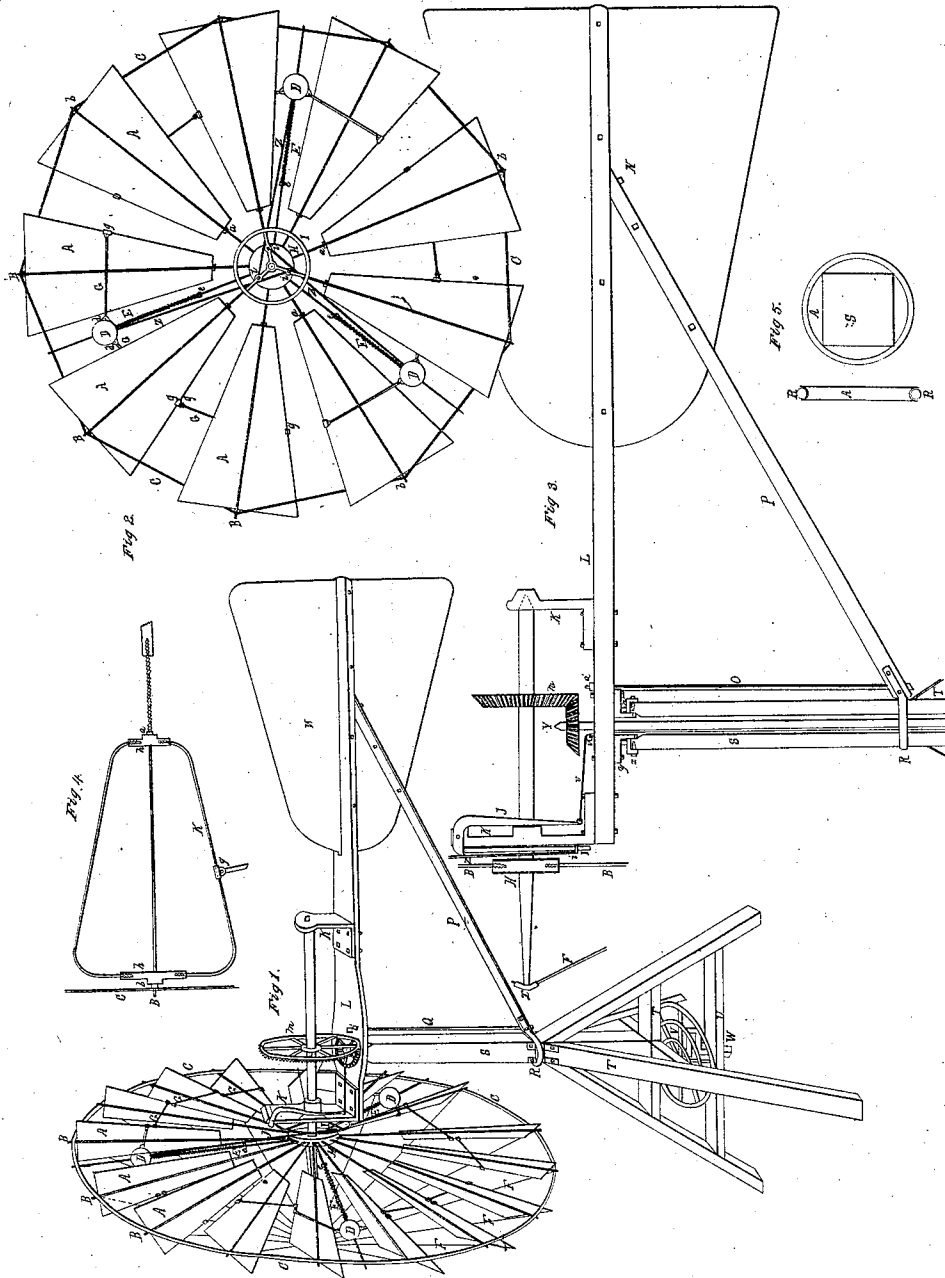


F. G. Johnson

Wind Wheel

N^o 14,099.

Patented Jan. 15, 1856.



UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF BROOKLYN, NEW YORK.

IMPROVED METHOD OF REGULATING SPEED OF WIND-WHEELS.

Specification forming part of Letters Patent No. 14,099, dated January 15, 1856.

To all whom it may concern:

Be it known that I, FRANK G. JOHNSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in the Method of Constructing, Regulating, and Stopping Windmills; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view; Fig. 2, a back face view of the wind-wheel; Fig. 3, a longitudinal elevation of the central portion of the mill; and Fig. 4, one of the fans, like letters referring to like parts.

The nature of my invention, in part, consists in providing the fans of windmills with three or more weights and springs, so connected as by the centrifugal force of the weights acting against the tension of the springs, in the manner hereinafter to be described, to control the position of the fans, causing them whenever their velocity is too great to be more or less turned edgewise to the wind, and vice versa.

My invention consists, further, in providing the wind-wheel with a brake-wheel and rods to connect the same with the said weights in such a manner that a slight pressure on the brake-wheel has the same effect on the weights and fans as an increased velocity, thus enabling the sails or fans to be turned edgewise to the wind, and the mill thereby stopped at pleasure.

My invention further and lastly consists in providing the manner, hereinafter to be described, of firmly holding the mill on the upright post or standard and at the same time allowing it the greatest freedom to be turned to face the wind by the action of the same on the vane.

In Fig. 1, A A A represent the fans; B B B, iron spokes; C C C, an iron band; D D D, the regulating-weights; E E E, spiral springs slipped onto spokes; F F F, iron braces; G G G, connecting-rods between the fans and weights; H, an iron hub; I, brake-wheel; J, the brake; K K, iron bearings for the wind-shaft; L, a strong hard-wood plank or beam; M, a set of beveled gearings; N, the vane; O, an iron bolt or rod; P, a strong wooden brace; R, an iron clasp surrounding the upright S;

T T, a strong wooden frame; U, a beam to sustain the upright shaft; V, a three-speed wheel; W, a bolt to adjust the upright shaft.

In Fig. 2 *i i i* represent nuts and bolts, which connect the rods Z Z Z to the brake-wheel I; *b b b*, nuts; *a a a*, nuts; *d d*, flanges or lips on the weight D D D; *g g g*, clasps that connect the rods G G G to the fans; *e e e*, nuts, to which are fastened the springs.

In Fig. 3 B B represent spokes; H, hub; I, brake-wheel; J, brake; K K, bearings; L, beam or plank; M, gearings; Y, upright shaft, Z, rod connecting brake-wheel to the regulating-weights; *i*, its connection with the brake-wheel; *v*, cord that operates the brake from below; *v*, small pulley over which the brake-cord runs; *y*, iron flange and socket; *z*, iron cap or collar holding the socket *y*; *n*, iron ring on which rests the mill to be turned; S, upright standard; R, clasp; P, brace; X, iron cap to receive the brace F.

In Fig. 4 C represents iron band; B, spoke; *b*, nut; *c*, nut; *h h*, strong irons slipped onto the spokes and left free to be turned and constitute the bearings of the fans; *g*, clasp to join the fan to its turning-rod.

Fig. 5 shows the method of joining the clasp R and brace P to the standard S.

The operation of my mill I describe as follows, reference being had to Fig. 2:

First. The sliding weights D D D, connecting-rods G G G, and spiral springs E E E constitute the regulating apparatus. Thus, suppose the wheel to commence and revolve at its maximum velocity, the weights by centrifugal force would be thrown out to their greatest distance from the center of motion, thus drawing the extremities *g g* of the rods G G nearer together and setting or turning the fans edgewise to the wind. The tendency of the mill now is to revolve slower and slower until the tension of the springs shall overcome the centrifugal force of the weights, which will slip or draw them in toward the center again, and thus turn the fans back to receive the wind again. To give the mill greater or less velocity at any time, it is only necessary to diminish or increase the tension of the springs, which is done by turning the nuts *e e e* (to which is attached their inner extremities) out from or in toward the center. To provide against very strong and sudden gusts of wind, I make the fans a little wider on

the back than on the front side of their bearings, so that they will turn back and crowd the weights out from the center before the velocity necessary to do the same could be acquired.

Second. The brake-wheel I and the rods Z Z Z connected therewith constitute the stopping apparatus, the operation of which is as follows: Thus, suppose the brake J, Fig. 3, be borne upon the brake-wheel I, and thus stopping said wheel, while the main wheel turns on the point *i*, would rise as far above the wind-shaft as now it is below it, and thus throw out the weights and set the fans edgewise to the wind. The unity and limitation of the action or motion of the weights are given by their similar connection with the common brake-wheel, so that whatever action is given to one weight or fan is given to all. It will be seen that one weight, Fig. 2, controls three fans, and can be made to control four by joining one fan to another, as in the drawings. The brake is made to operate by a cord *v'*, which comes down with the perpendicular shaft Y, and is kept borne on the brake-wheel I by a small weight of five or six pounds. This regulating and stopping apparatus revolve with and constitute a part of the wind-wheel, and thus making in every sense a self-regulating wheel, (wind-wheel,) which is wholly independent of every other part of the mill for its operation and which would regulate its own velocity if placed on a simple shaft and otherwise entirely disconnected with every other part of the mill.

Third. By means of the brace P, Fig. 3, and collar R, together with the iron bar O o', as connected in the drawings, I am enabled to

bring the strain of the mill in its tendency to be blown over on the bottom of the post or standard as well as on the top. If the mill were sustained by a continuation of the spindle *y* a distance down into the post, the whole mill, by the peculiar action of the wind, would have a tendency to acquire a rocking motion, and which would place the spindle and post in danger of being broken off, which liability is wholly prevented by the arrangement as shown in the drawings.

I do not claim as my invention the general principle of regulating windmills by the use of weights or governors revolving with or by means of the wind-wheel and controlling the sails thereof through the intervention of levers and rods; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The method, substantially as herein set forth, of regulating the velocity of the wind-wheel and controlling the position of its fans by the use of the weights D D D, with the springs E E E adjusted to slide from and toward the center of the wheel upon the spokes B B B, and connected to the fans A A A by means of the rods G G G or their equivalents.

2. The combination, together, of the brake-wheel I and the arms Z Z Z, for the purpose of setting the fans edgewise to the wind whenever desired, said arms and brake-wheel being formed and adjusted substantially in the manner herein set forth.

FRANK G. JOHNSON.

Witnesses:

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