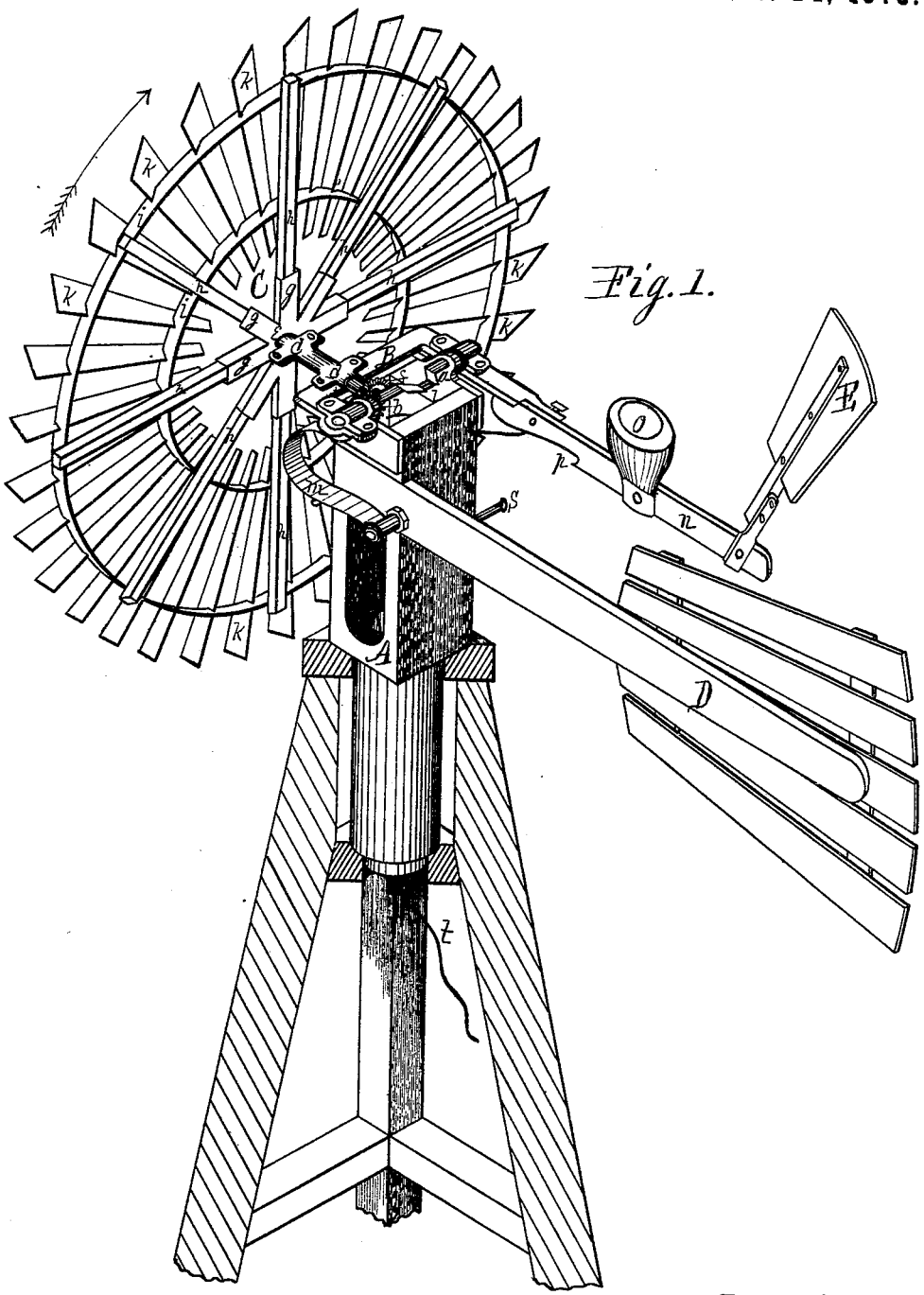
2 Sheets—Sheet 1.

A. H. CLEAVELAND.

WIND-MILL.

No. 183,641. Patented Oct. 24, 1876.

Fig. 1.



Witnesses.
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A. O. Behel.

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Per Jacob Behel
Atty

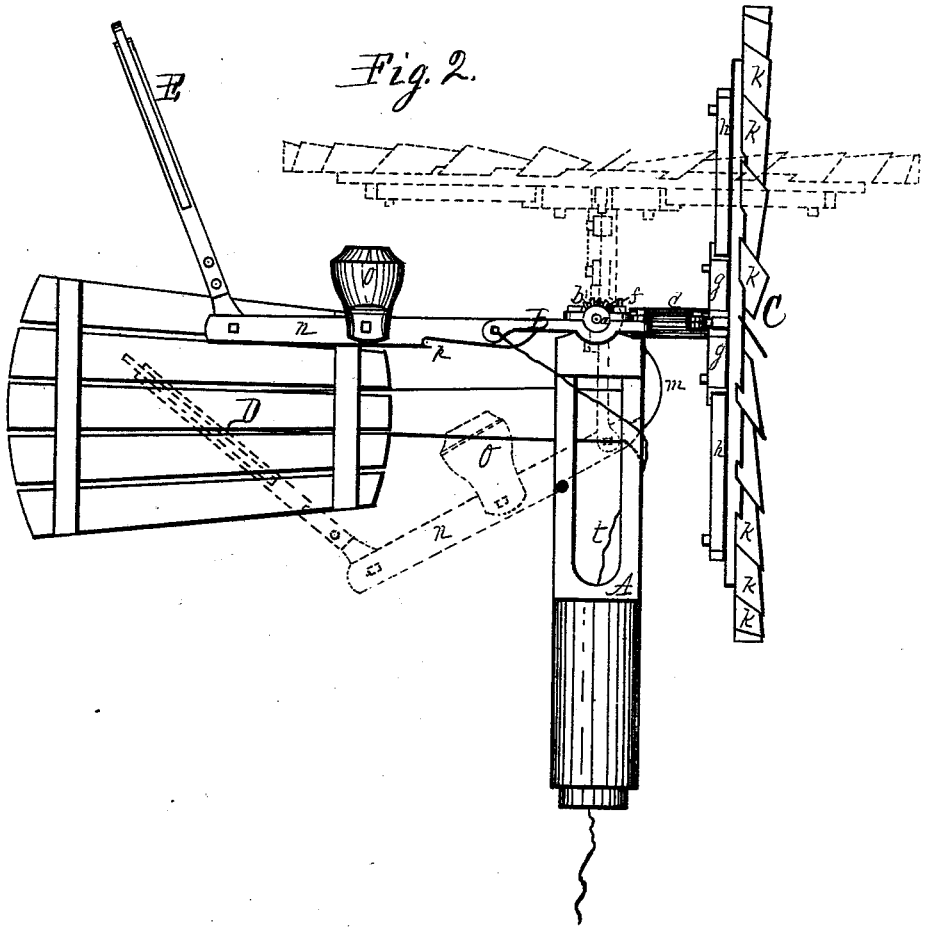
2 Sheets—Sheet 2.

A. H. CLEAVELAND.

WIND-MILL.

No. 183,641. Patented Oct. 24, 1876.

Fig. 2.



Witnesses.
E. J. Behel
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Atty

UNITED STATES PATENT OFFICE.

ALBERT H. CLEAVELAND, OF BONUS, ASSIGNOR OF ONE-HALF HIS RIGHT TO HIRAM R. GRAY, OF BELVIDERE, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **183,641**, dated October 24, 1876; application filed August 10, 1876.

To all whom it may concern :

Be it known that I, ALBERT H. CLEAVELAND, of Bonus, in the county of Boone and State of Illinois, have invented a new and useful Improvement in Windmills, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to that class of windmills in which the sails are fixed in the wind-wheel, and for the purpose of throwing the wheel out of the wind it is tipped upward in a horizontal position by the force of the wind when it rises above a certain degree, which degree can be varied by means of an adjustable counter-balance, so arranged as to bring the wheel back into the wind when the force falls below the degree at which the counter-balance is adjusted.

In the drawings, Figure 1 is an isometrical view of a windmill embodying my invention. Fig. 2 is a side elevation of the same, in which the position of the wind-wheel and the parts therewith connected, when thrown out of the wind, are represented in dotted lines.

In the figures, A represents the center support of the mill, which is of tubular or hollow form, to receive a pump or piston-rod, to play vertically in its axis, and is designed to be mounted on a suitable tower in such a manner as to permit it to freely turn horizontally. *a* is a crank-shaft, fitted to revolve in suitable bearings on the upper end of the center support, and is fitted with a miter-toothed gear-wheel, *b*. B is a yoke-frame, of the form represented in the drawings, hinged on the outer projecting ends of the crank-shaft *a* in such a manner that, when in a horizontal position, it will rest on the end of the center support, and will be free to swing upward to a perpendicular position. This yoke is fitted with an arm, *d*, which projects horizontally from the front edge of the yoke, and furnishes the bearings in which the wind-wheel shaft *e* is fitted to revolve. The inner end of the shaft *e* is fitted with a miter-toothed gear-wheel, *f*, the teeth of which engage the teeth of the gear-wheel *b*. C is a wind-wheel, of common construction, consisting of the spider *g*, radial arms *h*, rings *i*, and fixed sails *k*. This wind-wheel is mounted on the outward-projecting end of the shaft *e*, to which it may be secured in any proper manner.

From the foregoing description it will be observed that, if this mill is placed in position so that the wind-current will strike the face of the wheel at about right angles, the wheel will be made to revolve in the direction indicated by the arrows, and will impart a rotary motion to the crank-shaft, being connected therewith by means of the miter-gear wheels, and would impart a reciprocating motion to a pitman or connecting rod, properly applied to the crank *l* of crank-shaft *a*, for the purpose of operating a pump, or other purposes to which a windmill is applicable.

D is a directing-vane, of usual construction, rigidly secured to the center support at about right angles to the face of the wind-wheel, and is employed for the purpose of directing and holding the wind-wheel in the current of the wind. *m* is a spring, secured to the center support with its free end pressing upward against the under side of a rear extension of the yoke B, in such a manner as to tend to hold the yoke in a horizontal position; and when the yoke is raised in a vertical position the spring will tend more strongly to bring it back into the perpendicular working position. E is an upward-projecting governing-vane, with its horizontal arm *n* secured to a rear extension of the yoke by a hinge-joint connection—rigid, to prevent the vane from falling, and flexible, to permit it to rise. *o* is an adjustable counter-weight, employed on the arm *n*, for the purpose of counterbalancing the wind-wheel in such a manner that a certain force of wind, striking the governing-vane, will tip the wind-wheel rearward and out of the action of the wind, in which instance the hook *p* of arm *n* will engage the stud *s*, and prevent the wind-wheel from tipping farther than a horizontal position, as represented in the dotted lines; and when the force of the wind falls below the degree at which the counter-weight is set, the weight of the hinged portions of the governing-vane, acting upon the stud *s* as a fulcrum, will return the wind-wheel into its vertical working position.

I have represented my improved windmill

having miter-gears *b* and *f*, instead of which bevel-wheels may be employed, to vary the relative velocity of the wind-wheel, and pitmen, to adapt it to deep or shallow wells, or a large or small flow of water, or to the velocity required for other purposes.

t represents a wire, cord, or rope, by means of which the mill may be thrown out of the wind.

I claim as my invention—

1. The wind-wheel mounted on shaft *e*, having its bearing in hinged yoke B, and fitted with gear-wheel *f*, to engage the gear-wheel *b* on crank-shaft *a*, to impart a rotary motion to the crank *l*, as and for the purpose set forth.

2. The upward-swinging yoke B, in combination with the turning center support and wind-wheel, to permit the wind-wheel to turn upward out of the action of the wind, substantially as shown and described.

3. The combination of the upward-swinging yoke B, and governing-vane E, for the purpose of turning the wind-wheel upward in a horizontal position out of the action of the wind, substantially as shown and described.

4. The adjustable counter-weight *o*, in combination with the governing-vane and upward-swinging yoke, for the purpose of adjusting the mill to a required force of wind, to throw it out of the action of the wind, as described.

5. The hinged governing-vane, in combination with stud *s*, to limit the tipping of the wind-wheel to a horizontal position by means of hook *p*, and to return the wind-wheel to a perpendicular working position, substantially as hereinbefore set forth.

6. The spring *m*, in combination with the upward-swinging yoke, as and for the purpose set forth.

ALBERT H. CLEAVELAND.

Witnesses:

E. J. BEHEL,

HIRAM R. GRAY.