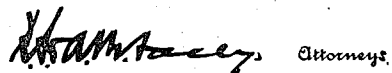


1,136,784.

2 SHEETS--SHEET 1.

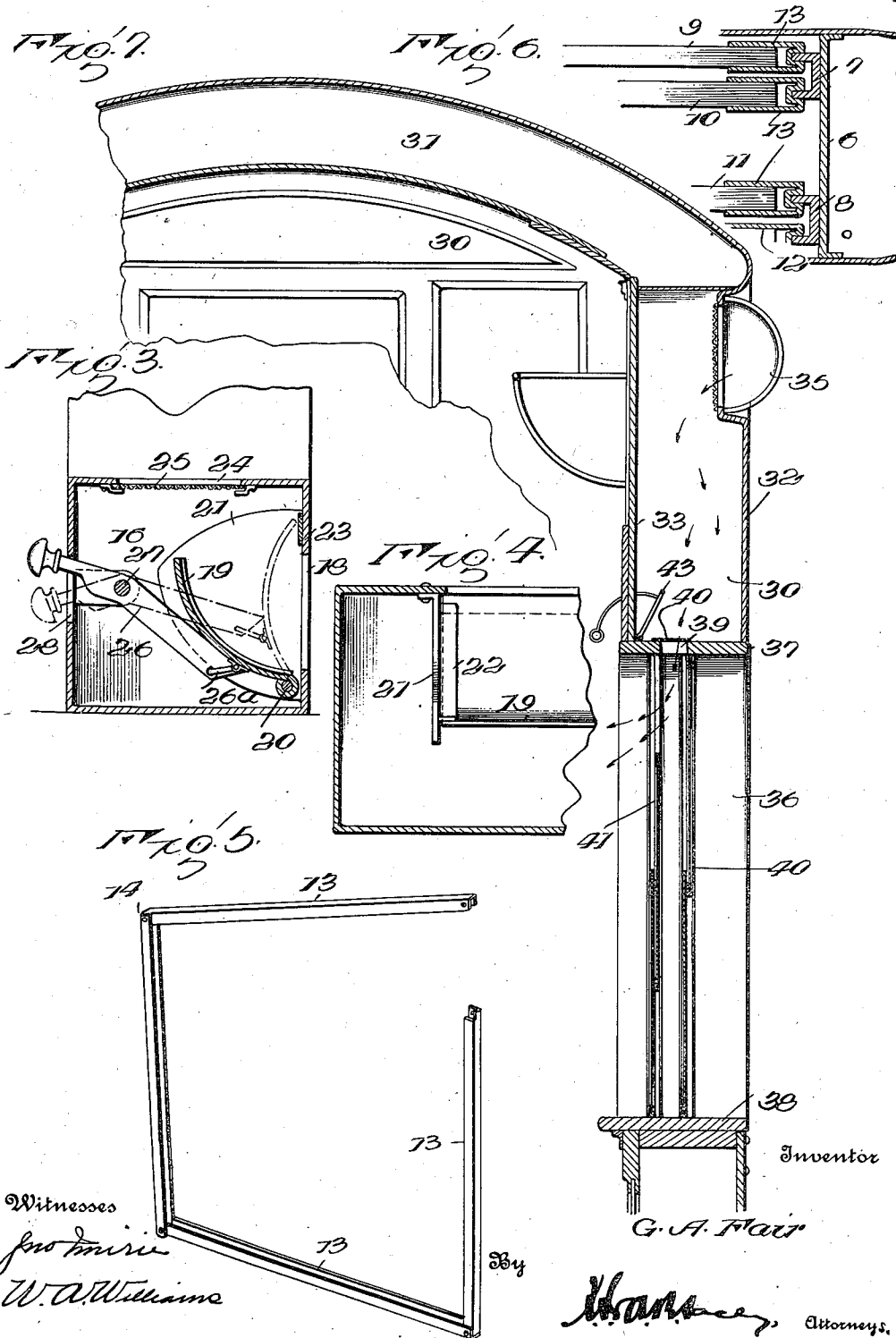


G. A. FAIR.  
VENTILATING WINDOW OR DOOR.  
APPLICATION FILED MAY 26, 1914.

1,136,784.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 2.



# UNITED STATES PATENT OFFICE.

GEORGE A. FAIR, OF LOS ANGELES, CALIFORNIA.

## VENTILATING WINDOW OR DOOR.

1,136,784.

Specification of Letters Patent.

Patented Apr. 20, 1915.

Application filed May 26, 1914. Serial No. 841,107.

*To all whom it may concern:*

Be it known that I, GEORGE A. FAIR, citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Ventilating Windows or Doors, of which the following is a specification.

My invention relates to windows and particularly to windows so constructed as to provide for a proper ventilation of the apartments in which the windows are used.

The primary object of my invention is the provision of means whereby the inlet of fresh air or the outlet of vitiated air into or from a room or other apartment may be readily regulated, the construction being such that direct drafts of air are prevented.

A further object of the invention is the provision in a window of spaced sashes inclosing between them a normally dead air space, the spaces between the sashes, however, being connected with means whereby fresh air may enter between the sashes and by a proper regulation of the inner sashes be allowed to enter the room.

A further object of the invention is the provision of a window so constructed that diffusion boxes are formed at the upper and lower ends of the window, these diffusion boxes admitting air between the outer and inner sashes and being provided with controlling dampers so that the amount of air so entering may be readily controlled.

Still another object of the invention is to provide a sash frame of a very simple construction so formed that it may be readily opened to permit the insertion or removal of a pane of glass.

Other objects will appear in the course of the following description.

Certain improvements of my invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a face view of a pivoted window constructed in accordance with my invention. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is an enlarged section of the lower diffusion box shown in Fig. 2. Fig. 4 is a fragmentary horizontal section on the line 4—4 of Fig. 2. Fig. 5 is a perspective view of one of the sash frames. Fig. 6 is a fragmentary sectional view on the line 6—6 of Fig. 2. Fig. 7 is a fragmentary vertical section through a portion

of a railway car showing my improved ventilating window as applied thereto.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

In Figs. 1 to 6 I show my improvement as applied to a particular form of window construction, such a window construction as is illustrated in my pending application, Serial No. 807,527, filed on the 18th day of Dec., 1913. In this form of window, the main frame of the window is rectangular and is pivoted at the corners so that the window opens outward in the manner of a casement window. Disposed within this main window frame and movable therewith are outer and inner sliding sashes. In this prior invention, above referred to, the diffusion boxes or ventilating boxes are disposed in the window casing above and below the pivoted window frame by which the passage of fresh air into the room could be controlled. I have shown my invention as applied to such a pivoted window frame, as is disclosed in my prior application, but I do not wish to be limited to this construction, as it is obvious that the invention might be applied to windows which were not pivoted.

Referring to Figs. 1 to 6, 2 designates a window casing of any usual or approved form. In the lintel and sill of the window casing are formed sockets 3 for the engagement of the pintles. The outer window frame proper is designated 4 and is rectangular in form and is preferably made up of sheet metal sections. This outer window frame is provided with pintles 5 and its upper and lower ends engaging the sockets 3 so that the window frame is pivoted for movement in a horizontal plane. The inner wall 6 of the window frame, as illustrated in Fig. 6 is provided with the channel irons 7 and 8, 7 designating the outer channel iron and 8 the inner channel iron for the guidance of the outer and inner pairs of sashes. The outer upper sash is designated 9 and the outer lower sash designated 10. The inner upper sash is designated 11 and the inner lower sash is designated 12. Each of the panes of glass forming the sashes is inclosed and supported by a sash frame, illustrated in Fig. 5. This sash frame may be formed in any suitable manner but preferably comprises four pieces designated

13, U-shaped in cross section, the four pieces or sections 13 being pivotally connected to each other as at 14 at the corners of the frame. The sash frame is so formed that when one of the pins 14 is removed, the frame may be opened out for the reception of the glass pane and then closed and pinned together in a manner which will be obvious to all those skilled in the art. My reason for forming the sash frames in this particular manner is that thereby I make the sashes very light and the sash frame itself can be made relatively thin so as to secure as much dead air space between the windows as is necessary. As illustrated in Fig. 6 there is a space of a half inch or two inches between the outer pair of sashes and the inner pair of sashes, this space being designated 15 and constituting normally a dead air space. The upper rail 16 of the outer frame 4 constitutes a diffusion box and the lower rail 17 of the window frame also constitutes a diffusion box, these boxes being hollow and having openings leading to the outside air and being also provided with dampers, as will now be explained. Each of these boxes 16 and 17 has an opening 18 upon its outer face through which air may enter, and pivotally supported within the bar or hollow member 16 is a damper plate 19, illustrated most clearly in Figs. 3 and 4. This damper plate is pivoted at 20 so as to swing toward and from the opening 18 and preferably the damper plate swings between inwardly projecting flanges 21 formed on or carried upon the outside wall of the members 16 and 17. The edge of the damper plate may be provided with felt or rubber backing 22 which will have air-tight engagement with the flanges of the wings 21. A transversely extending strip of felt or rubber designated 23 is likewise so disposed above the opening 18 as to contact with the free edge of the damper plate when the latter is closed as shown in dotted lines in Fig. 3. As illustrated, the damper plate is curved transversely of its length, but the particular form of this damper plate is not essential to my invention. Each of the boxes 16 and 17 is also formed with an opening 24 which opens from the hollow bar or box into the space 15 between the outer and inner ends of the window sashes. This opening 24 is preferably crossed by a screen 25 of gauze or like material, so as to prevent the entrance of dust into the space between the window sashes. While I may provide any suitable means for operating the damper plates 19, I have illustrated in Fig. 3 a lever 26 pivoted at 27 and having one arm projecting out through an opening 28 formed in the front wall of the members 16 and 17. The inner arm or end of the lever bears against the curved under face of the damper plate and is linked there-

to by a link 26<sup>a</sup> so that when the outer end of the lever is depressed the damper plate will be raised and shifted to the dotted line position in Fig. 3. I may provide any suitable means for holding the lever 26 in position to close the damper but for the purpose, however, I have illustrated the slot 28 as being formed with an offset 29 at its lower end and providing a shoulder. The lever is loosely pivoted upon its pivot pin so that after it has been turned down it may be shifted slightly to one side and thus locked. The operation of this portion of my invention will be perfectly obvious from what has gone before. If it is desired that the space 15 shall be filled with dead air then of course, the damper plates 19 are to be closed so as to prevent the entrance of air into the opening 13. If it is desired that slight ventilation should be secured the one or the other of the damper plates can be opened, allowing fresh air to enter, pass through the diffusion box and pass into the space 15. Either the lower or upper inner sashes may be raised or lowered, or the lower sash may be raised or the upper sash lowered, and thus the air entering one or the other of the diffusion boxes and passing into the space 15 will be either allowed to enter directly into the apartment by raising the sash adjacent to the diffusion box or may be allowed to enter indirectly by shifting the sash farthest away from the diffusion box. If a greater ventilation is desired, then both of the dampers in the two diffusion boxes will be opened and air allowed to enter through both of the openings 18 and the lower sash may be raised and the upper sash lowered so as to secure an entrance of fresh air both at the top and bottom of the window. Of course, if a greater amount of air is necessary, then both of the lower sashes may be entirely opened and if a still greater amount is necessary then the entire window may be opened and swung upon its pivot after the manner of a casement window.

It will be seen that my construction is particularly applicable to vehicles such as Pullman palace cars, where in winter there is ordinarily provided an outer fixed sash and an inner sliding sash. In these cars it is extremely difficult to secure proper ventilation without permitting a too direct inlet of cold air.

In Fig. 7 I show my improvement as applied to a car having outer and inner sashes. In this figure, 30 designates the side wall of a car and 31 a portion of the roof. The side of the car, as illustrated, is formed with outer and inner walls 32 and 33. At the spring of the roof there is an inlet hood designated 35, whereby air may enter into the space between the outer and inner walls. The window frame 36 is provided with the

lintel 37 and the sill 38. This lintel 37 is  
 formed with an inlet opening 39 protected  
 by a screen 40. The outer sash 41 is illus-  
 trated as fixed in position so that it cannot  
 5 be shifted. This is an ordinary and com-  
 mon arrangement in Pullman cars. It is  
 obvious, however, that this sash might be  
 made sliding without affecting the merits of  
 the invention. The inner sash 42 is prefer-  
 10 ably composed of two sashes sliding with  
 relation to each other so as to control the  
 entrance of air into the car from the space  
 between the sashes. If now both the upper  
 and lower inner sashes be closed it is ob-  
 15 vious that no air can enter. If now, on the  
 other hand one of these sashes be opened it  
 will be obvious that air passing down  
 through the aperture 40 will enter in the  
 car by the manner shown in Fig. 7. In  
 20 order to prevent the passage of air into the  
 space between the outer sash and the inner  
 sashes, I provide a damper 43 which is oper-  
 ated by means of a rod, lever, or other suit-  
 able instrumentalities projecting into the  
 25 car. The sill of the window is designated  
 56 and forms the top of a transversely ex-  
 tending hollow casing 57 which extends en-  
 tirely across the window and forms the  
 lower bar thereof. This lower hollow bar  
 30 or casing 57 at its outer portion extends  
 above the sill 56 so as to form a ventilation  
 box 58. The outside face of the hollow bar  
 57 is formed with an air inlet opening 59  
 and an inner wall 60 deflects the air enter-  
 35 ing through this opening into the ventila-  
 tion box 58. The inner wall of the ventila-  
 tion box is formed by a screen 61. It will  
 be seen that the lower sash 51 of the inner  
 pair of sashes when closed rests upon the  
 40 sill 56 but that when the lower sash 51 is  
 raised sufficiently, the upper sash will lower  
 so as to rest upon the upper wall of the ven-  
 tilation box 58. It will likewise be seen that  
 in the lowered position of the box the sash  
 45 51 when resting upon the sill 56 will close  
 the opening across which the screen 61 is  
 disposed but that when the lower sash is  
 raised air will be admitted from the ventila-  
 tion box 58 into the room. The lintel of  
 50 the sash frame is formed by a hollow casing  
 62 having a portion 63 at its upper end  
 which overhangs the sill 56. The front of  
 the casing 62 is formed below the overhang-  
 ing portion 63 with the opening 64 screened  
 55 by a wire gauze 65. The outer face of the  
 casing has an opening 66 for the admission  
 of fresh air and fresh air is directed up-  
 ward into the upper portion of the casing  
 which forms a ventilator box by means of  
 60 the deflector plate 67. It will be noted that  
 when the inner sashes are in their closed po-  
 sition the upper sash 50 will engage with  
 the under wall of the overhanging portion  
 63 and will close the opening 64, but that  
 65 when this upper sash is lowered this open-

ing will be unclosed and fresh air will be  
 admitted into the room. It will be seen  
 then that by raising the lower sash the up-  
 per sash will be lowered, and thus air will  
 be admitted through the screened opening  
 61 and the hot air will pass out through the  
 upper opening 64 or fresh air may enter  
 through this upper opening, just as circum-  
 stances dictate. The rear sashes operate be-  
 70 tween the upper wall of the ventila-  
 tion box 58 and the lower wall of the box  
 or casing 62 and preferably, one sash coun-  
 terbalances the other. Ordinarily, during  
 the winter months, the outer pair of sashes  
 are not opened and the inner pair of sashes  
 only opened to an extent which will inclose  
 75 the openings 61 and 64. Thus the dead air  
 space 68 between the inner and outer sashes  
 is at all times preserved, thus preventing the  
 warmth of the room from being dissipated  
 and also preventing the moisture gathering  
 upon the sashes. It is a very important  
 matter that the dead air space should be  
 preserved through the cold months of the  
 year, particularly in the cold climates, as  
 80 by this method frost is kept off the windows.  
 After the weather grows warmer, however,  
 all the windows may be fully opened and  
 the dead air space eliminated.

In order to prevent cold air from entering  
 85 the room, at right angles to the plane of the  
 windows I preferably provide a deflector  
 plate designated 69 and illustrated in Fig. 2.  
 This deflector plate is disposed in a slot 70  
 formed in the sill 56 and at its upper end is  
 90 flanged as at 71 so that it cannot drop down  
 too far through this slot 70. It is also pro-  
 vided with a ring or other form of handle  
 whereby it may be pulled up. The lower ex-  
 tremity of the plate 69 is deflected as at 73  
 95 so that when the plate is pulled up to its  
 full extent it may be tipped and will hold in  
 place without the necessity of using any  
 fastening device for the purpose.

Parting strips 74, are of course, disposed  
 100 between the front and rear pairs of sashes,  
 thus holding these front and rear parts of  
 sashes separated. Preferably the window  
 frame is reinforced by outer reinforcing  
 members designated 75 forming channels 76  
 105 within which a shade may be disposed while  
 the outer portion of the window casing is  
 reinforced by the reinforcing members 77  
 (see Fig. 3) providing a channel within  
 which a screen of wire gauze may slide.

This form of window is particularly ap-  
 plicable for use in Pullman cars which in  
 winter require a dead air space between the  
 outer and inner sashes and in which there  
 is a great deficiency in proper ventilation.  
 120 It is, however, obvious that the invention is  
 not necessarily limited to its use in Pullman  
 cars but may be applied to the windows of  
 houses and other buildings, with equally  
 good results.

It will, of course, be understood that the window is shown deeper in proportion than it actually will be, in order to show the parts distinctly.

5 While this form of the invention has been shown as applied to windows I wish it distinctly understood that it might also be applied to doors.

10 Having thus described the invention what is claimed as new is:—

1. In a window of the character described, outer and inner sashes, a frame in which said sashes move, one member of the frame being hollow and having communication  
15 with the outside air and with the space between said sashes, and a damper arranged within the hollow member and controlling the passage of air therethrough.

2. In a window of the character described, outer and inner sashes, a frame in which said sashes move, one member of the frame being hollow and having communication with the outside air and with the space between said sashes, a damper pivotally mounted within the hollow member and controlling the passage of air thereinto, and damper  
25 actuated means extending out of the front of said hollow member.

3. In a window of the character described, an outer sash and upper and lower inner sashes, a frame in which said sashes move, said frame including hollow elements opening into the space between the sashes and communicating with the outside air, and  
30 dampers controlling the entrance of air into said hollow elements.

4. In a window of the character described, outer and inner sashes spaced from each other, and an outer sash frame including a

hollow element having a lateral opening, 40 and an opening communicating with the space between the outer and inner sash frames, and a damper pivotally mounted within the hollow element and movable into position to cover or uncover said lateral 45 opening, and a lever pivoted to the exterior of the hollow member and having linked engagement with the said damper.

5. In a window of the character described, outer and inner sashes, the inner sashes comprising an upper and a lower sash, shiftable with relation to each other, a frame inclosing said sashes and within which the sashes move, said frame having a hollow lintel and a hollow sill, each communicating with the  
55 outer air, there being a screened opening leading into the space between the sashes, and dampers arranged one in each of said elements and controlling the passage of air through said hollow members into the space 60 between the outer and inner sashes.

6. In a construction of the character described, a member hinged at one side for movement in a horizontal plane, outer and inner sashes disposed in said member, the  
65 inner sashes being shiftable, the said member being hollow and having an opening for the entrance of fresh air and an opening leading to the space between the sashes, and means within the hollow member for 70 controlling the passage of air into said space.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. FAIR. [L. S.]

Witnesses:

FREDERIC B. WRIGHT,  
JOSEPH C. ZIRKLE.