Feb. 2, 1965 A. ALVAREZ 3,168,172

DUAL-VENT WINDOW

Filed June 15, 1962 3 Sheets-Sheet 1

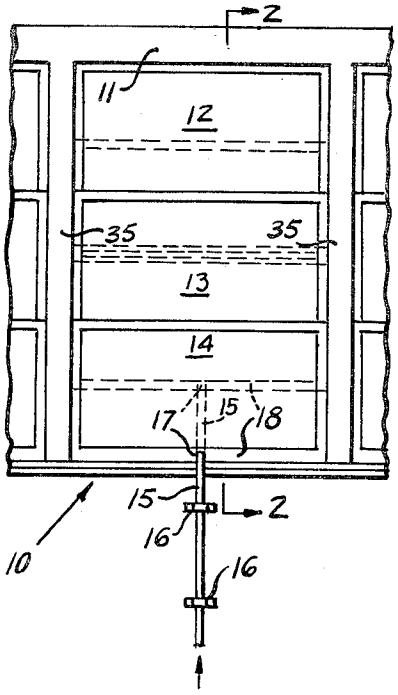


FIG. 1

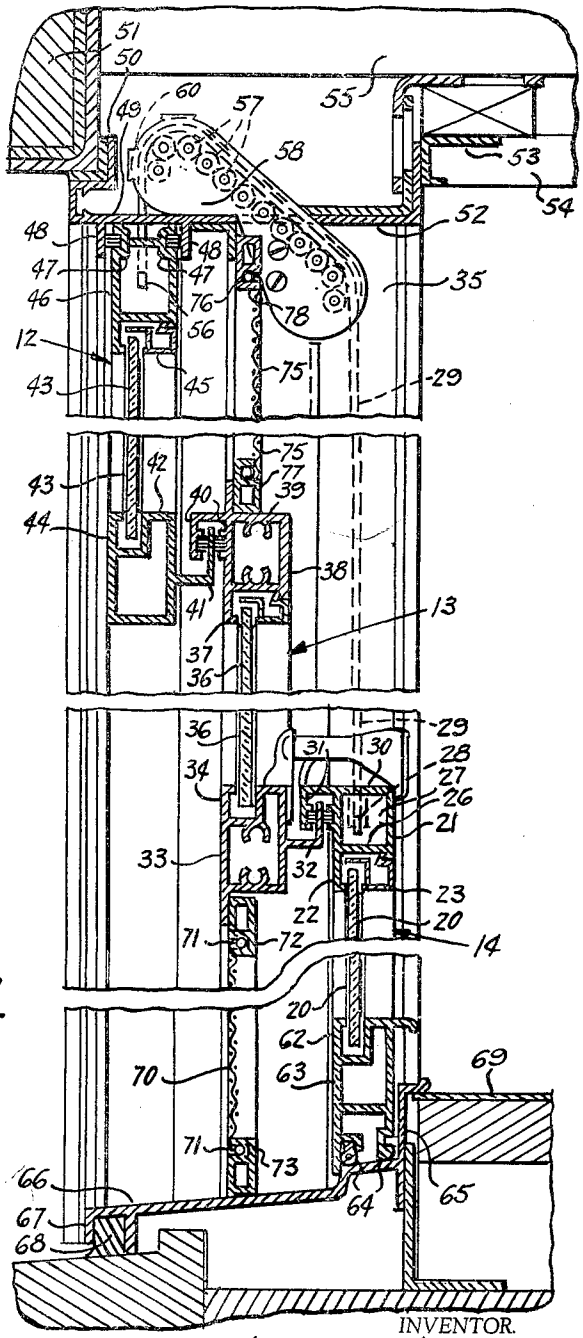


FIG. 2

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DUAL-VENT WINDOW

Filed June 15, 1962 3 Sheets-Sheet 2

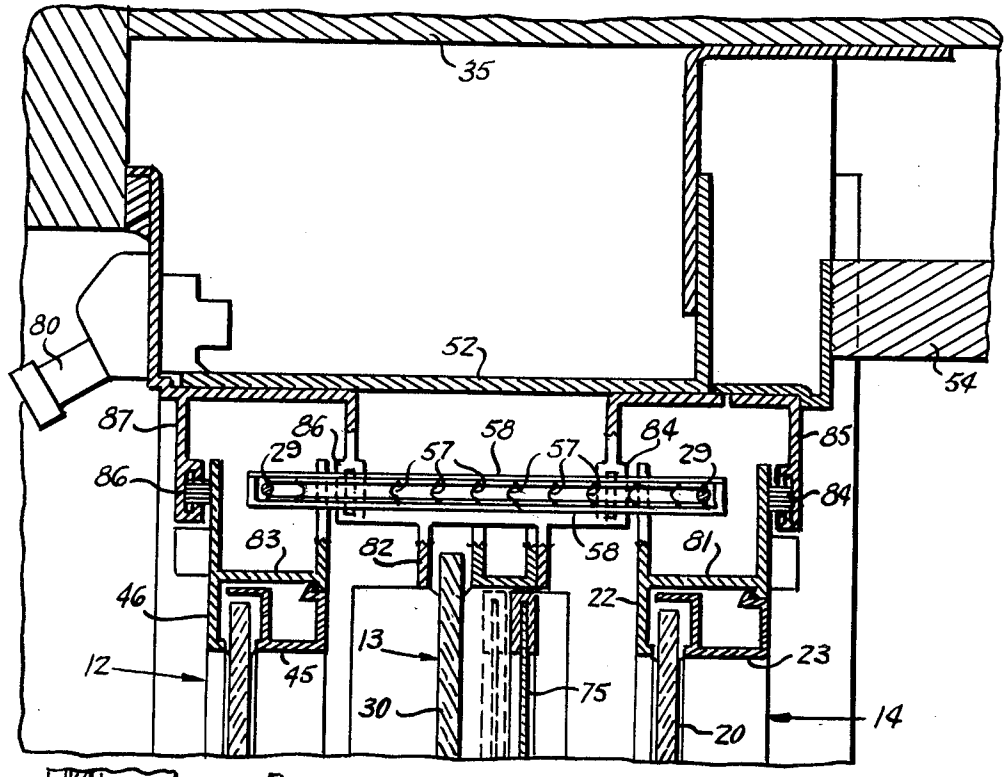


FIG. 3

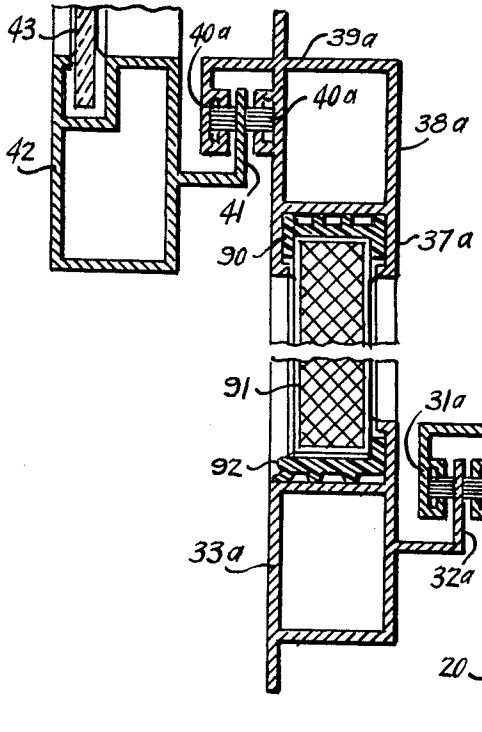


FIG. 4

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DUAL-VENT WINDOW

Filed June 15, 1962 3 Sheets-Sheet 3

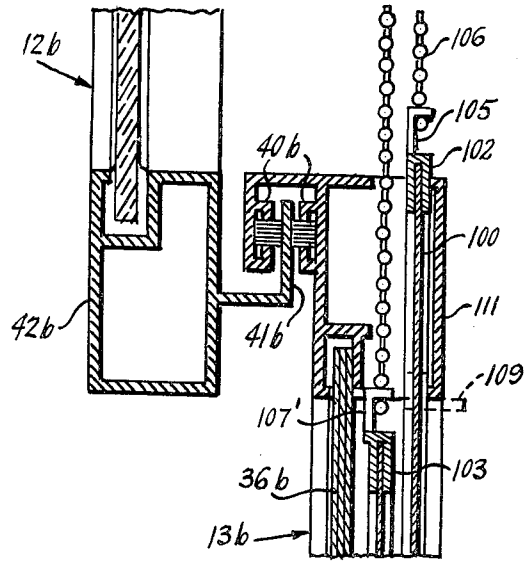


FIG. 5

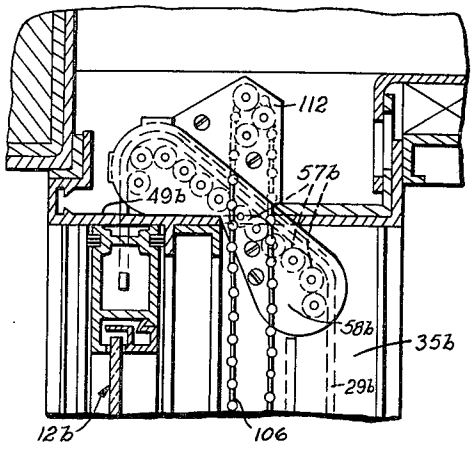
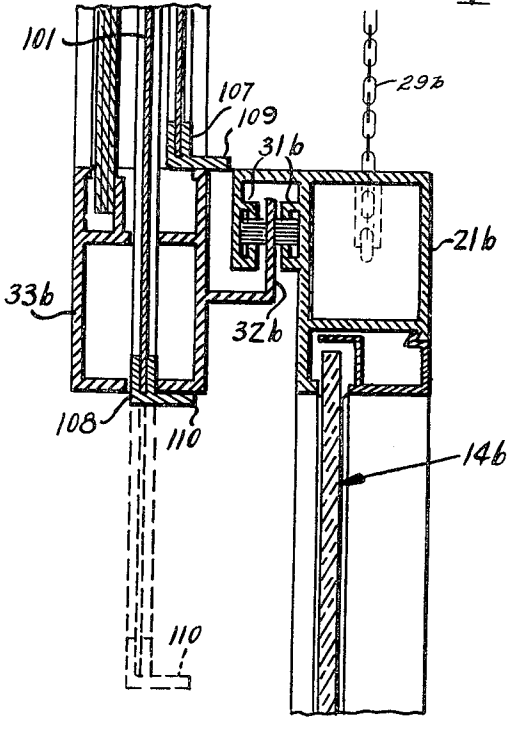


FIG. 6



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United States Patent Office 3,168,172 Patented Feb. 2, 1965

3,168,172

DUAL-VENT WINDOW

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Filed June 15, 1962, Ser. No. 202,796
4 Claims. (Cl. 189—72)

This invention relates to a dual vent window, and has as its primary object the provision of an improved window which is provided with a fixed central sash panel and movable upper and lower sections.

An additional object of the invention resides in the provision of a device of this character wherein the upper and lower sections may be simultaneously moved to either partially or fully open or closed position with a minimum of effort and difficulty.

A further object of the invention resides in the provision of an improved mechanism whereby such simultaneous movement be effected.

A further object of the invention resides in the provision of a window of this character which may be advantageously used with public buildings, and wherein the center section may, if desired, be opaque for the control of light.

Still another object of the invention resides in the provision of a device of this character wherein shade sections may be moved simultaneously or separately to cover the upper and lower panels, and wherein the center panel is either opaque or permanently covered.

A still further object of the invention resides in the provision of such a window which may be constructed substantially entirely of aluminum extruded sections, and wherein ease and simplicity of assembly, manufacture, and operation are provided.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter, and disclosed in the accompanying drawing wherein there are shown illustrative embodiments of the instant inventive concept.

In the drawing:

FIGURE 1 is a plan view of one form of window embodying the instant inventive concept, shown as controlled by a pole or rod, such window being employed in a high location, a partly opened position being shown in dotted lines.

FIGURE 2 is an enlarged vertical sectional view taken substantially along the line 2—2 of FIGURE 1, parts thereof being broken away disclosing constructional details.

FIGURE 3 is a fragmentary top view, partially in section, comprising a composite sectional view from the top of the structure as disclosed in FIGURE 2.

FIGURE 4 is a fragmentary sectional view similar to FIGURE 2, parts thereof being omitted, of a modified form of the invention.

FIGURE 5 is a view similar to FIGURE 4 but showing a further modification embodying simultaneously movable upper and lower shade sections; and

FIGURE 6 is a fragmentary view of the upper portion of the embodiment shown in FIGURE 5 indicating one manner in which the flexible member attached to the sashes and the flexible member attached to the window shades may be arranged.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawings in detail, and more particularly to FIGURE 1, there is generally indicated at 10 a window embodying features of the instant inventive concept set in a wall 11. The window comprises a movable upper panel 12, a center panel 13, which is normally fixed, and a lower panel 14. In the illustrative embodiment of the invention disclosed in FIGURE 1, an operating pole 15 is slidably mounted in brackets 16, and secured as at 17 to the lower panel 14, being secured to the center of the lower frame section 18 thereof in any conventional manner, the arrangement being such that when the pole 17 is moved upwardly in the direction of the vertical arrow, panel 14 moves upwardly and simultaneously panel 12 moves downwardly as shown in dotted lines, the operation effecting this movement to be more fully described hereinafter.

Having reference now particularly to FIGURE 2, lower panel section 14 is comprised of a glass pane 20, which may be either transparent, translucent, or opaque as desired, the pane being secured in a top sash member 21, which is preferably formed of extruded aluminum, or similar material, and which includes a lower section 22 having a channel 23 therein wherein the upper portion of pane 20 is secured. Upper sash member 21 also includes a central partition 26 which forms a chamber 27 within which on either side thereof are securing brackets 28 to which are secured the ends of operating chains 29.

A portion 30 of upper sash member extends outwardly thereof and is provided with meeting rails 31 which engage with an L-shaped flange 32 carried by the lower sash 33 of central section 13. Lower sash 33 includes a channel 34 which is fixed to the sides of the frame 35, as indicated in FIGURE 1, and which supports a central pane 36, the upper end of which seats in an appropriate channel 37 of an upper frame member 38, the upper sash frame member being also provided with an outwardly extending flange 39 which carries meeting rails 40 which engage over the upright end of an L-shaped member 41, which in turn is carried by the lower sash member 42 of upper section 12. Upper section 12 also includes a pane 43 which is seated in a suitable channel 44 in lower sash member, and a second upper channel 45 seated in an upper sash member 46, the latter being provided on opposite sides thereof with meeting rails 47 which engage between flanges 48 carried by the lintel piece 49. The latter includes a suitable angular portion 50 which is secured to the upper wall 51 of the building, and includes a transverse plate 52 carrying suitable flanges 53 for attachment to the trim 54 and ceiling 55. The other end of chain 29 is secured as at 56 interiorly of member 46, and extends over a plurality of guide rolls 57 carried between plates 58, the guide rolls being arranged so that the chain extends upwardly thereover as at 60 in direct alignment with the center of the top of upper panel 12, and thence downwardly into a space within the side frame 35 in direct alignment with lower panel section 14. The length of the chain is fixed, so that as upper panel section 12 moves downwardly, lower panel section 14 moves upwardly, or vice versa. Lower pane 20 is seated in a channel 62 of a lower sash member 63 which is provided with meeting rails 64 which seat on a portion 65 of the sill, the sill being extended as at 66 and comprising a plate having depending flanges 67 surrounding a sill rail 68 for fixation to the window frame. A suitable inner sill 69 may be provided, or if desired, the window may extend the full height of the room from floor to ceiling.

Removable screen sections 70 are positioned in front of each lower panel section 14, and include beads 71 secured in upper and lower channel members 72 and 73 which are carried respectively by the lower sash member or fixed central panel 13, and sill plate 66. Removal of the beads 71 from their associated channels permits removal of the screens. A similar screen 75 provided with beads 76 is provided interiorly of movable upper panel 12, the beads engaging in suitable channels 77 and 78 carried by the lintel and the upper sash member of

fixed central section **13**, respectively. Movement of the lower sash panel **14** may be effected by means of the pole **15**, by means of a manual arrangement, or by means of a conventional crank and pinion gear **80**, as best shown in FIGURE 3.

Obviously, pane members **20**, **36**, and **43** are suitably secured in side sash members, which however are not illustrated in detail, since they are conventional, the side sash members being indicated in FIGURE 3 at **81**, **82**, and **83**, respectively, for lower, middle, and upper members **14**, **13**, and **12**. Meeting rails **84** are provided in side flanges **85** for lower sash member **14** and similar meeting rails **86** are provided in flanges **87** for upper sash member **12**.

The use and operation of the device should now be readily understandable, in that the screens **70** and **75** may be selectively positioned in or removed from their associated grooves in front of upper and lower panes **43** and **20**. Movement of the lower sash **14** automatically affects movement of the upper sash **12**, since the panes are so arranged as exactly to counterbalance each other, the weight of upper sash **12** on chain **29** serving to lower the same automatically. Obviously, the maximum open position is when fixed center panel **13** is aligned directly in horizontal plane with upper panel **12** and lower panel **14**. However, opening to any intermediate point may be effected and the counterbalancing of the sashes is such that they remain in adjusted position.

FIGURE 4 shows a modified form of construction wherein a lower frame member **42** carries a pane **43** and is provided with a flange **41** which engages between meeting rails **40***a*. The meeting rails are carried by a flange **39***a* of an upper sash member **38***a* which is substantially identical to the previously described member except that it provides a wide slot or channel **37***a* within which is seated a gasket **90**, preferably of polyvinyl chloride plastic, which secures the upper portion of an opaque pane **91** therein. A lower fixed frame member **33***a* carries a similar gasket **92** for seating the lower end of pane **91**, while appropriate similar gaskets are provided in the sides of the sash for fixedly securing the same in position. Lower sash member **33***a* carries a flang **32***a* which engages between meeting rails **31***a* carried by upper sash member **21***a* of a lower panel **14***a* identical to the previously described panel **14**.

FIGURE 5 shows a similar arrangement of upper and lower panels generally indicated at **12***b* and **14***b* which include the same components including upper meeting rails **31***b* engaging a flange **32***b* of a central section **13***b*, flange **32***b* extending from the lower sash frame **33***b*. Upper sash frame **111** also has upper meeting rails **40***b* engaging a flange **41***b* carried by the lower sash member **42***b*, the previously described components being substantially identical to those in the foregoing modifications. However, central section **13***b* includes a pane **36***b* of translucent material. A flexible member or chain **29***b* passes upwardly over a plurality of guide rolls **57***b* carried between plates **58***b* in a manner similar to the embodiment of FIGURE 2, the guide rolls being arranged so that the chain **29***b* extends upwardly thereover in direct alignment with the center of the top of the upper panel **12***b* and thence downwardly into a space within the side frame **35***b* in direct alignment with the lower panel section **14***b* and the length of chain is fixed so that the upper panel section **12***b* moves downwardly and the lower panel section **14***b* moves upwardly, or vice versa. Shade members **100** and **101** are attached to suitable upper channel-shaped frames **102** and **103** which are provided with L-shaped extensions **105** and **107'**, respectively, the extensions being connected by means of a ball chain **105** which extends over a suitable upper guide roller **112** positioned adjacent the lintel **49***b* in the same manner as the guide rollers **57**, one arrangement for mounting the guide roller **112** being shown in

FIGURE 6 wherein it is offset with respect to the rollers **57***b* to allow the flexible member or chain **29***b* and the chain **106** to each pass vertically to the sashes and shades respectively. The lower portion of each shade is provided with a channel-shaped member **107** and **108**, respectively, having a laterally extending flange **109** and **110**, respectively, which engages the bottom of upper sash member **111** and the bottom of lower sash member **33***b*, respectively. The shades are preferably of opaque or translucent fiberglass, and the frame members include side frame portions (not shown). The arrangement is obviously such that when shade **100** is raised to upper panel obscuring position, shade **101** is simultaneously lowered to obscure the view through panel assembly **14***b*, and that as the upper shade is lowered the lower shade is simultaneously raised.

From the foregoing it will now be seen that there is herein provided an improved dual-vent window construction, which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

1. A window construction comprising a frame, an upper movable sash, a central fixed sash and a lower movable sash mounted in said frame, and means for moving said upper and lower sashes in opposite directions to open or closed position, said last-mentioned means comprising a flexible member secured at one end to the top of said upper sash and at its other end to the top of said lower sash, at least one conveyor roller fixed to said frame above the top of said upper sash, said flexible member passing over said conveyor roller, said upper and lower movable sashes being of substantially identical size and weight and serving to counterbalance each other, said center sash including a translucent pane and a pair of simultaneously movable shades each in a slidable frame and positioned adjacent said center sash, said shades being movable into and out of position to cover said upper and lower movable sashes.

2. The structure of claim 1 wherein said shades are connected at the tops of their frames by a flexible chain extended over a conveyor roller carried by the top of said frame.

3. The structure of claim 1 wherein an elongated pole is secured to the bottom of said lower sash for simultaneously moving upper and lower sashes located at a high level.

4. A window construction comprising a main frame, an upper movable sash, a central fixed sash and a lower movable sash mounted in said frame, and means for moving said upper and lower sashes in opposite directions to open or closed position, a pair of simultaneously movable shades each in a slidable frame and positioned adjacent said center sash, said shades being movable into and out of position to cover said upper and lower movable sashes.

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