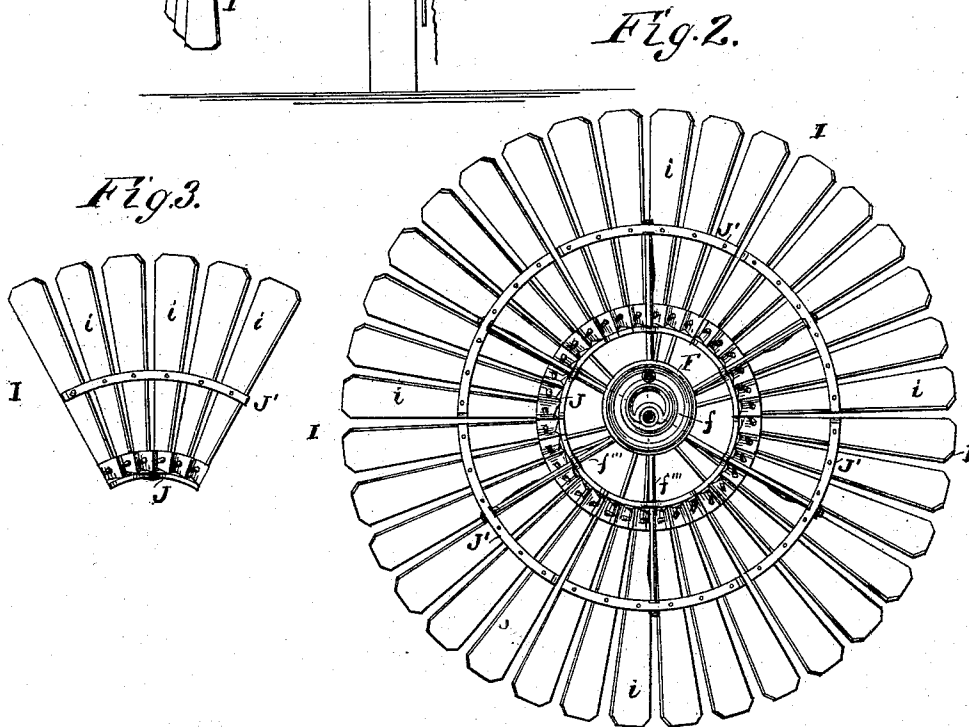
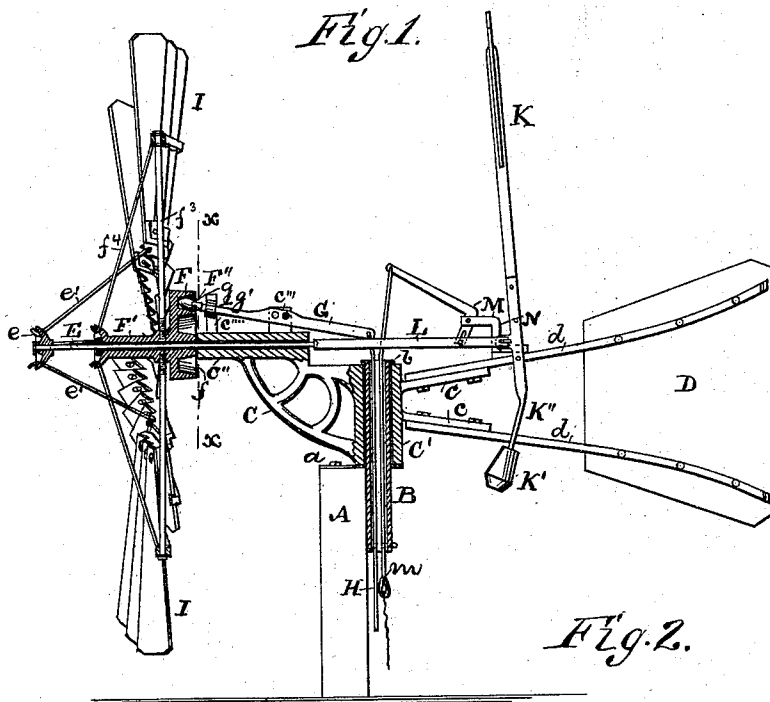


C. C. HARRIS.

WIND-MILL.

No. 177,937.

Patented May 30, 1876.



Witnesses:
L. Van Bismick.
D. C. Stuart

Inventor:
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Atty

UNITED STATES PATENT OFFICE.

CHARLES C. HARRIS, OF LA FAYETTE, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **177,937**, dated May 30, 1876; application filed March 13, 1876.

To all whom it may concern:

Be it known that I, CHARLES C. HARRIS, of La Fayette, in the county of Stark and State of Illinois, have invented certain new and useful Improvements in Windmills; 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 which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to windmills; and the invention consists in a new device or combination of devices for transmitting motion from the wind-wheel to the pump-rod, or for converting rotary into reciprocating motion in windmills. It also consists in a new device or combination of devices for regulating or governing the motion of the wind-wheel; and it further consists in certain improvements in the construction of the wind-wheel, all as hereinafter more fully set forth. It further consists in mounting the wind-wheel on a fixed tubular spindle, through which the rod passes which connects the sail-furling device with the sails.

In the accompanying drawings, Figure 1 is a side elevation of my improved windmill, partly in section. Fig. 2 is a sectional view on the line *x x*, showing the rear side of the wind-wheel. Fig. 3 is a detached view of one of the sections of the wind-wheel, showing its construction.

Referring to the parts by letters, A represents the tower, on the top of which is a flat plate of metal, *a*. B is the hollow cylinder or tube which passes through the plate *a*, and is rigidly secured thereto and to the tower A. The cylinder B and plate *a* constitute the turntable, on which the other parts of the mill turn as the wind-wheel is brought into or out of the wind. C is a bracket, which forms the support for the wind-vane, &c., the part C' being made hollow and cylindrical, so as to fit over the hollow cylinder B, which passes through it, a collar, *b*, on the top of the latter, serving to keep both in proper position. D is the rudder-vane, the arms *d d* of which are securely bolted to metal plates *cc*, which project

from, and form part of, the bracket C. The projecting part *c''* of the bracket is also made hollow, to receive a sliding rod, E, which is passed through it, and to form a spindle on which the wind-wheel revolves. F is the hub of the wind-wheel, having on its outer side an elongated sleeve, F', the extremity of which is flanged or flared outward. On the inner side of the hub is a disk, F'', having a cam-groove, *f*. The hub F, sleeve F', and cam-disk F'' are all rigidly united, so as to revolve on the spindle C'' together. G is a lever, pivoted between standards C''', which project upward from, and form a part of, the bracket C. The inner end of this lever G is connected with the pump-rod H, and its outer end carries a friction-roller, *g*, which travels in the cam-groove formed in the disk F''. *g'* is a friction roller or sleeve on the lever G, which turns against and between two guides, C''', C''', secured to the bracket C.

As the wind-wheel revolves the cam-groove and roller impart a reciprocating motion to the lever G and pump-rod H.

*f*² represents the arms or spokes of the wind-wheel, secured to the hub F; and I, the wind-sails, composed of a number of slats, *i*, arranged in the form of a fan, their inner ends secured to peculiarly-shaped metal plates, J, and united about midway of their length by arc-shaped bars J', both the plates J and bars J' being pivoted to the spokes *f'''*, so as to permit of the wind-sails turning to or from the wind. The plates J are arc-shaped in form, and have their outer portions corrugated or formed with a series of zigzag surfaces, to which the inner ends of the slats *i* are securely fastened. The outer ends of the spokes *f'''* are connected with the flange on the end of the sleeve F' by brace-rods *f⁴*. *e* is a flanged disk on the end of the rod E, and *e'* represents a series of rods which connect said disk with the wind-sails to one side of their axes. K is a vertical vane, pivoted to the upper arm of the tail-vane D, and K' is a weight, carried on an inwardly-bent rod, K'', which is connected with the stem of the vane K at the pivotal point. L represents a connecting rod or rods, pivoted to the stem of the vane K at one end, and connected with the inner end of the rod E at the other. M is a crank-lever,

pivoted to a bracket, N, secured to the stem of the tail-vane. The long arm of the lever M is connected with a rod or chain, *m*, which passes down to the ground through the cylinder B. Its short arm is slotted, and a pin secured to the connecting-rods L passes through the slot.

The devices last described constitute the governor for regulating the speed of the wind-wheel and for throwing the sails out of the wind when desired.

The operation is as follows: When the velocity of the wind increases, it will press the vane K backward and downward, thereby drawing the rod E inward, and, through the rods *e'*, turn the sails out of the wind.

When the velocity of the wind decreases, the weight K' will bring the vane K back to a vertical position, thereby moving the rod E outward, and turning the sails into the wind. In this way the speed of the wind-wheel is regulated and made uniform in varying velocity of the wind.

When it is desired to turn the sails out of the wind and stop the wind-wheel, it is effected by drawing down the rod or chain *m*, the slot in the short arm of the lever M engaging with the pin on the connecting-rod L, causing the latter to move inward with the same result as effected by the downward movement of the vane K.

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

1. The wind-wheel, having the cam-disk F'' operating in combination with the lever G, substantially as and for the purpose specified.

2. The combination of the wind-wheel, disk F'', sliding rod E, rods *e'*, vane K, and weight K', all operating substantially as and for the purpose specified.

3. The combination of the wind-sails I, rods *e'*, sliding rod E, lever M, and rod or chain *m*, substantially as and for the purpose specified.

4. The fan-shaped wind-sails I, constructed of a series of slats, *i*, secured to the zigzag plates J, and united by the arc-shaped bars J', substantially as and for the purpose specified.

5. The bracket C, constructed as described, with the vertical tube C' and the horizontal tubular portion C'', and arranged to operate in combination with the vane D, cylinder B, sliding rod E, and wind-wheel, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES C. HARRIS.

Witnesses:

JOHN PULHEIMS,
A. N. HARRIS.