

March 17, 1925.

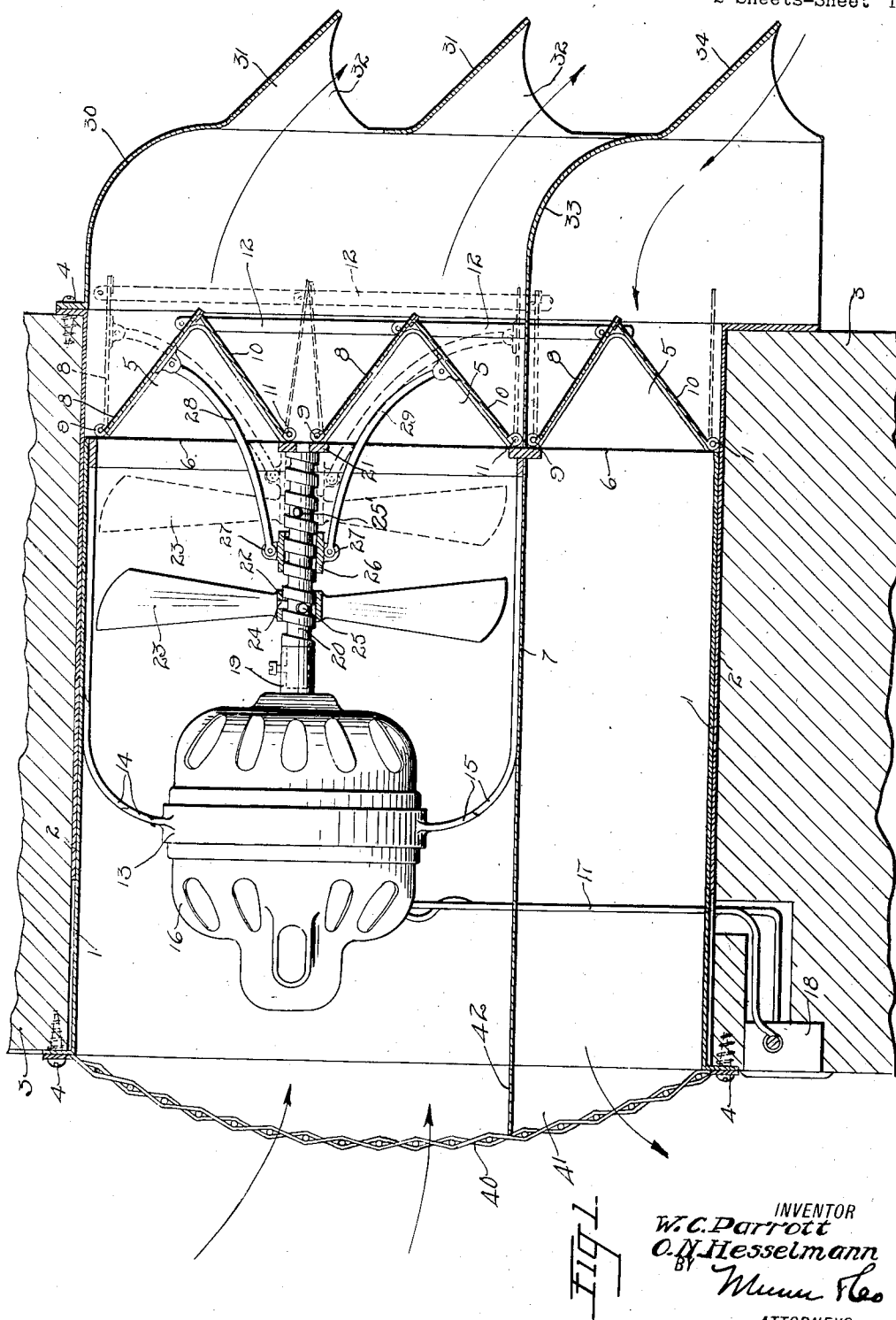
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1,529,711

VENTILATING DEVICE

Filed April 10, 1922

2 Sheets-Sheet 1



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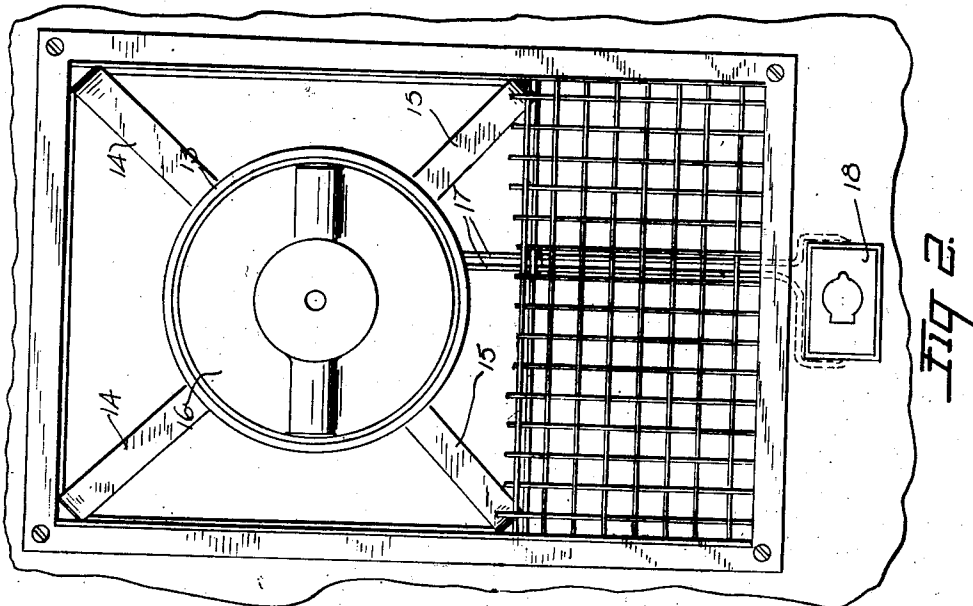
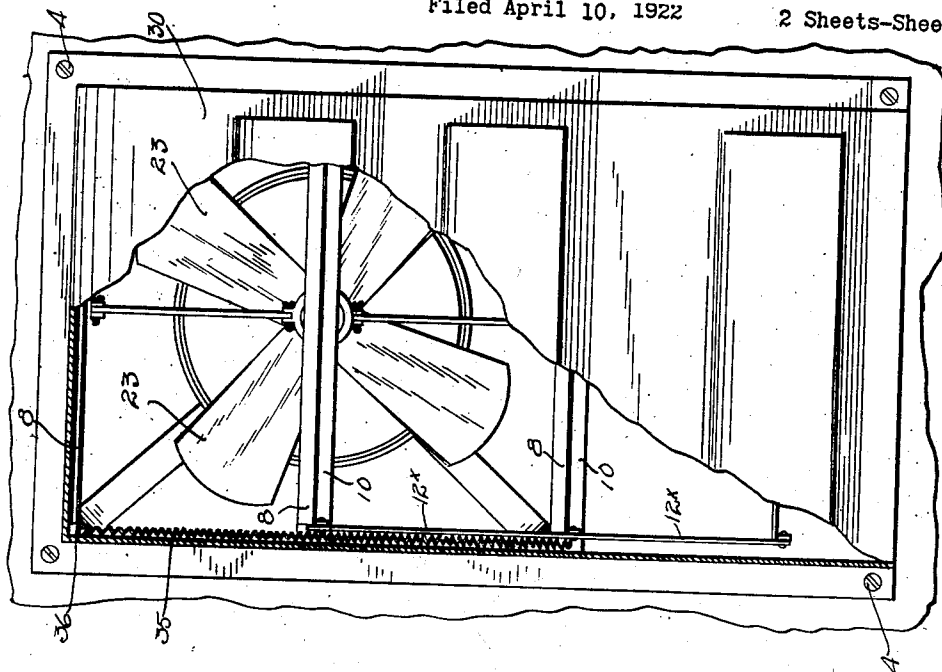
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INVENTOR
W.C. Parrott
BY O.N. Hesselmann
Minn. Geo.
ATTORNEYS

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1,529,711

UNITED STATES PATENT OFFICE.

WALTER C. PARROTT AND OTTO N. HESSELMANN, OF DYERSVILLE, IOWA.

VENTILATING DEVICE.

Application filed April 10, 1922. Serial No. 551,274.

To all whom it may concern:

Be it known that we, WALTER C. PARROTT and OTTO N. HESSELMANN, both citizens of the United States, and residents of Dyersville, in the county of Dubuque and State of Iowa, have invented a new and useful Improvement in Ventilating Devices, of which the following is a full, clear, and exact description.

Our invention relates to improvements in ventilating devices, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of our invention is to provide a ventilating device in the form of a unit which is designed to be inserted in the wall of a building, and which is provided with a fresh air inlet and a foul air outlet, both the inlet and the outlet openings being controlled by shutters which are operated automatically.

A further object of our invention is to provide a device of the type described, in which the automatic operation of the shutters is accomplished by means of a blower or a fan, which is designed to move longitudinally with respect to the shaft on which it is mounted to accomplish the opening and closing of the shutters.

A further object of our invention is to provide a device in the form of a unit, by means of which the air of a room may be changed in such a manner as to prevent perceptible drafts.

A further object of our invention is to provide a unit of the type described, having means for closing the inlet and the outlet openings, these means consisting of shutters which, when opened, will provide a minimum resistance to the air entering through the unit or leaving therefrom.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

Our invention is illustrated in the accompanying drawings, forming part of this application, in which—

Fig. 1 is a longitudinal section through the device, certain parts being shown in elevation and for the sake of clearness,

Fig. 2 is a view of one end of the device, and

Fig. 3 is a view of the opposite end of

the device, a portion being broken away to show the interior mechanism.

In carrying out our invention, we provide a box-like casing 1 which is preferably made of sheet metal and which is designed to enter a sheet metal sleeve 2, which extends from the outer to the inner side of a wall, such as that shown at 3, the casing and the sleeve 2 being held in position by screws 4, or in any other suitable manner. At the forward end of the casing 1, i. e. that part nearer the outer face of the wall 3, are forwardly projecting triangular-shaped extensions 5, which are integral with the side walls of the casing 1. A horizontal partition 7 divides the casing 1 into an upper and a lower passageway.

As will be seen from Figures 1 and 3, there is a shutter 8 which normally rests on the upper edge of each one of the triangular extensions 5, each of these shutters being hinged at its upper end as shown at 9. Similarly, there is a series of shutters 10 which are arranged to normally lie against the lower edges of the extensions 5, these shutters 10 being hinged at their lower edges, as shown at 11. The shutters 8 and 10 extend across the passages above and below the partition 7, so that in the position shown in Figure 1 the shutters form closures for preventing the entrance or exit of air.

As will be seen from Figure 1, the upper shutters 8 are pivotally connected by means of a common rod or bar 12, so that any movement of the bar 12 in an upward direction will open the shutters 8 simultaneously. Similarly, the shutters 10 are connected on the opposite side by means of a bar 12* (see Figure 3), which, when raised or lowered, will raise or lower the shutters 10 simultaneously.

Carried by a clamping ring 13, which is secured to the upper portion of the casing 1 by arms 14 and to the partition 7 by arms 15, is an electric motor 16, which is connected by conductors 17 with a plug socket 18. The shaft 19 of the fan has secured to it to form a prolongation thereof, a screw 20. The opposite end of the screw is reduced and is journaled in a cross bar 21, which extends transversely across the device from wall to wall of the casing. Mounted on the screw is the threaded hub 22 of a fan or blower 23. This fan is free to turn

with respect to the screw, within certain limits. The hub is provided with a stop pin 24, which is arranged to engage with a pin 25 carried by the screw 20 to limit the movement of the fan in one direction and with a pin 25' to limit the movement in the reverse direction. A sleeve 26 is provided, which is movable longitudinally with respect to the screw. This sleeve has eyes 27, one of these eyes being connected by a link 28 with one of the shutters 8, the other eye being connected by a link 29 with one of the shutters 10. When the sleeve is moved from the full line position, shown in Figure 1, to the dotted line position, then the shutters 8 are all raised into the dotted line positions, while the shutters 10 are lowered into the dotted line positions, in which positions they are parallel with one another and also parallel to the axis of the screw 20.

As will be seen from Figure 1, it will be noted that there is an auxiliary deflector casing 30, which extends past the outer face of the wall and which is provided with two downwardly and outwardly inclined deflectors 31 to provide passages 32 for the foul air. A partition 33 has a curved portion which extends inwardly between the shutters so as to form a continuation of the partition 7. The space below the partition, therefore, forms an inlet, which inlet is directed outwardly and downwardly. The inlet portion of the casing is provided with a deflector 34, as shown in Figure 1.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. Normally, the shutters are held in closed position by means of a spring 35 which is fastened at 36 (see Figure 3) at the upper end of the casing and to the bar 12* which controls the lower shutters. It will be observed, however, that, owing to the connection of the upper shutters and the lower shutters with the sleeve 27, any movement of either set will result in a similar movement of the other set, so that the spring 35 holds all the shutters normally closed. Let us assume that the fan 23 is in the position shown in Figure 1 when it is desired to ventilate. Current is now supplied to the motor, as by plugging in at the socket 18, or through the manipulation of a switch (not shown), the armature shaft and with it the screw 20 will begin to rotate, and, owing to the inertia of the fan, it will be forced forwardly by the screw, until it engages the sleeve 26, whereupon it will push the sleeve forwardly, i. e., to the right in Figure 1, thus opening the shutters. This movement will continue until the hub 22 engages with the pin 25'; and thereafter the fan, which is now in its dotted line position shown in Figure 1, will continue to operate and to blow the foul air out through the upper portion or passage

and past the deflectors 31. The fresh air will be drawn in through the inlet, to take the place of the foul air expelled from the room. The fresh air will pass underneath the partition 7 and into the interior of the room which is being ventilated. The fresh air, being ordinarily cooler than the foul air, passes downwardly, but not in sufficient current to make a draft perceptible.

When the ventilation of the room has been accomplished, and it is desired to stop the further movement, all that is necessary is to shut off the current. The motor thereupon slows down, but the momentum of the fan causes it to pass along the screw toward the stop pin 25, which it finally reaches. The sleeve 26 will follow the fan, and aided by the spring 35, will cause the closing of the shutters automatically.

Obviously, one or more of these units might be installed, and could be operated from distant points by merely switching on the current to the motor. It will be observed that the upper shutters 5 overlap the lower shutters slightly at the points where they come together when the shutters are closed. Any moisture which might have collected will therefore be drained off by the upper shutters, and thus will be prevented from running into the interior of the casing 1.

These units are designed to be made in different sizes, according to the size of the room or the number of persons occupying the room. The use of the ventilating apparatus necessitates the making only of a single opening, into which the casing may be placed. It also obviates any necessity of manually closing or opening the shutters before or after the ventilating operation, while at the same time insuring the closure of the shutters when it is desired. With such units as those disclosed, all that is necessary is to make a single opening, line it with some suitable lining, as the sleeve 2, and insert the unit, when the ventilating apparatus will be ready for use. It is also to be noted that these units can readily be mounted in walls of various thicknesses.

The inner end of the casing 1 is closed by a wire screen 40, this screen having metal side walls 41 and a transverse partition 42. The partition 42 forms a contiguous wall with the partition 7 when the screen 40 is in assembled position. The screen 40 is secured in adjusted position by means of the screws 4.

The principal object for providing the shutters in pairs and having them open toward each other lies in the fact that when the shutters are in opened position, two shutters occupy but the space of one shutter. With this type of shutter construction, the largest opening can be closed by a plurality of shutters which offer the least amount of

resistance to the passage of air through the opening when the shutters are in opened position.

We claim:

- 5 1. In a device of the type described, a casing having a plurality of triangular projections extending outwardly from one end of said casing, said projections being alined and made parallel with respect to each other,
 - 10 a plurality of shutters hingedly secured to said casing at the bases of each pair of alined projections, the bases of the vertically aligned projections being disposed adjacent to one another, said shutters being adapted
 - 15 to engage with the sides of said projections so as to close the opening of said casing, and means operatively connected to said shutters to swing the shutters, which have their pivoted points disposed adjacent to one another, toward each other.
 - 20 2. In a device of the type described, a casing having a plurality of triangular projections extending outwardly from one end of said casing, said projections being alined and made parallel with respect to each other,
 - 25 a plurality of shutters hingedly secured to said casing at the bases of each pair of alined projections, the bases of the vertically aligned projections being disposed adjacent to one another, said shutters being adapted
 - 30 to engage with the sides of said projections so as to close the opening of said casing, and means operatively connected to said shutters to swing the shutters, which have their pivoted points disposed adjacent to one another, toward each other, said shutters adapted to swing about a horizontal axis, the upper shutters extending slightly over the lower shutters, when said shutters are in closed position.
 - 35 3. A device of the type described comprising a plurality of shutters, a fan, means for rotating said fan, said means being adapted to move said fan toward said shutters, and
 - 40 means operatively connecting said fan with one of said shutters, whereby said fan will move toward said shutters and open them when said fan is actuated.
 - 45 4. A device of the type described comprising a plurality of shutters, a screw shaft having a stop disposed adjacent to each end thereof, a fan loosely mounted on said shaft and having a pin projected into the thread thereof, said fan being operatively connected to said shutters, whereby a rotation of said shaft will move said fan toward said shutters and open them, said stops limiting the movement of said fan on said shaft.
 - 50 5. A device of the type described comprising a telescopic casing having an air inlet and an outlet, a plurality of shutters adapted to close the inlet and outlet and mounted adjacent thereto, a fan disposed in said outlet and being operatively connected to said shutters to open said shutters when said fan is rotated, said shutters being adapted to close when said fan is idle, and a rain-proof housing disposed on the outer end of said casing.
 - 55 6. A device of the type described comprising a telescopic casing having an air inlet passageway and an air outlet passageway, a fan disposed in said outlet passageway and shutters adapted to close said inlet and outlet passageways, said shutters being operatively connected to said fan, whereby said shutters will be opened when said fan is actuated.
 - 60 7. In a device of the type described, a casing, shutters adapted to close one end of said casing, a shaft, a fan slidably mounted on said shaft, said fan being adapted to move longitudinally a short distance when said shaft is rotated, and means for opening said shutters, said means being actuated by the longitudinal movement of said fan.
 - 65 8. In a device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 70 9. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 75 10. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 80 11. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 85 12. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 90 13. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.
 - 95 14. A device of the type described, a casing, a plurality of shutters carried by said casing, said shutters consisting of two sets, means for swinging one set of shutters into opened position in one direction, means for swinging the other set of shutters into opened position in the opposite direction, each shutter of one set positioned alternately with each shutter of the other set, the shutters of both sets when in closed position closing one end of said casing and when in opened position lying substantially parallel with the flow of air passing through said casing.

WALTER C. PARROTT.
OTTO N. HESSELMANN.