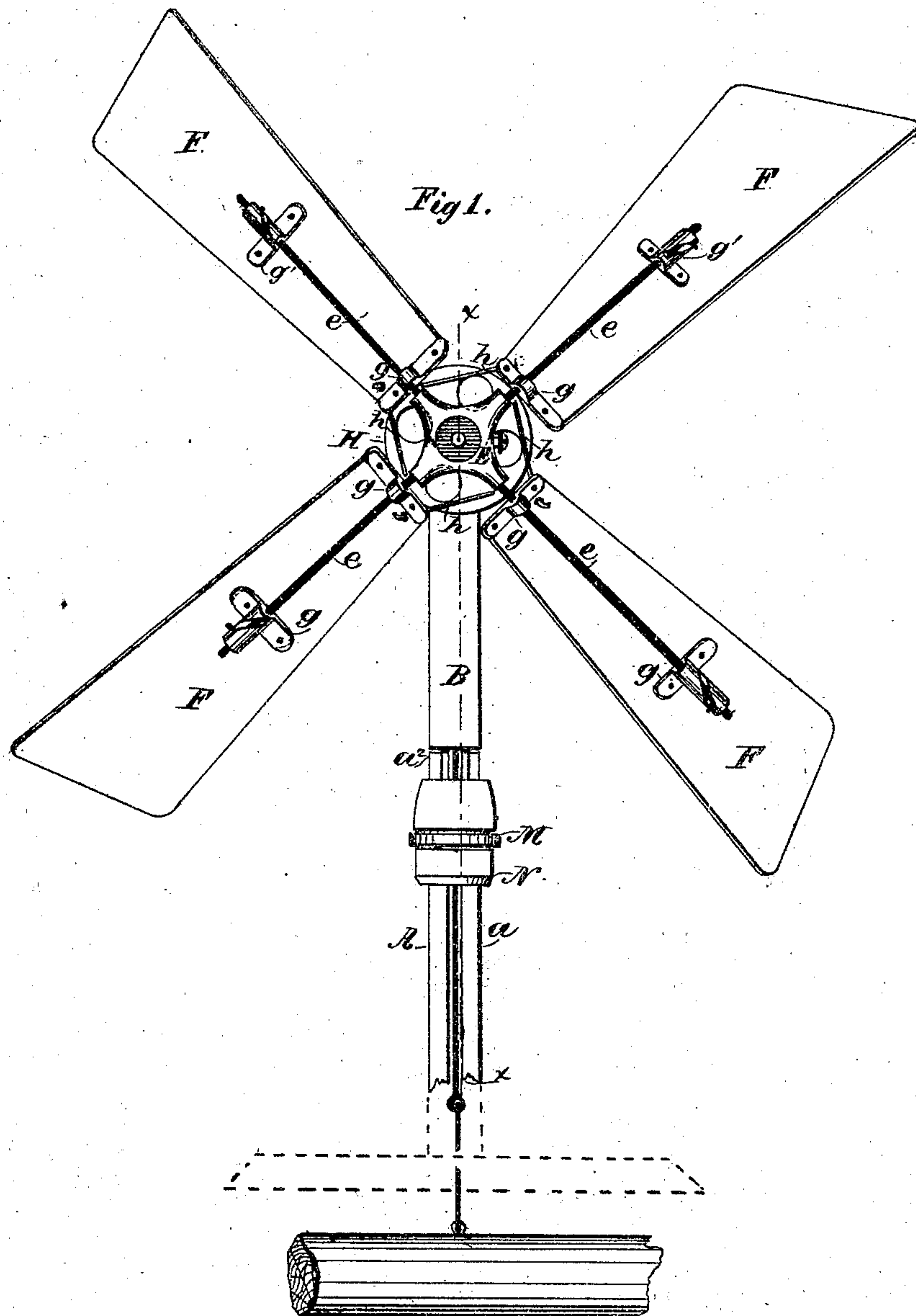


E. S. SMITH.
Wind-Mills.

No. 137,729.

Patented April 8, 1873.



Witnesses;
Harrie C. Clark.
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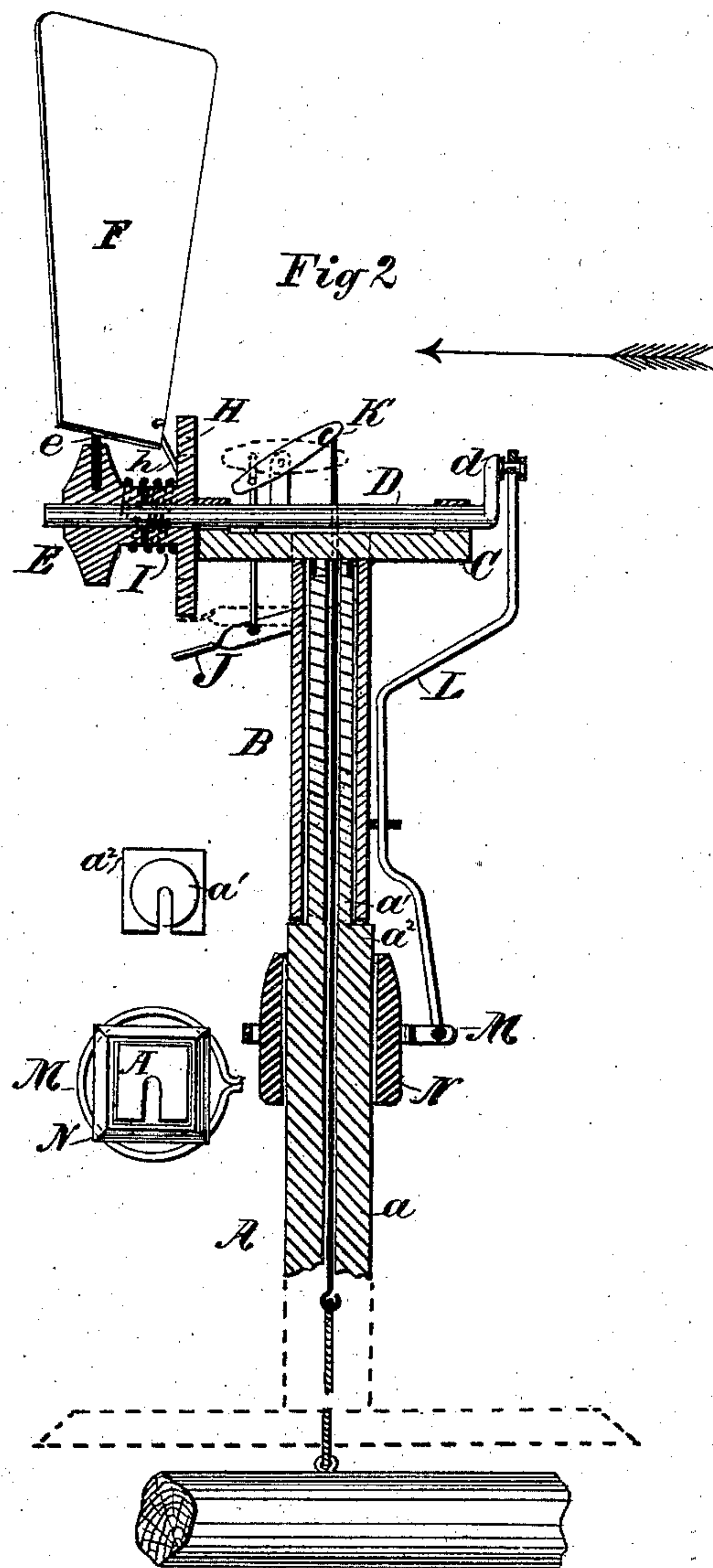
Inventor.
E. S. Smith.
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UNITED STATES PATENT OFFICE.

ELIJAH S. SMITH, OF GOOD HOPE, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **137,729**, dated April 8, 1873; application filed February 15, 1873.

To all whom it may concern:

Be it known that I, E. S. SMITH, of Good Hope, in the county of McDonough and State of Illinois, have invented new and useful Improvements in Windmills; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention is a windmill, which is adapted, by means of its peculiar construction, to operate without a guide or tail fan, and its novelty consists mainly, first, in the combination of a brake-wheel and mechanism for operating it with sails adapted to be turned by the force of the wind out of the wind when the brake-wheel is held. Second, in the combination of a brake-wheel, its operating mechanism and fans, adapted to be turned out of the wind by the force of the wind when the brake is held with a spring adapted to draw the sails into the wind. Third, in the combination of a float and suitable connecting mechanism with the brake-wheel, sails arranged as described, and the spring drawing the sails into the wind; and fourth, in the combination of the standard, the revolving box, the vertically-moving wrist, and the revolving sleeve and connecting-rod.

In the drawing, Figure 1 represents an elevation of my improved mill taken from the leeward side; and Fig. 2, a sectional elevation through the line *x x*, Fig. 1.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction.

A represents the supporting standard strongly secured in a vertical position by any proper means, it being constructed with its lower portion *a* square in form, and its upper portion *a*¹ round, the latter being of less diameter so that the shoulder *a*² is formed. B represents the box which supports the wind-wheel proper. It is held in place by the upper portion of the main standard, and is adapted to revolve freely thereon. It may have a bearing upon the shoulder *a*², but is preferably supported upon the upper end of the standard A. C represents a cross-beam attached to its upper end, which is provided at each end with suitable bearings for the shaft of the wind-wheel.

D represents the shaft provided at one end with a crank, *d*, and having rigidly attached thereto at the other, in any proper manner, a head, E, having arms *e e e e*, as shown. F F represent the fans or sails, which are secured to the arms *e e* by means of the cross-bars provided with the central sockets or thimbles *g g'*, the latter of which have angular slots in which rest pins secured to the arms *e e*, as shown. H represents a disk or wheel loosely held upon the shaft D, and connected by rods *h h*, or other suitable means, secured at proper and suitable intervals, near its periphery, to one corner of the sails, as shown. I represents a spring, the main portion of which is coiled about the hub of the head E and wheel H, one end being secured to each, as shown. J represents the brake having its fixed end pivoted to the box B, and its free end, when operated, adapted to bear against the edge of the brake-wheel. K represents a lever pivoted to any suitable standard, and connected by suitable means to the brake at one end, and to a floating weight at the other. L represents the pitman connected at one end to the crank of shaft D, and at the other to the sleeve M, which latter is adapted to revolve on the wrist of the pump-box N. The inner space of the pump-box conforms in shape to the square standard A, upon which it is free to move vertically, but cannot revolve. To the pump-box the pump-rod may be attached in any suitable manner.

The operation of my improved windmill will now be described.

In consequence of the non-employment of a tail or guide fan the wheel, under the influence of the wind, will necessarily swing to the leeward, and receive the wind upon the opposite side from the ordinary wheel. The brake-wheel is held in such relative position to the sails, by means of the connecting-spring, that the sails, when in their natural position, are exposed to the force of the wind, and they consequently revolve and give motion to shaft and its connections. When it is desired to throw the sails out of the wind the brake is applied, by which means the revolution of the brake-wheel is arrested. As the sails of the wind-wheel, however, are still exposed to the force of the wind the wheels revolve to some extent

against the force of the spring, by which means the fans are turned with their edges to the wind, this result being produced in consequence of their inner edges being held stationary by the connecting-rods which unite them to the brake-wheel, while their centers are carried forward by the revolution of the wheel. The angular slots of the thimbles upon the sails also insure the proper movement of the fans.

By means of this construction the sails are thrown out of the wind, while the brake-wheel is held by the action of the wind itself. When the pressure upon the brake-wheel is relaxed the fans assume, at once, their proper position, exposed to the wind, and freely revolve. The wire or cord of the brake-wheel may be used in connection with a weight above ground or it may be suitably connected to a float in the well, or a float in the tank or cistern. If desired the brake may be operated by different mechanism than that shown, such as a cord and pulley, but such changes are not important, and do not change the character of the invention. The mill being simple in its construction can be produced at a small cost.

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

1. The combination of a brake-wheel, and mechanism for operating it, with sails adapted

to be turned by the force of the wind, out of the wind, when the brake-wheel is held, substantially as described.

2. The combination of a brake-wheel, its operating mechanism, and fans adapted to be turned out of the wind, by the force of the wind, when the brake-wheel is held, with a spring adapted to draw the sails into the wind, substantially as described.

3. The combination of a float, and suitable connecting mechanism, with the brake-wheel, sails arranged as described, and the spring for drawing the sails into the wind, as described, for the purpose set forth.

4. The combination of the standard, of the revolving box, the vertically moving pump-box, and the revolving sleeve and connecting-rod, as described.

5. The combination of the brake and lever, and the connecting-rod, arranged as described, for the purpose set forth.

6. The windmill described, consisting essentially of the standard A, revolving box B, cross-bar C, shaft D, and wheel E F, brake-wheel H, spring I, brake J, lever K, and pitman L, with their connecting-parts combined and arranged as described.

This specification signed and witnessed this 7th day of February, 1873.

Witnesses:

E. S. SMITH.

J. A. McCLELLAND,

SAMUEL LOCK.