UNITED STATES PATENT OFFICE.

JAMES HALL, OF LIGONIER, INDIANA.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **162,062**, dated April 13, 1875; application filed December 19, 1874.

To all whom it may concern:

Be it known that I, JAMES HALL, of Ligonier, in the county of Noble and State of Indiana, have invented a new and valuable Improvement in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a side elevation of my windmill; and Figs. 2, 3, 4, and 5 are detail views of the same.

This invention has relation to improvements on the windmill for which Letters Patent of the United States, numbered 132,464, were granted to me on the 22d day of October, 1872, wherein the main vane is connected to a loaded lever, arranged on top of the turn-table, for automatically adjusting the said vane. The improvements which I have made consist in mounting the turn-table upon conical anti-friction rollers, which impinge against a beveled track of circular form applied to the bottom of the turn-table, the several parts being so constructed and combined that the said table is prevented from displacement and allowed to rotate horizontally with very little friction.

In the annexed drawing, A designates the pedestal or tower of my improved windmill, to the upper end of which is rigidly secured a horizontal annular bracket, B, which affords a support for a turn-table, C. This bracket has applied to it three conical rollers, *a*, which are arranged equidistant from each other, and whose axes radiate from the axis of rotation of the turn-table C. On the bottom of the turn-table I cast or bolt a track, *b*, which rests, by its beveled surface, upon the three rollers *a*, and which has an annular shoulder, *i*, for preventing displacement of the turn-table in a gale of wind. D designates the wind-wheel, which may be constructed as shown in the annexed drawings, or in any other suitable manner, and which is keyed on a horizontal shaft, supported in bearings cast on the turn-table, and provided with a crank-arm, *d*, for actuating the pump. E designates the main vane, which is pivoted at *d'* to one end of the turn-table C, and braced, balanced, and constructed as shown in Fig. 1. Between the pivot *d'* and the blade of the vane I pivot a rod, *e*, which connects the vane to one arm of a triangular lever, F, which has its fulcrum at the upper end of a standard, F', rising from the turn-table. The other end of the lever F is connected by a rod, *f*, to the upper end of an annularly-grooved hub or collar, *g*, through which passes freely a rod, G, which connects the crank-arm *d* to the pump-rod G'. When the collar *g* is raised to its full height the vane E will be brought around to a position parallel to the plane of the wheel D, as indicated by dotted lines in Fig. 5. H designates a yoke, which is rigidly secured to the upper end of a stiff reefing-rod, J, working in suitable guides at the base of the mill. The yoke embraces the grooved collar *g*, and thus connects the reefing-rod to it, so that they both receive vertical motion together. K designates a lever, which has its fulcrum on the pedestal A, and which is connected to the reefing-rod J by means of a removable pivot-pin, *h*. The lever K is provided with two loaded arms, L L', the weights on which are adjustable, and designed for holding the vane in proper positions for light or heavy winds, and preventing the wheel D from being carried around so suddenly that it would lose its rotary motion. This loaded lever, as applied in my mill, serves as a means for governing the run of the wheel and preventing too sudden changes from fast motion to slow, and vice versa. N designates an auxiliary vane, which is in the same plane as the plane of the wheel; and P designates a stop for the main vane when this vane is in the position indicated by dotted lines in Fig. 5. I shall hold the turn-table down in place on the anti-friction rollers *a* by means of L-shaped guides *n*, as described in my Letters Patent above referred to.

What I claim as new, and desire to secure by Letters Patent, is—

In a windmill, the turn-table C, having a beveled track, *b*, shouldered at *i*, in combination with the conical anti-friction rollers *a* and annular supporting-bracket B, as and for the purposes described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JAMES HALL.

Witnesses:

STEPHEN WILDMAN,

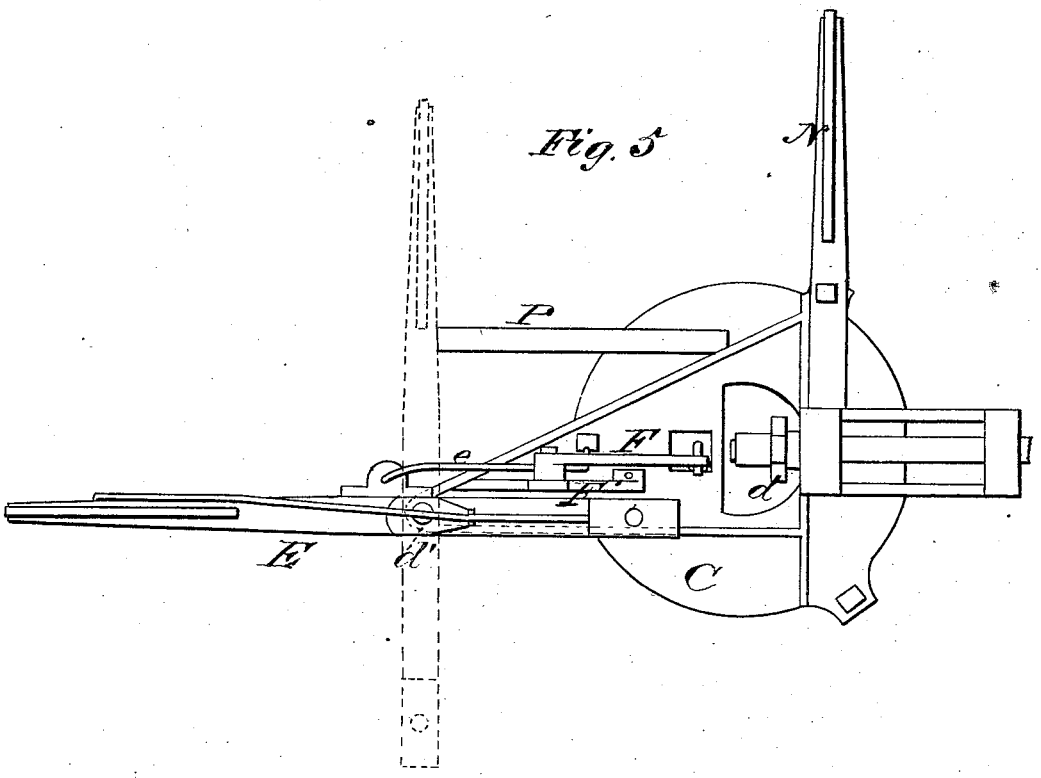
VINCENT C. MARR.

2 Sheets--Sheet 2.

J. HALL.
Wind-Mill.

No. 162,062. Patented April 13, 1875.

Fig. 5



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No. 162,063. Patented April 13, 1875.

Fig 1

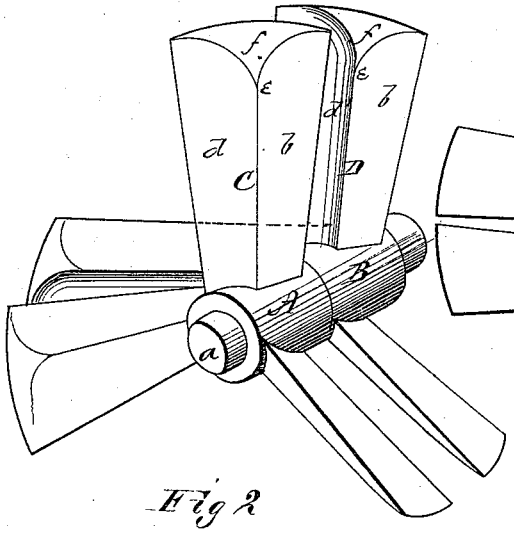


Fig 3

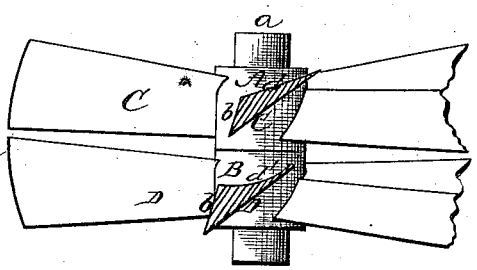
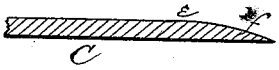
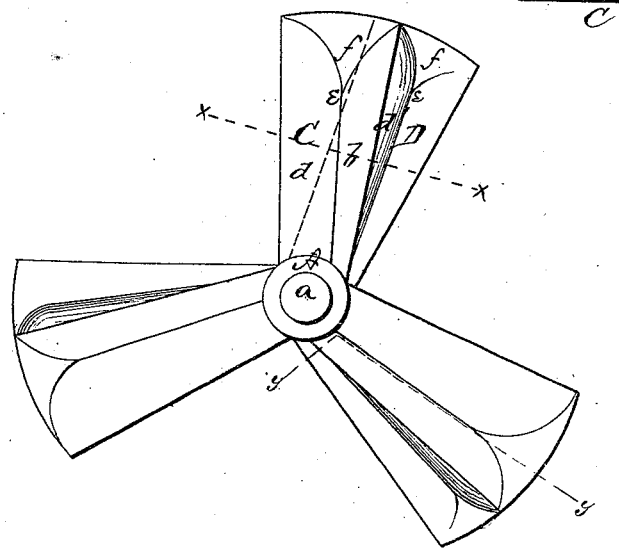


Fig 2

Fig 4





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