June 7, 1960 W. C. WILLIAMS 2,939,529

WINDOW STRUCTURE

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Fig. 1

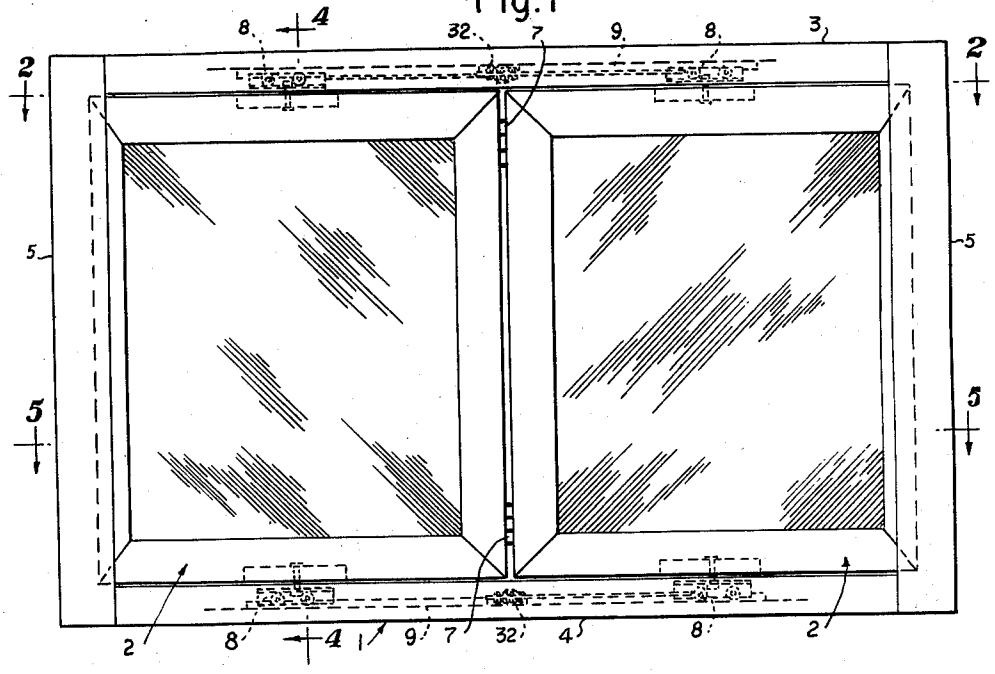
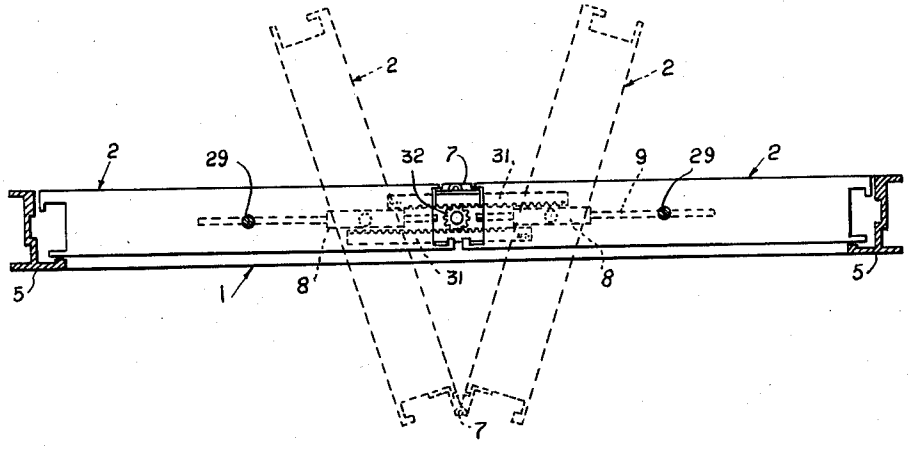


Fig. 2



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Fig. 3

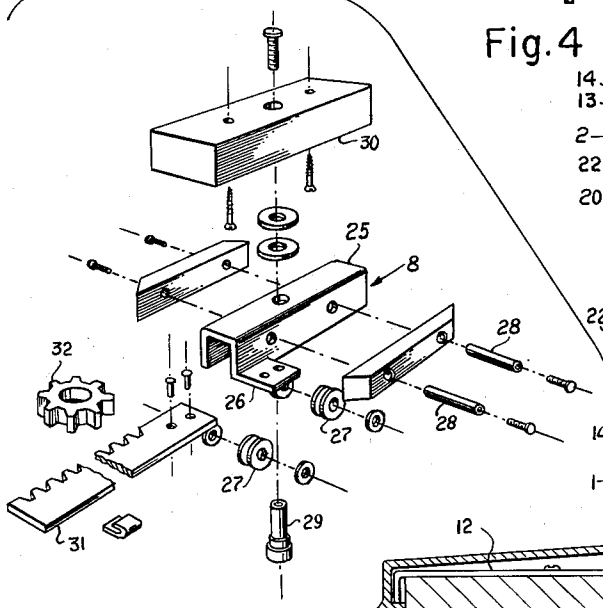


Fig. 4

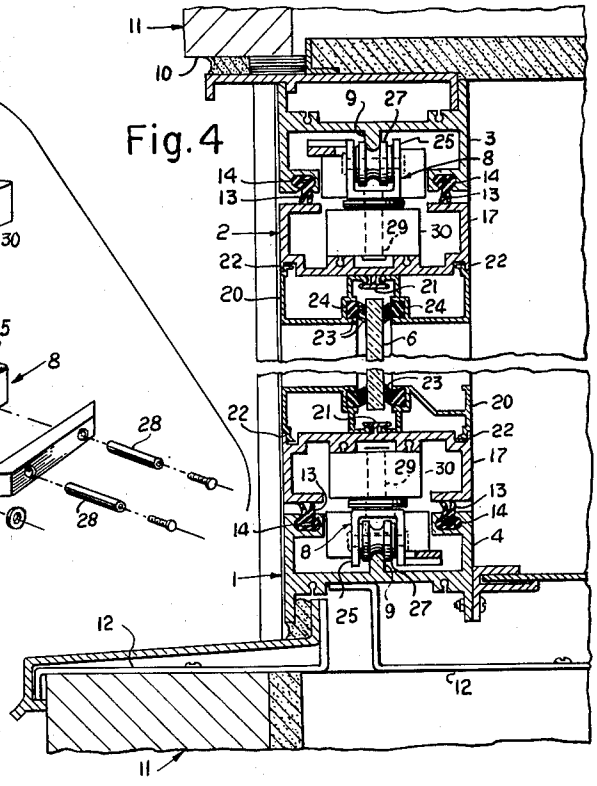
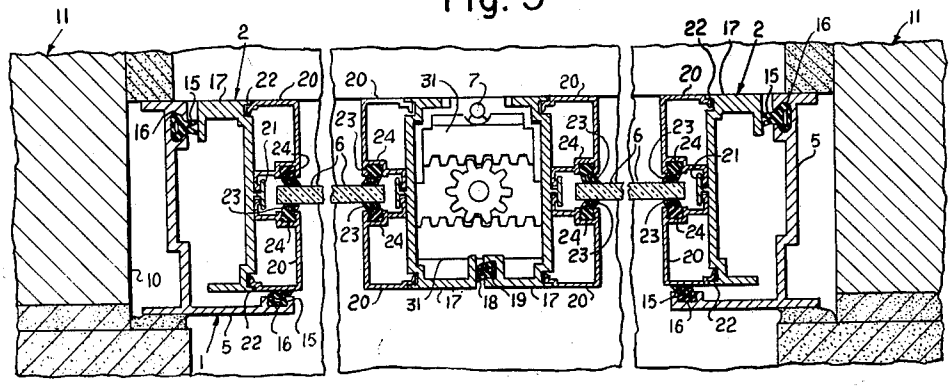


Fig. 5



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2,939,529

WINDOW STRUCTURE

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1 Claim. (Cl. 160—187)

This invention relates to a window, and it concerns more particularly a novel window arrangement including a pair of sashes and a frame therefor, and means for mounting the sashes in the frame whereby the window may be opened and closed.

An object of the invention is to provide a window in which a pair of sashes are normally positioned in a frame in side by side relation to each other and have their adjacent edges pivotally connected to each other by hinges, each sash being pivotally supported at its center by movable supporting means carried by the frame whereby the sashes are capable of being advanced and retracted with respect to each other, to thereby fold them about the hinges, to open and close the window.

Another object of the invention is to provide a window of the type described in which the sashes are pivotally supported at their centers by supporting means carried by the frame and movable with respect thereto whereby the sashes may be advanced and retracted with respect to each other, and at the same time moved pivotally about the supporting means, and about the hinges, to thereby open and close the window.

Another object of the invention is to provide a window of the type described in which the sashes are pivotally connected at their upper and lower edges, along their vertical center lines, to a pair of wheeled supports which travel along longitudinal tracks provided therefor in the head and the sill, respectively, of the frame, the wheeled supports being movable longitudinally with respect to the head and the sill whereby they are capable of being advanced and retracted with respect to each other, the sashes being movable pivotally with respect to the wheeled supports, and about the hinges, to open and close the window, upon advancing and retracting the wheeled supports with respect to each other.

The invention will be readily understood by referring to the following description and the accompanying drawing, in which:

Figure 1 is an exterior elevational view of a window embodying the invention;

Figure 2 is a sectional plan view taken on the lines 2—2 of Figure 1;

Figure 3 is an exploded perspective view, on an enlarged scale, of one of the wheeled, pivoted supports, two of which are provided for each sash of the window shown in Figure 1;

Figure 4 is a sectional elevational view, on an enlarged scale, taken on the lines 4—4 of Figure 1, showing adjacent portions of a building structure in which the window is installed; and

Figure 5 is a sectional plan view, on an enlarged scale, taken on the lines 5—5 of Figure 1, showing adjacent portions of a building structure in which the window is installed.

Referring to Figures 1 and 2 of the drawing, the window of the invention includes a frame, which is designated generally by the numeral 1, and a pair of sashes, indicated generally by the numerals 2. The frame 1 has a

head 3, a sill 4, and a pair of jambs 5. The sashes 2, each of which carries a pane of glass 6, are normally positioned within the frame 1 in side by side relation to each other, and have their adjacent edges pivotally connected to each other by hinges 7.

Each of the sashes 2 is pivotally connected at its upper and lower edges, along its vertical center line, to a pair of wheeled supports, indicated generally by the numerals 8, which travel along longitudinal tracks 9 provided therefor in the head 3 and the sill 4, respectively. The wheeled supports 8 are movable longitudinally with respect to the head 3 and the sill 4, whereby they are capable of being advanced and retracted with respect to each other. The sashes 2 are movable pivotally with respect to the wheeled supports 8, and about the hinges 7, to open and close the window, upon advancing and retracting the wheeled supports 8 with respect to each other.

Referring to Figures 4 and 5 of the drawing, a window embodying the invention is shown in place in an opening 10 provided therefor in the wall of a building, which is indicated generally by the numeral 11. The head 3, the sill 4 and the jambs 5 which comprise the frame 1 are of hollow, angular construction, and marginal portions thereof are secured in the opening 10 and anchor to the wall 11 by anchors 12.

The head 3 and the sill 4 are of the box type, being substantially H shaped in cross-section and each having parallel side portions and a transverse portion connecting the side portions. The tracks 9, each of which comprises a single rail, are formed integrally with the transverse portions of the head 3 and the sill 4, respectively. Two pairs of elongated, resilient sealing members 13 are received in longitudinal grooves 14 provided therefor in the side portions of the head 3 and the sill 4, respectively, for engagement with adjacent horizontal edge portions of the sashes 2.

The jambs 5 are substantially L shaped in cross-section, and one side of each of the jambs 5 overlies a vertical edge portion of the adjacent sash 2 when the window is in closed position. Two pairs of elongated, resilient sealing members 15 are received in longitudinal grooves 16 provided therefor in marginal portions of the respective jambs 5 for engagement with vertical edge portions of the adjacent sashes 2.

The sashes 2 each include an outer frame 17, which is of hollow, angular construction, the side, top and bottom members thereof being substantially channel shaped in cross-section and having parallel side portions and a transverse portion connecting the side portions. The hinges 7 are connected to adjacent side portions of adjoining side members of the respective outer frames 17. An elongated, resilient sealing member 18 is received in a longitudinal groove 19 provided therefor in a side portion of one of the adjoining side members, opposite the hinges 7, for engagement with the adjacent side portion of the other of the adjoining side members.

Each of the sashes 2 also includes a pair of mutually opposed inner frames 20, which are positioned within the outer frame 17 on opposite sides of the pane of glass 6. An alongated strip 21, which is aligned with the center line of the transverse portions of the top, bottom and side members which comprise the outer frame 17, is connected thereto for engagement with adjacent sides of the inner frames 20. A pair of marginal lips 22 are formed on the transverse portions, in spaced relation to the elongated strip 21, for engagement with opposite sides of the respective inner frames 20.

The inner frames 20 are of hollow, angular construction, the side, top and bottom members thereof being substantially channel shaped in cross-section and having parallel side portions and a transverse portion connecting

the side portions. The inner frames 20 are of comparatively light weight construction, as compared to the outer frame 17, and are characterized by their resilience whereby they may be snapped in place between the strip 21 and the lips 22.

A pair of sealing rings 23 are received in grooves 24 provided therefor in the inner frames 20, for engagement with opposite sides of the pane of glass 6, adjacent the peripheral edge thereof.

Referring to Figure 3 of the drawing, the wheeled supports 8 each include a housing 25, which is generally channel shaped in cross-section and has an ear 26 projecting laterally from one edge thereof for use as hereinafter described. A pair of annularly grooved rollers 27, for engagement with one of the tracks 9, are arranged in tandem between the side portions of the housing 25, and are journaled on pins 28 inserted through aligned openings provided therefor in the side portions. A pivot pin 29 is inserted through a central opening provided therefor in the transverse portion of the housing 25, for engagement with a pivot block 30 which in turn is connected to the outer frame 17 of a sash 2.

A rack gear 31 is connected to the laterally projecting ear 26 of the housing 25 for engagement with one of two pinion gears 32, which are rotatably mounted in the head 3 and the sill 4, respectively. A pair of rack gears 31, each corresponding to one of the wheeled supports 8 of each sash 2, are positioned on opposite sides of each of the pinion gears 32, so that upon rotation of one of the pinion gears 32, as by means of a crank (not shown), the wheeled supports 8 are capable of being advanced and retracted with respect to each other.

The invention may be modified in various ways without departing from the spirit and scope thereof.

What is claimed is:

A window structure comprising a frame having a head, a sill, and a pair of jambs, a pair of sashes normally positioned in the frame in side by side relation to each other and having their adjacent edges pivotally connected to each other by hinges, each of the sashes being pivotally connected at its upper and lower edges, along its vertical center lines, to a pair of supports therefor, the supports of at least one pair comprising wheeled supports each having a housing, channel shaped in transverse section, pivotally connected to a sash and having a pair of annularly grooved rollers arranged in tandem relation to each other and journaled on pins extending between the sides of the housing, the rollers of the wheeled supports being engageable with tracks each consisting of a single rail provided therefor in the head and the sill, respectively, of the frame, the wheeled supports being movable longitudinally with respect to the head and the sill whereby the supports of the two pairs are capable of being advanced and retracted with respect to each other, the sashes being movable pivotally with respect to their supports, and about the hinges, to open and close the sashes, upon advancing and retracting the supports of the two pairs with respect to each other, a rack gear rigidly connected to the housing of at least one of the wheeled supports and aligned longitudinally therewith, a pinion gear rotatably mounted on the frame and meshing with the rack gear, and means for rotating the pinion gear to thereby advance and retract the supports of the two pairs relative to each other.

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