

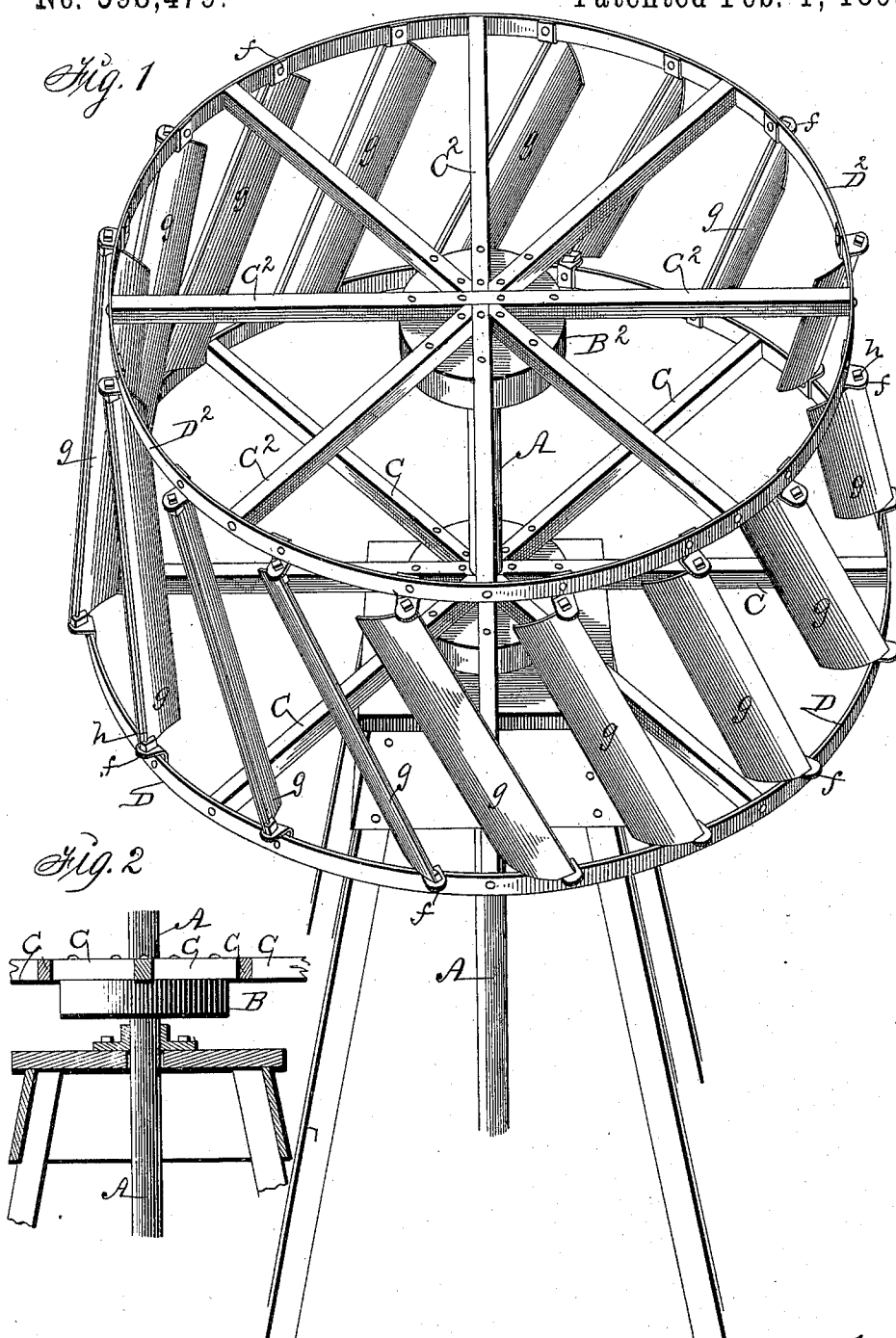
(No Model.)

2 Sheets—Sheet 1.

D. W. HOOVER.
WIND MOTOR.

No. 598,479.

Patented Feb. 1, 1898.



Witnesses: } Inventor: David W. Hoover,
W. J. Sankey. } By Thomas G. & J. Ralph Orwig,
George Allan } Attorneys,

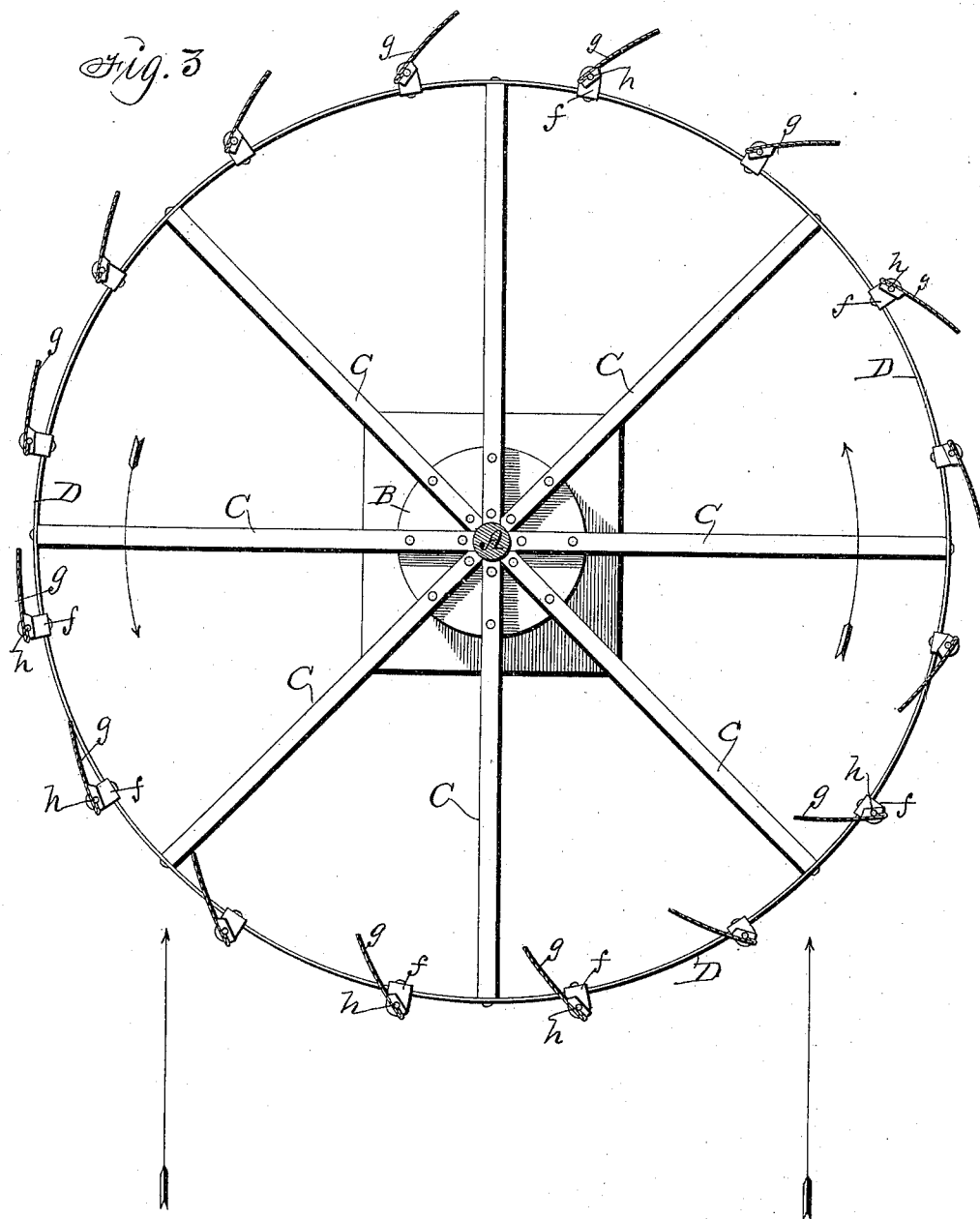
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Attorneys—

UNITED STATES PATENT OFFICE.

DAVID W. HOOVER, OF LYONS, NEBRASKA, ASSIGNOR OF ONE-HALF TO
ELISHA CROWELL, OF SAME PLACE.

WIND-MOTOR.

SPECIFICATION forming part of Letters Patent No. 598,479, dated February 1, 1898.

Application filed April 19, 1897. Serial No. 632,894. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. HOOVER, a citizen of the United States, residing at Lyons, in the county of Burt and State of Nebraska, have invented a new and useful Wind-Motor, of which the following is a specification.

My object is to provide a simple, strong, and durable wheel for a wind-motor that requires no vane to adjust it relative to the direction of the wind and that needs no governor to adjust the sails or wheel relative to the force of the wind or to regulate its speed.

My invention consists in a wheel adapted to rotate horizontally and in which each sail has independent motion at all times when subjected to wind-pressure and is self-adjusting by force of gravity and operative continuously, as required to gather and transmit wind-power, and it is constructed as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the wheel, showing the sails in their normal positions as retained by force of gravity. Fig. 2 is a detail view showing a section of the wheel connected with the rotating post and the bearing fixed to the top of the platform of a frame or tower to support the post and wheel in a perpendicular position. Fig. 3 is a horizontal sectional view of the wheel, showing the sails in various positions relative to each other and the axis of the wheel when subjected to wind-pressure, as required in practical use.

The letter A represents a post adapted to be supported in a step connected with a frame or tower.

B and B² are hubs, made of wood or metal, fixed to the top portion of the post A and at such distance apart as to correspond with the length of the sails and the dimensions of the wheel. To the hubs are fixed arms or spokes C and C² to extend radially. Those fixed to the lower hub B are longer than those fixed to the upper hub B².

D is a rim, preferably metal, fixed to the outer ends of the lower series of arms C, and D² is a corresponding rim of smaller diameter fixed to the ends of the arms C². A frame thus produced is adapted for supporting a

plurality of sails in inclined positions, as required to operate independently by force of gravity and also as required to allow each sail to be subject to wind-pressure continuously during each revolution of the wheel when in practical use for receiving and transmitting wind-power.

f are bearings fixed to the rims D and D² to admit and support journals on the ends of sails.

g are sails, preferably made of galvanized sheet metal. They correspond in length with the space between the two rims D and D² and are provided with journals h at their ends and corners adapted to engage and operate in the bearings f. They are uniform in size and shape and preferably concavo-convex in cross-section and their curvatures in correspondence with the curvatures or arcs of the rims of the wheel to which they are journaled.

It is obvious the dimensions of the wheel and the number of sails may also vary, but it must be so constructed that each sail can revolve upon its own axis.

Each sail g inclines from the lower rim D inward toward the smaller and upper rim D² about eighty (80) degrees and also inclines vertically relative to the perpendicular axis of the wheel about seventy (70) degrees in such a manner that it will swing inward by force of gravity when the wheel is at rest and remain in a normal stationary position adapted to engage wind successively by one of its faces at each revolution of the wheel, as required to aid in transferring wind-power to the wheel.

It is obvious that two or more wheels thus constructed may be fixed to the same post to gather and utilize wind-power by transferring it from the rotating post by means of suitable mechanical movement for connecting and transmitting power and motion to pumps, mills, or other extraneous machines.

In practical use when the wheel is quiescent and the sails in their normal positions the wind may blow from any point of the compass to start and operate the wheel.

Assuming the wind blows and the wheel moves in the direction indicated by arrows in Fig. 3 and the sails in their normal posi-

tions are engaged by the wind on their outside faces until their force of gravitation is overcome by centrifugal force, so as to swing them outward until the wind engages their inside faces, such change of position occurs during the first quarter-revolution of the wheel. During the next or second and third quarter-revolutions the pressure of the wind will be against the outside faces of the sails and restricted by the force of gravity that normally turn the sails inward, and during the last and fourth quarter of the revolution the wind will again engage the outside surface of the sails, while centrifugal force resists the inward pressure of the wind. Each sail as it passes from the first quarter-revolution of the wheel and also from the third, practically, is midway between the opposing forces that alternately press it inward and outward and in line with the wind, so that at those two points in each revolution of the wheel two of the sails are practically inoperative, while there is wind-pressure upon all the others that aids in rotating the wheel and accumulating wind-power.

When the wind force and the centrifugal force are combined and sufficient to overcome the force of gravity of the sails, the sails will turn outward quick enough and far enough to bring their faces nearer into parallel line with the direction of the wind, so as to diminish the force of the wind upon the sails and, as required, to automatically govern the wheel relative to the wind and to restrict the speed of the wheel in a gale or undue wind force.

I claim as my invention—

1. In a wind-motor a wheel having a larger circumference at its bottom than its top and a series of sails pivoted in the wheel to incline inward from the larger circumference toward the smaller circumference and also to incline relative to the perpendicular axis of the wheel in the manner set forth for the purposes stated.

2. A wind-motor comprising a rotatable post, hubs fixed to the post at some space apart, arms fixed to the lower hub to extend radially, a rim fixed to the outer ends of said arms shorter arms fixed to the upper hub to extend radially and a rim fixed to their ends and a series of sails pivoted at their ends and corners to said rims in inclined positions, to operate in the manner set forth for the purposes stated.

3. A wind-motor comprising a frame that has a larger diameter at its bottom than at its top and is thereby adapted to support a series of sails in inclined positions at its circumference, a series of sails extending in inclined positions relative to the axis of the frame and wheel and pivoted to the frame at their upper and lower ends and a rotatable post supported in a perpendicular and rotatable position to which the said frame is fixed to operate in the manner set forth for the purposes stated.

DAVID W. HOOVER.

Witnesses:

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THOMAS G. ORWIG.