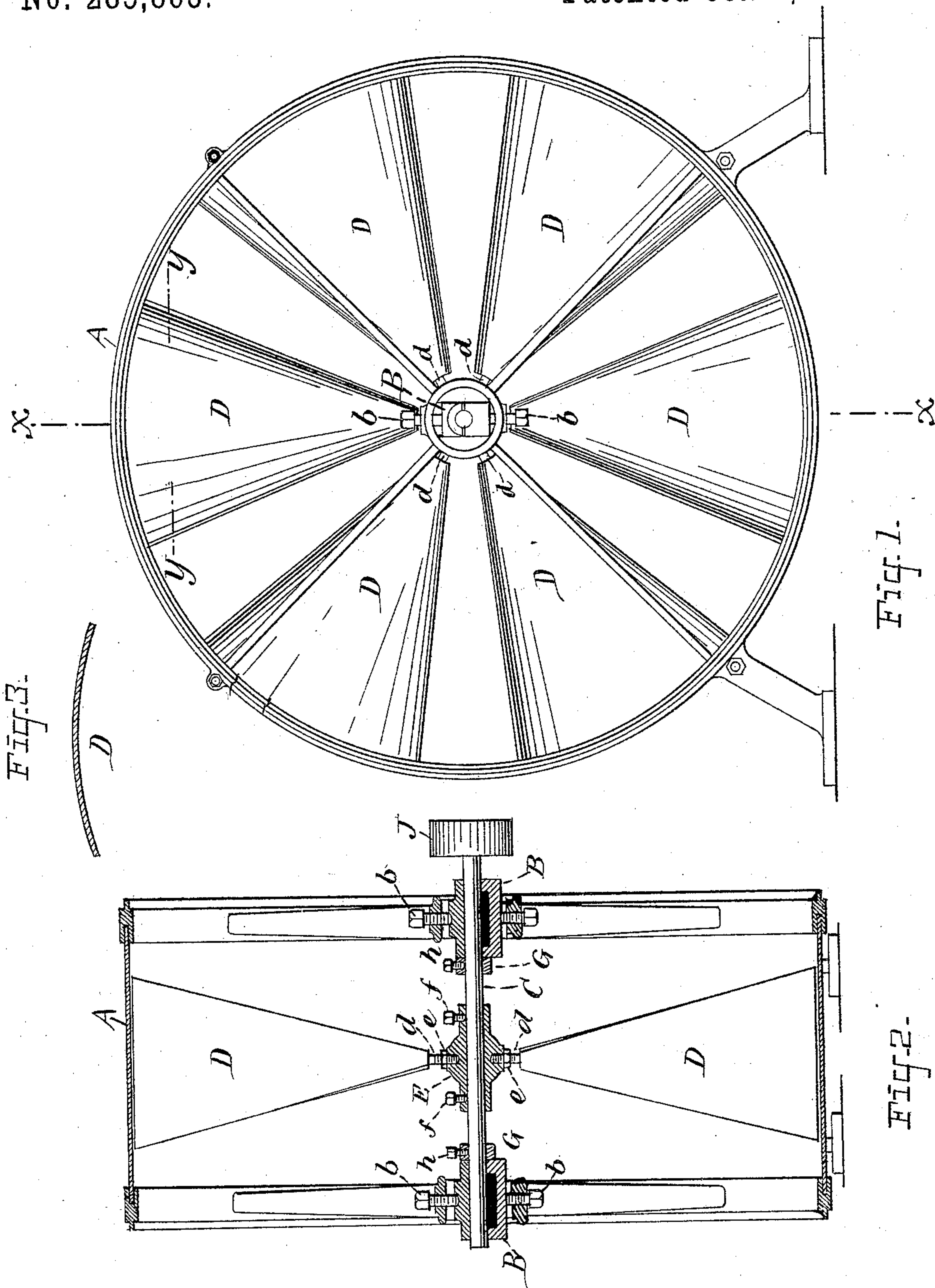


(No Model.)

L. J. WING.  
VENTILATING APPARATUS.

No. 285,865.

Patented Oct. 2, 1883.



ATTEST:

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att'y.



# UNITED STATES PATENT OFFICE.

LEVI J. WING, OF BROOKLYN, NEW YORK.

## VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 285,865, dated October 2, 1883.

Application filed January 5, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, LEVI J. WING, a citizen of the United States of America, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Ventilating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an apparatus for ventilating buildings, factories, mines, and for all similar purposes.

The invention consists, essentially, in a novel construction, arrangement, and combination 15 of a fan-wheel and its blades and connections, whereby provision is made for adjusting the various parts to different positions, all as hereinafter more particularly described.

In the accompanying drawings, Figure 1 represents a side view of my improved ventilator. Fig. 2 is a transverse vertical section taken in line *x x*, Fig. 1. Fig. 3 is a cross-section of blade, taken in line *y y* of Fig. 1.

Similar letters indicate similar parts.

25 The cylindrical casing A has its ends or sides of skeleton form, made of cast-iron, and so constructed and arranged as to allow a sheet-iron pipe to be slipped on either end, for the purpose of carrying air any distance required, and provided with adjustable journal-boxes B, in which the fan-shaft C has its bearings. These boxes or bearings are divided, and are provided with set-screws *b*, by means of which they may be adjusted at pleasure. The 35 lower box of each bearing is cast hollow or in two sections, and forms an oil-cellar, receiving the surplus oil applied, or may be filled when first used. In the center of this lower box is placed a worsted or cotton wick, with one end touching bearing of shaft, keeping the bearing lubricated.

The fan-blades D are curved in their cross-section, as shown in Fig. 3, and are spread from the inner to the outer end, for the purpose 45 of producing a gradually increasing or expanding pitch from the anterior to the posterior portion of the blade. The anterior part of the surface of the blade having set the air in motion, the posterior part or portion of the blade, 50 having a greater or expanding pitch, propels

the air with greater and increased velocity. Each blade is held in position by a wrought-iron arm, to which the blades are riveted or bolted. Each arm has a thread cut on it to screw it into the hub E, with a jam-nut, *e*, between said hub and the blade. The pitch of 55 the blades can be increased or diminished to suit different circumstances by slackening the jam-nut *e* and turning or changing the angle of the blade with the shaft, then tightening the 60 jam-nut against the hub to retain it in position, thereby enabling the ventilating-fan to be changed from an exhaust-fan to a force-blower without changing the position of fan-belts, pipes, &c., it being only necessary to change 65 the angle or position of the blades. Thus it can be alternated to suit demands in use. The blades can be reversed so as to change the fan from an exhauster to a force-blower—that is, the blades being reversed by slackening the 70 jam-nut, and being turned around, the curvature of the blades is reversed. This is done without changing the direction of the fan, and without any change of belt.

The hub E is held fast on the shaft C by 75 means of set-screws *f*. Between the hub and the bearings B on the shaft are placed collars G, held in place by set-screws *h*. As herein shown, the shaft G has a driving-pulley, J, at one end. When it is desired to change the 80 pulley J from one end of the shaft to the other, the set-screws *b*, *f*, and *h* are loosened. The pulley is then removed and the shaft moved longitudinally to the desired position, after which the set-screws are tightened, as before— 85 that is, if it be not practicable or advisable to drive the fan with the pulley J on the suction or receiving side of the fan, the shaft can be pushed through and be driven from the delivery side of the fan. 90

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

1. A ventilating-fan having its blades curved transversely and spread from the inner to the outer end to produce an expanding pitch from 95 the anterior to the posterior edges of the blades, in combination with a means for adjusting the angle of such blades relatively to the axis of the fan, as and for the purpose herein described.

2. In a ventilating-fan, the combination of 100

a hub, E, and fan-blade D, curved in cross-section and spread from the inner to the outer end, with screw-shank *d* and jam-nut *e*, substantially as and for the purpose described.

5 3. The combination, with the adjustable shaft C, hub E, and set-screws *f*, of the fan-blades and the detachable pulley fixed to said shaft, as herein shown and described.

10 4. In a ventilating-fan, the combination, with the adjustable shaft C, and with the fan-blades and the detachable pulley fixed to said shaft, of the divided boxes or bearings B and set-screws *b*, as herein shown and described.

5. In a ventilating-fan, the combination, with the longitudinal adjustable shaft C, and 15 with the fan-blades and detachable pulley fixed to said shaft, of the boxes or bearings B and set-screws *b*, the collars G, set-screws *h*, hub E, and set-screws *f*, substantially as and for the purpose shown and described. 20

In testimony whereof I affix my signature in presence of two witnesses.

LEVI J. WING.

Witnesses:

FRANCIS C. BOWEN,  
CHAS. P. WARDER.