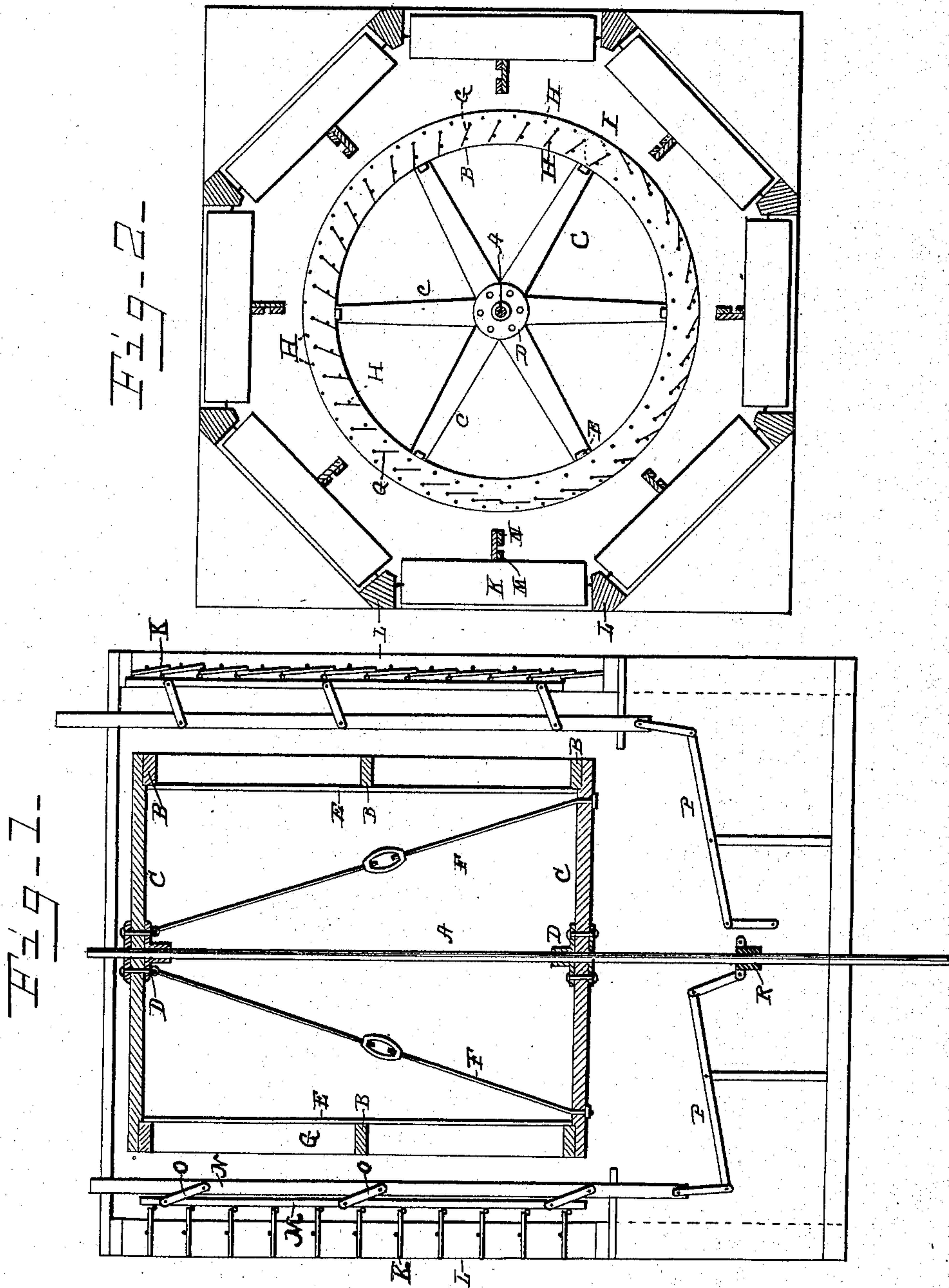


(No Model.)

W. R. ALLEN.  
WINDMILL.

No. 322,341.

Patented July 14, 1885.



WITNESSES

Edwin L. Yewell,  
John Bales.

INVENTOR

William R. Allen.  
by Frank Beebe  
his Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM R. ALLEN, OF CAPE VINCENT, NEW YORK, ASSIGNOR OF THREE-  
FOURTHS TO PHILIP MARKS, LEWIS C. MARKS, AND HENRY W. MARKS,  
OF SAME PLACE.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 322,341, dated July 14, 1885.

Application filed May 20, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. ALLEN, a citizen of the United States, residing at Cape Vincent, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Windmills; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in windmills, and is designed to produce a wind-actuated motor turning horizontally on an upright shaft, that shall utilize the wind in its passage through it and escape, and that shall be restricted as to speed without regard to the velocity of the wind.

A further object consists in providing a means whereby the wheel or motor is protected from the violence of sudden puffs or gusts of wind—such as flaws or squalls—and also in providing a means whereby the mill may be started or stopped at will.

The improvement consists, essentially, in the employment of automatically-feathering sails or wings in the motor and a series of counter-balanced shutters surrounding the wheel and mounted in a suitable cupola.

In describing the device reference is had to the annexed drawings, showing in Figure 1 a vertical section through the device, and in Fig. 2 a plan view with the top timbers removed.

The wheel or motor is supported on an upright shaft, A, and is composed of a felly or rim, B, at the top and bottom, supported by arms C, fixed in castings D, fixed to the shaft, and, if the wheel be of considerable size, one or more intermediate fellies secured to the standards E, which extend from the upper to the lower rim or felly. The wheel is stiffened and braced by rods F, provided with turn-buckles to tighten them. To the fellies or rims are pivoted the sails or wings G, the pivotal points being at one edge of the said sails. A series of stops, H, are placed on the rims, both outside and inside the wing or sail pivots.

As the wind enters the wheel the sails will rest against the inner series of stops, and being at an angle to the direction of the said wind will travel toward the escape-side. On reaching a certain point in the rotation—say at I—the air in the interior of the wheel will cause the sail to swing on its pivot till it reaches the outer series of stops, and thus bring the sail at the proper angle to aid in the rotative movement by utilizing the escaping air.

The stops are so placed that the angle the sail presents to the wind on entering is less than at the escape, since the initial force at entering is greater than at the escape, and to balance the rotation the angles must differ.

Since the speed of the wheel should vary with the work to be performed, it is an easy matter to set the pins or stops at such a point relative to the sails that the speed will not exceed a definite limit, whatever the force of the wind. Each wheel should be regulated relative to the work it is designed to perform.

As the sails return to their relative position at the inlet they feather, and thus present no obstruction.

To prevent eddies within the wheel, the top and bottom are left wholly or partially open.

The cupola or encasement of the wheel consists of a suitable frame-work having several vertical series of horizontal shutters, K, pivoted to the standards L of the frame. Each series, and there are preferably eight, of shutters are hinged or pivoted centrally to an upright bar, M, which moves them simultaneously. Parallel to this bar M, and guided in the frame so as to move vertically only, is a bar, N, connected to the said bar M by short links O. The operation is evident. As the bars N rise they carry the bars M with them, which will cause the shutters to close, the bars M N separating. When closed, the lower end of each shutter overlaps the upper end of the succeeding lower one, and the bar M rests against the entire series, preventing effectually all rattling.

By means of a lever, P, and links the bars N are connected to a counterbalancing-weight, R, which is of sufficient weight that when the wind becomes too strong the force exerted thereby, in addition to the weight R, will overbalance the shutters and cause them to close.

The weight R is preferably located on the



shaft and slides thereon, and by a connecting-rod to any convenient point may be moved to open or close the shutters and thus start or stop the mill at will.

5 When the violence of the wind is subdued, the rods M N outbalance the weight, and the shutters open.

I am aware that it is not new to form an open skeleton frame having hinged on vertical rods a series of frames carrying canvas or fans, the fans being adapted to swing edgewise to the wind on one side, but on the other side to be held by sliding movable lugs so that their faces are exposed to the wind and the wheel caused to revolve, and therefore do not claim such construction, broadly.

I claim—

1. In a windmill, a wheel or motor with a series of vertical sails or wings pivoted at one edge and a double series of stops, one series interior to and the other series exterior to the pivotal points of the sails and arranged relative thereto, substantially as and for the purpose specified.

25 2. In a windmill, a wheel or motor with a series of vertical sails pivoted at one corner and a double series of stops, one series exterior to and the other series interior to the pivotal points of the said sails, the said stops being so

arranged relative to the sails that they will present a greater angle to the plane of the direction of the wind when against one series than when against the other series, substantially as and for the purpose specified. 30

3. In a windmill, a series of shutters exterior to the wheel or motor, said shutters being pivoted horizontally and connected to a central bar operating all simultaneously, and a bar having a guided movement in the mill-frame and parallel to and connected to the shutter-bar by links, substantially as and for the purpose specified. 35 40

4. In a windmill, one or more series of shutters exterior to the wind-wheel or motor pivoted horizontally and connected to a central bar operating all simultaneously, a bar guided in the frame of the mill and parallel to and connected to the shutter-bar by links, a counterbalancing-weight on the wheel-shaft, and connecting levers and links from the guide-bar to the said weight, substantially as and for the purpose specified. 45 50

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. ALLEN.

Witnesses:

WALTER GRAY,

MICHAEL REFT.