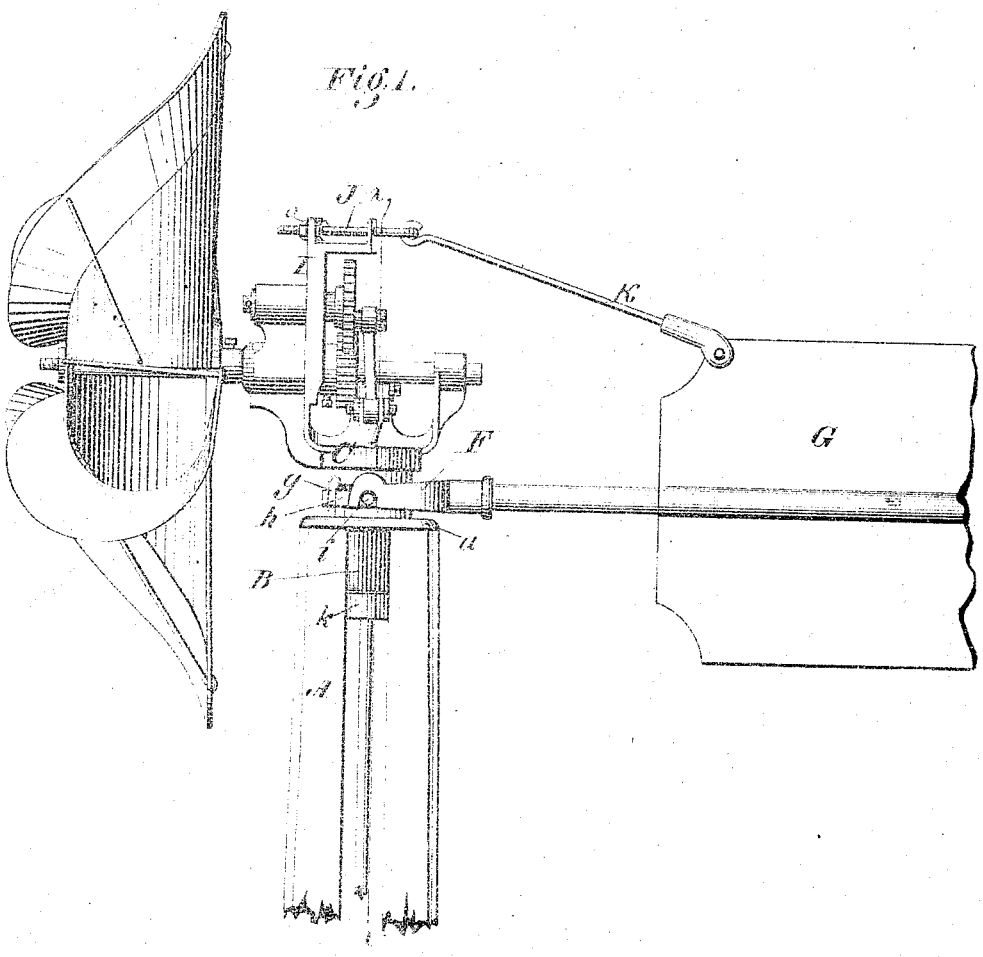
2 Sheets—Sheet 1

S. W. MARTIN.
Wind-Wheel.

No. 207,189. Patented Aug. 20, 1878.

Fig. 1.



Witnesses:
Conw. P. Hutchill
S. M. Madden

Inventor:
S. W. Martin
By his attys.
Dodge & Son

2 Sheets—Sheet 2.

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Wind-Wheel.

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Fig. 2.

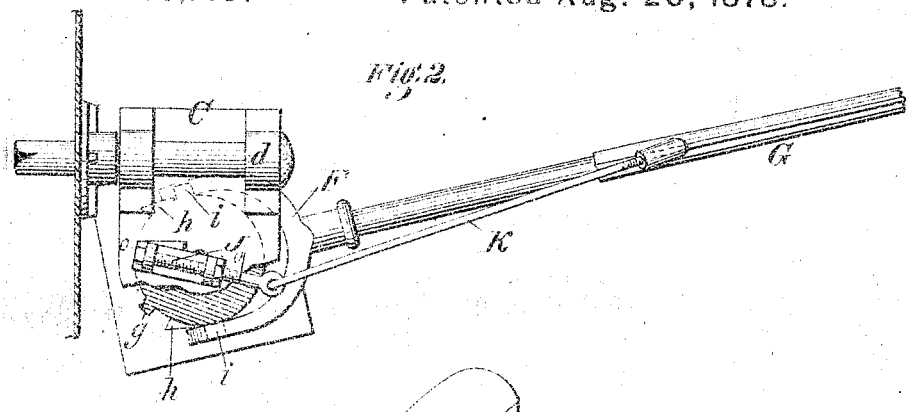
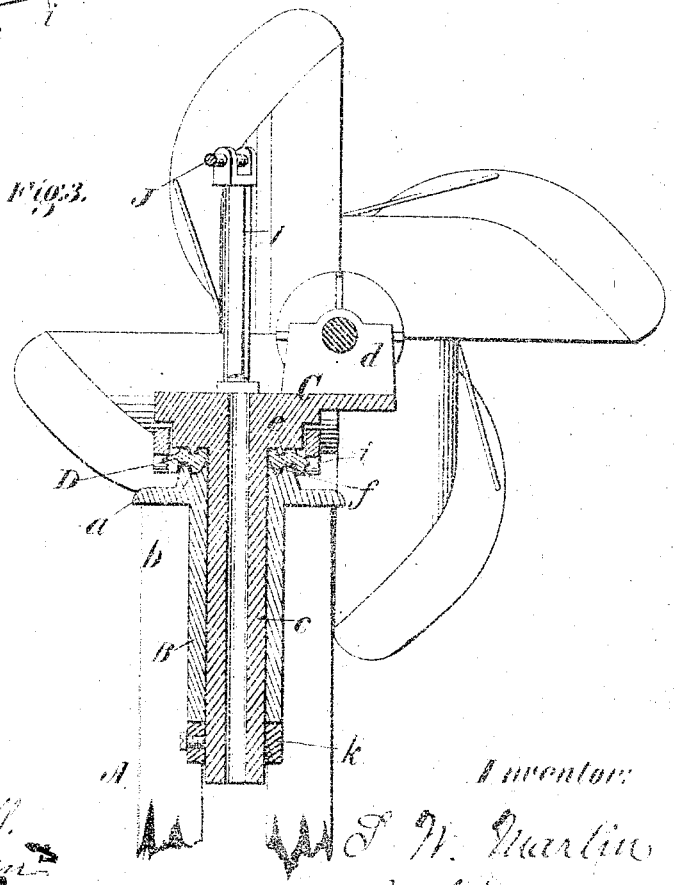


Fig. 3.



Witnesses:
Chas. F. Burdett.
S. M. Medbery

Inventor:
S. W. Martin
by his Attys.
Dodger & Co

UNITED STATES PATENT OFFICE.

SAMUEL WEBB MARTIN, OF SPRINGFIELD, OHIO, ASSIGNOR TO PHINEAS P. MAST, OF SAME PLACE.

IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. **207,189**, dated August 20, 1878; application filed March 15, 1878.

To all whom it may concern:

Be it known that I, SAMUEL W. MARTIN, of Springfield, in the county of Clarke and State of Ohio, have invented certain Improvements in Wind-Wheels, of which the following is a specification:

This invention relates to that class of self-governing windmills in which the wheel is arranged to swing around horizontally toward the tail-vane as the force of the wind increases, and more especially to that peculiar class of wheels in which the weight of the tail-vane is applied to assist in returning the wheel to its normal position.

The improvements consist in providing the turn-table or head on which the wheel is mounted with a crank-arm to receive the connection on which the weight of the tail-vane is received, and in making the length of this crank-arm adjustable for the purpose of increasing or diminishing the force with which the weight of the tail-vane acts upon the turn-table to rotate the same; in the use of a rotary ring or collar, to sustain the tail-vane mounted around the journal or neck of the turn-table, in the manner hereinafter described; and in the peculiar manner of connecting the tail-vane to this collar.

Referring to the drawing, Figure 1 represents a side elevation of the wheel, having my improvements embodied therein; Fig. 2, a top plan view of the same, with one side of the turn-table broken away in order to show the connection of the tail-vane to the collar; Fig. 3, a vertical central section of the wheel on the line *x x* of Fig. 2.

A represents the mast or support for the entire wheel; B, a vertical tubular sleeve, mounted in the top of the support A, and provided with a horizontal flange, *a*, bearing thereon, and also provided at the upper end with an annular groove, *b*, as shown in Fig. 3. C represents the head or turn-table on which the wheel is carried, the table being provided, as shown in Fig. 3, with a downwardly-extending neck or journal, *c*, bearing within the sleeve B, and also provided on its upper face with the usual bearings *d*, in which the horizontal shaft of the wheel is mounted, as shown. The top of the turn-table, which is larger than the depending neck, is provided on the under side with an annular flange, *e*, as shown in Fig. 3.

D represents a collar or ring, mounted around the neck or journal of the turn-table C, between the top of the sleeve B and the top of the table, and provided, as shown in Fig. 3, with a groove in its upper side to receive the flange *e* of the table, and on its under side with a flange, *f*, which enters the annular groove *b* in the sleeve B, as clearly represented in Fig. 3.

Under the above arrangement of parts, it will be observed that the weight of the turn-table is received upon the ring or collar D, which latter, in turn, bears upon the top of the sleeve B. This arrangement of parts, while holding the table and the ring securely in position, admits of their rotating freely and independently of each other. For the purpose of limiting the rotary motion of the collar and table in relation to each other, the table is provided, as shown in Figs. 1 and 2, with a depending arm, *g*, and the sleeve or collar, provided with two shoulders, *h*, against which the arm strikes when the desired limit of movement is reached. On each side of the collar or sleeve D there is cast a stud or trunnion, *i*, and upon these trunnions are hooked the ends of the forked metal head F, the rear end of which is provided with a socket, in which a stem or shaft of the tail-vane G is rigidly fastened, as shown in Figs. 1 and 2. The arms of the forked head F are held down upon the studs or trunnions by the turn-table bearing upon their upper side, as shown in Fig. 1, the table being in turn held down to its proper place by means of a collar, *k*, fastened upon its lower end below the sleeve B, as shown in Figs. 1 and 3.

Upon the turn-table there is secured a rigid upright standard, I, the upper end of which is provided with ears to support a horizontal eyebolt, J, which extends backward therefrom, and the eye of which stands behind, and one side of the line passing through the vertical axis of the turn-table and its collar D. The standard, with the backwardly-extending eyebolt, forms in effect a crank-arm upon the turn-table. From the end of the eyebolt a rod, K, extends backward, and is attached to the tail-vane by means of a pivot, as shown, preventing the vane from falling, as it would otherwise do, on account of its pivotal connection to the sleeve or collar D. As usual in this class of mills, the shaft of the wheel is lo-

cated to one side, or out of line with the vertical axis of the turn-table, the shaft and the vertical standard to which the tail-vane is attached being arranged on opposite sides of the vertical axis, as shown in the drawings.

Under the above arrangements of parts the weight of the vane, drawing the rod backward, causes the same to draw the rear end of the eyebolt or crank-arm backward in such manner as to draw the turn-table around in such position that the shaft of the wheel will stand in line with the longitudinal axis of the tail-vane, or, in other words, so that the wheel will be held with its face directly toward the wind. When the force of the wind exceeds the proper limit, it causes the wheel and turn-table to swing around sidewise, whereby the face of the wheel is presented obliquely to the wind, which is thus prevented from giving the wheel an excessive or dangerous speed. As the turn-table swings around, the rear end of the eyebolt or crank-arm is thrown forward, and caused, through the connecting-rod, to elevate the tail-vane, the weight of which serves to bring the parts to their original positions, with the wheel facing the wind as the force of the latter again diminishes. The rate of speed to which the wheel is limited depends, of course, upon the amount of resistance which the weight of the tail-vane offers to the side movement of the wheel in relation to the vane. In order that this resistance, and consequently the speed of the wheel, may be varied as may be desired, I provide the eyebolt to which the vane-supporting rod is connected with a screw-thread, and secure it in place in the standard by means of nuts *o*, as shown in Figs. 1 and 2, whereby a longitudinal adjustment of the bolt is permitted, so that its eye may be set nearer to or farther from the vertical axis of the turn-table. By adjusting the eyebolt backward, and thereby throwing its end farther from the axis of the turn-table, the weight of the vane is applied with an increased leverage upon the turn-table, which is thereby caused to hold the wheel against the wind until the latter attains an increased speed. By adjusting the bolt forward, the leverage of the vane is decreased, the table and wheel permitted to turn more easily from the wind, and consequently the wheel limited to a lower rate of speed.

While it is preferred to use the eyebolt and its supporting-standard in the manner shown, the vane may be otherwise connected with the turn-table, provided the point of connection is susceptible of adjustment to and from the vertical axis of the table.

The essential feature of my invention in this regard consists in so constructing the parts that the leverage or strain due to the weight of the tail-vane may be increased and diminished at will.

By introducing the sleeve or collar D, which supports the tail-vane, around the neck of the turn-table, between the said table and its supporting-sleeve, I am enabled to give a firm and solid support to both the wheel and the vane, to permit their free rotation horizontally independent of each other, and to construct the parts very cheaply.

The form of the ring or collar D may be modified as desired, provided it is adapted for use in the position shown. The manner of connecting the tail-vane to the collar or ring *d* may also be modified; but the construction shown is considered the best that can be used.

I am aware that it is old to mount the wheel and the vane on independent turn-tables or heads, and to locate the vane-table between a base-plate and the table which sustains the wheel, and hence I lay no claim thereto.

Having thus described my invention, what I claim is—

1. In a wind-wheel, the combination of a turn-table carrying the wheel and provided with an upright standard or crank arm, an independently-rotating turn-table, a tail-vane connected to the latter in such manner as to have a vertical movement, and a suspending device connecting the vane with the crank-arm, substantially as described and shown.

2. In a wind-wheel, the combination of a wheel-supporting head or turn-table, an independently-rotating head or turn-table, having a vertically-moving tail-vane attached thereto, and a suspending connection between the tail-vane and the wheel-supporting head, substantially as shown and described.

3. The rotating mill head or table provided with the standard and its adjustable eyebolt or arm, in combination with the vertically-moving tail-vane and its sustaining-rod.

4. In combination with the sleeve or bearing B and the mill-head C, having an elongated neck to enter the same, the independently-rotating sleeve or collar to support the vane mounted around the neck of the head between the latter and the sleeve B, as shown.

5. In combination with the sleeve B, having the annular groove in its top, and the head or table provided with annular flange and neck C, the intermediate collar provided with annular groove and flange.

6. In a windmill, the combination of a rotary collar or support, D, having trunnions thereon, the notched tail-support F, mounted on said trunnions, and the mill-head arranged to hold said parts together, substantially as shown.

7. A windmill having a turn-table provided with trunnions, in combination with tail-vane having forked arm F, mounted upon said trunnions, substantially as shown.

SAMUEL WEBB MARTIN.

Witnesses:
GEO. C. RAWLINS,
J. J. HANNA.