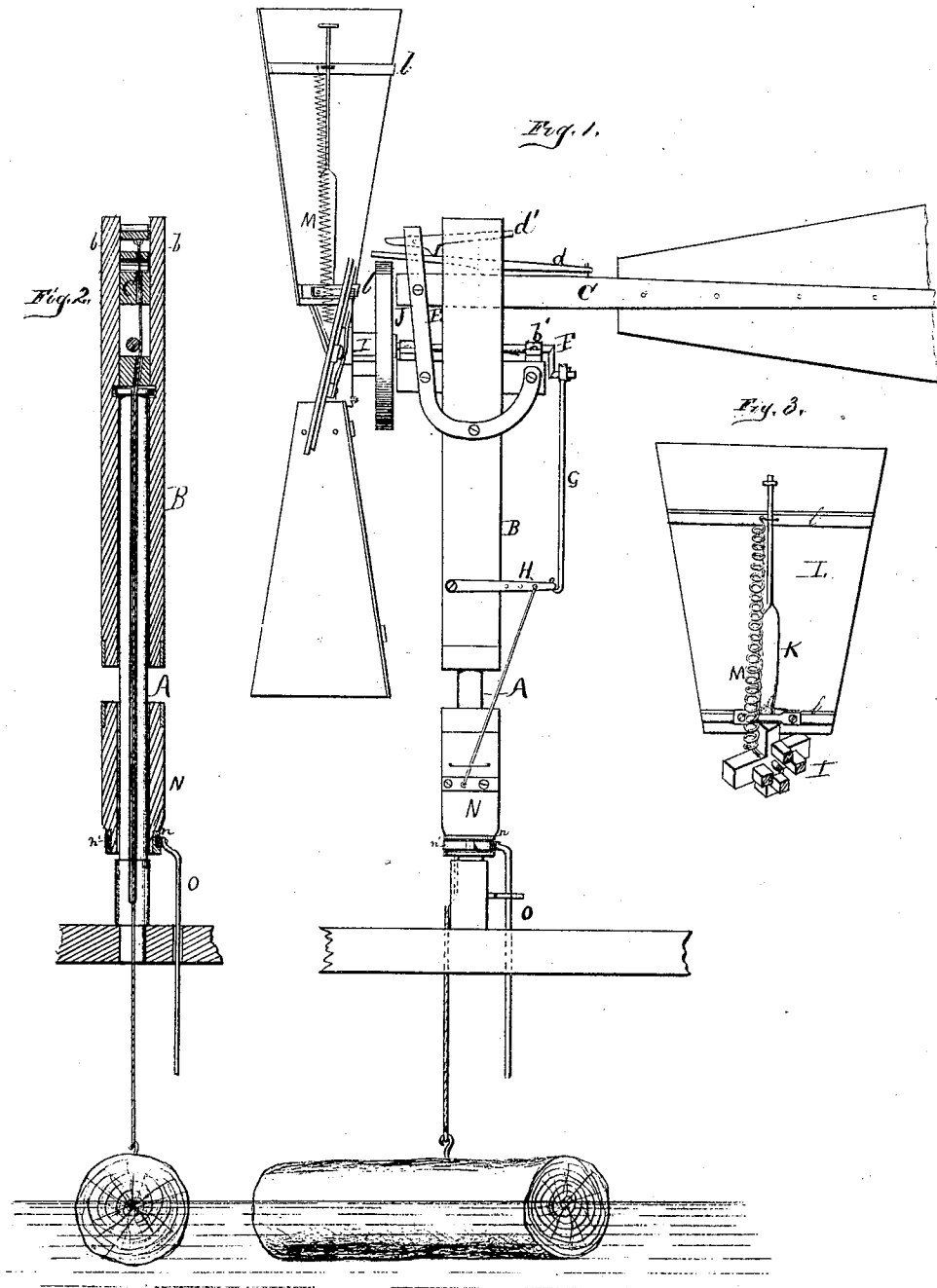


*E. S. Smith,*

*Wind Wheel.*

*No. 99,363.*

*Patented Feb. 1, 1870.*



*Witnesses*  
*E. A. Clarkson*  
*M. W. Beadle.*

*E. S. Smith Inventor*  
*by A. W. Beadle*  
*Attorney*

# United States Patent Office.

E. S. SMITH, OF MACOMB, ILLINOIS.

Letters Patent No. 99,363, dated February 1, 1870.

## IMPROVEMENT IN WIND-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, E. S. SMITH, of Macomb, in the county of McDonough, and State of Illinois, have invented a new and useful Improvement 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 drawings, and to the letters of reference marked thereon.

This invention relates to that class of windmills in which the fans are automatically adjusted by the action of the wind; and consists, first, in the peculiar construction of the fan-shafts, and in the manner of attaching the fans or sails to them; second, in the manner of connecting the mill to its standard; and, third, in the employment of a float, in connection with a cord and brake, for the purpose of regulating the supply of water delivered by the pump.

It further consists, also, in certain details of construction, which, in connection with the foregoing, will be fully described hereinafter.

In the drawings—

Figure 1 represents a side elevation of my improved mill,

Figure 2, a central vertical section of the standard, and

Figure 3, a detached view of one of the fans.

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

A represents the standard upon which the mill rests, which consists simply of a round rod or pole, of suitable size and stiffness, which is firmly secured to a proper base.

B represents a box or case, which rests upon the standard A, as shown, and revolves freely therein, in either direction. Upon this box all the machinery of the mill is built.

b b represent the side-pieces of the box, which, extending above the end-pieces, as shown, form supports for the guiding fan-shaft C. Between these supports are also located the brake d and eccentric lever d<sup>1</sup>.

The brake d is provided with a fulcrum, d<sup>2</sup>, and has, also, one of its ends much heavier than the other. By means of this arrangement, the brake, when in its natural position, is inoperative.

The eccentric lever d<sup>1</sup> is pivoted, as shown, between the upper ends of the irons E, and is operated by a cord attached to its free end, which passes through the brake and top of the box, down into the well, and is attached to a float.

F represents the crank-shaft, which turns in bearings upon the projections b' b.

To one end of this shaft is attached the upper end of the connecting-rod G, the lower end of which latter is attached to the swinging U-shaped iron H.

To the other end of the crank-shaft is attached a

head, I, consisting of two crossed beams, as shown.

Upon this shaft is also placed the wheel J, which revolves just beneath the working end of the brake d, as shown.

To the ends of the beams constituting the head I, are attached the inner ends of the fan-shafts K. Each of these shafts consists of a flat metallic bar, which is twisted near its base, as shown in fig. 3, so that its straight lengths are about at right angles to each other. These shafts terminate in round rods, as shown.

L L represent the fans or sails, which are constructed of any suitable material, and provided with the cross-bars l l. By means of these bars, the fans are secured to the shafts, as shown, a wide connection being used at the inner ends, to correspond with the form of the flat bar, and a simple staple at their outer ends, for the purpose of enclosing the rod.

M M represent springs, by means of which the fans are ordinarily held to their places.

N represents the pump-box, which has a vertical revolving movement upon the standard A. It is attached to the swinging iron H, by means of a connecting-rod, as shown.

The iron H, it will be observed, is provided with orifices at different points, in order that a longer or shorter play of the pump-box may be obtained at will. The lower part of the pump-box is provided with a wrist, n, in which is located a sleeve, n', as shown. By this means the former is enabled to revolve freely in the latter.

To the sleeve n' is attached the pump-rod O.

The operation of my windmill is as follows:

The mill, running in the usual manner, operates, through the various connections described, the pump-rod, and thus causes the delivery of the water to the tank or trough, in the usual manner.

When sufficient water has been pumped from the well to furnish the desired supply, its surface will be so lowered as to cause the float to hang down, and become a weight, and thus press the brake upon the wheel, and stop the mill. The brake, of course, may be perfectly adjusted to stop the mill when any desired quantity has been pumped, by simply shortening or lengthening the rope.

The fans are automatically adjusted as follows:

When the wind is blowing lightly, the fans remain in the usual position, well exposed to the wind, being thus held by their springs, as shown; but if a heavy wind arises, the force of the springs is overcome, and the fans being free to move on the shafts, are blown outwardly far enough to pass the half turn in the shafts, and thus they are caused to present their edges to the breeze. As soon, however, as the wind slackens, they are again drawn into position by means of the springs. If desired, other forms of springs may be used.

The construction herein described is simple, and by

it a strong and cheap mill, especially for pumping-purposes, can be produced.

Having thus fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a fan-shaft, formed of a twisted bar, with a fan, when the latter is free to move upon the former, as described, for the purpose set forth.

2. The combination of the box B, supporting the mill, with the standard A, in the manner described, for the purpose set forth.

3. The employment of a float, in connection with a brake,  $d'$ , and wheel J, in the manner described, for the purpose set forth.

4. The combination of the fans L, fan-shafts K, and springs M, in the manner described, for the purpose set forth.

5. The combination of the eccentric lever  $d'$ , weighted brake  $d$ , wheel J, cord, and float, in the manner described, for the purpose set forth.

6. The pumping-box N, with wrist  $n$  and sleeve  $n'$ , when operated as described, for the purpose set forth.

7. The windmill described, consisting, essentially, of the standard-box B, guiding-fan, crank-shaft F, head I, wheel J, fan-shafts K, fans L, and pumping-box N, with the connections, when constructed and arranged as described, for the purpose set forth.

This specification signed and witnessed, this 28th day of October, 1869.

E. S. SMITH.

Witnesses:

FRANK G. FLOYD,  
L. HOLLAND.