(No Model.)

C. W. WHITE.

WINDMILL.

No. 294,943. Patented Mar. 11, 1884.

FIG. 1.

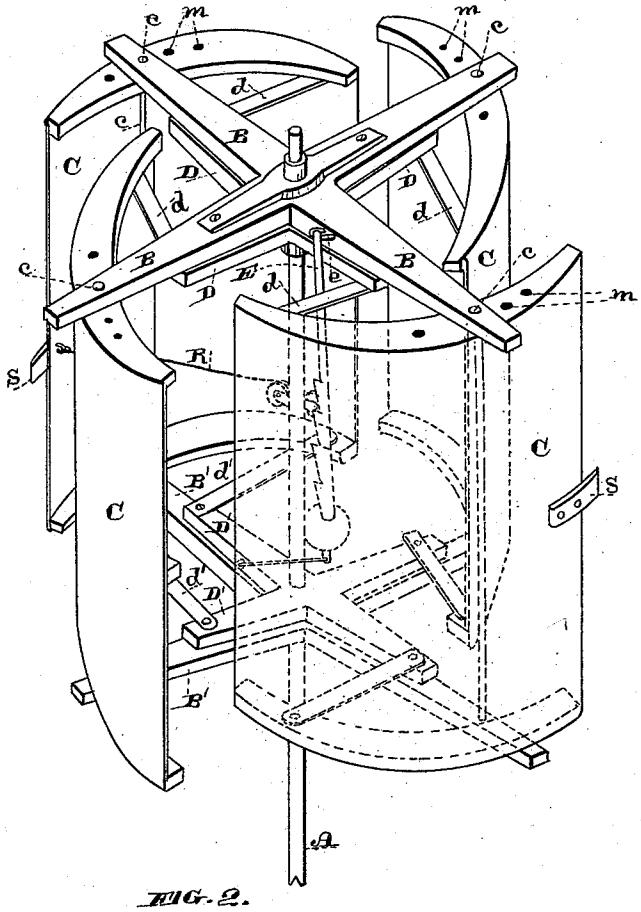
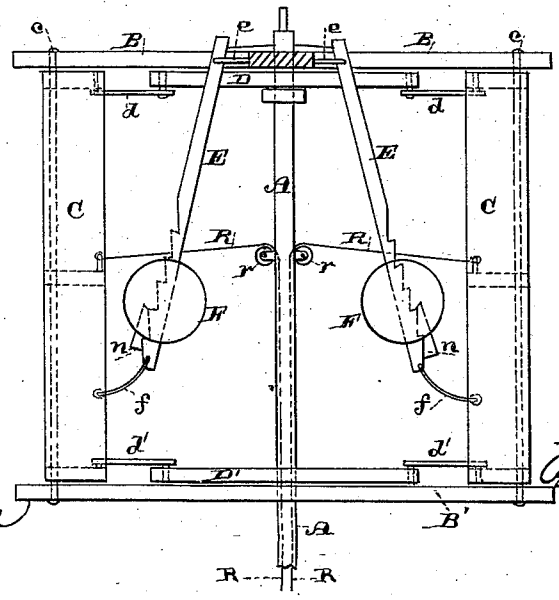


FIG. 2.



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UNITED STATES PATENT OFFICE.

CHARLES W. WHITE, OF SANTA ROSA, CALIFORNIA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 294,943, dated March 11, 1884.

Application filed June 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. WHITE, of Santa Rosa, county of Sonoma, State of California, have invented an Improvement in Windmills; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a new and useful windmill; and it consists in the vertically-pivoted or swinging concavo-convex vanes, the means for holding them open at an angle to receive the wind, and the means for adjusting them, hereinafter fully explained.

The object of my invention is to provide a simple and effective self-adjusting mill.

Referring to the accompanying drawings, Figure 1 is a perspective view of my windmill. Fig. 2 is a vertical section of same.

A is the shaft, which is to be suitably mounted upon a frame, and to have connected with it suitable power-transmitting devices for operating the pitman. These parts I have not deemed it necessary herein to illustrate, as my invention does not relate to them.

Upon the top of the shaft is a cross-frame, B, and lower down is a similar cross-frame, B′, both frames being rigidly secured to the shaft to turn therewith.

Pivoted by rods *c* in the ends of the arms of the cross-frames are the vanes C. These consist of concavo-convex plates, suitably braced, having their concaved faces turned inwardly.

Mounted loosely upon the shaft A, just under the top cross-frame, B, and supported by a collar on the shaft, is a smaller cross-frame, D, to the ends of each arm of which is pivoted a short arm, *d*, the other end of which is pivoted to one edge of each vane C at its top. Below is a similar cross-frame, D′, having short arms *d*′, pivoted similarly to the lower edges of the vanes C. These frames D D′ and their arms *d d*′ are the means for connecting the vanes to each other, whereby they all act together. The frames D D′, being mounted loosely on the shaft A, have an independent movement, thus providing for the swinging of the pivoted vanes C.

Suspended by links *e* from the top cross-frame, B, are rods or bars E, the lower ends of which have fitted upon them weights F. Their lower ends are connected with the edges of the vanes by wires or rods *f*, which are short enough to draw the bars E from the perpendicular toward the vanes, thus causing the power of the weights F to be exerted to draw one edge of the vanes inwardly and throw the opposite edge out. I may have as many of these weight-rods as there are vanes; but I here show but two, as, the vanes being connected, an effect produced on one will act on them all.

The operation of the mill as far as explained is as follows: The weights holding the vanes at an angle with the true circumference afford openings between each for the action of the wind. Its force is directed against the inner face of the vanes, which are drawn in sufficiently to expose more surface beyond the pivot-line than on the nearer side. The tendency of the wind is therefore to force said vanes closed, and thus the automatic regulation is effected. The stronger the wind the greater the tendency to shut the vanes. As its force decreases, the weights open them again. I have two further adjustments. The first is to expose more or less of the inner face of the vanes to the wind. This I do by pivoting the vanes nearer to or farther from their vertical center line. For this purpose I remove the pivot-rods *c* and place them in any of the series of holes, *m*, made in the vanes. By adjusting these rods nearer the edge a greater surface beyond the rods is exposed to the wind, and by putting them closer to the center less surface is exposed. The other adjustment is that of the weights to effect the opening of the vanes to a greater or less extent. The bars E are toothed, and the weights are secured thereon by keys *n*, fitting the teeth of the bars. By removing the keys the weights may be raised or lowered on the bars. The effect when raised is to exert less force than when lowered. Any other means of adjusting the weights—as by set-screws—may be used.

As a means for closing the vanes from below, I have the rope R. This passes up beside or (as I have here shown) through the shaft A, which is made hollow, out over the pulleys *r*, and is secured to the outer edge of

one of the vanes. This rope may have several branches secured each to a vane. In order to limit the closing of the vanes, I have the stops *s* on their edges, which, by coming in contact with the next vane, keep the vanes from turning beyond the true circumference.

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

In a windmill, the shaft A, cross-frames B B′, the cross-frames D D′, loose on said shaft, and connected by pivoted arms *d d′* to the vanes, in combination with the adjustable concavo-convex vanes C, pivoted vertically between the cross-frames, and provided with holes *m* and pivot-rods *c*, and means for turning said vanes at an angle to receive the wind, the hanging bars E, provided with weights F, and connected with one edge of each vane, and the operating-rope, all substantially as shown and described.

In witness whereof I have hereunto set my hand.

CHARLES W. WHITE.

Witnesses:

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O. DE BENDELEBEN.