

(No Model.)

2 Sheets—Sheet 1.

E. R. McMASTER.

WINDMILL,

No. 361,709.

Patented Apr. 26, 1887.

Fig. 1.

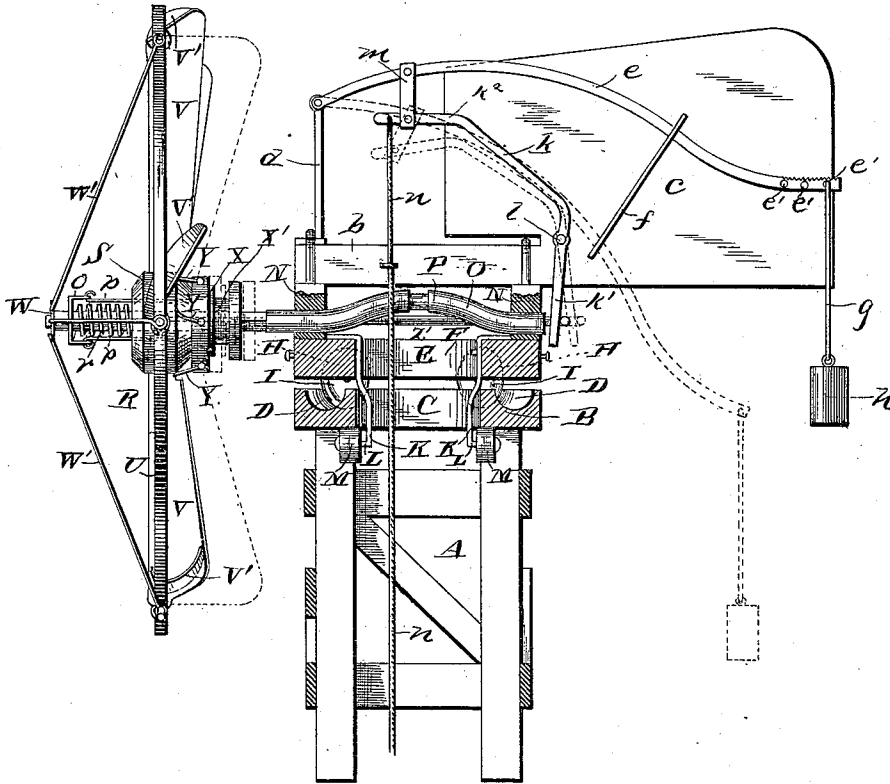
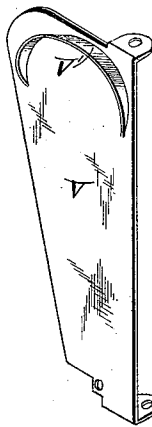


Fig. 4.



Witnesses

Chas. L. Taylor,
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Edwin R. ^{Inventor} ~~Wm~~ Master

By *his* Attorneys

C. A. Snowden

(No Model.)

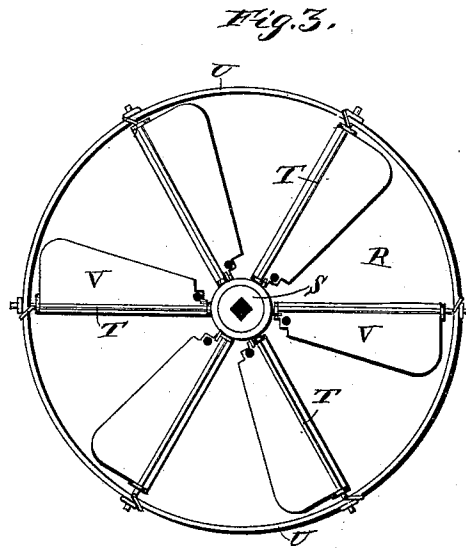
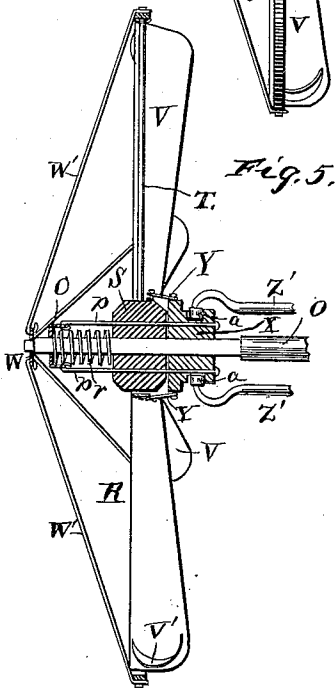
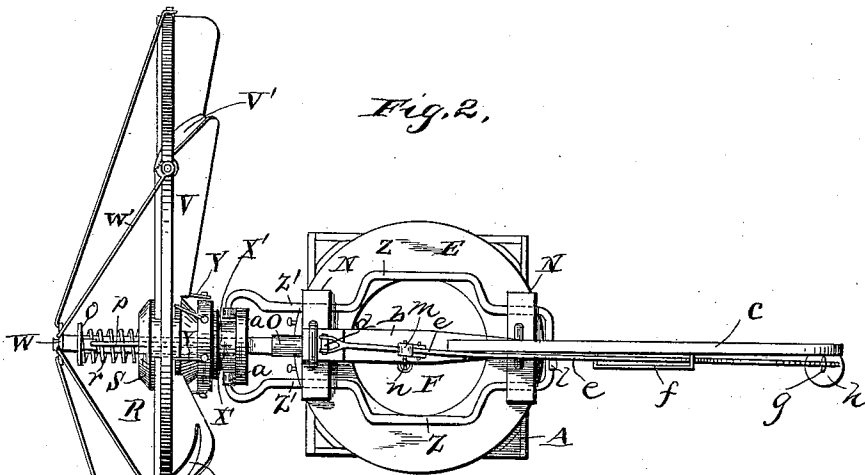
2 Sheets—Sheet 2.

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Chas. L. Taylor
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By his Attorneys

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UNITED STATES PATENT OFFICE.

EDWIN RUTHWIN McMASTER, OF BELLONA, NEW YORK.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 361,709, dated April 26, 1887.

Application filed October 7, 1886. Serial No. 215,630. (No model.)

To all whom it may concern:

Be it known that I, EDWIN RUTHWIN McMASTER, a citizen of the United States, residing at Bellona, in the county of Yates and State of New York, have invented a new and useful Improvement in Windmills, of which the following is a specification.

My invention relates to an improvement in windmills; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of a windmill embodying my improvement. Fig. 2 is a top plan view of the same. Fig. 3 is an inner side view of the wheel. Fig. 4 is a detail view of one of the blades. Fig. 5 is a vertical section through the wheel.

A represents a tower, which is provided at its upper side with a circular cap, B, having a circular central opening, C, and an annular groove, D, in its upper side.

E represents a circular turn-table, which corresponds in size with the cap B, and is provided with a circular central opening, F. In the under side of the turn-table is made a series of vertical openings or recesses, H, which are arranged in a circle of the same radius as the annular groove D, and in the said recesses are journaled anti-friction rollers I, which enter the said annular groove, and thus support the turn-table on the upper side of the cap.

K represents a series of vertical arms, which are attached to the turn-table and extend downwardly on the sides of the openings C and F, the lower ends of the said arms being turned outwardly to form horizontal spindles L, on which are journaled anti-friction rollers M, that bear against the under side of the cap B.

From the foregoing description it will be readily seen that the turn-table is secured on the cap so that it may be rotated with very little friction, and that, owing to the rollers M, which bear against the under side of the cap, it will be impossible to tilt or incline the turn-table from a horizontal position.

On opposite sides of the turn-table are secured bearing-blocks N, within which is journaled a horizontal shaft, O, having the crank P directly over the opening F.

R represents a wind-wheel, comprising the

hub S, which is secured rigidly to the shaft, near the front end thereof, the radial rods T, which project from the hub, and the circular rim U, which connects the outer ends of the rods. On the said rods are pivoted blades V, which are preferably made of sheet metal, and are wider at their outer ends than at their inner ends. On the front side of each blade, at the outer end thereof, is secured a semicircular outwardly-flared flange, V', the function of which will be hereinafter explained. To the front end of the shaft O is secured a circular disk, W, and stay-rods W' extend from openings which are made in the said disk to the outer ends of the radial rods on which the blades are pivoted.

X represents a collar, which is secured on the shaft in rear of the hub of the windmill, the said collar being adapted to slide upon the shaft toward or from the hub of the windmill. A series of rods, Y, connect the inner ends of the blades to the said collar, and the latter is provided, near its rear side, with an annular groove, X'.

Z represents a yoke, which is bent from a single rod of metal, and has the arms Z', which are secured in transverse openings made in the blocks N, whereby the yoke is adapted to slide or reciprocate longitudinally in the said blocks.

The front ends of the arms Z' are turned inwardly at right angles, to form bearings for anti-friction rollers a, which enter the annular groove X' of the sliding collar.

b represents a horizontal bar, which is secured to the upper side of the blocks N directly in line and over the crank-shaft, and to the rear end of the said bar is attached a vane, c, which is made solid. From the front end of the bar b projects a vertical arm, d, to the upper end of which is pivoted the front end of a curved lever, e. The said lever extends rearwardly and bears against one side of the vane, and is prevented from swinging laterally away from the vane by a keeper or guideway, f, with which the vane c is provided. The outer end of the lever e is provided with a series of openings, e'.

g represents a hook-rod, which is adapted to be attached to either of the openings e', and to the lower end of the said rod is suspended a weight, h.

k represents a bent lever, which is fulcrumed

to the vane on a bolt or pin, *l*, and is provided with a downwardly-extending arm, *k'*, which engages the yoke *Z*. The upper arm, *k*², of the said bent lever is connected to the lever *e*,

5 near the front end thereof, by a pivoted link, *m*. *n* represents a rod or cord, which is attached to the front end of the arm *k*² of the bent lever and passes down through the openings in the cap and turn-table to the bottom of the

o tower. *o* represents a sliding disk, which is secured on the front end of the crank-shaft, and *p* represents rods which are attached at their front ends to the said disk, pass rearwardly through 5 openings which are made in the hub of the wind-wheel, and have their rear ends attached to the sliding collar. A coiled extensile spring, *r*, bears between the front side of the hub and the rear side of the sliding disk, the function o of the said spring being to keep the sliding collar normally pressed against the rear side of the hub of the wind-wheel, whereby the blades of the said wheel will be turned and presented to the wind at an angle of about forty-five 5 degrees.

The operation of my invention is as follows: The vane keeps the wheel presented to the wind, and the wheel is turned thereby by the force of the wind against the blades. In the 10 event that the wind should increase in strength it will turn the pivoted blades rearwardly on the radial rods, so as to present them at a more acute angle to the wind, and thus diminish its force and prevent the wheels from rotating too 15 rapidly. When the blades are thus turned, the sliding collar, being connected to said blades by the rods *Y*, is moved rearwardly against the resistance of the spring *r*, thus moving the sliding yoke rearwardly and de- 20 pressing the front portion of the bent lever *K*, and thus drawing downwardly on the rear end of the weighted lever *e*. By moving the weight forwardly or rearwardly on the lever

e the pivoted blades are rendered more or less 45 susceptible to the wind, and thus the speed of the wheel can be regulated, notwithstanding the force of the wind. If it be desired to prevent the wheel from rotating, it is only necessary to draw downwardly upon the rod or 50 cord *N*, thus causing the bent lever *k* to move the sliding yoke and the sliding collar rearwardly, and thus turn the pivoted blades so that they align directly in the direction of the wind.

The function of the semicircular flanges *V'* 55 at the outer ends of the blades is to form cups which are adapted to hold the wind while the wheel is rotating, thus utilizing the entire force of the wind and preventing it from being 60 "spilled."

It will be observed that I utilize the vane as pivot-points for the levers *e* *k*, and also as a shield to protect the operating levers from the direct action of the wind.

Having thus described my invention, I 55 claim—

The combination, in a windmill, of the wheel having the feathered or pivoted blades, the sliding yoke connected to the said blades to turn the same, the vane to direct the wheel 70 to the wind, the bent lever *k*, pivoted to the said vane and having one end engaging the sliding yoke, the lever *e*, connected to the front end of the bent lever *k* and bearing against the vane, and a keeper or guide se- 75 cured upon the vane to hold the lever *e* there-to, and adjustable weight devices for the latter, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 80 presence of two witnesses.

EDWIN RUTHWIN McMASTER.

Witnesses:

MASON S. BALDWIN,
O. G. SHEARMAN.