

A. T. PAGE.
WIND-MILL.

No. 171,630.

Patented Dec. 28, 1875.

Fig. 1.

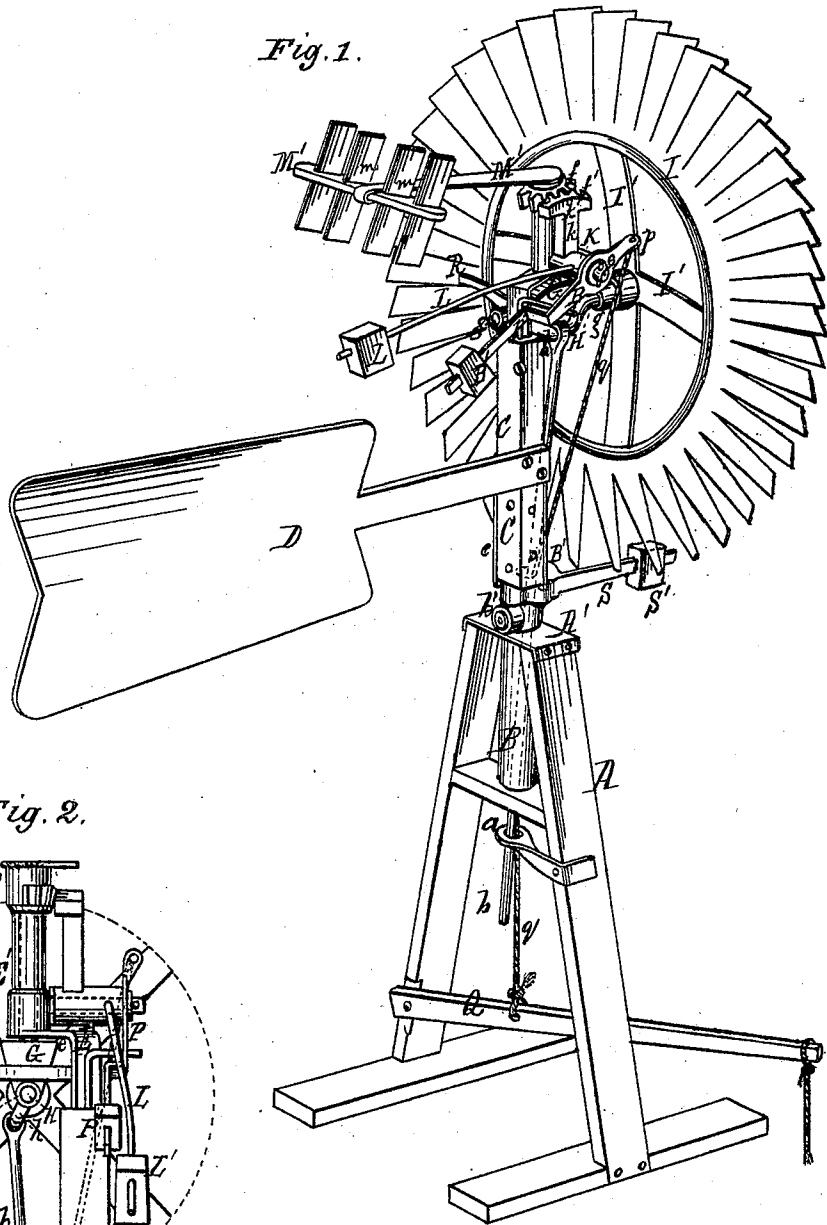
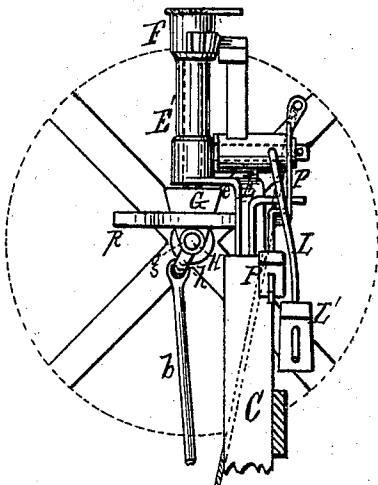


Fig. 2.



Witnesses
Alex. Mahon
John C. Center

Inventor
Arthur T. Page
G. W. Ford, Attorney.
by A. M. Smith
Associate.

UNITED STATES PATENT OFFICE.

ARTHUR T. PAGE, OF GARDEN PRAIRIE, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **171,630**, dated December 23, 1875; application filed March 18, 1875.

To all whom it may concern:

Be it known that I, ARTHUR T. PAGE, of Garden Prairie, in the county of Boone and State of Illinois, have invented a new and useful Improvement in Windmills; and I 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.

Figure 1 represents a perspective view of my improved windmill, and Fig. 2 represents a rear elevation of a portion of the same.

Similar letters of reference denote corresponding parts in both figures.

The invention relates to a novel arrangement of means for holding the wheel in the face of the wind, and for deflecting the same therefrom, as the force of the wind increases beyond what is required for rotating the wheel with the desired velocity, and to certain details of construction and arrangement of parts hereinafter fully set forth.

In the drawings, A represents the tower, which may be of any usual or preferred construction. The upper part of this tower is provided with suitable bearings for the reception and support of a hollow vertical cylinder, B, which forms the pivot on which the windmill, as a whole, turns to accommodate itself to the direction of the wind, and centrally through which the pump-rod *b* passes, said rod further passing through suitable guides, as at *a*. At different points in its length, near the upper end of this hollow pivot B, is secured a horizontal stud or studs, carrying a friction-roller, *b'*, which rests on the top plate A', this roller, where but a single one is used, being arranged upon the same side of the sleeve-axle B with the vane, and opposite to the wind-wheel, where the binding action due to the action of the wind would be the greatest, said roller taking the weight of the wind-wheel and its attachments, and permitting them to turn freely on the vertical axis B. Above this roller is a collar, B', formed on, or rigidly connected with, the upper end of sleeve B, and at one side of, or eccentrically to, the sleeve the collar B' is provided with an angle-iron socket, *c*, in which is secured the upright wooden block C, to which, midway of its height, the vane D is rigidly secured, as shown.

To the upper end of this block C is firmly secured, in any suitable manner, an angle-iron, E, the outer end of the horizontal arm *e* of which is provided with a sleeve, E', arranged vertically over the pivot B, or nearly so. The sleeve E' affords bearings for a vertical shaft or pivot, which is retained in position therein by an enlarged head or collar, F, at its upper end. The lower end of this shaft has a yoke or arched plate, G, permanently secured to it midway of its length, and the depressed ends of this yoke or arch-plate are provided, each, with a sleeve-bearing, *g*, in which the wind-wheel shaft H is mounted, said shaft, between its bearings *g*, being provided with a crank at *h*, through which motion is imparted to the pump-rod. To the outer projecting end of the crank-shaft H the wind-wheel I is rigidly connected, said wheel, by preference, being of that class known as the solid wheel, in which the blades are rigidly attached at the preferred angle of obliquity. The central radial arms or spider I' are dished on the inner face of the wheel, in such manner as to bring the weight of the wheel as nearly as practicable into the same vertical plane with the vertical pivots of the wheel, thereby reducing the tendency to cramp the pivots in their bearings. The collar F on the upper vertical pivot is provided with a toothed beveled segment, *f*, and the sleeve E, in which said pivot or shaft has its bearings, has a horizontal stud-shaft, *e'*, projecting from it on one side, upon which is mounted a sleeve, K, the inner end of which has cast upon it a perpendicular arm, *k*, with a cross-head, *k'*, the inner face of which is provided with a beveled segment-rack, *f'*, the teeth of which engage with the teeth of the segment *f*, for vibrating the rack-pivot F.

To the rear face of the sleeve K is secured a lever-arm, L, upon which is a sliding weight, L', by the adjustment of which the wheel, through its connection therewith by the pivot F, segment *f* and *f'*, and sleeve K, may be held to the wind with any required power. To the upper end of the pivot F is permanently secured a horizontal arm, M, extending rearward at right angles to the plane of the wind-wheel, or thereabout, and to the rear end of this arm a transverse bar, M', is secured, to which a number of slats, *m*, are connected,

said slats being set obliquely to the plane of the wind-wheel, as shown, and serving, as the force of the wind is increased beyond what is requisite for giving the desired velocity to the wheel, to deflect the wheel or turn it on its pivot F slightly away from the wind, in which position the direct action of the wind upon the wheel itself will serve to further turn it out of the action of or away from the wind, swinging it around on its pivot F to a position more or less approaching a plane parallel with the vane, according to the force of the wind. In this movement the segment *f*, acting on the rack *f'*, and thence through the sleeve K on the arm L, raises the weight L', which steadily resists the deflection of the wheel, and causes it to return more or less directly into the face of the wind as the force of the latter abates.

Thus far it will be seen that the action of the wheel is automatic. For placing it under the control of the attendant on the ground, a lever, P, is pivoted loosely on the outer end of the stud-axle *e*², from the short arm *p* of which a cord, *q*, extends downward through the tubular shaft B, and is connected at its lower end with a lever, Q, near the ground. The long arm P' of this lever is bent at *p'* into an angular or crank form, reaching under the weighted arm L, which vibrates on the same center *e*², as explained. This arm P' has an adjustable weight secured to it sufficient to counterbalance the weight of the cord *q* and lever Q, and to remove it from contact with the arm L, as shown, so as to leave the latter unobstructed in its automatic action, as explained, except when it is desired to turn the wheel away from the action of the wind by hand, when the attendant, by pressing down on lever Q, raises the long arm of lever P, bringing it up into contact with the arm L, when, by a continued movement of the lever P, the arm L will be raised, turning the wheel-shaft on its vertical pivot F, through the rack-connection described.

The lever Q may be locked in this depressed position for holding the wind-wheel wholly or partially out of the face of the wind by a rack and pin, or any suitable device for the purpose.

Upon one of the sleeve-bearings *g*, or to any convenient point on the yoke G, is se-

cured a transverse stop-bar, R, the ends of which strike against the upright portion of the supporting-iron E, and limit the movement of the wheel relatively to the vane on the pivot F, within an arc of a circle of ninety degrees, or from a position in which the face of the wheel is at right angles to the vane, to one in which it is parallel therewith, or nearly so, and vice versa.

The location of the block C eccentrically to the pivot B, as above explained, tends to cramp the latter in its bearings, and this is in a measure obviated by the arrangement of the friction-roller *b'*, as explained. For further overcoming this an arm, S, is projected from the collar B', and rigidly connected therewith on the side opposite to the standard C and to the vane, and upon this is placed a sliding weight, S', which may be set at any desired point, for balancing the weight of the vane and block, and standard C.

Parts of the mill and of its supporting-tower not specifically described above may be of any usual construction.

The mill has been described with reference to its application for driving the pump-rod; but it will be obvious that it may be used for any of the purposes to which this class of wind-wheels are applicable.

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

1. The supplemental fan-blades *m*, connected with the vertical pivot F, for deflecting the wheel from the direct action of the wind as the force of the latter is increased, in combination with the racks *f f* and weighted arm L, substantially as and for the purpose set forth.

2. The angular weighted lever P, in combination with the weighted arm L, arranged and operating substantially as described.

3. The combination, with the eccentrically-located pivotal standard C, of the weighted arm S and friction-roller *b'*, arranged and operating as described.

This invention signed and witnessed this 23d day of January, 1875.

ARTHUR T. PAGE.

Witnesses:

O. H. WRIGHT,
HENRY CURTIS.