

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 165,634, dated July 13, 1875; application filed May 6, 1875.

To all whom it may concern:

Be it known that I, WILLIAM WALKER, of West Liberty, in the county of Muscatine and in the State of Iowa, have invented certain new and useful Improvements in Windmills; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a windmill, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a perspective view of my windmill. Fig. 2 is a horizontal section of the same, and Fig. 3 is a side view of the governor-vane.

The wind-wheel is composed of a hub, A, radial arms B, and vane C, forming the framework to support the sails or vanes D. These vanes or sails are riveted or otherwise fastened to revolving arms *a*, which move in journals in the rim C, with the ends nearest the axle or shaft resting in sockets in the hub A. In each vane or sail D is cut a slot, *b*, at or near the center, on one side, which slot enables the vane to pass a circle or rim, C', attached to the wheel-arms. E represents the traverse-plate, formed or provided with suitable bearings for the hollow main shaft G, through which passes a rod, *d*, from one end to the other. One end of the rod *d* is attached to the center of arms *e e* of a wheel, *f*, while the other end is attached to the governor-arm H by means of a swiveled clevis, *h*, which enables the rod to revolve with the hollow shaft G and the main wheel. Inside of the hollow shaft G, around the rod *d*, is a spiral spring, *k*, one end of which rests against the end of the shaft G nearest to the governor, and the other end presses against a collar, *i*, on the rod *d*, which forces the rod toward the opposite end of the shaft. The outer end of the shaft G is slotted, for the passage of the arms *e e* of the wheel *f*, said slots being of sufficient

length so that the wheel *f* may be moved horizontally on the shaft to any desired distance. The wheel *f* may be located either on the outer or inner side of the wind-wheel, as desired, and has an enlargement at the center of the arms *e* to fit the inside of the shaft G, to prevent any lateral motion of said wheel. The rod *d* is connected with the wheel *f* at its center, or at the point where the arms *e e* rest on the inside of the shaft G. The arms *e* of the wheel *f* are pressed upon by springs *m*, attached to the hub A, which assist the spring *k* in keeping the vanes or sails D in gear, and also prevent any lateral or wobbling motion.

The wheel *f* is, by rods *n*, connected with the sails D, so that, by the wind or operator pressing against the governor-vane I I' on the arm H in a direction opposite to the wind-wheel, it acts upon the wheel *f*, and, by the connecting-rods *n*, throws the sails D with their edges to the wind, or out of gear. As the wind or the operator decreases the pressure, the spring *k* and springs *n* press the wheel *f* from the main wheel, which draws the edges of the sails D out of the wind and throws them in gear.

On the hollow main shaft G is secured an eccentric, J, provided with a series of friction-rollers, *p*, to operate in the yoke L, attached to the plunger K. The yoke L is provided with an oblong hole or opening, in which the eccentric J works, whereby all lateral or side motion of the yoke is entirely avoided. The governor-vane is made in two parts, I and I', one adjustable upon the other by means of a slot and bolt, as shown in Fig. 3, whereby the surface of the vane exposed to the wind may be decreased or enlarged at the pleasure of the operator, so as to require more or less density or pressure of the wind to throw the sails out of the wind. O is the ordinary main or tail vane. To the governor-arm H are attached two ropes, *s* and *s'*, the former passing over a pulley, *t*, on the traverse-plate E, and from thence through the center of said plate downward. The rope *s'* passes around a pulley, *v*, on the arm of the tail-vane O, and over a pulley, *w*, on the traverse-plate E, down through the center opening therein. By means of these ropes the operator can throw the sails D in and out of the wind, at pleasure, from the ground. On the opposite side from the

governor-vane I I' is a small stationary vane, P, for the purpose of counteracting the action of the wind on the governor, so that the pressure of the wind upon the governor will not turn the wheel from the wind, and hence the vane P assists the tail-vane O to keep the wheel to the wind.

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

1. The combination, with the wheel A B C and circle C', of the revolving arms *a a* and the sails D D, attached to said arms and provided with slots *b b*, substantially as and for the purposes herein set forth.

2. The rod *d*, with collar *i* and spiral spring *k*, arranged within the hollow main shaft to form a connection between the wheel *f* and the governor-arm H, substantially as and for the purposes herein set forth.

3. The combination of the hollow shaft G, slotted at its outer end, and the wheel *f*, having its arms *e* operating in said slots, substantially as and for the purposes herein set forth.

4. The springs *m*, in combination with the arms *e* of the wheel *f*, substantially as and for the purposes herein set forth.

5. The combination of the governor-arm H with adjustable vane I I', swivel *h*, rod *d* with spring *k*, wheel *f*, connecting-rods *n*, and sails D, all constructed substantially as and for the purposes herein set forth.

6. In a windmill provided with the ordinary tail-vane O and governor-vane I I', the stationary supplementary vane P, arranged on the opposite side from the governor-vane, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of April, 1875.

WILLIAM WALKER.

Witnesses:

C. L. EVERT,
J. M. CLARK.