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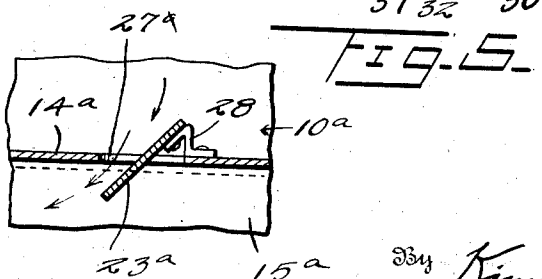
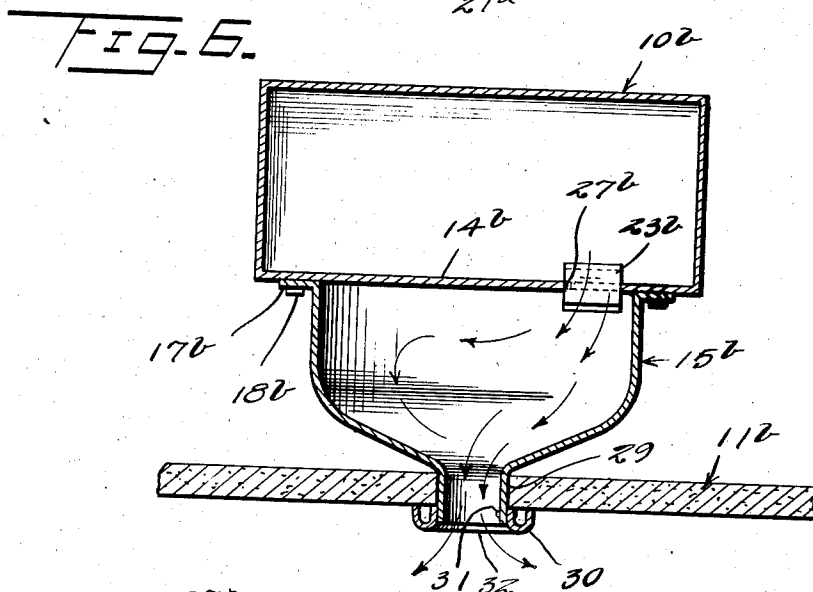
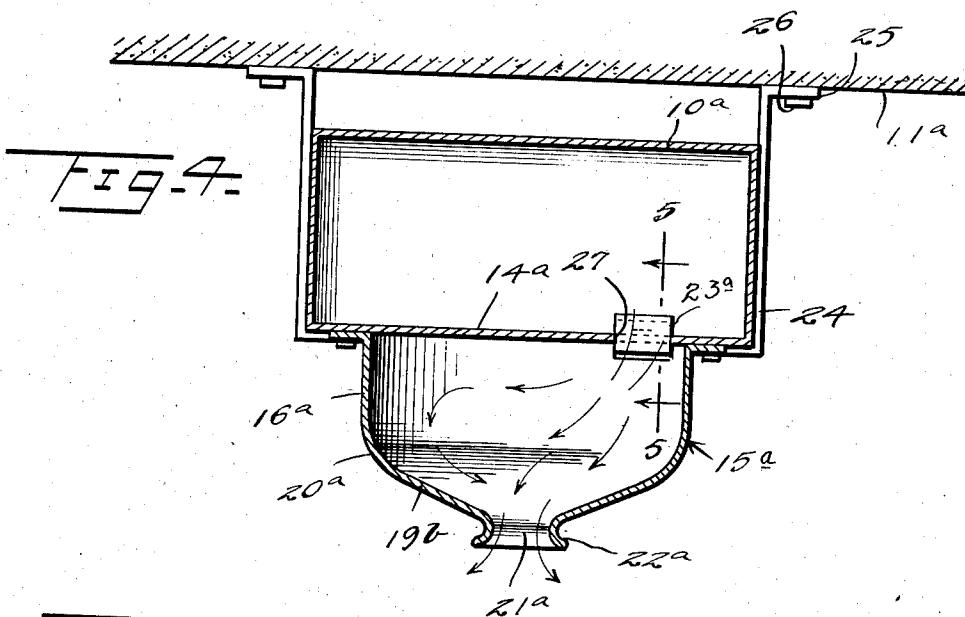
I. I. BOCK

2,203,590

AIR CONDITIONING DEVICE

Filed June 29, 1939

3 Sheets-Sheet 2



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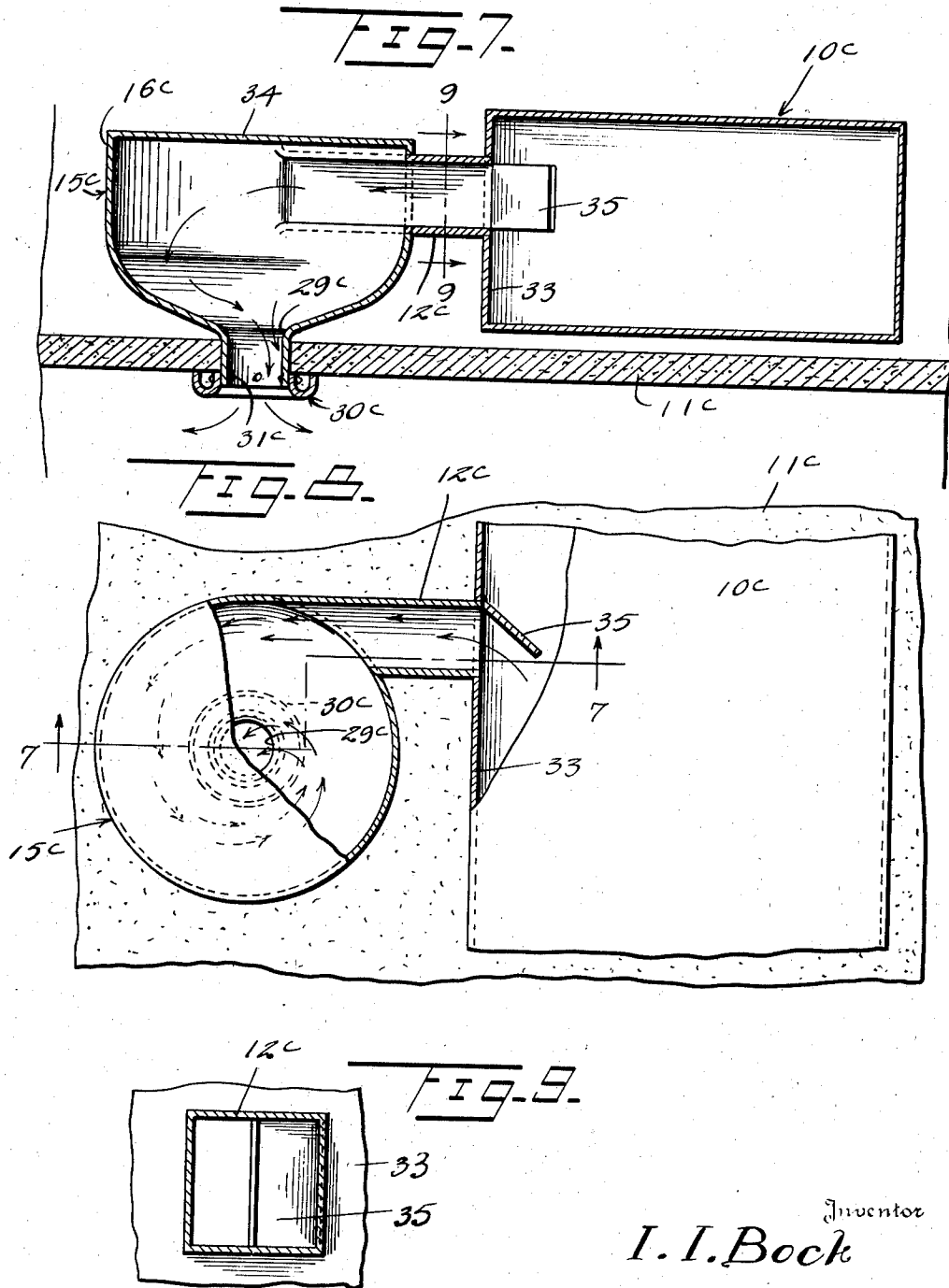
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UNITED STATES PATENT OFFICE

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AIR CONDITIONING DEVICE

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7 Claims. (Cl. 98—40)

This invention relates to air conditioning devices and more particularly to an improved means for discharging air into a room in a manner to prevent the creation of a draft from the air discharging means.

An object of this invention is to provide an improved outlet means which is adapted to be connected to an air duct and which is adapted to discharge air from the duct into a room, the device being so constructed as to substantially diffuse the air from the duct so as to prevent the creation of a draft.

Another object of this invention is to provide a device of this kind which is adapted to be connected to an air duct and which, if desired, may be mounted entirely within the room and connected to the air duct by a tube, or if desired may be mounted exteriorly of the room and connected to the room by a short outlet connection so as to thereby eliminate the use of grills or the like as is at present the case to discharge air from an air conditioning duct into a room.

A further object of this invention is to provide an improved outlet or discharge member which may be connected to an air duct and which includes means whereby the air entering the discharge member is given a swirling or rotary motion so that the air when discharged from the outlet member will be diffused laterally of the outlet in all directions rather than in only one direction as is the case at present where grills or the like are connected to an air duct.

To the above objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings, wherein are illustrated embodiments of the invention, but it is to be understood that changes, modifications and variations may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a transverse sectional view of an air duct having a discharge or outlet means constructed according to an embodiment of this invention mounted thereon.

Figure 2 is a sectional view partly in elevation taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a transverse sectional view of a modification of this invention.

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

Figure 6 is a transverse sectional view of another modification of this invention.

Figure 7 is a transverse sectional view of a further modification of this invention taken on the line 7—7 of Figure 8.

Figure 8 is a fragmentary plan view partly broken away and in section of the structure shown in Figure 7, and

Figure 9 is a sectional view taken on the line 9—9 of Figure 7.

Referring to the drawings and first to Figures 1 to 3 inclusive, numeral 10 designates generally an air duct which in the present instance is rectangular in transverse section and is adapted to be connected to a source of air supply, either cool air or hot air. The duct 10 is supported in any suitable manner in spaced relation to a wall 11 which in the present instance is a ceiling and the ceiling 11 is provided with an opening 13 within which an end of a tube 12 is mounted. The tube 12 is connected at one end to the bottom wall 14 of the duct 10 and the opposite end of the tube 12 extends through the ceiling 11 and discharges into an outlet or discharge member generally designated as 15.

The outlet member 15 is constructed in the shape of an inverted substantially dome-shaped body provided with a substantially cylindrical upper portion 16 having an outwardly extending flange 17 secured as by fastening devices 18 to the under side of the ceiling 11. The lower portion of the outlet member 15 is provided with an inverted substantially frusto-conical member 19 connected to the cylindrical portion 16 by an arcuate portion 20. The apex of the tapered portion 19 is provided with a reduced outlet opening 21 and the lower portion 19 is preferably provided with a reverted or outwardly flared discharge neck 22.

The tube 12 discharges as shown in Figure 2 into the outlet member 15 at one side of the axial center thereof and a baffle member 23 is disposed across the lower end of the tube 12 so that the air passing downwardly through the tube 12 will be directed towards the cylindrical wall 16 of the outlet member 15. In this manner the air passing downwardly through the tube 12 and into the outlet member 19 will be given a circular or swirling movement so that when this air is then discharged through the flared neck 22, the air will be diffused or sprayed into the air in the room and thus eliminate a draft.

The baffle member 23 may be secured about three marginal edges thereof to the tube 12 which if desired may be rectangular or square

in transverse section. The baffle 23 may be welded, soldered or otherwise fixedly secured on a downwardly inclined angle to the length of the tube 12 so that the air discharging from the tube 12 into the outlet member 15 will be given a rotary or swirling movement within the outlet member 15.

In Figure 4 there is disclosed a slightly modified form of this invention wherein the outlet or discharge member 15a is connected directly to the bottom wall 14a of the air duct 10a. The air duct 10a in the present instance is suspended from a ceiling or other support 11a by means of supporting straps 24 provided with outturned upper end portions 25 secured as by fastening members 26. The outlet member 15a is constructed similar to the outlet member 15 being provided with a cylindrical upper portion 16a and an inverted substantially frusto-conical lower portion 19a which merges at its upper portion as at 20a into the lower end of a cylindrical portion 16a. A reduced outlet 21a is provided in the lower end or apex of the tapered portion 19a and the outlet member 15a is provided with an outwardly flared neck 22a. The bottom wall 14a is provided with an opening 27 and a baffle 23a is positioned within the opening 27 extending partly upwardly into the interior of the duct 10a and partly downwardly into the interior of the outlet member 15a. The baffle 23a is supported in an inclined position by means of a bracket 28 which is secured to the bottom wall 14a and to one face of the baffle 23a.

The baffle 23a is adapted to cause air to be deflected from the duct 10a downwardly into the outlet member 15a, the air being deflected on an angle to the horizontal. The opening 27 through the bottom wall 14a is positioned at one side of the axial center of the air diffusing member 15a so that the air entering the diffusing member 15a from the duct 10a will not flow directly to the discharge opening 21a.

In Figure 6 there is disclosed a further modification of this invention wherein the air duct 10b is positioned above the wall or ceiling 11b and the discharge member 15b is secured to the bottom wall 14b of the duct 10b and is likewise positioned above the ceiling or wall 11b. The outlet member 15b has a marginal flange 17b secured as by fastening members 18b to the under side of the bottom wall 14b and the wall 14b is provided with an opening 27b through which air from the duct 10b is adapted to pass into the outlet member 15b. A baffle member 23b similar to the baffle member 23a is supported in the opening 27b and projects partly into the interior of the duct 10b and partly downwardly into the interior of the outlet member 15b at one side of the axial center thereof.

The lower portion of the outlet member 15b is provided with a cylindrical neck 29 extending through the wall 16b and a ring 30 which is substantially U-shaped in transverse section is secured to the lower end of the neck 29 by fastening devices 31. The ring 30 is disposed with the parallel legs thereof extending upwardly so that the bight 32 will form an outwardly flared air diffusing means to assist in the diffusing of the air passing through the interior of the discharge neck 29.

In Figures 7 to 9 inclusive there is disclosed a further modification of this invention wherein the duct 10c is disposed above the ceiling or wall 11c. In this form, the air diffusing or outlet member 15c is disposed at one side of the duct

10c. The outlet member 15c is connected to the side wall 33 of the duct 10c by means of a connecting tube 12c. The tube 12c as shown in Figure 8 is disposed substantially tangential to the circular or cylindrical wall 16c and an upper wall 34 is secured to the upper end of the cylindrical portion 16c. The discharge member 15c is provided with a cylindrical discharge neck 29c and a ring 30c which is substantially U-shaped in transverse section and disposed with the free legs thereof extending upwardly is secured as by fastening members 31c to the lower end of the cylindrical discharge portion 29c below the wall 11c.

A baffle 35 is secured as shown in Figures 7 and 8 to the side or vertical wall 33 of the duct 10c in a position to deflect a portion of the air passing through the duct 10c into the connecting tube 12c. With a structure of the type disclosed in Figures 6 and 7, the air duct and the air diffusing member are positioned within the wall and are concealed, the only portion being exposed being the diffusing outlet which is provided with a rounded rim as shown at 30 and 30c in Figures 6 and 7 respectively.

In the use of this air diffusing structure where the air duct is positioned within a wall the structure shown in Figure 1 may be used or if desired the structure shown in Figures 6 and 7 may be used. Where conditions are such that the diffusing member cannot be positioned either directly below the air duct within the wall space or at one side of the air duct as shown in Figures 6 and 7, the diffusing member may be positioned within the room as shown in Figure 1. The air from the duct 10 will pass through the interior of the tube 12 and be deflected by means of baffle or deflecting member 23 on an angle to the horizontal and at one side of the axial center of the diffusing member 15. The rotating air in the diffusing member 15 will be discharged in a rotary motion through the flared discharge neck 22 so that the discharged air will be diffused in all directions laterally of the discharge neck 22. In this manner the cold or hot air which is discharged from the duct 10 will not cause a draft adjacent the outlet member as is the case where a grill or non-diffusing discharge member is provided.

With a structure of this kind, a number of diffusing members may be positioned in a wall or ceiling and where the outlet of the diffusing member extends through the wall, the outlet will be relatively small and will not occupy as great a space as is the case where a grill is used to cover up the outlet of an air duct.

What I claim is:

1. In an air duct an inverted dome-shaped outlet member provided with a reduced axial outlet opening, and means for discharging air from said duct tangentially into said member whereby to effect a circular movement of air in said member.

2. In an air duct an inverted dome-shaped outlet member provided with a reduced axial outlet opening, and means for discharging air from said duct tangentially into said member whereby to effect a circular movement of air in said member, said means including an inclined baffle between the duct and said member.

3. In an air duct an inverted dome-shaped outlet member provided with an axial outlet opening, an outwardly flared discharge member extending from said outlet member, and means discharging air from said duct tangentially into

said outlet member whereby to effect a swirling movement of air in said member.

4. In an air duct an inverted dome-shaped outlet member provided with an axial outlet opening, means securing said member to a wall of said duct, said duct having an opening in a wall thereof at one side of the axial center of said member, and a baffle plate secured to said wall of said duct and disposed partly in said duct and partly in said member whereby to effect a swirling movement of air in said member.

5. In an air duct an inverted dome-shaped outlet member provided with an axial outlet opening, a flared discharge member extending from said opening, a tube connecting said outlet member with said duct, said tube communicat-

ing with said outlet member at one side of the axial center thereof, and a baffle in said tube inclined to the longitudinal axis thereof, said baffle being disposed adjacent said outlet member.

6. In an air duct a dome-shaped outlet member, a tube communicating said member with said duct, and a baffle at one end of said tube inclined to the length thereof, said tube being connected to said member in a manner to effect a swirling movement of air in said member.

7. In an air duct a dome-shaped outlet member, a tube disposed substantially tangentially of said member, and a baffle inclined to the length of said tube and extending interiorly of said duct.

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