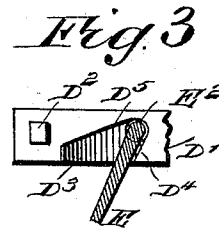
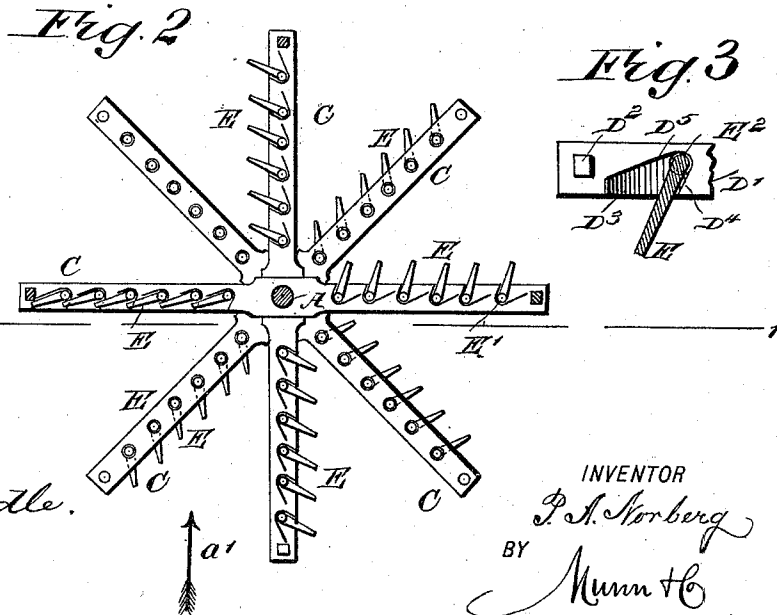
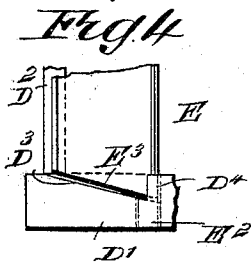
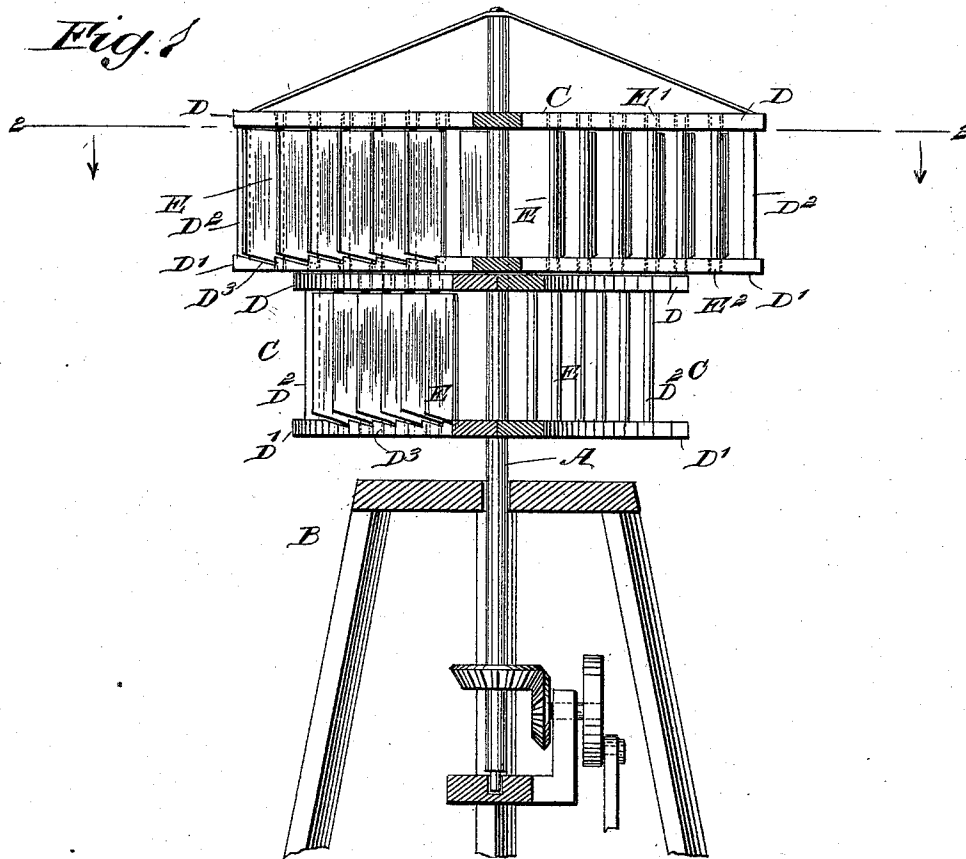


(No Model.)

P. A. NORBERG.
WINDMILL.

No. 535,120.

Patented Mar. 5, 1895.



WITNESSES:
S. McAuley.
C. Sedgewick

INVENTOR
P. A. Norberg
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

PETER A. NORBERG, OF ROSLYN, WASHINGTON.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 535,120, dated March 5, 1895.

Application filed April 3, 1894. Serial No. 506,193. (No model.)

To all whom it may concern:

Be it known that I, PETER A. NORBERG, of Roslyn, in the county of Kittitass and State of Washington, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved windmill, which is comparatively simple and durable in construction, very effective in operation, and adapted to utilize the force of the wind to the greatest advantage.

The invention consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 of Fig. 2. Fig. 2 is a sectional plan view of the same on the line 2—2 of Fig. 1. Fig. 3 is an enlarged sectional plan view of one of the plates and part of the wing frame; and Fig. 4 is a side elevation of the same.

The improved windmill is provided with the vertically-disposed wind-wheel shaft A, journaled in suitable bearings in the tower B and connected at its lower end in the usual manner with the machinery to be driven. On the shaft A is secured the wind wheel provided with wings C extending radially from a shaft, as plainly illustrated in Fig. 2. Any desired number of such wings may be employed and sets of wings may be arranged one above the other, as indicated in Fig. 1.

Each wing C is provided with a wing frame composed of the horizontally-extending arms D and D' fastened to the shaft A and connected with each other at their outer ends by a post D². Between the arms D and D' are arranged the blades E each having the vertically-disposed trunnions E' and E² journaled in suitable bearings in the arms D and D' respectively, so that the blades can freely swing open and shut as indicated in Fig.

2. The ends of the blades are slightly beveled and the lower bevel E³ of each blade is adapted to swing into a correspondingly-shaped recess D³ formed in the top of the lower arm D', so as to limit the opening and closing movement of the blade, as will be readily understood by reference to Fig. 3. The recess D³ forms the shoulders D⁴, D⁵, so that the blade E in swinging open, as indicated in Fig. 3, stands at an acute angle to the arm D' to permit the wind to readily open the blade without swinging the same past a central or right angular position relative to the arm D. When the blade E is closed then it stands nearly in alignment with the arms D, D', and the free end of one blade abuts against the trunnion end of the next following blade, with the outermost blade resting with its free end against the corresponding post D².

Now, when the several parts are in position as illustrated in Figs. 1 and 2 and the wind blows in the direction of the arrow a', then the wings to the left of the shaft A close, while those on the right hand side of the shaft swing rearwardly into an open position, to permit the wind to readily pass through the wings without the latter offering great resistance. Thus, it will be seen that the force of the wind is utilized principally on one side of the wheel and little resistance is offered on the other side, so that the power of the wind is utilized to the greatest advantage.

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

1. A wind wheel, comprising two sets of radial arms spaced apart, one set being provided with recesses to form limiting shoulders, and blades pivoted between the arms with one end in the recesses thereof, substantially as described.

2. A windmill provided with a wind wheel, comprising a shaft, sets of radial arms extending from the said shaft, the lower arm being formed with a beveled recess forming limiting shoulders, and blades having vertically-disposed trunnions journaled in the said arms, the lower end of each blade being beveled and adapted to swing into a correspondingly-shaped recess formed in the top of the lower arm, so as to limit the opening and closing movement of the blade, as will be readily understood by reference to Fig. 3.

eled to fit into the said recess to abut against the shoulders thereof, substantially as shown and described.

3. A wind wheel, comprising two sets of radial arms D D' spaced apart, the lower set D' being provided with the angular recesses D³ having inclined bottoms, and the wings E having beveled ends and provided with trun-

nions E' and E², the said wings being pivoted between the arms with one end in the said recesses, substantially as herein shown and described.

PETER A. NORBERG.

Witnesses:

CARL ANDERSEN,
FRED CARLSON.