

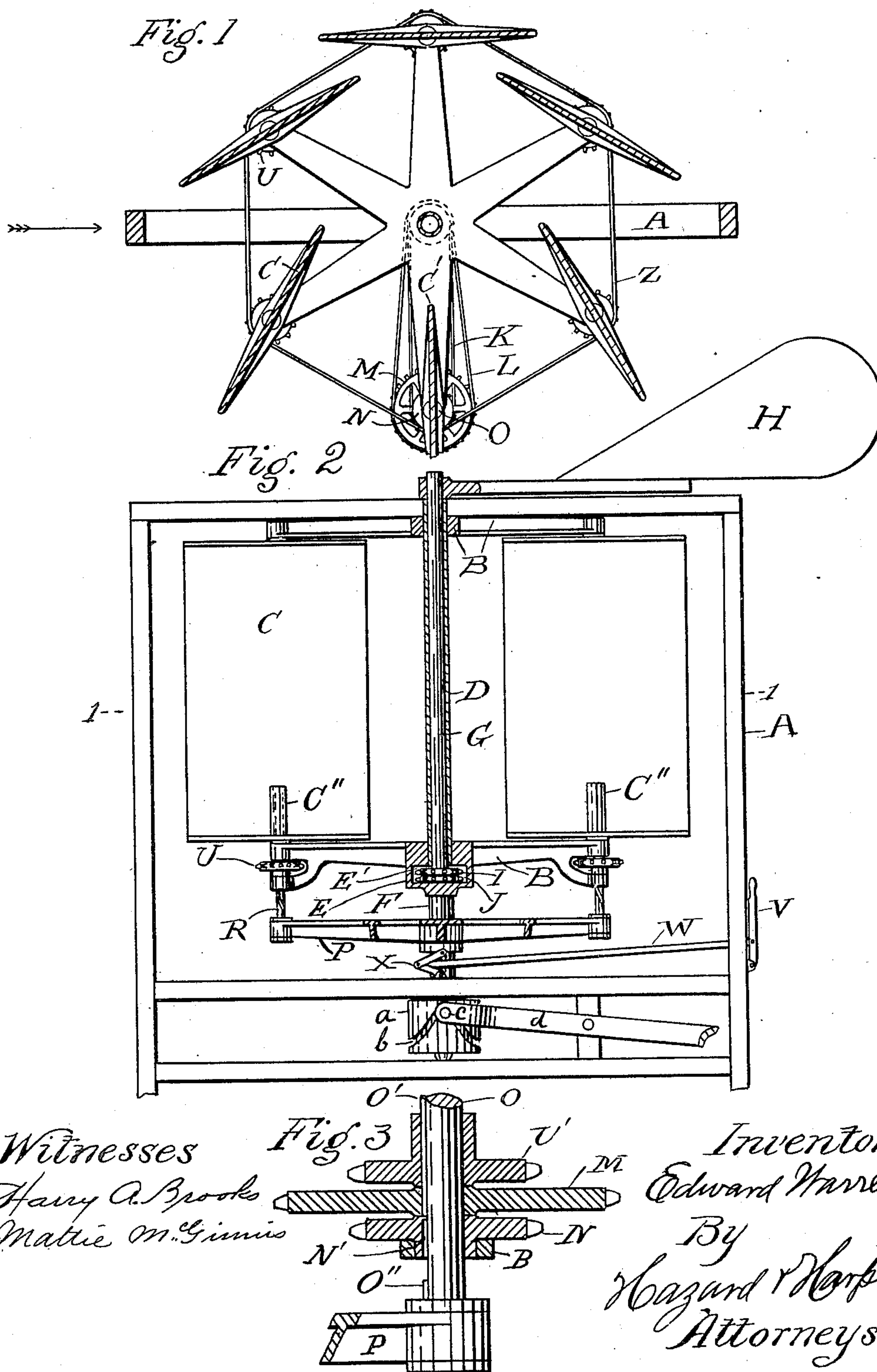
No. 675,075.

Patented May 28, 1901.

E. WARREN.  
WINDMILL.

(Application filed Sept. 24, 1900.)

(No Model.)





# UNITED STATES PATENT OFFICE.

EDWARD WARREN, OF SAN MARCOS, CALIFORNIA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 675,075, dated May 28, 1901.

Application filed September 24, 1900. Serial No. 30,997. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WARREN, a citizen of the United States, residing at San Marcos, in the county of San Diego and State of California, have invented new and useful Improvements in Windmills, of which the following is a specification.

My invention relates to that class of windmills known as "horizontal" mills; and the objects thereof are to provide a mill in which the vanes are retained in the best possible positions for effective service when working and which when not working will keep the vanes feathered to the wind. I accomplish these objects by the mechanism described herein and illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a top cross-section on the line 1 1 of Fig. 2. Fig. 2 is a vertical section of my mill with some of the parts shown in elevation and the sprocket-chains removed. Fig. 3 is an enlarged detail view of a part of the mechanism by which the vanes are thrown into or out of the wind.

In the drawings, A represents the outer stationary frame, in which is centrally mounted the revoluble inner frame B, which carries vanes C. The upper part of frame B is rigidly affixed to hollow shaft D, and the lower portion is affixed to slotted coupling-box E. The lower end of shaft D is also rigidly affixed in the upper portion of the coupling-box, above slot E' therein. Passing through shaft D is shaft G, to the upper end of which is rigidly attached vane H, and on the lower end are rigidly attached sprocket-wheels I and J, which are connected, by chains K and L, with sprocket-wheels M and N. In each of the arms of spider P are rotatively-mounted shafts which extend upward through the lower arms of frame B and enter sockets C' in vanes C, in which sockets they slide when desired, but do not turn therein, the upper ends being, preferably, square. Shaft O of vane C' passes through sprocket-wheels M, N, and U'. Wheel U' is held from rotation on said shaft at all times by spline O', which spline also prevents wheel M from rotating on said shaft when the vanes are in the wind, at which time wheel N turns on shaft O. The lower portions of shafts R of the other vanes are provided with threads which extend from

the spider up through and to the upper edge of sprocket-wheels U, passing therethrough in threaded contact and preventing said wheels from turning thereon. The threaded portions of these shafts are smaller than the portions which extend into the sockets of the vanes, so that the threads may not catch when the shafts slide up in the sockets. The length and pitch of the threads on these shafts are such that the respective vanes are caused to turn into planes which lie parallel with the plane in which vane C' lies when the vanes are all feathered, as hereinafter explained. When six equally-distant vanes are used, as shown in Fig. 1, the two nearest vanes C' would be turned thirty degrees, the next two sixty degrees, and the others ninety degrees. Sprocket-wheels I, J, N, and U have the same number of teeth, while sprocket-wheel M has double the number of teeth of any of the other wheels. Sprocket-chain Z passes around sprockets U to impart to each the same movement, which is controlled by the movement of sprocket U' on vane C'. Sprocket-wheels I and J, being rigidly mounted on shaft D, which is prevented from rotation by vane H, do not rotate, and as sprocket-wheel M has double the number of teeth of wheel I when the vanes are in the wind each vane will be rotated on its axis once on every two revolutions of frame B, thus keeping all the vanes except one with a driving-surface presented to the wind, thereby rotating shaft F, which is rigidly affixed in the lower portion of the coupling-box, below the slot therein, and passes through one of the cross-timbers of frame A and rests in bearings affixed in another of the cross-timbers of frame A. On the lower end of shaft F is rigidly affixed collar a, in which is spiral groove b, which receives pin c on the end of lever d, which pin follows in said groove as the shaft revolves and operates the working machinery through lever d. When my mill is in operation and the wind blowing in the direction of the arrow in Fig. 1, with the vanes set as shown, it will be seen that all of the vanes present a driving-surface to the wind except the vane opposite vane C', which is feathered. When it is desired to have the mill cease working, spider P, slidable on shaft F, is raised by lever V, rod W, and toggle-arms X,



(said arms being connected in the center to rod W and at one end to a bearing affixed to shaft F and at the other end to spider P,) which causes the threaded portion of shaft R to pass up through sprocket-wheels U, (they being held by chain Z from rotating any faster than sprocket U' of vane C',) which causes shafts R to rotate vanes C to feather them to the wind, the pitch of the threads on shaft R being so arranged that all of vanes C will be feathered when spider P is raised as far as possible. Spider P carries shaft O upward and causes spline O'' to enter groove N' in wheel N and lock it to shaft O, and at the same time spline O' is disengaged from wheel M, and it then turns on shaft O, while wheel N turns with it, and thereby causes the rotation of the vanes on each revolution of frame B, thus keeping all the vanes feathered to the wind all the time. Groove N' is in position to receive spline O'' only when vane C' is feathered.

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

1. The herein-described windmill, comprising a main stationary frame; an inner frame, revoluble, mounted in the outer frame; said inner frame having a hollow shaft in the center thereof, and radial arms at the top, affixed to the hollow shaft; like arms at the bottom thereof affixed to a slotted coupling-box; vanes revolubly mounted in the arms of the inner frame, having sockets at the bottom thereof; a threaded shaft, revoluble in each of the arms of the spider, extending into the socket of each vane; a sprocket-wheel on each of said shafts; a sprocket-chain surrounding and connecting said sprocket-wheels; a second and third sprocket-wheel on one of the shafts, one of which has double the

number of teeth of the other; a vane exterior the outer frame, rigidly affixed to a shaft; a shaft extending through the hollow shaft of the inner frame, having two sprocket-wheels on the end thereof in the slot of the coupling-box; sprocket-chains connecting said last sprocket-wheels with one of the small and the large sprocket-wheel on the shaft, which enters the socket of the vane; a slotted coupling-box; a shaft affixed thereto, extending through a timber of the stationary frame and terminating in a bearing; a collar on said last shaft, having a spiral groove therein; a lever pivoted to the stationary frame, and having a pin in the end thereof, adapted to fit and follow in the groove in the collar, and impart to the lever, movement, when the shaft revolves..

2. In a windmill having vertical vanes mounted in a revoluble vane-frame; means to stop the working of the mill comprising a spider slidably mounted on the shaft to which the vane-frame is affixed; shafts revolubly mounted in the arms of the spider, having the lower portion threaded, and the upper portion adapted to slide in the sockets of the shafts of the vanes; internally-threaded sprocket-wheels on the upper portion of the threaded part of said shafts and means to elevate said spider, substantially as shown and described, whereby the upward movement of the spider will cause the vanes to stand in parallel vertical planes.

In witness that I claim the foregoing I have hereunto subscribed my name this 10th day of September, 1900.

EDWARD WARREN.

Witnesses:

NED HALL,  
LEWIS J. GALL.