(No Model.)

W. D. SMITH.

ROTARY VENTILATING FAN.

No. 339,030. Patented Mar. 30, 1886.

Fig. 1

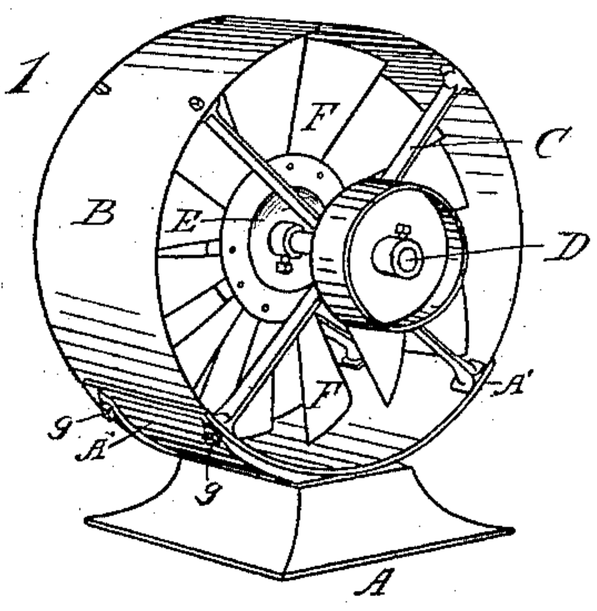


Fig 2

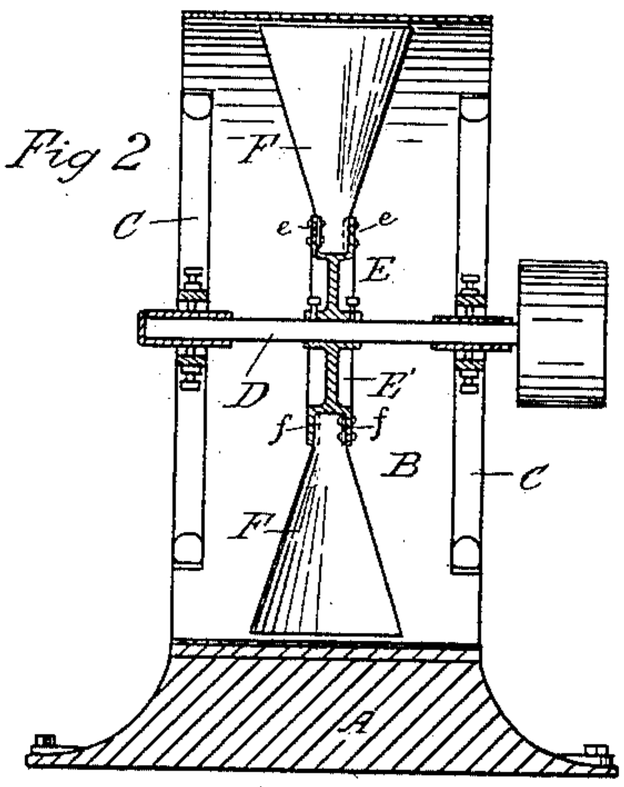
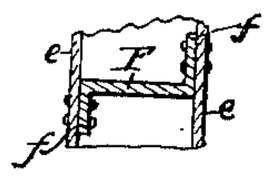


Fig. 3.



Attest

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UNITED STATES PATENT OFFICE.

WRIGHT D. SMITH, OF DETROIT, MICHIGAN, ASSIGNOR TO THE HUYETT & SMITH MANUFACTURING COMPANY, OF SAME PLACE.

ROTARY VENTILATING-FAN.

SPECIFICATION forming part of Letters Patent No. 339,030, dated March 30, 1886.

Application filed October 1, 1883. Renewed January 21, 1885. Again renewed December 17, 1885. Serial No. 185,070. (No model.)

To all whom it may concern:

Be it known that I, WRIGHT D. SMITH, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Rotary Ventilating-Fans; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in the construction of rotary ventilating-fans; and the invention consists in the peculiar construction of the wheel, in the peculiar means for furnishing bearings to the fan-shaft, and in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter set forth.

The purposes for which this fan is designed are principally for ventilating buildings, mines, malt-houses, &c.; also for various kinds of malt-houses where a large volume of air is required at a moderate speed.

In the accompanying drawings, Figure 1 is a perspective view of my improved device. Fig. 2 is a vertical central cross-section of the same. Fig. 3 is a sectional detail.

A represents the bed of the fan-case, provided with wings or extensions A′, said bed being designed to be bolted or otherwise secured to the floor or ceiling, or any other convenient place in the building in which it is to be used. This bed with its wings I preferably make of cast-iron, with its upper surface conforming in shape to the periphery of the fan-case B, which latter is cylindrical in shape, and is made of sheet metal and bolted to the wings A′ of the bed A. At each end of the bed-plate I rigidly secure two arms of a four-arm hanger, C, to the center of which is secured the proper boxes for carrying the shaft D, on which the wheel or fan is secured. The two upper arms of the hanger are fastened to the sheet-metal portion of the fan-case, which latter entirely surrounds and closes the periphery of the wheel.

E represents a suitable hub or disk, having a solid center, E′, and circumferential flanges *e*, to which the inner ends of the blades F are rigidly secured by bolts or rivets passed through flanges *f*, extending in opposite directions and at right angles to the said inner ends. Said blades are so constructed that their inner ends and side edges at the disk travel nearly parallel with one another and parallel with the travel of the wheel. Then they turn outward from the inner end of the blades spirally or screw-shaped until at the outer end of the blades they stand at or nearly an angle of one-eighth of a turn from the inner end, and a line drawn from the center of the disk or hub to the center of the blades at their outer ends would pass directly across the center of the face of the blade.

The reasons for this construction are as follows: The farther from the center toward the periphery of wheel the greater the velocity of its travel, and hence a greater resistance of air, and the more air will be forced ahead and through the wheel, and it will be seen that if the wheel travels ten thousand feet per minute at the periphery, and only five thousand feet at half-periphery, the outer portion of the wheel forces the air so much stronger than the inner portion that in case there was the least obstruction in the air-outlet the air would pass through the outer portion of wheel and back through the inner portion, providing the blades stood at the same angle or pitch from the inner to outer ends; but I find by experiments that blades constructed spiral-shaped and mounted as described will retain the air evenly from center to periphery, while it allows a free passage and flow of air directly through the wheel and case.

I am aware of the Patents Nos. 273,805 and 285,865, and make no claim to the constructions shown therein as forming part of my invention.

It will be observed, on reference to Fig. 1, that the bolts *g* pass through the extension A′ and the case B into the hangers C, thus firmly securing these parts together.

What I claim as my invention is—

1. The combination, with the base A, provided with the extensions A′ and the case B, of the hangers C, supporting the fan-case and fan-shaft, and firmly secured to said extensions

by the bolts *g*, passing through said case and extension into the ends of said hangers, substantially as described.

2. In a rotary fan, the combination, with the base A, case B, hangers C, supporting said case, shaft D, and disk E, having a hub fitting the shaft and circumferential flanges *e*, of the spiral blades F, provided at their inner ends with flanges *f*, extending in opposite directions and at right angles to said inner ends, and secured between the flanges *e* of the hub by bolts passing through said flanges *e* and *f*, substantially as and for the purpose specified.

WRIGHT D. SMITH.

Witnesses:
J. C. MULFORD,
T. F. WATSON.