

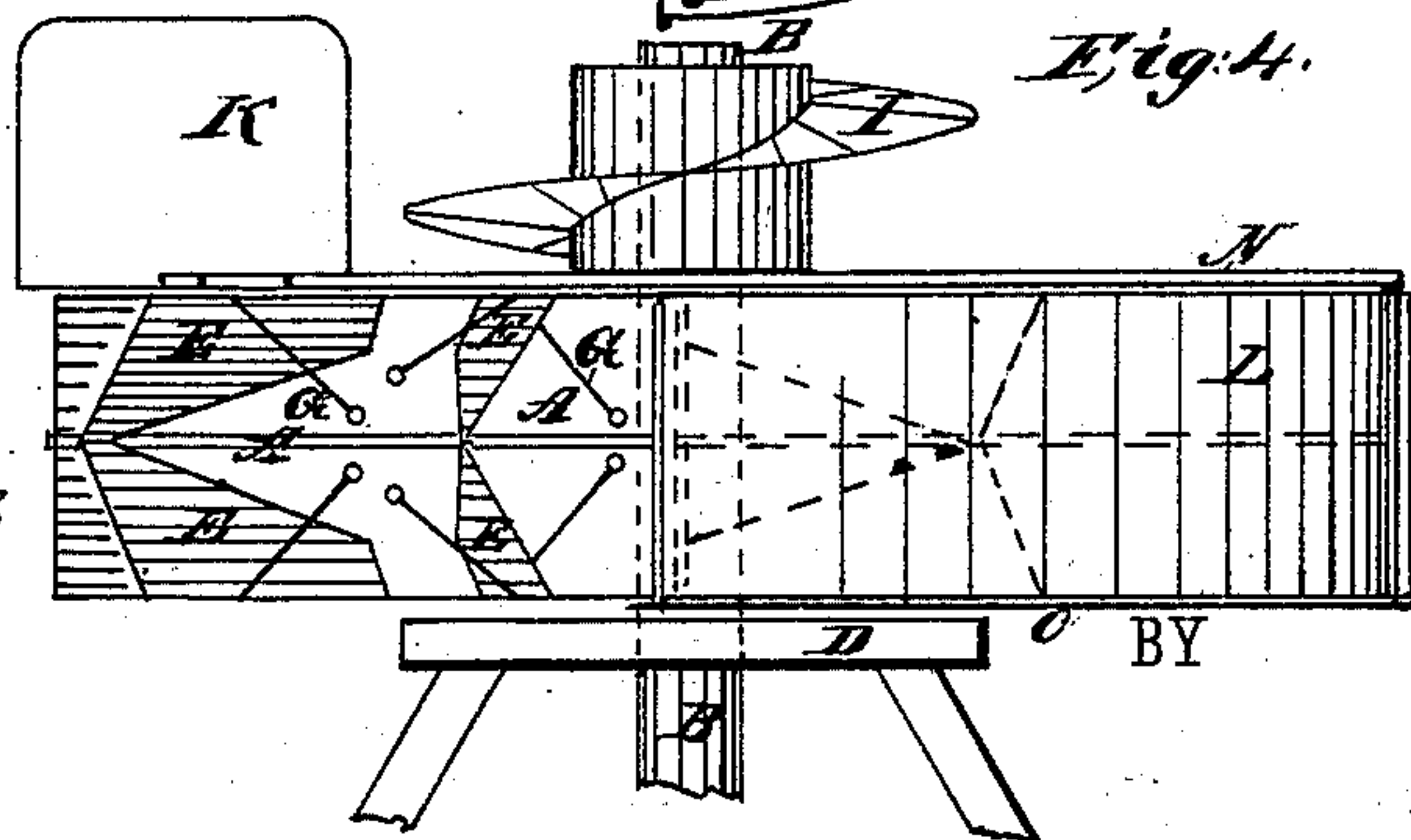
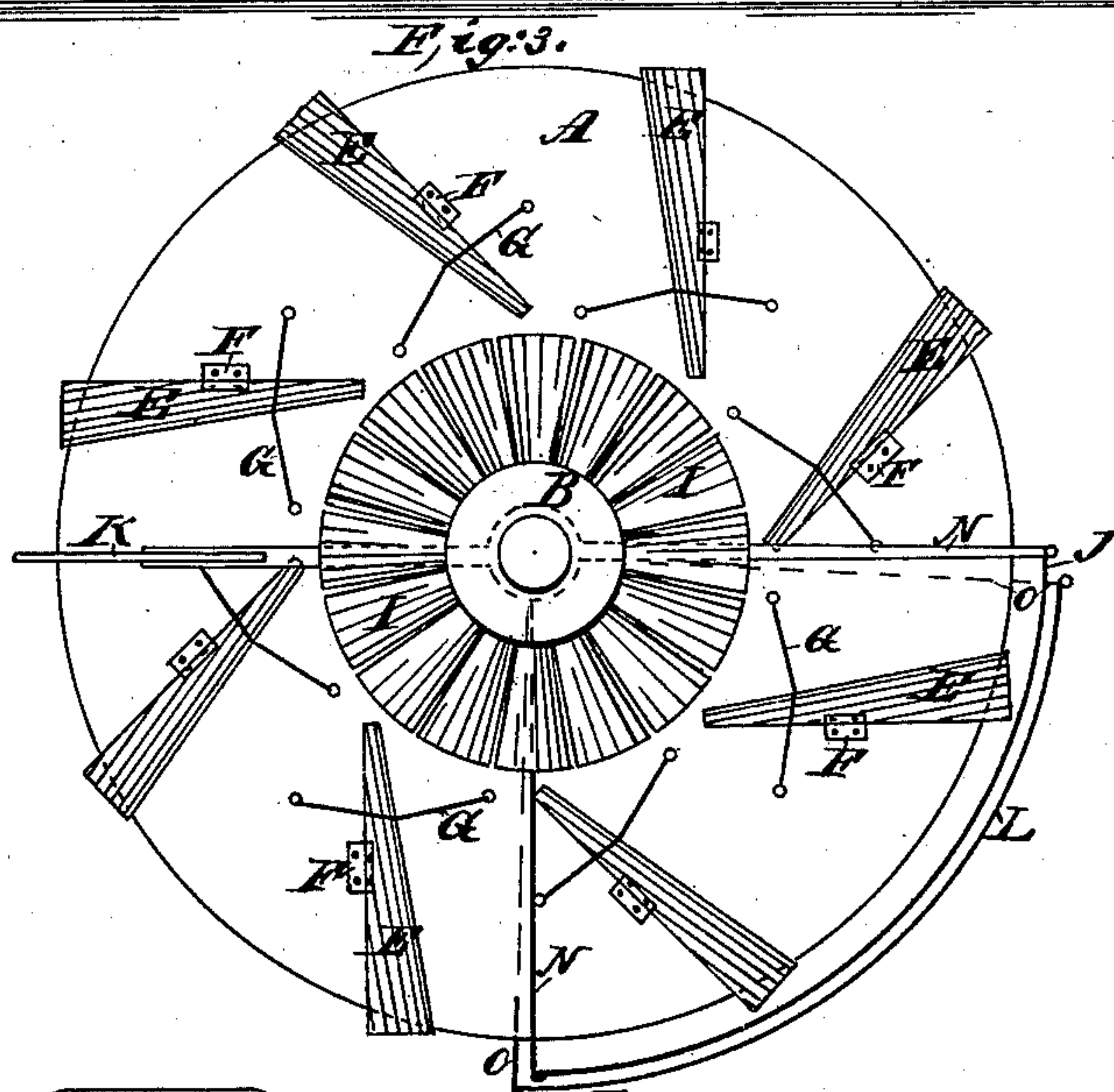
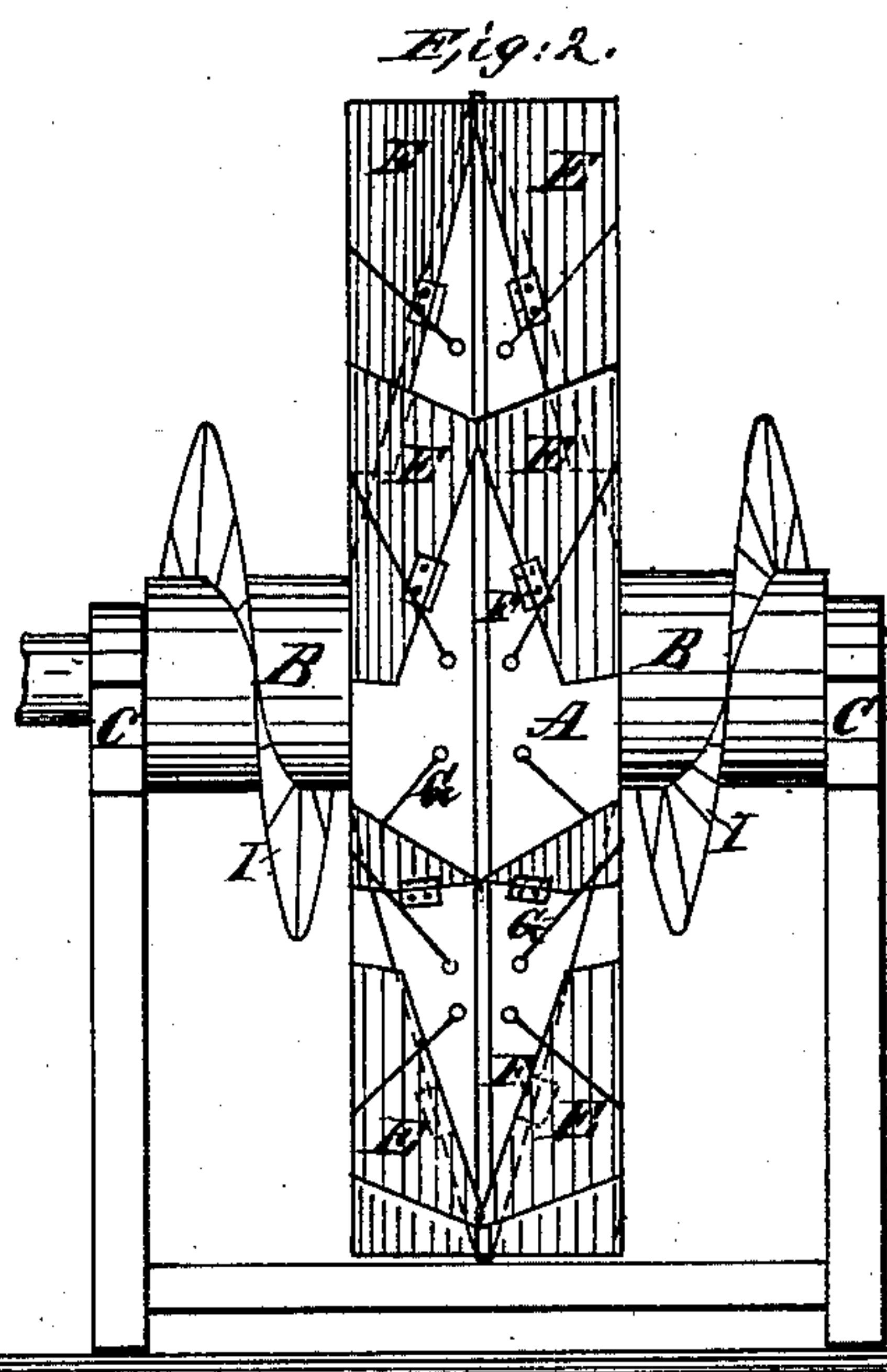
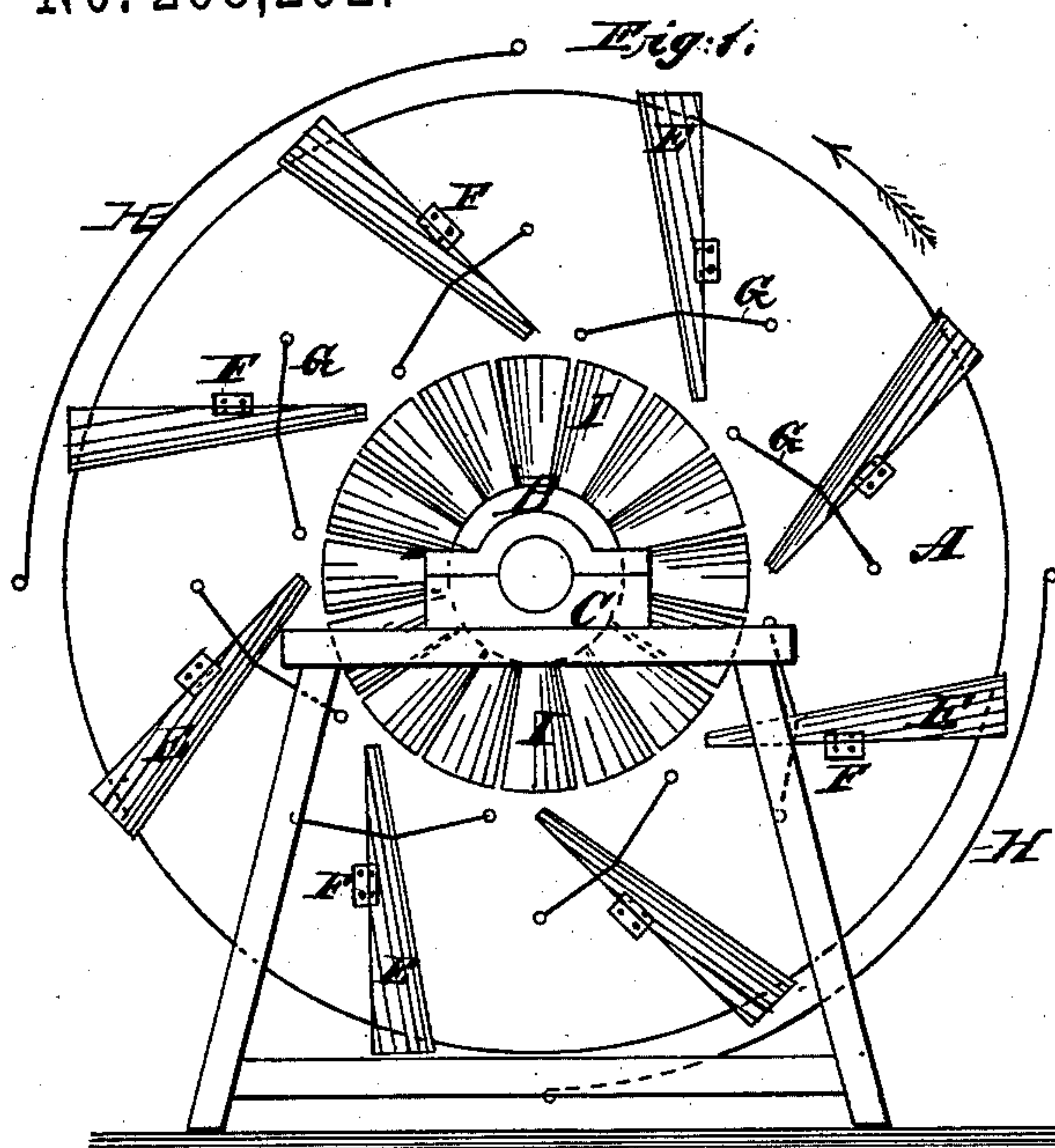
(No Model.)

R. O. ROBINSON.

WINDMILL.

No. 268,292.

Patented Nov. 28, 1882.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

RANDOLPH O. ROBINSON, OF GLIDDEN, IOWA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 268,292, dated November 28, 1882.

Application filed May 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, RANDOLPH O. ROBINSON, of Glidden, in the county of Carroll and State of Iowa, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

This invention consists of a contrivance of the vanes of a wind-wheel, whereby the wheel, being arranged on a horizontal shaft the bearings of which are stationary, will run in the same direction, whichever way the wind blows, so as to avoid the use of a turn-table and contrivances for enabling the shaft to shift around as the wind shifts.

The invention also consists of an improved construction of the vanes of the wheel, calculated to increase the efficiency of the area of surface acted on by the wind, as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved wind-wheel arranged on a horizontal shaft. Fig. 2 is a front elevation of Fig. 1. Fig. 3 is a plan view of the wheel as arranged on a vertical shaft, and Fig. 4 is a side elevation of Fig. 3.

A represents a drum or disk with slightly conical sides and a V-face, mounted on the shaft B, which will generally be arranged horizontally in stationary bearings C, as in Figs. 1 and 2, but may be in a vertical position on a tower, D, or other support, as in Figs. 3 and 4.

E represents the principal vanes of the wheel, said vanes being located on the sides of the disk or drum in lines tangential to a circle about half-way between the axis and periphery of the drum, and inclined about twenty degrees to the plane of the shaft, and outer edges and ends projecting forward the way the wheel turns. The vanes are alike on both sides of the disk both as to the tangential pitch and the axial inclination. They project lengthwise a little beyond the face of the disk outwardly, and inwardly a little past a point about mid-way the length of the radius of the disk. They are hinged to the sides of the disk at F, and they have stay-braces G attached to them and the sides of the disk, as shown, to support the hinge-joints, and in practice said braces will

be adjustably attached to the disk, so that they can be shifted to vary the inclination of the vanes for regulating them to the conditions of the wind and the requirements of the work to be done by the wheel. It will be seen that if the wind blows against the side of this wheel in the line of the shaft it will act alike on all the vanes E of that side to turn the wheel in the direction of the arrow. If the wind shifts from the line of the shaft to the right hand, it will take effect on the right hand and upper side of the wheel. If it shifts to the left hand, it will take effect on the left hand and lower side of the wheel. The action will be the same on both sides of the wheel, the motion being always in the same direction. Should the wind blow directly against the face of the wheel from the right hand a guard, H, to shield the lower portion of the wheel from the wind, will enable the wheel to be turned in the same direction as before. A similar guard, H, to shield the upper portion of the wheel from the wind blowing from the left hand directly against the face of the wheel, will enable the wheel to be turned in the same direction; but in practice the wheel may generally be so set that it will always receive the wind upon one or the other of the sides or quarters thereof, so as not to require the guards.

The stays G are designed to shift the inclinations of the vanes to suit the wind when blowing upon the quarters, which requires the angle of the vanes to the shaft to be increased the more the angle of the wind to the shaft increases.

In order to obtain the greatest attainable effect from the whole area of the side of the wheel, I propose to apply another series of vanes, I, of smaller dimensions, within the circle of the inner ends of vanes E, the same being a coil of radial vanes set in the shaft spirally and pitched in the right direction to work in unison with vanes E, said vanes I being to cover the blank within vanes E and utilize the wind that would otherwise be expended on the central portion of the wheel without effect. Each side of the wheel is alike armed with these auxiliary vanes within the circle of the principal vanes, and thus the whole area of the wheel is turned to good account.

The wheel thus constructed is very simple, and, being mounted in stationary bearings, may



be made very large and be successfully operated without difficulty for the application of great power for driving cane-crushing mills and the like, the said wheel being located inside of a building with doors to open at both sides of the wheel to allow the wind to act upon it, and to close and shut off the wind when the wheel is not required to run.

To use the wheel upon a vertical shaft one of the spiral courses of vanes I will be taken off to get a bearing for the shaft directly under the wheel, and a guard, J, will be employed, with a tail-vane, K, to shut off the wind from the returning side of the wheel, which in this arrangement receives the wind directly against the face instead of the side, as before. Another guard, L, will be employed, to be shifted by hand for being set, so as to shut off the wind when the wheel is to be stopped, both of these guards being fitted to swing on the shaft by arms N and O. The guard L will have suitable means for fastening it in the different positions in which it may be set, according as the wind shifts. In this upright arrangement of the shaft the wheel may be set upon the top of a flat-roof building, the shaft extending down through the building to where it may be required to take off the power in a simple arrangement.

The guards H may be arranged so as to be readily removed by swinging or otherwise shifting out of the way when the wind is blowing against the sides of the wheel, Figs. 1 and 2, which will generally be the case, or when the wheel is located between permanent guards, as within an inclosure, with doors opening to both sides of the wheel. There may be ample space between the faces of the wheel and the parts of the inclosure forming the guards to said faces to allow full passage of the wind around or past the faces after acting upon the vanes.

In practice the effect of the wind may be increased on the sides of the wheel by employing wind-guides consisting of stationary chutes set up in advance of the wheel, with widely-di-

vergent outer ends, to which the air will be compressed as it advances upon the wheel by the force of the deflection from the chutes consequent upon the pressure behind, so as to increase the effect, and these chutes may be hinged, so as to form the doors before mentioned for closing in the wheel and shutting off the wind to stop the wheel.

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

1. The combination, with the sides of a drum or disk, A, of vanes E, arranged tangentially to the disk and obliquely to a circle about equidistant between the shaft and the periphery of the shaft, substantially as described.

2. The combination, with the sides of a drum or disk, A, of vanes E, arranged tangentially to a circle about equidistant between the shaft and the periphery of the disk and obliquely to the shaft, and being hinged to the side of the disk and provided with stay-braces G, substantially as described.

3. A windmill-wheel consisting of a drum or disk, A, having conical sides, and vanes E, mounted on said sides, said vanes being arranged with the outer ends and also the outer edges pitched or inclined in the same direction with respect to the plane of rotation of the disk, substantially as described.

4. A wind-wheel consisting of a disk or drum, A, having conical sides, and vanes E, mounted on said sides, the vanes of each side being pitched or inclined in the same direction with respect to each other, whereby the wheel turns in the same direction alike, whether the wind acts upon one side or the other, substantially as described.

5. The combination of auxiliary vanes I with a wind-wheel consisting of a drum or disk, A, having a conical side, and vanes E, arranged thereon, substantially as described.

RANDOLPH O. ROBINSON.

Witnesses:

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