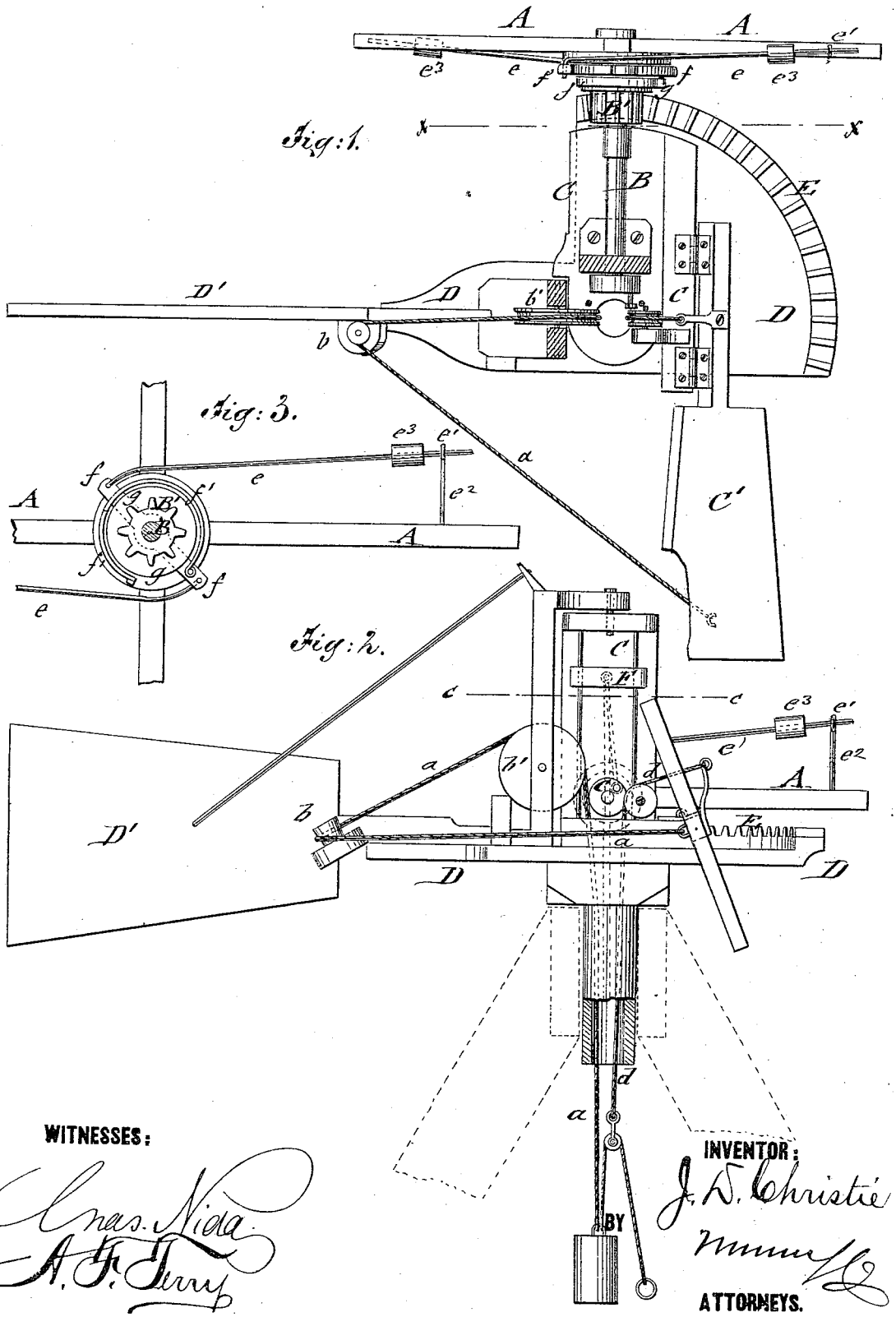
J. D. CHRISTIE.

Wind-Mill.

No. 166,501. Patented Aug. 10, 1875.



WITNESSES:

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JACOB D. CHRISTIE, OF SCHRALLENBURG, NEW JERSEY.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **166,501**, dated August 10, 1875; application filed June 26, 1875.

To all whom it may concern:

Be it known that I, JACOB D. CHRISTIE, of Schrallenburg, in the county of Bergen and State of New Jersey, have invented a new and Improved Windmill, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view of my improved windmill, partly in section on the line *c c*, Fig. 2; Fig. 2, a side elevation of the same; and Fig. 3, a detail view, partly in section on line *x x*, Fig. 1, of the wheel-regulating mechanism.

Similar letters of reference indicate corresponding parts.

The object of my invention is to so improve the construction of windmills that the position and speed of the wheel toward the wind are regulated, and variable power, with uniform speed of the wheel, obtained.

The invention consists of the adjustment of the wheel-shaft, having hinged supplementary vane, on a quadrantal turn-table, to any angle with the main vane. The wheel is provided with adjustable weights of sliding rods, that act on a brake mechanism of the shaft, to change the position of the wheel-shaft toward the main vane.

In the drawing, A represents the wheel of my windmill, the shaft B of which turns in bearings of a swinging supporting-frame, C, that is pivoted to a standard of the base-frame D, governed by the main vane D′. The pivoted frame C is provided with a smaller supplementary vane, C′, that extends in the direction of the wheel-shaft, being hinged to the side of frame C. A loose pinion, B′, of the wheel-shaft gears with a quadrantal rack, E, of the base-frame D, and admits thereby the adjustment of the wheel to any angle within ninety degrees toward the main vane, the wheel-shaft being independent in its motion of that of the main vane. The supplementary vane C′ is connected by a strong cord, *a*, passing over a side pulley, *b*, of the main vane and pulley *b′* of the standard, to a point below the base-frame, to be weighted there in suitable manner for retaining the position assigned to the wheel. By releasing the weight and throwing, by a regulating-cord, *d*, the hinged vane into horizontal position, the wheel is carried on the turn-table to an angle of ninety degrees toward the main vane, being in this position not acted upon by the wind.

When a certain speed is desired the hinged vane is released, and the wheel set to the required angle toward the main vane, to be retained therein by the weight and the regulating mechanism of the wheel itself. This mechanism consists of two radial rods, *e*, that are arranged in opposite direction, and guided at the outer ends in eyes e^1 of spring-rods e^2, attached to diametrically-opposite wheel-arms. The inner ends of rods *e* are attached to a diametrical piece, *f*, that swings loosely on the wheel-shaft B, and is attached to a suitable brake-band, *f′*, which is placed around a disk, *g*, attached to pinion B′, the other end of band *f′* being attached to a fixed point of the wheel-hub. The sliding rods *e* are threaded and provided with weights e^3, that are adjustable thereon, to regulate the greater or less speed of the wheel. When the velocity of the wind increases, the weights are thrown, with the rods, by centrifugal force, in outward direction, acting on the brake-band, which binds around the disk, and causes the retardation of the wheel by the friction, and finally the turning of the pinion and the adjustment of the wheel to a more oblique angle toward the wind, so that thereby the speed is decreased. The brake is thereby released and the wheel free to be carried back again with fuller face toward the wind by the supplementary vane and the governing-weight, when the force of the wind is diminishing.

The separate adjustability of the wheel and shaft from the main vane, in connection with the regulating mechanism of the wheel, gives a uniform motion and even speed at varying velocity of the wind, and admits, also, the exact setting of the mill to the power required for certain purposes.

The wheel-shaft is connected by crank pin and rod with a pivot-pin of a cross-head, F, which slides on vertical guide-rods of shaft-frame C, the pump-rod being attached thereto and actuated in a steady manner, thereby securing the regular working of the pump.

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

1. The combination of the independently-

swinging and adjustable wheel-shaft, provided with loose pinion and supplementary vane, with a quadrantal toothed turn-table, governed by the main vane, for securing position of wheel to any desired angle toward the direction of the wind, substantially as and for the purpose set forth.

2. The combination of the weighted and swinging wheel-supporting frame with a hinged supplementary vane for throwing wheel out of the wind on releasing weight, and throwing vane in horizontal position, substantially as described.

3. The combination of the revolving wheel, having adjustable and centrifugally-working brake mechanism, with the disk-pinion and quadrantal turn-table, to produce uniform speed of wheel at varying velocity of wind, substantially as set forth.

Witnesses: JACOB D. CHRISTIE.
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