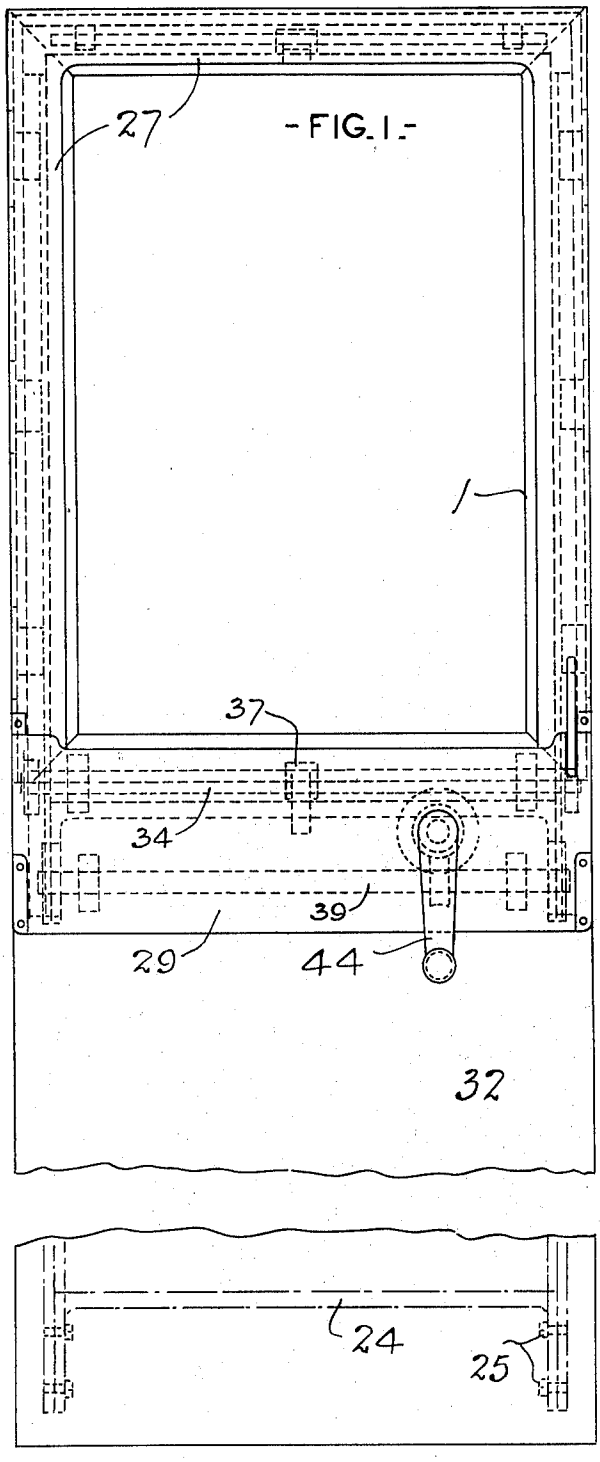
June 12, 1934. H. D. ROHMAN ET AL 1,962,328

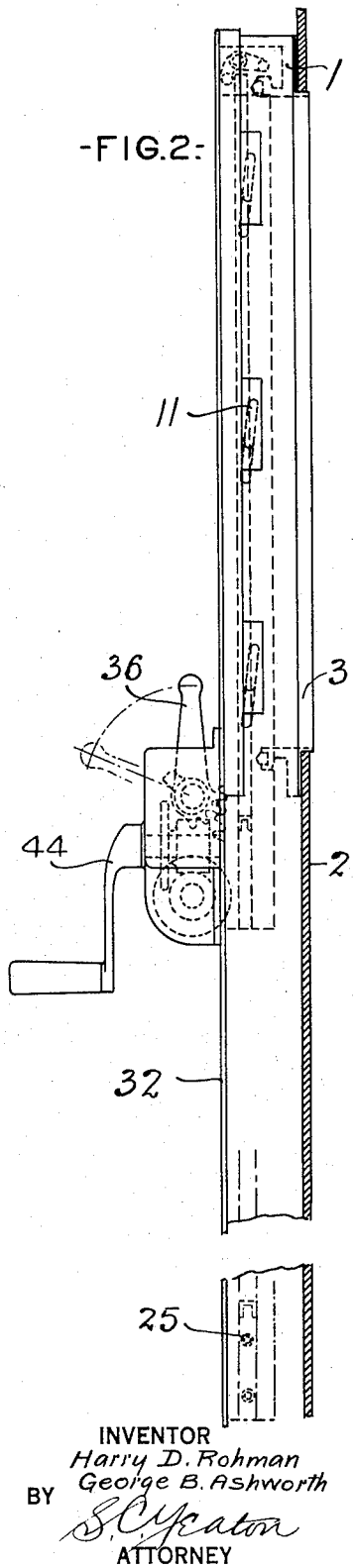
SLIDING WINDOW

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-FIG. 1-



-FIG. 2-

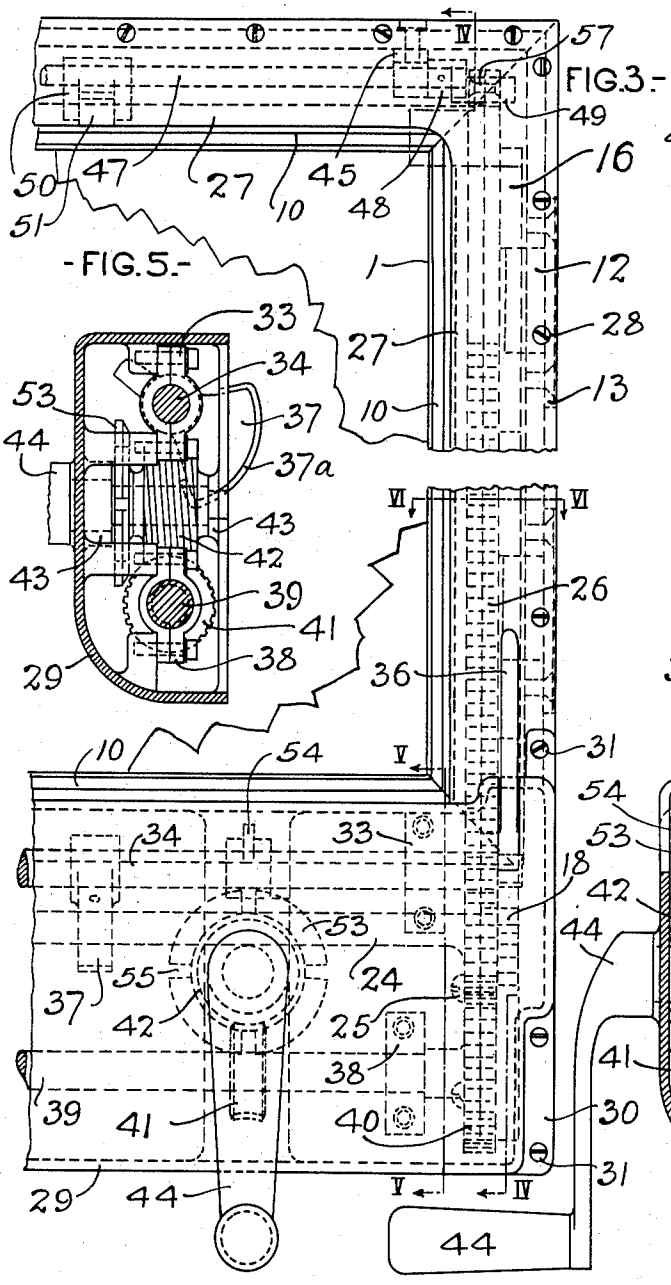


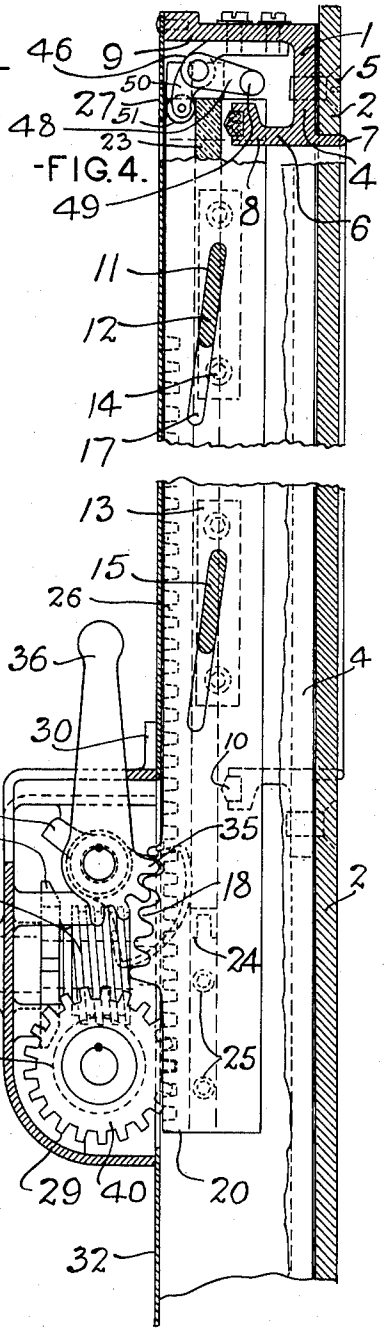
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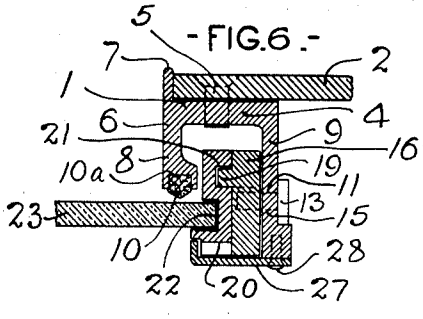
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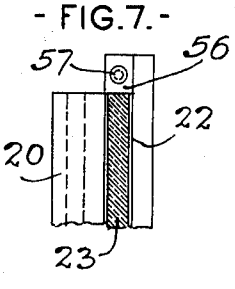
SLIDING WINDOW

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UNITED STATES PATENT OFFICE

1,962,328

SLIDING WINDOW

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Application February 7, 1933, Serial No. 655,554

4 Claims. (Cl. 114—178)

This invention relates to sliding windows of the type used as deck house lights on a ship.

An object of the present invention is to provide an improved sliding window embodying a pane or light adapted for up and down or vertical movement for opening and closing, and for outward and inward or lateral movement for evenly and tightly pressing against a seating and for positive locking in closed or in any partly open position without risk of breakage, which construction will be compact, simple and safe, will comprise a minimum number of parts, and will be characterized by sturdiness, durability, and ease of operation.

A further object is to provide a window of the character described embodying a frame or support for the pane without any material at the top of the pane, thus affording the greatest possible visibility for all positions of the pane.

A further object is to provide a window of the character described which will embody the aforesaid means for tightly securing the pane in any partially open position so as to prevent rattling and breakage, with the securing means arranged so that the pane will be completely water-tight in fully closed position.

A further object is to provide means preventing opening and closing movement of the pane when the pane is in seat-engaged position.

Other and further objects of and advantages achieved by the invention will be apparent from the following description of an approved embodiment thereof.

In the accompanying drawings, Figure 1 is an inside elevation of a window embodying the present invention, a part being broken away and the lower ends of the racks and tie bar of the window being indicated by dot and dash lines in their lowermost position; Fig. 2 is an end view of the structure shown in Fig. 1, a part of the bulkhead to which the window is attached being shown in section; and Figs. 3 to 7 are enlarged detail views of the structure shown in Fig. 1, Fig. 3 being a fragmentary inside elevation of the upper right hand part of the structure shown in Fig. 1, Fig. 4 is a section on the broken line IV—IV of Fig. 3 showing part of the bulkhead to which the window is secured, Fig. 5 a section on the line V—V of Fig. 3, Fig. 6 a section on the line VI—VI of Fig. 3 showing a part of the bulkhead and Fig. 7 a view of the upper portion of the rack shown in Fig. 6 as viewed from the left with the corresponding portion of the pane shown in section.

The window comprises an oblong frame indicated generally by the numeral 1, which is secured to the bulkhead or wall indicated by the numeral 2 (Figs. 2, 4 and 6) of a ship. The bulkhead or wall 2 is provided with an opening 3 for the frame, and the frame includes flat side, top and bottom members 4 which are permanently secured to the bulkhead by means of countersunk screws 5 disposed around the opening 3 at the respective sides, top and bottom thereof. Transverse flanges 6 are formed on the inner edges of the members 4 integrally therewith, one portion 7 of the flanges extending from the members 4 toward the outside of the window and engaging the edges of the opening 3, and another portion 8 of the flanges extending from the members toward the inside of the window. The frame is further provided with supporting flanges 9 extending from the outer edges of the side and top members 4 toward the inside of the window. At the ends of the transverse flange portions 8, a rubber seating 10 is mounted in a groove 10*a* provided therefor in the portions 8.

Each of the vertical side flanges 9 of the frame is provided with spaced inclined slots 11, (Figs. 2, 4 and 6), the slots slanting in an outward direction from bottom to top. Each of the slots 11 is provided with a removable wedge member 12. Each wedge member includes an oblong plate 13 which is secured to the outer side of its respective side flange 9 by screws 14, and a slanting wedge piece 15 integrally formed on the side of the plate 13, which piece 15 fits into and extends through the slot 11.

Adjacent the inner surfaces of the side flanges 9, on each side of the frame, vertical wedge bars 16 are disposed. Each wedge bar is provided with slanting slots 17 in its sides, into which the wedge pieces 15 extend. The slots 17 extend in the same direction as the wedge pieces 15, but are of a greater length than the wedge pieces, so that by virtue of the engagement of the wedge bars with the wedge pieces, up and down movement of the wedge bars will effect outward and inward movement respectively, or in other words lateral movement of the wedge bars. Each of the wedge bars is provided near its lower end, on its inner face with respect to the window, with a toothed rack 18 which is inwardly inclined from top to bottom (Fig. 4), for a purpose hereinafter to be described.

Extending from top to bottom, in the direction of the flange portion 8, on each wedge bar 16 is formed a tongue 19 (Fig. 6). Adjacent the inner face of each of the wedge bars, a rack 20 is disposed and each rack 20 is provided with

a vertical groove 21 throughout its length which groove is engaged by the tongue 19 of the adjacent wedge bar. The racks are thus vertically movable with relation to the wedge bars, the tongues and grooves serving as guiding means. A groove 22 is formed in the inner face of each of the racks 20 spaced inwardly with respect to the window from the groove 21. A pane or light 23 is disposed between the racks with its opposite vertical edges extending into the respective opposite grooves 22 of the respective racks, and rigidly secured to the racks by a suitable cement or other suitable securing means such as felt lined rubber. The pane is thus carried by the racks. The lower ends of the racks 20 are connected by a tie bar 24, end members of the tie bar being suitably secured to the respective racks by screws 25, (Fig. 1), with the lower edge of the pane bearing against the tie bar. Each of the racks 20 is provided on its inner face with respect to the window with teeth 26, substantially throughout its length.

On the inner edges of the flanges 9 a casing 27 is secured by suitable countersunk screws 28 (Figs. 3, 4 and 6). The casing 27 extends across the top of the window and down the sides thereof, the upper portions at the sides being bent in the direction of the pane, so as to completely enclose the teeth of the racks 20 at these locations (Fig. 6). The side portions of the casing 27 extend downwardly a short distance below the level of the lower edge of the opening 3 and between this level and their lower ends the side portions are cut away so as to clear parts of the operating mechanism hereinafter described at this location.

A housing 29 (Figs. 4 and 5) is provided for operating mechanism for the window and is disposed across the inner side of the window immediately below the lower edge of the bulkhead opening 3. The housing comprises a substantially box-shaped metal structure open at the side thereof adjacent the casing 27 and secured to the lower side portions of the casing 27 by flanges 30 formed on the housing, and suitable countersunk screws 31 passed through said flanges and casing into the side flanges 9 of the frame. From the lower edge of the housing 29, a metal panel 32 (Fig. 4) extends downwardly providing an enclosed space into which the pane and racks extend when the window is open, i. e. the pane is lowered. The panel is suitably secured in place by screws (not shown). The racks 20 and tie bar 24 are indicated in Fig. 1 by dot and dash lines in their lowermost positions, that is, their positions when the pane is in full open position.

In the upper portion of the housing, 29, at each end thereof, bearings 33 are secured to the housing, and a shaft 34 is mounted in the bearings and extends through the housing. Toothed segments 35 are secured at the opposite ends of the shaft 34 and engage the teeth of the racks 18 on the wedge bars. An operating handle 36 is rigidly secured to the shaft 34. In the embodiment illustrated the handle is formed integral with one of the segments 35. It will be apparent that when the handle is moved downwardly, the shaft 34 and segments 35 will be rotated so as to raise the respective wedge bars. By virtue of the incline of the racks 18, the teeth of the racks and segments will be maintained in proper mesh regardless of the lateral movement of the racks, caused by the wedge pieces and their engaging slots, relative to the shaft when the racks are moved vertically.

Rigidly secured to the central portion of the shaft 34 is a cam-shaped member 37. The cam surface of the member 37 is covered with felt 37*a*, although of course any other suitable material may be employed, and when the shaft is rotated to raise the wedge bars, the cam surface resiliently engages the pane and forces the pane against that portion of the rubber seating 10 in the lower part of the inwardly extending flange portion 8. The lower portion of the pane, when the pane is in its uppermost position, extends below the aforementioned lower portion of the seating 10 so that the member 37 will engage the pane when it is in fully closed position.

In the lower portion of the housing 29 suitable shaft bearings 38 are secured to the housing and a shaft 39 is mounted in the bearings 38 and extends parallel to, and beneath, the shaft 34. At the opposite ends of the shaft 39, pinions 40 are rigidly mounted thereon, the teeth of the respective pinions 40 meshing with the teeth 26 of their adjacent racks 20, so that when the shaft and pinions are rotated, the racks will be moved upwardly or downwardly to close or open the window according to the direction of rotation of the shaft and pinions.

Spaced inwardly from one end of the shaft 39, a worm wheel 41 is secured thereon, and a worm 42 in mesh with the worm wheel 41, is carried by suitable bearings 43 formed integral with the housing 29. A crank 44 is rigidly and operably secured to the worm 42, the shaft of the crank extending through a suitable opening formed in the wall of the housing 29. It will be apparent that by turning the crank 44, the shaft 39 will be rotated by the movements of the worm 42 and worm wheel 41 and the pane may thus be raised or lowered as aforedescribed, according to the direction of rotation of the crank. It will also be apparent that by virtue of the worm 42 and the worm wheel 41 the pane will be supported in any vertically moved position and will not be movable from that position except by the turning of the crank 44.

Brackets 45 are secured to the upper inwardly extending flange 9 on the bottom surface thereof at the opposite sides of the frame. Bearings 46 are formed in the brackets and a shaft 47 is rotatably mounted in the bearings 46. At the opposite ends of the shaft 47, arms 48 are secured. Each of the arms 48 extends substantially horizontally and outwardly, with respect to the window, and is provided at its outer end with a boss 49, which extends toward the respective side of the frame above the upper end of the respective wedge bar 16, at said side. Centrally on the shaft 47 a curved arm 50 is rigidly secured and extends downwardly. The lower end of the arm 50 is bifurcated and a roller 51 is rotatably mounted therein. Normally, the weight of the arms 48 and their bosses 49 hold the shaft in the position shown in Fig. 4, with the roller 51 bearing against the casing 27. When the wedge bars 16 are moved upwardly, their upper ends engage the respective bosses 49 so as to rotate the shaft 47 and move the arm 50 and roller 51 outwardly, with respect to the window, so that, when the pane is in its uppermost or closed position, the roller will press against the inner surface of the pane, at its central upper portion, and force the pane against the seating 10 at this location.

To prevent opening and closing of the window when the pane is in seat-engaging position, i. e.

held tightly against the seat 10 by the wedge bars having been laterally moved to their outward positions as aforedescribed, an arrangement is provided which includes a disc 53 secured on the shaft of the crank 44, within the housing 29, and an outwardly projecting tongue 54, rigidly secured on the shaft 34 immediately above the disc 53. A plurality of slots 55 (any suitable number may be employed) are circumferentially formed in the disc 53 and the tongue 54 is so positioned on the shaft 34, that when the handle 36 is in an upwardly extending position, that is to say, in a position where the wedge bars are held by the racks 18 in their lateral inward positions, the tongue will be vertically positioned away from the disc and thus not in engagement with any of the slots 55, while when the handle 36 is swung downwardly, that is to say, the shaft 34 is turned to raise the wedge bars and move them laterally outward to hold the pane tightly against the seat, the tongue will also be swung downwardly and will fit into one of the slots 55 in the disc 53, according to the position of the crank, thereby holding or locking the crank and connected mechanism against movement.

In the upper ends of each of the grooves 22, a stop 56 for the upper edge of the pane, is secured by a suitable rivet 57 (Fig. 7). It will be apparent that in order to replace a damaged pane, it is only necessary to remove the tie bar 24 and the securing cement (Fig. 1). The damaged pane can then be dropped down and a new pane inserted, suitably cemented, and the tie bar then replaced. The stops 56 serve to limit the insertion of the pane to the correct height.

It will be apparent that when the window is in completely closed position, the pane will be forced evenly, at both sides as well as at both the top and bottom of the frame, against the seating 10 thereby making a complete water-tight connection.

In the foregoing description the window has been described as operating vertically, but it will of course be apparent that it is equally adaptable for operation horizontally, in which case the portions of the members and the directions of the movements hereinabove illustrated and described will be changed accordingly. In such an arrangement the entire structure would be turned 90 degrees, and it will be understood that the appended claims are intended to include such structures.

While an approved embodiment of the present invention has been described, it will be understood that many and various changes and modifications may be made without departing from the spirit of the invention and that all such changes and modifications are contemplated as a part of the present invention as defined in the appended claims.

The invention claimed and desired to be secured by Letters Patent is:

1. A sliding window comprising a fixed frame; a pane; a seating for said pane fixed relative to said frame; supporting means engaging said pane; guide means engaging said supporting means and permitting sliding movement relative thereto of said supporting means together with said pane in their longitudinal direction; wedging means engaging said guide means, operable upon longitudinal adjustment of said guide means to move said guide means, supporting means and pane laterally of said seating for forcing said pane against said seating; means for effecting said relative sliding movement; means for effecting said longitudinal adjustment; and means operable by said last mentioned means disposed adjacent the lower central portion of the seating engageable with said pane to force said pane against said seating at said lower central portion, upon said longitudinal adjustment of said guide means.

2. A sliding window comprising a fixed frame; a pane; a seating for said pane fixed relative to said frame; supporting means engaging said pane; guide means engaging said supporting means and permitting sliding movement relative thereto of said supporting means together with said pane in their longitudinal direction; wedging means engaging said guide means, operable upon longitudinal adjustment of said guide means to move said guide means, supporting means and pane laterally of said seating for forcing said pane against said seating; means for effecting said relative sliding movement; means for effecting said longitudinal adjustment; and a cam element disposed adjacent the lower central portion of said seating and operable with said longitudinal adjustment effecting means to force said pane against said seating at said lower central portion, upon said longitudinal adjustment of said guide means.

3. A sliding window comprising a fixed frame; a pane; a seating for said pane fixed relative to said frame; racks supportably engaging said pane; guide means engaging said racks and permitting sliding movement relative thereto of said racks together with said pane in their longitudinal direction; wedging means engaging said guide means, operable upon longitudinal adjustment of said guide means to move said guide means, racks and pane laterally of said seating for forcing said pane against said seating; rack elements on said guide means; segments engaging said rack elements; means for rotating said segments to effect said longitudinal adjustment; a rotatable shaft; pinions engaging said racks and mounted on said shaft to rotate therewith; a crank operably connected with said shaft for rotating said shaft to effect said sliding movement; and means including a slotted disc carried by said crank and a tongue operably connected with said segment rotating means, engageable with a slot of said disc upon rotation of said segments to effect said longitudinal adjustment, to lock said crank against movement when said pane is forced against said seating.

4. A window having a vertically slidable pane and vertical seats disposed opposite the vertical margins of the pane in combination with operating mechanism comprising a vertical rack secured to said pane, a horizontal shaft, a pinion secured on said shaft engaging said rack for vertically moving said pane to any desired position, a worm wheel secured on said shaft, a worm engaging said worm wheel for supporting said pane in any vertically moved position and, when rotated, for driving said shaft, and manually operated means for rotating said worm; and means for pressing said pane against said seats in any of said moved positions including means for simultaneously locking said shaft.

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