

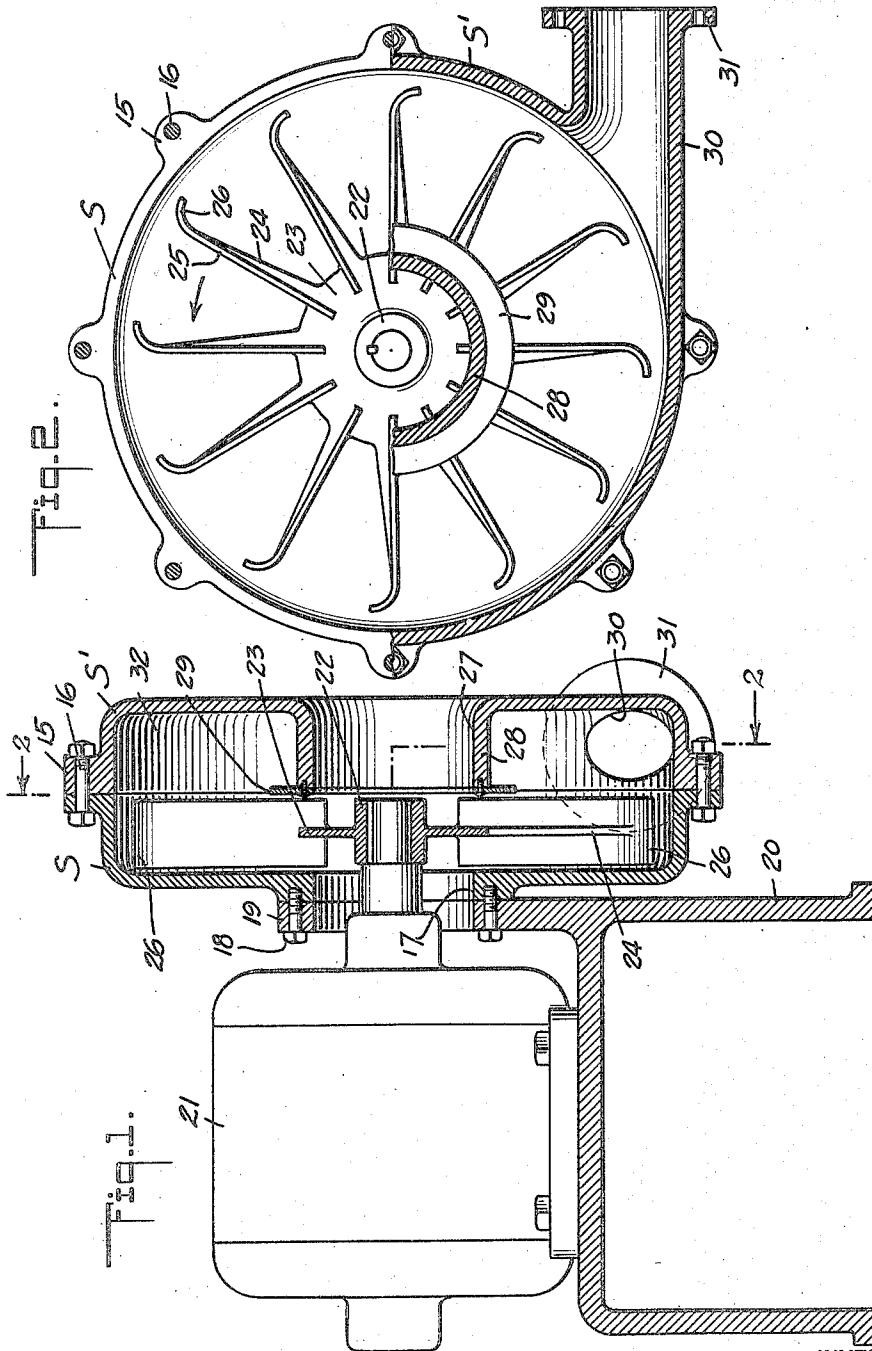
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ROTARY BLOWER

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ROTARY BLOWER.

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My invention relates to rotary blowers as used for generating blasts of air for various purposes, and a purpose of my invention is the provision of a blower possessing the desirable characteristics of cheapness, simplicity, compactness and of superior efficiency, the blower delivering an air blast of higher velocity and in greater volume than is possible with blowers heretofore proposed which are of the same size and driven at the same speed.

It is also a purpose of my invention to provide a blower of the above described character in which its superior blowing efficiency is obtained by reason of a chamber to which air is supplied and trapped by the action of a blower rotor, the latter being further operable to compress the air and thus cause it to be discharged from the stator at high velocity and in great volume. In handling the air in this manner the blower when in operation is comparatively silent as against the loud humming noise of other blowers.

I will describe only one form of rotary blower embodying my invention, and will then point out the novel features thereof in claims.

In the drawings—

Figure 1 is a view showing in vertical section one form of rotary blower embodying my invention in applied position to a motor; Figure 2 is a vertical sectional view taken on the line 2—2 of Figure 1.

Referring specifically to the drawings, my invention in its present embodiment comprises a stator of annular form and constructed in the present instance of two sections S and S' provided at their peripheries with ears 15 regularly spaced about the circumference of the sections and provided with openings through which bolts 16 extend for securing the sections to each other. The section S as shown in Figure 1 is provided with an axial opening 17 which constitutes an air inlet, and the wall of this opening is relatively thick to receive bolts 18 by which the stator as a unit is supported in elevated position upon a ring shaped upright 19, the latter forming part of a support 20 upon which an electric motor 21 is mounted. The positioning of the motor 21 is such that its shaft extends through the ring 19 and the opening 17, with its inner end positioned

axially within the section S. To this end 55 a fan wheel or rotor is secured so as to be disposed wholly within the section S. The rotor comprises a hub 22 keyed to the motor shaft and provided medially of its ends with an annular and flat web 23, the latter being provided at its periphery with tapered and radially extending arms 24 disposed at the rear sides of blades 25. The hub, web, arms and blades are in the present instance cast integral with each other, the blades and arms being disposed at regular spaced intervals circumferentially about the web and the inner ends of the blades extending inwardly beyond the outer periphery of the web as clearly illustrated in Figure 2. The outer ends of the blades are curved rearwardly as indicated at 26 and it will be noted that these ends are disposed in spaced relation to the inner periphery of the stator when the rotor is in applied position therein.

The stator section S' is provided axially with an opening 27 which constitutes an air inlet, and this opening is bordered by a collar 28 coextensive in length with the width of the stator section so that its inner end terminates flush with the corresponding side of the stator and in relatively close proximity to the adjacent edges of the blades 25. Secured to the inner edge of the collar is a flat ring 29 which constitutes means by which air entering the stator through the inlet 27 is directed radially outward of the blades of the rotor, thereby causing the air to travel lengthwise of the blades. As clearly shown in Figure 2, the stator section S' is provided with an air outlet spout 30 disposed tangentially of the stator and provided at its outer end with a flange 31 by which it can be attached to a pipe for conducting the air blast to any point desired.

In the operation of the blower the motor 21 functions to rotate the rotor in the direction of the arrow in Figure 2, and under the action of the rotating blades 25 air from the atmosphere is drawn into the stator through the air inlets 17 and 27, where it travels lengthwise of the blades to their outer curved ends. From this point the air is discharged from the blades into the chamber provided by the stator section S' and indicated at 32. Upon continued operation of the rotor air accumulates in the chamber 32 to the extent of being placed under pres-

sure because of the fact that the rotor functions to supply air to the chamber in greater volume that it can be exhausted therefrom through the outlet spout 30. As the result, the air blast produced at the spout 30 is of relatively high velocity and hence capable of producing greater pressure than is possible with previous blowers of the same size. Obviously, the increased intensity of the air blast produces a blower of greater efficiency than previous blowers.

In practice, the curved blade ends 26 are substantially tangent with respect to the circle defined by the outer ends of all of the blades, and by constructing the blade ends in this manner the air is caused to travel outwardly in a manner to prevent a partial vacuum at the rear sides of the blades and thus setting up a resistance to the rotative movement of the blades. The curved blade ends also materially aid in discharging the air laterally from the ends of the blades into the chamber 32 against the back pressure of the trapped air in the chamber. The arrangement of the web 23 in relation to the blades 25 is such that it functions as a partition to maintain the two currents of air entering the stator through the openings 17 and 27 separate until they are wholly within the stator. This insures the movement of the air currents lengthwise of the rotor blades. It is important to note that the ears 15 of the stator sections S and S' permit a circumferential adjustment of the stator section S' on the section S and this circumferential adjustment of the stator section can be utilized to position the air outlet spout 30 at any point desired in respect to the circumference of the stator.

Although I have herein shown and described only one form of rotary blower embodying my invention, it is to be understood that various changes may be made therein without departing from the spirit of the invention, and the spirit and scope of the appended claims.

I claim:

1. A blower comprising a stator having axial air inlets, one of which is provided with an inwardly extending collar to provide an annular compression chamber at one side of the stator between the inner end of the collar and one side wall of the stator, a rotor axially within the stator and disposed between the collar and the other side wall of the stator, and a ring secured to the inner end of the collar for guiding air lengthwise of the rotor blades as it enters the stator.

2. A blower comprising a stator formed of two sections, one of the sections being provided with an air outlet, means for connecting the sections to allow circumferential

adjustment of the air outlet section to permit positioning of the air outlet at any desired point circumferentially of the stator, air inlets in the sections, and a rotor axially within the stator.

3. A blower comprising a stator formed of two sections, one of the sections being provided with an axial air inlet and a peripheral tangentially disposed outlet, a collar bounding the air inlet and extending inwardly of the section, an axial air inlet for the other section, a shaft extending through the air inlet of the last mentioned section, a rotor on the shaft and disposed wholly within the last mentioned stator section, and an air guiding ring on the inner end of the collar, said rotor comprising a hub, an annular web surrounding the hub, radial blades on the web with their inner ends in overlapped relation to the web and their outer ends projecting beyond the web and curved rearwardly with respect to the direction of rotation of the rotor.

4. A blower comprising a stator, a rotor in the stator, the stator being formed with air inlets axially disposed with respect to and at opposite sides of the rotor through which air at atmospheric pressure is delivered to opposite sides of the rotor, a chamber in the stator at one side of the rotor into which air acted on by the rotor is discharged and compressed, and a restricted outlet in the stator and peripherally of the chamber through which the air is discharged from the chamber.

5. A blower comprising a stator, a rotor in the stator, the stator being formed with air inlets axially disposed with respect to and at opposite sides of the rotor through which air at atmospheric pressure is delivered to opposite sides of the rotor, a chamber in the stator at one side of the rotor into which air acted on by the rotor is discharged and compressed, means on the rotor operating to maintain in two separate currents the air drawn through said inlets until the currents are moving lengthwise of the blades, said means so related to the rotor as to finally permit the currents to unite and be then discharged as a single current into said chamber, and a restricted outlet in the stator and peripherally of the chamber through which the compressed air is discharged from the chamber.

6. A blower as embodied in claim 5 wherein said means comprises a web dividing the rotor blades longitudinally and terminating at a point between the inner and outer ends of the blades so as to permit the two separate air currents to unite before being discharged from the blades.

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