

(No Model.)

2 Sheets—Sheet 1.

J. S. LINDQUIST.
WINDMILL.

No. 360,706.

Patented Apr. 5, 1887.

Fig.1.

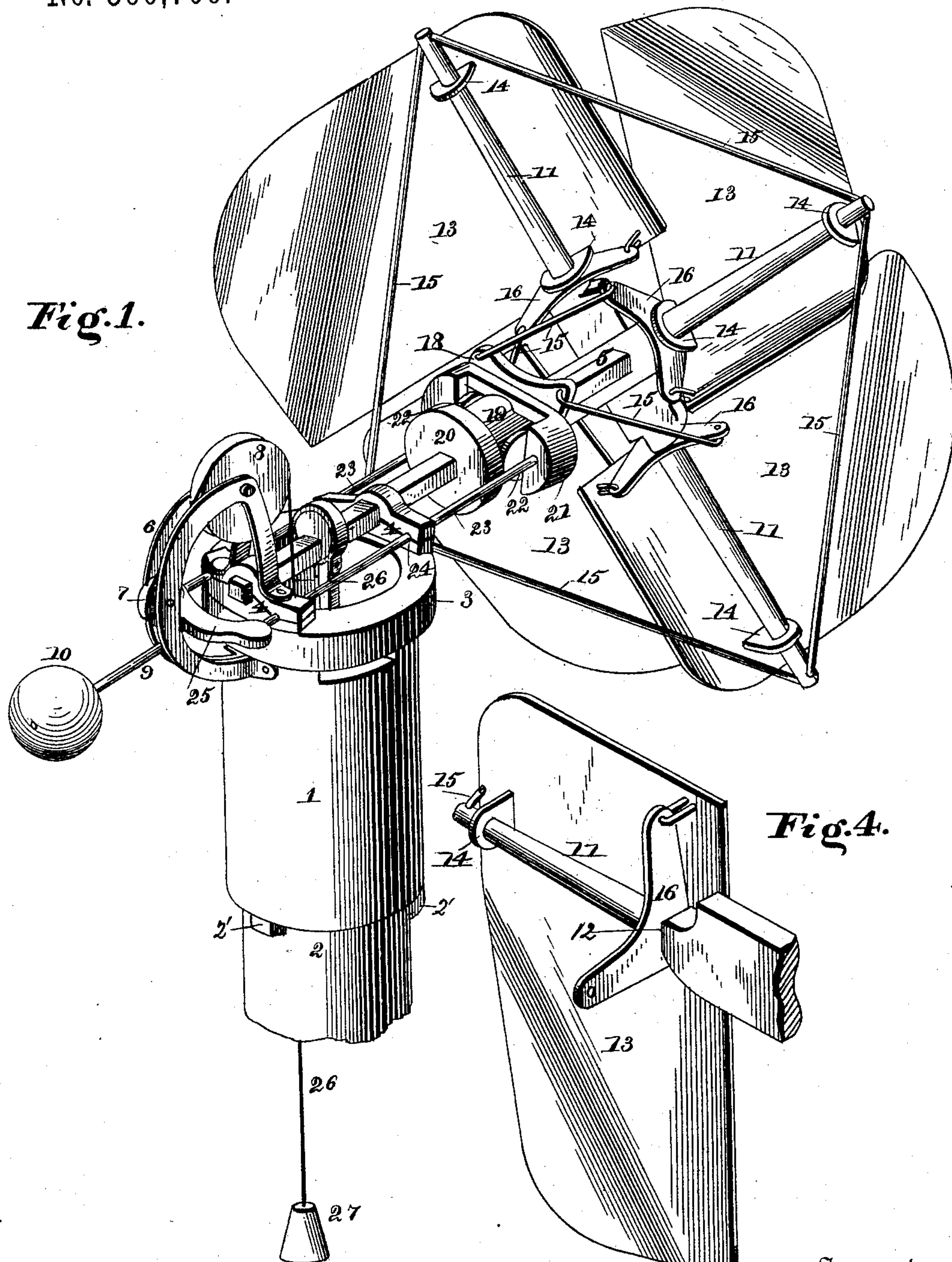
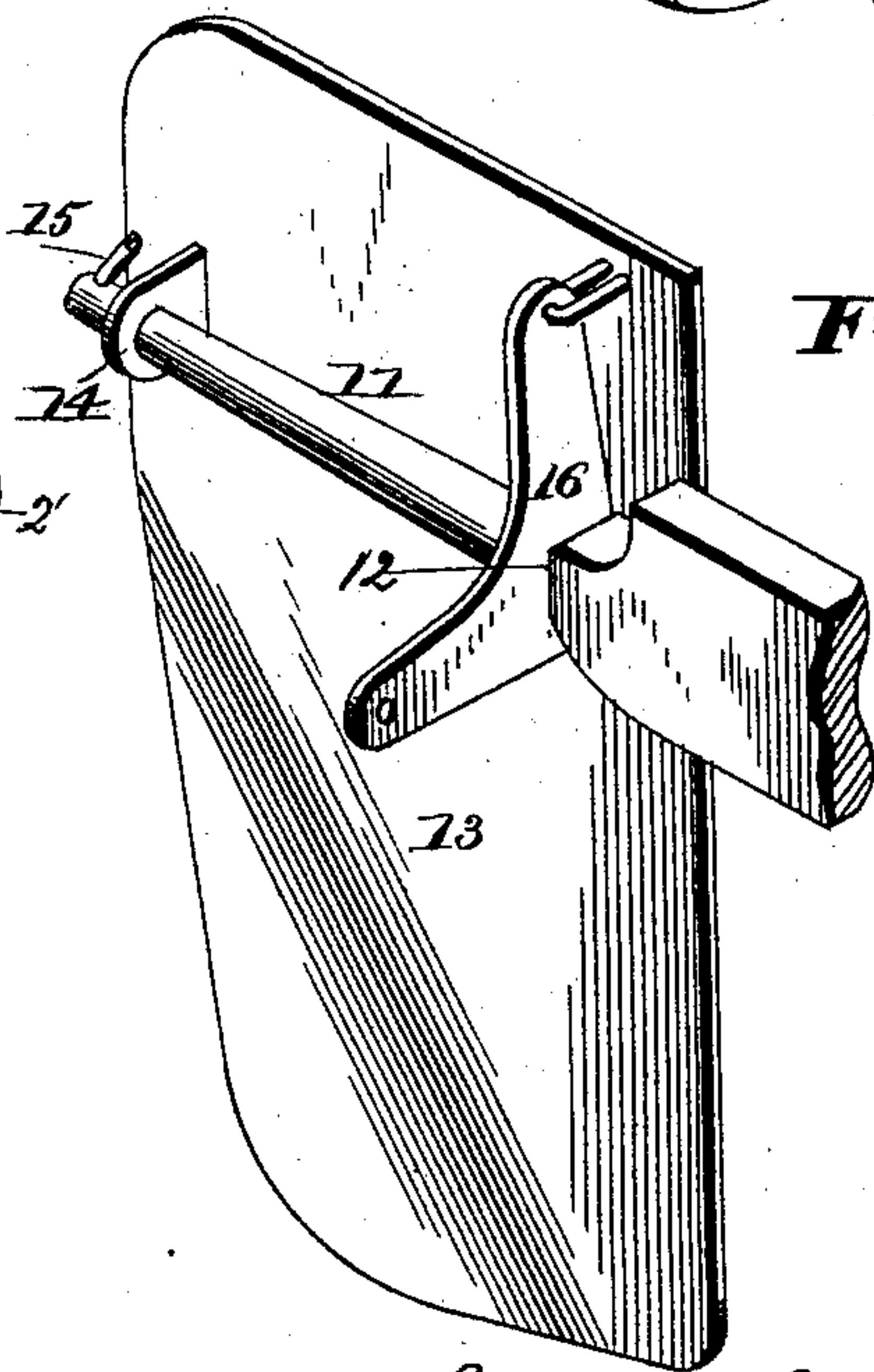


Fig.4.



Witnesses
F. L. Ourand
Bennett & Jones,

Inventor
John S. Lindquist,
By his Attorneys
Louis Ragger & Co.

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2 Sheets—Sheet 2.

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Fig. 3.

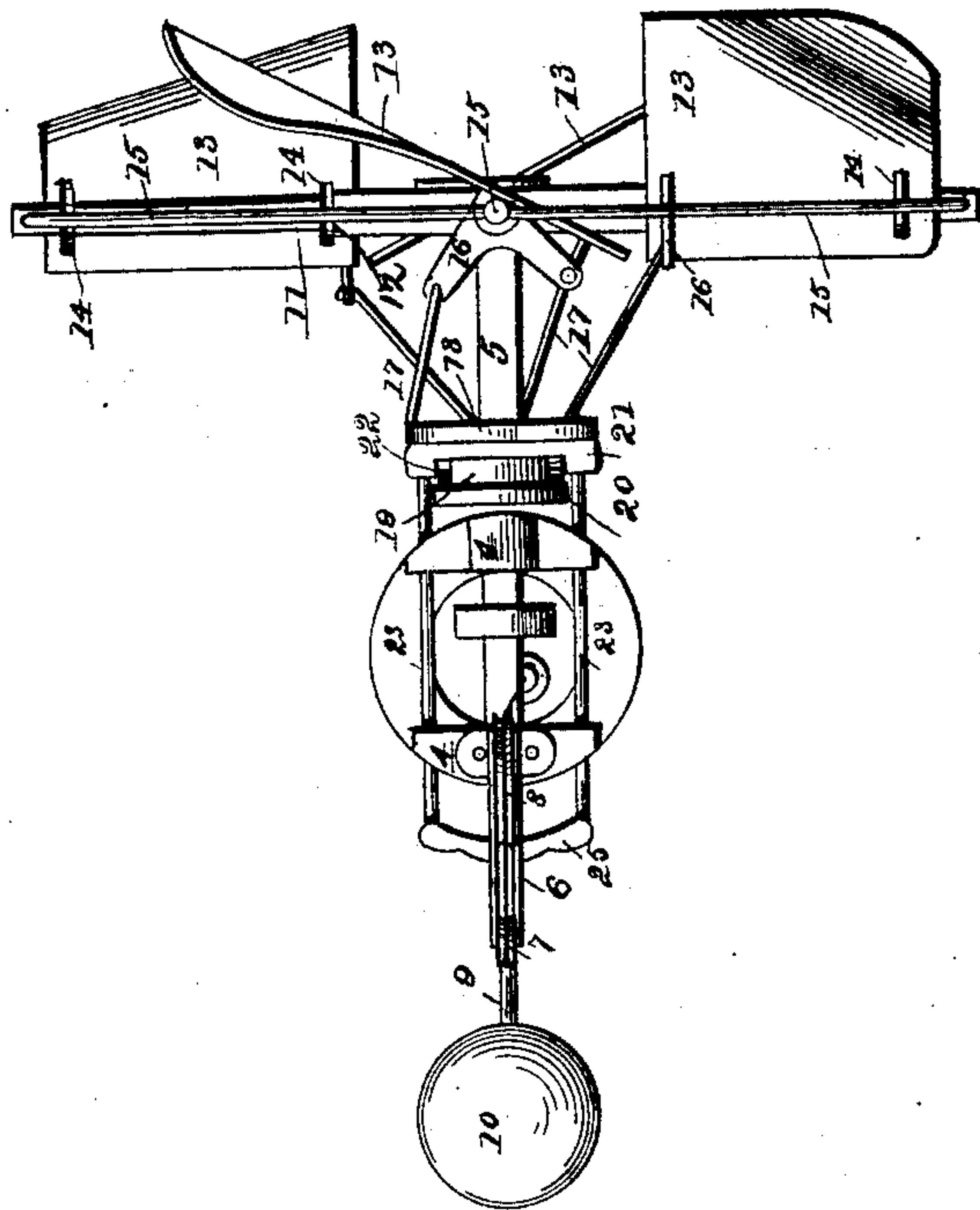
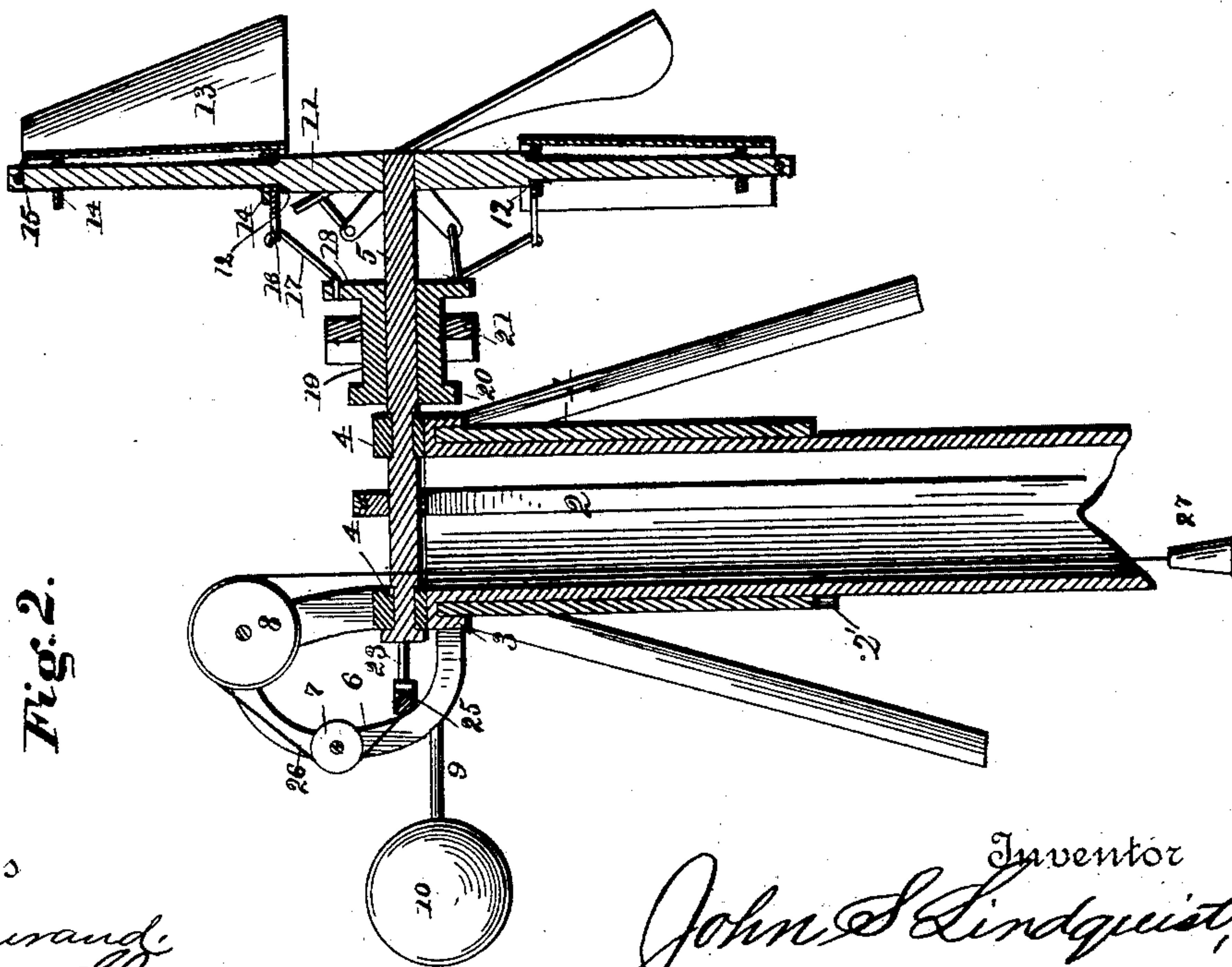


Fig. 2.



Witnesses
H. L. Curand
Bennett Jones

Inventor
John S. Lindquist,
By His Attorneys
Louis Bagger & Co

UNITED STATES PATENT OFFICE.

JOHN S. LINDQUIST, OF SWEDEBURG, NEBRASKA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 360,706, dated April 5, 1887.

Application filed November 27, 1886. Serial No. 220,033. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. LINDQUIST, a citizen of the United States, and a resident of Swedeburg, in the county of Saunders 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 of the invention, 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, which form a part of this specification, and in which—

Figure 1 is a perspective view of the upper portion of my improved windmill. Fig. 2 is a vertical axial sectional view of the same. Fig. 3 is a top plan view, and Fig. 4 is a perspective detail view, of one of the arms and its vane and operating mechanism.

Similar numerals of reference indicate corresponding parts in all the figures.

My invention has relation to windmills having horizontal shafts and having means for automatically bringing the vanes to stand at a more obtuse angle to the wind as the force of the wind decreases and at a more acute angle to the direction of the wind as the force of the wind increases; and it consists in the improved construction and combination of a mill of that class in which the wind-wheel of the radiating vanes will serve as guide-vanes, the vanes being secured to that end of the shaft which projects away from the point from which the wind comes, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates a cylindrical box secured in the top of the frame supporting the mill, and a sleeve, 2, is journaled in the same, having a flanged collar, 3, at its upper end, projecting over the upper end of the box or bearing and having suitable lugs or stops, 2', bearing against the lower end of the bearing, the flanged collar and the stops thus securing the sleeve within the bearing.

The upper side of the flanged collar is provided with two diametrically-opposite horizontal bearings, 4, in which the shaft 5 of the mill is journaled, and an outwardly and upwardly projecting frame, 6, is secured above and outside of one of the bearings, having a

sheave, 7, journaled in its outer end and a sheave, 8, journaled in its upper end. An arm, 9, projects from this frame and is provided with a counterpoise, 10, which counterbalances the wind-wheel, which is secured at the other end of the shaft.

The wheel consists of a number of vanes, 13, pivotally secured upon the radiating arms 11 by means of the perforated lugs or ears 14. The outer portion of these arms is preferably made round and braced at their ends by means of the rods or braces 15, and the inner portion is provided with an outwardly-facing shoulder, 12.

The outer or rear ends of the vanes have their outer corners curved or rounded toward the side to which the ears project, so that they will cause the arms and shaft to rotate when they are exposed to the action of the wind striking them from the direction of their inner edges.

Bell-cranks 16 are pivoted at their bends upon the inner ends of the arms, bearing against the shoulders upon the same, and the ends of the arms of the bell-cranks, which project parallel with the vanes, are pivotally connected to the same, while the outwardly-projecting arms of the bell-cranks are provided with rods 17, pivoted to the arms with their outer ends and pivoted to a disk or flange, 18, with their inner ends. This disk or flange projects at the outer end of a sleeve, 19, which slides upon and turns with the main shaft, and the inner end of the sleeve is provided with another flange, 20.

A frame, 21, fits around this sleeve between the flanges, and is provided at its ends with anti-friction rollers 22, journaled to bear with their edges against the inner sides of the two flanges, and two parallel horizontal rods, 23, have their ends secured to the ends of this frame and slide in longitudinal perforations 24 in the ends of the boxes for the main shaft, parallel with the shaft and at both sides of the same, having a transverse yoke, 25, secured with its ends to the other ends of the sliding rods, the said yoke being placed within the sheave-bearing frame at that side of the vertical sleeve.

A chain or rope, 26, is secured to the middle of the yoke and passes over the sheaves in

the frame, pending through the vertical sleeve and having a weight, 27, at its lower end. It will now be seen that when the mill is set up in operative position the wind will force the wheel to stand at the side of the vertical box and frame opposite to the side from which the wind comes, and with the inner or forward ends of the vanes projecting toward the direction of the wind. The wind bearing against the curved portions of the vanes will rotate them, and the weight attached to the chain will serve to draw the yoke toward the outer end of the frame, drawing the flanged sleeve inward upon the shaft and placing the vanes with their faces presented to the wind, while the tendency of the wind bearing against the longer outer portions of the vanes will be to tilt them with their forward ends pointing toward the wind, so that by adjusting the weight at the end of the chain the vanes may automatically be set at different angles, according to the strength of the wind, so that the speed with which the wheel and shaft rotate may always be the same. The flanged vertical sleeve, turning within the vertical bearing, will allow the wind to revolve the entire shaft and mechanism, so as to bring the wheel to stand in a position opposite to the direction from which it comes, and it will be seen that the guide-vane usually found in this class of mills will thus be dispensed with, the wheel itself serving as a guide-vane. The arm having the counterpoise will counterbalance the weight of the wheel, and will also counterbalance the strain of the wind upon the wheel, which will be a drawing strain with the direction of the wind, instead of the usual pushing strain with the direction of the wind found in windmills having a guide-vane and having the wheel facing the wind at the end of the drive-shaft.

The lower end of the chain or rope regulating the position of the vanes may be secured to the frame of the mill in any well-known method, thus securing the vanes at a certain angle, and when the weight is released from the chain or rope the vanes will stand with their forward ends pointing toward the wind and with their faces parallel to the direction of the wind, when the mill will stand still, there being no resistance against the vanes.

Any suitable mechanism may be connected to the drive-shaft or main shaft for the purpose of conveying the motion of the same to the ground and for converting it, if required, the hollow flanged vertical sleeve offering sufficient space for the admission of the necessary gearing.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a windmill, the combination of a shaft journaled across the top of the supporting-frame, radial arms secured upon its outer end, the outer portions of which are round and the inner portions provided with outwardly-facing shoulders, vanes having perforated lugs or ears upon one side; bell-cranks upon said arms, one end of each of which is pivotally secured to one of each of said vanes, a flanged sleeve upon said shaft, rods pivotally secured to said bell-cranks and to said sleeve, and means, substantially as described, for moving said sleeve.

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

JOHN S. LINDQUIST.

Witnesses:

PETER ANDERSON,
LOUIS BLAKESTOD.