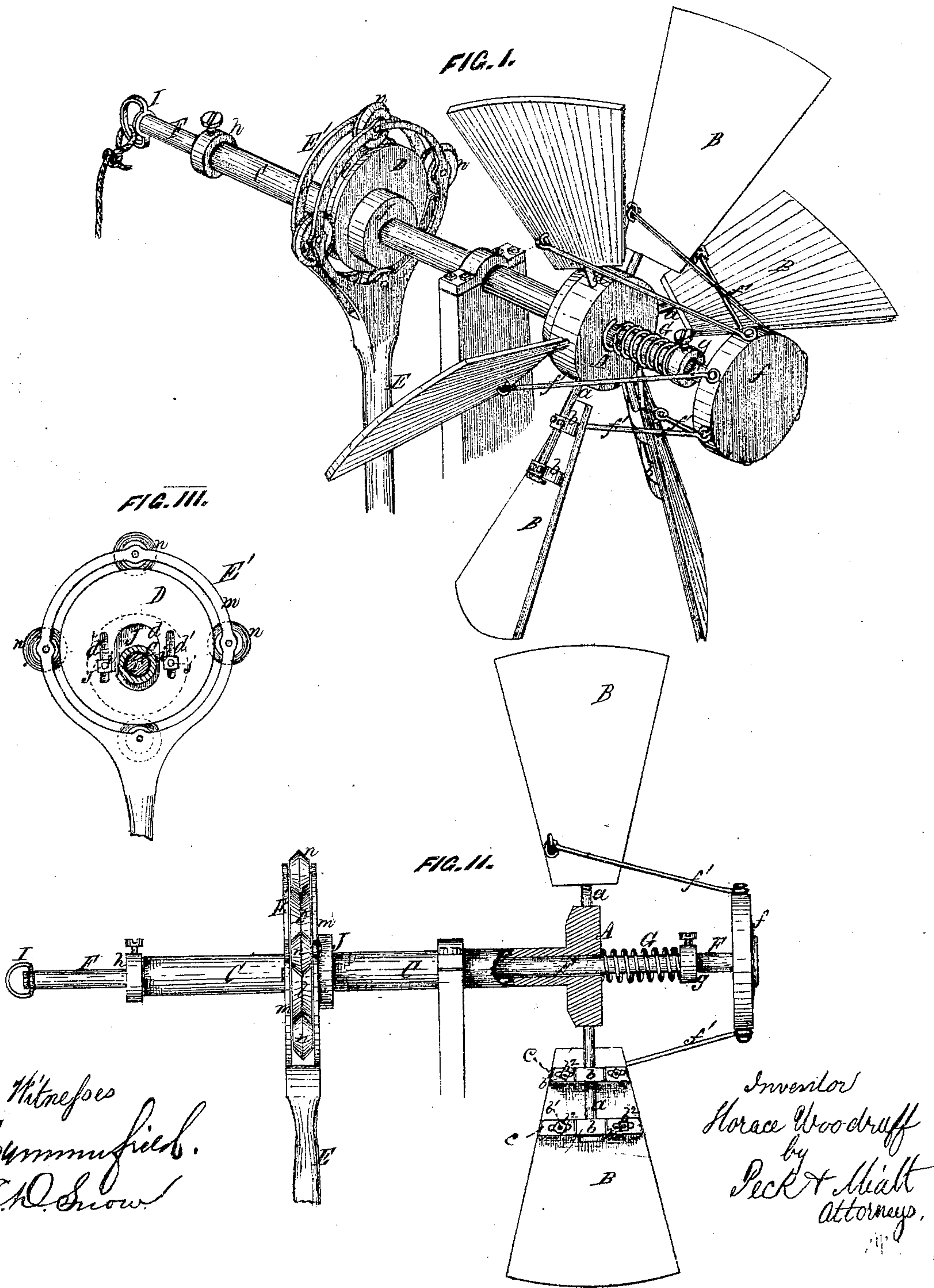


Improvement in Wind-Wheels.

Patented May 2, 1871.

No. 114,381.



United States Patent Office.

HORACE WOODRUFF, OF SANDWICH, ILLINOIS.

Letters Patent No. 114,381, dated May 2, 1871.

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, HORACE WOODRUFF, of Sandwich, in the county of DeKalb, in the State of Illinois, have invented a certain new and useful Improvement in Windmills, of which the following is a description.

Nature of the Invention.

This invention consists in the peculiar arrangement and construction of a windmill, as hereinafter set forth, for the purpose of rendering the sails automatic in their adjustment to the wind; also, in making the eccentric adjustable to gauge the length of stroke of the pitman, and in obviating friction by the employment of friction-rollers in the piston-head, all as hereinafter described.

General Description.

In the drawing—

Figure 1 is a perspective view of my improved windmill.

Figure 2, a sectional side elevation of the same.

Figure 3, a cross-section of the shafts in plane of line *x x*, showing the eccentric and pitman-head in elevation.

A is the hub, from which radiate the arms *a a* which carry the bearings *b b*, to which the sails B B are secured by means of nuts and bolts *b¹ b¹ b² b²*, said bolts resting in longitudinal slots *c c*, and thereby allowing the sails to be adjusted laterally.

The hub A is firmly secured to a hollow shaft or sleeve, C, which extends backward, supported by suitable bearings, and has an adjustable eccentric, D, situated upon it at any suitable position, which operates the pitman E, presently to be described.

A primary shaft, F, of greater length, rests loosely in and extends through the hollow shaft C, and has a head or hub, *f*, secured rigidly to its front or outer extremity, to the periphery of which are secured loosely rods *f'*, which extend backward and attach to the further or inner edge of the face of the sails B, so that when, in operation, the head of wind is too great the sails will be allowed to partially or wholly open by turning upon their supporting-arms *a a* before the wind, and against the resistance of a spiral spring, G, which latter encircles the shaft F, and rests against the face of the hub A at one end, and against an adjustable shoulder, *g*, at the other.

The opposite or rear portion of the primary shaft F has an adjustable shoulder, *h*, which rests against the end of the hollow shaft C, and, by being moved backward or forward, gauges the extent to which the shaft F may be drawn forward by the springs G, and thereby, through the medium of rods *f'*, controls the angle to which the faces of the sails are presented to the wind.

A swivel or other loose loop, I, is attached to the

extreme inner end of the shaft F, to which a rope or chain is attached to enable the shaft to be drawn backward by hand when desired to open the sails.

A shoulder, J, of suitable extent, situated rigidly upon the hollow shaft C, forms the bearing to which the eccentric proper, D, is secured.

The latter is formed with three parallel longitudinal slots *d d d'*, the central one of which is made sufficiently wide to pass over the shafts F C.

Threaded bolts *j j* of the bearing J pass through the smaller slots *d d'*, situated on opposite sides of the slot *d*, and have nuts *i i* screwing upon their outer ends, by which means the eccentric D is clamped to its bearing J at any degree of eccentricity, according to the depth of stroke required of the pitman.

The periphery of the eccentric is formed with an angular groove, *l*.

Instead of the pitman E being provided with the ordinary pitman-head encircling the eccentric, mine is formed with two strong circular loops or rings, *m m*, between which are hung friction-rollers *n n* of protruding angular form, to correspond and intermatch with the groove *l* of the eccentric D, in which they roll.

The advantages obtained by my arrangement are important. The evenness and regularity of action secured by the automatic adjustment of the sails to the wind adapt the mill to almost any form of labor, as both the power and motion are perfectly uniform under all circumstances while in operation. All possibility of breakage or overstrain on the parts is obviated by the sails giving way and opening before the wind if it should be too strong, thereby stopping the machine, while the moment the danger is removed by the winds abating the spring forces them forward again and motion is resumed.

I am aware that other inventions have been patented which intend to accomplish a similar effect, but they are mostly unsafe and impracticable, and have not that certainty and ease of adjustment to control the sails which I secure by the use of the two concentric shafts sliding one within the other and relatively adjustable by means of movable shoulders at either end, features which I believe to be original with myself. The simple and delicate gauging of the resistance offered by the spring is also of great value; and my whole special arrangement and construction is practical and effectual.

The advantages arising from my special form of eccentric and pitman-head are obvious. The adjustment of the degree of eccentricity of the eccentric head enables the stroke of the pitman to be varied with the greatest precision to suit the labor to be performed. The mitred friction-rollers of the pitman-head intermatching and rolling in the corresponding groove in the periphery of the eccentric obviate friction in a

large degree, while all tendency to lateral looseness or play is counteracted. It will be readily seen that the form of the groove in the periphery of the eccentric and the corresponding projection on the rollers may be varied without affecting the principle.

By making the sails adjustable upon their bearings they may be moved laterally to either side of the supporting-arms, as desired, to harmonize with the adjustment of the other parts, or for other reasons.

I am aware that devices for automatically controlling the action of windmills have before been known and patented; also, that springs have been employed in connection with such devices, and I do not, therefore, claim such broadly; but

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

1. The two concentric shafts C F, the latter sliding loosely on the former, and rendered relatively adjustable by means of two movable shoulders, *g h*, sliding on opposite ends of the shaft F, in combination with the spring G and connecting-rods *f*, for the purpose of adjusting the sails B to the wind, as herein described.

2. The primary shaft F, resting in and extending through a hollow concentric shaft C, and being connected at the front end by rods *f* with the sails B, and at the rear end having a swivel or loop, I, for the attachment of a rod or rope, to allow the sails to be opened by hand from the rear of the mill.

3. The eccentric D, adjustable upon its bearing J by means of longitudinal slots *d d'*, bolts *j j*, and nuts *i i*, to vary the length of stroke of the pitman E, in combination with the friction-rollers *n n* of the pitman-head E', as herein set forth.

4. The lateral adjustment of the sails B upon their bearings *b b* of supporting-rods *a* by means of longitudinal slots *c c*, bolts *b' b'*, and nuts *b'' b''*, in the manner described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HORACE WOODRUFF

Witnesses:

W. W. SEDGWICK,

JOHN J. ARMSTRONG.