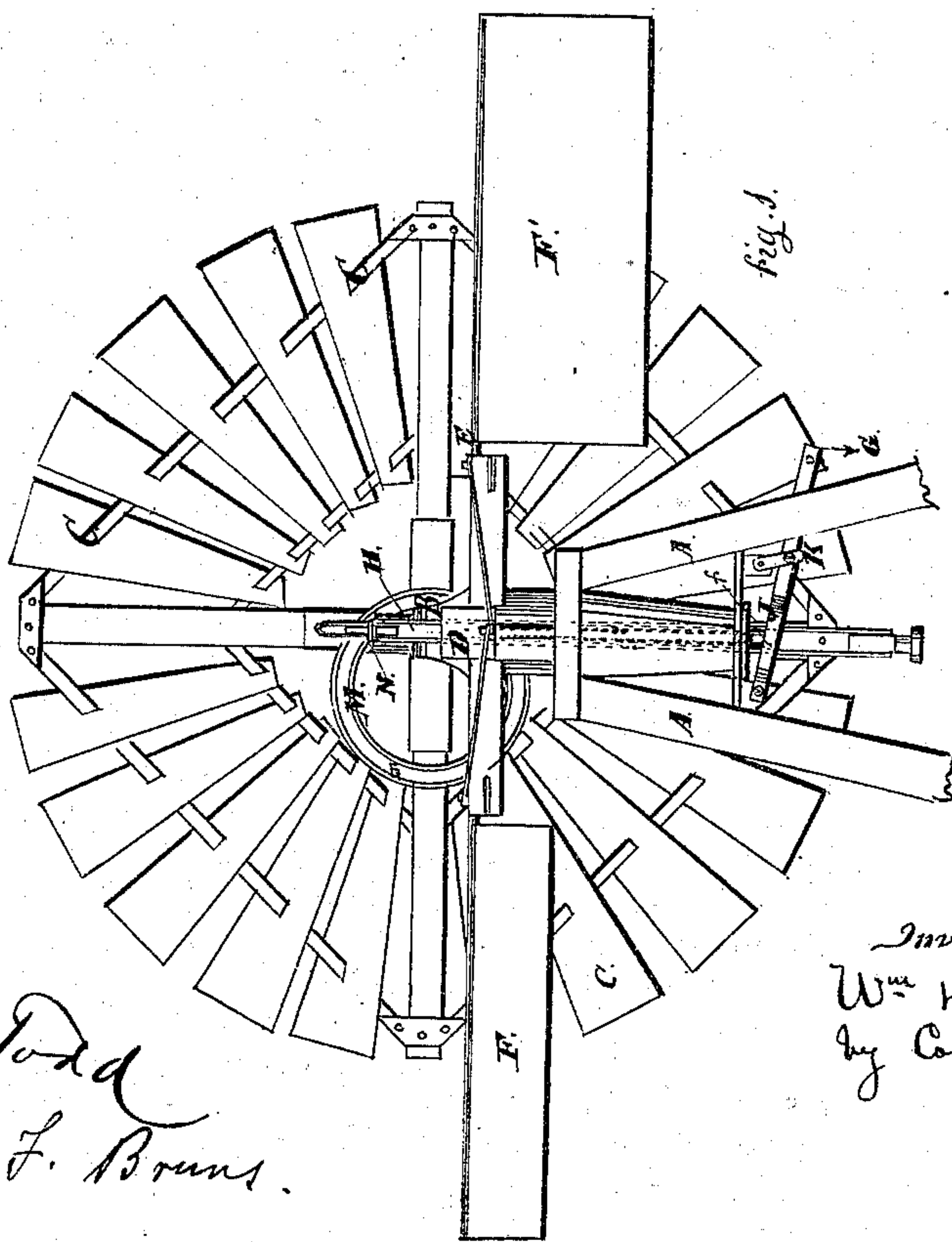
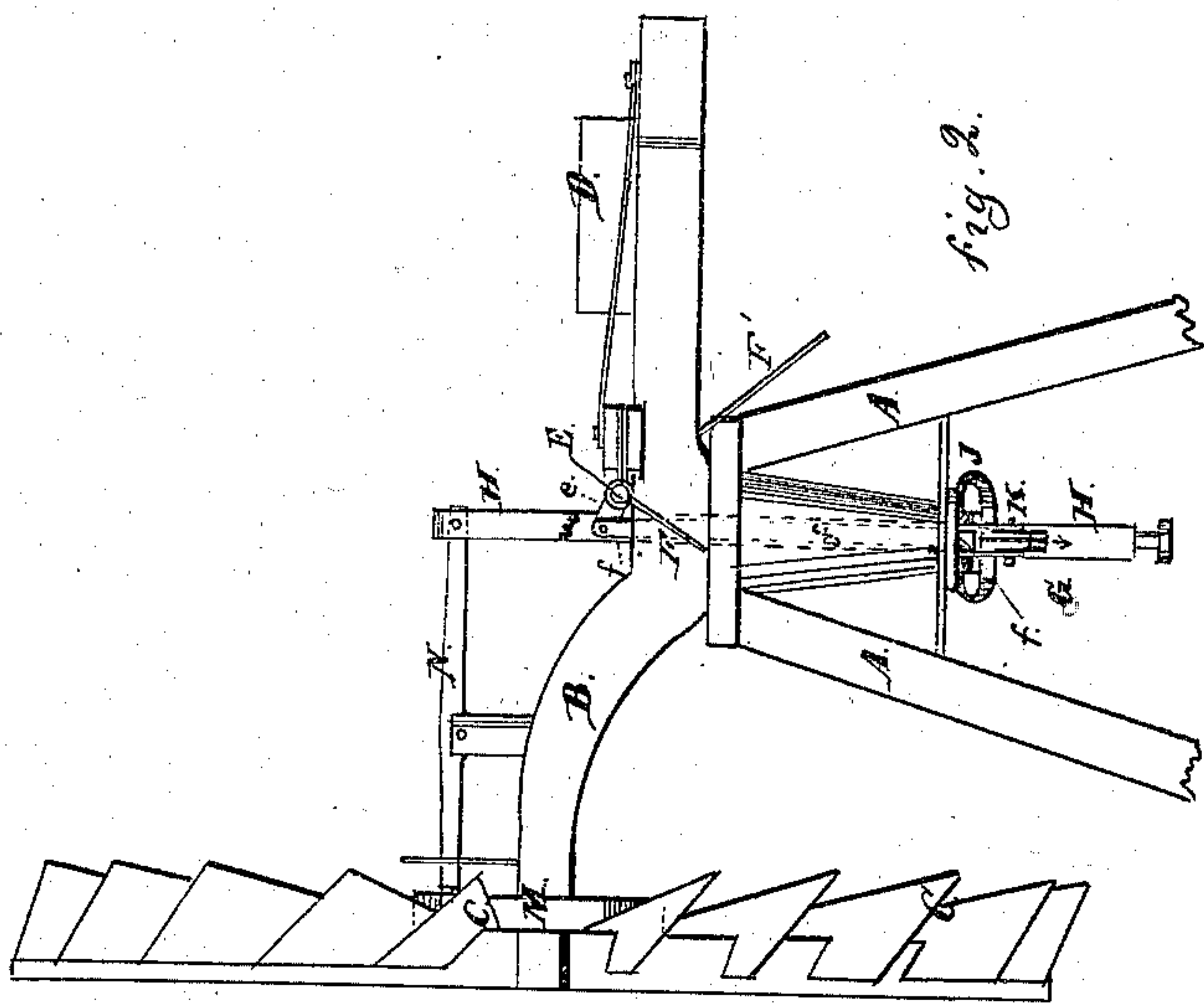


W. D. NICHOLS.

Wind-Mills.

No. 137,793.

Patented April 15, 1873.



Witnesses:
James Todd
Henry L. Brown.

Inventor.
Wm D. Nichols
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Attys

UNITED STATES PATENT OFFICE.

WILLIAM D. NICHOLS, OF BATAVIA, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **137,793**, dated April 15, 1873; application filed October 3, 1872.

To all whom it may concern:

Be it known that I, WILLIAM D. NICHOLS, of Batavia, in the county of Kane and State of Illinois, have invented certain Improvements in Windmills, of which the following is a specification:

Nature of the Invention.

The object of this invention is to simplify and cheapen the construction and cost of self-governing windmills, and the first part of the invention relates to the governor arrangement, and consists in applying to the mill a transverse shaft, lying horizontally near the pivot and at right angles to the axis of the wind-wheel, which shaft carries at each end a blade or vane, the vanes being of unequal width and radiating from the shaft at different inclinations. The mill is operated tail to the wind, the vane for holding the wheel in the wind being dispensed with, and the wheel kept in the wind by its own surface. The transverse shaft above mentioned is weighted, so as to keep the blades in a position to exhibit equal vertical surface to the wind, so as to balance each other. When the wind blows strong enough to raise the weight the lesser blade goes out of the wind and the larger blade comes into the wind, and, offering a broad surface, turns the mill upon the pivot and brings the wind-wheel more or less out of the wind, as will be explained.

In the accompanying drawing which forms a part of this specification—

Figure 1 represents an elevation from the rear of the mill, which is the side toward the wind in this invention. Fig. 2 is a side elevation of same.

Like letters of reference made use of in the several figures indicate like parts.

To enable those skilled in the art to make and use my invention I will proceed to describe the same with particularity, making use in so doing of the aforesaid drawing by letters of reference thereto.

General Description.

A represents the frame-work of the tower. B is the boat or pivoted carriage, prolonged to form the axle of the wind-wheel. C is the wind-wheel, made with the common radial in-

clined sails. No vane or tail-sail is used in this invention, and the weight of the wind-wheel is balanced by a weight, D, upon the opposite end of the pivoted carriage. There being no vane, the wind acting upon the whole body of the wind-wheel, veers it around tail to and square across the current, holding it thus in balance while revolving. E is a horizontal shaft with bearings upon the carriage B, standing parallel with the plane of the wind-wheel. This shaft is furnished with a vane at each end F F' of equal length, but of unequal breadth, the vane F' being greatly the broadest, but the vane F' is so fixed upon the shaft in a different plane from the vane F that when said smaller vane F is standing vertical full in the wind the larger vane, by reason of its different inclination, offers the same vertical extent of surface, and the two exactly balance. The shaft E at its center has a bell-crank, e, from which in a manner presently specified said shaft is weighted so as to hold the vanes F F' to present equal surfaces to the wind by the weight G. The amount of power being previously determined which it is desired to give the wheel, this weight is adjusted to hold the vanes F F' until the wind comes above the necessary force when, acting upon the said vanes F F', the shaft E is turned and the weight raised, and by the turning of the shaft the small vane F is raised out of the wind and the broad vane F' lowered into the wind to present a broad surface, which, being without balance at the other end of the shaft, swings the carriage around horizontally, turning the wind-wheel more or less edgewise and out of the wind. In this position the vane F', being also out of the wind, is brought up by the weight, and a balance being attained the wind acts upon the wind-wheel to return it again in place. In fact, however, the result is that the wind-wheel is kept by the two opposing forces just in that position in which it receives the pre-determined force. The method of connecting the weight to the bell-crank e is as follows: The pump-rod H is made hollow or double, and a connecting-rod, f, passes from the bell-crank down through it part way, and is connected by a transverse piece passing through slots in the sides of the hollow pump-rod to an universal-joint, J, in the lever K,

which is pivoted to the frame-work of the tower, and to which the weight G is appended. This construction allows the pump-rod to turn with the carriage B while the lever K remains stationary. To the other end of the lever K is fastened a cord, so that by pulling down upon the cord the weight is raised and the vane F' brought down to throw the wind-wheel permanently out of the wind by securing the cord so that the weight will remain raised. To that side of the wind-wheel which is next the carriage is attached eccentrically the grooved wheel M, within the groove *m* of which plays the end of the lever N, furnished at this point with a friction-roller. This lever N is pivoted from the carriage B, and its other end is connected to the pump-rod H, so that as the wind-wheel revolves the eccentric groove causes the lever N to vibrate, actuating the pump-rod in reciprocal motion. This is a very simple, cheap, and durable method

of transmitting and changing the motion of the wind-wheel.

Claims.

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

1. The wind-wheel C, in combination with the transverse weighted shaft E carrying the vanes F F', constructed and operating substantially as specified and shown.

2. The combination of the shaft E, vanes F F', bell-crank *e*, hollow pump-rod H, rod *f*, lever K with universal joint J and weight G, substantially as and for the purpose specified.

WILLIAM D. NICHOLS.

Witnesses:

THOMAS SNOW,

JAMES ROCKWELL.