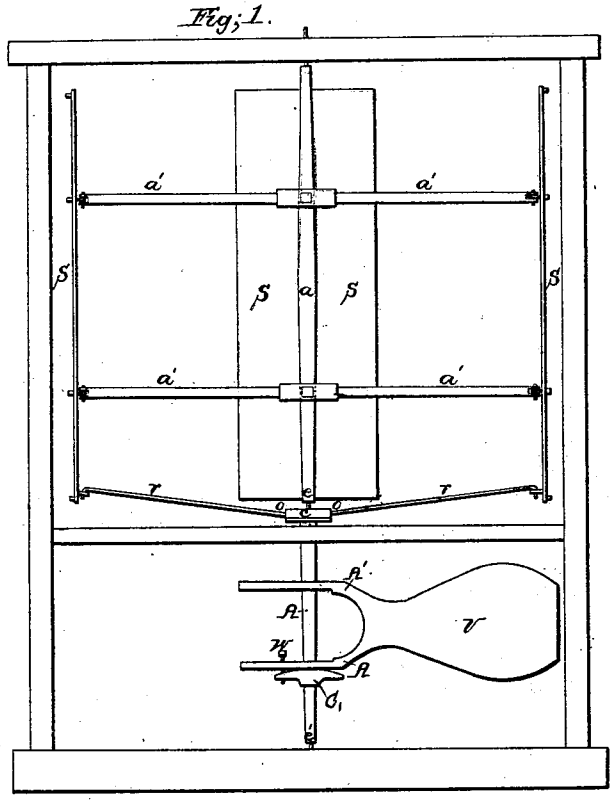
T. G. FOWLER.

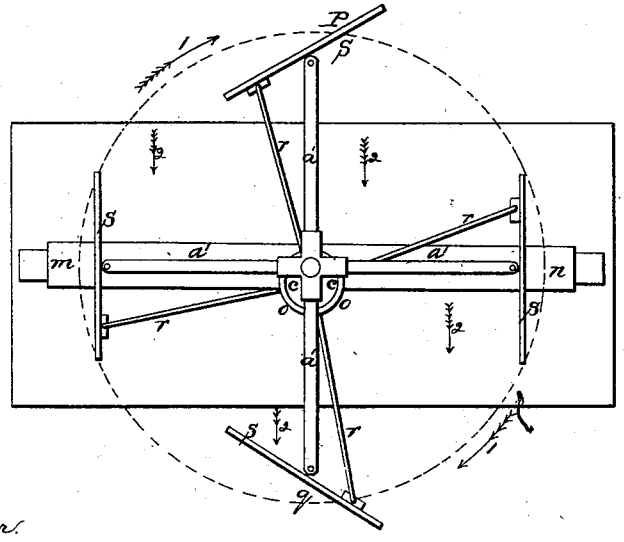
WIND WHEEL.

No. 61,530. Patented Jan. 29, 1867.

Fig; 1.




Fig; 2.




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*Letters Patent No.* 61,530, *dated January* 29, 1867.

## IMPROVEMENT IN WINDMILLS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, F. G. FOWLER, of Springfield, in the county of Sangamon, and State of Illinois, have invented a new and improved Wind-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of my invention.

Figure 2 is a horizontal section of the same.

Similar letters of reference indicate like parts.

This invention relates to an improvement in that class of wind-wheels which are provided with a series of vertical sails hung on horizontal arms, which extend from a vertical central arbor, and so arranged that the sails oscillate on hinges as the wheel revolves in such a manner that they receive a propelling force from the wind. This oscillating motion is produced by a stationary eccentric, with which each sail is connected. A vane, which moves only when the wind changes, is attached to the shaft upon which the eccentric is secured, which causes it to occupy a position corresponding with the direction from which the wind blows, and serves to give the sails a proper adjustment.

The nature of my invention and its peculiar advantages will be understood by the following description:

The frame which supports the wheel may be of any desirable construction that will hold it in a perpendicular position, and at sufficient elevation. My wheel consists of a vertical shaft, *a*, which may be provided at either end with cranks or any kind of gearing that may be necessary to transmit or communicate power. From this shaft extend four sets of horizontal arms, *a'*, to the extremities of which are attached sails, S. These sails are rectangular in form, and attached to the extremities of the arms by hinges placed on their vertical central line. The weight of the wheel is sustained by a shaft, A, the upper end of which passes through a horizontal timber in the frame, and forms a bearing with the lower end of the arbor of the wheel *e*. The lower end of the shaft terminates in a small point, forming a bearing at *e'*. Near the central part of the shaft A is placed the vane V. It is supported by the horizontal arms A', through the ends of which the shaft A passes. This vane is kept in position by the circular shelf C, upon which the lower arm A' rests. This shelf is firmly secured to the shaft A, and is provided with a circular series of apertures, any one of which can be made to connect with an aperture in the arm resting upon it, and so arranged that the arm can be turned in any direction, and then secured to the shelf by passing a pin, *w*, through both. At the upper end of the shaft A, and firmly secured to it, is an eccentric, *c*, which is attached with its wide side in the direction in which the vane V extends, namely, from the direction in which the wind blows. This eccentric is surrounded by a strap, *o*, and is provided with the radial rods *r*, each of which is attached by a pivot to a corresponding sail. These pivots are placed about one and one-half time the throw of the eccentric from the vertical central line of the sail; yet the distance may be made more or less than that if it is desired to increase or diminish the oscillating motion of the sails, and thereby the power and speed of the wheel. The length of the rods *r* must be such that the sails will be held at right angles to the arms, when the arms are at right angles to the wind currents, as at *m n*, fig. 2. The effect of the eccentric is such that the sails will be inclined to the arms when the arms are parallel to the wind currents, as at P *q*.

The operation of my wheel is as follows: The force of the wind upon the vane V will have the effect to retain the eccentric with its wide side in a direction opposite the direction from which the wind blows. If the wheel is in motion in the direction of arrow 1, the wind blowing in the direction of arrow 2, each sail in passing the point *m* will be held edgewise to the wind. As it passes that point, and while passing to P, its rear edge will gradually be drawn in by the rod *r*. In passing from P to *n*, its rear edge will be forced out till, arriving at *n*, it is edgewise to the wind. In passing from *n* to *q*, its rear edge will still further be forced out, as clearly shown in the drawings; and in passing from Q to *m* its rear edge is again gradually drawn in, till it arrives at its original position, the wind exerting on it a propelling force throughout its entire circuit, except at the two "dead-points" *m* and *n*. If the pin *w* be withdrawn, which secures the arm A' to the shelf C, and the shaft A be turned one hundred and eighty degrees, or half around, the action of the eccentric will reverse the adjustment of the sails, and the wheel will run with the same force, but in an opposite direction. If the shaft A be turned ninety degrees from its original position in either direction, the sails will be adjusted in such a manner that the force which one exerts will be counteracted by an equal force exerted by the sail on the opposite side of the wheel,

and the wheel will cease to run. If turned forty-five degrees in either direction, the wheel will exert but half its maximum power; the degree of power which the wheel exerts, and the direction in which it runs, depending upon the relative position of the eccentric *c* with respect to the direction from which the wind blows. By properly operating the shaft A, the wheel can be made to exert the whole or any part of its power in any direction. A small vane balanced by a weight may be connected with the pin *w* in such a manner that it will withdraw it and cause the wheel to stop in case the wind becomes unduly severe. The common ball governor may be connected with the shaft A, so that its action will turn it and maintain a uniform motion of the wheel, when the wind and the resistance against which the wheel acts are variable.

What I claim as new and useful, and wish to secure by Letters Patent, is—

1. The eccentric *c*, in combination with the sails S hung on pivots placed on their vertical central line, and revolving in the manner and for the purpose substantially as described.

2. The vane V, in combination with the eccentric *c* and sails S, arranged in the manner and for the purpose substantially as shown.

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Witnesses:

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