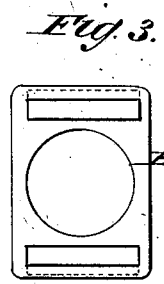
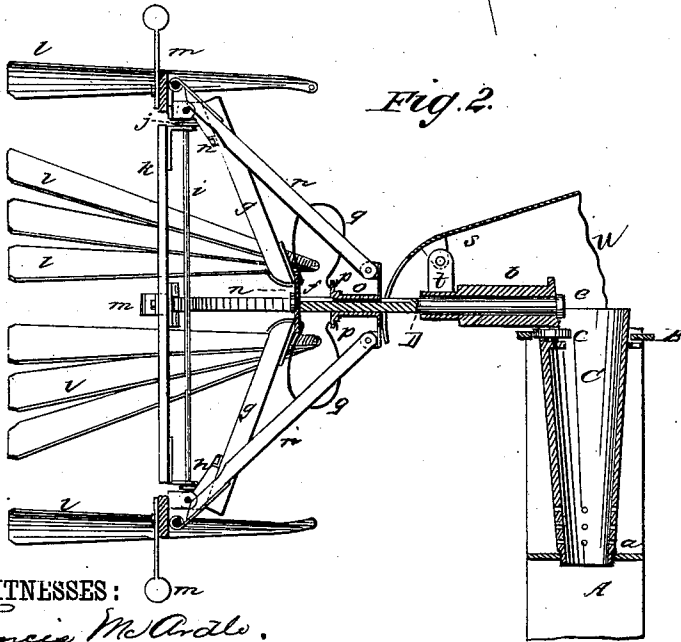
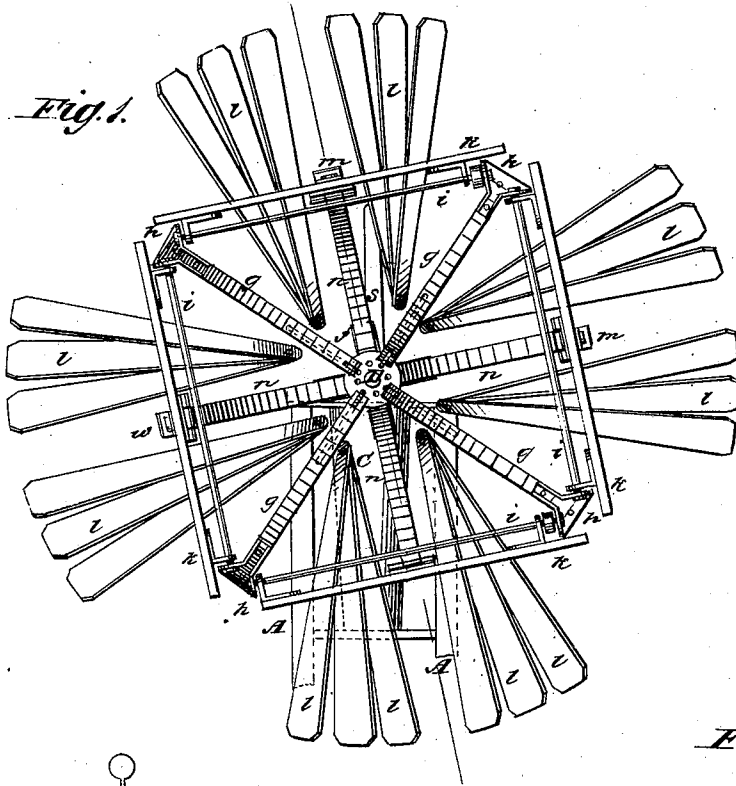


I. H. PALMER.  
Wind-Engine.

No. 207,545.

Patented Aug. 27, 1878.



WITNESSES:  
*Francis McOrdo.*  
*C. Sedgwick.*

INVENTOR:  
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# UNITED STATES PATENT OFFICE.

ISAAC H. PALMER, OF LODI, WISCONSIN.

## IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **207,545**, dated August 27, 1878; application filed March 20, 1878.

*To all whom it may concern:*

Be it known that I, ISAAC H. PALMER, of Lodi, in the county of Columbia and State of Wisconsin, have invented a new and useful Improvement in Wind-Wheels; 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a front elevation of my improved wind-wheel. Fig. 2 is a side elevation, partly in section. Fig. 3 is a detail plan view of the tower-cap.

This invention has relation to improvements in wind-wheels; and it consists in the construction and novel arrangement of a rotating shaft and its attached spider or head carrying the tilting frames, a flanged sleeve sliding on said shaft, the operating-arms extending from said sleeve to the tilting frame, and the bow-springs connecting said sleeve and spider or head, as will be hereinafter more fully shown and described.

Referring to the drawings, A A are the vertical timbers of the windmill-tower, and B is a metallic cap, which is apertured to receive the upper ends of the timbers A, and also to receive the upper end of the hollow conical trunk C. The lower end of the said trunk turns in a step, *a*, which is secured to the timbers A. A sleeve, *b*, is secured to the upper end of the trunk C, at right angles to its axis, and below the said sleeve a friction-roller, *c*, is journaled, between ears that project inwardly from the side of the trunk C, and rolls on the inner edge of the cap B. In the sleeve *b* the shaft D is journaled. A crank-disk, *e*, is attached to the inner end of the said shaft, and to the outer end of the shaft is secured a spider, *f*, to which four or more arms, *g*, are attached. To the outer ends of these arms ears *h* are attached for supporting the rods *i*. Upon these rods are pivoted ears *j*, which are secured to the bars *k* near one edge. Vanes *l* are fastened in diagonal slots cut in the bars *k*, and are arranged in two sets in each bar,

each set being composed of three or more vanes, the inner ends of which converge and are fastened together. To the outer face of each bar *k* a weighted arm, *m*, projects. Rods *n* are pivoted to the bars *k*, and connected with a sleeve, *o*, placed on the shaft D, between the spider *f* and the sleeve *b*. The sleeve *o* is prevented from turning on the shaft by a slot in the shaft and a feather in the sleeve. Upon the outer end of the sleeve *o* there is a flange, *p*, which flange and the spider *f* are apertured to receive the ends of the bow-springs *q*, which press the sleeve *o* backward toward the sleeve *b*, thereby throwing the vanes *l* into the wind. The number of these springs may at any time be increased or diminished to change the velocity of the wheel.

The vanes are tapering, being widest at their outer ends, and as the wind acts upon them it turns them more or less upon the rods *i*, so that they present a more or less effective surface to the wind. The velocity of the wheel is by this means regulated automatically. The weighted arms *m* afford an additional means of governing the speed of the wheel. Being acted on by centrifugal force, they tend to fold in the outer ends of the vanes.

A curved and forked lever, *s*, is pivoted between ears *t*, that project from the sleeve *b*, and its shorter forked end straddles the shaft D, while its longer end projects over the trunk C, to receive the cord or wire *u*, by which the vanes may at any time be thrown into or out of the wind.

The connecting-rod by which the crank on the inner end of the shaft is connected with the mechanism below extends downward through the trunk.

It will be observed that the mill has no vane or rudder to keep it to the wind, and that the wind acts on the tower side of the wheel.

It will also be noticed that the bow-springs *q* have a great advantage over the ordinary spiral regulating-springs, as they may be changed at any time, and are not liable to be clogged by ice or snow.

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

1. In a windmill, the combination, with the rotating shaft D and its attached spider or head *f*, to which tilting sail-frames are connected, the sleeve *o*, sliding on said shaft D, and the operating-arms extending from said sleeve to the tilting frames, of the bow-springs *g*, connecting said sleeve and spider, substantially as specified.

2. In a wind-wheel, the bow-springs *g*, bent

radially outward between the frame-head *f* on the end of the rotating shaft D, and the sleeve *o*, sliding on said shaft, the ends of said springs being attached to said head *f* and said sleeve *o*, substantially as specified.

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Witnesses:

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