

A. S. BAKER & C. SNASHALL.

Wind-Mills.

No. 150,275.

Patented April 28, 1874.

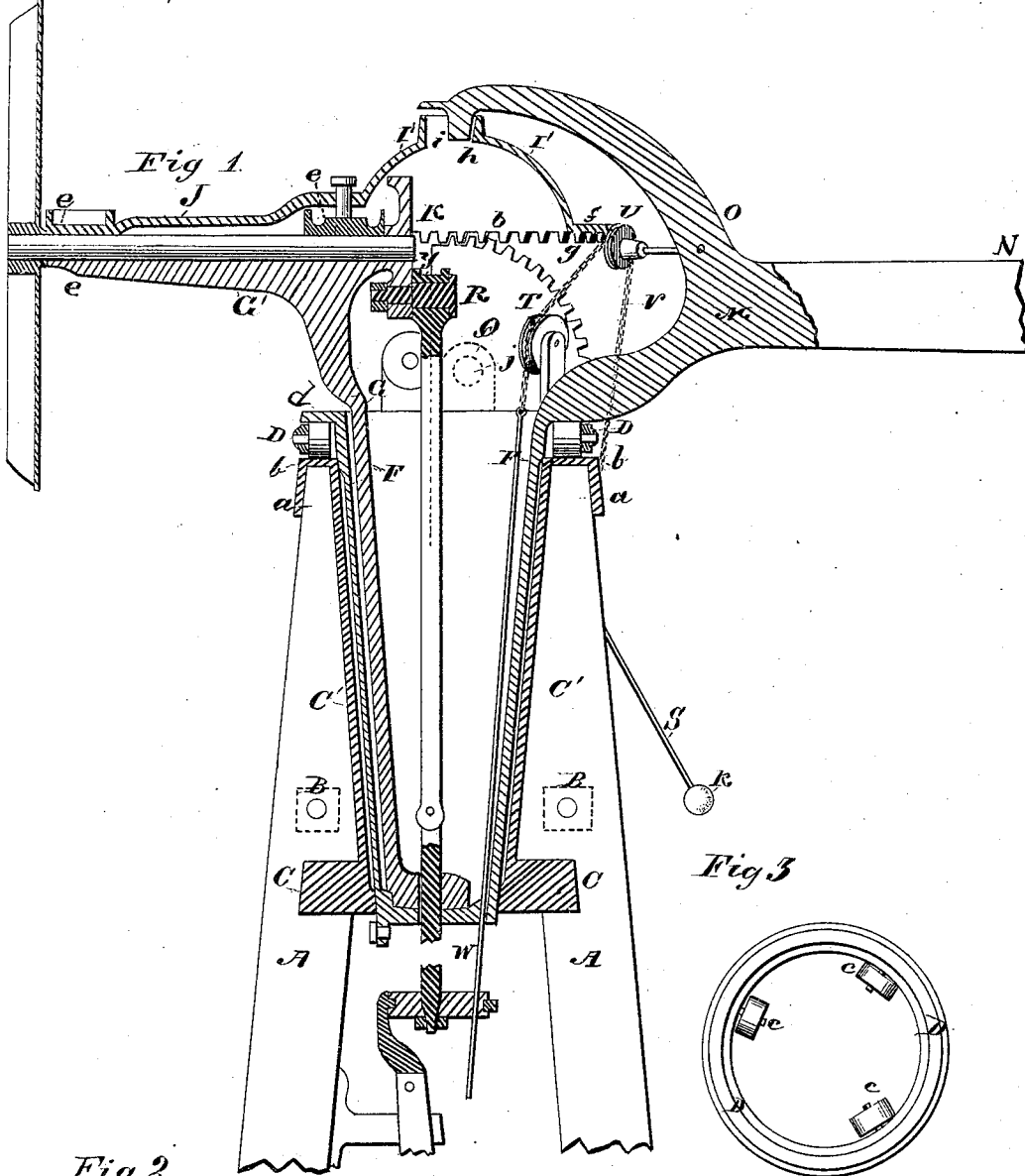
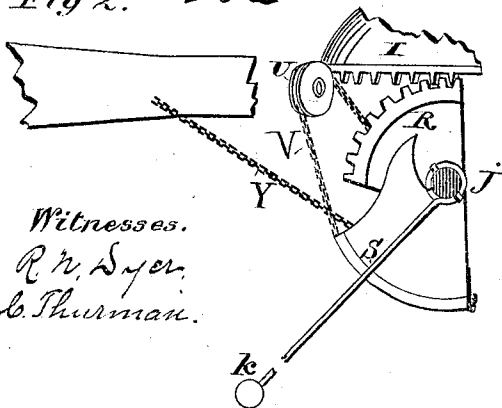
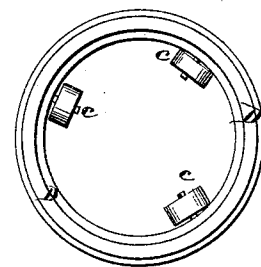


Fig 2.



Witnesses.
R. H. Syer.
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Fig 3



Inventors
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Attys

UNITED STATES PATENT OFFICE.

ALLEN S. BAKER AND CALEB SNASHALL, OF EVANSVILLE, WISCONSIN.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **150,275**, dated April 23, 1874; application filed January 21, 1874.

To all whom it may concern:

Be it known that we, ALLEN S. BAKER and CALEB SNASHALL, of Evansville, in the county of Rock and State of Wisconsin, have invented a new and useful Improvement in Windmills; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The object of our invention is such a construction in windmills as will enable them to run more steadily and uniformly under the varying forces of the winds, and increase their durability, efficiency, and convenience in use; and our invention therein consists in the means employed by which the wind-wheel is automatically and regularly thrown out of the full force of the wind, or returned to it, as the wind increases or diminishes; also, the means by which the same result may be accomplished by hand; also, in the means employed to give freedom of movement to the parts; also, in the novel construction, combination, and arrangement of the various operative parts, all as more fully hereinafter explained.

In order to enable others skilled in this particular matter to construct and use our windmill, we proceed to describe the same more in detail.

In the drawings, Figure 1 is a vertical central section of the windmill in elevation; Fig. 2, a separate view of the hoods, ratchet, and weighted lever; and Fig. 3, a separate view of the friction-roller ring.

Like letters of like kinds denotes the same parts in each figure.

A represents one of the standards—of which there are four—composing the tower, of suitable dimensions, drawing in toward each other at the top, and suitably tied by the screw-bolts B, and having chucks C fitted to their inner angles to support the bottom of a tubular casting, which will be hereinafter described. These standards are cut away on their inner angles at their tops, which fit into and are secured in proper sockets *a* in the flanges *b*, upon the upper end of tubular casting *C'* before named. This tubular casting, which, with its flanges and sockets, is preferably in one piece, tapers gradually from the top to the

bottom, and has a ring, D, with suitable friction-rollers *e* resting upon its top or flange, where it is secured in place during its revolution by the interposition of the axis F. This axis, which is also a tubular casting in one piece, of a shape and size corresponding to the internal cavity of the casting *C'*, has upon its top a flange, *d*, of a size corresponding with that of the flange *b*, and also of the ring D, upon which it rests in use, the friction-rollers of which ring are of sufficient diameter to allow the ring to revolve upon the flange *b*, and also to allow the flange *d* in turn to revolve upon the same friction-rollers. Within the tubular axis, which is closed at its bottom, and furnished with a proper step, the vertical shaft G of the wheel-arm turns freely, which shaft, bending a little outwardly over the flange of the tubular axis, is then prolonged at a right angle, as shown at letter G', and serves to support the journal-boxes *e e* for the shaft proper H of the wind-wheel I. Above the shaft-arm G is a cap, J, corresponding in shape, but preferably a little wider than the arm G', so as better to exclude rain and snow, which cap widens into a dome-cover, I', of a size to cover and protect the gearing beneath it. This dome has a flange, *f*, around its bottom, and upon a portion of the under side of the flange a series of gear-teeth, *g*. Upon the inner end of the wind-wheel shaft, and directly under, and partially within, the dome, is the crank-wheel K, to which is connected the pitman L, which passes down through the cavity of the tubular axis, and through the step within the same, and is connected below with the driving machinery in any proper manner. Upon the side of the axis opposite to the shaft G, and secured to the top of the flange of the axis, is an arm, M, curving upwardly and outwardly, to which is secured the vane N. From the same arm M another arm, O, curves upwardly and inwardly until its inner end is over the center of the top of the dome-cover, where it has a stud, *h*, extending from its lower side, and into the top of the dome, which has a slot, *i*, extended in the direction of the wind-wheel shaft, by means of which slot the dome-cover, and everything connected with it, has a freedom of movement back and forth to a certain extent; also, upon the top

of the flange to the tubular axis there is secured a standard, Q, from which extends outwardly a shaft, j, upon which a gear-segment, R, revolves, which segment has gear-teeth upon a portion of its periphery, intended to mesh with those described upon the bottom of the flange to the dome-cover. To the end of the same shaft there is connected a lever, S, with an adjustable weight, k, upon its outer end. Upon the top of the flange to the tubular axis is also journaled upon suitable standards a grooved pulley, T, which is placed behind the segment R, just described, and from a shaft extending out from the arm O is another grooved pulley, U. A chain, V, secured to the lower corner of the segment R, passes in a groove around its edge, and thence over the pulleys U and T, and down into the cavity of the tubular axis, where it is connected to a suitable rod, W, which extends down through the bottom of the axis far enough to be within convenient reach for operation. Another chain, Y, connects the vane with the segment, and completes the description of all parts of the windmill.

The following is the method of operation of our windmill: In its ordinary and normal position for work with a desirable force of wind, the vane and wind-wheel shaft are in line with the weighted lever hanging down as far as the chain y will permit, the gears arranged as shown in Fig. 1, and the stud h rests in the end of the slot i, farthest from the wind-wheel, by reason of the overbalancing weight of the wind-wheel. Now, as the force of the wind increases, the wind-wheel, with its shaft and shaft-cover and dome-cover, is forced backward until the end of the slot next to the wind-wheel presses against the stud. In this movement, however, as the wind-wheel cannot turn toward that side where the gear-segment R is, on account of the segment-gear R and chain y, it must turn to the opposite side and a little upwardly as far as it is permitted to go with entire freedom, and to such extent is thrown out of the wind, and also a little out of line with the vane. By an increasing force of wind, the wind-wheel is thrown around in the same direction a still greater distance at the same time by the simultaneous movement of the gear on the dome-cover, turning the segment R and raising the weighted lever, and thus more and more in the increase of wind is the wind-wheel thrown out of the wind, and its shaft more and more out of line with the vane. As the wind decreases, the weighted lever moving the segment-gear, and

this again the dome-cover, the wind-wheel shaft is brought more and more into line with the vane, and consequently more and more directly into the wind, and thus the wind-wheel is made to have an automatic regularity of revolution under the varying pressures of the wind. When it is desirable to turn the wind-wheel out of the wind by hand, it is done conveniently by means of the rod W and its chains passing over the pulleys and operating upon the segment R, and thereby throwing the wind-wheel and shaft around to one side in the same manner as done by the wind, as just explained.

The operations of the other parts need not be explained, as they are apparent upon inspection.

The principal advantages which we think follow from our construction, in addition to the great one of securing uniformity of revolution in the wind-wheel, may be found in the ease with which the wind-wheel is revolved to meet the changes in direction of wind, in the strength of the parts, and in the protection from the elements afforded to the working parts.

Having thus described our windmill, its mode of operation, and having referred to some of its advantages, we claim as new therein and our invention—

1. In combination, the shaft-cover J I' having the slot i, and the arm O having a stud, h, substantially as described, for the purpose set forth.
2. In combination, the shaft-cover J I' having gears g, and the weighted gear-segment R, substantially as described, for the purpose set forth.
3. In combination, the shaft-cover J I', the weighted gear-segment R, and the chain V, substantially as described, for the purpose set forth.
4. In combination, the shaft-cover J I', the vane N, and the shaft-arms G G', substantially as described, for the purpose set forth.
5. In combination, the shaft-arms G G', the vane N, and the tubular axis F, substantially as described, for the purpose set forth.

This specification signed and witnessed this 16th day of January, 1874.

ALLEN S. BAKER.
CALEB SNASHALL.

Witnesses:

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