

Aug. 2, 1938.

E. T. FISK

2,125,669

SOUND EXCLUDING VENTILATING WINDOW

Filed Nov. 15, 1935

2 Sheets-Sheet 1

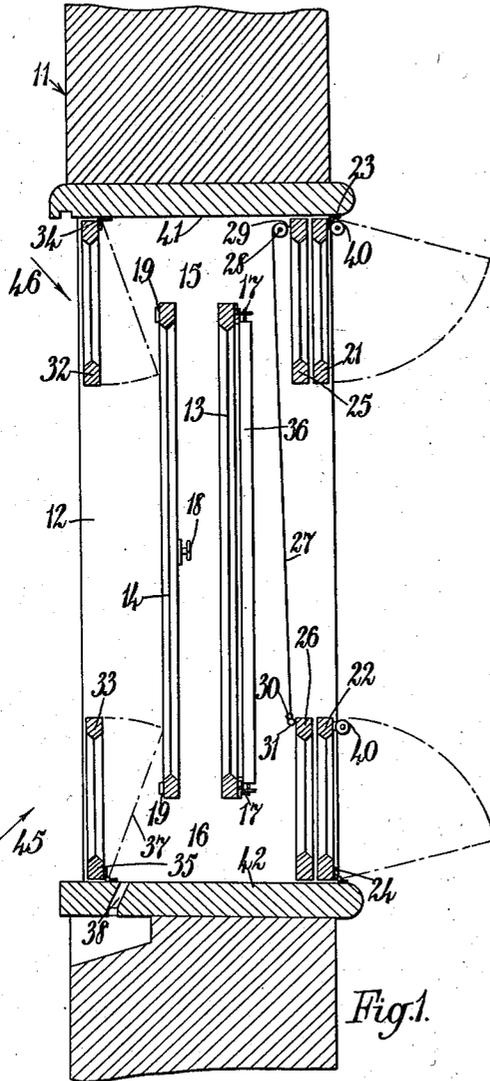


Fig. 1.

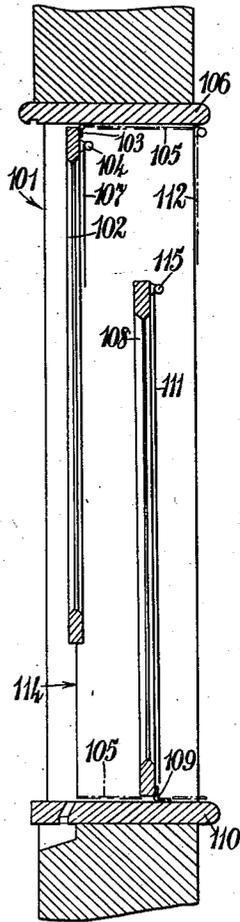


Fig. 3.

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2 Sheets-Sheet 2

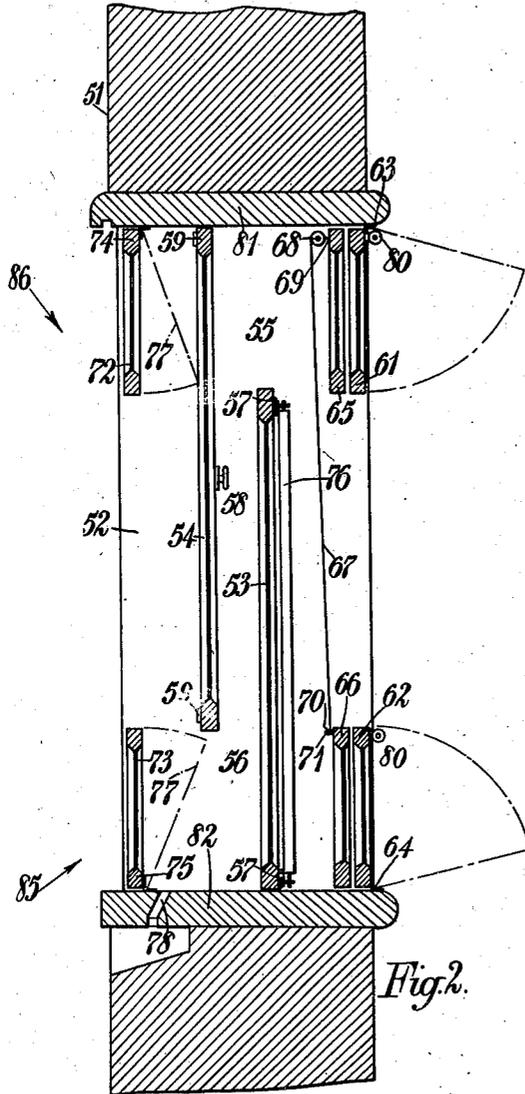


Fig. 2.

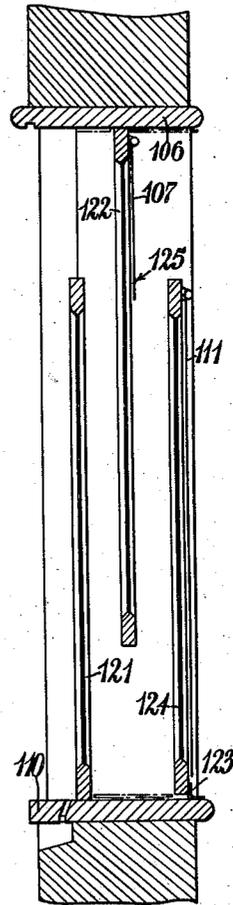


Fig. 4.

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UNITED STATES PATENT OFFICE

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SOUND EXCLUDING VENTILATING WINDOW

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Application November 15, 1935, Serial No. 50,038
In Australia December 8, 1934

1 Claim. (Cl. 98—88)

This invention relates to window fittings adapted for the exclusion of sound without restricting ventilation.

The invention has for its object the provision of effective means for excluding noise by reflecting and/or absorbing the sound waves, whilst maintaining efficient ventilation through a window opening; for maintaining ventilation during wet and windy weather; and for providing simple means for the safe and effective cleaning of the window; also reducing transmission of dust through the aperture.

Provision is made for the reflection of part of the sound waves which reach the window from any angle, and for reduction of the remainder by absorption or dampening.

In order that the invention may be clearly understood reference will now be made, by way of example, to the accompanying drawings in which:—

Figure 1 is a vertical sectional view of one arrangement of sound excluding ventilating window.

Figure 2 is a modification of the sash arrangements shown in Figure 1.

Figure 3 shows a construction with two window sashes only, and

Figure 4 is a further construction with three window sashes.

Referring to the embodiment of the invention seen in Figure 1, 11 shows a window opening in which two vertical hinged sashes 13 and 14 are fitted in parallel spaced relation to one another so as to form an air cell between them, with an opening 15 above the sashes and an opening 16 below the sashes. The sashes are respectively hinged to opposite sides of the window opening to swing inward, and are provided with suitable stops 19 and latches 18. The drawings show the hinges 17 of the sash 13 and the stops 19 and latch 18 of the sash 14. On the inside of the window opening two short sashes 21 and 22 are horizontally hinged at 23 and 24 respectively. These sashes are adapted to swing inward as indicated in dotted lines to facilitate cleaning and to provide clearance for the sashes 13 and 14 to swing inward. They are maintained in vertical alignment by any suitable means and their vertical height is preferably not less than one quarter the height of the window opening.

A roller blind 36 may be fitted on the sash 13 and provided with means for supporting it in position when drawn.

Immediately behind the sashes 21 and 22, two sashes 25 and 26 are slidably positioned, and

suspended in balance by cords 27 which are reeved over pulleys 28 mounted on opposite sides of the window opening. The cords 27 are connected to the upper sash 25 at 29, and are attached by a hook 30 to suitable catches 31 on the lower sash. The sashes 25 and 26 are of the same vertical height as the sashes 21 and 22, and when the sashes 25 and 26 are moved into engagement at the horizontal centre line of the window opening, they combine with the sashes 21 and 22 to completely close the window opening. For cleaning purposes the sashes 25 and 26 may be removed by unhooking the cords 27 from the catch 31. Small rollable sun blinds 40 may be fitted on the inner faces of the sashes 21 and 22. Near the outer face of the window opening are positioned two sashes 32 and 33, similar to the sashes 21 and 22. The sashes 32—33 may be demountably fitted for cleaning, or they may be hinged at 34 and 35 to swing inwardly as shown in the dotted lines 37.

Drain holes 38 are provided in the sill for the drainage of water which may enter the window opening 11.

The faces 42 of the reveals 41 of the head and 42 of the sill are preferably covered with a suitable sound absorbing material.

Sound waves approaching the window opening from the direction indicated by the arrow 45 are deflected upwardly by the sashes 33, 32 and 14. Some of these waves are deflected by the sash 14 onto the inner side of the sash 32 by which they are again deflected onto the face 41 where they are mostly absorbed, the balance being trapped between the panes 14, 13 and 25.

Sound waves approaching the aperture 11 from the direction indicated by the arrow 46 are similarly reflected and absorbed by the sashes and surfaces in the lower portion of the window opening.

In some cases it may be sufficient to dispense with one of the vertically hinged sashes.

A further embodiment of the invention is shown in Figure 2 in which 51 is a vertical section of a window opening in which two vertical hinged main sashes 53 and 54 are fitted in parallel spaced relation to one another to form an air cell between them, the sash 53 being displaced downwardly to contact with the sill 52 and leaving a space 55 above it, and the sash 54 being displaced upwardly to contact with the head 51, leaving the space 56 below it.

The sashes are respectively hinged to opposite sides of the window opening to swing inwardly for cleaning purposes, and are provided with

suitable stops 59 and latches 58. The drawings show the hinges 57 of the sash 53 and the stops 59 and latch 58 of the sash 54. On the inside of the window opening, two short sub-sashes 61 and 62 are hinged at 63 and 64 respectively. These sashes are adapted to swing inwardly as indicated in dotted lines to facilitate cleaning and to provide clearance for the sashes 53 and 54 to swing inwardly. They are maintained in vertical alignment by any suitable means.

Immediately behind the sashes 61 and 62 two sub-sashes 65 and 66 are slidably positioned and suspended in balance by cords 67 which are reeved over pulleys 68 mounted on opposite sides of the window opening. The cords 67 are connected to the upper sash 65 at 69 and are attached by hooks 70 to suitable catches 71 on the lower sash. The sashes 65 and 66 are of the same vertical height as the sashes 61 and 62, and when the sashes 65 and 66 are moved into engagement at the horizontal centre line of the window opening, the four sashes combined completely close the window opening. For cleaning purposes the sashes 65 and 66 may be removed by unhooking the cords 67 from the catches 71. Near the outer face of the window opening are positioned two sashes 72 and 73, preferably similar to the sashes 61 and 62, which may be demountable for cleaning, or they may be hinged at 74 and 75 to swing inwardly as shown in the dotted lines 77.

The vertical height of the openings 55 and 56 should be preferably less than the respective vertical height of the sashes 65 and 73.

A roller blind 76 may be fitted on the sash 53 vertically or horizontally with means for supporting it in position when drawn. Small roller blinds 80 may be fitted on the inner faces of either or both the sashes 61 and 62.

Drain holes 78 are provided in the sill for the discharge of water which may enter the window opening.

The faces 52 of the reveals, 81 of the head and 82 of the sill are preferably covered with a suitable sound absorbing material.

Sound waves approaching the window opening from the direction of the arrow 85 are reflected upwardly by the sashes 73, 72 and 54. Some of these waves are reflected into the pocket formed between the sashes 72 and 54 and the head 81, and there dampened or absorbed. Some of the waves are reflected upwardly and outwardly.

Sound waves approaching the window opening from the direction of the arrow 86 are reflected downwardly from the sashes 72, 54 and 73. Some of these waves strike the sill 82 in the clearance 56 under the sash 54. Of these waves the unabsorbed portions oscillate between the sashes 53 and 54 with diminishing amplitude and are mainly dampened before passing the space 55.

Sound waves approaching in a horizontal direction approximately at right angles to the sashes, either frontally or laterally, are baffled by the plurality of sashes from penetrating to the interior.

As an alternative arrangement the relative positions of sashes 54 and 53 may be changed so that 54 extends from the sill upward and sash 53 extends from the head downward.

In a further development of the arrangement according to Figure 2 the outer panel 72 or 73 or both 72 and 73 may be dispensed with. In the latter case sound waves arriving from outside 75 are partially reflected by the panels 53 and 54

and dampened or absorbed in the space between those panels.

The panels 53 and 54 hinged to the top and bottom of the frame or any suitable combination of such hinging positions may be employed.

A further embodiment of the invention is shown in Figure 3 in which 101 is a window opening having a vertical sash 102 suspended from the head 106 by a hinge 103, and occupying the full width of the opening and the greater portion of the height. A second sash 108 is supported on the sill 110 on a hinge 109. A sunshade 107 is mounted on a roller 104 which is fitted to the top rail of the sash 102, and a sunshade 111 is mounted on a roller 115 which is fitted on the top rail of the sash 108. The two sunshades 107 and 111 together provide shade protection for the opening, but alternatively adequate shade protection might be secured by a single sunshade 112. The sashes are normally in parallel spaced relation forming an air cell space therebetween and may be connected to move together by means of linkage for the reduction of the opening or complete closure of the window by inclination of the sashes towards one another, until in contact, either or both sashes being moved. In addition to providing flexibility for closure of the window, the hinges 103 and 109 permit of the necessary in-swinging of the sashes for cleaning purposes. The head 106, reveals 114, and sill 110 are preferably faced with a suitable sound absorbing material 105.

A modification of the arrangement according to Figure 3 is shown in Figure 4 in which a sash 121 is positioned fixedly on the sill 110, a second sash 122 is fixedly positioned on the head 106, and a third sash 124 is hingedly mounted on the sill preferably at the interior side of the window opening. Closure or partial closure may be effected by swinging sash 124 towards sash 122 (clearance being provided) until they contact at 125, a suitable step-by-step locking device being used to retain the sash 124 at any desired angle. The window opening is faced with sound absorbing material, and sunshades 107 and 111 may be fitted as in the previous case. The sashes 121 and 122 may be hinged, or may be adapted for slip out removal from the opening to facilitate cleaning.

The sashes may be mounted in the window openings in reverse of the positions shown in Figure 4, that is to say with the open spaces below where in the drawings they are shown above the sash and vice versa.

Various modifications of the arrangements hereby described or illustrated may be employed which come within the scope of this invention. Important features of the invention are to provide a plurality of vertically disposed and horizontally separated glazed panels or sashes fitted into a window frame in such a manner as to cause ventilating currents to change direction in passing through the aperture and to cause sound waves to be partially or wholly reflected by the glazed panels and to be partially or wholly dampened or absorbed in the vertical spaces between the glazed panels; also to make a practical structure in which opening and closing to the ventilation space may be facilitated, and cleaning may be simplified.

It will be clear that one or more of the panels may be fitted at an angle from the vertical without departing from the essential features of this invention although the simple vertical position is preferred. Variations in the described meth-

ods of opening and closing the window for ventilation may also be made without departing from the scope of this invention.

5 While the main sashes are described as being vertically disposed it is to be understood that they may be inclined and arranged accordingly where local circumstances require it. Also some or all the sashes may be opaque.

I claim:

10 A window fitment adapted to be arranged in an aperture comprising in combination, a window frame, two vertically disposed non-sliding glazed panels arranged in said frame, one panel fitting three sides of the frame leaving an open-

ing between the top thereof and the frame, the other panel fitting three sides of the frame leaving an opening between the bottom thereof and the frame, two main panels arranged in the frame in a spaced relation with respect to each other, both of said main panels being displaced with respect to said first mentioned panels, each of said main panels fitting opposite vertical sides of the frame, and each of said main panels being dimensioned to provide an opening between the top thereof and the frame and an opening between the bottom thereof and the frame.

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