

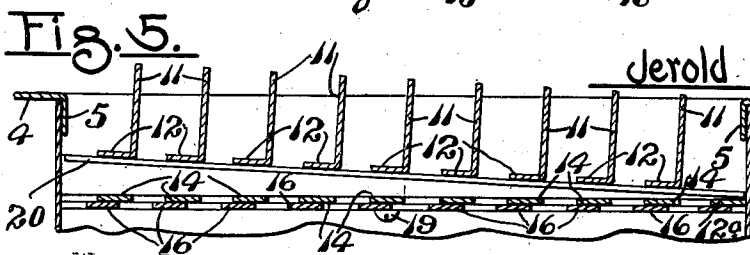
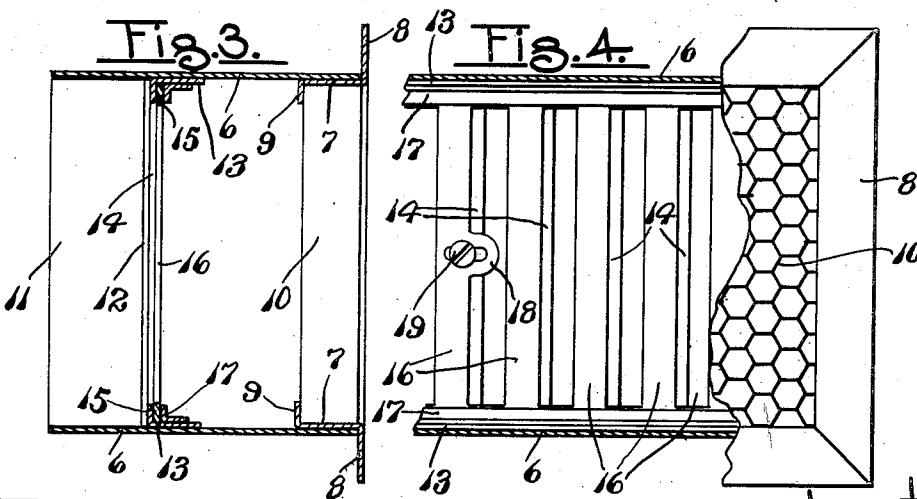
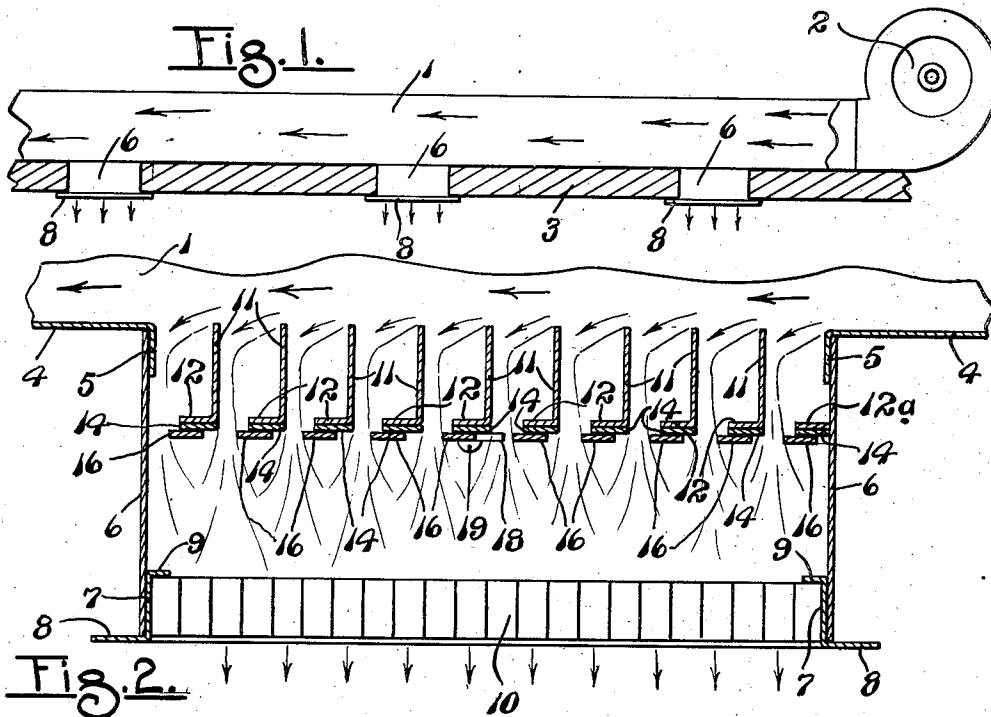
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AIR OUTLET AND CURRENT EQUALIZER

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AIR OUTLET AND CURRENT EQUALIZER

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5 Claims. (Cl. 98—101)

This invention relates to air distribution and particularly to a novel structure whereby air may be controlled as to its entrance and distribution into a room, railway car or the like, the air being initially forced through an elongated conduit and under active pressure which imparts velocity thereto. It is necessary to have outlets to the conduit which extend through a ceiling or wall of a room or roof of a car and to mount within a very limited distance an air controlling and disseminating outlet so that the air coming into the outlet from the conduit with considerable velocity will leave the same with a uniform low velocity and not produce objectionable drafts.

My invention for the attainment of the objects stated may be understood from the following description, taken in connection with the accompanying drawing, in which,

Fig. 1 is a fragmentary elevation illustrating the air conduit above the ceiling of a room or railway car or the like and with a plurality of outlets in spaced apart relation to each other from the conduit through said ceiling.

Fig. 2 is a fragmentary enlarged vertical section taken through one of said outlets.

Fig. 3 is a section, somewhat similar to Fig. 2 and at right angles thereto, illustrating the manner in which the control damper is mounted.

Fig. 4 is a fragmentary underplan and sectional view of one of said outlets, and

Fig. 5 is a fragmentary section similar to Fig. 2 showing a modification in structure.

Like reference characters refer to like parts in the different figures of the drawing.

The air which is to be disseminated with substantial evenness and uniformity in a room is carried through an elongated conduit 1, it being forced through the conduit in the direction indicated by the arrows by a suitable blower 2. Such air carrying conduit is located above the ceiling 3 of a room, railway car or the like.

At a plurality of selected spaced apart points in the length of the conduit the under side 4 thereof is provided with openings, the metal being bent downwardly in a vertical direction to make flanges 5 surrounding each of said openings. An outlet casing 6 of sheet metal surrounds said flanges 5 and extends vertically downwardly through the ceiling 3 and at its lower end is equipped with an open frame, preferably of Z-bar construction, including a vertical web 7, an outwardly extending horizontal flange 8 at the lower end of the sides of the casing 6, and an inwardly extending flange 9 located above said lower end of the casing 6 and within the same. A suitable grille 10 is lo-

cated within the frame made by the webs 7 of the frame members. This grille is shown as of conventional form having straight passages therethrough but it is, of course, to be understood that a grille having directional structure for deflecting the air in its passage therethrough to other directions than the straight vertical direction may be used, such directional grilles not being novel and being adapted for use at the ends of casings through which air passes.

In the upper end of the casing 6 a plurality of spaced apart parallel vertical vanes 11 of thin sheet metal are mounted, being disposed transverse to the direction in which the air in the conduit 1 is passing, as shown in Fig. 2. The lower end of each vane 11 preferably has a horizontal flange or leg 12 turned at right angles so as to narrow the space through which air entering from the conduit 1 between any two vanes 11 may pass therefrom at their lower portions. A bar 12a having the same purpose as a flange 12 extends inwardly from one side of the casing 6.

Underneath the flanges or legs 12 described a parallel bar grating is mounted, made from a plate of sheet metal which at opposite sides is turned at right angles to provide attaching flanges 13 adapted to be secured to opposing sides of the casing 6, the plate between said attaching members being stamped and cut to provide a plurality of spaced apart parallel bars 14 one of which lies underneath each flange 12 and the bar 12a. Directly underneath said grating a second and movable parallel bar grating is positioned made from a plate of sheet metal so as to provide opposite edge portions 15 and spaced apart parallel bars 16 integral therewith and extending between the same. The movable second grating is mounted for a lateral adjustment so that the bars 16 may be moved with respect to the bars 14 and thus adjustably vary the distance between the edges of said bars 16 and the next adjacent vanes 11 or the side of the casing 6 as shown in Fig. 2. Retaining angles 17 secured by spot welding or otherwise to the members 13 serve as supports and guide members for the movable grating. One of the bars 16 (see Fig. 4) is provided with an ear 18 slotted at right angles to the length of the bar 16 through which a screw 19 passes to thread into a bar 14 above. With this structure the movable grating may be adjusted to different positions to restrict or enlarge the areas through which the air passes.

It will be noted that the vanes 11 and the movable bar grating which controls the effective area through which the air can pass are located

in the upper part of the casing 6 whereby in the lower part of the casing above the grille 10 is an unobstructed chamber to which the air is delivered and in which the velocity of the air is greatly reduced and the air uniformly distributed throughout the chamber so that it leaves the same and passes through the grille 10 at low velocity and with substantial uniformity.

The conduit 1 may be relatively long and the velocity of the air at different portions in the length of the conduit vary greatly. Where the velocity is high there will be a tendency for the air to pass over the upper edges of the vanes 11 more than where the air velocity in the conduit is less. Therefore, at points farther away from the blower 2 the movable air controlling grating may require adjustment to diminish the quantity of air which will be permitted to pass so as to build up a proper pressure at points between the same and the blower such that a substantially equal amount of air will enter all of the outlet casings 6 and pass through the air controlling mechanism described, enter the mixing chamber below and leave all of the outlets in substantially equal volume and at a uniform low velocity.

In Fig. 5 I have shown the vanes 11 with the flanges 12 thereof mounted at their lower ends on an inclined support 20 so that from one end of a conduit casing 6 to the other there is a projection of the upper parts of said vanes into the conduit 1 which projection progressively decreases from one end to the other. As thus projected into the air which is being blown or forced through the conduit 1 they serve to stop and deflect air downwardly between the vanes. The control of the quantity of air passing into the mixing or velocity decreasing chamber is by the same fixed and movable bar gratings which provide in effect a damper control for air passage.

The construction described is of a very practical yet simple character. With it, in a space in which the length of the outlet casing 6 may not exceed three inches, a proper control to decrease air velocity and provide uniform low velocity outlet of air from a conduit through which the air is forced at relatively high velocity is very effectively attained. The invention has proved very practical and useful in commercial practice. The claims appended hereto define the invention which is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In apparatus of the class described, an elongated air conduit having an outlet in a side thereof, an outlet casing for said outlet, a plurality

of vanes located in spaced apart relation transversely to the length of the conduit in said casing at the end thereof adjacent the conduit, an air passing grille in the outer end of said casing, an expansion chamber between the grille and vanes, and adjustable means, in said casing between the expansion chamber and said vanes for restricting the passage of air from said conduit between said vanes to the expansion chamber, as and for the purposes described.

2. In apparatus of the class described, an elongated conduit through which air is adapted to be forced at relatively high velocity, said conduit having an air passing opening in its under side, a vertical outlet casing associated with and around said opening, an air passing grille in the lower end of each casing, a plurality of spaced apart vanes in the upper portion of said casing disposed transversely to the length of the conduit and at its lower end having a laterally extending flange thereby forming a restricted area for passage of air from the conduit through said vanes to below the vanes and above the grille whereby the amount of air passing through said restricted area is reduced, as specified.

3. A construction containing the elements in combination defined in claim 2 combined with a grille adjustably mounted below said flanges, said grille having spaced apart bars adapted to be located one below each of said flanges or moved laterally to further restrict the passage of air, and means for adjusting said grille in its casing.

4. In apparatus of the class described, an elongated horizontal conduit for carrying air forced therethrough located at the outer side of a ceiling of a room, said conduit having a plurality of spaced apart openings in the side thereof adjacent said ceiling, an outlet casing open at both ends surrounding each of said openings and extending through the ceiling, a plurality of spaced apart parallel vanes located in each of said casings in the end thereof adjacent the conduit and transversely to the length of said conduit, said vanes extending outwardly less than one-half the length of the casing, and means at the outer ends of said vanes for adjustably and selectively reducing the areas of passage for air from said conduit between the vanes, whereby the velocity of the air after passage through said vanes is lowered.

5. A construction containing the elements in combination defined in claim 4, combined with means for releasing said adjustable means for adjustment and for securing the same in any position to which adjusted.

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