

T. J. & M. F. INGELS.
Wind-Mills.

No. 157,833.

Patented Dec. 15, 1874.

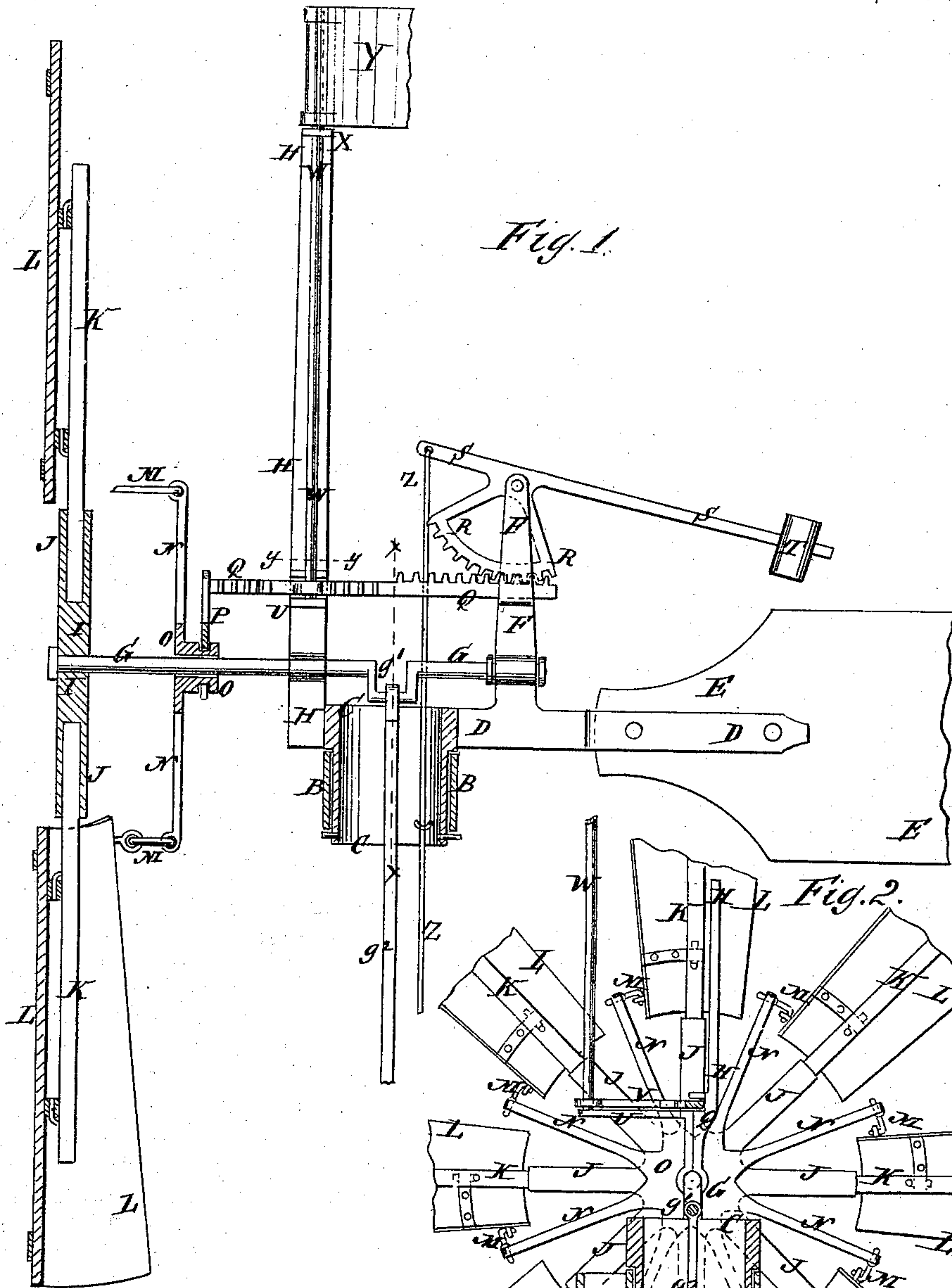


Fig. 1.

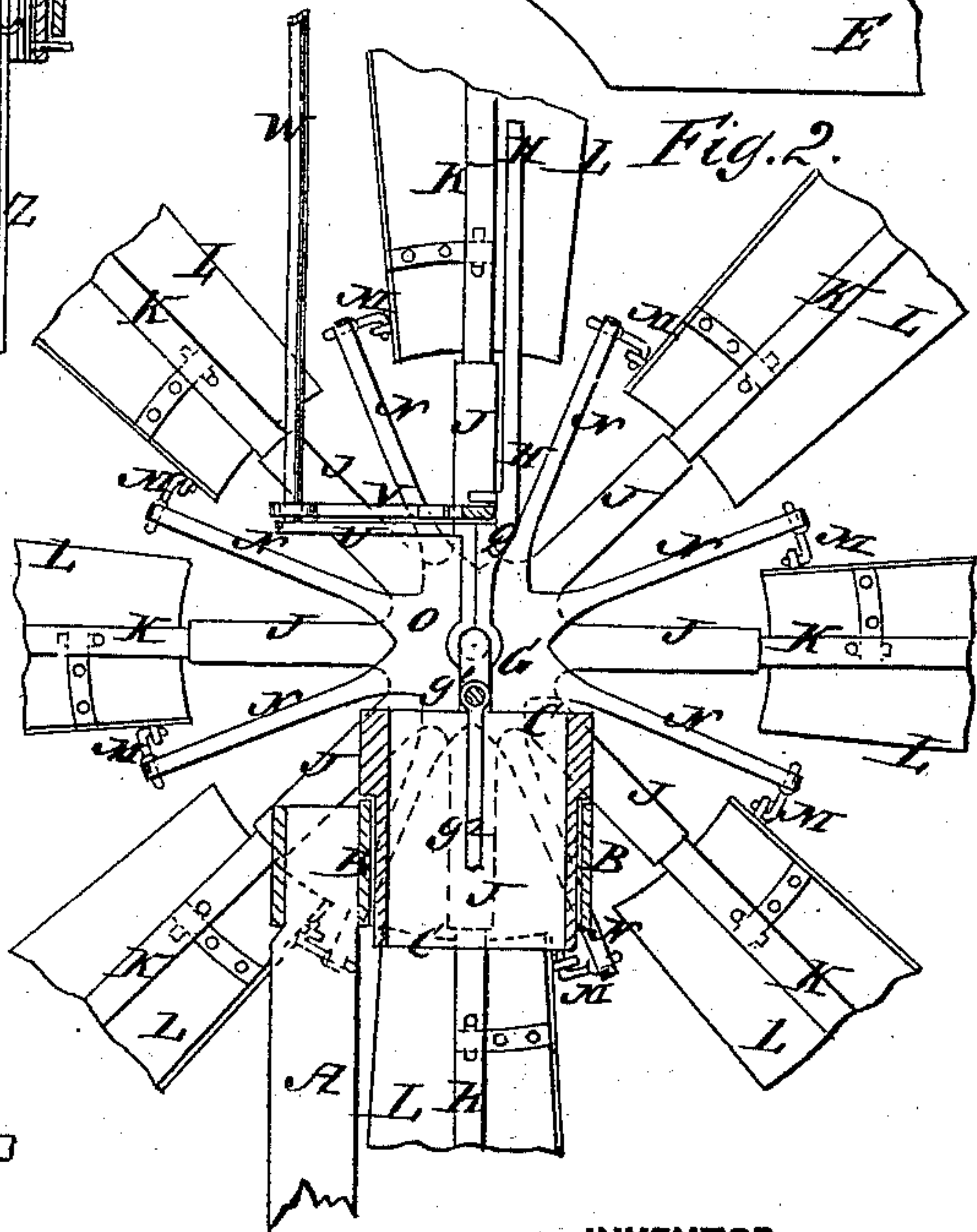


Fig. 2.

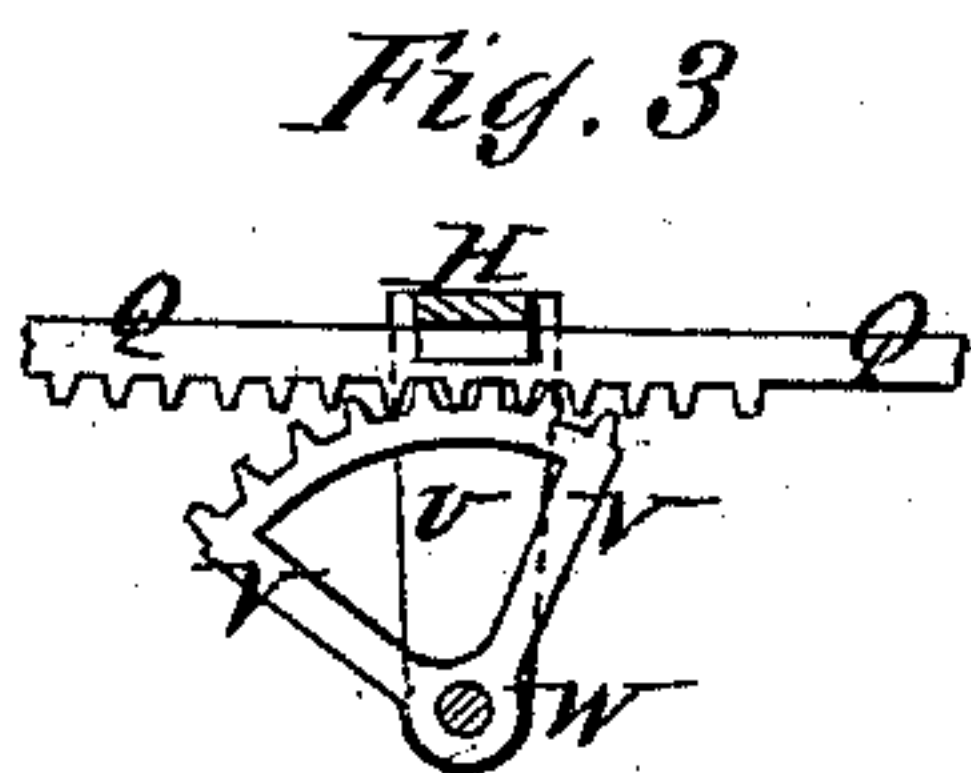


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

THOMAS J. INGELS AND MILLARD F. INGELS, OF ATCHISON, KANSAS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **157,833**, dated December 15, 1874; application filed August 29, 1874.

To all whom it may concern:

Be it known that we, THOMAS J. INGELS and MILLARD F. INGELS, of Atchison, in the county of Atchison and State of Kansas, have invented a new and useful Improvement in Windmills, of which the following is a specification:

Figure 1 is a detail vertical section of our improved machine. Fig. 2 is a vertical cross-section of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a detail horizontal section taken through the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The invention is an improvement in the class of windmills in which a supplementary pivoted vane is so connected with the revolving wings or sails as to throw them out of the wind when the latter is too violent.

The invention consists in the arrangement of parts, whereby a single toothed bar connects with and operates devices for adjusting and regulating the position of the wings or sails, as hereinafter described.

A represents the post by which the mill is supported, and to the upper end of which is attached a tubular socket, B, in which works a tubular journal, C, the upper end of which projects above the upper edge of the socket B, and has a horizontal bar, D, attached to it upon one side. The outer part of the bar D is slotted to receive the tail or vane E. To the bar D, at a little distance from the hollow journal C, is attached, or upon it is formed, an upwardly-projecting bar, F, in which, a little above the hollow journal C, is formed a bearing for the end of the wheel-shaft G. The other journal of the shaft G revolves in bearings in the upright bar H, the lower end of which is attached to the upper part of the hollow journal C upon the side opposite the bar D. To the forward end of the shaft G is rigidly attached a hub, I, which is made with eight (more or less) radial sockets, J, in which are bolted the arms K. L are the fans or wings, which are hinged upon their center lines to the arms K. To the rear lower corner of the wings L are hinged the ends of the connecting-rods M, the other ends of which are hinged to the outer ends of the radial arms N, the inner ends of which are rigidly attached

to the hub O, that slides longitudinally upon the shaft G.

By this construction the outward movement of the hub O turns the wings L toward a position at right angles with the shaft G, or throws them into the wind, and the inward movement of the hub O upon the shaft G turns the wings L toward a position parallel with the shaft G, or throws them out of the wind.

The inner end of the sliding hub O has a ring-groove formed around it to receive the forked lower end of the arm P, the upper end of which is rigidly attached to, or formed solidly upon, the end of the bar Q. The bar Q slides longitudinally in bearings in the upright bars H and F; and upon the upper side of its inner end are formed teeth, into which mesh the teeth of the segmental wheel R, which is pivoted in the slotted upper end of the upright E. To the segmental wheel R is rigidly attached the lever S, the long arm of which projects in the direction of the vane or tail E, and has a weight, T, attached to it adjustably.

By this construction, by adjusting the weight T nearer to or farther from the pivot of the lever S, the wings L may be held against the wind in such a way as to yield when the force of the wind has reached any fixed point.

To the lower part of the upright bar H is secured a horizontal arm, U, to which is pivoted a segment, V, the teeth of which mesh into teeth formed upon the side of the forward part of the bar Q. The pivot W of the segment V is extended upward as a rod, and its upper part works in a horizontal arm, X, formed upon or attached to the upper end of the upright H; and to its upper end is rigidly attached a vane, Y, which I prefer to make in the form of a flag.

By this arrangement, should a sudden dash of wind strike the flag or vane Y, it turns the segment V, which forces back the bar Q, and throws the wings L so far out of the wind that the force of the wind upon the said wings L will only equal the amount for which the weight T has been set.

To the forward end of the short arm of the lever S is attached a wire or cord, Z, which passes through the hollow of the journal C, where it is kept in place by a keeper, and pro-

jects downward along the part A, into such a position that it may be readily reached and operated by the attendant, to throw the wings L out of the wind, and thus stop the mill, when desired.

It will be observed that, when the wings L are out of the wind, the said wings and the vane or flag Y are all parallel with the vane E.

Upon the shaft G, directly over the hollow journal C, is formed a crank, g^1 , upon which works the upper end of the rod g^2 , by which motion is communicated to the machinery to be driven.

The segments R and V, instead of being toothed, may be grooved and connected with the bar Q by cords or chains, if desired.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The bar Q, provided with teeth on two sides, the segment V, rod or shaft W, vane Y, the segment R, lever S, and weight T, the sliding hub O, arms N, and pivoted wings L, all combined and arranged as shown and described.

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Witnesses:

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