

R. W. BURT.
Windmills.

No. 213,543.

Patented Mar. 25, 1879.

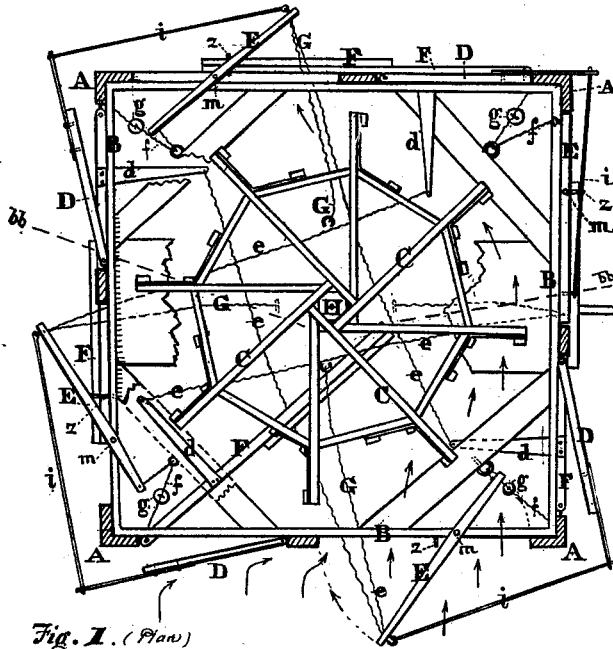


Fig. 1. (Plan)

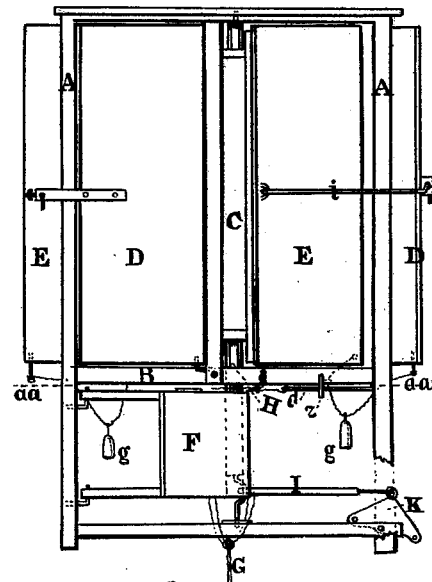


Fig. 3. (Elevation on smaller scale)

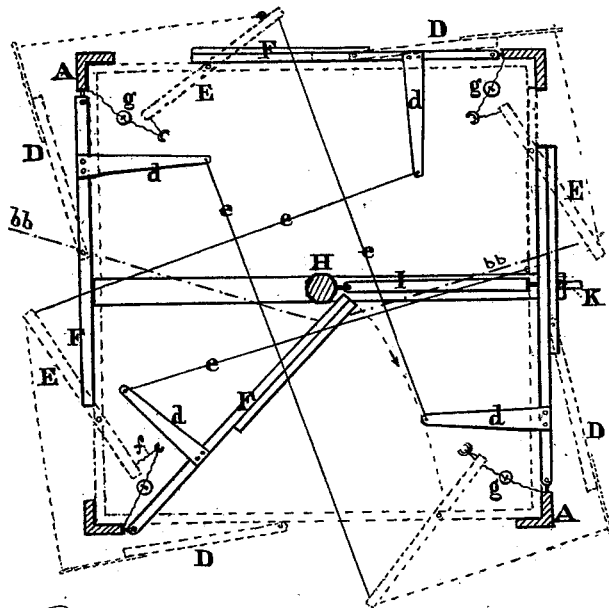


Fig. 2. Horizontal sec.
on line "a-a" fig. 3;
showing "Vanee"

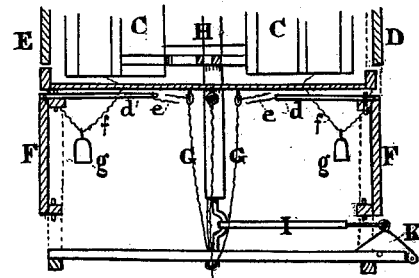


Fig. 4. Sec elevation on line
"b-b" figs. 1 & 2.

Witnesses
Luther Shurlow
Lyndhurst Shurlow

Inventor
Richard W. Burt
by E. Shurlow atty in fact

UNITED STATES PATENT OFFICE.

RICHARD W. BURT, OF PEORIA, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **213,543**, dated March 25, 1879; application filed January 14, 1879.

To all whom it may concern:

Be it known that I, RICHARD W. BURT, of the city of Peoria, in the county of Peoria, in the State of Illinois, have invented an Improvement on the Windmill patented to me by the United States on September 11, 1877, No. 194,988; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a plan view, the roof removed; Fig. 2, a plan view or horizontal section on line *a a*; Fig. 3, on smaller scale, intended to show the vanes below the shutters; Fig. 4, also on smaller scale, vertical section on line *b b*, Figs. 1 and 2.

My said former patent consisted of a wind-wheel surrounded by case or system of alternating pivoted and stationary shutters. The movable or pivoted shutters turned vertically on one edge, and remained open by means of levers and weights, to admit light winds, but were closed by heavy winds bearing upon a vane projecting inward from each shutter. There were defects about this plan, which my present improvement remedies.

I now pivot the movable shutters (corresponding with the movable shutters of my former patent) at about one-third of their breadth above and below on that edge next to the nearest corner of the casing or frame, and connect the outer edge of each so pivoted shutter with the edge of the nearest shutter around the corner of the mill, by means of a rod, in such a manner that these shutters (a pair being at each corner of the mill) move with each other. The second shutter of the several pairs corresponds with the stationary shutters of my former patent, and these pairs are thus linked together so that the weight on the primary shutter may open both simultaneously and they may be closed simultaneously by an impinging strong wind, so doing away with the vane attached to the base of each primary shutter, which performed the same offices in my former patent. I use a different form of vane, and for a different purpose—*i. e.*, to close the corner pair of shutters to the rear. By thus pivoting the primary shutters,

so as to allow about two-thirds of their respective widths to project beyond the mill, the object of closing them by means of a strong wind is obtained, and without the employment of the connected vanes as a leverage for this purpose, used in my former patent.

Each of the vanes now employed—there being one on each side of the mill, under the shutters—is pivoted to one of the corner posts of the mill, so as to swing horizontally inward when acted upon by the wind on that side of the mill, and draw with it the outer edge of the primary shutter, situated at the opposite corner of the mill to that corner to which said vane is pivoted, by means of a cord or other connection, and thus cut off the wind from the wheel. Of course but one of these vanes is so acting at one time, and then only when the wind blows too strong.

The secondary shutters, which cover and prevent access of the wind to the wheel on one-half of each side of the mill, are each pivoted above and below, near the middle of said sides, the outer edge being attached by a rod to its primary shutter, as before mentioned, the weight on the latter holding both open to fair winds, and in such a manner in respect to the secondary shutter as to direct wind, if blowing upon that face of the mill, into the nearest wind-opening covered by the nearest primary shutter on that side. The secondary shutters also allow wind to enter between them and the corner of the mill when the wind blows against the opening of its primary shutter.

In the drawings, which represent one of the forms in which I construct this improvement, Fig. 1 represents the mill at work, the arrows representing the course of the wind. *A A A* are the vertical corner posts; *B*, horizontal ties or frame-work; *C*, wind-wheel; *D D D*, secondary shutters, each situate on one side of a wind-opening, and covering about half the wheel, each pivoted at its inner edge above and below, near the middle of the side on which it is situated, and connected by means of a rod, *i*, at its outer edge next the corner of the mill, with the outer edge of its primary shutter, *E*, around the adjoining side of the mill, so as to move simultaneously

when acted upon by weights or the wind; E E E, primary shutters, corresponding in number to the secondary shutters, and covering their respective wind-passages, each pivoted at their upper and lower edges at *m* in the frame B, in such a manner that the greater part of the shutter can project beyond or outside the casing or front of the mill, while the inner edge is weighted, by cord *f* and weight *g*, within the casing, to keep the shutter open for fair winds; *i*, the rod which connects the outer edge of each primary with its secondary shutter.

The outer corner of each primary shutter is connected by a cord, *e*, or similar device, with one of the vanes F diagonally in direction from it.

F F F F are four vanes, set vertically and pivoted respectively to one of the four posts of the frame under the shutters, and normally in or near the same plane as the latter, each having an arm, *d*, connected by means of a cord, *e*, with the outer edge of one of the primary shutters, E, as before mentioned. A stop, *z*, prevents the vane from swinging outward. G G G G, cords connected with the outer edge of each primary shutter, and converging to the center of the mill, where they are united in one cord reaching low enough to be manipulated to stop the wheel, if required; H, wheel-shaft, with pump-crank at its lower end; I, crank-rod; K, pump-crank.

It is to be observed that the vane F is not in the position shown in Fig. 1 when the wind is fair. It is drawn thus to show its other position merely.

The operation of this wind-wheel is as follows: (Fig. 1 will be of convenient reference in describing the mill at work.) The wind enters at the side nearest the observer, through the open primary shutter, E, in the direction of the arrows, and also through the opening of the secondary shutter, D, to which the primary is linked by means of the rod *i*, and puts the wheel C in motion. At the same time the secondary shutter, D, at the opposite corner, to the left of the wind-opening, directs the wind into the latter opening by reason of its inclination in that direction being so held by its own primary shutter. A sufficient weight, *g*, at the corner of each of the latter shutters holds these connected pairs of shutters open to fair winds, but allows stronger or too rough winds to close them when they are situated on that side facing such wind.

In like manner one of the vertically-hinged vanes F, when the wind is rough, is blown back toward the center of the mill, drawing the arm *d* and cord *e*, and with them the attached shutters D, in the farther corner of the mill, thus closing such shutters when in the rear or lee part of the mill.

The whole of this operation is repeated and applies to each side of the mill.

To recapitulate, the shutters are all open in fair winds, one pair in the drawings being shown closed, to illustrate only the joint action of the vane and shutters in a high wind.

What I claim as my invention is—

1. In a horizontal wind-wheel, four pairs of vertically-pivoted shutters, each pair linked together at adjacent corners, and each pair covering one of the corners of the mill, one of the shutters of each pair being pivoted above and below in such a manner as to allow the greater part of it to project outward beyond the wind-opening during fair winds by means of an interior weight, but closable, with its secondary shutter attached, by means of its eccentric pivoting, by high winds, substantially as and for the purposes described.

2. In a horizontal wind-wheel casing, two vertically-pivoted shutters, forming together one of the corners of the wind-wheel, there being a similar pair at each corner of the mill, each shutter of a pair being individually connected by a rod, so as to move together when operated upon by a weight when the wind is fair for the wheel, and closable by a vane on the opposite side when the wind is in a certain direction, or by the unequal pivoting of one of the pair when the wind is facing the latter shutter, substantially as and for the purposes described.

3. The four primary shutters E, linked to the respective secondary shutters, D, and connected weight *g*, and with cord or rod *e* and arm *d* of vane F, substantially as and for the purposes described.

4. The secondary shutters, D, each connected by a rod, *i*, with its primary shutter, E, so as to remain at an inclination toward the wind-opening nearest to its respective hinge, to direct wind into said opening, but to close that side of the wheel behind it at such time, substantially as and for the purposes described.

5. The vanes F, connected by cord or rod *e*, respectively, with one of the primary shutters, E, on the opposite side of the mill.

6. The combination and arrangement of the secondary shutter, D, rod *i*, eccentrically-pivoted primary shutter, E, weighted at *g*, cord or rod *e*, arm *d* of vane F, substantially as described.

In testimony that I claim the foregoing wind-wheel I hereunto have set my hand this 6th day of January, A. D. 1879.

RICHARD W. BURT.

Witnesses:

JAMES M. MORSE,
H. W. WELLS.