

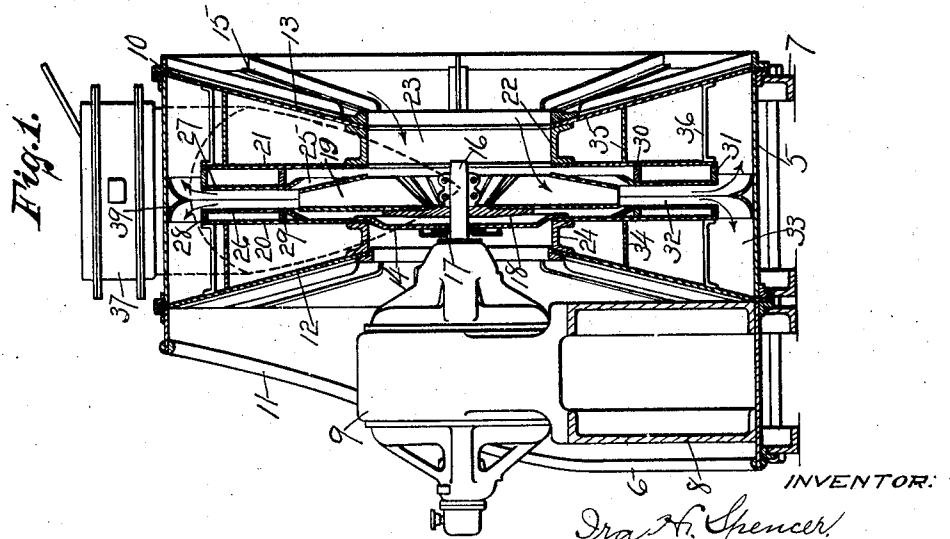
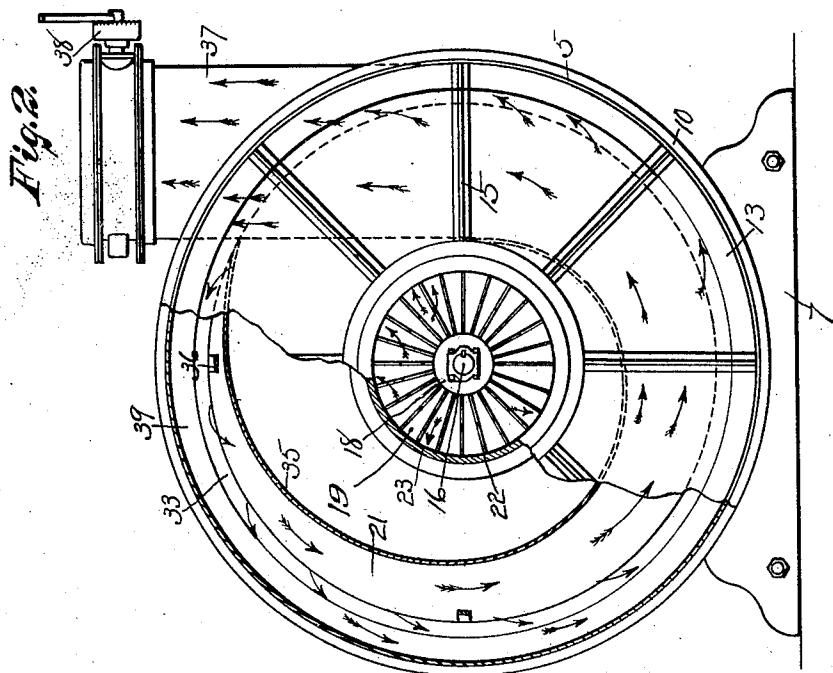
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DEVICE FOR CAUSING FLOW OF FLUID

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## DEVICE FOR CAUSING FLOW OF FLUID.

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My invention relates more especially to that class of devices for causing flow of fluid, more especially of air, which devices embody a rotor including fan blades, and 5 an object of my invention, among others, is to provide a device of this class that shall be particularly efficient in operation and that shall be simple but extremely strong in construction.

10 One form of device embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

15 Figure 1 is a view in central section through my improved apparatus on a plane passing through the axis of the rotor shaft.

Figure 2 is a view in side elevation of my improved apparatus, with parts broken 20 away to show construction.

In order to produce an apparatus of the type herein illustrated and described that shall be of minimum weight, and yet, at the same time, shall be extremely strong and 25 durable, I have employed sheet metal almost entirely throughout the structure, which structure comprises a case or body 5 of cylindrical form as to the main part and having on one side an extension 6, which extension, 30 however, is not wholly of cylindrical form, but is more or less round and in the construction herein shown is composed of a separate piece of metal from that comprising the case 5. This extension is longer at 35 the bottom than at the top. The case and extension are composed of sheet metal, as plate steel, each preferably of a single piece bent into tubular form with the ends secured in any desired manner. The case may be 40 supported in saddles 7 in a manner common to structures of this class and the extension 6 has a pedestal 8 upon which a motor 9 of any suitable type is mounted. The case and its extension are provided with angle iron 45 flanges 10 of annular form extending around said members and secured thereto in any suitable manner, and a bead 11 may be formed at the edge of the extension 6, and as shown in Figure 1 of the drawings.

50 The case or cylinder 5 is closed at opposite ends by means of cone shaped heads 12—13 also preferably formed from plate steel, each of said heads having a central opening, which opening through the head 55 12 is closed by a plate 14 in a manner to

be hereinafter described, and the opening in the head 13 forms the eye through which air gains entrance to the interior of the apparatus. Ribs 15 of angular form and also preferably constructed of plate steel are 60 disposed radially on the outer surface of each of the heads 12—13, such number of ribs being employed as may be desired, in the structure shown eight being used. These ribs are of a length to extend substantially 65 from the periphery of the heads radially inward to the edge of the openings above mentioned at the center of the structure. A shaft 16 extends from the motor 9 through the plate 14, a packing 17 of any suitable 70 construction being placed about the shaft at the point where it passes through the plate 14. A fan base 18 is secured to the shaft 16 within the casing and fan blades 19 are secured to the base in any suitable 75 manner.

Division plates 20—21, preferably round, are mounted within the casing substantially midway between the heads 12—13, these plates also being preferably formed from sheet steel. They are smaller in diameter 80 than the interior of the casing and having central openings, and the plate 14, hereinabove mentioned, is secured to the plate 20 to close the opening through said plate and through the head 12, as hereinbefore referred to. The central opening in the plate 21 communicates with the central opening in the head 13 and a flanged ring 22 is secured to the head 13 and plate 21 rigidly 85 connecting the same and in fact comprising the eye 23 to the interior of the case.

Similarly a flanged ring 24 connects the head 12 and plate 20, these flanged rings being of a length to space the plates 20—21 sufficiently to form a fan chamber 25 within which the fan is located. The fan chamber is narrowed beyond the periphery of the fan as by means of plates 26—27, preferably of sheet steel, and of annular form, these plates being supported by rings 28—29—30—31, thus spacing the plates from the plates 20—21 and from each other to form an expansion chamber 32.

The expansion chamber 32 opens into a 105 second expansion chamber 33 having its peripheral wall formed by the case 5 and its inner wall formed by two volutes 34—35 preferably composed of plate steel and located between the heads 12—13 and the 110

plates 26—27, the disposition of these volutes being shown more clearly by the dotted lines in Figure 2 of the drawing.

The plates 20—21 are further supported by struts 36 disposed as may be desired between said plates and the heads 12—13 and as shown in Figure 1 of the drawing.

The expansion chamber 33 increases in area in the direction of flow of the air currents and from the periphery of the case toward the center, as shown by the dotted lines in Figure 2 of the drawing, this chamber at the plane of its greatest area opening into a discharge conduit 37 secured to one side of the case and extending tangentially therefrom and as shown in Figure 2 of the drawing.

It will be noted from the device as illustrated in the drawing and from the foregoing description that the air entering through the eye 23 is forced by the fan outwardly through the expansion chamber 32 and from thence into the expansion chamber 33, the air at those portions of the latter expansion chamber of the largest area passing over the edges of the walls of the expansion chamber 32, and as denoted by the arrows in Figure 2, and it is here remarked that the spaces between the plates 20—21 and the plates 26—27, as well as the spaces within the volutes 34—35 are "dead air" spaces created merely to occupy space and thus avoid solid construction with added weight.

35 A damper 38 of any ordinary construction may be employed to regulate the flow of air through the discharge passage in the conduit 37. Guides 39 are located on the outer wall of the expansion chamber 33 to direct air currents laterally from the mouth of said chamber 32 into said chamber 33.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim—

1. A case comprising a body of cylindrical shape adapted for support at the periphery thereof and formed from sheet metal, annular shaped heads of sheet metal separately formed from said body and closing opposite ends of the case, ribs radially disposed upon and secured to said heads, plates separately formed from said body and head and spaced apart within the case to form a fan chamber, said plates being supported by said heads and spaced therefrom, and a fan rotatably mounted in said chamber.

65 2. A case comprising a body of cylindrical

shape formed from sheet metal for support at the periphery thereof, heads of cone-shape closing opposite ends of the case, said heads being formed from sheet metal and arranged to present concaved surfaces on the outer ends of the case, plates separately formed from said body and head and spaced apart within the case to form a fan chamber, said plates being supported by said heads and spaced therefrom, and a fan rotatably mounted within said chamber.

3. A case of cylindrical form, heads closing the ends of said case, sheet metal plates supported in spaced relation within the case to form a fan chamber, one of said plates having a central opening, spacing members closing the spaces between said heads and plates at the inner edges of the latter to provide a smooth air passage therethrough, plates of annular form supported by said fan chamber plates on the facing surfaces of the latter to form an expansion chamber, and a fan located within said fan chamber.

4. A case of cylindrical form, heads closing the ends of said case, one of said heads having an inlet opening at the center thereof, sheet metal plates supported in spaced relation within the case to form a fan chamber, one of said plates having a central opening, spacing members closing the spaces between said plates and heads at the inner edges of the plates to provide a smooth air passage therethrough, plates of annular form supported by said first mentioned plates on the facing surfaces of the latter to form an expansion chamber opening from the periphery of said fan chamber and gradually increasing in cross sectional area into the outlet, means to close the space between said fan chamber plates and annular plates at the outer and inner edges of the latter, and a fan located in said fan chamber.

5. A case comprising a body of cylindrical shape, heads separately formed from said body and closing the ends of said case except for an inlet in the center of one of said heads, separately formed sheet metal plates spaced apart within the case to form a fan chamber, separately formed sheet metal plates of annular form spaced apart to form an expansion chamber at the periphery of said fan chamber, a volute independently formed from sheet metal and located between the plates forming the fan chamber and the ends of the case to comprise an expansion chamber of gradually increasing unobstructed area towards and into the outlet thereof, and a fan located within said fan chamber.

6. A case comprising a body of cylindrical shape with heads separately formed from said body and closing the ends of said case, one of said heads having an inlet opening at the center thereof, separately formed sheet metal plates spaced apart within the case to

form a fan chamber, volutes independently formed from sheet metal and located between said plates and ends of the case to form a "dead space" between each of said plates and an end of the case, said volutes also providing an expansion chamber of gradually increasing unobstructed area towards and into the outlet of the apparatus, said volutes also acting as supports for said plates, and a fan located in the fan chamber between said plates.

7. A case of cylindrical shape formed

from sheet metal, heads of sheet metal separately formed from said case and of cone shape, plates within said case spaced apart and from said heads, flanged rings secured to said plates and said heads at the center thereof, one of said rings providing an air inlet to a fan chamber, and volutes secured to said heads and to said plates to locate and position the latter and to create dead air spaces between said plates and heads.

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