

(Model.)

J. W. ARTHURS & J. C. FICK.

WIND ENGINE.

No. 252,860.

Patented Jan. 31, 1882.

Fig. 1.

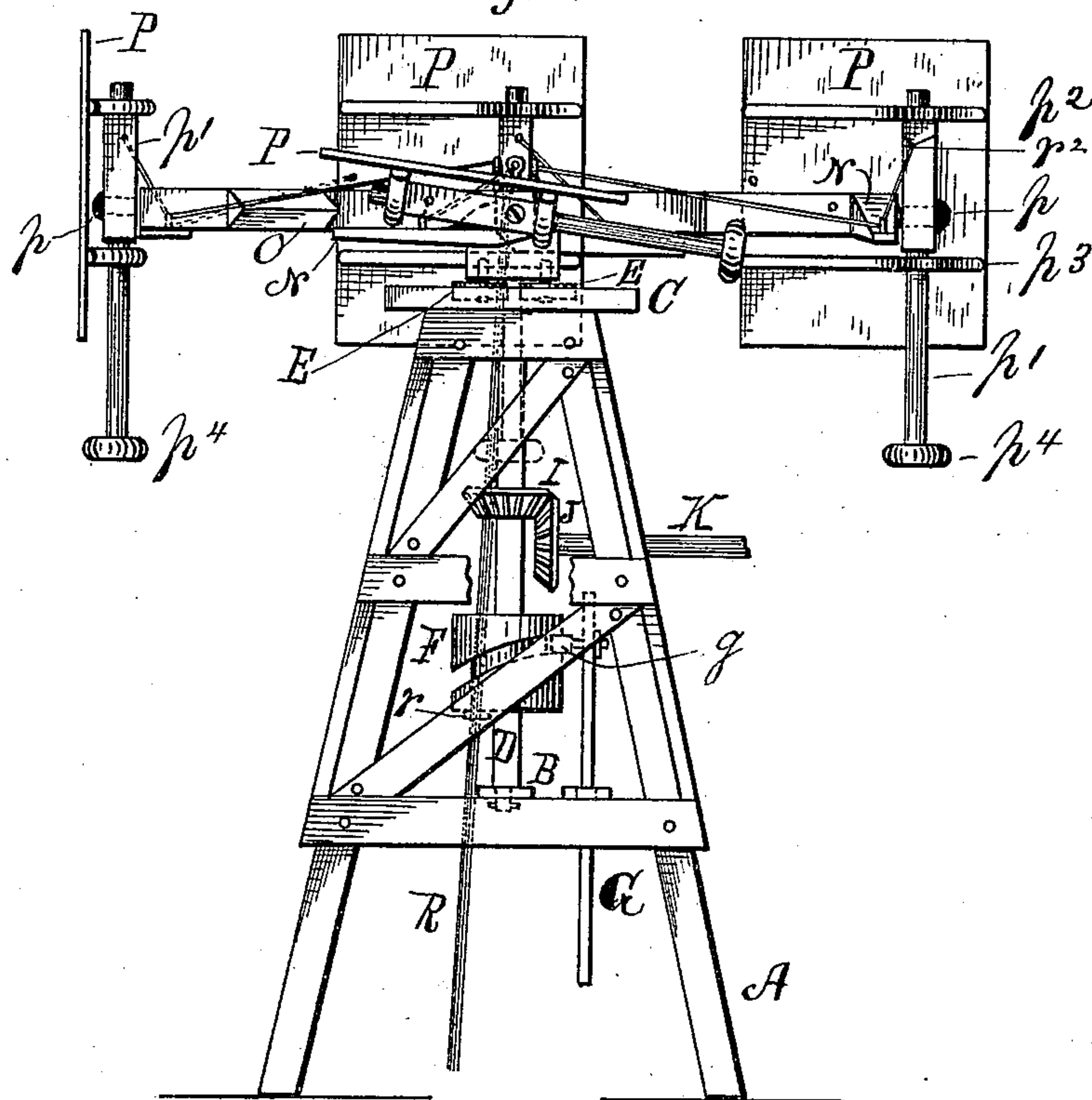
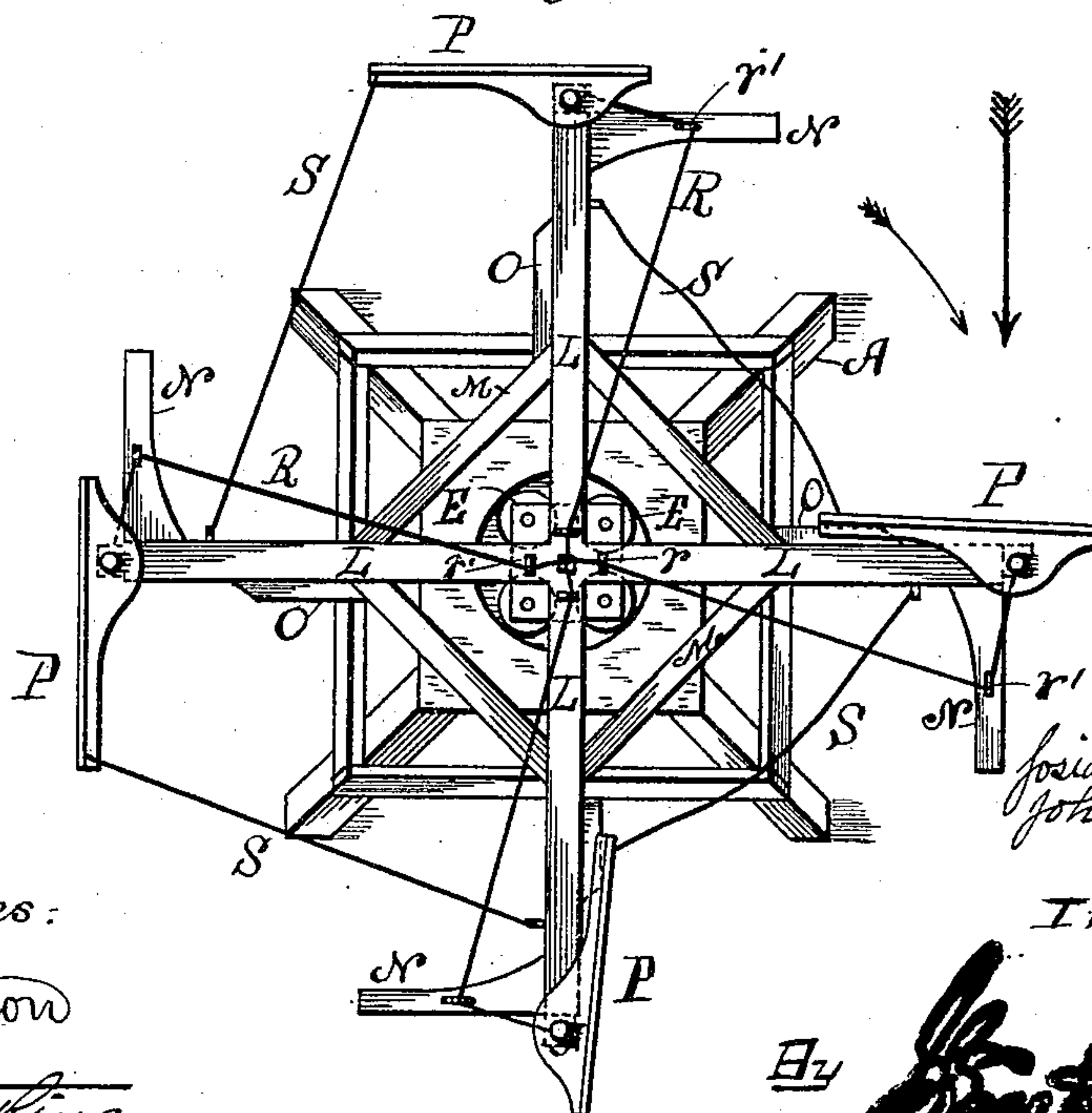


Fig. 2.



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UNITED STATES PATENT OFFICE.

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WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 252,860, dated January 31, 1882.

Application filed October 15, 1881. (Model.)

To all whom it may concern:

Be it known that we, JOSIAH W. ARTHURS and JOHN C. FICK, citizens of the United States of America, residing at Bull's City, in the county of Osborne and State of Kansas, have invented certain new and useful Improvements in Wind-Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 represents in front elevation a wind-engine embodying our improvements. Fig. 2 is a plan of the same.

Like letters of reference refer to like parts in all of the figures.

A represents the supporting frame-work, which is of the usual construction, and it is provided with two platforms, B C, the former serving as a foundation, upon which rests the bearing of the main shaft D, and the latter is provided with a circular opening, through which the shaft D passes. The head of the shaft D is provided with four or more friction-rollers, E, which bear against the edge of the platform at said central opening, or said edge may be provided with an iron or other suitable bearing-surface. At F the shaft D is provided with a grooved cam, rigidly attached thereto, for operating the pump-rod G by means of the pin and friction-roller g, the rod being held in place by and reciprocated in grooves or slots formed in the base B, and in a simple cross-bar above the cam F. Shaft D may also be provided with a rigidly-attached bevel-gear, I, adapted to mesh with and operate a companion bevel-gear, J, rigidly attached to a shaft, K, supported in any suitable manner in the frame-work and at a right angle to shaft D, whereby the engine is adapted to run any properly connected machinery in addition to the pump usually attached to this class of inventions.

Suitable well-known devices may be provided for the disconnection of the pump-rod or the shaft K, when desired.

The head of shaft D is provided with arms L, (in this instance four in number,) strengthened by the connecting-braces M, and at their

outer ends said arms are provided with rigidly-attached rods N, projecting to the front in the direction of their rotation. Upon the rear side of each arm is a knife edge bearing-plate, O, the purpose of which will hereinafter be explained. At the outer ends of the arms L are pivotally attached swinging vanes P, the pivots p on which they oscillate passing through the vane-shafts p', which have their bearings in the ribs p² p³, attached to the vanes, and said shafts are extended downwardly, and are at their lower extremities provided with weights or counter-balances p⁴.

Through the head bevel-gear I and cam F, and near the shaft D, are apertures, through which pass four cords or ropes, R, to which is attached by tying a stick, r, longer than the diameter of said apertures, which operates as a stop to the passage of the ropes through said apertures in an upward direction, said stop or stick r being located below the cam F. Each of the ropes R terminates at each vane P, being passed through suitable guide-eyes and secured at r² to the vane-shafts p', as clearly shown. Ropes S are attached to the arms L and to each of the vanes P, as shown.

The shaft D may be hollow throughout its length and the ropes R passed therethrough, if desired, and the cords S may be dispensed with and stops constructed to project from rods N as a means to limit the outward movement of the free ends of the vanes, and, if desired, the number of the arms and vanes may be increased.

The operation of our wind-engine is as follows: The wind being in the direction of the straight arrow, Fig. 2, causes the vanes and arms to rotate in the direction indicated by the curved arrow. As each vane approaches the windward it is presented edgewise, as shown at the left of Fig. 2, and gradually swings or turns upon its shaft p' as it advances, its free rear end swinging inwardly toward the shaft D, the rope S becoming slack, and when nearly in the position shown at the right of Fig. 2 the vane presents its entire surface to the wind and takes the full force thereof throughout the last quarter of the revolution of the arms, as shown at the bottom of Fig. 2, when the wind strikes the back side of the vane and swings its free rear edge out, so that it

is again presented edge to the wind as it approaches the completion of the revolution. In case of unsteady or high winds each vane automatically adjusts itself, so that a comparatively uniform rotation of the arms is secured by means of the pivotal attachment of the vane-shafts to the outer ends of the arms. When the vane is presented flat against the wind it will, if the wind be strong enough to overcome the counter-balance p^4 , turn on its pivot p and against the knife edge bearing-plate O , so as to assume a depressed position, as shown at the front vane in Fig. 1; and in very high winds all of the vanes may be permanently depressed or partly depressed by means of the ropes R and stop r , which stop is adjustably secured at any desired point in or on the ropes for this purpose.

The arms L may be further strengthened by arched braces, with their centers resting upon an upward extension of the main shaft D and their ends attached to said arms in a manner evident to any skilled mechanic.

Having described our invention and its operation, what we claim as new, and desire to secure by Letters Patent, is—

1. In a wind-engine, the combination of arms and counterbalanced vane-shafts supported and operating upon horizontal pivots at the outer

ends of said arms, with vanes pivotally attached to said vane-shafts, substantially as shown and described.

2. The combination of the main shaft, the arms, swinging counterbalanced vanes, projecting rods, pivotally attached vane-shafts, and knife-edge bearing-plates, substantially as shown and described.

3. The combination of the vanes P , provided with the bearings $p^2 p^3$, and the vane-shafts p' , pivotally attached to their arms and carrying the counter-balances p^4 , substantially as shown and described.

4. The combination of the vanes P and shafts p' with the arms L , provided with the knife-edge bearing-plates O and rods N , substantially as shown and described.

5. The combination of the arms L , pivotally attached swinging counterbalanced vane-shafts p' , vanes P , pivotally attached to said vane-shafts, and cords, S , substantially as shown and described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

JOSIAH W. ARTHURS.
JOHN C. FICK.

Witnesses:

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L. G. RHODES.