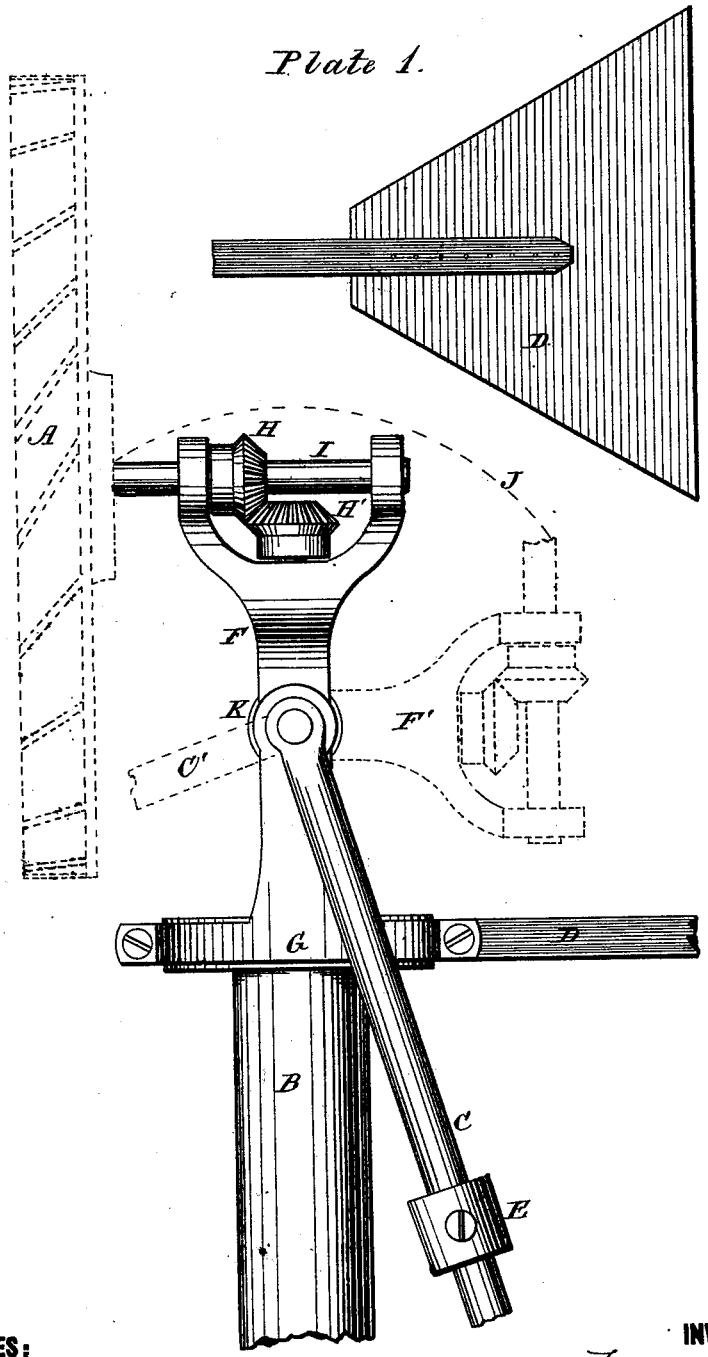
2 Sheets—Sheet 1

F. A. MITCHELL.

Wind-Engine.

No. 206,815. Patented Aug. 6, 1878.

Plate 1.



WITNESSES:

A. B. Robertson.

Edw. W. Byrn

INVENTOR:

Frank A. Mitchell

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ATTORNEYS.

2 Sheets—Sheet 2.

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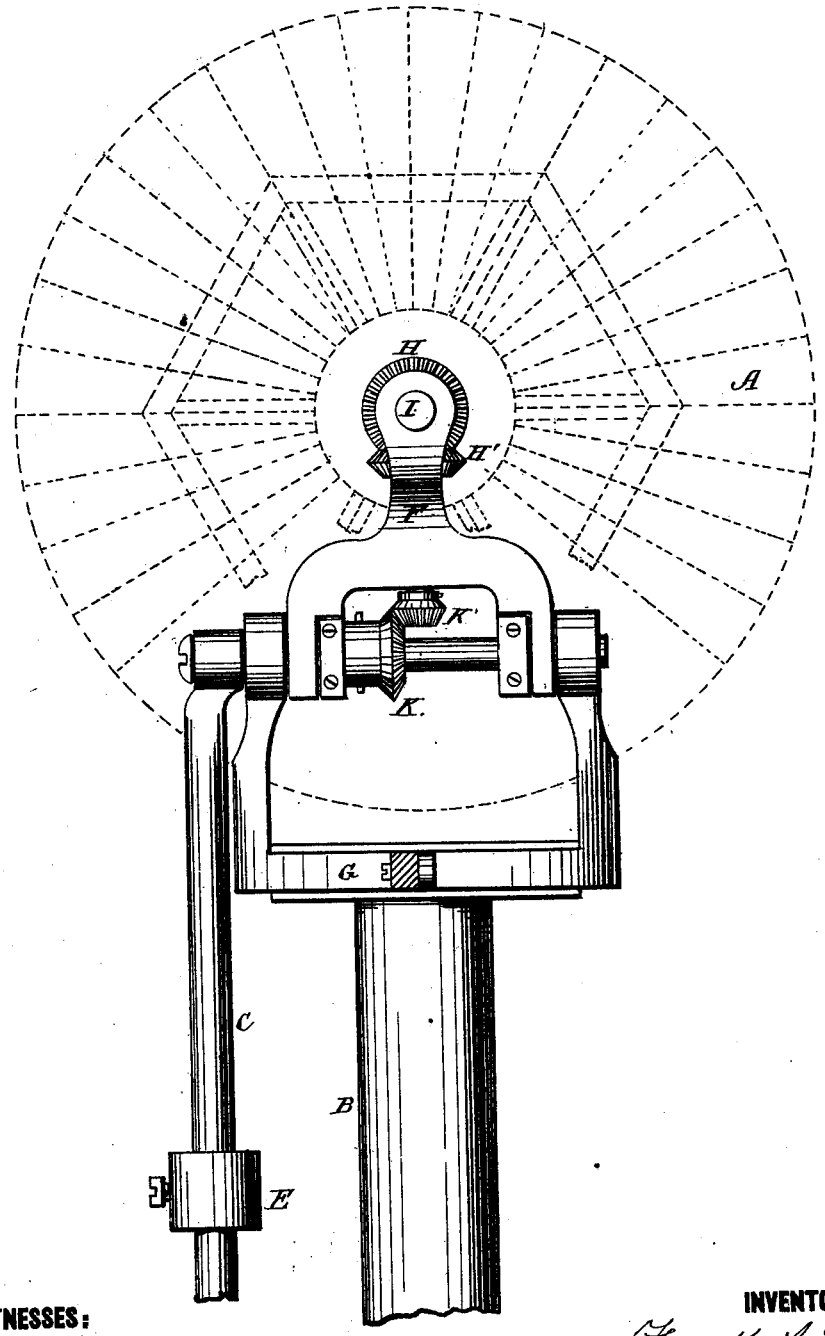
Plate 2.



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INVENTOR:

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK A. MITCHELL, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **206,815**, dated August 6, 1878; application filed February 27, 1878.

To all whom it may concern:

Be it known that I, FRANK A. MITCHELL, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Windmills, of which the following is a clear, exact, and full description, reference being had to the accompanying drawings, in which like letters indicate like parts.

My invention relates to that class of windmills known as "self-regulating;" and its object is to provide a mill of this class the wheel of which may be solid—*i. e.*, without joints—and which shall maintain a more uniform speed, at the same time relieving the pressure on the wheel by allowing it to lean or incline, so that the square surface exposed to the wind is inversely proportioned to its velocity.

In accomplishing this object my improvement consists in providing the windmill-frame with a pendent rod and adjustable weight, and pivoting said frame on trunnions at right angles to the axis of the wheel and in a different horizontal plane from the axis of the wheel, so that the pressure of the wind on the face of the wheel serves to deflect the vertical frame on its trunnion without the use of a deflector-blade, as hereinafter more fully described.

In the drawings, Plate I shows a side, and Plate II a rear, elevation of my invention.

A represents the wheel, which is sustained by the yoke-piece F, swinging upon trunnions near the point K. These trunnions are supported by arms rising from either side of the collar G, which is turned by the vane D, keeping the face of the mill to the wind. B is a tube or box having a flange at its upper extremity, into which the collar G is recessed, so that it may turn as described. Through this tube or box B the shaft, rod, belt, or other means of conveying the power may run. The wheel is kept in working position by the adjustable counter-balance E on the rod C, which is fixed rigidly to the yoke F. As the force of the wind increases the wheel and its supports, turning in their bearings, describe the arc J, having reached the extremity of which, the yoke F will occupy the position F′, the rod C the position C′, and the edge of the wheel only be presented to the wind. As the wind subsides the wheel is gradually brought back to its original position by the counter-balance E.

The wheel may be adjusted so as to incline at any desired velocity of the wind by raising or lowering the weight E on the rod C, on which it is secured by a set-screw.

In defining my invention more clearly, I would state that I am aware that it is not new to swing a windmill-frame on trunnions which are in the same horizontal plane with the axis of the wheel, to permit the wheel to move from a vertical to a horizontal position in automatically adjusting itself to the force of the wind. When the axis of the wheel is in the same horizontal plane with the trunnions, however, the deflection of the wheel is accomplished, not by the force of the wind on the face of the wheel itself, but by a special deflector-blade or governing-vane. I therefore do not claim, broadly, pivoting a windmill-frame on trunnions at right angles to the axis of the wheel, but only the arrangement of the trunnions in a different horizontal plane from the axis of the wheel, whereby the force of the wind on the wheel itself is made to deflect the frame and throw the wheel into a horizontal position without the use of a deflector-blade.

In the example shown it will be seen that the rod C and weight E form, with the frame F, to which they are rigidly attached, a sort of vertical lever whose fulcrum is the trunnions, whose short arm is the distance from the trunnions to the axis of the wheel, and whose long arm is the vibrating pendulum or rod and weight C E.

In the place of the gear-wheels H H′ and K K′ any other convenient means of transmitting the motion from the wheel-shaft may be employed.

Having thus described my invention, what I claim as new is—

1. A windmill having a swinging frame pivoted upon supports in a different horizontal plane from the wheel-shaft, as and for the purpose described.

2. A windmill having a swinging frame, F, and an attached pendent and weighted rod, and a wheel-shaft, I, located at right angles to and in a different horizontal plane from the pivots of the swinging frame, substantially as and for the purpose described.

FRANK A. MITCHELL.

Witnesses:

ALBERT G. MITCHELL,

J. T. CLARK.