

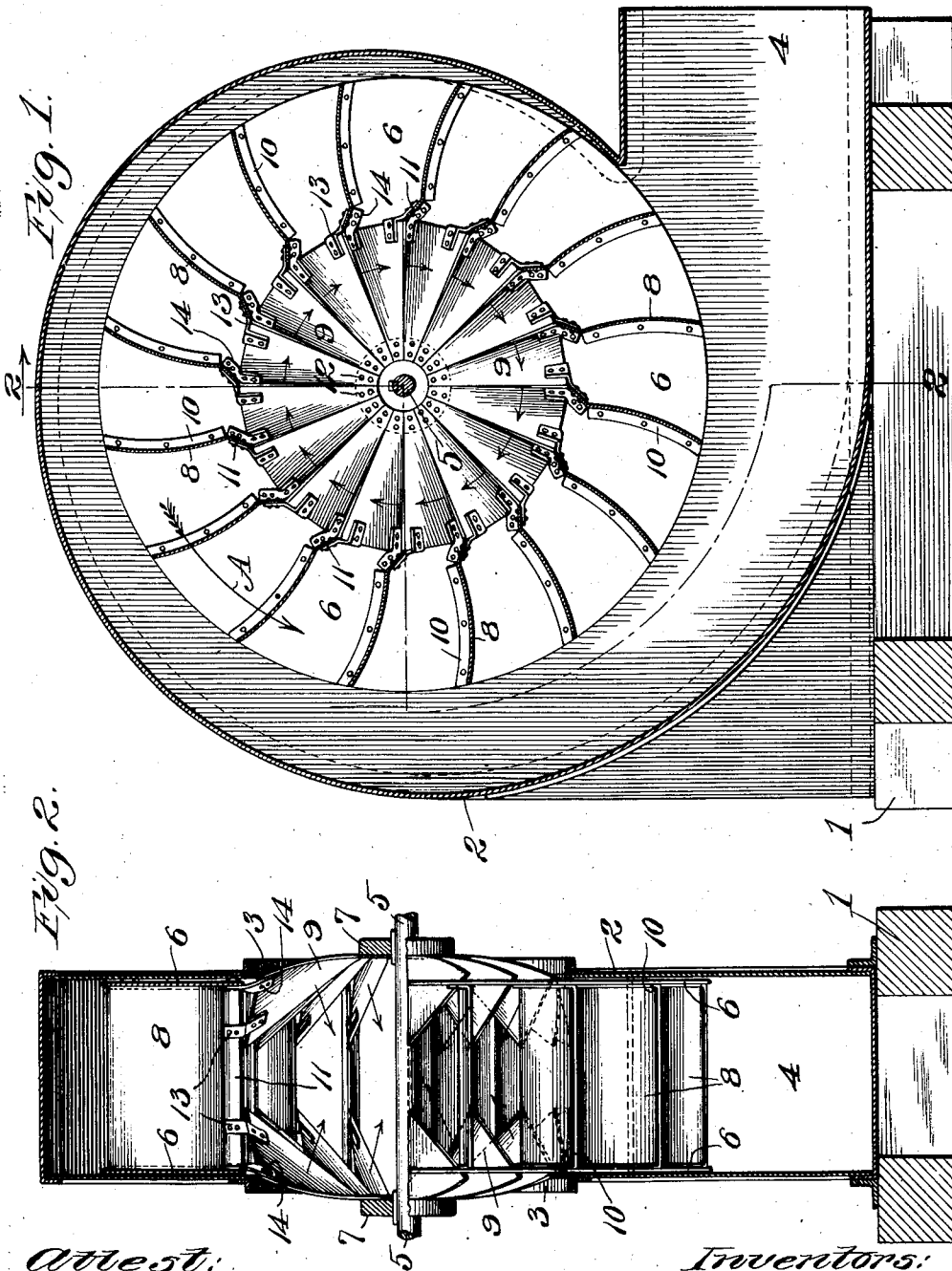
F. NOLD & L. E. WILDERMAN.

MECHANICAL DRAFT FAN.

APPLICATION FILED NOV. 6, 1911.

1,049,758.

Patented Jan. 7, 1913.



Attest:
W. H. Scott.
E. L. Mallan.

Inventors:
Frederick Nold,
Loren E. Wilderman,
by Higdon & Longan attys.

UNITED STATES PATENT OFFICE.

FREDERICK NOLD AND LOREN E. WILDERMAN, OF FREEBURG, ILLINOIS.

MECHANICAL DRAFT-FAN.

1,049,758.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed November 6, 1911. Serial No. 658,830.

To all whom it may concern:

Be it known that we, FREDERICK NOLD and LOREN E. WILDERMAN, citizens of the United States, and residents of Freeburg, St. Clair county, Illinois, have invented certain new and useful Improvements in Mechanical Draft-Fans, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to improvements in mechanical draft fans, and the object of our invention is to construct a fan, the construction of which reduces the cost of such fans to a minimum and, by the peculiar shaping and arrangement of the blades of the fan, a maximum of efficiency is obtained.

With the above purposes in view our invention consists in certain novel features of construction and arrangement of parts as will be hereinafter more fully described, pointed out in the claims and illustrated by the accompanying drawings, in which—

Figure 1 is a sectional elevation of our complete fan and casing; and Fig. 2 is a transverse, sectional elevation taken on the line 2—2 of Fig. 1 and in the direction indicated by the arrow.

Referring by numerals to the accompanying drawings: 1 designates the base which supports the fan casing 2. The casing or stator 2 is preferably constructed, as shown, of sheet metal and is of the ordinary design having the in-take openings 3 in the side walls of the casing and the outlet 4, the walls of which outlet are tangential extensions of the casing 2.

5 designates the shaft upon which the rotor is mounted. This shaft is mounted in bearings, not shown, which are preferably independent of the casing or stator. The rotor comprises two spaced apart rings 6, the collars 7, the blades 8 and the blades 9. When the rotor is completely assembled and in position relative to the casing the rings 6 occupy positions within the casing and the collars 7 occupy positions outside of the casing.

Each of the blades 8, which will be hereinafter termed peripheral blades, have their end margins turned at right angles to form flanges 10 whereby the blades 8 may be secured by rivets or bolts to the rings 6. The blades 8 and flanges 10 are bent relative to radial lines through the rotor to present

convexed surfaces for the expelling of air from the casing. The body portions of each of the blades 8, that is the convexed surfaces as well as the flanges 10 referred to, do not extend the full distance between the inside and outside margins of the rings 6. From the innermost end of the convexed or body portion each of the blades 8 has a forwardly inclined plane portion 11 which extends the full width between the rings 6 and occupies a position at a tangent relative to a radial line through the rotor. The blades 8 and rings 6 are connected with the collars 7 by means of the blades 9, each of which blades is tapered and their outermost margins have greater lengths than their innermost margins. Each of the blades 9 is secured to the collars 7 by means of rivets or bolts 12 and at their outer ends each blade 9 is secured to the forwardly inclined portions 11 of the blades 8 by means of a strap 13 and to one of the rings 6 by means of a strap 14. The forward margin of each of the blades 9 is held outside of the casing 2 and the rear-most margin of each blade 9 extends within the casing.

In the practical operation of our fan power is applied to the shaft 5 and the rotor set in motion and, when employed as a draft fan, is rotated in the direction of the arrow A in Fig. 1. The blades 8 serve to expel the air from the casing and thus produce a partial vacuum or suction which tends to draw the air through the in-take openings into the casing. The function or office of the blades 9 is to reach out or extend to atmosphere or air outside of the casing and introduce it with force into the partial vacuum formed by the expelling of air from the casing by the blades 8. The air thus drawn into the casing by the blades 9 is first received by the forwardly inclined plane portions of the blades 8, the inclines of which plane portions 11 serve to force the air toward the outer wall of the casing. After the air passes over the inclined portions 11 it is received by the convexed body portions of the blades 8 which convexity further serves to force the air toward the outer wall of the casing. In this manner the rotor, as a whole, has no portion which might create a "back" pressure.

By the construction shown we are enabled to build practically the entire rotor from sheet metal which materially lessens the cost of fan rotors.

We claim:

1. In a mechanical draft fan, the combination with a casing of a rotor comprising radial blades which extend transversely of the casing, each blade having a forwardly inclined inner end and blades which extend from the first mentioned blades to a point adjacent the axis of the rotor, the forward margins of which last mentioned blades extend outside of the casing and their inner margins extend to points within the casing, the outermost ends of said blades approximately paralleling said radial blades and the innermost ends disposed at approximately right angles to the outermost ends.
2. In a mechanical draft fan, the combination with a casing having intake openings in its side walls and a peripheral outlet, of a rotor comprising blades extending transversely relative to the casing and radially relative to the rotor, and a set of blades adjacent each intake opening, each blade of which is located wholly within the casing at its outer end and extended outside the casing at its inner end, the outer end of each of said blades being substantially at right

angles relative to the inner end, said outer ends being approximately parallel with the radial blades and of greater width than the inner ends.

3. In a mechanical draft fan, a rotor comprising spaced apart rings and spaced apart collars, the collars being wider apart than the rings, a plurality of convexed blades having forwardly inclined inner ends connecting said rings, and a plurality of blades arranged between and connected with said rings and collars, the innermost ends of said last mentioned blades being substantially parallel with said collars and the outermost ends of said last mentioned blades being substantially parallel with the first mentioned blades.

In testimony whereof, we have signed our names to this specification, in presence of two subscribing witnesses.

FREDERICK NOLD.
LOREN E. WILDERMAN.

Witnesses:

E. L. WALLACE,
E. E. LONGAN.