I. M. PHELPS.
Fan-Blower.

No. 206,129. Patented July 16, 1878.

Fig. 1.

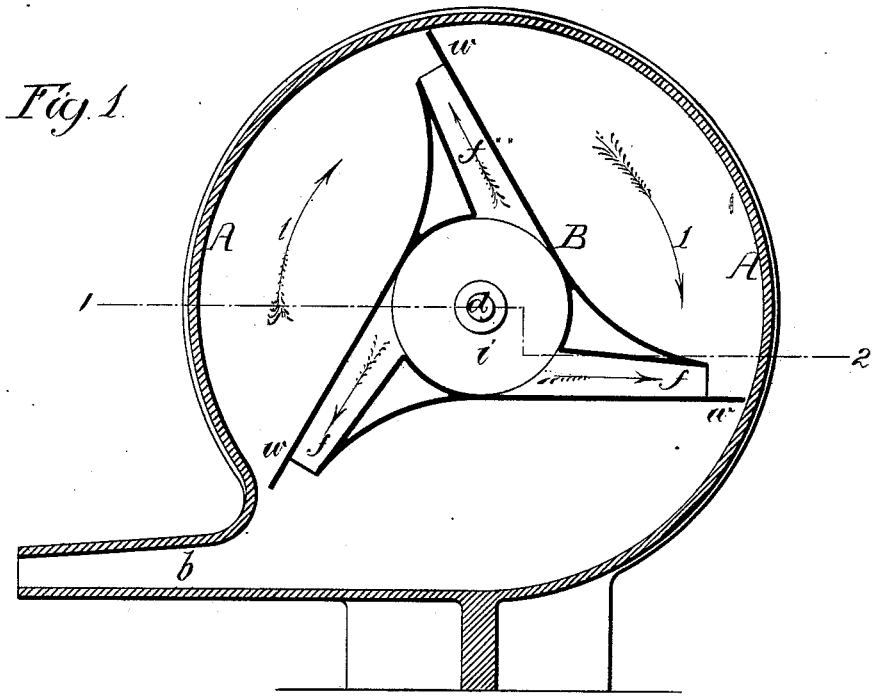


Fig. 2.

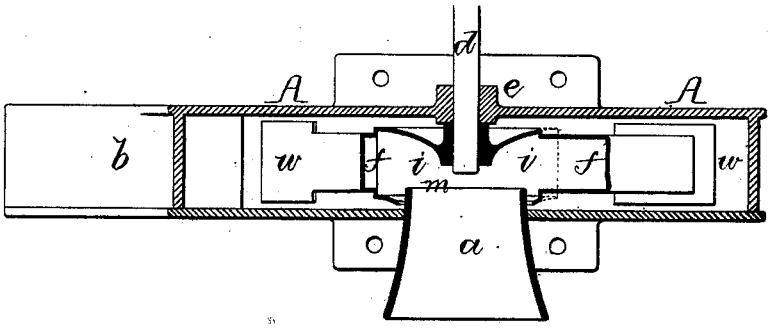
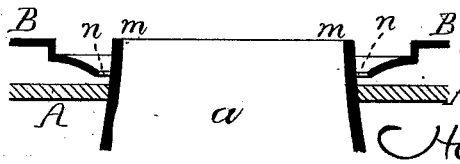


Fig. 3.



Witnesses,
Harry Smith
John W. Beemer

Inventor:
Ira M. Phelps
by his Attorneys
Houston and Co.

UNITED STATES PATENT OFFICE.

IRA M. PHELPS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN SHILLITO, JR., OF SAME PLACE.

IMPROVEMENT IN FAN-BLOWERS.

Specification forming part of Letters Patent No. **206,129**, dated July 16, 1878; application filed April 16, 1878.

To all whom it may concern:

Be it known that I, IRA M. PHELPS, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Fan-Blowers, of which the following is a specification:

The object of my invention is to construct a fan-blower which will impart a greater pressure to the air than those in common use, and this object I attain in the following manner, reference being had to the accompanying drawing, in which—

Figure 1 is a longitudinal vertical section of my improved fan-blower; Fig. 2, a sectional plan on the line 1 2, and Fig. 3 an enlarged view of part of the device.

The casing A of the blower is of the usual form, and has a discharge-nozzle, *b*, at the base, and in one side a central inlet-opening, to which, in the present instance, is tightly fitted a funnel, *a*. Within the casing A is arranged a wheel, B, the shaft *d* of which is adapted to a bearing, *e*, in the back of the casing, and this wheel B has hollow arms *f*, (three in the present instance,) which communicate with the hollow hub *i* of the wheel, the said hub being open at one side, so as to receive the inner end of the funnel *a*, which projects beyond the inside of the casing A, so as to form an annular flange, *m*.

The opening in the hub *i* is somewhat larger in diameter than the said flange *m*, so that an annular space, *n*, intervenes between the two, as shown more fully in Fig. 3.

On the front of each of the arms *f* is a blade, *w*, which, in the present instance, projects beyond the sides of the arm, and also beyond the end of the same, as shown in Figs. 1 and 2.

When the wheel B is revolved rapidly in the directions of the arrows 1, air will enter the hollow hub *i* through the funnel *a*, and this air will pass through the hollow arms *f* with a force due partly to centrifugal action, and partly to the partial vacuum existing immediately in the rear of the projecting portions of the rapidly-moving blades *w*.

The air which thus enters the casing is acted upon by the succeeding blade, and is thereby forcibly driven out through the discharge-nozzle *b*.

By means of the hollow arms *f* the air is at once conveyed to a point where it is directly in the path of the blades, so that the full blowing or fanning effect of the latter is utilized.

As the funnel *a* fits tightly in the opening in the casing A, all leakage of air at the inlet is prevented, any air which passes between the outer face of the wheel B and the casing A being directed by the projecting flange *m* of the funnel *a* into the hub *i* through the annular space *n*, so that it does not interfere with the free inlet of air through the opening *a*.

By allowing the space *n* to intervene between the edge of the opening in the hub of the wheel B and the funnel *a*, I overcome the friction which would be caused by a contact of these two surfaces.

The blades *w* need not in every case project beyond the ends of the arms *f*, nor even beyond the sides of the same—for instance, the arms might be made of such a width that they would themselves form blades without any addition. The form shown, however, is preferred.

I claim as my invention—

1. The combination of the casing A, having an inlet and outlet, with the wheel B, having a hollow hub, *i*, and hollow arms *f*, which afford communication between the hollow hub and the interior of the casing, and the fronts of which form or carry fanning-blades, all substantially as set forth.

2. The combination of the wheel B and its hollow arms *f*, open at the outer ends, with blades *w*, projecting beyond the ends of the arms, as specified.

3. The combination of the wheel B, having a hollow hub, *i*, the casing A, and the annular flange *m* around the inlet-opening, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IRA M. PHELPS.

Witnesses:
HARRY A. CRAWFORD,
HARRY SMITH.