C. M. LEE.

CENTRIFUGAL EXHAUST FAN.

APPLICATION FILED JULY 2, 1917.

1,329,668. Patented Feb. 3, 1920.

Fig. I

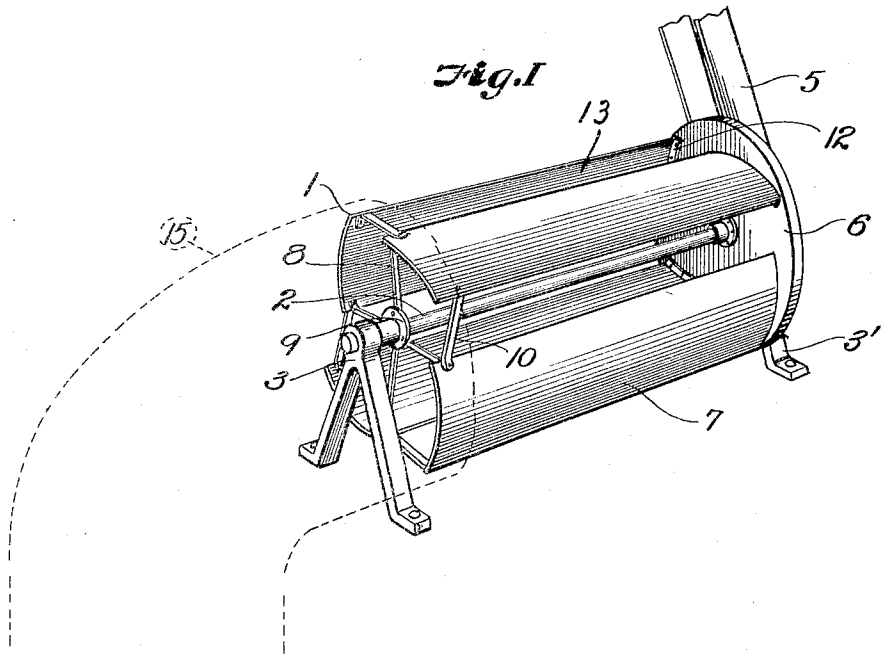


Fig. II

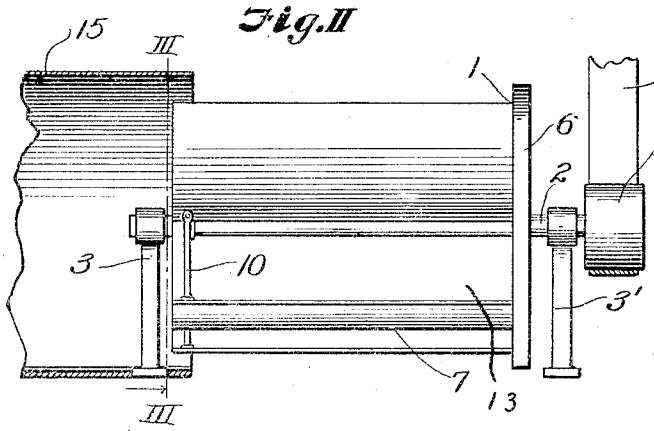
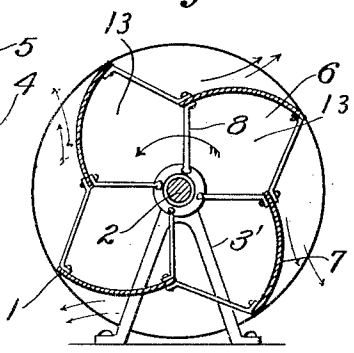


Fig. III



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CENTRIFUGAL EXHAUST-FAN.

1,329,668. Specification of Letters Patent. Patented Feb. 3, 1920.

Application filed July 2, 1917. Serial No. 178,101.

To all whom it may concern:

Be it known that I, CHARLES M. LEE, a citizen of the United States, residing at Falls City, in the county of Richardson and State of Nebraska, have invented certain new and useful Improvements in Centrifugal Exhaust-Fans; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon which form a part of this specification.

My invention relates to centrifugal exhaust fans, and more particularly to a fan of that character employing a substantially cylindrical rotary member, or fan wheel, comprising a plurality of parallel vanes so located relative to each other that rotation of the fan will tangentially discharge air therefrom; the principal object of the invention being to provide a fan of this character adapted for use in stores, mills, factories, etc., for ventilating, or other purposes, which is of simple and substantial construction, yet highly efficient and practically noiseless.

In accomplishing this object, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Figure I is a perspective view of a fan constructed according to the present invention.

Fig. II is a side elevation of the same, shown in functional relation to an air shaft.

Fig. III is a transverse, sectional view of the fan wheel on the line III—III, Fig. II.

Referring more in detail to the drawings:

1 designates a rotary fan embodying the present invention, comprising a longitudinally arranged drive shaft 2, which is revolubly supported adjacent its opposite ends by brackets 3—3′ and is provided at one end with a belt wheel 4 over which a belt 5 may operate to drive the fan.

Fixed to the shaft adjacent the belt wheel 4, is a head or drum 6, and mounted thereon and extending in parallel relation longitudinally along the shaft 2 are vanes 7, each of the latter being supported at its end opposite the drum 6 by brace rods 8, which are attached at their outer ends to the forward edges of the vanes and at their inner ends to a collar 9 that is fixed on the shaft 2, and are spaced apart by brace rods 10, extending between adjacent edges of the vanes so that the latter are held substantially rigid along the drive shaft.

Each of the vanes 7 comprises an oblong metal sheet, curved transversely to present an outwardly facing convex surface, and is provided at one end with an inturned flange 12 for receiving nails or bolts, whereby it may be attached to the head 6; the vanes being mounted on the head with their forward, longitudinal edges located below and slightly back of the rear edge of a forward blade, forming passages 13 therebetween, so that as the wheel revolves forwardly air will be drawn from the interior of the cylinder and discharged tangentially from the vanes, tending to create a vacuum within the cylinder which creates a suction at the open end of the fan cylinder.

When in use, the open end of the fan wheel is located adjacent the discharge or intake end of an air shaft 15, so that with the fan operating in the direction indicated by the direction of the central arrow (Fig. III), the tendency to create a vacuum within the cylinder causes a draft of air through the shaft; the force of the draft created being dependent on the rate at which the fan is driven and its discharging capacity.

It is also apparent that by reversing the direction of rotation of a fan of this construction, a current of air may be forced into an air shaft instead of being drawn therefrom.

Fans of this type are usually operated at high speed and it has been found that the present arrangement of blades effects considerable higher efficiency than in those wherein the blades have the spiral form and produces a fan of great rigidity and strength.

It is further apparent that the efficiency of the fan may be increased to a certain extent by an increase of the number of vanes, or by a lengthening of the fan cylinder.

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

A fan of the class described comprising a longitudinal drive shaft, a head on said drive shaft, a plurality of vanes, each connected at one end to the head and extending

longitudinally of said shaft to form a fan cylinder, the forward longitudinal edge of each blade being spaced below the rear longitudinal edge of a preceding blade, braces connected to the shaft at points distant from the head, said braces being laterally disposed and engaging the rear edges of the blades or vanes, and additional braces adjacent to the first named braces, the additional braces being connected to the rear edge of one blade or vane and the forward end to an adjacent blade or vane.

In testimony whereof I affix my signature.

CHARLES M. LEE.