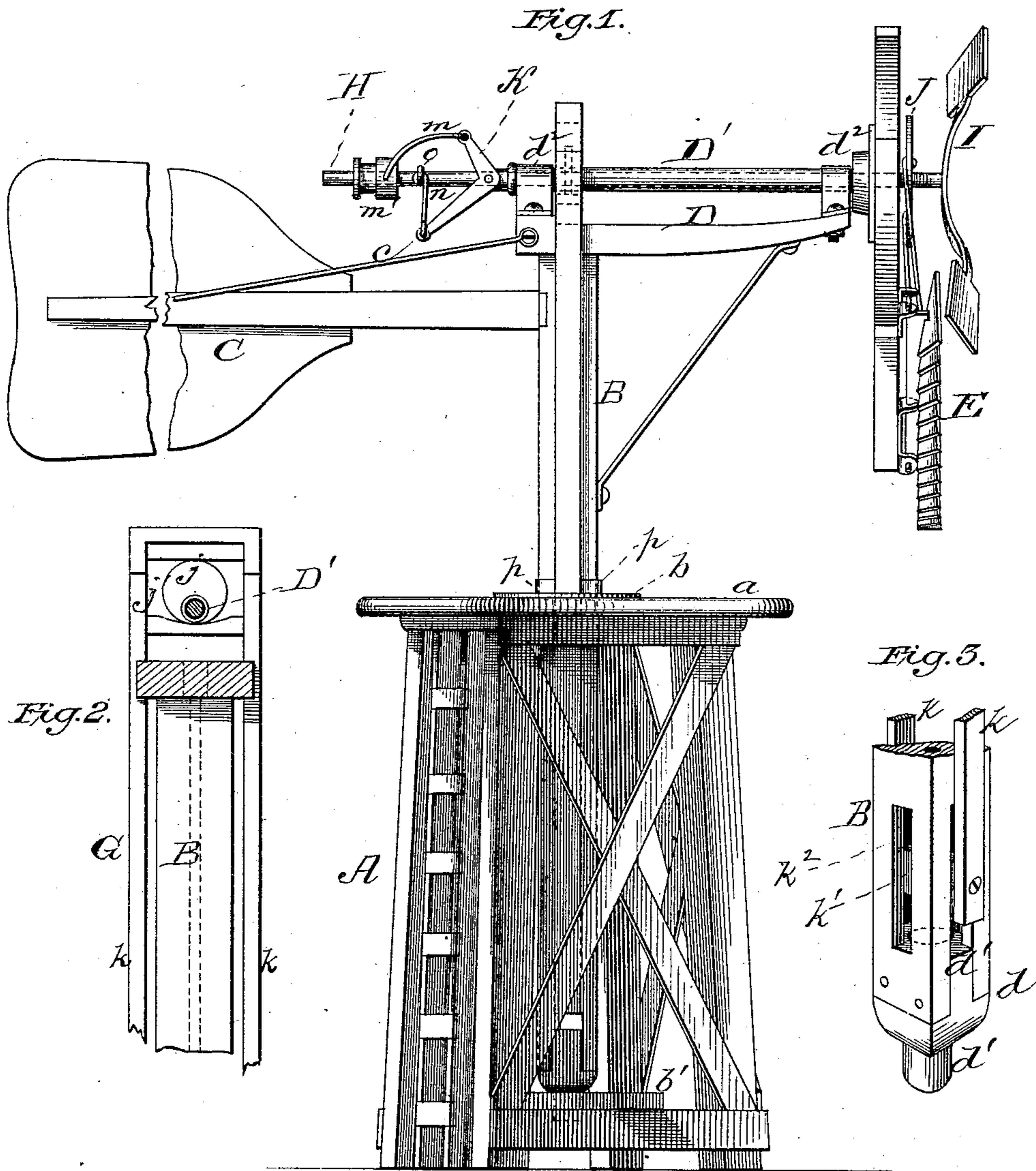


L. G. KREGEL.  
Wind-Engine.

No. 215,636.

Patented May 20, 1879.



WITNESSES

*John A. Ellis.*  
*F. J. Chase*

INVENTOR

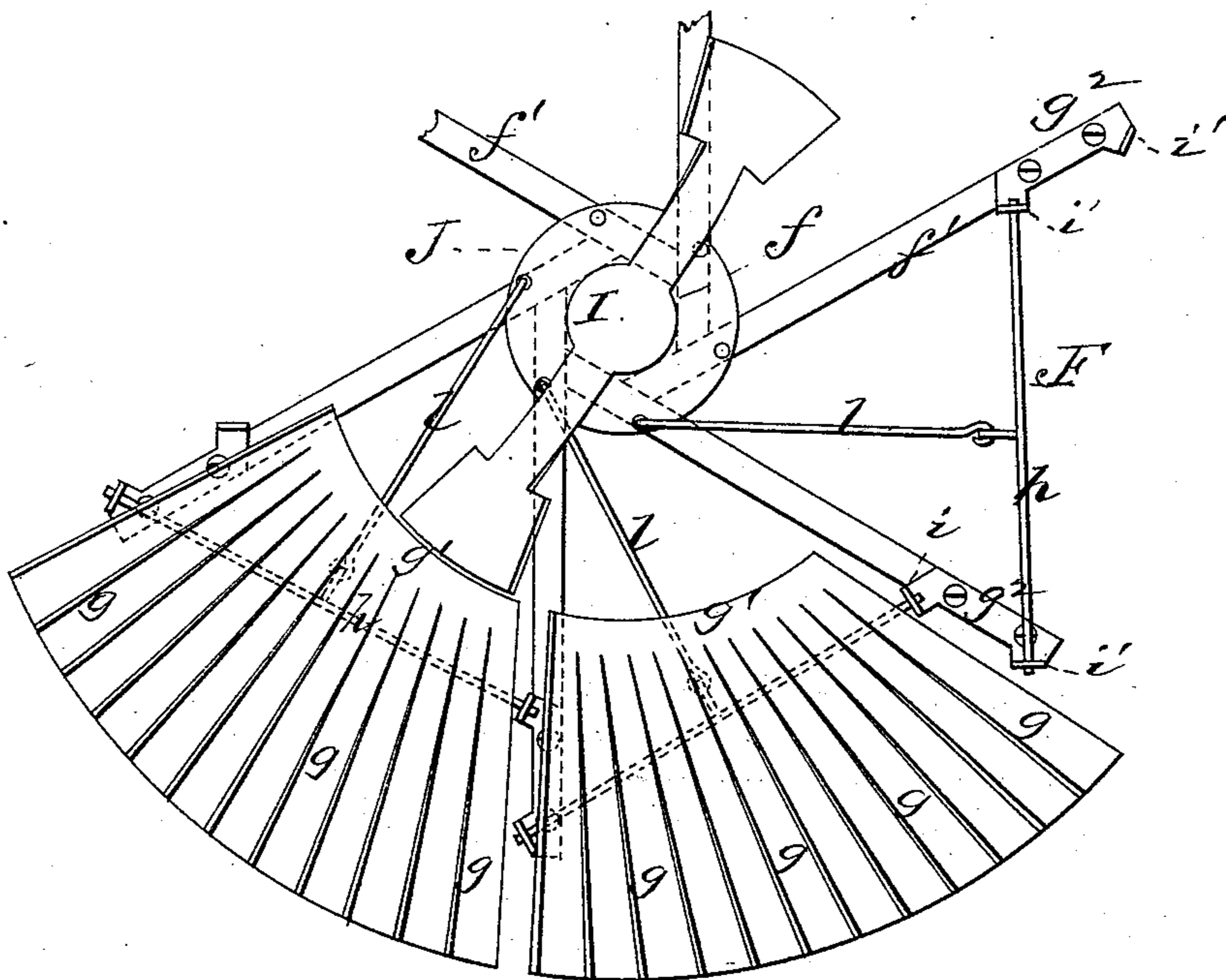
*L. G. Kregel,*  
*by E. W. Anderson,*  
ATTORNEY

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Fig. 4.



WITNESSES

*John A. Davis.*  
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# UNITED STATES PATENT OFFICE.

LOUIS G. KREGEL, OF NEBRASKA CITY, NEBRASKA.

## IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **215,636**, dated May 20, 1879; application filed January 25, 1879.

*To all whom it may concern:*

Be it known that I, LOUIS G. KREGEL, of Nebraska City, in the county of Otoe and State of Nebraska, have invented a new and valuable Improvement in 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my improved wind-engine; and Figs. 2, 3, and 4 are details.

This invention has relation to improvements in windmills; and it consists in certain novel combinations of parts, whereby the usefulness of such devices is greatly enhanced, as will be hereinafter more fully set forth.

In the annexed drawings, the letter A designates a tower of suitable construction and material, having at its upper end a platform, *a*, provided with a central opening of circular form, bounded by an annular metallic plate, *b*, and at a point intermediate the said platform and the base of the tower a transverse beam, *b'*, in which is stepped the lower end of a post, B. This post has its bearings in the plate *b*, and at that portion thereof in contact therewith will have friction-plates *p*, anti-friction-rollers, or other such devices to cause post B to work easily. Upon this post are sustained all the working parts of the mill. The main vane C is mortised into said post somewhat below its upper extremity, and is braced thereto by means of rods *c*. The step *d* of this post is a tubular casting, and its tang *d'* is let into the forked end of said post, as shown in Fig. 3. It is secured to said post by means of suitable bolts.

D indicates a strong metallic arm secured to the upper end of post B and projecting therefrom horizontally in an opposite direction from the vane. This casting has at each end a bearing, *d*<sup>2</sup>, in which is journaled a tubular shaft, D', upon the end of which is the wind-wheel E. This is composed usually of a hexagonal hub, *f*, of arms *f'*, bolted or otherwise secured to said hub, and of independent wind-sails F. These are composed of blades *g*, connected at their inner extremities by a curved

plate, *g*<sup>1</sup>, and secured in an oblique position to a straight brace, *h*. These braces are journaled to vibrate toward and from the plane of the wheel-frame in the arms *f'*, bearing-plates *g*<sup>2</sup> being secured to said arms for the purpose. These plates are provided with an inner and an outer bearing, *i* *i'*, respectively, and the journal-braces *h* have one end journaled in an outer bearing and the other in an inner bearing, the effect of which is to cause the outer extremity of each of said journal-braces to extend beyond the adjacent inner end of adjoining ones and to completely close the interval between the wind-sails, thus securing the full effect of the wind and obtaining the full power of the wheel.

Upon shaft D' is secured an eccentric, *j*, that works in a slot, *j'*, of a wooden pitman, G, the side rails *k* of which extend alongside of the post through the platform, and are secured to the ends of a cross-head, *k*<sup>1</sup>, extending through and reciprocating in a slot, *k*<sup>2</sup>, above the step-casting. The connecting-rod operating the pump or other mechanism is coupled to this cross-head, and the post is tubular in order to receive a small cord, by means of which the wind-sails are thrown out of or into the wind.

H indicates a shaft extending through the tubular shaft aforesaid, and provided upon its end outside of the wheel with a weighted fan, I, the blades of which are arranged after the manner of a propeller-screw, and which is rigidly secured to the said shaft in any suitable manner.

Between the wheel and this fan is a metallic disk, J, or its equivalent, that is connected to the journal-bars of the wind-sails by means of rods *l*, which are pivoted both to the said bars and to the said disk. When the wind becomes so high as to be dangerous, it acts upon the screw-fan I, causing it to rotate and to rotate the said shaft, and, through the medium of the disk and connecting rods *l*, throwing the sails out of the wind.

K indicates a bell-crank lever of suitable strength, and pivoted on the inner end of the tubular shaft aforesaid. The upper end of this lever is secured by means of a rigid forked rod, *m*, to a sliding collar, *m'*, upon the shaft H, the said rod being so pivoted to the collar

and lever that as the latter vibrates the former slides, but does not rotate upon the shaft H.

The lower extremity of the lever K is connected by means of a rod, *n*, to a collar, *o*, rigidly secured on the shaft H, the said rod being pivoted both to the collar and lever. If a cord secured to the lower end of this lever be drawn down upon, the said lever by its vibration causes the sleeve *m'* to slide, and, through the medium of the rod *n*, the shaft H to rotate in its bearings in the tubular shaft.

The rotation of the shaft thus produced throws the wind-sails out of the wind through the medium of the disk J and the rods *l*, connecting the same to the sails.

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

1. The combination, with the tower A, tubular post B, rotating therein and provided with a transverse slot, *k*<sup>2</sup>, and the metallic bearing-arm D, projecting therefrom, of the shaft D', carrying the wheel E and journaled in said arm, the eccentric *j*, the pitman G straddling the post, slot *j'*, the cross-head *k*<sup>1</sup>, working through slot *k*<sup>2</sup> and secured to the ends of the pitman, substantially as specified.

2. The combination, with the tubular shaft D' and a wind-wheel secured thereon, and having vibrating wind-sails F, of a shaft, H, extending through the shaft D', and provided with a screw-fan, I, and a disk, J, and the rods *l*, connecting said disk and the sails, substantially as set forth.

3. The combination, with the tubular shaft D' and the wind-wheel E secured thereon, and having vibrating wind-sails F, of the inside shaft, H, its disk J, connecting-rods *l*, its sliding and fixed collars *m' o*, the bell-crank lever K on shaft D', and the rods *m* and *n*, connecting, respectively, the upper end of lever K with the sliding collar and the lower end thereof with the fixed collar, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LOUIS G. KREGEL.

Witnesses:

G. L. WOOLSEY,  
W. L. WILSON.