

Dec. 11, 1962

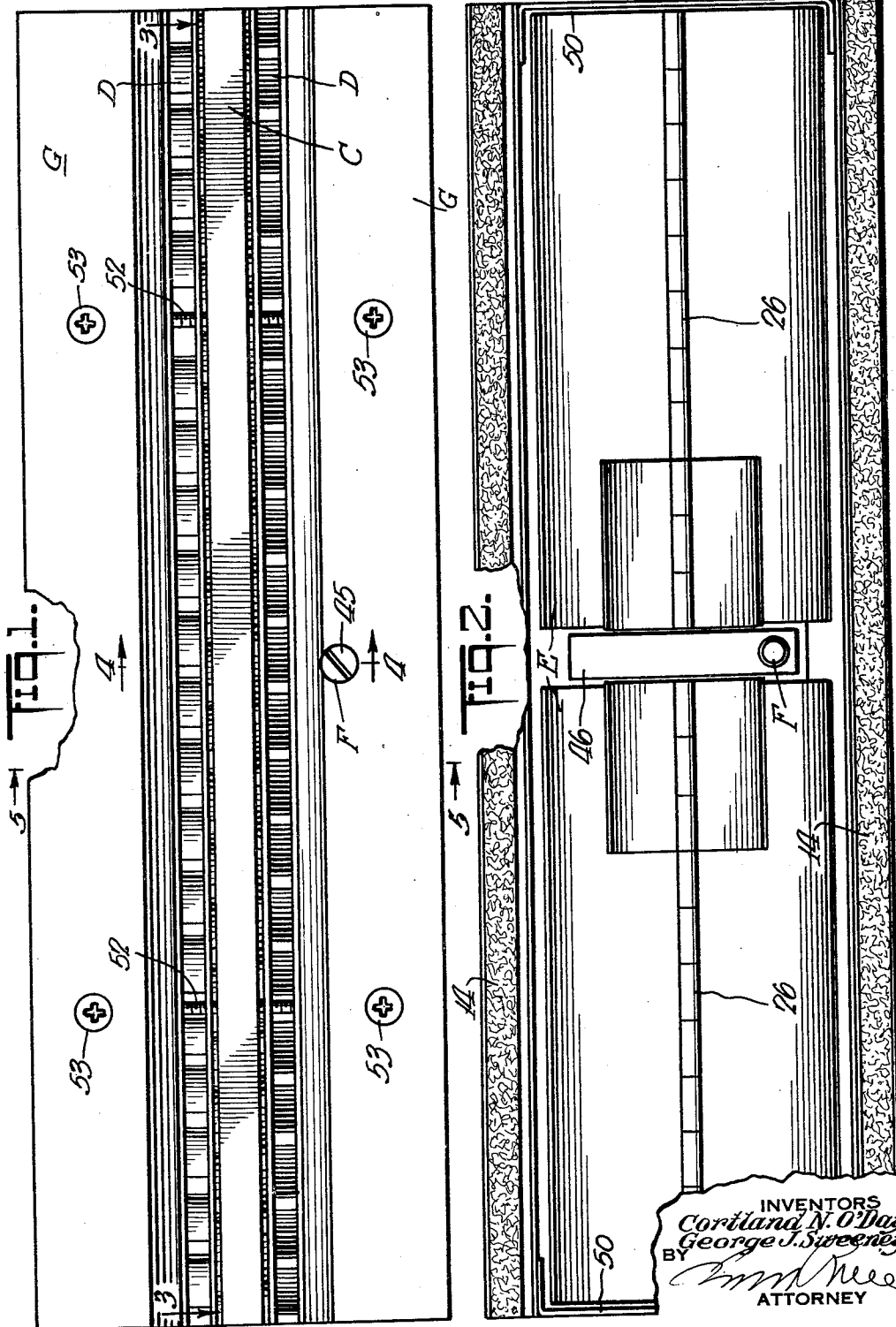
C. N. O'DAY ETAL

3,067,669

AIR DIFFUSER

Filed July 8, 1958

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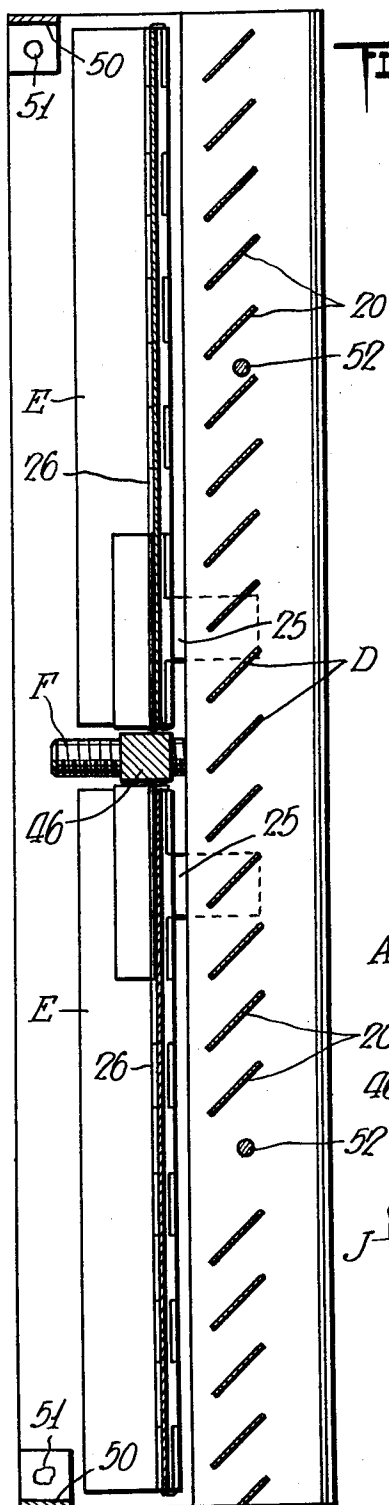


FIG. 3.

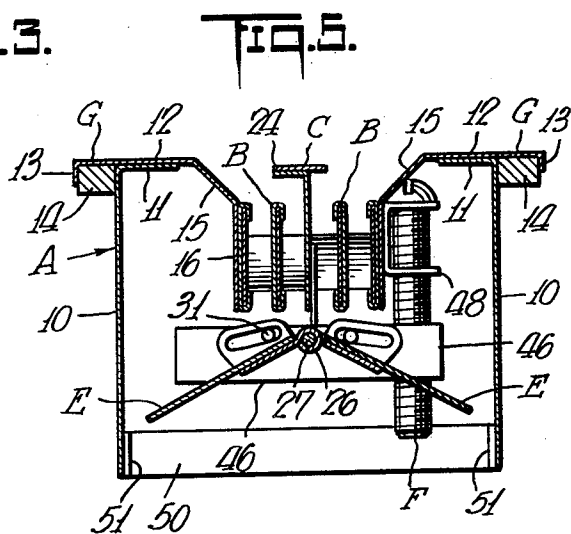


FIG. 5.

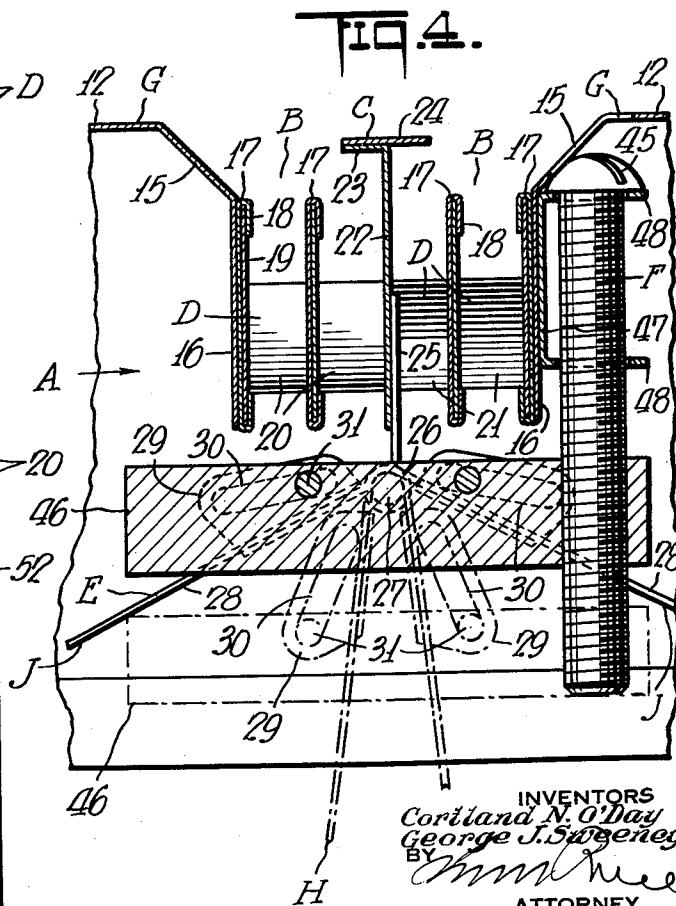


FIG. 4.

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3,067,669

AIR DIFFUSER

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5 Claims. (Cl. 98—40)

The present invention relates to an air diffuser, and it particularly relates to a diffuser designed for controllably feeding fresh or conditioned air into an enclosure parallel or perpendicular to the walls or ceilings.

A particular object of the present invention resides in the position of an air diffuser which may be positioned along the wall or ceiling, and particularly adjacent walls or junctions of walls or ceilings, or even upon windowsills or adjacent door frames or window frames, which will give a predetermined ventilating, air conditioned air distribution pattern for the entire area of the room, office or other enclosure.

A further object of the present invention is to provide a novel air diffuser system in which a desired degree of turbulence will be achieved at the point of discharge with mixing of the primary and room air, and with turbulent air distribution from any location and without occupying an undue amount of wall or ceiling space.

A further object is to provide a diffuser which will give an air pattern control enabling more ready adaptation to present architectural and engineering designs without the need of central locations and without difficulty of placement because of intervening beams or other obstructions, whether space to be ventilated or conditioned has low or high ceilings, low, narrow or wide corridors, or whether it is square, rectangular or T-shaped.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects, according to one embodiment of the present invention the diffuser structure is arranged in an elongated frame, having separated elongated passageways which discharge air into a space over an elongated yet narrow area.

In the preferred form of the invention, there are at least two, four or a greater plurality of elongated passageways which may have individual oblique vanes parallel to one another or passing each other on the same or opposite sides of a central partition so as to give the desired amount of turbulence.

In addition, to the rear of the arrangement there is provided an adjustable damper construction which will enable control of the air which flows outwardly through the elongated channels.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is a front elevational view of an elongated air diffuser construction, according to the present invention.

FIG. 2 is a rear elevational view of the elongated construction of FIG. 1.

FIG. 3 is a vertical longitudinal sectional view upon the line 3—3 of FIG. 1.

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FIG. 4 is a transverse sectional view upon the line 4—4 of FIG. 1, upon an enlarged scale as compared to FIG. 1.

FIG. 5 is a transverse vertical sectional view upon the line 5—5 of FIG. 1.

Referring to FIGS. 4 and 5, there is shown a frame A having separated channels B with an intervening central partition C.

These channels B are provided with the oblique vanes D and with a rearwardly positioned damper construction E. The damper is provided with an adjustment construction F accessible from the front of the device. The arrangement is provided with the facing flanges G.

Referring particularly to FIGS. 4 and 5, the frame structure A is formed of the side plates 10 having in-turned flanges 11 which carry the face plates 12.

These face plates 12 are provided with edge flanges 13 which grasp the rubber sealing strips 14. The face plates 12 have the inclined, inwardly directed positions 15 which have the inwardly and downwardly directed side plates 16. These plates separate the channel members 17 which have in-turned ends at 18 to receive the plates 19 which carry the oblique elements D.

As shown in FIG. 4, all the vanes or directors 20 on the left side of FIG. 4 incline upwardly away from the observer, while those on the right side of the central partition C, as indicated at 21, incline toward the observer.

Referring to FIG. 3, the vanes 20 are shown, and it will be noted that they all incline upwardly, away from the observer when in position of FIG. 4.

The central partition C has a main plate element 22 with a flange 23 which carries the elongated separating plate member 24.

This plate member 24 extends substantially over the inside channels D, leaving the outside channels D uncovered so that the air flowing within the channels D close to the wall or partition C will be caused to flow upwardly and conflict with the flowing through the through channels D away from the central partition C.

The central plate 22 also carries the plate 25 which in turn extends downwardly and carries the hinge connection 26. The hinge connection 26 receives the hinge rod 27 on which are hinged the opposite vane elements 28, forming part of the damper.

The opposite vane elements 28 are provided with the side flanges 29 which have the slots 30.

These slots 30 receive the pins or studs 31, which ride to the outer end of the slots 29 when the vanes are in the dot and dash line position H of FIG. 4 and ride toward the inner end of the slots when the vanes are closer to the full damping position J in FIG. 4.

This is accomplished by means of the threaded bolt F. The threaded bolt F has a fillister or slotted head 45 which is accessible from the outside of the device, as shown in FIG. 1. The screw F, upon being turned, will lift or lower the bar 46 which carries these studs 31, causing the damper leaves to move from open to damping position. (See FIGS. 4 and 5.)

It will be noted that the bolt is carried in the U-shaped bracket 47, which has the legs or flanges 48. Upon turning the screw F which is threaded through the block 46 (see FIG. 4), the block 46 will be moved toward or away from the front of the diffuser and the studs 31 which move with the block will move the vanes E.

The cross bracket 50 has the end tabs or flanges 51 which space the walls 10 apart.

The through bolts 52 hold the structure A together, whereas the face bolts 53 (see FIG. 1) enable ready mounting of the structure upon a wall or ceiling.

The pads 14 will give an airtight seal and prevent leakage of air and streaking of the walls.

The damper arrangement J will enable ready control of the flow of air through the passages D, while the in-

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clination of the vanes, as indicated at 20 and 21, together with the position of the central transverse plate 24, will control the amount of distribution and turbulence.

The diffuser construction as shown will give a predetermined air distribution pattern and will enable the diffuser to be positioned adjacent the junction of ceilings and walls in and about window frames or doors to give a predetermined desired air distribution pattern.

As many changes could be made in the above air diffuser, and many widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. An elongated rectangular air diffuser for a wall having an interior conduit system accessible through an opening in the wall, said diffuser having a front and a rear, said front being above said opening and said rear being within said opening, comprising elongated rectangular frame side plates extending into said opening and positioned against the wall along the sides of said opening, flange members extending outwardly from said frame side plates in airtight engagement with said wall, a well between said frame side plates, said well formed by inclined, inwardly-directed well face plates extending rearwardly into said opening from said flange members and terminating in rearwardly extending side well plates parallel with, and spaced from, said frame side plates, a plurality of vertical passageways in said well formed by at least two vertical side partitions and a vertical central partition spaced between said side partitions, said central partition having a top and bottom extending vertically above and below said side partitions and said well side plates, a horizontal obstruction plate fixed to the top of said central partition and extending on both sides of

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said central partition to cover a portion of the space between the side partitions and the central partition, a plurality of side oblique vane members separating said side well plates and said side partitions, and a plurality of central oblique vane members separating said side partitions and said central partition.

2. An air diffuser in accordance with claim 1 wherein said side and central oblique vanes on one side of said central partition are inclined in a direction approximately 90° out of phase with said side and central oblique vanes on the other side of said central partition.

3. An air diffuser in accordance with claim 1 comprising further a damper hingedly mounted on the bottom of said central partition and having swinging vanes extending the length of the rear of said diffuser, and means accessible from the front of said diffuser to adjust the position of said swinging vanes.

4. An air diffuser in accordance with claim 1 comprising further a damper hingedly mounted on the bottom of said central partition and having swinging vanes extending the length of the rear of said diffuser, slotted members attached to each of said swinging vanes, a reciprocable block having studs fitting in said slotted members, and means, accessible from the front of said diffuser, to reciprocate said block whereby said studs will ride in said slots to open and close said swinging vanes.

5. An air diffuser in accordance with claim 4 wherein said means is a screw.

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