J. A. ALLEN.

WIND-MILL.

No. 188,563. Patented March 20, 1877.

Fig. 1.

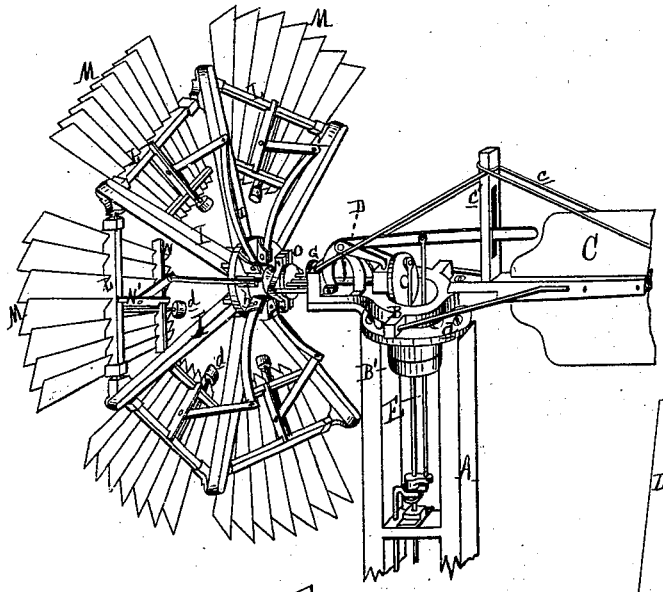


Fig. 3.

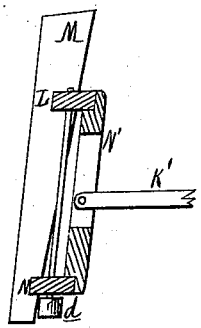
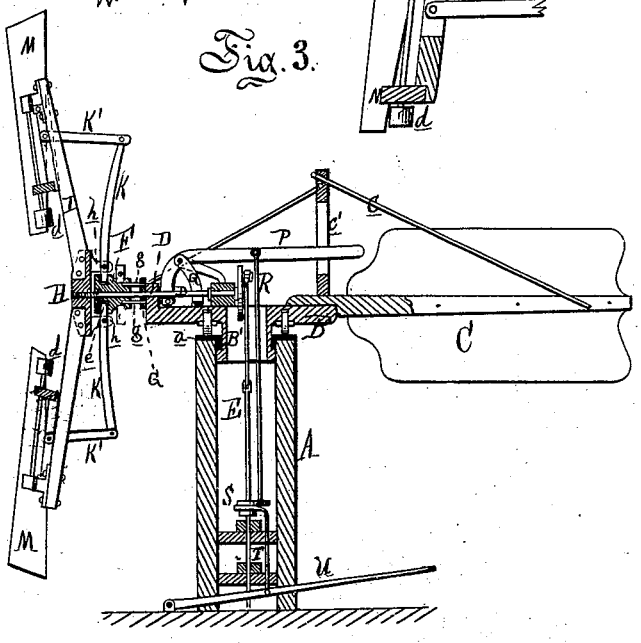


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES A. ALLEN, OF ALBION, ASSIGNOR TO HIMSELF AND HENRY OSBORN, OF SHERIDAN, MICHIGAN.

IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. **188,563**, dated March 20, 1877; application filed August 31, 1876.

To all whom it may concern:

Be it known that I, JAMES A. ALLEN, of Albion, in the county of Calhoun and State of Michigan, have invented an Improvement in Windmills, of which the following is a specification:

My invention relates to an improvement in windmills which are provided with a governing device for turning the sails more or less out of the wind as the latter increases in force, thereby regulating and limiting the speed of the wind-wheel, and insuring its safety in high winds; and the invention is more particularly designed as an improvement on the windmill for which Letters Patent No. 167,724 were issued to me September 14, 1875.

The object I have in view in the present improvement is to regulate the angles of the sails with relation to the plane of the wind by centrifugal force developed in the rotation of the wind-wheel, in a more simple and effective manner, by weighting the nose or inner end of each sail, and thus dispense with the complicated system of centrifugal arms and levers heretofore employed.

Figure 1 is a perspective view. Fig. 2 is a longitudinal vertical section. Fig. 3 is an enlarged longitudinal section of one of the sails.

In the drawing, A represents a tower, surmounted by an annular cap-plate, *a*, in which is inserted the sleeve B′ of a turn-table, B. C is the vane, projecting from the tail end of the turn-table, and is sustained by truss-rods *c*, spreading each way from a truss-post, *c′*. D is the wheel-shaft, with a face-plate and wrist at its inner end for reciprocating the connecting-rod E. F is a hub, sleeved on the outer end of the shaft. A groove is turned in its inner end, and its outer end is mortised, as at *e*. G is a collar, keyed on the shaft next to the outer bearing of the turn-table.

Two rods, *g g*, project forward into the sockets in the back of the hub, which slides onto them, so that as the hub is turned the shaft turns with it. H is the head or spider for the wheel, radially flanged to receive the wheel-arms I, and cast with as many radial lugs *h* on the back as there are mortises in the hub, each lug being slotted to receive a lever, K, pivoted therein, its inner and short arm being stepped in the hub. L are sail-shafts, axially pivoted between the outer ends of the sail-arms. M are the sails, the slats of which are radially secured in slots obliquely sawed into the edge of each shaft L, their inner ends being a little longer, but present less area, than their outer arms, and are also let into a girt, N. A brace, N′, is nailed to the girt and to the shaft, and to it is pivoted one end of a link, K′, the other end of which is pivoted to the outer end of the lever K. A yoke, O, embraces the neck of the hub in its groove. From the yoke two rods, *k*, extend back through the outer bearing of the turn-table, and are connected to the ends of a forked lever, P, pivoted to a standard, Q, on the turn-table. A link, R, is pivoted at its upper end to this lever, and passes down through the eye of the turn-table to a collar, S, sleeved on the connecting-rod.

The foregoing description of the principal parts of the windmill, shown and described in my said Letters Patent, is only introduced to show the application of my recent improvement thereto.

The collar S is embraced by a forked rod, T, the lower end of which is connected with a lever, U, in the base of the tower, by means of which the collar, the link, and the forked lever P may be raised or lowered, and through the latter the sails can be turned into or out of the wind.

To stop the wheel, the sails are turned edgewise to the wind. To set it in motion, the sails are turned to a right angle with the plane of the direction of the wind.

In lieu of the centrifugal governors and levers described in my said Letters Patent for governing or regulating the angle of the sails, I now secure a simple weight, *d*, to the girt of each sail, near the nose or inner end thereof. These weights are so proportioned that when the speed of the wheel exceeds a given velocity, the centrifugal force thereby developed tends to throw outward these weighted ends of the sails, turning them upon their axes partially out of the plane of its direction, and thereby reducing its effective force upon the wheel. As the wind increases in force, the

sails will turn farther out of it, and thus keep down its velocity. As the wind dies away the sails turn back into it.

What I claim as my invention is—

In a windmill, substantially as described, the combination, with the sails M, of the pivoted shafts L, a girt, N, at the inner ends of each set of sails, the braces N′, the links K′, for turning the sails, and the weights *d*, secured to the said girts near the inner ends of the said sails, all constructed and arranged substantially as described and shown.

JAMES A. ALLEN.

Witnesses:
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