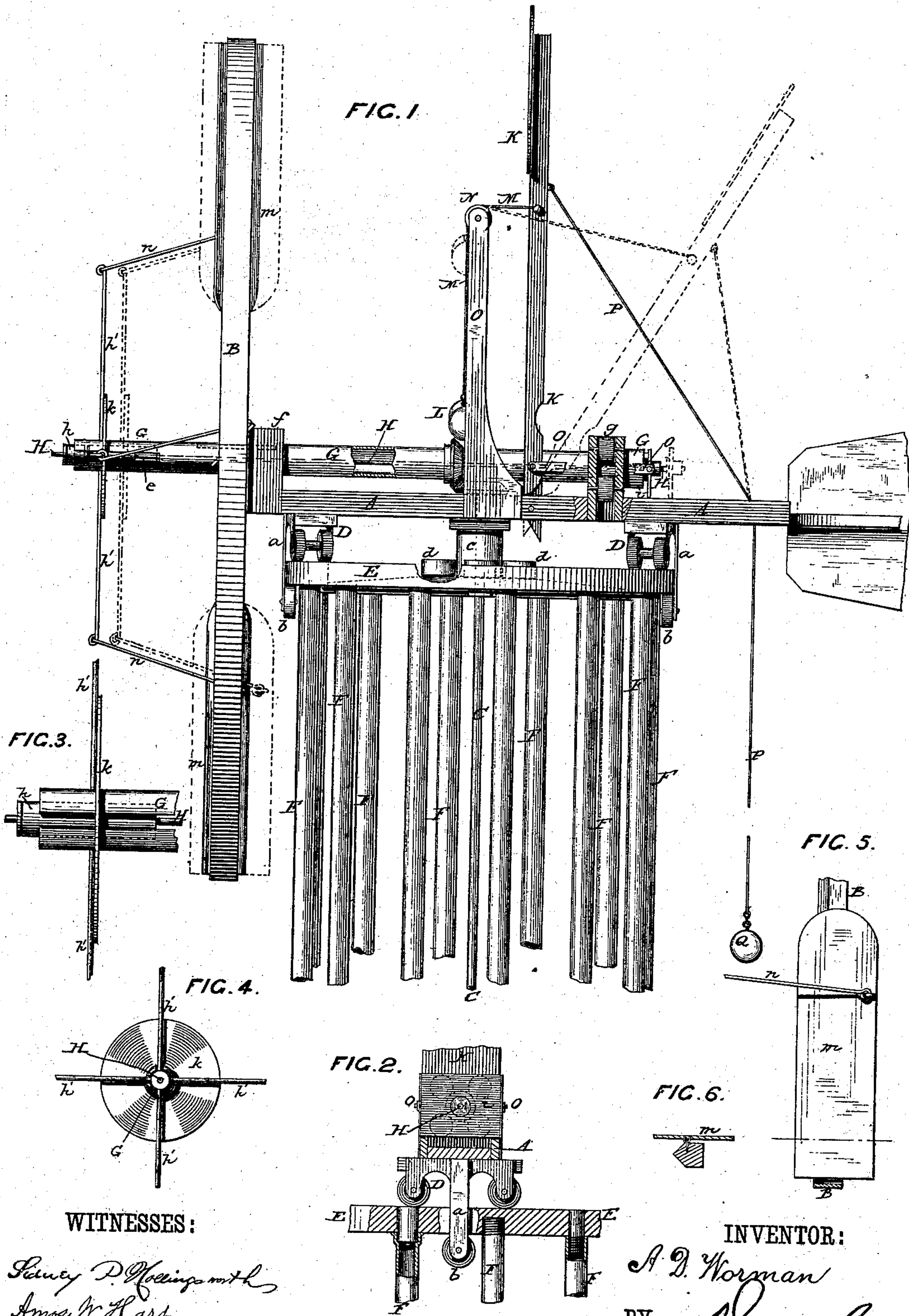


A. D. WORMAN.
Wind-Wheel.

No. 228,157.

Patented May 25, 1880.



WITNESSES:

Samuel D. Hogginsmith
Amos W. Hart.

INVENTOR:

A. D. Worman

BY

Samuel L.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ANDREW D. WORMAN, OF FREDERICK, MARYLAND.

WIND-WHEEL.

SPECIFICATION forming part of Letters Patent No. 228,157, dated May 25, 1880.

Application filed November 10, 1879.

To all whom it may concern:

Be it known that I, Dr. ANDREW D. WORMAN, of the city and county of Frederick, and State of Maryland, have invented a new and Improved Wind-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improvement in that class of vertically-revolving wind-wheels having radial feathering sails or vanes, which are adjusted, according to the force of the wind acting on them, by means of a lever or governor vane.

The invention consists in the construction and arrangement of parts, as hereinafter described, and as shown in accompanying drawings, in which—

Figure 1 is a side view of my improved wind-wheel. Figs. 2 to 6, inclusive, are detail views.

The horizontal frame A of the wind-wheel proper, B, revolves on the vertical shaft C, and is supported on two four-wheeled carriages, D, which run on a circular track, E. The said carriages D are held down on the latter by means of a pendent arm, a, carrying a friction-roller, b, at its lower end, which runs in contact with the under side of the track E.

The frame A has a hub, c, whose lateral bearings are four friction-rollers, d.

By means of the above-described arrangement of parts the wind-wheel frame is adapted to rotate with little friction, and is yet held steady under great pressure or force of wind.

The means for supporting the track E rigidly and firmly are tubular iron columns F, whose ends are connected with both the track and base by screw-joints, so that they may be easily attached and detached. For said columns I utilize gas-pipe of proper dimensions, and by their concentric arrangement around the shaft C they also form a guard or protector for the latter.

The horizontal wheel-shaft G is hollow, and has friction-roller bearings at f and g, to adapt it to rotate with minimum friction. It has bevel-gear connection with the shaft C, from

which, in practice, the power is taken, by belt or other means, for operating other machinery.

Through the lengthwise center of the wheel-shaft G extends a rod, H, whose respective ends are attached to a cylindrical slide, h, and cross-bar i.

The slide h is located in the front end of the wheel-shaft G, and, together with its arms h', forms a device which may be denominated a "spider." Its said arms are braced by disk k, attached thereto and arranged concentrically with the shaft G, as shown, and the latter is provided with lengthwise slots l, to accommodate the spider-arms h'.

When the spider h h' is moved toward the wheel proper, A, the hinged radial vanes m of the latter are feathered or adjusted to take less wind, since they are loosely connected by rods n with the spider-arms h'. This movement of the spider longitudinally of the wheel-shaft G is caused by traction on the rod H, and it is greater or less according to the force of the wind acting on the vertical regulating lever-vane K, pivoted to the horizontal frame A at a point contiguous to the hub of the latter. Said vane K is connected with the cross-bar i on the rear end of rod H by means of bars o, so that when the vane is thrown back at any angle from its normal vertical position the rod H will be moved a corresponding distance and the wheel-vanes m assume an inclination having a direct correspondence with that of the regulator-vane K. The latter is held vertical against a wind of ordinary force by weights L, suspended by cords M, passing over pulleys N, having their bearings in frame B.

The regulator may be drawn back by means of a weighted cord, P, or by using weights of different sizes the regulator may be made more or less sensitive to the wind.

I do not claim, broadly, the combination of a hinged vane-regulator and a sliding rod with a sliding device connected with feathering wheel-vanes; but

What I do claim is—

1. In a wind-wheel, the combination, with the wind-wheel and its horizontal revolving frame, of the tubular shaft having its front end

provided with lengthwise slots, the spider
formed of the cylindrical part *h* and radial
arms *h'*, which project through and work in
said slots, the hinged wheel-vanes, rod H, ex-
5 tending through the tubular shaft, and the
pivoted and weighted vane-regulating lever K,
connected with said rod H, all as shown and
described.

2. The support for the revolving wheel, con-
sisting of the circular track E and the tubular 10
iron-column supports, connected therewith by
screw-joints, as shown and described.

DR. ANDREW DEAN WORMAN.

Witnesses:

GEORGE L. CRAMER,

WILLIAM MAHONY.