W. W. MARSH.

Wind-Mills.

No. 163,597. Patented May 25, 1875.

Fig. 1.

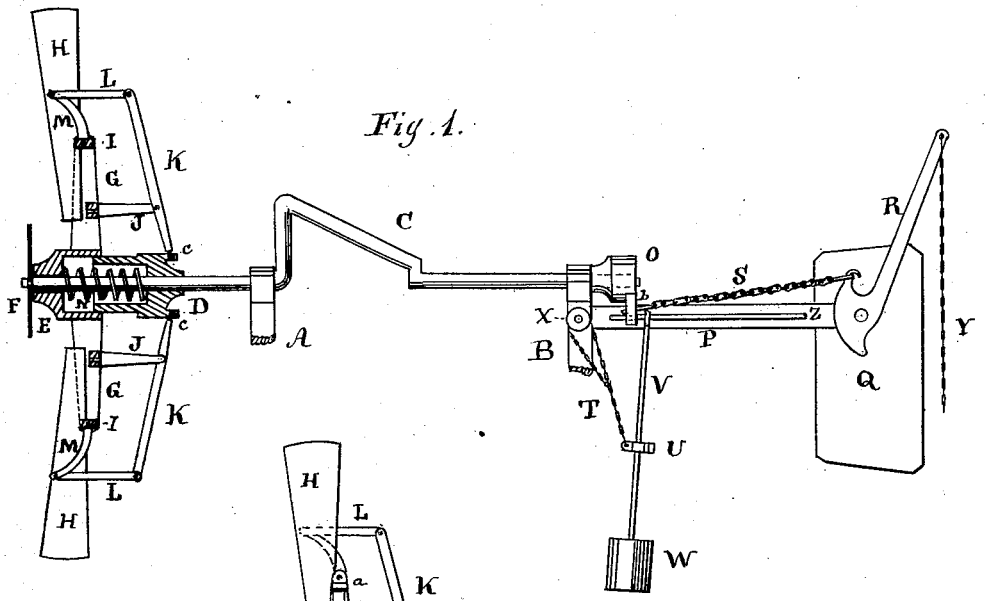


Fig. 2.

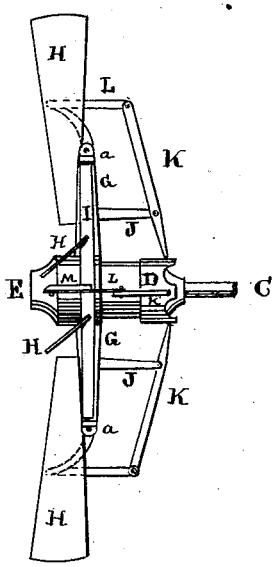
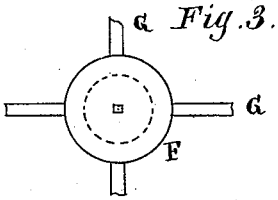


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM W. MARSH, OF SYCAMORE, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **163,597**, dated May 25, 1875; application filed February 26, 1875.

To all whom it may concern:

Be it known that I, WILLIAM W. MARSH, of Sycamore, in the county of De Kalb and State of Illinois, have invented new and useful Improvements in Windmills, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation; Fig. 2, a side view of the head; Fig. 3, a detail.

The object of my invention is to improve a windmill of the class patented to myself and Orin E. Miles, April 21, 1873; and its nature consists in certain improved devices for automatically throwing the fans out of play, and, also, for forcing them out, as hereinafter set forth, and claimed as new.

In the drawings, A B represent the upper ends or arms of any suitable supporting-frame; C, the shaft; D, the sliding head; E, the hub; F, the disk or plate; G, the spokes or arms; H, the fans; I, rocking bar or shafts, to which the fans are attached; J, horizontal arms, attached to the arms G; K, a lever; L, a connecting-bar; M, an arm on the rock shaft or bar I; N, a spring; O, head on the rear end of the shaft C; P, fixed arm, attached to the supporting-frame; Q, the vane; R, a lever; S, chain, connecting the lever with the head O; T, chain, connecting the slide U with the main frame; V, a rod; W, a weight; X, a friction-pulley; Y, a chain or cord, operating the lever R; Z, rod on the arm P, upon which the rod N and an arm of the head O slide; *a*, pivots of rock shafts or bars I; *b*, arm on the head O; *c*, holes in the sliding head D, into which the levers K project. The supports A B are connected with any suitable supporting-frame which has a revolving head, and may be applied to the frame shown and described in the patent hereinbefore mentioned. The hub E is permanently attached to the main shaft, and is provided with four arms and spokes, G, to which the cross-bars I are pivoted at their ends. The fans are permanently attached to these bars I, leaving about two-thirds of their length projecting beyond them, as shown, their lower ends when in position resting against the cross-bars, to which the arms J are attached. In order to hold them in position I apply to the main shaft a sliding head, D, which is made to slide into the hub E, and is also hollowed out for receiving the spring N, as shown at Fig. 1. The tendency of the spring is to force the sliding head out or toward the post A. To the arms J are pivoted levers K, which engage with the sliding head D at their inner ends, and at their outer ends are connected with their arms M by means of the bars L, so that the pressure of the spring N crowds the lower ends of the fans over as far as the cross-bars, to which the arms J are attached, will permit. The fans will remain in this position while the mill is running in a light wind. As the wind increases the fans will rock back, crowding the rock-shafts I with their arms M over, and compressing the spring N. If the wind is very strong the fans will lie over nearly horizontal, so as to take a greater or less power from the wind, according to its velocity, thereby making an automatic regulator for the mill.

This same device is also used for forcing the fans out of position when it is not desired to have the mill run. To accomplish this I attach the lever R to the vane, or to the arm P, and connect it with the rear end of the main shaft by a chain or cord, S, so that, by pulling down upon the cord Y, the sliding head D is brought against the post A, which drives the head D into the hub E, and lays the fans H over in a nearly horizontal position, as before described. By fastening the cord Y to any part of the supporting-frame the fans will be held in that position, so that the mill will not run.

In order to adjust the force by which the sliding head D will be pressed against the post A by the wind, I attach a regulating-weight to the opposite side, which presses against the head O on the end of the main shaft. This head O is provided with an arm, *b*, which slides on the rod Z. I hang a rod, V, on the horizontal rod Z, which rod is furnished with a heavy weight at its lower end. On this rod the sliding collar U is placed, which is provided with a set-screw, so that it can be held in any position on the rod V. This collar is connected with the support B by means of a chain, T. The sliding collar U forms a fulcrum, by which the weight W is lifted or moved in a circle. As the collar U is placed near the arm P the power required to move the weight

is increased, and as it is placed near the weight the required power is diminished, so that by sliding the collar U up or down on the rod V the weight is adjusted to different powers, as desired. The wind pressing against the fans and the disk F presses the arm *b* against the upper end of the rod V and crowds it back upon the rod Z, lifting or swinging the weight W in its movement, so that I am enabled to adjust the power required to move the weight without changing the weight itself; and, as the collar or fulcrum U is only attached by the chain, there is no binding in the sliding of the rod V on the rod Z, so that by these improvements the windmill automatically adjusts itself to the force of the current, and automatically adjusts the power necessary to bring it into action, and so that the fans may be thrown and held out of the wind permanently whenever desired.

The disk or plate F, which fills, or nearly fills, the space between the inner ends of the fans, is employed to assist in driving the fan-frame against the support A, and in compressing the spring N in high winds.

The mill is connected with a pump, or other machinery, in the same manner as the mill shown in the patent before mentioned, and for this reason the supporting-frame and its connecting parts are not shown.

What I claim as new is as follows:

1. The combination of the fixed hub E on the outer end of the shaft and the sliding head D, cut out to form a recess and a covering for the spring, with the spring N and shaft C, substantially as and for the purpose specified.

2. The combination of the rocking bars or shafts I with the levers or arms M, bars or rods L, and levers K with the fans H, sliding head D, hub E, and spring N, substantially as specified.

3. The plate F, covering the central space, in combination with a sliding main shaft C, substantially as and for the purpose specified.

4. The combination of the weighted rod V, adjustable collar U, and chain S, with the rod Z and the rear end of the main shaft C, substantially as and for the purposes specified.

5. The combination of the lever R, chain S, and chain or cord Y with a sliding main shaft, substantially as and for the purposes specified.

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Witnesses:

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