

(No Model.)

L. S. FITHIAN.
Blower or Exhaust.

No. 234,014.

Patented Nov. 2, 1880.

FIG. I.

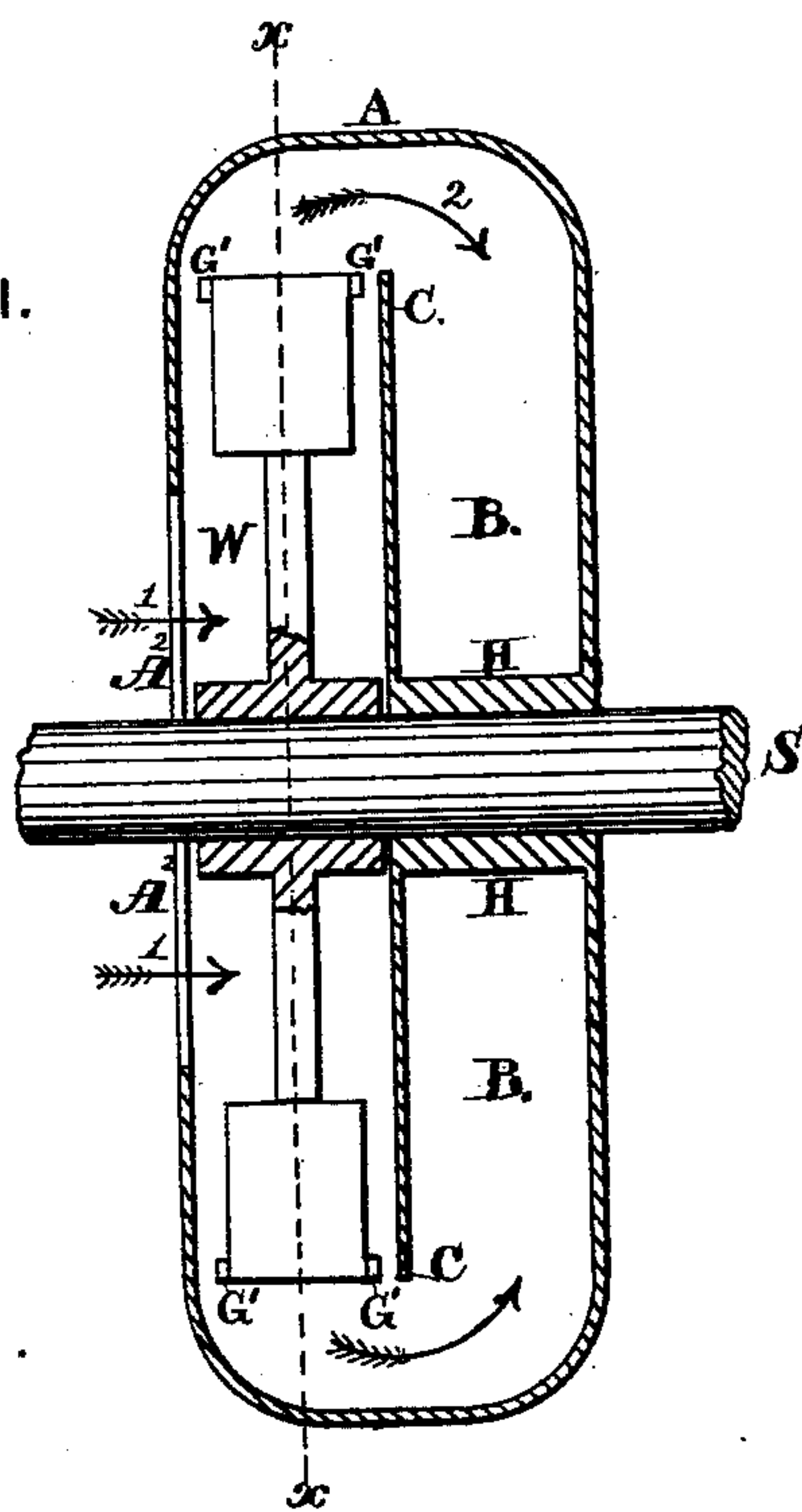
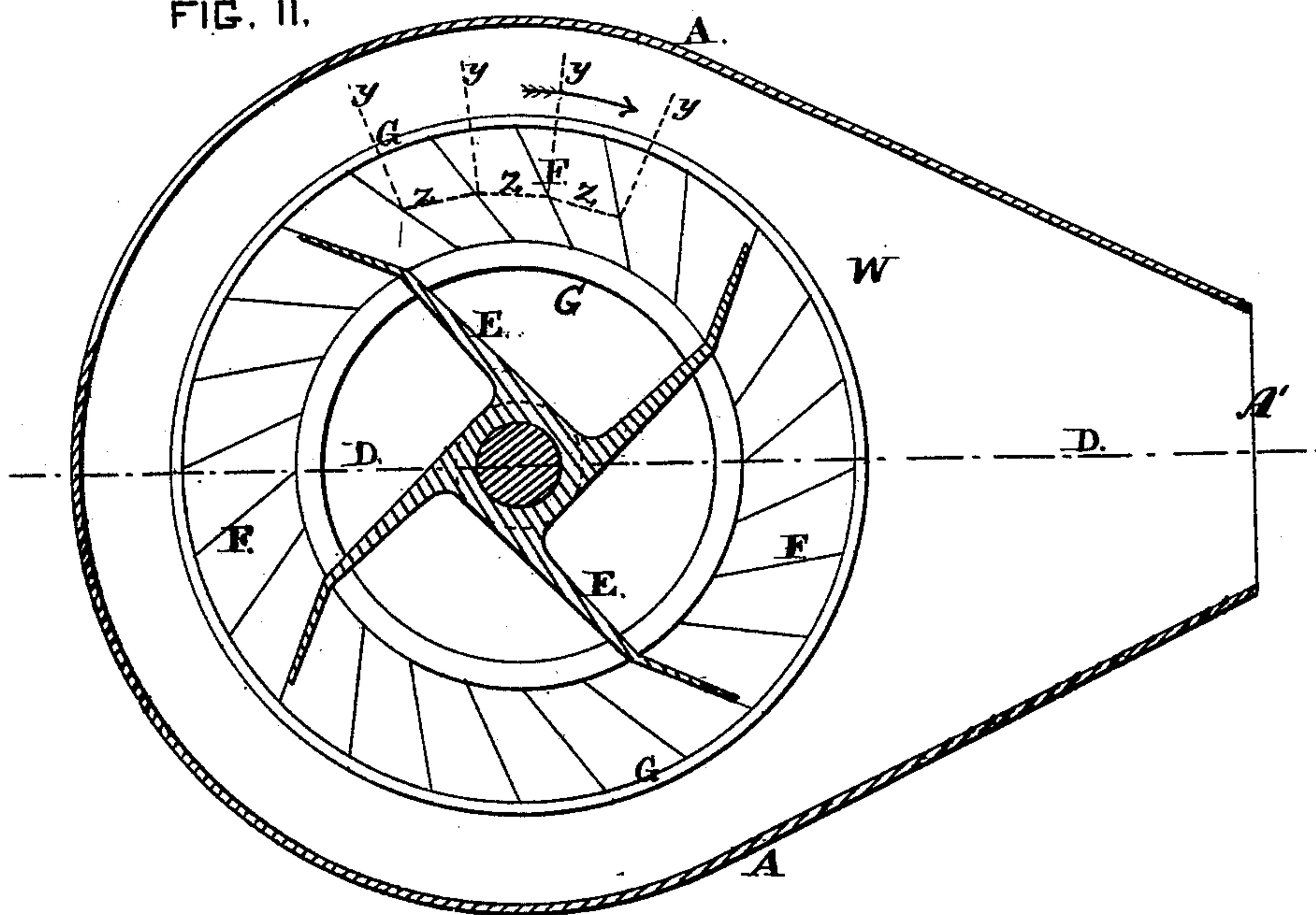


FIG. II.



WITNESSES:

P. A. Jessup
R. B. Fithian

INVENTOR:

Samuel Scudder Fithian

UNITED STATES PATENT OFFICE.

LEMUEL S. FITHIAN, OF BROOKLYN, NEW YORK.

BLOWER OR EXHAUST.

SPECIFICATION forming part of Letters Patent No. 234,014, dated November 2, 1880.

Application filed March 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL SCUDDER FITHIAN, of Brooklyn, Kings county, New York, have invented a new and Improved Blower or Exhaust, of which the following is a specification.

The object of my invention is to prevent the retardation of the fan-wheel of a blowing-machine by compressed air within the wheel-chamber, and to facilitate the escape of the air from the blower-case in the direction in which the blast is to be produced. These objects I accomplish by making the wheel-casing considerably wider axially than the axial width of the wheel, partially dividing said casing by a screen or partition having a diameter about equal to that of the wheel, an open passage being left around it, or nearly so, and mounting the wheel on one side of this screen, on the other side a chamber being left vacant. Both the wheel-chamber and this vacant chamber communicate with the outlet, while the inlet is formed by an opening in the wall of the casing opposite the center of the wheel.

Heretofore fan-wheels have been mounted in casings just about wide enough to contain them, or a very little wider. A portion of the air, of course, escapes from the outlet; but a large portion does not, but is carried around by the wheel and compressed within the chamber, so that a large portion of the power applied is used up in simply forcing the wheel through the compressed air, and the greater the speed, the greater, of course, the compression and retardation.

In my apparatus as the air enters at the center of the wheel and is driven centrifugally by the buckets, the greater portion passes directly to the outlet, the remainder passing over the edge of the screen into the vacant chamber described, and thence to the outlet, so that there is no retardation of the wheel by compressed air in the casing.

In the accompanying drawings, Figure I is a diametric section through the casing, wheel, and screen; and Fig. II is a section of the apparatus indicated by the line *xx* of Fig. I.

The letter A indicates the casing, which has a generally circular shape; but its peripheral walls are extended on straight lines from opposite points at about where the letters A A

are placed on the drawings, said walls converging toward a radial line, (indicated by D D,) and forming, with the flat side walls, the discharge-passage, the center of the outlet A' of which is on the line D D, the size of the said outlet being regulated in accordance with capacity of the wheel, as usual.

The letter W designates the wheel, the arms or spokes E of which project from a central hub fixed upon a shaft, S, which may be mounted in bearings supported by standards on opposite sides of the casing. The blades of the wheel are preferably flat and arranged obliquely, so that when the wheel is rotated in the direction of the arrow, Fig. II, the blades strike the air in the direction of the dotted lines *zzz*, or nearly so, and the reflection takes place outwardly in the direction of the dotted lines *yyy*, producing no reactionary effect upon the wheel. Any other suitable construction of wheel may, however, be used.

The screen C is simply a stationary circular disk secured centrally to a stationary hub, H, projecting from one of the side walls of the casing, and having a passage or bore to receive the shaft S. The screen has a diameter almost equal to that of the wheel, and between its edge and the peripheral wall of the casing is a considerable annular space, which serves as an air-passage.

The discharge-passage is not divided, but has a width equal to the entire width of the case, and, of course, opens into both the wheel-chamber and the vacant chamber B on the opposite side of the screen C. Now, when the wheel is put in rotation in the direction of the arrow, Fig. I, the air enters the casing through the inlet-opening A², Fig. I, in the direction of the arrows numbered 1, and a great portion is driven directly toward the outlet, while another portion forms a steady current past the edge of the screen C, in the direction of the arrows numbered 2, into the chamber B, and thence through the outlet, so that there is a constant flow from all parts of the circumference of the wheel toward the outlet, and no compression or packing of the air can take place within the casing to retard the wheel. The wall of the casing may be extended in the form of a spout arranged radially with respect to the wheel, and having its walls both inclined

gradually toward its outlet, these walls guide the air toward said outlet under whatever pressure it may receive from the wheel, instead of carrying a large portion of it past the outlet-opening, as occurs when the spout is arranged tangentially, as heretofore.

What I claim is—

1. In a blowing apparatus, the combination, with a casing provided with a suitable air-inlet and a peripheral discharge-opening, of a screen arranged in said casing dividing it into two approximately-circular chambers, which are connected by a suitable air-passage and independently connected with the discharge-opening and a rotary fan-wheel mounted in one of said chambers, substantially as described.

2. The combination, with the casing A, having inlet-opening W' and discharge-opening

A', and the fan-wheel W, of the screen C, partially dividing said casing into two chambers, both of which communicate independently with the discharge-opening, substantially as and for the purpose set forth.

3. The casing A, divided by a screen, C, into two communicating chambers, and having the ends of its peripheral wall extending and converging toward discharge-opening A', in combination with the rotary fan-wheel mounted in one of said chambers, which is provided with an inlet-opening in its outer side wall, substantially as described.

LEMUEL SCUDDER FITHIAN.

Witnesses:

R. B. FITHIAN,

R. H. JESSUP.