

M. Smith,

Fan Blower,

N^o 48,986.

Patented July 25, 1865.

Fig. 1.

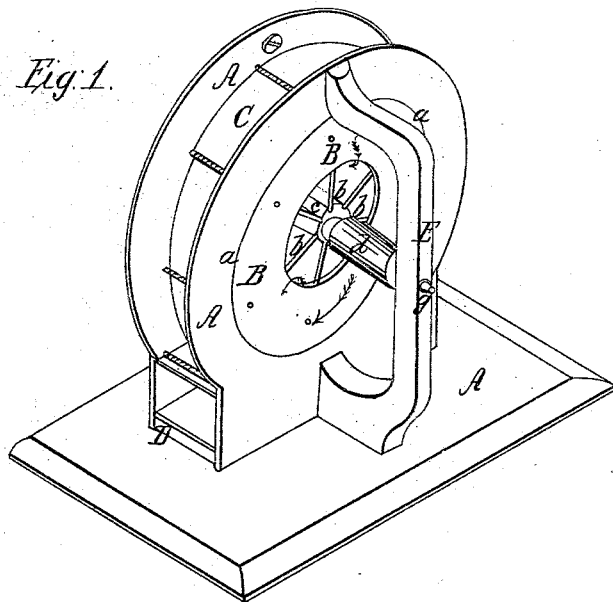
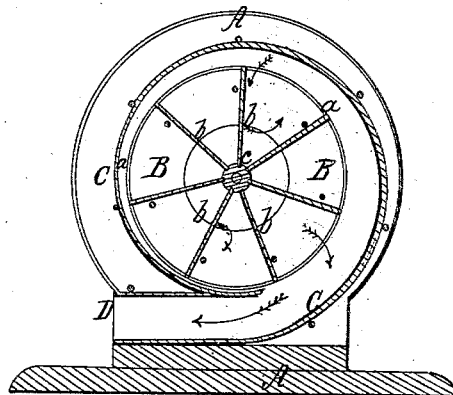


Fig. 2.



Witnesses;
L. D. Davis
R. H. Guald.

Inventor;
Marion Smith.

UNITED STATES PATENT OFFICE.

MARVIN SMITH, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN TURBINE FAN-BLOWERS.

Specification forming part of Letters Patent No. **48,986**, dated July 25, 1865.

To all whom it may concern:

Be it known that I, MARVIN SMITH, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Turbine Fan-Blowers; and I do hereby declare that the following is a full, clear, and exact description of the construction, character, and operation of the same, reference being had to the accompanying drawings, which make part of this specification, in which—

Figure 1 is a perspective view of the blower as ready for use, showing one end of the revolving fan, air-space, &c. Fig. 2 is a plan of the same, cut vertically through the center at right angles to the shaft, showing the vanes or blades of the fan, the volute-shaped fan-box, and annular disk or casing.

My improvement consists in making the revolving fan with a suitable number of vanes or blades and two broad annular disks or rings extending from the extreme outer ends of the vanes to about two-thirds of the distance to the hub or shaft, (forming side casings,) so that all of the air which passes in at the open center will (by the centrifugal force) be thrown out at the outer extremities of the vanes into the volute fan box or chamber, thus keeping up a partial vacuum to cause the air from without to be forced in through the central opening, while it will all be forced out at the ends of the vanes into the volute-shaped chamber or fan-box and out at the orifice.

I make the frame A A A of cast-iron or any other suitable material, substantially in the form represented in Fig. 1, with a circular hole or space in the central part, (through both disks,) as indicated at *a a*, Fig. 1, and also in section in Fig. 2, of the proper size to receive the rotary fan or blower B B; and between the two disks of the frame I fit a flange or band, C, Fig. 1, in a scroll or volute position, as shown at C C, Fig. 2, which forms the fan box or chamber through which the blast is forced (by the revolution of the fan) out at the orifice or embrasure D, Figs. 1 and 2.

I make the fan of iron or any other suitable material, with a suitable number of vanes or blades attached to the shaft *c*, as shown at *b b*, &c., in Fig. 2 and in part in Fig. 1, and of a

width along the shaft equal to the depth of the fan box or chamber C in that direction. On the two edges of these vanes I fit annular disks or casings, which should extend about two-thirds of the distance from the outer extremity of the vanes to the shaft, as shown at B, Figs. 1 and 2, so as to inclose the outer portion of the two sides, so that when the fan is revolved in the direction indicated by the darts the air will be carried round in apartments closed on four sides, whence it can only escape by the centrifugal force (as indicated by the darts) into the volute-shaped chamber or fan-box. (Shown at *a a D*, Fig. 2.) On the shaft or arbor *c* I fit a suitable driving-pulley, *d*, on which a belt is worked to drive the fan. I fit two suitable posts or standards, one of which is shown at E, Fig. 1, and the other is opposite, but not seen, which support the bearings for the journals of the shaft, as at *g*, Fig. 1.

Having made the several parts as before described, and fitted the fan in its position, as represented in Fig. 1, I put it in motion by a belt on the driving-pulley *d*, and revolve it in the direction indicated by the darts, when, by the centrifugal force, the air in the spaces between the vanes *b b*, &c., will be thrown out, as indicated by the darts, into the volute fan-box, as *a a*, and the blast forced out at D; and as the centrifugal force displaces the air within a partial vacuum will be formed, into which the outer air will be forced, so as to produce a constant blast at D.

The advantages of my improvement consist in that by having the annular disks or casings attached to the vanes, so as to revolve with them, the air is much more compressed in the apartments of the fan, and in its motion it is free from friction, except that which is caused by its impinging on the concave surface of the volute-shaped fan box or chamber, where the deflection is easy and regular, and amounts to but a mere fraction of that which is caused by the air coming also in contact with the plain sides of the stationary parts or sides of the fan-box, when they cover a large portion of the length of the vanes, as has heretofore been the case, so that to equal the force of the blast the velocity of the fan is required

to be only a small part of that commonly used. Thus it saves a great amount of wear and expense of repairs, as well as great liability to accident from such high velocity, while it will accomplish the desired result in a much more simple and yet efficient manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the annular disks or

casings B B with the vanes or blades *b b*, &c., when the whole is constructed, arranged, and fitted to operate with the parts C and D, substantially as herein described

MARVIN SMITH.

Witnesses:

L. D. DAVIS,

R. FITZGERALD.