Aug. 14, 1956 E. P. TURNER 2,758,343

WINDOW CONSTRUCTION

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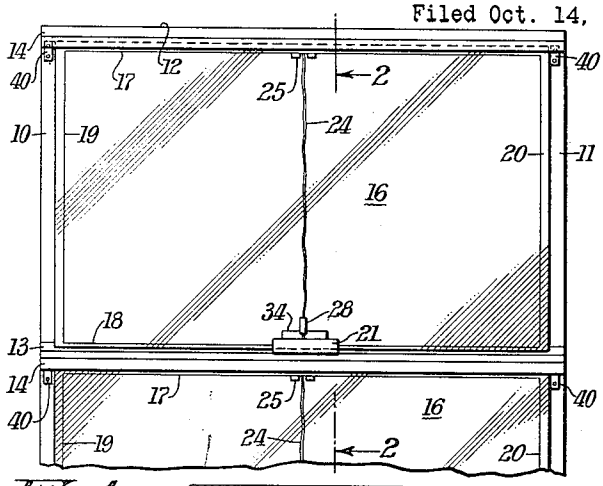


Fig. 1.

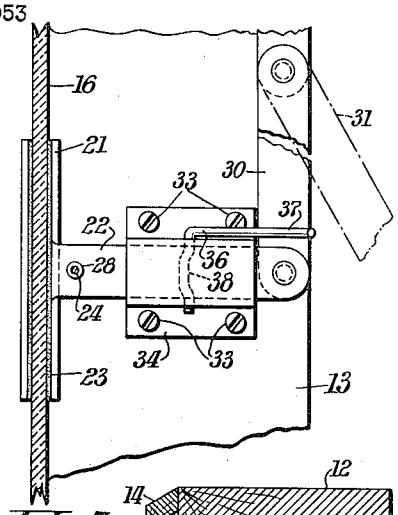


Fig. 5.

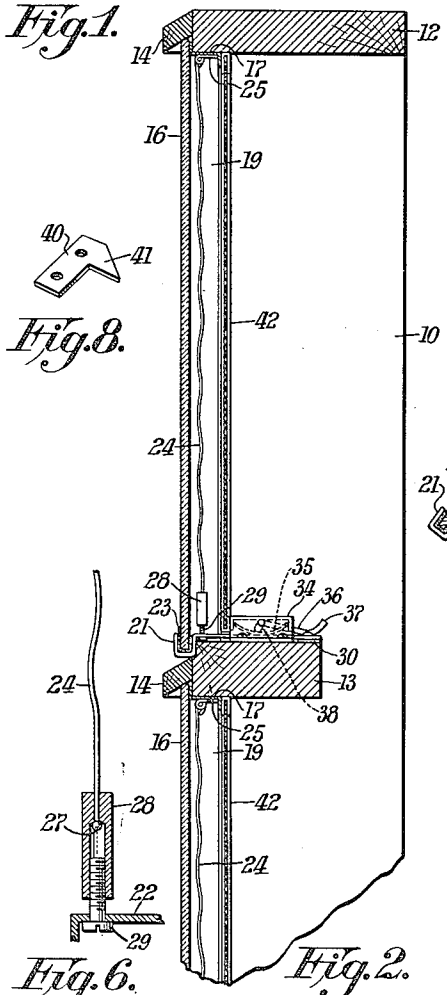


Fig. 2.

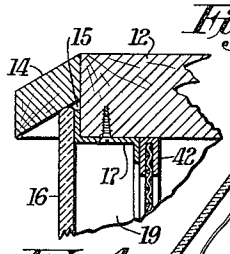


Fig. 4.

Fig. 3.

Fig. 8.

Fig. 6.

Fig. 7.

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WINDOW CONSTRUCTION

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9 Claims. (Cl. 20—53)

This invention relates to window construction and more particularly to an awning-type window which is hinged and adjustable to substantially any angular position.

It is a primary object of this invention to provide a window which does not require a sash.

Another object of this invention is to provide a window which can be readily installed and made weather-tight, rattle-proof, and tamper-proof with a minimum of effort.

A further object of this invention is to provide a window construction comprising a few inexpensive elements which are readily assembled without requiring any special skills.

A still further object of this invention is to provide a window which shall require a minimum of maintenance in respect to cleaning and painting.

A further object of this invention is to provide, in connection with a window construction, simple means to adjust the opening of the window from within doors and to hold it in any desired angular position including complete closure.

Still other objects and attendant advantages of this invention will be manifest from the detailed description following in connection with the attached drawings wherein Fig. 1 is a fragmentary outside elevation of a window construction embodying the invention.

Fig. 2 is a vertical sectional view of the window taken on line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view similar to Fig. 2 except taken with the window opened.

Fig. 4 is a fragmentary detail of part of the window construction of this invention.

Fig. 5 is a plan view partly in elevation showing the window locking means.

Fig. 6 is a detail view of one of the primary components of the window structure.

Fig. 7 is a perspective detail view of a hinge joint forming part of the window structure.

Fig. 8 is a perspective detail view of a stop used in the window construction.

Referring now to Fig. 1 a rectangular window frame is formed with vertical side members 10 and 11 and connecting horizontal cross members 12 and 13. The top cross member 12 and the bottom member (not shown) extend to the full depth of the frame as seen best in Fig. 2, while the intermediate cross members such as 13 are narrower in depth as shown, to permit the use of a single venetian blind or roller shade for the full height regardless of the number of window openings. It is understood that the frame described here provides a series of vertically stacked window openings as is customary with awning-type windows.

Secured to the cross members 12 and 13 on the exterior thereof and extending horizontally for the full width of the frame are cap members 14. Shown best in Fig. 4, the cap members 14 have a cross-section in the form of a parallelogram and form with the respective cross members 12 and 13 an acute angle pocket 15 running the full width of the frame for receiving the rounded top edge of a pane 16 preferably of bevelled plate glass in a manner to be described later.

The frame opening defined by members 10, 11, 12, and 13 cannot be relied on to furnish a true seat for the pane 16. Therefore metal strips 17, 18, 19, and 20 having a Z section are secured to the four edges of the window opening as seen best in Fig. 4. These are pushed tightly outward against the inner surface of the glass pane 16 in its fully closed position, and serve as stripping to form a weather-tight seal and thus compensate for dimensional irregularities usually found in the rough-milled frame members.

Secured to the central portion of the bottom edge of the pane 16 is a T-shaped clamp member 21 shown best in Fig. 5. This clamp member is formed preferably of hard aluminum and has a pane-engaging portion of U-shaped section and a joining flat stem portion 22. Between the edge of the glass pane 16 and the U-shaped section is a gasket 23 of rubber or similar resilient material to distribute the stress and to serve as a friction grip to prevent displacement and rattling. The clamp member 21 is urged upward against the pane 16 which, in turn, is thus urged into the hinge pocket 15 by a spring member 24. The member 24 is shown as a very stiff steel wire spring having few extended small-diameter coils, with a view to making a high-rate spring with a limited extension represented by the full length of the wire. This makes practically impossible the unauthorized disengagement of the pane 16 from the pocket 15 by pulling down on the clamp 21 from the exterior of the window and thus promotes security consistent with minimum visual obstruction. It is clear that this member 24 may be any resilient element capable of transmitting the required force.

A hinge piece 25 is secured to the top member 12 and the end of the spring member 24 is anchored thereto by looping the wire end about a hinge pin 26 as shown best in Fig. 7. The opposite end of the spring member 24 is formed with an enlarged upset portion 27 which fits within a threaded sleeve 28 as seen best in Fig. 6. A screw 29 passes through an aperture in the stem portion 22 of the clamp member 21 and is threaded into the sleeve 28. It is evident that, by taking up on the screw 29, the required tension may be established in the spring 24 to seat the upper edge of the pane 16 in the hinge pocket 15 with the required force.

Hinged to the end of the stem portion 22 is a link 30 of flat spring steel to the opposite end of which is hinged a flat operator member 31 which terminates in a turned-up portion 32 serving as a finger hold for easy manipulation. Parts 21, 30, and 31 thus form an articulated window operator by means of which the pane 16 may be adjusted for all degrees of opening including full locked closure in a manner to be described.

Secured to the intermediate cross member 13 by means of screws 33 is a box-like guide bracket 34 which receives in sliding engagement, the flat members 21, 30, and 31 of the articulated window operator as seen best in Fig. 3, which shows the window pane 16 in its fully opened position. Positioned within the bracket 34 is an arcuate leaf spring 35 presenting its convex surface to the members 22, 30, and 31 as they slide through the bracket 34 during adjustment of the pane 16.

An eccentric actuator 36 is journaled in the bracket 34 and is formed with an exterior handle portion 37 and an interior offset portion 38. It will be seen that, with the handle portion 37 turned up, as in Fig. 3, the leaf spring 35 exerts only light pressure against the window operator member 31 and it slides freely through the bracket. It will be noted that, at the hinge point between

elements 30 and 31, there is a build-up of thickness due to the two elements plus the rivet head and this resists passage under the spring 35 to provide an important anti-slam feature. However, when the desired position of the pane is reached, the actuator handle 37 is turned down as shown in Fig. 2 whereby the offset portion 38 turns downward to urge the leaf spring 35 into frictional engagement with the members 22, 30, or 31, as the case may be, to clamp them securely against the cross member 13 thus securing the pane in that position. It will be noticed that this locked position of the actuator 36 corresponds to a locked-over-center condition of the offset portion 38, thus maintaining the actuator in locked position until released by manipulation of the handle 37.

A notch 39 is provided in the exterior edge of the cross member 13 as shown in Fig. 3 into which enters the clamp member 21 as seen in Fig. 2 when the pane is in fully closed position. This allows the pane 16 to fully seat tightly against the strips 17, 18, 19, and 20 in weather-tight engagement. It will be seen that, in this fully closed and locked condition, the head of the screw 29 cannot be reached from the exterior and the window is thus rendered tamper-proof.

When the operator elements 30 and 31 are pulled in to fully close the window they may be folded about their hinge points in nested fashion as shown in Fig. 5 to prevent unsightly and inconvenient protrusion into the room and to provide additional locking security.

To prevent sidewise displacement of the pane 16 in the hinge pocket 15, stop pieces 40 shown in detail in Fig. 8 are secured to the side members 10, and 11 as seen in Fig. 1. These pieces may be formed of sheet metal and have a portion 41 which may be turned down to fit into the pocket 15 and against each end of the top edge of the pane 16 serving as lateral stops therefor.

The three hinged elements 22, 30, and 31 provide an articulated, relatively stiff, semi-flexible member which bends to follow the arc of the pane 16 as it is moved to various angular positions. Further, the three elements 22, 30, and 31 represent the optimum number of parts to give the required flexibility consistent with lateral stability and convenient disposition of the parts in closed position. A larger number of parts would destroy lateral stability while a smaller number would be inconvenient as member 31 would become unduly long for a given window opening. The removal of the pane 16 for cleaning, painting, or replacement is readily accomplished by loosening screw 29 to release the tension in the wire 24 to the point where the pane may be pulled down and disengaged from the hinge pocket 15. The cap member 14 provides a weather-tight seal against entry of wind and water at the top edge of the pane in all positions of the window.

A screen 42 (or storm window) may be readily inserted in the window frame using the strips 17, 18, 19, and 20 as positioning stops as seen best in Figs. 2 and 3.

While the window construction shown is described as preferably employing a glass pane without a sash, this invention is not to be construed as so limited, but includes the form of construction in which a sash may be used if desired.

From the above it will be evident that the constructional elements of this invention provide a fully adjustable window which may be readily constructed from a few simple parts with ordinary skill in assembly, with insurance against leaking, rattling and tampering and with minimum requirements as to servicing.

Having thus described the invention, I claim:

1. A top-hinged adjustable window comprising a stationary frame, a transparent pane, a cap strip secured to the top of said frame and forming therewith a hinge pocket for receiving the top edge of said pane, a clamp member for receiving the bottom edge of said pane, a resilient tension element adjustably secured at one end to said clamp member and hingedly anchored at the other end to the top of said frame to urge said pane upwardly into said hinge pocket, a manually-operated articulated link member attached to said clamp member for adjusting the angular position of the pane, a guide member secured to said frame for receiving said link member in slidable engagement, and means carried by said guide member for frictionally locking said link member in any desired angular position of said pane.

2. Apparatus according to claim 1 in which the resilient tension element is a high-rate spring of limited extension formed with extended small-diameter coils.

3. Apparatus according to claim 1 in which the pocket-forming strip secured to the top of the frame presents a section which slopes downward and away from said frame to form therewith an inverted acute angle which provides a sheltered hinge pocket for said pane.

4. Apparatus according to claim 1 in which the articulated link member comprises two flat flexible leaf springs hinged together for lateral folding, one of which is formed at the end with a turned-up portion serving as a finger hold.

5. Apparatus according to claim 1 in which the locking means is an arcuate leaf spring and a manually-operated eccentric cam for urging said spring into frictional engagement with said link member.

6. A window construction comprising a frame forming a plurality of window openings made up of vertical and horizontal members, transparent panes for each opening, a cap strip secured to the frame at the top of each opening to form therewith an inverted V-pocket for receiving the upper edge of its respective pane, a clamp member for receiving the lower edge of said pane, adjustable tension means secured at one end to said clamp member and hingedly anchored at the other end to said frame to urge said pane upwards into said V-pocket, and operator means for adjusting said pane in its angular movement about said V-pocket including articulated spring means attached to said clamp member, stationary bracket means secured to the horizontal frame member at the bottom of each window opening for slidably receiving the articulated spring means, and means carried by said bracket for frictionally locking said spring means to said horizontal frame member in any desired angular position of said pane.

7. Apparatus according to claim 6 in which the transparent panes have their upper edges rounded.

8. Apparatus according to claim 6 in which the articulated spring means comprises overlapping hinged elements providing double thickness at the hinge to resist passage through the stationary bracket to prevent slamming.

9. Apparatus according to claim 6 in which Z-sectioned strips are secured to the edges of the window openings to form exteriorly a true edge for receiving the pane in weather-tight engagement and to form interiorly a stop for a screen.

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