June 8, 1937. E. L. ANDERSON 2,083,185

FAN

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FIG. 1.

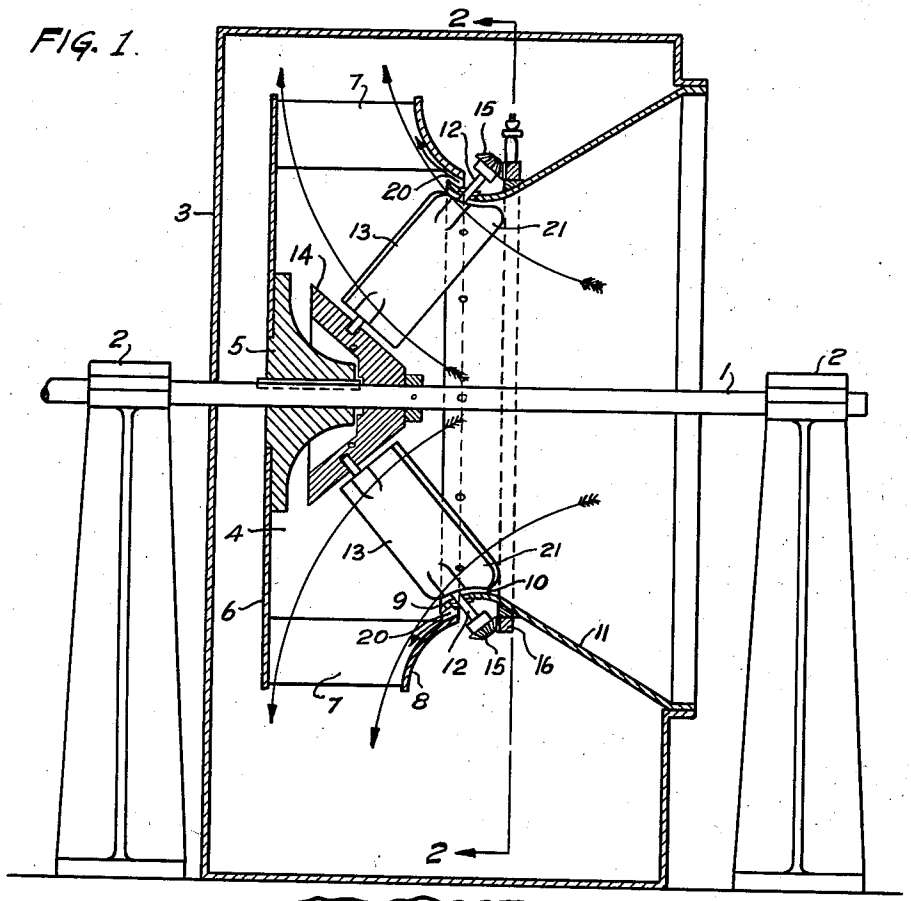
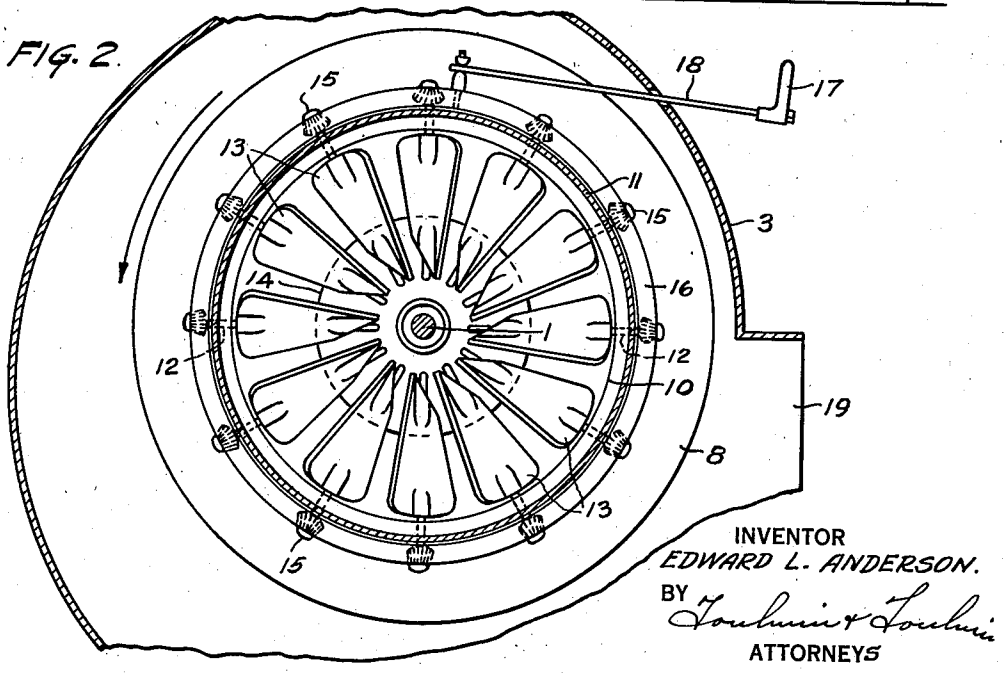


FIG. 2.



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3 Claims. (Cl. 230—114)

My invention relates to blowers.

It is the particular object of my invention to provide means of controlling the volume of air delivered by the blower and the direction of the air entering the blower.

It is a special object to provide such means within the blower rotor.

In particular it is the object to provide a plurality of vanes into the Venturi throat of the blower inclined to the axis of rotation of the blower and the axis of air flow into the blower so that a major portion of the vanes will extend beyond the end of the air inlet passageway and the Venturi throat at the inner end thereof.

It is a further object to be able to adjust the position of these vanes to a point exterior of the blower with all the operating mechanism inside of the blower.

Referring to the drawing, Figure 1 is a section through the air inlet passageway, a blower casing and rotor and the inner supporting hub for the air control vanes, and through a part of the adjusting mechanism therefor.

Figure 2 is a section on the line 2—2 of Figure 1 looking in the direction of the arrows.

Referring to the drawing in detail, 1 is an axle mounted on the bearings 2—2. This axle or rotor shaft is driven by any suitable source of power. It carries within the housing 3 the rotor 4 which is provided with a hub 5 supporting the back plate 6. The back plate is provided with a plurality of arcuate air moving blades 7, the other ends of which carry the ring 8 that overlaps at its inner side the inner end 9 of the Venturi throat 10 of the conical air inlet passageway 11. The axles 12 carrying the guide vanes 13 are pivotally mounted in the Venturi throat 10. The inner ends of these axles are pivotally mounted in the tapered hollow hub 14. The vanes 13 and their axles 12 are rotated by the beveled pinions 15 on the ends of the axles 12, being engaged by the ring gear 16 which is rotated by the handle 17 and link 18 from a point outside the casing 3.

By adjusting the angularity of the vanes, the direction of the air as to its preliminary whirl is controlled and the quantity of air delivered by the rotor of the blower is also controlled for discharge through the discharge outlet 19.

By mounting these guide vanes 13 partially in the Venturi throat but largely within the rotor and at right angles to the general flow of air from the Venturi throat over the tapered hub 14, it is possible to secure very accurate control as to direction and volume without setting up turbulence in the rotor. It also results in the directing of the air in a uniform path over the entire area of the blades 7 of the rotor. The reentry of the air through the passageway 20 assists in this distribution so that the entire area of the blades 7 is effectively utilized.

The course of the entering air is as follows: The air enters through the inlet cone 11 where its diameter is reduced; it then passes through the Venturi throat and expands; as it does that it starts to turn in a turn that amounts to about 90 degrees from the horizontal flow to flow in a vertical direction over the blades 7. The vanes 13 have their axes at an angle of about 45 degrees or halfway around this turn of 90 degrees. The outer ends of the guide vanes 13 which are within the Venturi throat start to guide the air in a whirling path and control the volume of it. These ends are designated 21. The air, therefore, as it turns from the horizontal to the vertical direction, is guided and controlled. When I say from the horizontal to the vertical direction, I am referring to the view in Figure 1, but, of course, it will be understood that this 90 degree turn takes place through all degrees of the compass as the air expands and is guided by the vanes 13 throughout the entire 360 degrees, forming the lip 9 of the Venturi throat 10.

It will be understood that it is desired to comprehend within this invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what I claim is new and desire to secure by Letters Patent, is:

1. In a blower, a casing, a rotor, a telescopically arranged air inlet Venturi throat arranged within but spaced from said rotor to permit the reentry of air on the outside of the Venturi throat, and radially extending guide vanes having their outer ends disposed in the Venturi throat and their inner ends disposed within the rotor for guiding the air on the inside of the Venturi throat substantially parallel to the flow of the air on the outside of the Venturi throat.

2. In combination, in a blower, of a blower casing, a rotor, a conical air inlet passageway having a Venturi throat on the inner end thereof arranged within but spaced from said rotor to permit the re-entry of air from the outside of the Venturi throat, and vanes disposed at an angle of about 45 degrees to the axis of rotation of the blower and the axis of entry of the air, said vanes being so arranged that their inner ends extend partially within the Venturi throat and partially within the rotor.

3. In combination, in a blower, of a blower casing, a rotor, a conical air inlet passageway having a Venturi throat on the inner end thereof arranged within but spaced from said rotor to permit re-entry of air from the outside of the Venturi throat, vanes disposed at an angle of about 45 degrees to the axis of rotation of the blower and the axis of entry of the air, said vanes being arranged partially within the Venturi throat and partially within the rotor, and a conical hub supporting the inner ends of the vanes and disposed within the rotor and guiding the air from its axis of entry to its plane of discharge by the blower rotor.

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