J. WARD.

WIND-MILL.

No. 177,597. Patented May 16, 1876.

Fig. 1.

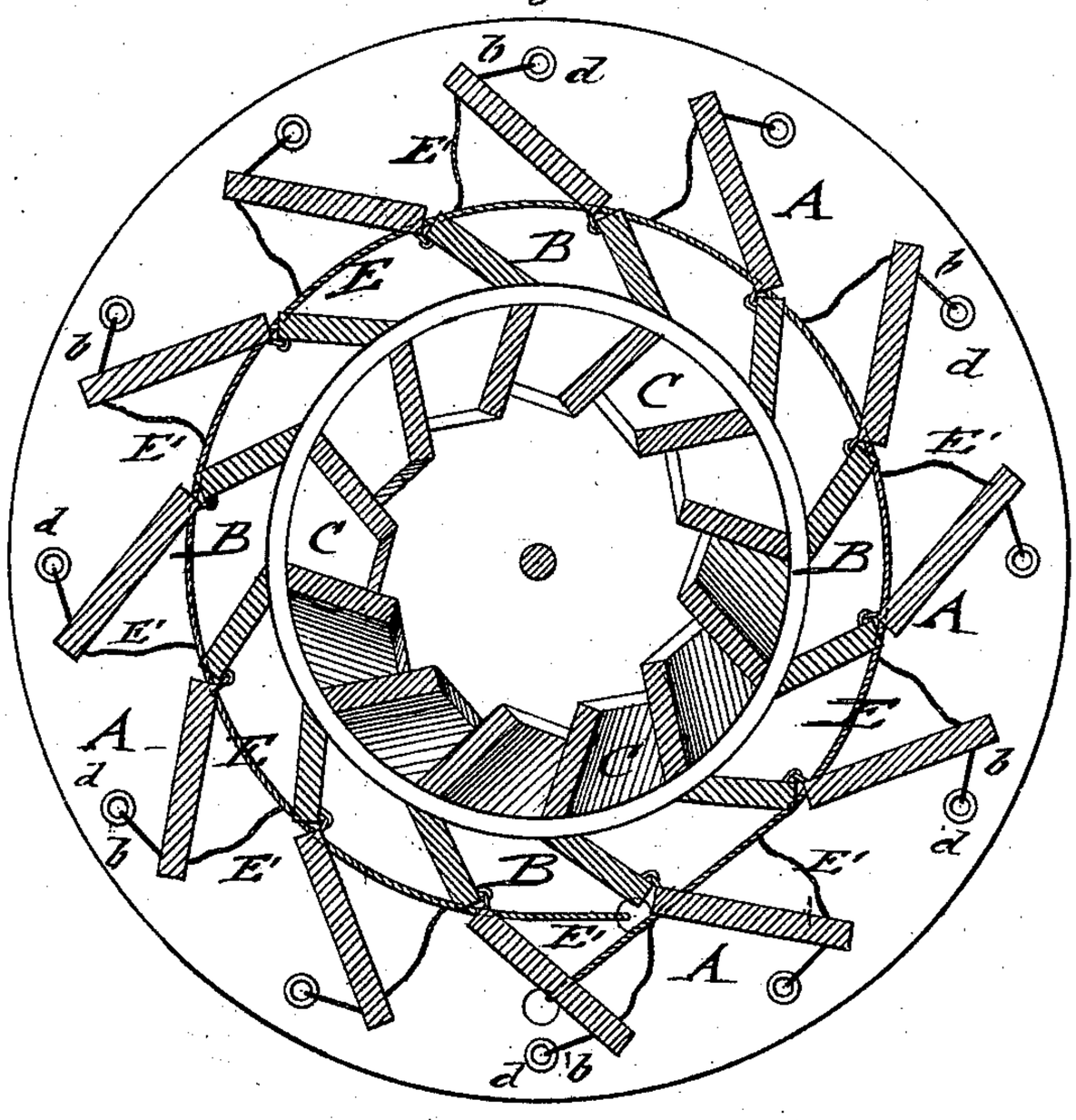
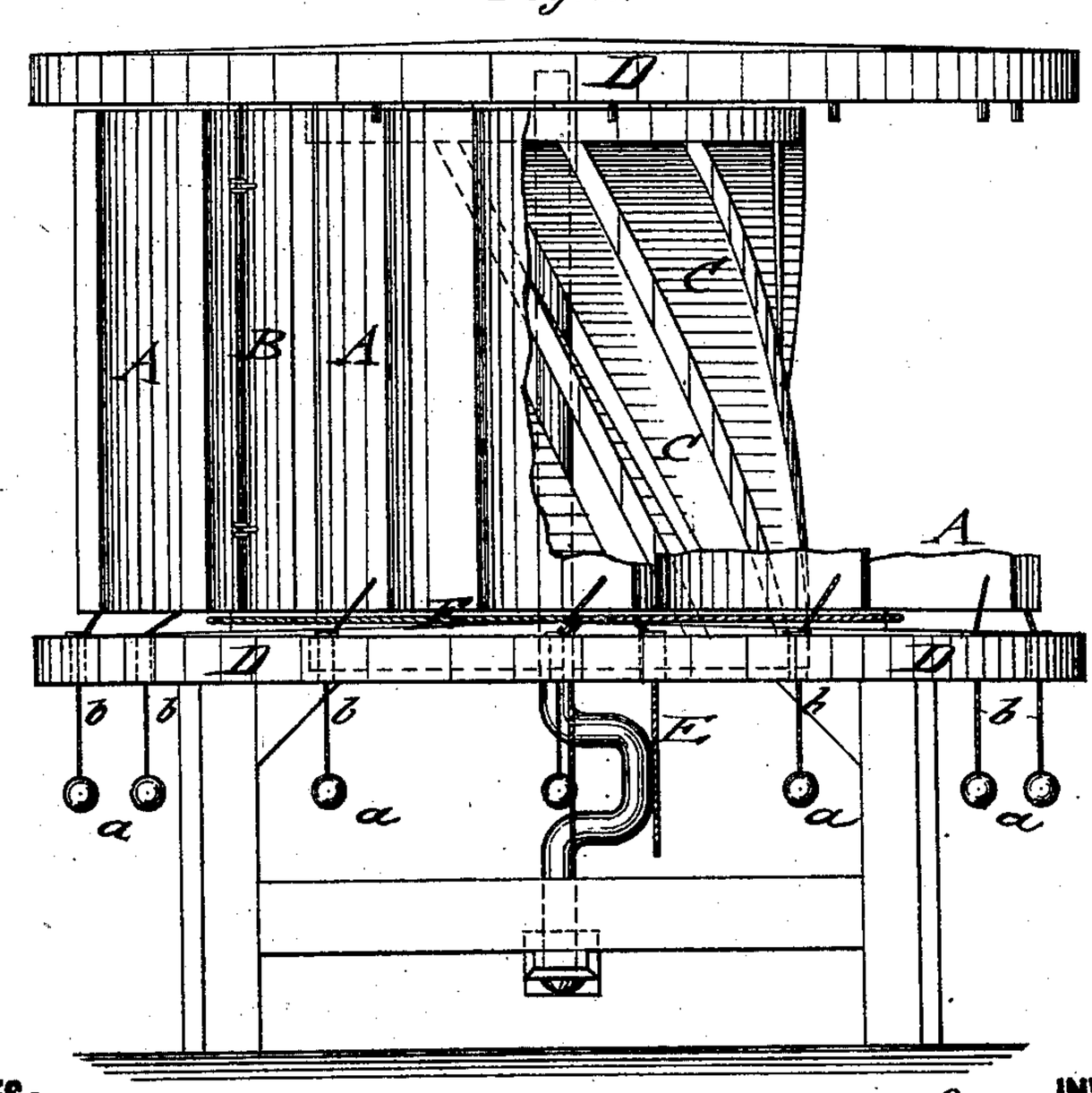


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES WARD, OF WINNEMUCCA, NEVADA.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **177,597**, dated May 16, 1876; application filed April 4, 1876.

To all whom it may concern:

Be it known that I, JAMES WARD, of Winnemucca, in the county of Humboldt and State of Nevada, have invented a new and Improved Windmill, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a horizontal section of my improved windmill, and Fig. 2 a side elevation of the same, with parts broken out to show construction of wheel.

Similar letters of reference indicate corresponding parts.

The object of my invention is to so improve that class of windmills having upright wheels, in the nature of turbine-wheels, that the power of the wind is more completely utilized, and the mill regulated in perfectly automatic manner, being entirely closed by the action of strong wind, or, when not required for work, by a closing mechanism.

The invention consists of an upright wheel with spirally-curved floats, in connection with a corresponding number of fixed and hinged and weighted shutters, of which the latter are regulated by weights and a connecting governing-string.

In the drawing, A represents the outer hinged shutters; B, the inner fixed or stationary shutters; and C the upright wheel, whose shaft revolves in suitable top and bottom bearings. The wheel C is made with spirally-curved buckets or floats, in place of straight upright wings or floats. The back action of the wind on the wheel is thereby reduced in analogous manner, as the back action of the water in turbine water-wheels of similar construction. The stationary and movable shutters B and A correspond in number to the floats, the stationary shutters being attached at suitable angle to the wheel by horizontal top and bottom supports D. The movable shutters A are hinged to the outer edges of the fixed shutters, and regulated to swing thereon into open or closed position by the action of the wind in connection with weights *a*, attached by strings *b*, passing through holes *d* of the lower support D to the shutters A. The fixed and movable shutters are analogous to the chutes and gates in water-wheels, and admit, when fully opened, the more perfect action of the wind on the wheel, and the more complete utilization of the power of the same. The wind regulates the weighted shutters by partially closing them when the wind is high, and entirely closing them when blowing a gale. The shutters are weighted according to the speed and work that are to be accomplished by the mill. The weights open the shutters, when the velocity of the wind decreases, and close the same more or less with the increase of velocity, the wheel revolving thereby at uniform speed. The speed of the wheel is further regulated, and the action of the mill entirely discontinued, by a string, E, that extends around the lower part of the fixed shutters, and connects, by shorter strings E′, with each of the swinging shutters A. The main string E is conducted through a hole of the bottom support to the lower part of the mill-frame, to set the movable shutters or close them at will in quick or convenient manner.

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

1. In upright windmills, a wheel, having upright spirally-curved floats or buckets, substantially in the manner and for the purpose set forth.

2. The combination of an upright wheel, having spirally-curved buckets or floats, with fixed shutters and hinged weighted shutters, to produce automatical adjustment of shutters by the wind, and uniform speed of shaft, substantially as set forth.

JAMES WARD.

Witnesses:
JAMES HUBLER,
M. HOFMAN.