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WEATHER STRIPPING MEANS FOR ROTATABLE WINDOW

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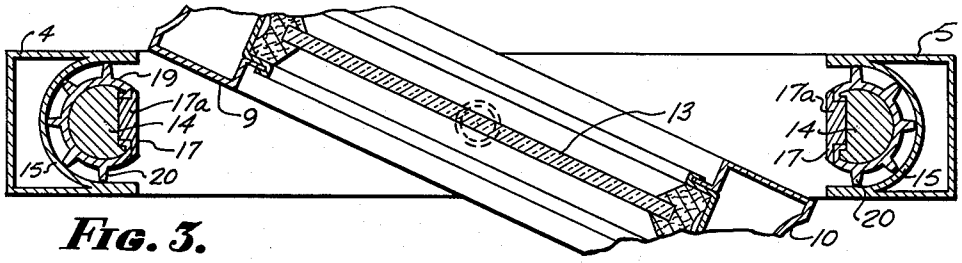


FIG. 3.

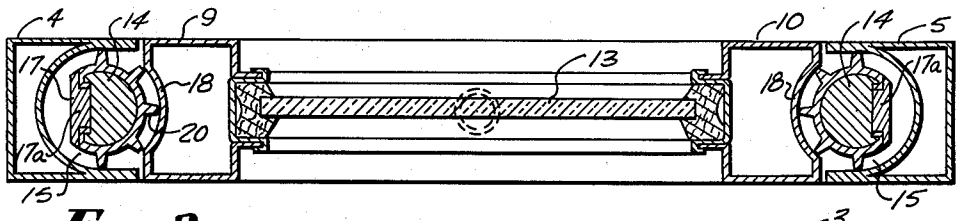


FIG. 2.

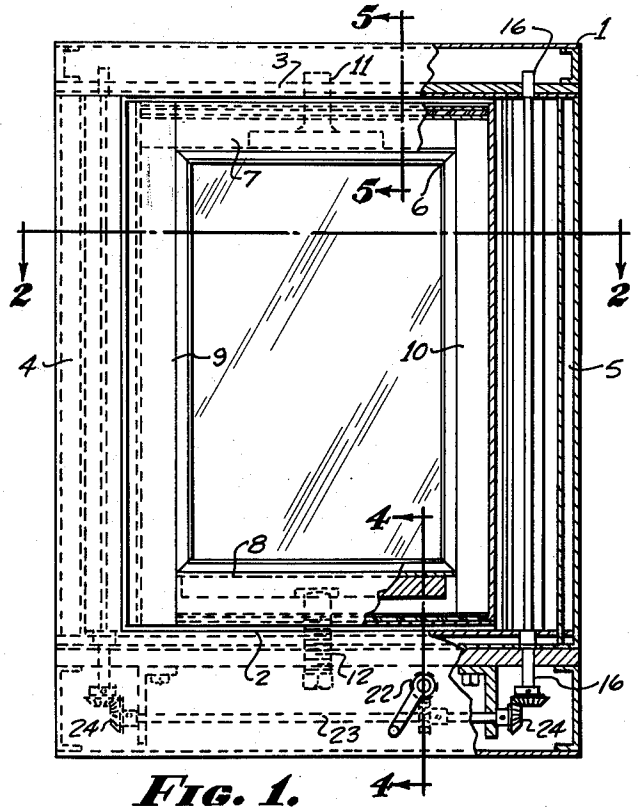


FIG. 1.

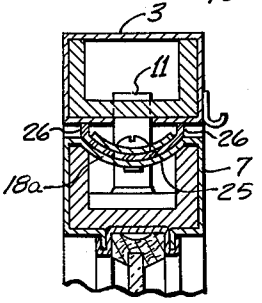


FIG. 5.

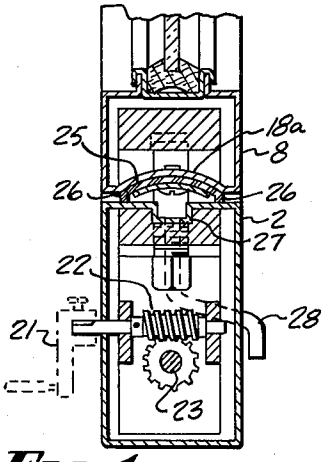


FIG. 4.

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WEATHER STRIPPING MEANS FOR ROTATABLE WINDOW

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4 Claims. (Cl. 20—53)

This invention relates to rotatable or reversible windows and has to do with the provision of weather stripping means for such window.

In the conventional reversible window, the sash is vertically pivoted at its center so that it may be rotated to reverse its position for cleaning purposes, thereby permitting both sides of the window glass to be washed from the inside of the building. One of the principal difficulties with window structures of this character is the provision of suitable weather stripping means which will effectively seal the window when in closed position and yet permit the seal to be readily released so that the window may be reversed for cleaning purposes. While numerous forms of sealing means have hitherto been proposed, they have been generally unsatisfactory in that they are unduly complicated, difficult to install and operate, and generally quite expensive both to install and to maintain.

Accordingly, a principal object of the instant invention is the provision of weather stripping means for reversible windows which is positive in action and may be readily operated to either tightly seal the sash or release it for revolving movement.

A further object of the invention is the provision of weather stripping means which is of relatively simple construction, which can be readily installed, and which is easy and inexpensive to maintain.

Still a further object of the invention is the provision of a reversible window structure incorporating sealing means which can be readily fabricated as a unit utilizing interchangeable parts.

The foregoing together with other objects of my invention which will appear hereinafter or which will be apparent to the skilled worker in the art upon reading these specifications, I accomplish by that construction and arrangement of parts of which I shall now describe an exemplary embodiment.

Reference is now made to the accompanying drawings wherein:

Figure 1 is an elevational view with parts in section of a window unit incorporating weather stripping means in accordance with the invention.

Figure 2 is a vertical sectional view taken along the line 2—2 of Figure 1 showing the weather stripping means in closed or sealed position.

Figure 3 is a sectional view similar to Figure 2 but illustrating the weather stripping means in open or unsealed position.

Figure 4 is an enlarged vertical sectional view taken along the line 4—4 of Figure 1 illustrating the mechanism for operating the sealing members.

Figure 5 is an enlarged fragmentary sectional view taken along the line 5—5 of Figure 1.

Referring now to Figure 1 of the drawing, it will be seen that the window structure is composed of a frame 1 having a sill 2, a header 3, and jambs 4—5, the frame so formed mounting a sash 6 having upper and lower horizontal rails 7 and 8, respectively, and vertical side rails 9 and 10. In accordance with the invention, the sash 6 is pivotally mounted on vertically disposed pivot pins 11 and 12 so that the sash may be rotated relative to the frame in either direction, thereby permitting the sash to be readily reversed for cleaning purposes and the like. It will be understood, of course, that the sash 6 will mount one or more panes of glass 13.

While window structures of the general character just described have hitherto been proposed, the major difficulty encountered has been in the provision of suitable weather stripping means effective to secure a tight seal between the frame and sash and yet permit the sash to be readily released for reversing movement. In accordance with the instant invention, a tight yet readily releasable seal is effected between the jambs of the frame and the side rails of the sash by means of the rotatable sealing members 14 positioned in vertically extending recesses or pockets 15 formed as a part of the jambs 4 and 5. These pockets, as best seen in Figures 2 and 3, are essentially semi-circular in cross section and are preferably formed as integral parts of the window frame.

The sealing members 14, as best seen in Figure 1, are each rotatably mounted in the pockets 15 by means of vertical pivot pins 16, the arrangement being such that the axis of rotation of each sealing member coincides with the longitudinal axis of the pocket in which it is received.

The sealing members themselves are of generally cylindrical configuration, although they each have a flat side 17 which, as will be evident from Figure 3, terminates substantially coextensive with the innermost edges of the jambs 4, 5, when the sealing members are rotated to the sash "release" position. However, when the sealing members are rotated through substantially 180°, i.e. to the sash "sealing" position illustrated in Figure 2, their cylindrical sides will project beyond the edges of the pockets for contact with the side rails of the sash.

As will be evident from Figures 2 and 3, the side rails of the sash are each formed to define a longitudinal recess 18 which is arcuate in cross section and complementary to the pockets 15. That is, each of the pockets 15 and the corresponding recess 18 define opposite wall surfaces of a cylinder the longitudinal axis of which coincides with the axis of rotation of the sealing members 14.

The sealing members 14 are each provided with a covering of vinyl plastic or wool pile weather stripping material 19 which, as the sealing members 14 are rotated, is selectively brought into contact with the pocket 15 and the recesses 18. In a preferred form of the invention, the weather stripping material 19 is in the form of a vinyl plastic having a plurality of spaced apart, longitudinally extending resilient vanes 20 extending around at least half the circumference of the sealing members. When the sealing members are in the "sealing" position of Figure 2, it will be evident that a plurality of the vanes 20 make sealing contact with the recesses 18, and at the same time the endmost fingers make sealing contact with the wall surfaces of pockets 15, thereby sealing the window structure both against the circulation of air between the sealing members and the sash, and also between the sealing members and the walls of the pockets 15 which, unless sealed, would permit the primary seal at the sash to be bypassed. When the sealing members are rotated to the "release" position of Figure 3, all of the fingers are brought into contact with the pockets 15 and the flat sides of the sealing members face the side rails of the sash but do not materially project beyond the inner edges of the jambs, the sash thus being freed for reversing movement.

The weather stripping material may be readily fitted to the sealing members and replaced by means of the

locking plate 17*a* which serves to clamp the weather stripping maetrial to the sealing member.

As seen in Figures 1 and 4, the sealing members are adapted to be rotated by means of a crank handle 21 operative through worm gear 22 to rotate shaft 23 which acts through spur gears 24 to rotate the lowermost pivot pins 16 mounting the sealing members. It will be obvious that the means illustrated for rotating the sealing members is exemplary only and that various known mechanical expedients may be employed for rotating the sealing members either singly or jointly as desired.

It has been my experience that the critical sealing areas in reversible windows are between the jambs and the side rails of the sash; and that the top and bottom rails of the sash can be satisfactorily sealed by stationary sealing members of the character illustrated in Figures 4 and 5. As seen therein, the horizontal rails 7 and 8 are of identical construction to the side rails 9 and 10 in that they incorporate recesses 18*a*; but in this instance the recesses 18*a* are utilized to mount weather stripping members 25 which are of more or less U-shape in cross-section and preferably formed of a resilient material such as vinyl plastic, rubber or the like. The weather stripping members have projecting flanges 26 which make sealing contact with the header and sill of the frame. It will be apparent that the weather stripping members 25 will permit free rotation of the sash and yet, when juxtaposed to the window frame, will make sealing contact therewith. If desired, the sill 2 may be provided with a drain gutter 27 having an outlet tube 28 extending through to the outside of the window frame.

While in the preferred embodiment of the invention illustrated in the drawings, only the side rails of the sash are sealed by means of the rotatable sealing member just described, the upper and lower rails being sealed to the header and sill by the resilient sealing members 25, it will be apparent that other forms of sealing members may be substituted for the members 25 inclusive of rotatable sealing elements of the character utilized to seal the vertical rails of the sash.

The window structure just described may be readily fabricated from extruded aluminum, stainless steel, or the like, and it should be apparent that a minimum number of parts are required in that all of the rails are of identical construction, as are the jambs of the frame. The entire structure may be prefabricated and shipped as a unit ready for installation. Once installed, maintenance is relatively simple in that the rotatable sealing members may be readily removed and the weather stripping material replaced in the manner already described.

Modifications may be made in my invention without departing from its spirit and purpose. For example, while the rotatable weather stripping means described will find particular utility in rotatable windows its utility is not so limited and the rotating sealing units may be installed in doors and other applications wherein a tight yet releasable seal is desired. Thus a pair of such units could be installed in the frame of a revolving door for use when the door is locked.

Having thus described my invention in an exemplary embodiment, what I desire to secure and protect by Letters Patent is:

1. In a window construction wherein a sash is pivotally mounted within a frame for pivoting movement in a vertical plane, pockets extending lengthwise along opposite sides of said frame, rotatable sealing members mounted in said pockets in spaced relation thereto, said sealing members being of generally cylindrical configuration and each having a flat side, said sealing members being rotatable from a sash sealing position to a sash release position, the opposite sides of said sash having recesses therein adapted to receive said sealing members when rotated to said sealing position, said pockets and recesses being radially disposed and concentric with respect to said sealing members, the said cylindrical portions of said sealing members each having a length of resilient weather stripping material attached to it which are adapted to make sealing contact with the surfaces of the recesses in said sash when said sealing members are rotated to sash sealing position, said weather stripping material having longitudinally extending spaced apart flanges adapted to make sealing contact both with the surfaces of said recesses and the said pockets when said sealing members are in sash sealing position, and means for rotating said sealing members from one position to the other.

2. The structure claimed in claim 1 wherein, when said sealing members are in sash sealing position, intermediate ones of said flanges are in contact with said recesses and endmost ones of said fingers are in contact with said pockets.

3. A sealing member for effecting a releasable seal between a frame member and a member movable relative to said frame and having an edge adapted to be juxtaposed to said frame, said sealing member comprising an elongated body extending lengthwise of said frame, an elongated pocket in said frame opening toward the said edge of the movable member, means rotatably mounting said sealing member in said pocket, said sealing member being rotatable from a first position in which a portion thereof projects from said pocket and makes sealing contact with the edge of said movable member to a second position in which said sealing member is out of contact with the edge of said movable member, said sealing member having a length of weather stripping material attached to it which is adapted to contact the edge of said movable member when said sealing member is in said first named position and to simultaneously make sealing contact with marginal edge portions of said pocket.

4. The sealing member claimed in claim 3 wherein said elongated body is of generally cylindrical configuration but has a flat side, wherein said weather stripping material covers the cylindrical portion of said elongated body, and wherein, when said sealing member is rotated to said second named position, the flat side thereof faces the edge of said movable member in spaced relation thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

661,653	Youlten	Nov. 13, 1900
1,042,591	Olberg	Oct. 29, 1912
2,876,506	Knebel	Mar. 10, 1959