J. CLARK.
Wind-Mill.

No. 197,457. Patented Nov. 27, 1877.

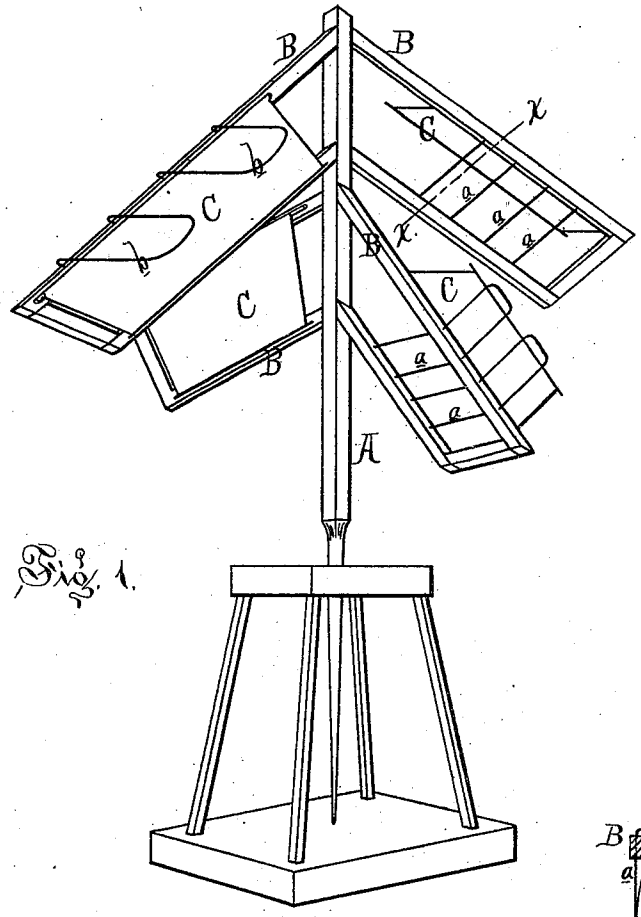


Fig. 1.

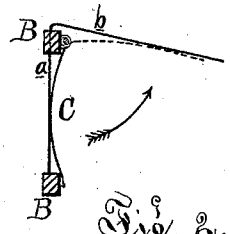


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN CLARK, OF PONTIAC, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM H. OSMUN, JR., OF SAME PLACE.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **197,457**, dated November 27, 1877; application filed May 23, 1877.

To all whom it may concern:

Be it known that I, JOHN CLARK, of Pontiac, in the county of Oakland and State of Michigan, have invented an Improvement in Windmills, of which the following is a specification:

The nature of my invention relates to an improvement in horizontal windmills; and consists in combining with the vertical shaft two or more sets or pairs of inclined sail-frames, not in the same plane, but one set or pair above the other, and each provided with a flap-sail, which rises into the plane of motion as the arm to which it is hung comes up into the wind, the effect of this arrangement of the sail-frames being such as to have the sails receive the force of the wind through one-half of a revolution, instead of coming into the lee of a succeeding sail in the same plane after completing one-fourth of a revolution.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view, and Fig. 2 is a cross-section through a sail-frame at *x x*.

A represents a vertical shaft, stepped and journaled in suitable bearings. B B are sail-frames, consisting each of two parallel bars, secured at their inner ends to a shaft on opposite sides thereof, and inclined at an angle of about twenty-two degrees, which inclination may be varied, however, to suit the elevation of the shaft above the cap on which the upper bearing is secured, in order that the lower bars of the sail-frames may clear the same. The outer ends of the bars of each frame are secured together by a girt, as shown.

Above the lower sail-frames a second set are secured to the shaft at right angles with the lower ones; and if much power be wanted, the shaft may be extended, and other frames can be added in like manner.

C C C C are the sails, each being secured at its upper edge to the upper bar of each frame, each frame being provided with a series of light slats or bars, *a*, to prevent the loose sail from being blown through it. The upper bar is also provided with several guard-rods, *b*, projecting to the rear, to prevent the sails from blowing over and winding around the arm.

It will be seen that one-half the sails are "drawing" during an entire half of the revolution, and during the other half they are free to come up edgewise into the wind.

Such a mill will cost but a fraction of the expense of a vertical mill exposing an equal sail area to the wind, besides being much simpler in construction, having less parts, and is easier to gear from.

I claim as my invention—

In a windmill, substantially as described, the combination, with the vertical shaft, of the inclined sail-frames, arranged in pairs in different planes, each frame being provided with a flap-sail, substantially as shown and set forth.

JOHN CLARK.

Witnesses:
H. F. EBERTS,
H. S. SPRAGUE.