J. M. Clock,

Wind Wheel.

No. 18,440. Patented Oct. 20, 1857.

Fig. 3.

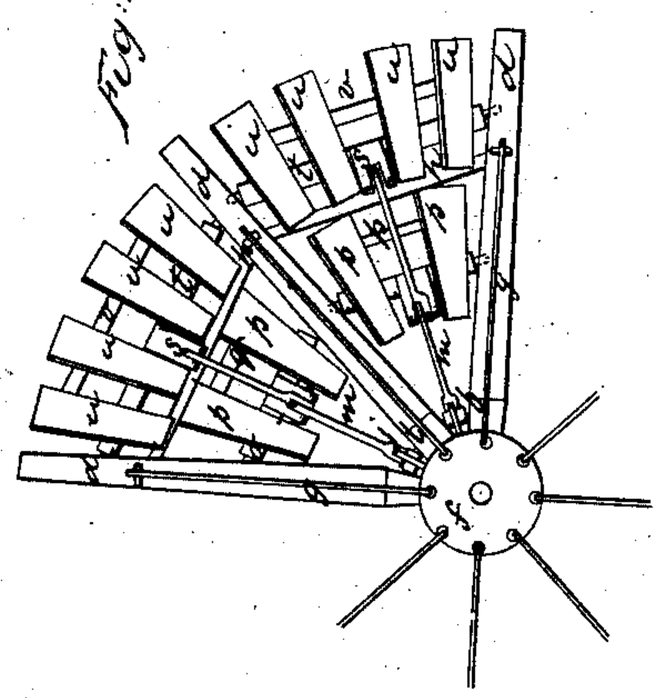


Fig. 1.

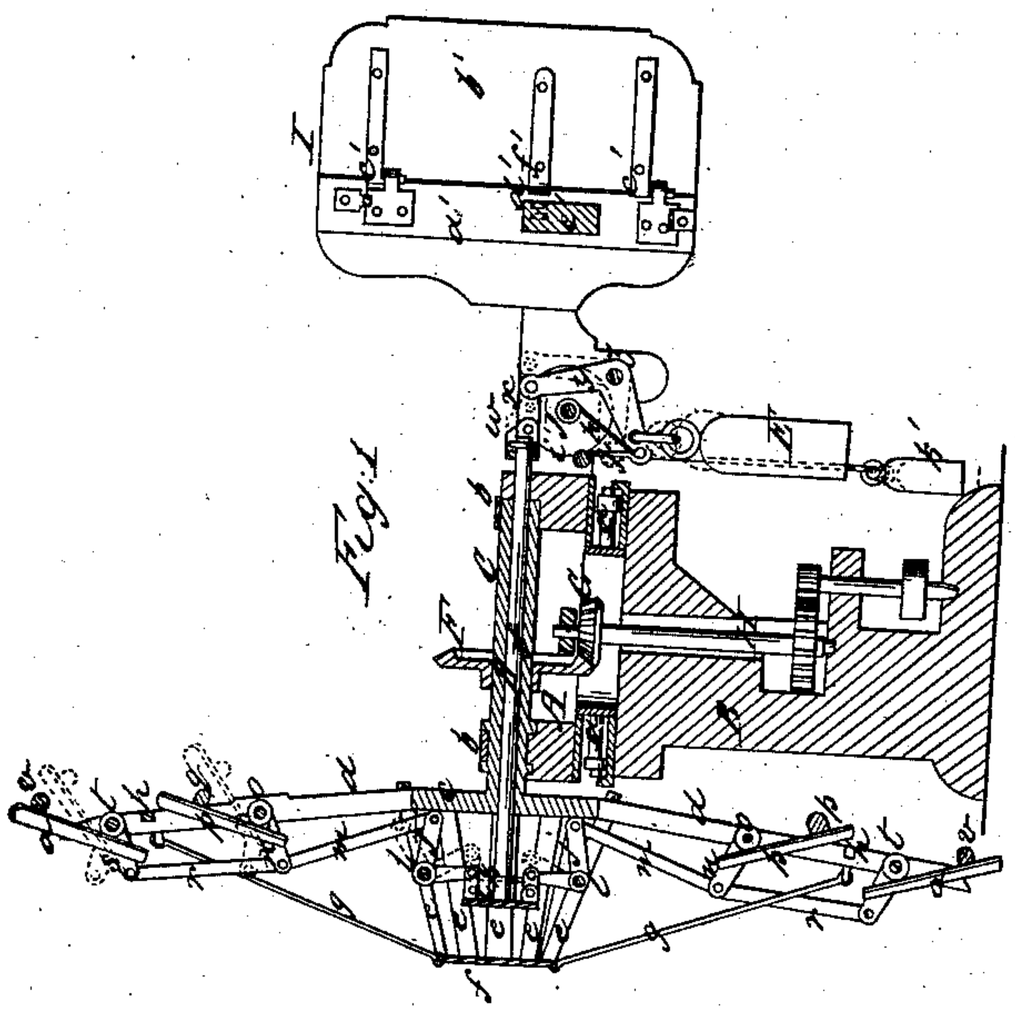
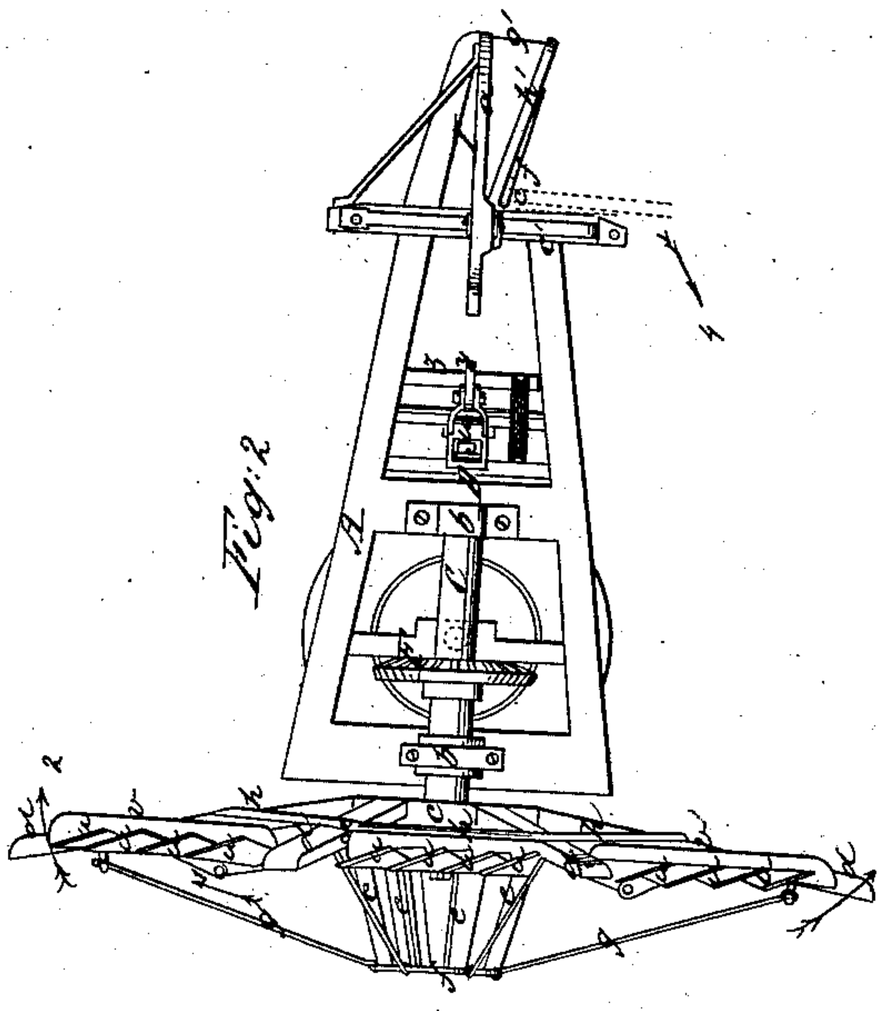


Fig. 2.



UNITED STATES PATENT OFFICE.

JESSE M. CLOCK, OF ATLANTICVILLE, NEW YORK.

IMPROVED VANE FOR WIND-WHEELS.

Specification forming part of Letters Patent No. **18,440**, dated October 20, 1857.

To all whom it may concern:

Be it known that I, JESSE M. CLOCK, of Atlanticville, in the county of Queens and State of New York, have invented a new and Improved Self-Regulating Wind-Wheel; 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 central section of my improvement, the plane of section bisecting the shaft or axis of the wheel longitudinally. Fig. 2 is a plan or top view of the same. Fig. 3 is a face view of a segment or portion of the wheel.

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

The invention consists in an improved construction of the vane, whereby the wheel is quickly adjusted to face the wind during sudden changes of the same, and the tendency of the wheel to be deflected or turned from its proper position relatively with the direction of the wind, in consequence of the resistance offered to the revolutions of the wheel by the application of machinery thereto effectually prevented.

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

A represents a horizontal frame, which is placed on the upper end of an upright B, and so arranged that it may turn or rotate freely thereon, friction-rollers *a* being interposed between the frame and upright and arranged in any proper way to facilitate the turning of the frame. (See Fig. 1.)

C represents a horizontal tubular shaft, which is fitted in the frame A, in proper bearing *b* in which the shaft is allowed to rotate freely. To the outer end of the shaft C a hub or boss *c* is attached, said hub or boss having radial arms *d* secured to it, any proper number of arms being used, according to the intended size of the wheel. To the inner arms *d*, at their junction with the hub or boss *c*, bars *e* are attached, one to each arm. These bars converge slightly toward each other from their inner to their outer ends, and their outer ends are secured to a circular plate *f*. Metal rods *g*, which serve as braces, are attached to the periphery of the plate *f* and to the arms *d* near their outer ends. The arms *d* are connected at their back sides by metal rods *h*, which serve to brace and stiffen the arms.

D represents a rod, which is of metal, and is fitted within the hollow or tubular shaft C and projects beyond it at both ends. The outer end of the rod D has a head *i* attached it, and to this head the inner ends of bent levers *j* are attached by links *k*, as shown clearly in Fig. 1. The levers *j* work on rods *l*, placed between the bars *e*, and the ends of the upper arms of the levers *j* are pivoted to the lower ends of rods *m*. The outer ends of the rods *m* are pivoted to projecting arms *n*, which are attached to bars *o*, which are fitted between the arms *d*, so as to form a polygonal figure concentric with the hub or boss *c*. This will be understood by referring to Fig. 3. The bars *o* are allowed to turn freely between the arms, and two wings or sails *p p* are attached to each bar. These wings or sails may be constructed of wood or metal, and they are secured obliquely or angularly to the bars, as shown clearly in Fig. 2, so that the wind may act upon them to rotate or propel the wheel, a sufficient space being allowed between the wings or sails to allow the wind to pass through. The outer ends of each pair of wings or sails *p p* are connected to a bar *q*, which serves as a brace and support. The arms *n* of the bars *o* have the inner ends of rods *r* pivoted to them. The outer ends of these rods are pivoted to arms *s*, which project from bars *t*, fitted between the upper parts of the arms *d*. The bars *t* are allowed to turn freely between the arms *d* and are arranged precisely similar to the bars *o* and are placed concentrically around them. (See Fig. 3.) To the bars *t* wings or sails *u* are attached. These wings or sails are constructed precisely similar to the wings or sails *p* and have the same oblique position relatively with their bars *t* as the sails *p* have with the bars *o*. The upper ends of the wings or sails *u* at their back sides are attached to bars *v*, which serve as braces or supports.

The inner end of the rod D is fitted within a box *w*, which is connected by a link *x* with the upper end of a bent lever *y*, which lever is attached to a shaft *z*, fitted in the back end of frame A. To the lower end of the lever *y*

a weight E is attached. On the shaft C a toothed wheel F is placed, said wheel gearing into a pinion G on a vertical shaft H, from which the power may be taken.

To the back end of the frame A a vane I is attached. This vane is formed of two pieces or parts a' b'. The part a' is in line or in the same plane with the shaft C and rod D, and is formed of a board or metal plate of sufficient area to keep under ordinary circumstances the face of the wheel to the wind. The other part b' of the vane is hinged to the part a', as shown at c', and a spring d', which is fitted in a bar e' at the back end of the frame A, bears against a projecting plate f' on the part b' of the vane. The spring d' has a tendency to keep the part b' against cleats g', which are secured to the side of the part a', said cleats having their outer sides so beveled as to cause the part b' to have an oblique or angular position relatively with the part a', as shown clearly in Fig. 2.

In the back part of the frame A a shaft J is placed, to which a cord h' is attached. This cord is attached to the lower end of the lever y. On the shaft J a pulley i' is placed, said pulley having a cord j' attached to its periphery, a weight k' being attached to the end of the cord. (See Fig. 1.)

The operation is as follows: The wind acts against the sails or wings p u with a greater or less force or pressure, according to its velocity, and if the force of the wind is sufficient to overcome the weight E the sails or wings will be thrown back, the bars o t being their axis, as indicated in red, Fig. 1, the weight E being raised through the medium of the rod D, lever j, and rods m r. When the sails or wings are thrown back, they of course present a less area or surface to the wind, and as the said wings or sails are thrown back by its increased force or velocity it follows as a matter of course that the wind-wheel will be self-regulating and the weight E the exponent of its power, the velocity of the wheel being regular or rotating with equal speed, however variable the velocity of the wind may be.

In vertical wind-wheels the wheels have a tendency to move out of a proper relative position with the wind, owing to the resistance offered to its rotation by the gearing or machinery applied to it. For instance, by referring to Fig. 2 it will be seen that the wheel rotates in the direction indicated by arrow 1, and the wheel in the effort to turn shaft H has a tendency, together with the frame, to turn bodily in the direction indicated by arrow 2. This tendency of the wheel is obviated by the part b' of the vane I, which part, owing to its oblique position, has a tendency to turn the wheel in the direction indicated by arrow 3. Consequently one force is neutralized by the other, and the wheel is retained in a proper relative position with the direction of the wind.

The wind frequently shifts suddenly and is very fluctuating, and at such times vertical wind-wheels cannot operate well, as the vanes are not sufficiently sensitive. In my improvement if the wind shifts suddenly and strikes the back side of the wind-wheel the wheel, instead of remaining stationary, like the usual wheels, will be immediately thrown around in consequence of the wind acting upon and throwing open the part b' of the vane, as shown in red, Fig. 2, so that said part will act as a lever and allow the wind to throw the wheel and frame around in proper position and in the direction indicated by arrow 4.

I would remark that the cord j is merely a stop-cord for turning the wings or sails in a horizontal position, the weight k' being sustained or held up by a hook or any device when the wheel is in operation.

I do not claim, broadly, the application of a weight to the wings or sails of a wind-wheel for the purpose of rendering them self-regulating, for this has been done in various ways. Neither do I claim the sails arranged and applied to the wheel, as shown; but,

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

The vane I, formed of two parts a' b', the part b' having an oblique position relatively with the part a', and either hinged to said part a' or attached permanently to it, for the purpose specified.

JESSE M. CLOCK.

Witnesses:
ELBERT VERITY,
ROBERT SMITH.