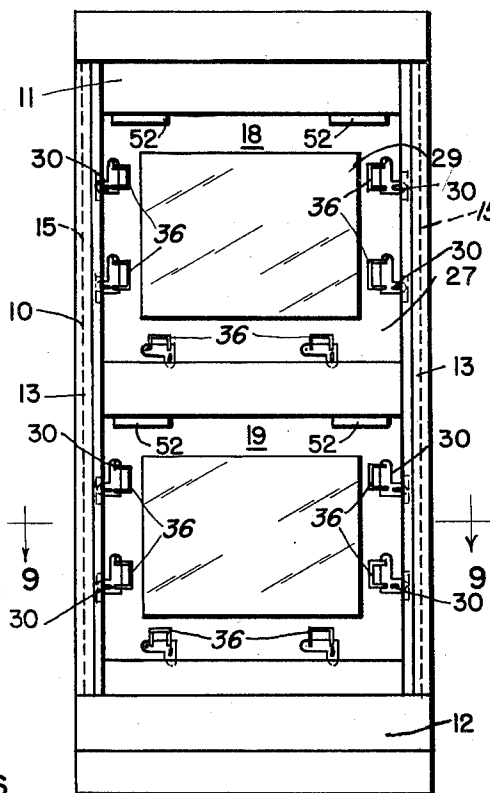


FIG. 6.

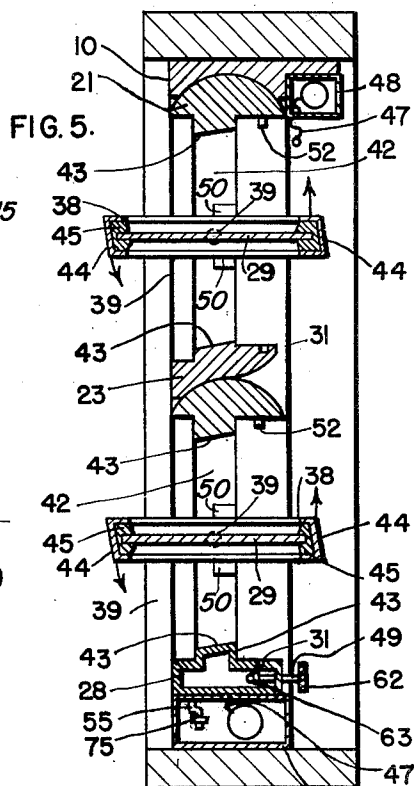


FIG. 5.

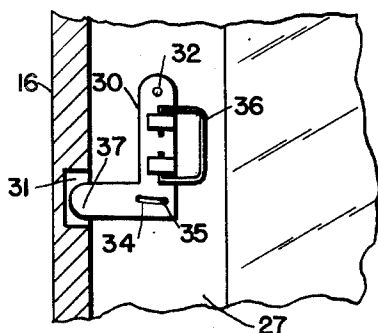


FIG. 7.

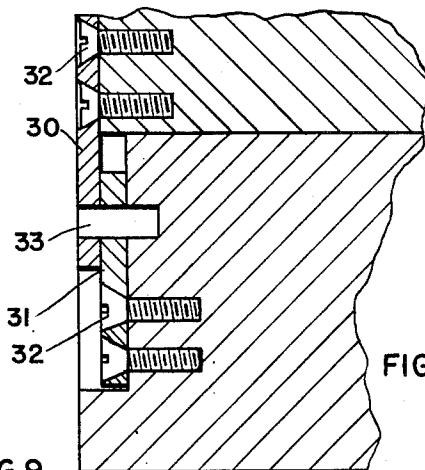


FIG. 8.

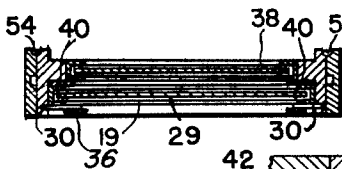
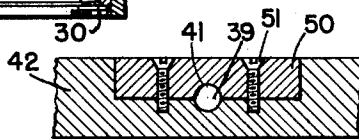


FIG. 10.



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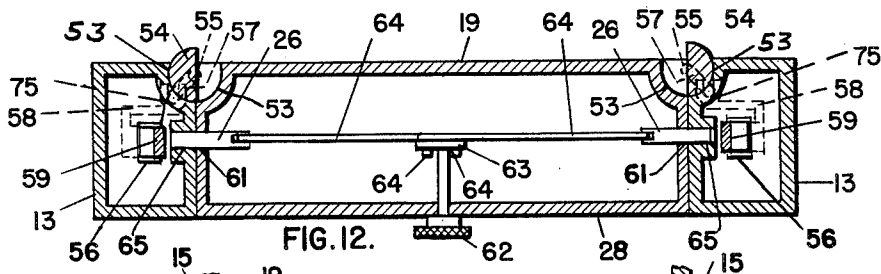


FIG. 12.

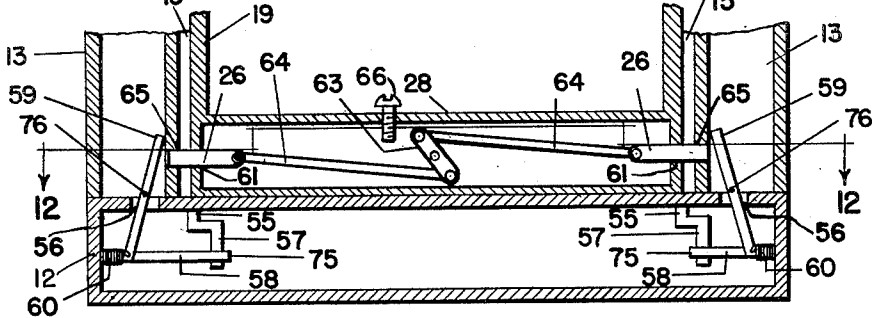


FIG. 11.

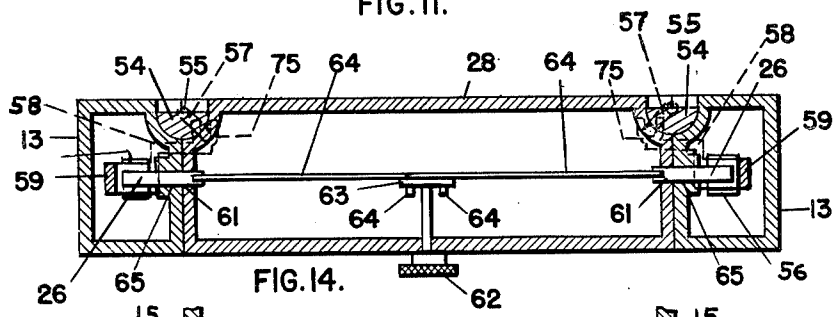


FIG. 14.

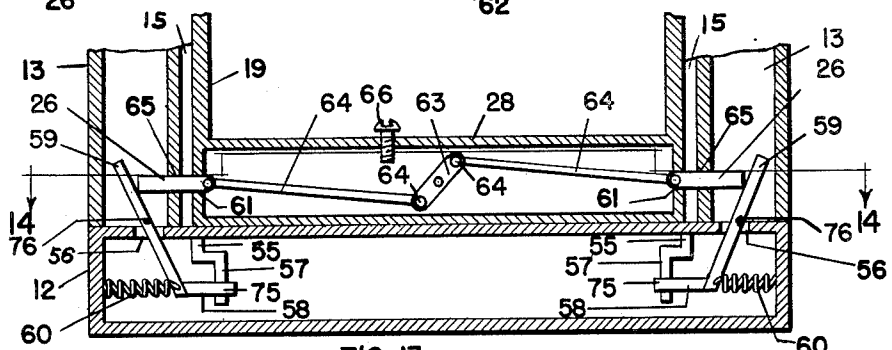


FIG. 13.

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# UNITED STATES PATENT OFFICE

2,637,381

## JACKKNIFE WINDOW

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Application May 7, 1949, Serial No. 92,019

4 Claims. (Cl. 160—40)

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This invention relates to window construction and more particularly to double glazed sash fitted in window frames of the jack-knife variety which operates along the lines indicated in the co-pending applications of the applicant, and identified by the Serial Number 672,863, filed May 23, 1946 now Patent Number 2,513,278, issued July 4, 1950, and Serial Number 81,375, filed March 14, 1949, now abandoned, to which reference is made.

The constructions shown in the previous applications included an adjustable frame that folds into various angular positions outside the normal plane of the window casement opening and are hinged together to enable this to be done. The sashes positioned in said frames are double glazed but lacked means for cleaning the outer pane from the inside of the building to which they are attached, and lack means for weather stripping.

One of the objects of this invention is to provide a new and improved window structure that will avoid one or more of the disadvantages and limitations of the prior art.

Another object of the present invention is to provide a new and improved window structure that will provide a plurality of slide joints between the frame and casement sections to make them weather tight during their movements to various angular positions.

Another object of the present invention is to provide an improved double glazed structure having its outer window pane pivotally connected to the sash to enable it to be rotated therein and having its inner window pane removably connected in said sash.

Another object of the present invention is to provide a new and improved window structure that will facilitate access to all parts of the window pane without dismantling the outside frames in which they are mounted and operated.

A still further object of the present invention is to provide a jack-knife frame having a plurality of double glazed sashes mounted to enable the inner lites to be removed and the outer panes to be rotated to permit access to the faces for cleaning and other purposes.

Other objects of the invention will be observed as its structure and principles are outlined.

For a better understanding of the invention and the objects thereof, reference is made to the appended drawings, which illustrate a particular form by way of example, while the claims indicate the scope of the invention.

The conventional types of window frames and sashes have the disadvantage of fixity that pre-

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vents access to the outside in a convenient manner. This is due to the fact that these sashes move up in runways that keep them from movements outside of the planes in which they normally reciprocate. This invention provides a window frame structure that allows the window panes to be taken out of the main window structure or revolved therein to present the face of the window pane either towards the front or back of the structure and be rendered accessible to an individual in the building for cleaning and other purposes.

In the drawings:

Figure 1 is an outer view of the combined storm window embodying this invention;

Figure 2 is a sectional view taken along line 2—2 of Figure 1;

Figure 3 is a side elevation of the window in raised jack-knife position with parts broken away to show its inner construction;

Figure 4 is a view of Figure 3, looking from the outside of the building;

Figure 5 is a sectional elevation, similar to that shown in Figure 2, except that the inner sections have been removed and the outer sections tilted inwardly for cleaning;

Figure 6 is an elevational view taken of the inner window showing the inner sashes locked in position;

Figure 7 is an enlarged view showing the cam clips locked in the slots to hold the inner sash in place;

Figure 8 is an enlarged view of the hinge arrangement showing the method used for joining the sashes;

Figure 9 is a sectional view taken along line 9—9 of Figure 6;

Figure 10 is a sectional view taken through the outer sash pivoting means to show its construction;

Figure 11 is a sectional view taken through the lower sash, bottom member and side rails and shows the window in locked position but with the revolving window stripping in open position;

Figure 12 is a sectional view taken along line 12—12 of Fig. 11;

Figure 13 is a sectional view taken along and through the lower sash similar to that shown in Figure 11 except that the window is in locked position against raising, but the weather strips are closed; and

Figure 14 is a sectional view taken along line 14—14 of Fig. 13.

Similar parts are designated by the same reference numerals throughout the drawings.

The main or outside casement structure of a

window is shown at 10 and is composed of a top member 11 having a concaved surface 14 therein, a bottom member 12, two side members 13 provided with channels 15 to be referred to in detail later. A frame 16 is positioned in the casement structure 10 and supported and pivoted on pins 17 that enable the frame to be swung up and down. The frame 16 is composed of an upper sash 18 and a lower sash 19 pivoted at 20 to enable the frame and sashes to swing outwardly in a jack-knife manner.

The upper sash 18 is formed with an upper rail 21 having an arcuate form at 22 that fits into the concaved surface 14 of top member 11. The lower rail 23 is provided with a reverse curve of semi-convexed and concaved surface 24 preferably of the same radius used for concave surface 14 in top member 11.

Side rails 25 are preferably of a T shape and are used to connect the upper member 11, and lower member 23, as shown in Figures 1 and 2. The lower sash 19 is very much the same shape and size as the top sash previously mentioned. It has an upper rail 121 having an arcuate form at 122 that fits into the concaved surface 24 of the lower member 23 of the upper sash. The side members 125 are preferably T-shaped and are usually the same as side members 25 above mentioned and used to connect the upper rail 121 to the lower member 23. The lower member 23 is formed as shown in the drawings. The upper and lower sashes are pivotally connected by hinge parts 30 and 31 and are attached to the sashes by screws 32 and connected by pivot pins 33.

Lugs 26 are projected laterally from the lower sash 19 to ride in the channels 15 provided in the vertical wall members 13 of the casement 10. As the lower sash 19 is raised the lugs 26 slide in the channels 15 and guide the lower member 23 so it cannot move out of alignment with the channel but will slide in same to allow the rest of the frame and sashes to jack-knife outwardly. The upper sash 18 hinges at 17 to the casement 10 and to the lower sash at 20 as already noted. The hinge 17 pivots and supports the sash 18 held at the top of the casement 10, but allows the upper sash 18 to jack-knife outwardly as shown.

The sashes 18 and 19 are of the storm window type and of a different construction from that of the ordinary sashes, in that they both have an inner removable panel 27 holding a window pane 29 preferably of glass, and a pivoted outer panel 39.

The panel 27 frames the glass in it in a single removable unit, and has cam clips 30 fastened to the inner panel 27 by pins 32 and its movement is regulated by an arcuate slot 34 in which a stop 35 is positioned and is moved by a handle 36 so the end 37 will engage in the slots 31 in the frame 16 to permit the placement and removal of the inner removable panels 27. The panels 27 are held at the top of sashes 18 and 19 by stops 52. When the panels 27 are removed they may be cleaned at the leisure and convenience of the user. The sashes are double paned as in storm windows, with the outer panel 38 in each case held by and swung on pins 39 which project into holes 41 in the side ledges 42 of the side rails 25 and 125 of the upper and lower sashes 18 and 19 respectively. The sash 38 can only be swung on its pivot when the inner sash 27 has been removed. The ledges on the upper and lower sashes 18 and 19 are of angular form 43 to prevent weather entering the sash when the

angular face 44 of outer panel 38 is pressed tightly against the face 43. Suitable weather stripping 40 is installed at suitable locations between the inner and outer panels to prevent undue leakage between the frame and the sashes. Glazing gaskets 45 are positioned in the outer panel 38 and glazing gaskets 46 are positioned in the inner panels to support the glass 29 in their respective panels.

The frame 16 and sides 13 are provided with concaved faces 53 in which half-round weather strips 54 preferably rotate to prevent leakage between the faces of the frame and outside casement. The strip 54 is provided with pins 55 that fit in holes in the top and bottom members 10 and 12 respectively. A lever 57 is attached at one end to the lower pin 55 and with the other end bent downwardly and fitted into the slotted fork end 75 of a lever 58 affixed to plate 59. The plate 59 is pivoted at 76 and swings thereon in a slot 56 when pushed backwards by the lugs 26 to rotate the weather strip 54 into closed position. Holes 65 are positioned at the rear of the channel 15 to allow the lugs 26 to pass therethrough and contact the plates 59. When the lugs are withdrawn from the holes 65, the plate 59 returns to its normal position against the rear wall of the channel 15 under tension of springs 60. The lugs 26 are mounted in holes 61 in the lower member 23 of sash 19 and are moved by a knob 62 connected to a fulcrum 63 through connectors 64. A screw 66 limits the movement of the fulcrum 63 to prevent the lugs 26 from being withdrawn from holes 61 when it is desired to withdraw the lugs 26 from the channel 15 and remove the frame 16 from the casement 10. The sashes 18 and 19 are held in open position through contact of the lugs with the rear wall of the channel 15 in the sides 13.

A suitable arrangement of flexible screening 47 is installed in conjunction with the window sashes to prevent the ingress of flies or other insects. The screening winds up on a spring actuated roller (not shown) in casings 48 mounted on the inside casement, and being attached to the lower sash 19 it opens and closes with same, as the latter is raised or lowered. The connection or anchor 49 enables the inner screen to be attached or detached as desired or required. A similar screen 47 is mounted in bottom member 12 and attached to lower member 28.

The access to the panes of glass that the panels afford by their construction is very convenient and removes the dangers that repairmen and window washers incur in the repair and maintenance of the present forms of windows that necessitate that the window washer be suspended from the outside of the building keeping them clean.

It should be particularly noted that this type of window avoids the use of balance weights and can be raised or lowered mechanically or manually locked in the predetermined positions as shown in applications mentioned above. When the window is lowered, the knob 62 is turned and moves the lugs 26 into holes 65 and prevents the sash from being raised from the outside. When it is desired to engage the half round weatherstrips 54, the knob 62 is rotated until the lugs 26 pass through holes 61 and 65 and pushes plates 59 and moves the strips 54 into closed position. When it is desired to withdraw the lugs 26 from engagement with channels 15, the screw 66 is removed and the movement of

knob 62 reversed until the fulcrum contacts stop 67.

While but one general form of the invention is shown in the drawings and described in the specifications, it is not desired to limit this application for patent to this particular form, as it is appreciated that other forms of construction could be made that would use the same principles and come within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. In combination, a window casement comprising side walls, a bottom member, a top member having an inner concave surface, a frame composed of an upper and lower sash, the upper sash including an upper rail of outwardly arcuate form being received in and cooperating with the concave surface of the top member to allow rotation of the upper sash in the top member, the upper sash including a lower rail having an inner concave surface and an adjacent convex surface and the lower sash including an upper rail of outwardly arcuate form being received in the concave surface of the upper sash rail when the sashes are in closed position and cooperating with the convex surface of the upper rail to allow rotation between the sashes to open the latter, frames carried by the sashes for mounting glass panes therein, pivot means between the sashes and guide means for the lower sash cooperating with the aforesaid side walls, whereby said sashes protrude outwardly of the casement while rotating about the pivot means when the lower sash is moved upwardly along the guide means, said guide means comprising a lug carried by and protruding laterally from each vertical side of the lower sash and frictionally contacting the aforesaid side walls to maintain the sashes in open position and means for withdrawing said lugs from contact with the side walls to permit removal of the frame from the casement.

2. The combination set forth in claim 1 including a screen, means for securing one end of the screen to the top member and the opposite end of the screen to the bottom of the lower sash,

whereby the screen moves with the lower sash, a second screen cooperating with the lower sash, and means for securing one end of the last mentioned screen to the lower member and the opposite end to the lower sash, whereby the second screen moves with the lower sash.

3. The combination set forth in claim 1, including weather stripping between said casement and frame, and manual means for moving said weather stripping out of engagement with said casement and frame.

4. In combination, a window casement, a frame in said casement composed of an upper and a lower sash, means for pivoting the upper edge of the upper sash to the casement, means for pivoting the lower edge of the upper sash to the upper edge of the lower sash, means for guiding the lower edge of the lower sash in the casement whereby both sashes will move outwardly and angularly when the lower sash is pushed upwardly, a removable glass-carrying panel in each sash, a second glass-carrying panel in each sash and means for pivoting said last mentioned panel medially of its length to the cooperating sash, whereby the said last mentioned panels may be swung about its pivot when the adjoining panel in the same sash is removed.

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