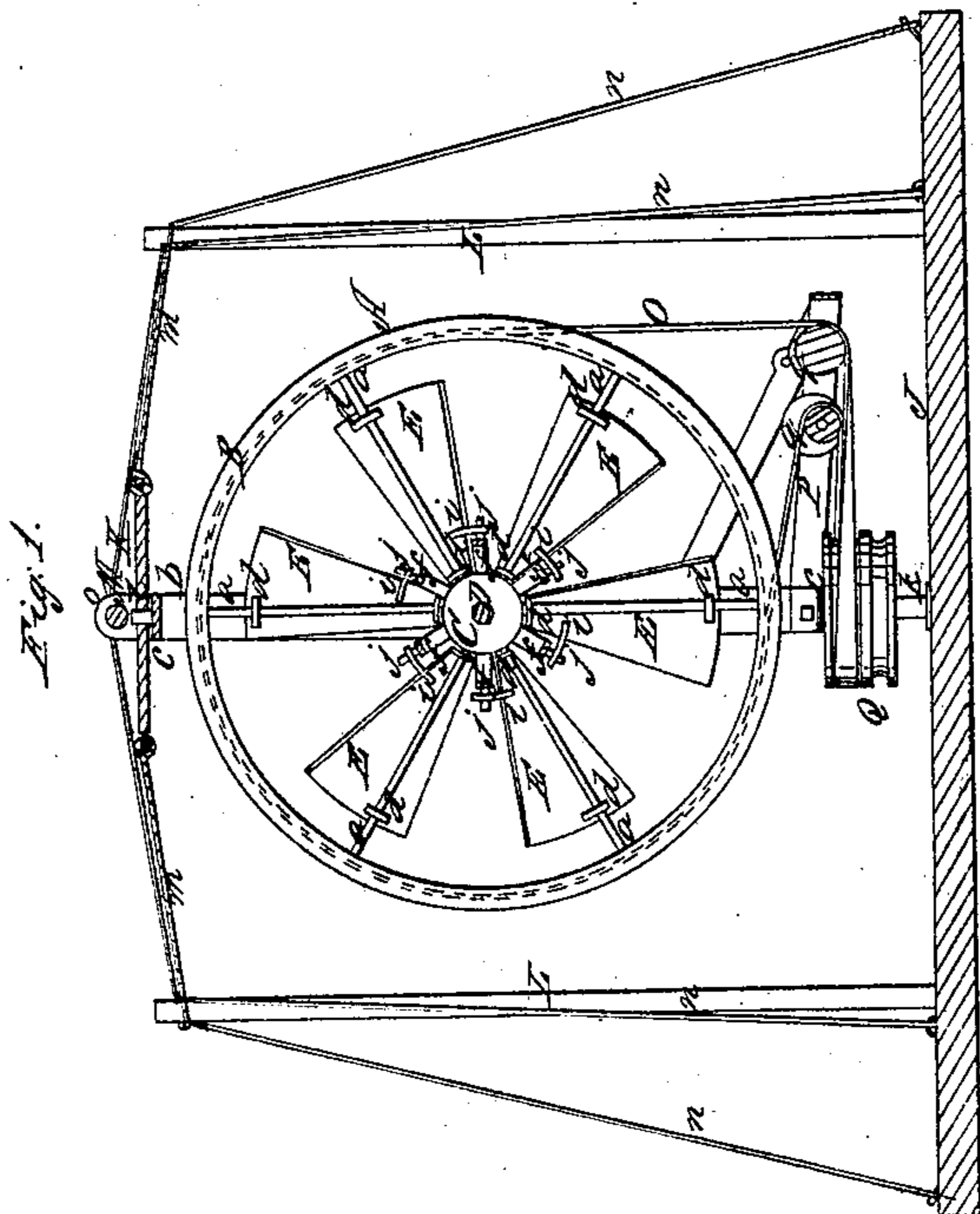
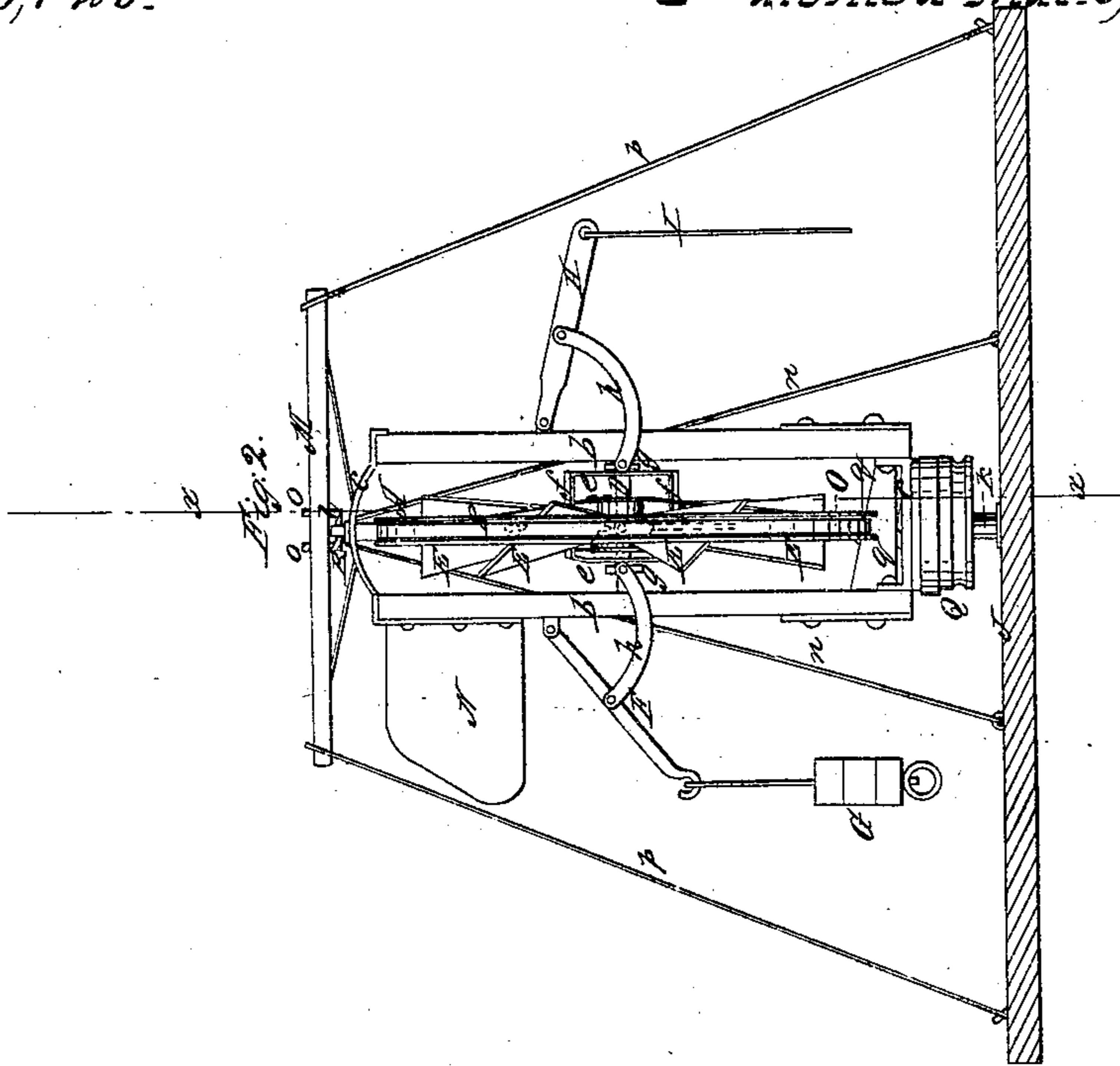


J. De Sendzimir

Wind Wheel

N^o 16,723.

Patented Mar. 3, 1857.



UNITED STATES PATENT OFFICE.

JOSEPH DE SENDZIMIR, OF SOUTH OYSTER BAY, NEW YORK.

IMPROVED METHOD OF SUSPENDING WIND-WHEELS IN SELF REVOLVING OR ADJUSTING FRAMES.

Specification forming part of Letters Patent No. **16,723**, dated March 3, 1857.

To all whom it may concern:

Be it known that I, JOSEPH DE SENDZIMIR, of South Oyster Bay, in the county of Queens and State of New York, have invented a new and Improved Windmill; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my improvement, *x x*, Fig. 2, showing the plane of section. Fig. 2 is a side view of the same.

Similar letters of reference indicate corresponding parts in the two figures.

This improvement consists in suspending the wind-wheel within a revolving frame, as hereinafter set forth.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the wind-wheel, which is formed of a rim B, attached by arms or spokes *a* to a hub C, said hub being upon a shaft D, the ends of which are fitted in uprights *b b*, connected at their upper and lower ends by means of cross bars *c*.

To the arms or spokes *a* the wings or sails E are attached, the back sides of the wings or sails having eyes *d* attached to them, the arms or spokes *a* passing through the eyes *d*. The wings or sails are attached to the arms or spokes rather out of center, as shown in Fig. 1.

On the shaft D there are placed two circular plates *e e*, one at each side of the hub C. These plates are allowed to slide loosely on the shaft D, and are connected by metallic strips or bars *f*, which pass between the wings or sails E, as shown in Fig. 2. On the shaft D there are also placed two collars *g g*, one at each end of the shaft. These collars have curved arms *h h* attached to them, one to each. To the outer ends of the arms of one collar a lever F is attached, one end of said lever being pivoted to one of the uprights *b* and the opposite end having a weight G attached to it. A similar lever H is attached to the outer ends of the arms of the other collar, a rope I being attached to said lever.

The wings or sails E have each an arm *i* attached to them near their inner ends, and pins *j* on the strips or bars *f* pass through the ends of the arms *i*.

The lower cross-bar *c* of the uprights *b b* has a rod or shaft *k* attached to its center, the lower end of said rod being stepped in a platform or base J, and the upper cross-bar *c* has a rod *l* attached to its center, said rod passing through a plate K, the ends of which have ropes *m* attached to them, said ropes being secured to the upper ends of poles L L, which are braced or kept in a vertical position by ropes *n*. The rod *l* also passes into a bar M, which crosses the plate K at right angles, said bar passing through loops *o o* on the plate. The ends of the bar M have ropes *p* attached to them, the lower ends of the ropes being attached to the base A. One of the uprights *b* has a vane N attached to it. (Shown in Fig. 2.)

The rim B of the wind-wheel A is grooved, and a band or belt O passes around it, said band passing around cone-pulleys *q q*, which are secured in a frame P at the lower end of the uprights *b b*. The band or belt O also passes around a drum Q, placed loosely on the rod or shaft K.

The uprights *b b*, connected by the plates *c c*, form a frame which is allowed to turn freely in its bearings, and the vane N keeps the wind-wheel A facing the wind. The wind-wheel frame is firmly supported or braced by the ropes *n p*, in connection with the plate K and bar M, and the usual tower is therefore avoided or rendered unnecessary.

The weight G is the exponent of the power of the wind-wheel, as the wind when acting against the sails or wings E with too much power will overcome the resistance of the weight and turn the wings or sails edgewise, thereby raising the weight, the plates *e e* being moved on the shaft D and operating the arms *h*, to which said weight is attached, by means of the arms *i* on the wings or sails, which arms, as before stated, work on pins *j* on the steps or bars *f*. The power of the wind-wheel, therefore, may be regulated by the size of the weight G.

The wind-wheel may be stopped when necessary by drawing downward the rope I, thereby causing the lever H to press the collar of the arms *h h* against one of the plates *e* and throw the wings or sails E edgewise to the wind. The power is taken from the drum Q, and consequently gearing and much friction are thereby avoided.

The common vertical-wheel windmills are

provided with an upright post or frame whose top terminates in a fixed disk. Upon the round platform thus formed another disk is laid, which is movable. The shaft of the wind-wheel is laid across the movable disk. Said shaft carries the wind-wheel at its extreme end, which is very heavy and causes an undue pressure upon the front bearing of the shaft, while the rear bearing has little or nothing to support. By attaching a vane or tail-board to the said movable disk the wind-wheel will be made to face the wind; but the wind in pressing against the sails tends to lift the front side of the revolving disk, while the rear side is depressed and caused to bind upon the fixed disk, thus retarding the free movement of the upper disk and preventing the sails from squarely facing the wind. It requires but a very slight variation of the sails from a true right angle with the direction of the wind to materially reduce the effective power of the machine. If the wind-wheel is turned edgewise to the wind, (or to an angle of only ninety degrees,) it will, as is well known, stop at once; if its position is at any angle except that of a true right angle to the direction of the wind, power will be lost in proportion to the extent of the angle. If the variation from a right angle be only ten degrees, one ninth of the effective force of the machine is lost. If the variation is forty-five degrees, one-half of the power is lost, &c. In the common windmills, whose construction I have described, the sails are seldom or never made to face the wind at direct right angles, owing to the friction on the disk. The wind acts upon the tail-board when the latter is brought nearly into line with the wind with but very little power. A slight friction on the disk will be sufficient, therefore, to prevent the sails from being brought to a true position at right angles with the wind. Hence such mills are defective. It requires the utmost freedom of movement

of the centers on which the wind-wheel is carried in order to keep the vanes properly presented to the wind. The arrangement of the ordinary vertical windmills is such as to forbid this freedom; but by my method of suspending the wheel within a pivoted frame the wind-wheel is turned to the wind with perfect ease and freedom, as there are no parts to bind, cramp, and produce undue friction. Besides this, the wind-wheel itself is supported in the center of its shaft, and both bearings of the latter support their due proportion of the weight. My arrangement also permits a cheapening of the general construction of the machine, as the revolving frame may be readily braced, as described. The power of the wheel is also easily transmitted. No cogged-wheel gearing is required. All the parts are simple and can be made by any ordinary mechanic.

I do not claim the regulation of the sails by weights, levers, and cranks. Neither do I claim the use of brakes for stopping the wind-wheel. Examples of these devices are seen in the patents of B. Frantz, July 10, 1855; A. Lempeke, May 8, 1855, and D. Halladay, August 29, 1854. Neither do I claim communicating power by pulleys, bands, cones, &c. Neither do I claim any part or feature of the machine herein described which is seen in any other windmill; but to the best of my knowledge it is new to suspend the wind-wheel within a revolving frame in the manner and for the purposes already described.

Therefore what I claim, and desire to secure by Letters Patent, is—

Suspending the wind-wheel A within a revolving frame *b c* in the manner and for the purposes substantially as herein set forth.

JOSEPH DE SENDZIMIR.

Witnesses:

ZEPHANIAH DARBY,
RICHARD P. DARBY.