

F. MURPHY.

EXHAUST AND BLOWER FAN.

No. 176,755.

Patented May 2, 1876.

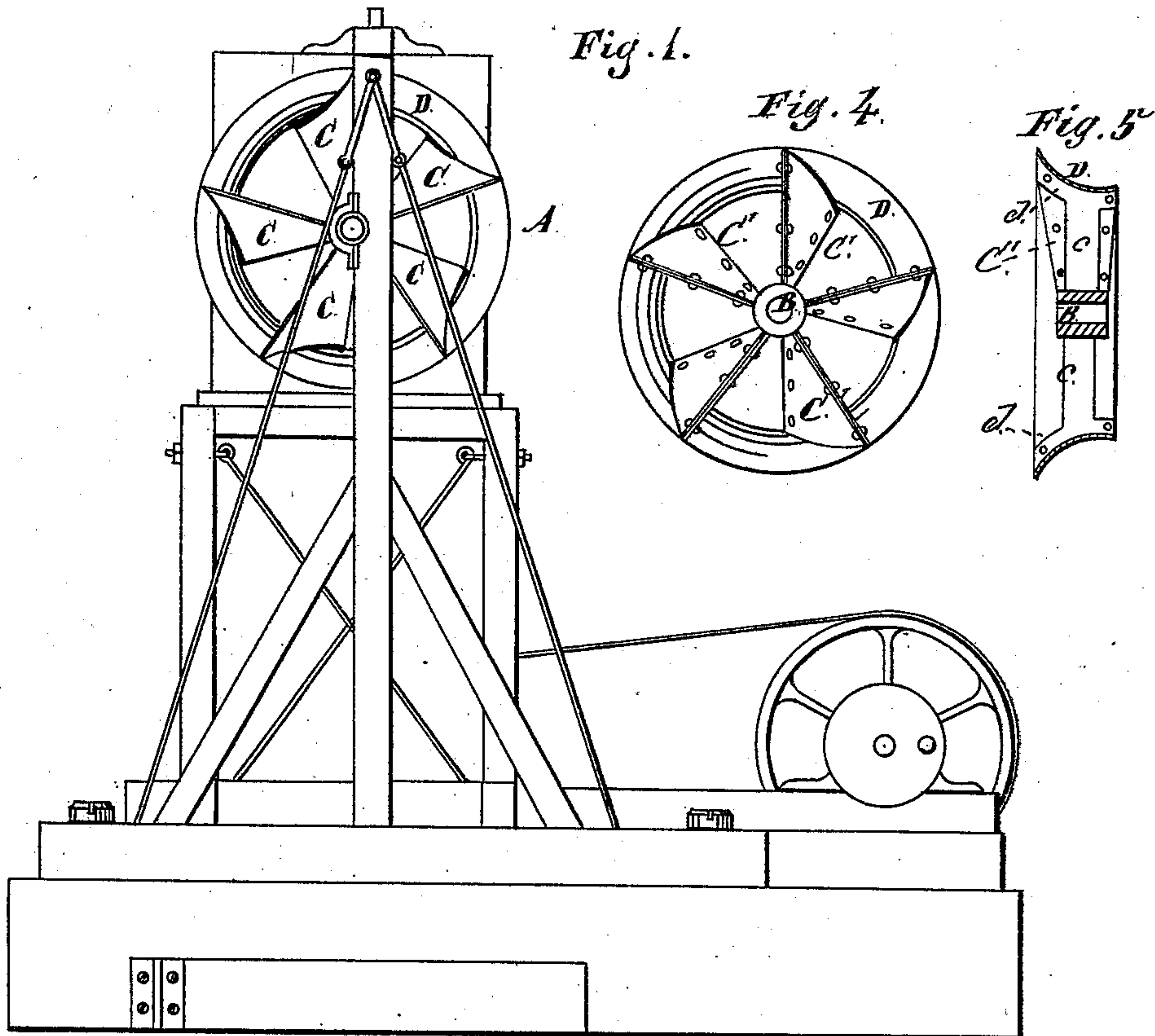


Fig. 1.

Fig. 4.

Fig. 5.

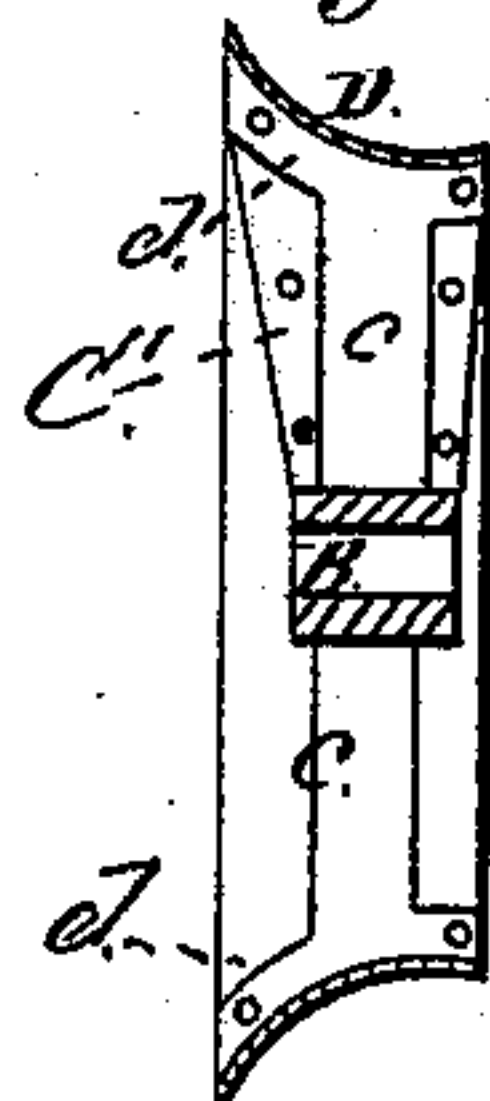
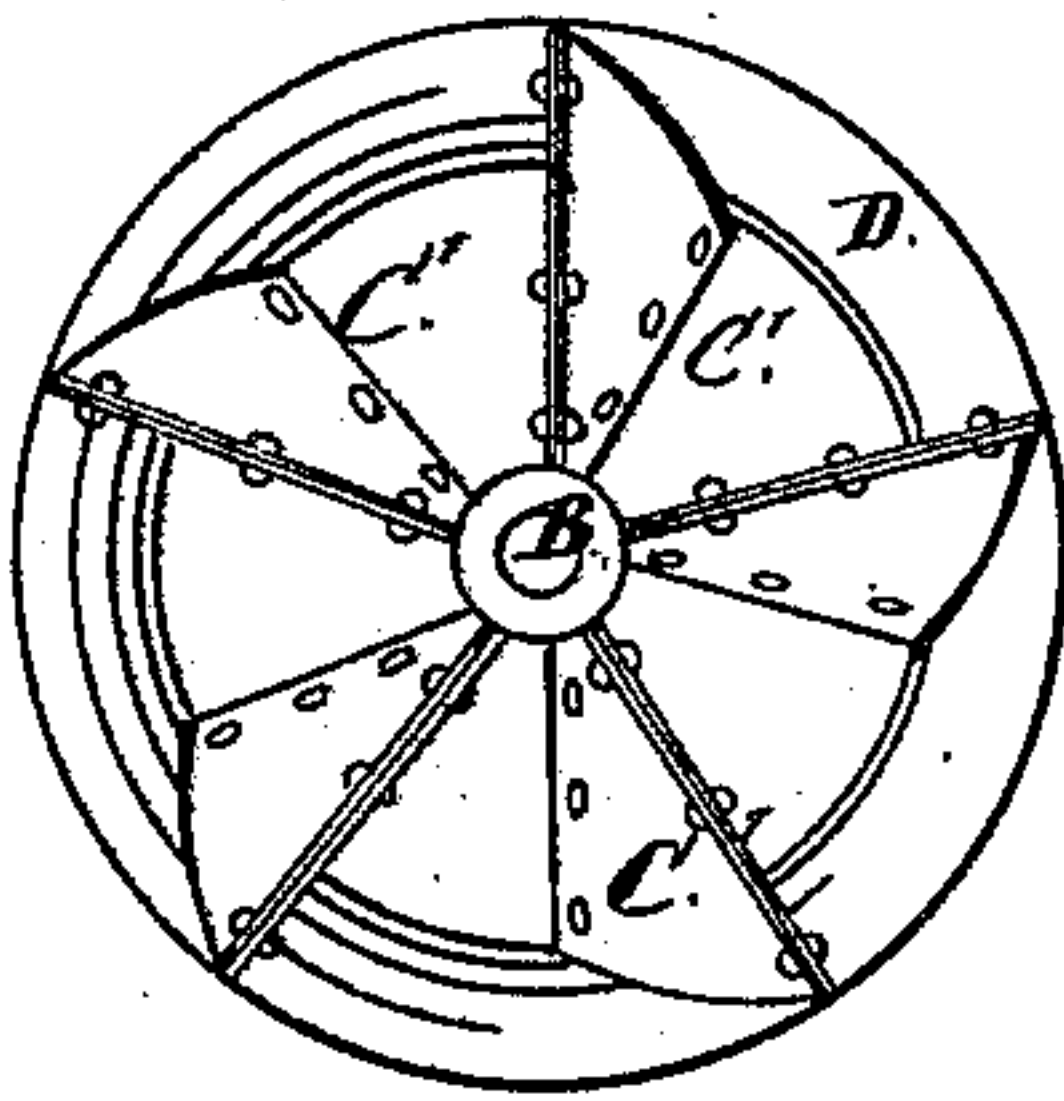


Fig. 2.

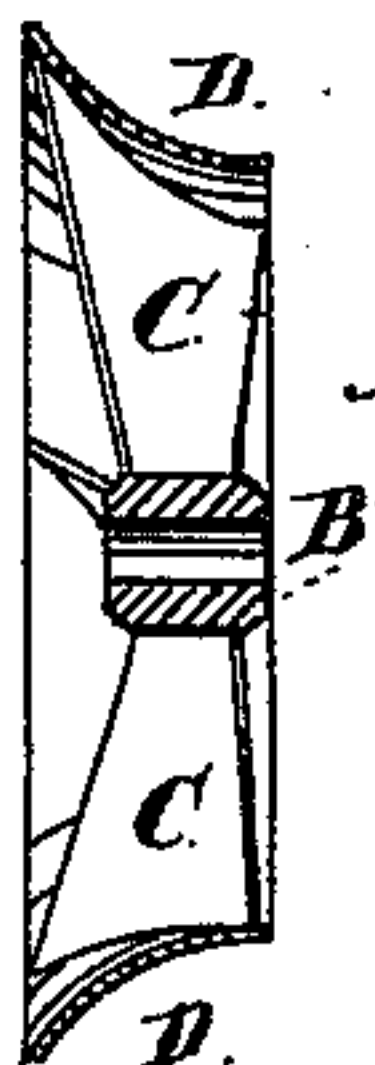
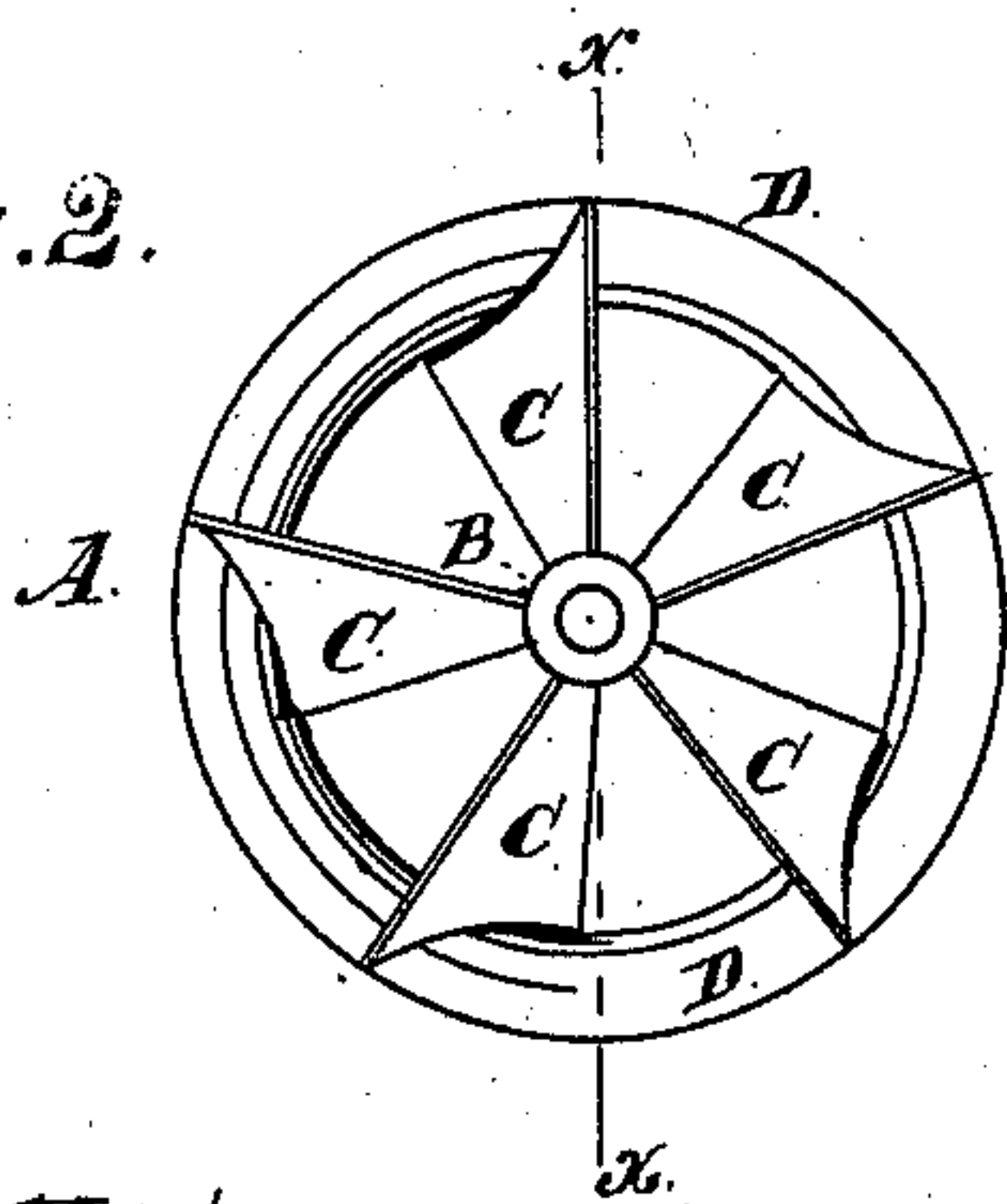


Fig. 3.

Witnesses:
S. A. Bunting.
Heinrich F. Bruns.

Francis Murphy,
Inventor.

By Coburn & Thacher
Attys.

UNITED STATES PATENT OFFICE

FRANCIS MURPHY, OF STREATOR, ILLINOIS.

IMPROVEMENT IN EXHAUST AND BLOWER FANS.

Specification forming part of Letters Patent No. **176,755**, dated May 2, 1876; application filed November 20, 1875.

To all whom it may concern:

Be it known that I, FRANCIS MURPHY, of Streator, in the county of La Salle and State of Illinois, have invented a new and useful Improvement in Exhaust and Blower Fans, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of an apparatus for ventilating mines, with my improved fan applied thereto. Fig. 2 is a front elevation of the fan; Fig. 3 a sectional view of the same, taken through the line *x x*, Fig. 2; and Figs. 4 and 5, a front elevation and cross-section, showing a modification in the construction of the fan.

The object of this invention is to produce friction, when the wheel is used as an exhaust-fan, and to facilitate the gathering and compression of the air when the fan is used as a blower.

The invention consists in surrounding the blades of the fan with a flaring or bell-shaped rim attached to the blades, substantially as described.

In the drawing, A represents the wheel or fan, consisting of an ordinary hub, B, to which the blades C are attached, the latter being curved, as clearly shown in Figs. 2 and 3. To the outer end of these blades a rim, D, is rigidly attached. This rim is gradually curved outward, so as to present a flaring or bell-shaped appearance, the outer diameter of the rim being considerably larger than the inner.

In an ordinary rimmed fan, the rim being of the same diameter throughout, when the fan is used for the purpose of exhausting, the outflowing current of air is restricted by the rim, and produces considerable friction.

By constructing the fan in the manner described above, this difficulty is largely obviated, for the current of air is permitted to expand the moment it enters the fan, and the expansion continues until the foul air, drawn from the mine or elsewhere, is finally dissipated in the surrounding atmosphere.

If the fan is used as a blower it will be seen that, by reason of the bell-shaped rim, a larger quantity of air will be gathered between the blades and forced backward until it enters the receiving-chamber.

Instead of casting the rim, blades, and hub together the fans may be cast with simply an arm or spoke, *c*, connecting the hub and rim, the spoke *c* being widened at the rim, so as to form a rib, *d*, on the latter, as shown in Fig. 5. Two pieces of sheet metal, *C' C'*, of suitable shape, are then placed within the rim, so as to inclose the spoke, in which position they are firmly fastened by rivets passing through their outer ends and the ribs *d*, their edges being also riveted together, as clearly shown in Fig. 5. If desired, a rib may also be cast on the hub, to which the blade-plates may be riveted, and for greater security the plates, if necessary, may be riveted to the spokes along their entire length.

I prefer this construction, as it is very difficult to cast the fan entire of so large a size as is required for actual use; but the rim, small spokes, and hubs may be cast without difficulty.

The ventilating apparatus to which the fan is applied, as shown in Fig. 1, forms no part of this application, as it is described and claimed in other applications for patents already made by me.

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

1. The exhaust fan or blower, constructed with blades C and the flaring or bell-shaped rim D, substantially as described.

2. The combination of the rim D, provided with a rib, *d*, the spokes *c*, and the plates *C' C'*, substantially as and for the purposes set forth.

FRANCIS MURPHY.

In presence of—

HEINRICH F. BRUNS,
L. A. BUNTING.