Oct. 10, 1950 R. N. TRANE 2,525,157

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Filed Jan. 5, 1946 3 Sheets-Sheet 1

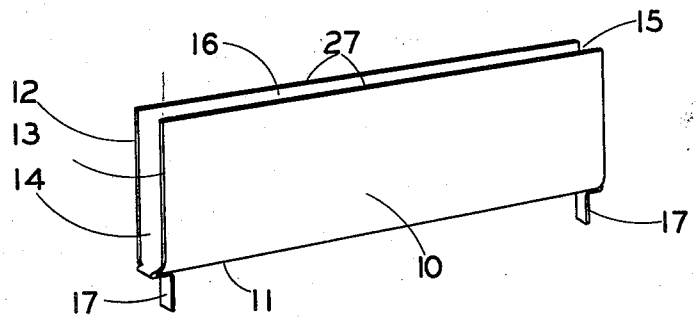


Fig. 1

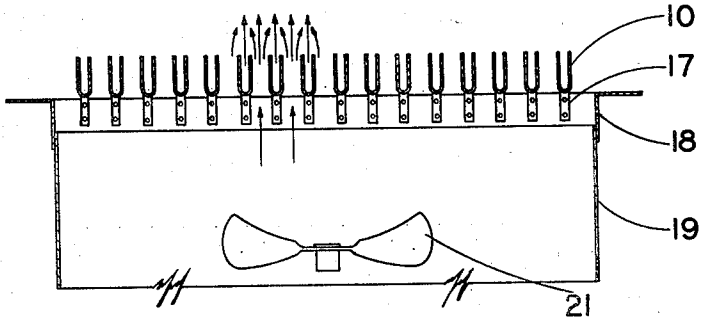


Fig. 2

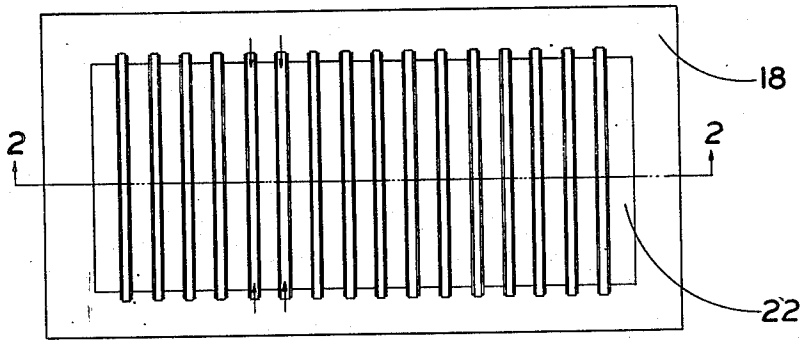


Fig. 3

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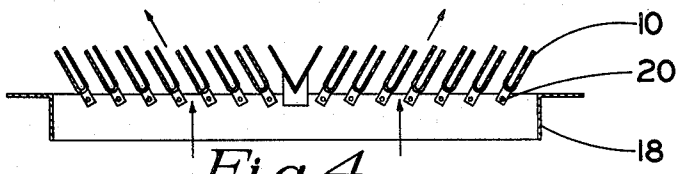


Fig. 4

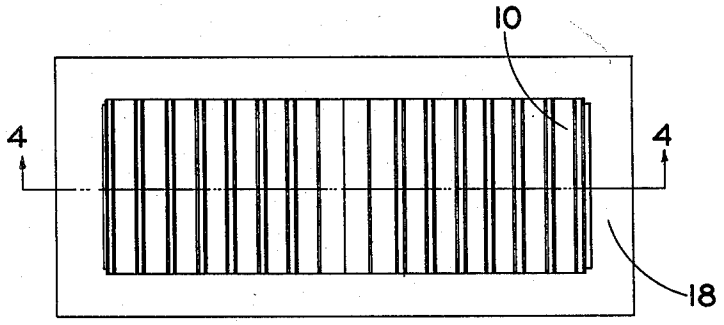


Fig. 5

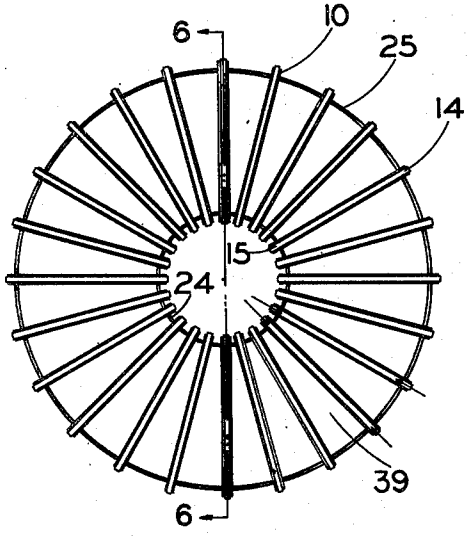


Fig. 7

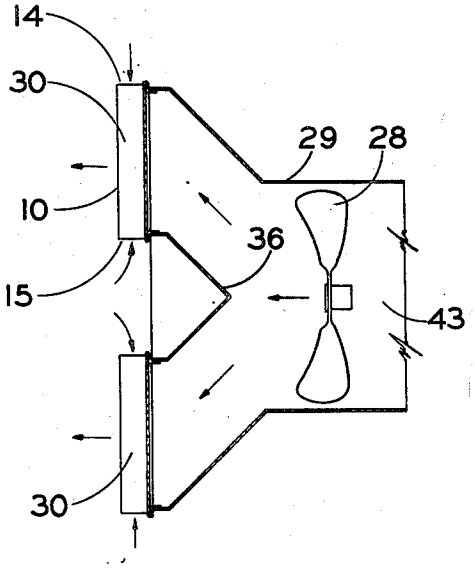


Fig. 6

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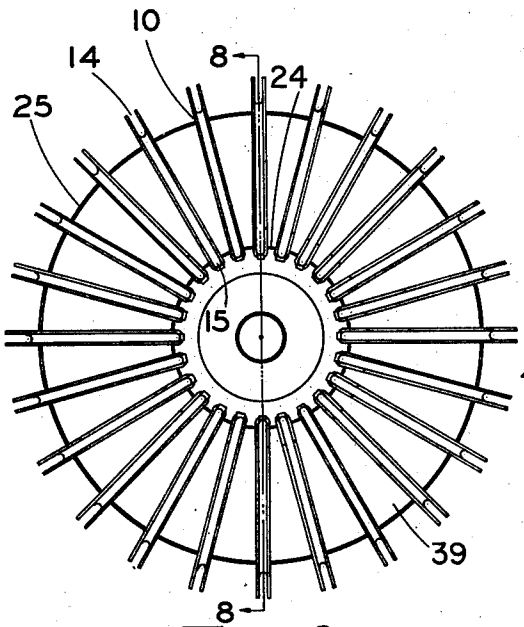


Fig. 9

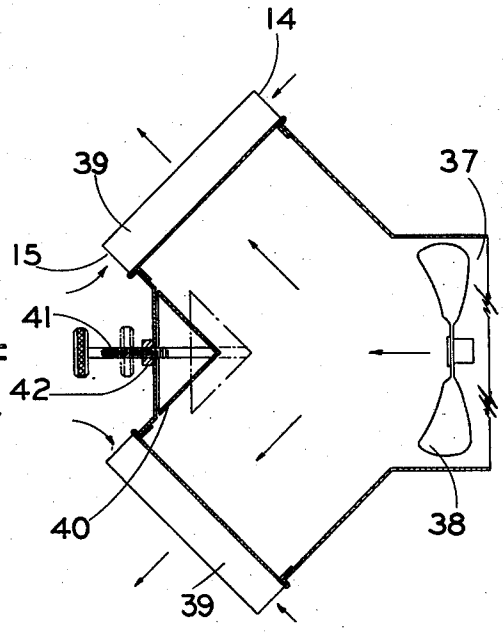


Fig. 8

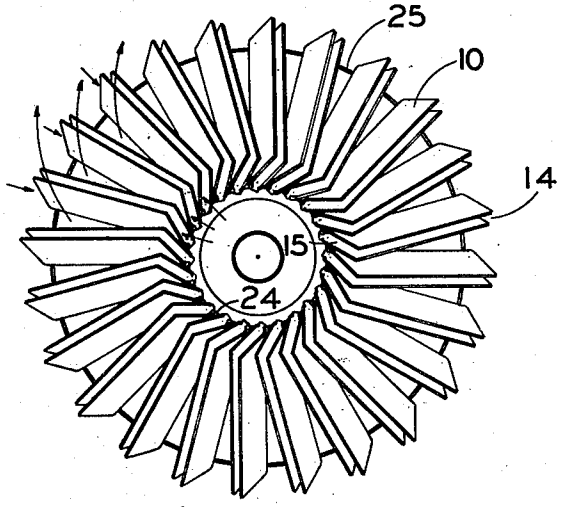


Fig. 10

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UNITED STATES PATENT OFFICE

2,525,157

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Application January 5, 1946, Serial No. 639,472

3 Claims. (Cl. 98—40)

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This invention relates to air distributors.

One of the objects of my invention is to make an air distributor which will distribute primary air and induce a maximum amount of secondary air with means to change the directional flow of the primary air.

Another object of my invention is an air distributor which will take a small stream of primary air at either high temperature for heating or low temperature for cooling, and combine this stream of air with a maximum amount of secondary air for the purpose of moderating the temperature of the primary air and thereby avoid draft.

Another object of my invention is to combine the maximum induction of secondary air with means to change the flow of the combined stream to avoid drafts.

The foregoing and many other specific features of my invention are set forth in the following specification, where I describe what I consider the preferred embodiments of my invention. These are illustrated in the accompanying drawings where—

Figure 1 is an isometric view of the U-shaped member.

Figure 2 is a sectional view of Figure 3 taken on the lines 2—2 of Figure 3.

Figure 3 is a plan view of the diffuser.

Figure 4 is a sectional view taken on the lines 4—4 of Figure 5.

Figure 5 is a plan view of a diffuser.

Figure 6 is a sectional view of Figure 7 taken on the lines 6—6 of Figure 7.

Figure 7 is a plan view of a circular diffuser.

Figure 8 is a sectional view of Figure 9 taken on the lines 8—8 of Figure 9.

Figure 9 is a plan view of a cone-shape diffuser.

Figure 10 is a modification of Figure 9 showing the U-shaped members tilted for spiral discharge.

Referring to Figure 1, a U-shaped member 10 is shown comprising a closed portion 11, flanges 12 and 13 extending laterally from the closed portion, with open ends 14 and 15 and a longitudinal opening 16 with lug attachment 17. The longitudinal edges of the flanges 12 and 13 are designated by the numeral 27.

Figure 3 shows the U-shaped members in a grille effect with a frame 18 which may be of any shape, having an opening 22 for the passage of air against the closed portions and past the lateral flanges 12 and 13 of the U-shaped members.

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Referring to Figure 2 which shows a sectional view of Figure 3 taken on the lines 2—2 of Figure 3, the lugs 17 are attached to the side of the frame 18 which is attached to the duct 19 through which a stream of primary air is forced by the fan 21 against the closed portions 11 of the U-shaped members 10.

Figures 4 and 5 show a modification of my invention in which the U-shaped members 10 are attached to the frame 18 and pivotally mounted on a pin 20 which is attached to the frame 18 so that the U-shaped members may be tilted from the normal, so that the air passing through is thereby diverted.

The induction of a large amount of secondary air is of great value in air conditioning when it is desirable to have the primary air at either relatively high or low temperatures to be then modified by the secondary air in the room which tends to avoid drafts and give good distribution.

Referring to Figure 6, there is shown a duct casing 29 with a fan 28 located in the duct, and outlet 30, in which outlet, are placed the U-shaped members 10 spaced from each other as shown in Figure 7. It will be noted that the ends 14 and 15 of the U-shaped members are open to the atmosphere exterior of the duct.

Figure 7 shows a flat circular diffuser in which the U-shaped members 10 are attached to the inner web 24 and the outer web 25. The diffuser is attached to a circular duct work shown in Figure 6 wherein the primary air enters through the opening 43, is forced through the duct work by the fan 28 and against a cone 36 and out the circular passage 30 so as to produce a stream of primary air in the form of a doughnut, and the passage of primary air past the U-shaped members 10 will cause a flow of secondary air through the open ends 14 and 15 which are positioned outside of the stream of primary air.

Figures 9 and 10 show a modification of my invention in which the U-shaped members 10 are attached to the inner web 24 and the outer web 25 to form a cone-shaped diffuser which is attached to the outlet of the duct work shown in Figure 8 in which the air entering at 37 is forced through the duct and past the diffuser by the fan 38 to the openings 39. The air is forced against the cone 40 so as to change the direction of the air into a circular stream. The open ends 14 and 15 are positioned outside of the stream of the primary air. The cone 40 may be adjusted towards the fan by means of the stem 41 which is a screw thread extending through the nut 42. In Figure 10, the members 10 are tilted

from the normal so as to change the directional flow of the primary air into a spiral. The direction of the flow of the air in all cases is indicated by arrows. It will be noted that, in both Figures 9 and 10, that the U-shaped members 10 extend radially past webs 24 and 25 so that their end openings 14 and 15 are respectively open for the passage of secondary air either from outside web 25 or under web 24.

I claim:

1. An air distributor comprising a duct having generally the shape of a frustum of a cone, a substantially circular baffle substantially coaxial with said duct and spaced from the end thereof, said circular baffle and said duct defining a frusto conical opening therebetween, a plurality of longitudinal U-shaped members each having a web portion with flanges extending laterally therefrom to provide a longitudinal opening and open ends, said U-shaped members being connected to said duct and said circular baffle and lying in radial planes across said conical opening with their ends extending beyond the opening, a substantially conical baffle coaxial with said duct and adjustably mounted on said circular baffle.

2. An air distributor comprising a duct having generally the shape of a frustum of a cone, a substantially circular baffle spaced from the large end of the duct, said circular baffle and said duct defining a frusto-conical opening therebetween, a plurality of longitudinal U-shaped members each having a web portion with flanges extending laterally therefrom to provide a longitudinal opening and open ends, means pivotally connecting said U-shaped members to said duct and said circular baffle with the U-shaped members positioned in substantially radial planes across said frusto-conical opening with the ends of said U-shaped members extending beyond said frusto-conical opening, and a

substantially conical baffle adjustably mounted on said substantially circular baffle.

3. An air distributor comprising a duct having a substantially circular open end, a baffle member having generally the shape of a cone and positioned substantially at the center of said open end to form an annular opening with said duct, a plurality of longitudinal U-shaped members each having a web portion and laterally extending flange portions providing a longitudinal opening and open ends, means connecting said U-shaped members to said duct and to said baffle member with said U-shaped members positioned in substantially radial planes across said annular opening with the ends of said U-shaped members extending beyond said annular opening, and means to force a stream of air through said annular opening and over said U-shaped members whereby air is drawn in through said open ends of said U-shaped members and out through the longitudinal openings of said U-shaped members.

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