

- [54] **DEVICE FOR DISTRIBUTING VENTILATING AIR**
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2,749,833	6/1956	Hekelaar.....	98/37
3,063,357	11/1962	Eberhart.....	98/40 V
3,122,087	2/1964	Demuth et al.....	98/40 V
3,452,667	7/1969	Coleman et al.....	98/41 R
3,506,038	4/1970	Perry et al.....	98/41 R
3,572,233	3/1971	Bar et al.....	98/2.09
3,727,539	4/1973	Wilmes.....	98/41 R
R20,778	7/1938	Eckenroth.....	98/106

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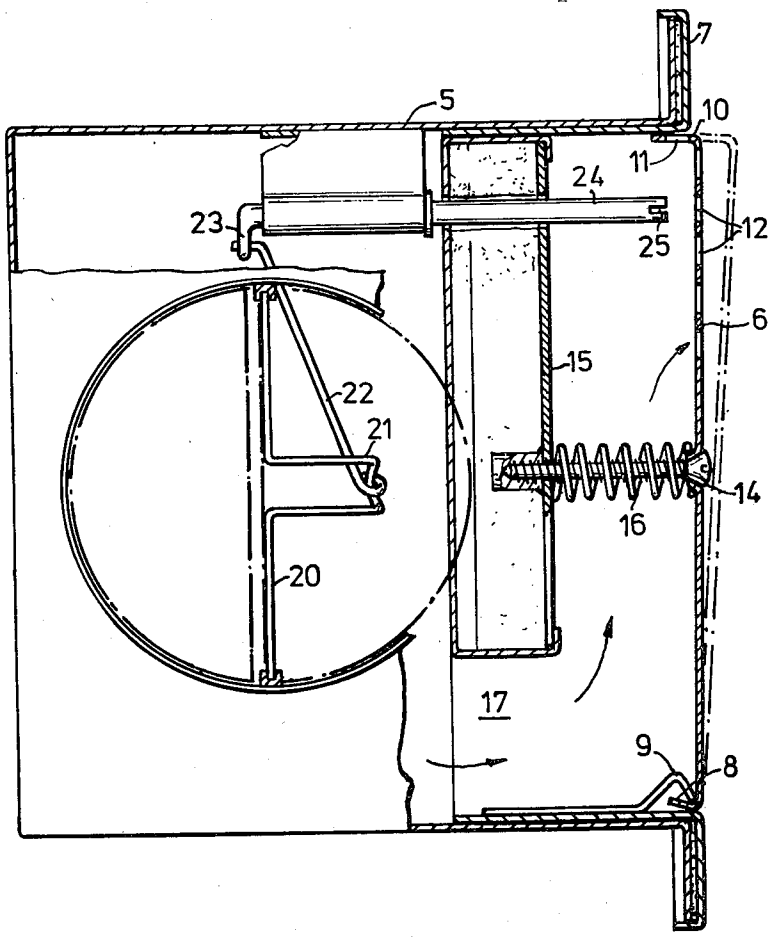
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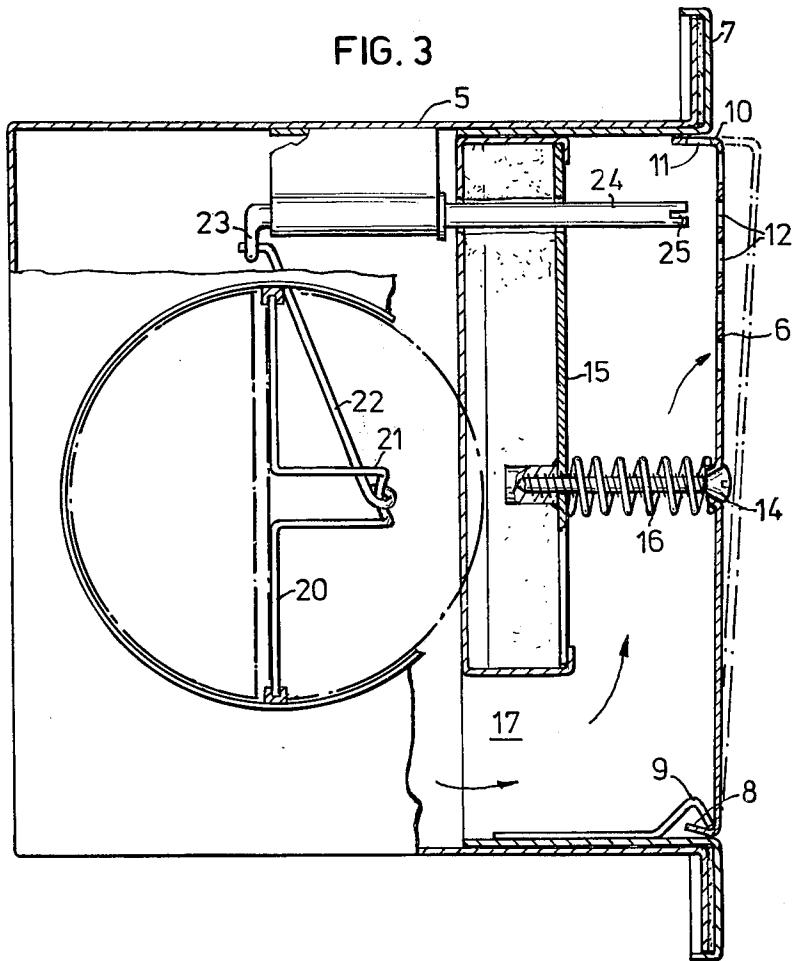
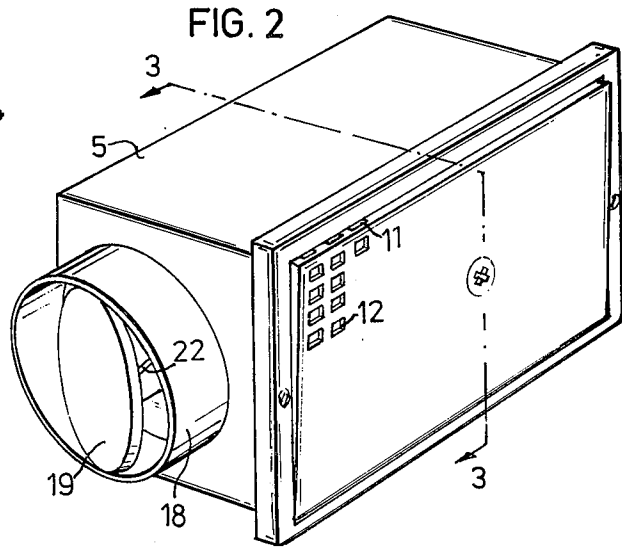
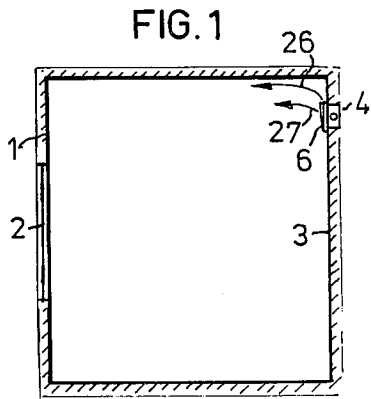
- [56] **References Cited**  
**UNITED STATES PATENTS**

1,062,177	5/1913	McElfatrick.....	98/41 AV
2,059,616	11/1936	Shortlidge.....	98/99.2
2,341,113	2/1944	Nelson.....	98/41 R
2,733,889	2/1956	Mattingly.....	98/41 R

[57] **ABSTRACT**  
 A ventilation device provided with a grille, pivotable along its lower edge and preferably arranged in a box, having a perforated front face and upper flange for horizontal and vertical air flow, respectively, for distributing air towards a window wall of a room from a duct outlet in an inner wall of said room. Exposure of the upper flange is adjusted by a setscrew passing through the grille front and threaded into a partially sound insulating wall having less height than the grille and being arranged between same and the duct. Air flow, regulated by throttling means in the duct connection, is adjusted by screwdriver through a front grille perforation.

2 Claims, 3 Drawing Figures





## DEVICE FOR DISTRIBUTING VENTILATING AIR

If a stream of air, at lower than room temperature, is blown towards a window wall in a room, from an inner wall or ceiling adjacent thereto, and if said stream has a trajectory enabling it to reach the window wall, draught from the window is reinforced, causing a heavy draught which is primarily a floor draught. If a writing desk is placed at the window, it will be draughty for the staff working at the writing desk. In order to lessen the inconvenience caused by draught in such ventilation installations where a cooled air supply is used, it has been necessary to lead in (supply) the air at the outside wall. Such a ventilation system is expensive, since ventilation ducts must be taken to the outer wall or walls and either cast in situ in the floor or hidden behind a so-called "false ceiling." To prevent draughts, or the feeling of draughts, it may be found necessary to use fresh air having a relatively high duct temperature, or also allow fresh air to flow into the room at a low velocity. If it has a high injection velocity, a stream of air from the fresh air ventilation opening can namely pass right across the room to the window wall, where it flows downwards, thus increasing the cold draught.

The present invention relates to a simple device by which the inconveniences mentioned can be circumvented and servicable distribution of the ventilating air flowing into a room can be obtained. It is assumed that the ventilation duct has its outlet at an inner wall and not at an outer wall in the room, and that in front of the ventilation duct outlet there is provided an air routing element having the appearance of a grille or grid. The invention is primarily characterized in that the grille-like air routing element, designated "grille element" in the following, mainly determines two flow directions, the one upwards and the other principally horizontal. The upwardly directed air stream is deflected along the ceiling of the room, and exerts a certain intermingling effect on the principally horizontally flowing air, thereby attaining quick admixture and distribution of the individual currents (streams) of air, and with the air in the room. In this manner, cold air never reaches the opposite wall, but is mixed up with the warm room air at some distance in front of the outside (outer) wall of the room. As a result, fresh air having a relatively low temperature, e.g. only 14°C, can be used, when the temperature of the air in the rest of the room is 24°C. Discomfort from convection currents and other air draughts in occupancy zones of the room therefore does not arise.

In a simple embodiment of the invention the grille element can be provided with a perforated flange at its upper edge, the flange extending into the duct outlet, and the grille element being adjustable in such a way that the flange can be more or less exposed. When it is open, the grille thereby allows air to flow not only principally at right angles to the plane of the grille, but also upwards through the perforated flange.

The grille element may form the forward wall in a box inserted into the duct outlet, being attached or connected to the box by its lower edge in such a way that its upper edge can be swung towards and from the box. A set-screw or the like, working against a spring can be arranged for this adjustment.

Even distribution of air passing through the box as well as a certain amount of sound insulation, can be ob-

tained if there is provided an intermediate wall within the duct outlet or box, respectively, and behind the grille element, between the inside of the duct or an inlet on the box, respectively, and grille element, said intermediate wall downwardly defining a through opening through which the air must pass on its way to the grille element.

Further characterizing features of the invention, and the advantages associated therewith may be seen from the following description of an embodiment shown on the accompanying drawings, where

FIG. 1 is a vertical section through a room, in which the air distributing device according to the invention is shown,

FIG. 2 shows a perspective of the device in a larger scale,

FIG. 3 displays in an even larger scale a cross section along a plane denoted by the lines 3—3 in FIG. 2.

On the drawing the outer wall is designated by the numeral 1, in a room having a window 2, and an opposite inner wall 3. In the latter there is the outlet for a ventilation duct 4 carrying fresh air intended to flow into the room. In the outlet of the ventilation duct there is arranged a box 5 the outward side of which, turned towards the room, is provided with a grille-like element 6. Box 5 is on its outward side provided with a flange 7 extending like a frame around the box and intended to cover the edges of the opening in the wall in which the box is inserted. Along its lower edge the grille element has a flange 8 folded inwards, which goes under a retainer 9, shaped like a half-stirrup, thus forming a joint which makes it possible to swing the grille element somewhat outwards and inwards about its lower edge. The grille element 6 is upwardly provided with an inwardly directed flange 10, having a number of holes 11, for the passage of air. The grille element is also provided with air passage holes 12. A setscrew 14 extends through the grille into an intermediate wall 15, situated inside the box. Around screw 14 there is placed a spring 16, compressed between the grille element 6 and the intermediate wall 15. By tightening or loosening screw 14 the grille element can be moved outwards or inwards, so that flange 10 with its holes 11 is exposed to a greater or lesser extent outside the outward edge of the box.

The intermediate wall 15 extends downwards a portion from the upper side of the box, but terminates above the bottom of the box so that a through flow area or slot 17 is formed here, extending from one side of the box to the other.

The box is provided on one side with an air intake stub 18, flow-through being regulated by a throttle butterfly 19, mounted on a rotatable shaft 20 provided with an arm 21. In its turn, arm 21 is joined by link 22 to a crank 23 mounted on turning pin 24. This pin is provided with a screwdriver slot 25, opposite an opening in the grille element 6. This arrangement allows setting the throttle 19 to a more or less open position by turning pin 24 in one or the other direction with a screwdriver.

The modus operandi of the device which has been described is mainly as follows. If the grille element 6 has been adjusted by the setscrew 14 to the position shown in FIG. 3 by full lines, air flows from the box principally at right angles to the plane of the grille, i.e. horizontally out into the room from wall 3 towards the outer wall 1. Hereby there is the risk that the cold air

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follows down along the outside wall and reinforces the draught from window 2, giving rise to a floor draught. If, on the other hand, the grille is swung out to the position shown by dotted lines in FIG. 3, by turning the setscrew 14 and with the help of the bias from spring 16, the holes 11 facing upwards in flange 10 are exposed. Consequently, an upwardly directed stream of air will flow through the holes, as noted by the arrow 26 in FIG. 1. This air stream is deflected along the ceiling and thereby catches up the air which flows out through the openings 12 in the grille. Air from openings 12, as denoted by an arrow 27 in FIG. 1, is mixed up with the upwardly directed air stream 26 and with the air in the room, so that it does not reach the outer wall. The formation of draughts is hereby effectively circumvented.

Air flows into the box 5 through the stub 18, and the quantity of air is regulated by the throttle 19. The air flowing into the box flows down into area 17 under the intermediate wall 15 and is here distributed along the whole width of the box. The wall 15 also has a sound insulating effect, allowing the device to accept relatively large amounts of air without causing a disturbing noise.

To regulate the incoming air to the right amount, a pressure measuring outlet can be arranged in the box, this outlet being connected to a micro pressure gauge on which the pressure drop can be read according to the adjustment of throttle 19.

What we claim is:

1. An air distributing device for distributing air flowing into a room having an inner wall from a duct outlet in said inner wall and discharging air into the room, said air from the duct being discharged into the room through said device at least a portion of which is dis-

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posed in said duct outlet, said device comprising a box-like housing having air inlet means and air outlet means for feeding air into the room, said outlet means having primary and secondary air openings in a grille element which is movably fitted in a front wall of said housing and which determines two flow directions into the room, one said direction being upward and the other said direction being substantially horizontally in the room, an upper edge of said grille element comprising a perforated flange extending into the housing toward the rear portion of the device and containing said secondary openings, and means mounting the grille element for adjustive movement into different positions in the housing front wall in such a manner that the flange openings are exposed to a greater or lesser extent, the air thereby passing through the grille element not only mainly at right angles to the plane of said element but also upward through said flange, the grille element being attached or joined to the housing front wall along the lower edge of said element and being maintained adjustably in position by a setscrew, and an intermediate wall inside the housing upstream of the grille element and downstream of air inlet means having the form of an air intake stub, a lower portion of the intermediate wall together with the inside of the housing defining a flow passage through which the air must pass on its way to the grille element, said intake stub having a throttle for regulating the air flow through the device, which throttle by means of a link is connected to a crank joined to an inner end of an adjustment screw accessible through the grille element primary openings.

2. A device according to claim 1, said primary air openings being free from closure means and permanently open.

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