

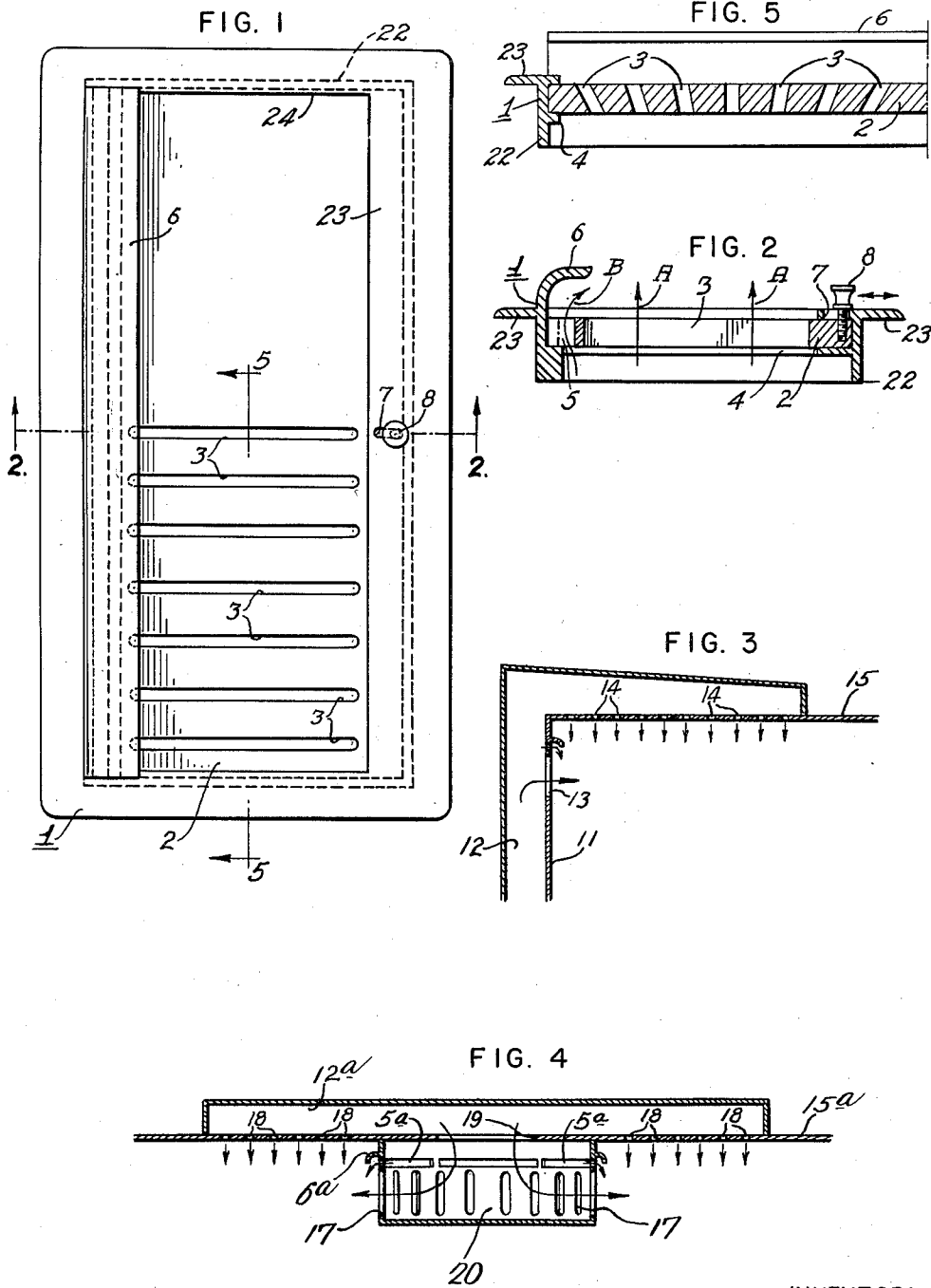
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METHOD FOR INTRODUCING A GASEOUS MEDIUM IN AN ENCLOSURE

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METHOD FOR INTRODUCING A GASEOUS MEDIUM IN AN ENCLOSURE

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5 Claims. (Cl. 98—40)

The present invention relates to a new and improved method for introducing a gaseous medium, preferably air, into an enclosure to be ventilated. The supply of a gaseous medium is one of the most difficult problems of the technical field of ventilating and these difficulties are present in ventilating of enclosures of almost all kinds. Different methods are prior known.

In accordance with one known method the gaseous medium is introduced by means of an element with a number of regularly arranged openings, suitably spaced, whereby an effective mixing of circulating room-air as secondary air is made possible. This method involves that a mixture of fresh air and circulated room-air is introduced into the room or enclosure with great length of throw. According to another method medium is supplied through a perforated ceiling. The disadvantage of such supply of medium through perforated ceilings is that down draft of cold air easily occurs and furthermore it is difficult to supply great quantities of air through a relative small area by this method. The present invention briefly consists in a combination of air introduction through air supply elements, where the air is introduced with a relative high velocity and introduction of a certain quantity of the same medium through one or more adjacent openings in such a direction that a mixing of these two parts of the medium occurs. The advantage of this combination is mainly that great quantities of air can be introduced with a small length of throw, whereby the disadvantage of draft is eliminated when supplying ventilating air. Although the supply of ventilating air to a room is an important field of use the invention is however not limited to such use.

The invention is mainly characterized in that the gaseous medium is introduced into the enclosure partly through a number of openings in a distributing element arranged at the air supply point and partly through one or more openings adjacent to said distributing element, the last-mentioned part of the medium being introduced substantially perpendicular to the direction of the first-mentioned part of the medium and preferably with a low velocity so that a soft introduction of the medium is obtained by the mixing of said two medium parts immediately after that the medium is supplied. The proportion between the quantities of said parts of the medium can in accordance with a suitable performance of the invention be varied.

Another performance of the method according to the invention, wherein the gaseous medium is introduced at the ceiling or at a wall of the enclosure is characterized in that one part of the medium is introduced into the enclosure through a number of openings of a grill-like distributing element and in that the other part of said medium is introduced preferably through an adjacent elongated slot along the ceiling or the wall, the slot having the same extension as said openings or through a row of openings with corresponding length, the two parts of the medium thus being introduced substantially perpendicular to each other. According to a modification of the method wherein the gaseous medium is introduced at the

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ceiling of the enclosure, one part of the medium is introduced into the enclosure substantially parallel to the ceiling through a number of openings in a grill-like distributing element and the other part of the medium through perforations in the adjacent part of the ceiling. According to still another performance of the method the medium introduced through said distributing element is given a fan-shaped diffusion by turning the openings of a distributing element to a corresponding oblique direction.

The invention will now be more closely described with reference to some exemplifying performances of suitable arrangements. In the accompanying drawing

Fig. 1 is a plan view of a distributing element for the introduction of the medium into an enclosure and

Fig. 2 is a cross section of said element along the line 2—2 in Fig. 1.

Fig. 3 illustrates a combination of a grill-like distributing element and perforations in the adjacent part of the ceiling.

Fig. 4 shows an arrangement consisting of a distributing element arranged just below the ceiling and surrounded by perforated parts of the adjacent ceiling area.

Fig. 5 is a cross section of the distributing element along the line 5—5 of Fig. 1.

Referring now to Figs. 1, 2, and 5, the distributing element or grill comprises a frame 1 having side walls 22 and a front plate 23 extending outwardly beyond the side walls 22. The front wall of the frame has an enlarged central opening 24 therein, the side walls of which are spaced inwardly from the side walls 22 of the frame 1. A flange 4 extends inwardly of the side walls 22 in spaced relation to the front wall 23. A front plate 2, in the present instance of substantial thickness, is mounted in the frame 1 between the flange 4 and the front wall as shown in Figs. 2 and 5. The front plate 2 is mounted for transverse sliding movement within the frame and is smaller in width than the opening 24 in the front wall 23. The front plate 2 is provided with a number of parallel transverse slots 3 for introducing jets of air into an enclosure. As shown in Fig. 2, the reduced width of the front plate 2, when the plate is in its right hand limit position, as shown in Fig. 2, provides a passageway or longitudinal slot 5 through which air can pass into the enclosure, the passageway 5 being perpendicular to the slots 3. The transverse slots 3 are preferably disposed obliquely as shown in Fig. 5 to effect a fan-shaped diffusion of the air jets introduced into the enclosure through the slots 3. The size of this passageway 5 can be varied by moving the plate and its position can be fixed for instance by tightening of a screw 8, which freely passes an elongated aperture 7 in the frame. The direction of the air through the distributing element is illustrated by the arrows A and B, of which A designates the main current of the medium through the opening of the grill plate and B the shunt current through the slot 5. In order to cause an immediate mixing of these medium currents the distributing element is suitably provided with a deflecting flange 6, giving the medium current through the slot 5 a direction substantially perpendicular to the medium current passing through the openings of the grill.

In Fig. 3 the designations 11 and 15 stand for one wall and the ceiling, respectively, of the enclosure, into which a gaseous medium, preferably air is to be introduced in accordance with the invention. The medium is supplied through the duct 12 and is introduced into the room or enclosure partly through an opening 13, arranged in the wall 11 and partly through a grill or series of openings in the ceiling 15 adjacent to the wall opening 13. This construction provides the same type of air diffusion as the construction Figs. 1 and 2. The wall opening 13 may be provided with a standard grill, or as shown in Fig. 3

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schematically, with a grill made in accordance with the construction shown in Figs. 1, 2, and 5.

In Fig. 4, 15a designates the ceiling of an enclosure and 12a stands for a duct for the medium (ventilating air) to be introduced into the enclosure, said duct being arranged above the ceiling. Said duct communicates partly through the opening 19 with a distributing means 20 which projects downwardly into the enclosure. A portion of the gaseous medium passes outwardly into the room or enclosure through the perforations 18 arranged in the ceiling adjacent to the distributing means 20. The distributing means 20 may either be of circular shape with radial openings 17 or it may consist of a rectangular duct extending along the ceiling, in which case the openings 17 are positioned along the two vertical sides of the duct. A portion of the gaseous medium is directed horizontally outward through the opening 17 to mix with the medium passing vertically downward through the opening 18. In the first case the distributing means may be provided with slots 5a above the openings 17 for one part of the medium current and deflecting flanges 6a for the guiding of said medium current in the same manner as is illustrated in Figs. 1 and 2.

What I claim:

1. In a method for introducing a gaseous medium into an enclosure, the steps which comprise supplying a medium having a given condition to at least one area of introduction into the enclosure, dividing the medium supplied into two portions at each area of introduction, directing one portion of said medium into the enclosure in one direction in a plurality of jet streams at a relatively high velocity, and interrupting said jet streams by directing the second portion of said medium into the enclosure adjacent the entrance of said jet streams in a direction at right angles to said jet streams across said area at a relatively lower velocity than said jet streams, said second portion being formed as a medium-curtain stream coextensive with the area of introduction to thereby intermix the curtain

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stream with all of said jet streams and prevent creation of drafts in the enclosure.

2. The method according to claim 1, including the step of varying the ratio between the quantities of the medium in the jet streams and the curtain stream.

3. The method according to claim 1, wherein the said jet streams are directed horizontally into the enclosure along the ceiling of the enclosure and the curtain stream is directed vertically downward into the enclosure from an adjacent part of said ceiling.

4. Grill structure for introducing air and like gaseous medium into an enclosure comprising a rectangular frame having an opening therein for passing said air, a front plate covering said opening, a plurality of transverse slots in said front plate for introducing jets of the air there-through into the enclosure, a longitudinal slot along one edge of the frame coextensive with and at right angles to said transverse slots, a deflector mounted adjacent the remote edge of said longitudinal slot extending outwardly from said front plate and overlying said slot to direct the air passing through said longitudinal slot transversely across said front plate to intermix with the air introduced through said transverse slots, and means in said grill structure to throttle the medium flow through said longitudinal slot.

5. Grill structure according to claim 4 wherein said transverse slots are disposed obliquely to effect a fan-shaped diffusion of said jets introduced therethrough.

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