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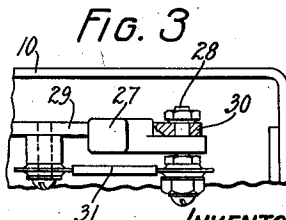
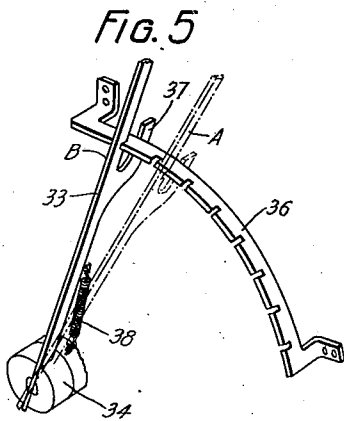
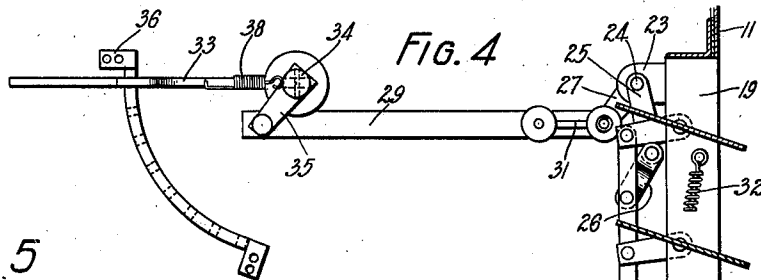
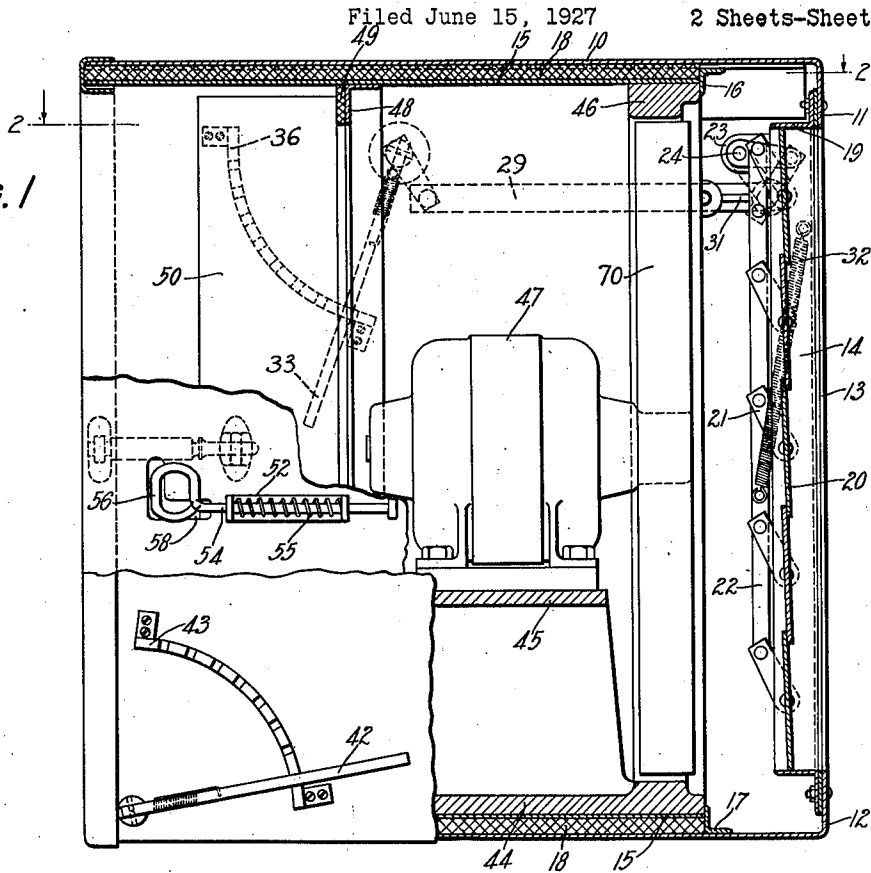
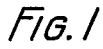
E. B. WOOD ET AL.

1,788,556

VENTILATING DEVICE

Filed June 15, 1927

2 Sheets-Sheet 1



ERNEST B. WOOD
INVENTORS OSCAR C. ELIASON
By Irving Mac Donald
ATTORNEY

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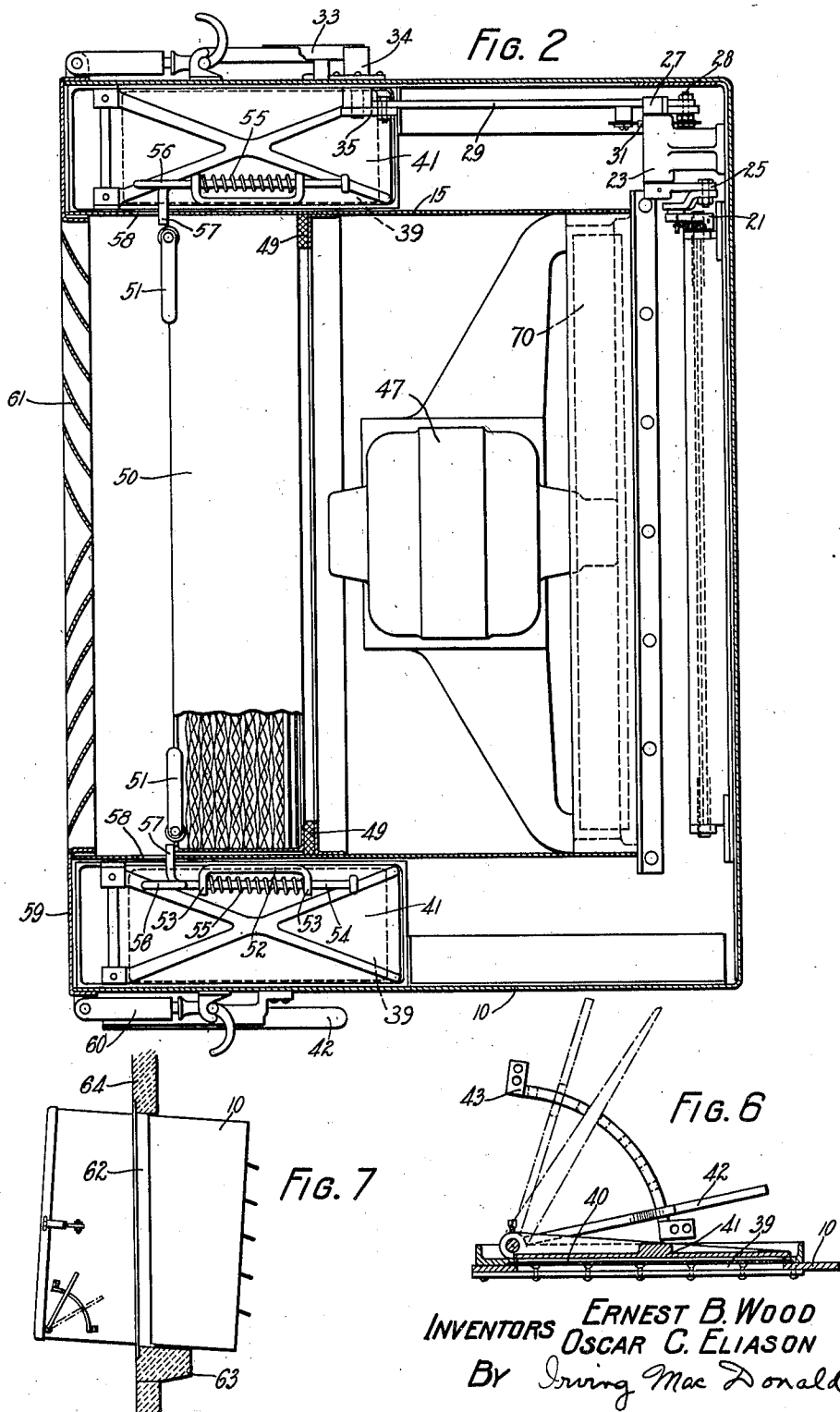
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

ERNEST B. WOOD AND OSCAR C. ELIASON, OF CHATHAM, NEW JERSEY, ASSIGNORS TO
BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A COR-
PORATION OF NEW YORK

VENTILATING DEVICE

Application filed June 15, 1927. Serial No. 198,975.

This invention relates to ventilating devices, and more particularly to such devices capable of being placed in the window frame of a building.

5 An object of the invention is to condition the air received either from the outside or the inside of the room, or both, so that clean air is delivered to the room.

10 In accordance with one embodiment of the invention, the ventilating device comprises an outer housing which is supported in a frame member adapted to be fitted into a window casing. The housing is provided with main inlet and outlet openings at the
15 front and rear ends thereof respectively, and deflecting members or shutters are positioned in these openings. The shutters in the inlet opening are adjustable to regulate the amount of air received from outside of the room. The
20 housing is also provided with a removable inner compartment containing a blower unit adjacent the air inlet opening and a filter unit in the rear of the blower unit, to draw the air through the inlet and force the air through
25 the filter unit and the deflecting members in the outlet opening. The inner compartment is spaced from the outer housing at the top and bottom by vibration absorbing material.

30 A feature of the invention is the provision of auxiliary air chambers or recirculating chambers in the housing so that the air in the room may be reconditioned by passage through the filter. These chambers are formed by the walls of the inner compartment and the housing and are provided with
35 adjustable air inlet dampers located in the housing. These chambers also facilitate the mixing of the air from the room with the air received from outside so that moderate clean
40 air is supplied to the room.

Another feature relates to the control of the air supplied to the blower unit which comprises simple and positive lever mechanism controlled wholly from within the room
45 so that the area of the openings may be reg-

ulated and the mechanism locked in position. This arrangement comprises a notched arcuate member attached to the housing and a lever engaging the notched member to ad-
50 just the opening of the air inlets.

A further feature of the invention associated with the main air inlet relates to a protective mechanism automatically operative in the event of a fire. This arrange-
55 ment comprises a spring member connected to the shutter lever and the housing and a fusible member on the lever. The fusible member is operative to disconnect the shutter lever from the actuating lever.

60 Another feature of the invention relates to the accessibility of the various elements of the ventilating device for repair and maintenance without removing the ventilating device from the window frame. This ar-
65 rangement comprises a removable closure member over the outlet end of the device and a removable inner compartment. The filter unit and the blower unit are also easily removable from the inner compartment.

70 A more detailed description of the invention follows and is illustrated in the accompanying drawing:

Fig. 1 is a side view in cross-section of the invention showing the outer housing with adjustable shutter in the main air inlet in
75 closed position, the blower unit adjacent the shutter, the main air outlet at the opposite end of the housing with respect to the inlet and the filter unit located between the blower and the main air outlet.

80 Fig. 2 is a view in section taken on line 2—2 of Fig. 1 showing the inner compartment within the housing and the recirculating chambers having the adjustable air dampers in the outer housing;

85 Fig. 3 is an enlarged detailed view of the assembly of the fusible link on the operating levers of the shutter;

Fig. 4 illustrates the adjustable shutter assembly in open position;

Fig. 5 illustrates the adjusting lever and locking member for the operation of the shutter and the air dampers;

Fig. 6 shows the recirculating chamber air damper in closed and open position; and

Fig. 7 is a side elevation of the ventilating device positioned in a window casing.

Referring to Fig. 1 the ventilating device comprises an outer housing 10 having top, bottom, and side walls of sheet metal, formed into a box-like structure, with front and rear openings. The front opening or air inlet is smaller than the rear opening or air outlet because the right angle extensions 11 and 12 of the top and bottom walls and the extensions 13 of the side walls, one of which is shown, form a frame member for the adjustable shutter assembly 14. A removable inner compartment 15 having top, bottom and side walls of sheet metal with front and rear openings is inserted in the outer housing 10 through the rear opening thereof and is positioned with the front opening of the compartment spaced from the air inlet of the housing by the angle stops 16 and 17 at the top and bottom of the housing 10. The rear end of the compartment 15 is flush with the rear end of the outer housing 10 so that the air inlet and air outlet of the inner compartment are in alignment with the air inlet and air outlet of the outer housing. Between the top and bottom walls of the housing 10 and the compartment 15 is fastened vibration absorbing material 18, such as felt, and the side walls of the compartment are spaced from the housing by auxiliary air spaces or recirculating chambers to be hereinafter described and shown in Fig. 2. This arrangement forms a compact assembly in which a direct passageway is provided for the air drawn through the ventilating device. Furthermore, the air spaces on either side of the inner compartment reduce the transmission of noise vibration to the outer housing.

The adjustable shutter assembly 14 comprises a frame member 19 attached to the extensions 11, 12 and 13 of the outer housing and is removable from the inside of the housing for repair and maintenance. The frame member 19 carries a plurality of longitudinally pivoted vanes 20 which overlap when in closed position, as shown in Fig. 1. An inwardly extending arm 21 is rigidly attached to each vane 20 at the pivotal point, as shown in Fig. 2. Each of these arms is pivoted to a common lever bar 22. A shaft bearing 23 is attached to the inner surface of the metallic extension 13, near the upper end of the housing 10 and is more clearly shown in the upper right-hand corner of Fig. 2. The bearing 23 carries a stub shaft 24 to which an arm 25 is rigidly attached adjacent the common lever bar 22. A connecting link member 26 is pivotally attached to the arm 25 and the lever bar 22 to regulate

the position of the vanes 20 when the shaft 24 is rotated. Rigidly attached to the other end of the shaft 24 is another arm 27, which is loosely attached to a pin member 28. A horizontal actuating lever 29 having a bifurcated end portion 30 is held in engagement with the pin 28, by means of a fusible link 31, attached to the lever 29 and the pin 28. This assembly is shown more clearly in Fig. 4 and provides an automatic release of the shutter assembly 14 in case of fire, to prevent the occurrence of drafts. A suitable resilient member, such as a spring 32, attached to the shutter frame 19 and the lever bar 22, closes the vanes 20 when the fusible link 31 disconnects the actuating lever 29 from the shutter assembly 14. The shutter is shown in fully opened position in Fig. 4, in which an operating lever 33, on the exterior of the housing 10 is pivotally attached to a shaft 34 which projects through the housing and carries an arm 35 pivoted to the horizontal actuating lever 29. The operating lever 33 engages a slotted arcuate sector 36 attached to the housing 10 so that the lever may be moved to any desirable position and then locked. This arrangement is shown in Fig. 5 in which an angular extension 37 on the lever 29 engages the inner rail of the sector 36 until the lever is moved to a definite position, as shown at A, and if the operating lever is to be locked in a position, such as B, the lever is pushed toward the housing and engages one of the slots in the sector 36. A suitable spring 38 holds the lever 33 in its locked position.

The air spaces on either side of the inner compartment, shown in Fig. 2, serve as recirculating chambers for reconditioning the air in the room, or for mixing the warm air from the room with the air received from outside of the building. In each of these chambers at the bottom of the housing and toward the rear or outlet opening thereof, is a rectangular opening 39, shown in dotted lines, and having a wire screen 40 placed over the opening, as shown in Fig. 6. A hinged damper 41, of metal, covers the opening 39 within the chamber and is attached to the operating lever 42 on the outside of the housing. A notched arcuate sector 43 on the housing cooperates with the lever 42 to adjust and lock the damper 41 in a closed position, or an open position as shown in dotted lines in Fig. 6. The construction of the operating lever 42 and the sector 43 is the same as shown in Fig. 5.

A blower unit is inserted in the inlet of the inner compartment 15 adjacent the adjustable shutter to draw the air from outside the building or from the room. This unit is easily removable for maintenance and repair and comprises a frame casting having a main base portion 44, an elevated base portion 45, and a vertical portion 46 having a circular opening fitted into the air

inlet of the inner compartment 15. Attached to the elevated base portion 45, is a motor 47, having a fan 70 located in the circular opening of the frame portion 46.

Any desirable blower unit may be used instead of the assembly shown, to draw the air directly through the adjustable shutter, or indirectly through the recirculating chambers. A frame member 48 of angular cross-section is attached to the inner walls of the compartment 15, behind the blower unit, and carries a felt strip or gasket 49. An air filter unit 50, of any suitable construction having minute oiled surfaces to trap dust or dirt, is inserted in the inner compartment by means of the swinging handles 51 on the rear of the filter unit, and is held in position by spring clamps extending through the compartment wall. These clamps are located on the outer side walls of the compartment and consist of a supporting member 52 having outwardly extending apertured ends 53 through which a slidable rod 54 extends. A spring 55 which surrounds the rod and has one end attached thereto is positioned between the aperture ends 53 of the supporting member 52. A portion of the rod 54 is bent to form a handle 56 having a termination 57 which may be inserted through the compartment wall through the slot 58. This arrangement clamps the air filter unit against the felt gasket 49 and forms an air-tight seal around the filter unit.

A removable cover plate 59 is attached to the rear of the housing by means of the spring clamps 60. This plate closes the rear of the recirculating chambers and is provided with vertical louver plates 61, the plates on either side of the centre of the opening being spaced at diverging angles across the air outlet, to distribute the air discharged through the air filter.

Fig. 7 shows the arrangement of the ventilating filter device in a window space of a building. The housing 10 is attached to a supporting frame-member 62 intermediate the air inlet and air outlet openings and is preferably positioned at a slight slope, to facilitate draining off rain. The frame 62 is fitted into a window space with the lower end supported on the window sill 63 and the upper end held by the window frame 64. The compact assembly of the device makes the installation extremely simple and the maintenance and repair of the different parts comprising the ventilating filter can easily be accomplished without removing the device from the window frame. Furthermore, all adjustments of the air openings may be performed from within the room.

The operation of the device is as follows, air is drawn through the adjustable vanes 20 located in the inlet opening by means of the motor 47 and the fan 70, the air is then

forced through the filter unit 50 which traps the dust and dirt, the cleansed air then passes into the room through the outlet passage and deflecting louvers 61. If it is desired to recirculate and filter the air of the room without drawing in air from outside the building the vanes 20 are closed and the dampers 41 are opened by means of the operating levers 42, the air is then drawn through the opening 39, it then passes along the chamber on either side of the inner compartment and is then forced through the filter unit 50 out through the louvers 61 in the outlet passage, into the room. By opening the vanes 20 and the dampers 41 part way air can be drawn both from the outside atmosphere and from the room. This is for the purpose of mixing the air which is forced through the filter unit 50.

While the above description relates to a particular construction it is to be understood that various modifications may be made in the assembly without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. In a ventilating device, an outer housing having an air inlet passageway and an air outlet passageway, an inner compartment having inlet and outlet passageways in alignment with the passageways in said outer housing, said inner compartment being mounted in spaced relation with respect to said outer housing to provide air chambers therebetween, openings in said chambers having adjustable dampers associated therewith, a filter located in said inner compartment between said inlet and outlet passageways, and a blower between said filter and said inlet passageway whereby the air may be drawn either through said inlet passageway or the openings in said chambers and forced through said filter and said outlet passageway.

2. In a ventilating device, a housing having air passageways at either end, deflecting members located at each of said passageways, an inner compartment located within said housing having an inlet communicating with one of said passageways and an outlet communicating with the other of said passageways, said inner compartment being mounted in spaced relation with respect to said housing to provide air chambers therebetween, openings in said chambers having adjustable dampers associated therewith, a blower mounted in the inlet passageway of said inner compartment for drawing the air either through the inlet passageways of said inner compartment and said outer housing or through the openings in the chambers and forcing it through said outlet passageways in said inner compartment and outer housing.

3. In a ventilating device, an outer housing having air passageways at either end,

- an inner compartment within said housing having a filter located in one end thereof, said inner compartment being mounted in spaced relation with respect to said outer housing to form chambers therebetween, openings in said chambers having adjustable dampers associated therewith, a blower located in the other end of said inner compartment for drawing the air through said openings and forcing it through said filter, and an adjustable closure member positioned in said outer housing adjacent the blower. 70
4. In a ventilating device, an outer housing having air passageways at either end, an inner compartment within said housing, said inner compartment being mounted in spaced relation with respect to said outer housing to form chambers therebetween, openings in said chambers having adjustable dampers associated therewith, a blower in one end of said compartment adjacent one of said passageways whereby the air may be drawn through said openings, a filter at the other end of said compartment adjacent the other of said passageways, a closure member positioned in said passageways adjacent said blower, actuating means for opening said closure member, and fusible means on said actuating means for automatically operating said closure member. 80
5. In a ventilating device, an outer housing having an air inlet passageway and an air outlet passageway, at either end, an inner compartment within said housing having a filter located in one end thereof, said inner compartment being mounted in spaced relation with respect to said outer housing to form chambers therebetween, openings in said chambers having adjustable dampers associated therewith, and clamping means mounted on the exterior of said compartment and projecting therethrough for holding said filter firmly in place. 85
6. In a ventilating device, an outer housing having adjustable outside and inside air inlets, a compartment mounted within said housing, said inner compartment being mounted in spaced relation with respect to said outer housing to form chambers therebetween, said inner compartment having an air inlet and an air outlet, a filter mounted in said outlet, and a blower mounted in said inlet whereby the air is drawn through said outside or inside inlets and is forced through said filter. 90
7. A ventilating and filtering device comprising an outer housing having an air inlet and an air outlet, an adjustable closure member in said inlet, an inner compartment within said housing, said inner compartment being mounted in spaced relation with respect to said outer housing to provide air chambers therebetween, openings in said chambers having adjustable dampers associated therewith, vibration damping means between housing and said compartment, a removable blower in said compartment adjacent said closure member whereby the air is drawn through said inlet, a removable filter in said compartment adjacent said blower and a removable member closing the outlet of said housing, said member having stationary deflecting plates therein. 95
- In witness whereof, we hereunto subscribe our names this 14th day of June A. D., 1927. 100
- ERNEST B. WOOD.
OSCAR C. ELIASON. 105
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