

(No Model.)

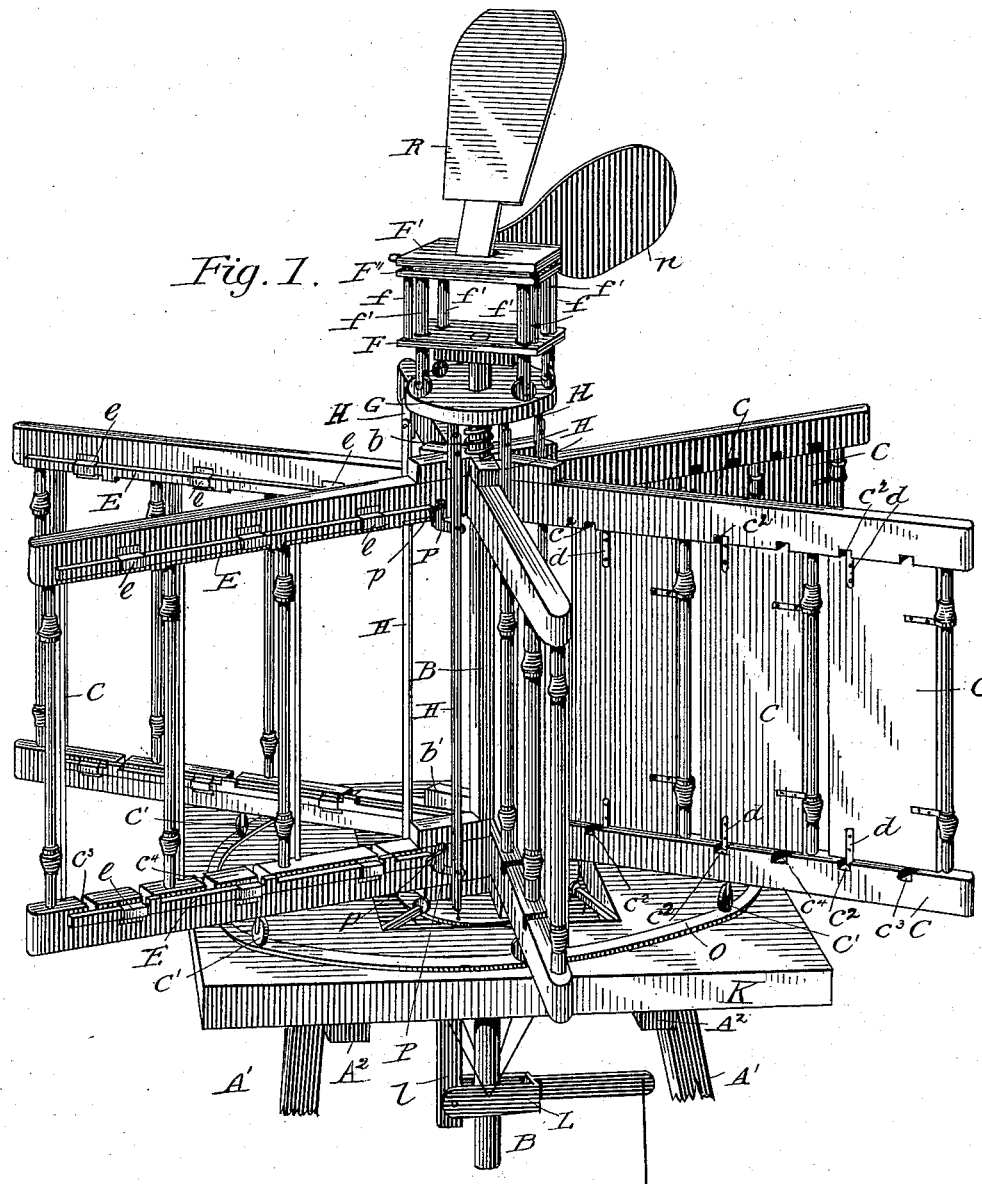
2 Sheets—Sheet 1.

A. W. BRODRICK.

WINDMILL.

No. 384,232.

Patented June 12, 1888.



*Witnesses.*

Norris A. Clark  
M. F. Connett.

*Inventor.*

Allen W. Brodrick.

By Wiles, Greenmead.  
Atty.

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Fig. 2.

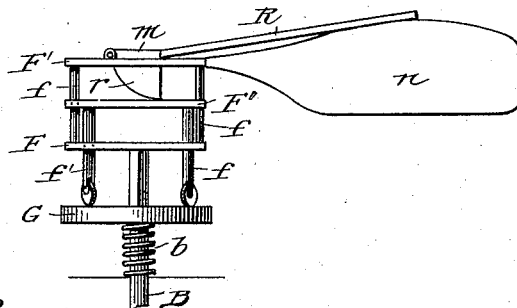


Fig. 3.

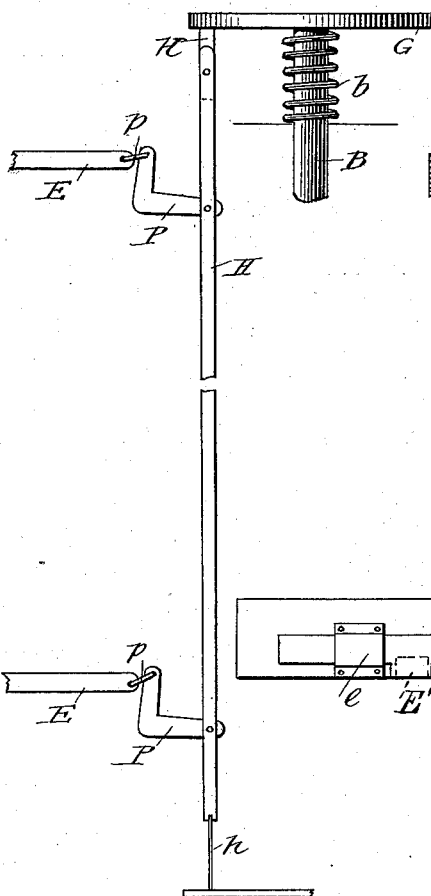


Fig. 4.

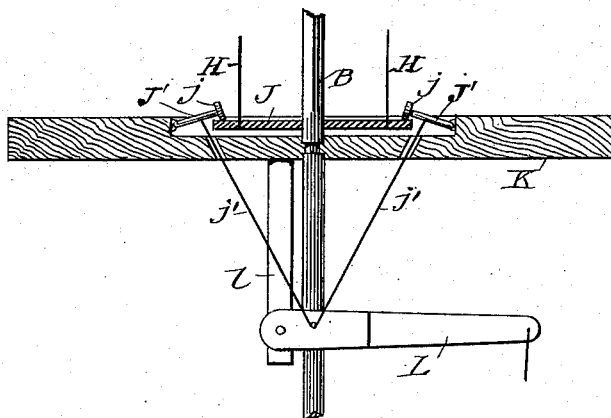
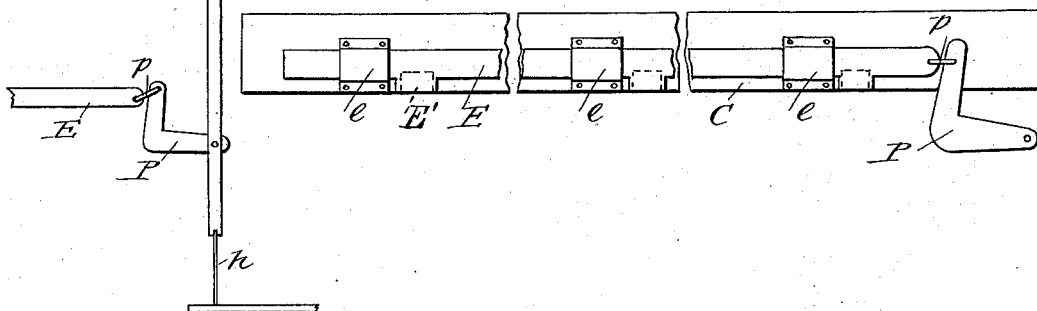


Fig. 5.



Witnesses:

Horis A. Clark.  
M. F. Connitt.

Inventor

Allen W. Brodrick,  
By Wiles, Stewart & Mead,  
Attys.

# UNITED STATES PATENT OFFICE.

ALLEN W. BRODRICK, OF MAHOMET, ILLINOIS.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 384,232, dated June 12, 1888.

Application filed March 15, 1887. Serial No. 230,932. (No model.)

*To all whom it may concern:*

Be it known that I, ALLEN W. BRODRICK, a citizen of the United States, residing at Mahomet, in the county of Champaign and State of Illinois, have invented certain new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of the invention is to produce a windmill in which the area of surface against which the force of the wind is exerted may be changed automatically or by manipulation in a novel and effective manner, in order that area may be decreased during the prevalence of a wind strong enough to injure the mill or increased to present the greatest possible amount of surface in a light wind.

I have illustrated the invention in the accompanying drawings, in which—

Figure 1 is a perspective view of the windmill made in accordance with my invention, the parts being shown in positions assumed when the mill is at work. Fig. 2 is a detail view of the device for automatically throwing the doors and panels of the wings out of the wind when the wind is too strong. Fig. 3 is a detail view showing the means of communicating motion from the device shown in Fig. 2 to the doors in the wings. Fig. 4 is a detail view showing the means for releasing the doors by hand, and Fig. 5 is a detail view showing the latches by which the doors are held or released.

In the drawings, K represents the top plate of a windmill-tower, supported and retained in place by the tower-posts A' and the horizontal beams A<sup>2</sup>.

B represents a vertical shaft, upon which the wings are mounted and upon which the principal working parts of the mill are carried.

C represents the wings, which project radially from the shaft B, to which they are rigidly attached. Each of the wings is provided with a supporting-wheel, C', which bears upon a track, O, mounted upon the plate K. Each of the wings is provided with a door or panel hinged near the outer end of the wing, and with a second door situated in such relation to the first that when both are held rigidly

they form a continuous surface to receive the force of the wind.

The number of doors or panels may be increased at will, according to the required capacity of the mill.

Both the upper and the lower beams forming the frame of the wings are provided with the notches C<sup>2</sup>, which are designed to receive projections d from the doors. When it is desired that the mill be put out of motion, the doors are allowed to swing freely irrespective of the motion of the wings to which they are attached, and to this end the beams are provided with the notches C<sup>3</sup> and C<sup>4</sup>, which permit the free revolution of the doors by forming passages for the projections d.

When it is desired to present a sufficient surface to the wind to operate the mill, the slide-bars E, Fig. 5, provided with the projections E', are slid along in such position that the projections will register with the notches or indentations C<sup>2</sup>, and thus hold the doors against swinging during that portion of the revolution when they are on the windward side of the beams of the wings. As they move around to be on the lee side of the beams, they are free to swing out, in order to present no obstruction to the movement of the mill. In their normal positions the slide-bars are in such positions that their projections register with the notches in the frame of the wings, and they are moved from this position, either automatically or by hand, through the medium of the bell-crank levers P and the vertical rods H. The bell-crank levers are connected to the sliding bars E by means of links, and to the vertical rods, also, by pivots.

It is desirable that the doors be so arranged as to be released automatically when the wind is too strong, and to this end I have devised the means shown in Fig. 2 of the drawings. This consists in the plate F, secured to the top of the shaft B, the plate or platform secured to the plate F by the pins f, and the plate F'' arranged between the plates F and F', and capable of moving vertically independent thereof. Depending from the plate F'' are the legs f', provided at their lower ends with wheels, which bear upon a plate, G, which is rigidly attached to the shaft B and is capable of a limited vertical movement. The plate G,

when at the limit of its upward movement, at which position it is normally held by the spring *b*, holds the slide-bars through the medium of the rods *H*, to which it is attached, in such position as to prevent the doors from moving from their proper position to present their entire surface to the action of the wind.

The tail-vane is attached to the plate *F'*, and to this plate is also pivoted the horizontal vane *R*, provided with a depending cam, *r*. This cam *r* rests in an opening in the plate *F'* and bears upon the plate *F''*, so that in any great wind the plate *F''* is depressed through the medium of the vane *R* and the slide-bars operated in order to release the doors. Those stops or projections on the slide-bars which engage with the projections from the outer doors may be twice the width of those which engage the projections from the inner doors, so that by sliding the bars along toward the center the inner doors are released, and if the pressure on the bars is continued the outer doors are released and allowed to swing around to present their edges to the wind.

The lower ends of the bars *H* are attached to a plate, *J*, which turns with the shaft *B*, upon which it is mounted, and is capable of sufficient vertical movement to operate the slide-bars *E*. In order to release the doors by hand, I provide a series of shafts, *J'*, having wheels *j*, which bear on the plate *J*. To these shafts are attached ropes or chains *j'*, running to a lever, *L*, mounted in a hanger, *l*. By depressing this lever the wheels *j* are brought to bear on the plate *J* and draw this plate down, and this movement, communicated to the slides *E* through the bars *H* and the bell-crank levers, releases one or both sets of doors in the wings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a windmill, a series of radial vertical

sections having swinging doors or panels provided with projections, and sliding plates capable of sliding to engage or release said doors or panels.

2. In a windmill, a series of radial vertical wings made up of radial arms, swinging doors or panels arranged between the arms, the said doors or panels being provided with projections, and sliding plates arranged upon the radial arms and having projections engaging the projections from the doors or panels.

3. In a windmill, radial wings made up of a series of upper and lower radial arms provided with the notches *C'*, *C''*, and *C'''*, the swinging doors or panels having the projections *d*, and the sliding plates *E*, engaging the projections.

4. In a windmill, radial wings having the swinging doors or panels, the sliding plates *E*, engaging the doors, and the rods connected to the sliding plates and to the plate *J*, and the shaft *J'* and wheels *j*, for depressing the plates, substantially as described.

5. In a windmill, radial wings having swinging doors or panels, sliding plates having projections engaging the doors or panels, the vertical operating-rods connected to the sliding plates by bell-crank levers, and the regulating-vanes connected to the operating-rods, substantially as described.

6. In a windmill, radial wings having swinging doors or panels, sliding plates engaging with the doors or panels, vertical operating-rods connected to the sliding plates, the plate *G*, connected to the operating-rods, and the regulator-vane provided with a cam connected to the plate *G*, substantially as described.

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

ALLEN W. BRODRICK.

Witnesses:

DAVID H. MEAD,  
L. M. THURLOW.