T. N. SHEPHARD.
Windmill.

No. 199,473. Patented Jan. 22, 1878.

Fig. 1.

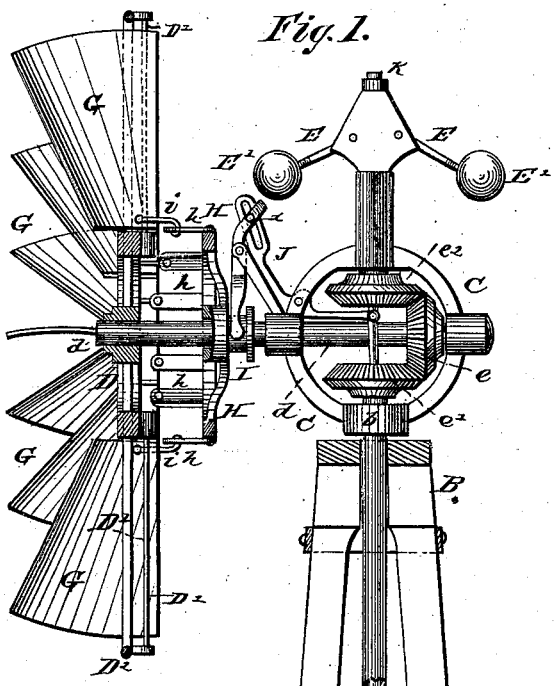


Fig. 4.

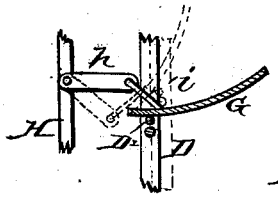


Fig. 2.

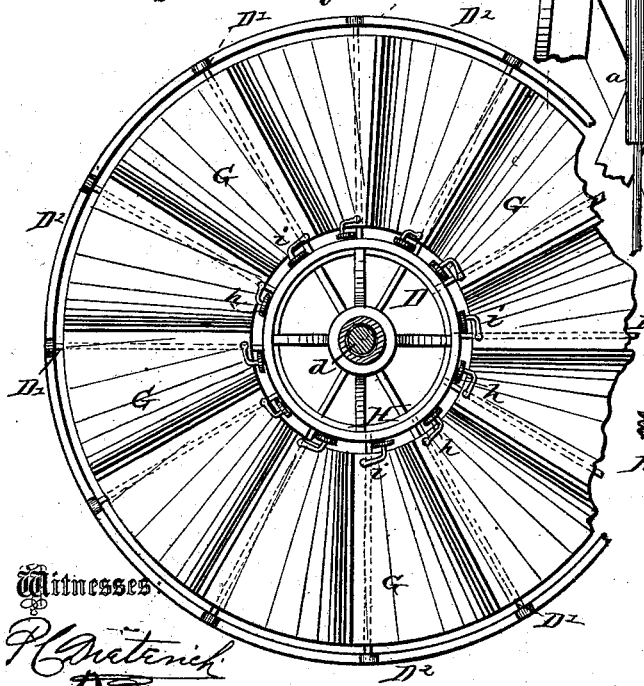
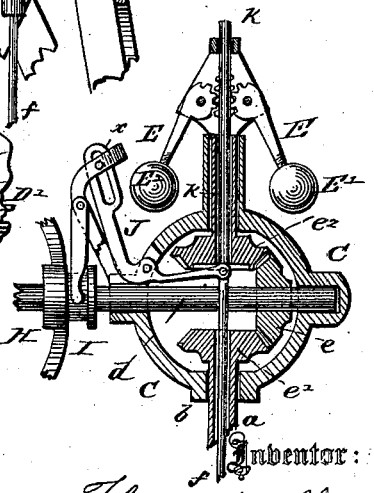


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS N. SHEPHARD, OF LINCOLN, NEBRASKA, ASSIGNOR OF ONE-HALF HIS RIGHT TO WARREN FULLER, OF SAME PLACE.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **199,473**, dated January 22, 1878; application filed December 1, 1877.

To all whom it may concern:

Be it known that I, THOMAS N. SHEPHARD, of Lincoln, in the county of Lancaster and State of Nebraska, have invented certain new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of a vaneless windmill, as will be hereinafter more fully set forth.

In the annexed drawings, to which reference is made, and which fully illustrate my invention, Figure 1 is a side elevation of my windmill, partly in section. Figs. 2, 3, and 4 are detail views of parts thereof.

A represents the tower of the mill, of any suitable construction, with bed-plate B on top. C represents the turn-table, made in circular form, with a tube, *a*, extending downward from the same through the bed-plate, and through a guide, *b*, at a suitable point in the tower.

In bearings formed in the turn-table C is placed the horizontal shaft *d*, to the end of which the wind-wheel is secured. Upon this shaft, within the turn-table, is a gear-wheel, *e*, which meshes with a similar wheel, e^1, underneath for rotating the shaft *f*, passing down through the tube *a*. The wheel *e* also meshes with a similar wheel, e^2, on top, for operating the governor-arms E E above.

The wind-wheel is composed of a central hub, D, provided with a series of radial arms, D^1, connected at their outer ends by a rim D^2.

G G represent the fans of the wheel, pivoted on the arms D^1, and connected by links *i* and arms *h* to a spider or wheel, H, placed loosely on the shaft *d* between the wind-wheel and the turn-table.

The hub of the spider or wheel H is formed with a circumferential groove, in which fits the forked arm of a lever, I. This lever is pivoted between two short arms projecting from the turn-table, and its upper end is slotted, and passes over one arm of an elbow-lever, J, which is also slotted, as shown.

A pin, *x*, is passed through and fastened in the slotted end of the lever I, said pin passing through the slot in the lever J, whereby all liability of said levers disengaging with each other is entirely obviated, while at the same time they can easily move as required.

In a full-sized windmill the pin *x* will be provided with a roller to reduce the friction.

The lever J is pivoted at its elbow in a slot in the turn-table, and its inner end is connected to the shaft or rod *k*, that connects with the governor-arms E.

The fans G of the wind-wheel are so hung upon their arms D^1 that about one-fourth of each fan is in front of the arm, and three-fourths in rear. The fans being thus hung form the vane of the mill, and also a second governor. The wind blowing on the fans hung in this manner turns the edge to the wind, and also raises the governor-balls E′ in time of severe storm, and the revolving of the governor-balls acts upon the fans, which gives the mill a uniform speed.

The balls E′ are to be made adjustable by set-screws on the arms, which will make the mill throw out easy or hard, according to the required power wanted.

The lower end of the shaft *f* is to be geared to a horizontal shaft, from which latter the machinery to be operated will receive its motion.

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

1. The turn-table C, inclosing the gear-wheels *e* e^1, in combination with the tube *a*, shaft *f*, and governor, substantially as and for the purpose set forth.

2. The combination of the wind-wheel fans G, links *i*, arms *h*, spider H, lever I, with slot and pin *x*, the slotted elbow-lever J, and the governor-rod *k*, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

THOMAS N. SHEPHARD.

Witnesses:
BENJA. F. FISHER,
J. H. HARRISON.