

Jan. 27, 1953

L. G. DAVIES

2,626,556

AIR DISTRIBUTOR

Filed May 15, 1950

2 SHEETS—SHEET 1

FIG. 1.

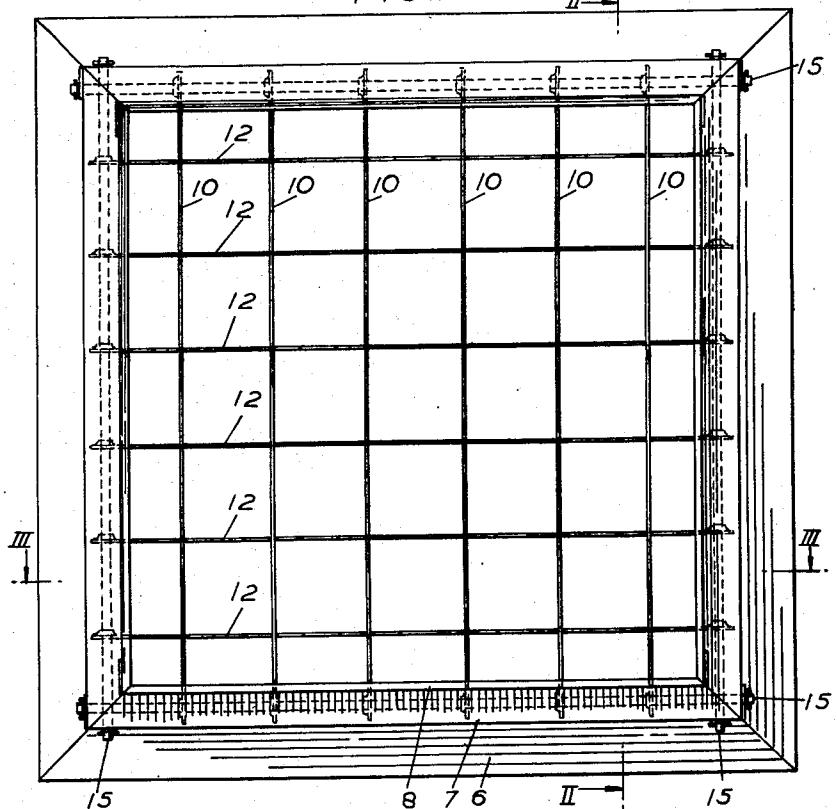


FIG. 4.

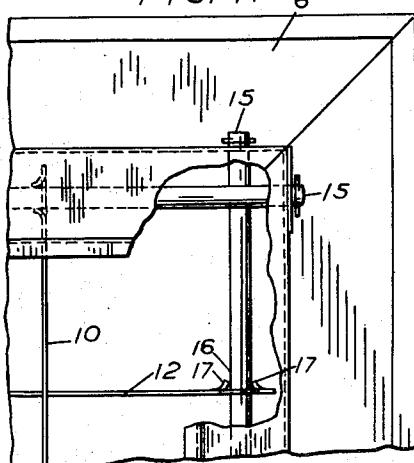
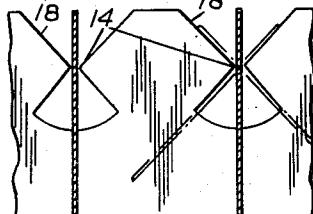


FIG. 5.



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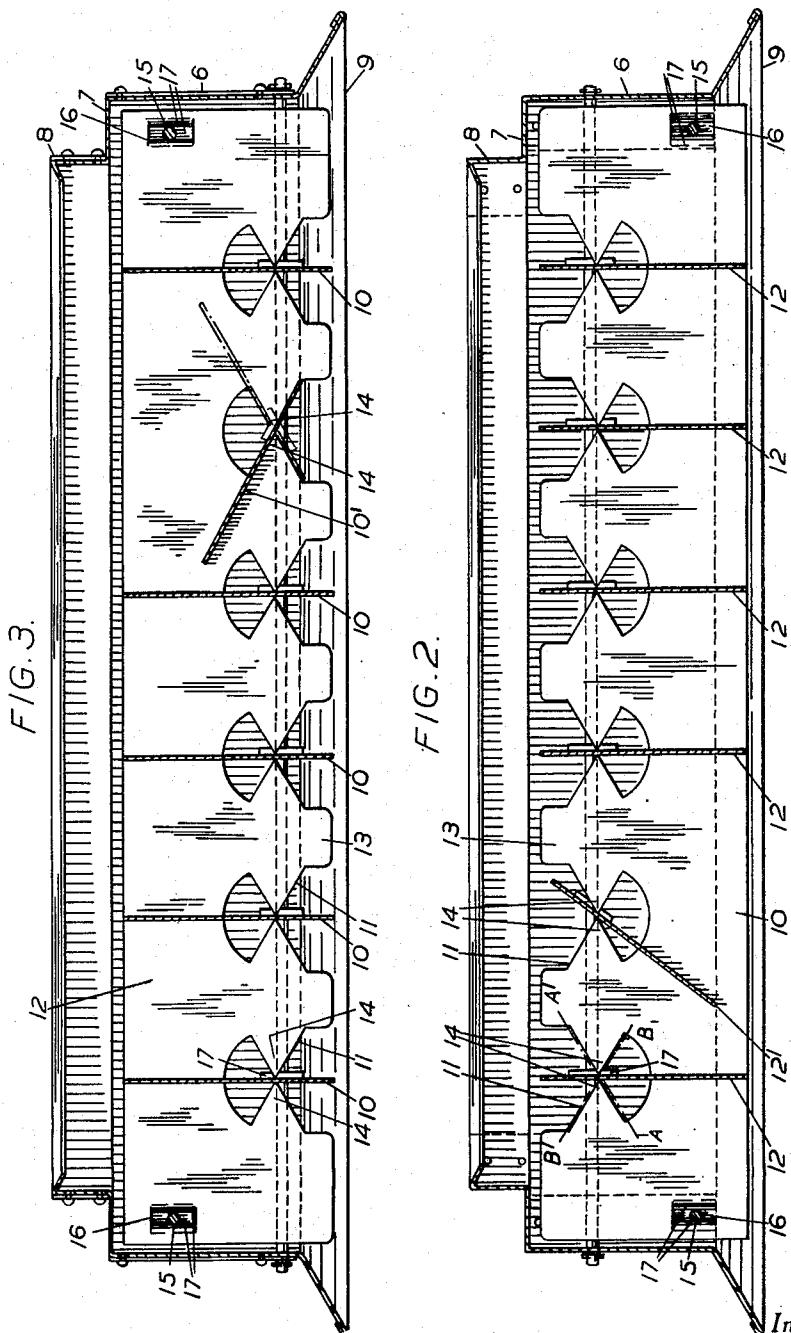
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2 SHEETS—SHEET 2



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## UNITED STATES PATENT OFFICE

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## AIR DISTRIBUTOR

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3 Claims. (Cl. 98—40)

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This invention relates to air distributing devices for directing, diffusing or spreading an air stream, for example, where it issues from the air duct of a ventilation or air conditioning system.

The main object of the invention is to provide a construction of such a device which enables the air stream passing through it to be directed in any desired direction, or to be divided into a number of different directions.

A further object is to provide a construction in accordance with the preceding object, embodying two intersecting sets of louvers in which each louver of either or both sets can be turned, independently of the others, to either side of its central position for deflecting the air passing over it and through the device accordingly.

The invention is illustrated in the accompanying drawings of which:

Figure 1 is a front elevation of a device for fitting over the end of a ventilation duct;

Figure 2 is a section on the line II—II of Figure 1 on an enlarged scale;

Figure 3 is a section on the line III—III of Figure 1 on an enlarged scale;

Figure 4 is an enlarged detail of Figure 1, and

Figure 5 shows an alternative form of slot for the louvers.

In the drawings, the louvers are assembled into a rectangular housing 6 of sheet metal construction. One side of the housing 6 has a shoulder 7 and lip 8 around its periphery by which the housing may be fastened in the end of an air duct, while the other side of the housing has an outwardly splayed mouth 9.

A number of louvers are fitted into the opening of the housing 6, half of the louvers being arranged vertically in Figure 1 and marked 10, and having a number of equally spaced notches 11 in each facing to the rear, while the remaining louvers 12 are arranged horizontally in Figure 1, 40 with their notches 11 facing the front.

Both the vertical and horizontal louvers 10 and 12 are similar, and since their notches 11 extend to approximately half the depth of the louvers, the two sets can be assembled by sliding them together until the ends of the notches 11 at each intersection meet. For convenience in manufacture the notches 11 in the louvers are actually stamped out, but their form is of double wedge shape and is, in effect, derived from two cross cuts on the lines AA' and BB', Figure 2 having an included angle of about 120°. The width of these cross cuts is approximately equal to the thickness of the metal used for the louvers, so as to leave a gap at their intersection of slightly more than

the gauge of the louver plates. The material of the louvers between the cross-cuts is removed on the inner sides of the cross-cut intersections in the form of circular segments, and on the outer sides by transverse cuts to the edges of the louvers leaving tongues 13 between each notch 11 and the next. From the two sides of each notch 11 the material of the louvers converges inwardly about midway of the depth of the notch and then diverges to a wide base of the notch to form oppositely facing points 14 which together act effectively as loose pivots for the solid section of the intersecting louvers beyond the corresponding notches.

When, for example, the vertical louvers of Figure 1 are central, the horizontal louvers intersecting them, such as 12', Figure 2 can be turned one way or the other on the points 14 of the vertical louvers, within the limits imposed by the included angle of the cross-cuts AA' and BB'. The pivot points 14 of the horizontal louvers 12 accordingly turn through an arc about the pivot points 14 of the vertical louvers 10. Thus, if all the horizontal louvers 12 are turned through the same angle, the pivot points in them remain coplanar so that all the vertical louvers 10 can be turned freely from their central positions; but if the horizontal louvers 12 are turned unequally, the pivot points 14 in them for the vertical louvers 10 will not be co-planar, but the gap between the points 14 is made large enough to allow for this so that no undue stiffness is experienced in turning individual louvers of the two sets through unequal angles. It is necessary to provide some clearance between the edges of the louvers 10 and 12 and the tongues 13, so that these edges and the tongues may not interfere to prevent both sets of louvers from being turned through substantial angles from their central positions.

When using thin material for the louvers some stiffness is generally desirable, nevertheless, so that the louvers will remain in the position into which they are set, and in constructing the device the thickness of the metal louvers, and the clearance in the notches amongst other factors are chosen to give the requisite flexibility and resistance to displacement.

For mounting the assembly of the louvers 10 and 12 in the housing 6 a pair of parallel rods 15 is used for each set of louvers, these rods being situated close to the sides of the housing 6 with their ends secured in opposite walls of the housing. The louvers 10 and 12 are formed with parallel sided locating slots 16 through which the rods 15 pass. The metal punched out to form

the notches 16 is bent over to form ears 17 which frictionally engage the rods 15 on opposite sides. The rods thus locate the louvers, 10 and 12 in the housing 6 while their position in relation to the pivotal axis of each louver is chosen to give the requisite friction for holding the louvers in the position in which they are set. The louvers can be turned to direct an air stream wholly in one direction, or by independent settling of different louvers, such as 12' and 10', the air stream can be split up as desired. Alternatively, the louvers can be outwardly splayed with the ones at the edge at the greater angle so as to act as a diffuser.

In cases where the maximum angle of inclination given by the notches 11 in Figures 2 and 3 is not required, a simpler form of notch such as that shown at 18 in Figure 5 may be formed having an included angle of about 90°.

The invention is not limited to the particular mounting of louvers, using the rods 15 as described, and in the other cases the assembly of louvers can be held in the housing by flanges, or by wires or resilient strips of material, fixed across the faces of the louvers.

In the example given, a square shaped air distributing device has been described in which the two sets of louvers are identical. In other cases, however, the device may be rectangular and have one set of louvers more closely spaced than the other set.

Owing to their versatility of control, the air distributing devices are particularly suitable for installation in industrial premises having hot process plant, where each device can be adjusted to direct fresh air over one or more zones for the comfort of the plant operators.

I claim:

1. An air distributing device comprising a housing, one set of parallel louvers mounted in said housing, each of said louvers having a series of transverse notches formed along one edge thereof, a second set of parallel notched louvers mounted in said housing and intersecting said first set of louvers, said second set of louvers lying in the notches of said first set, and said first set lying in the notches of said second set, and the notches of both of said sets having the shape wherein the sides of each notch converge inwardly from the edge of the louver towards oppositely disposed median points spaced from each

other a distance sufficient to admit an intersecting louver and thereafter diverge towards a wide base of the notch, the said points forming pivots for the longitudinally continuous section of the intersecting louver beyond the corresponding notch in said intersecting louver so as to render each louver pivotally adjustable, independently of the others, for deflecting the air passing over it and through the device accordingly.

10 2. An air distributing device as claimed in claim 1, wherein means for mounting the louvers in said housing comprises rods, one disposed adjacent each side of said housing with its ends secured in opposite sides of the housing, and 15 flanged apertures formed in opposite ends of each said louvers, the flanges of said apertures being adapted to bear frictionally against opposite sides of said rods passing through said apertures.

20 3. An air distributing assembly for use in air ducts comprising two cooperating intersecting sets of louvers, each transversely notched along one edge, the notches in the louvers having the shape wherein the sides of each notch converge inwardly from the edge of the louver towards oppositely disposed median points spaced from each other a distance sufficient to admit an intersecting louver of the cooperating set and thereafter diverge towards a wide base of the notch, and said oppositely disposed points forming 25 pivotal supports for the longitudinally continuous section of the intersecting louver beyond the corresponding notch in said intersecting louver, which pivotal supports constrain each louver to independent pivotal movement within 30 the limits determined by the angle between the sides of the notch.

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