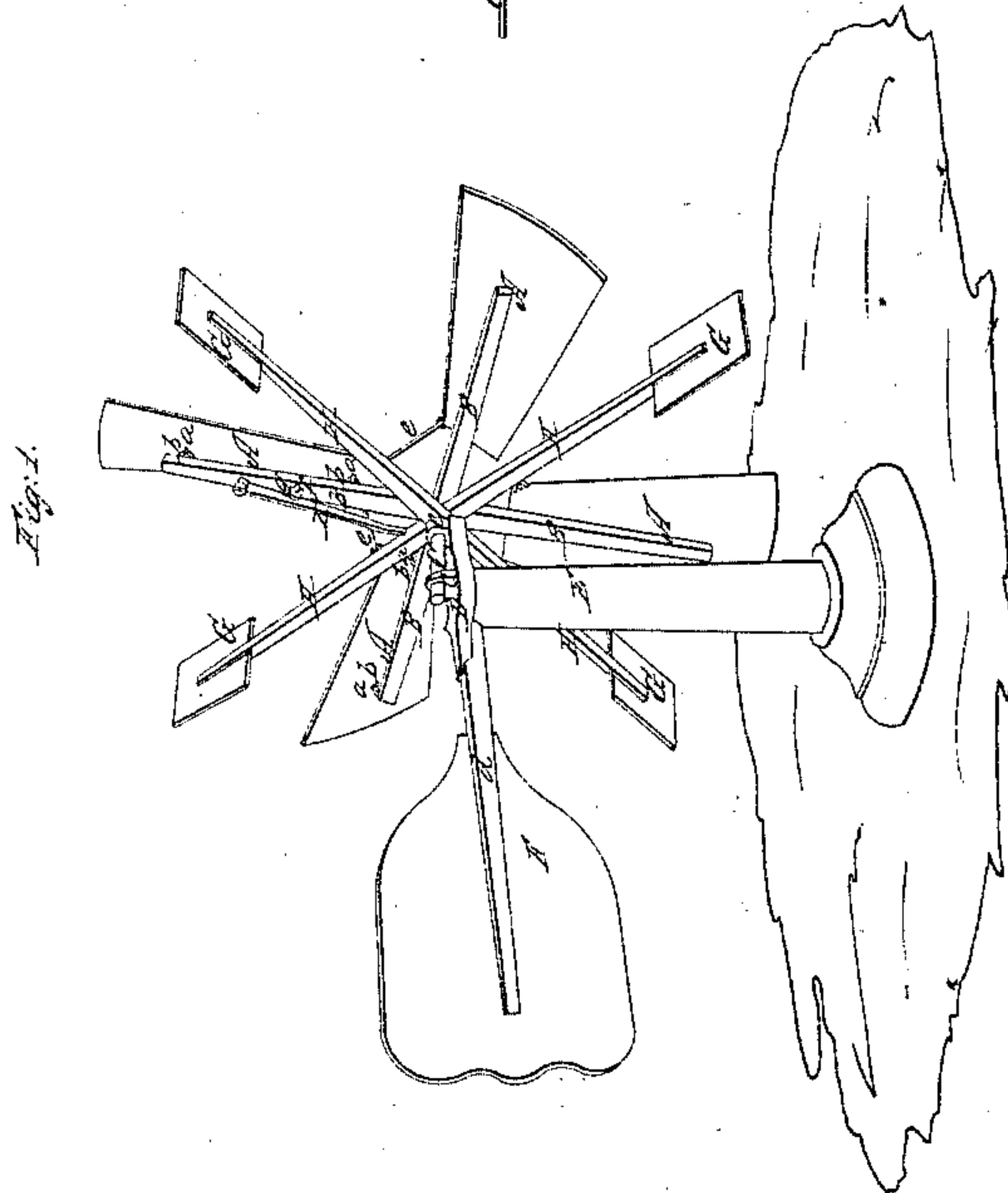
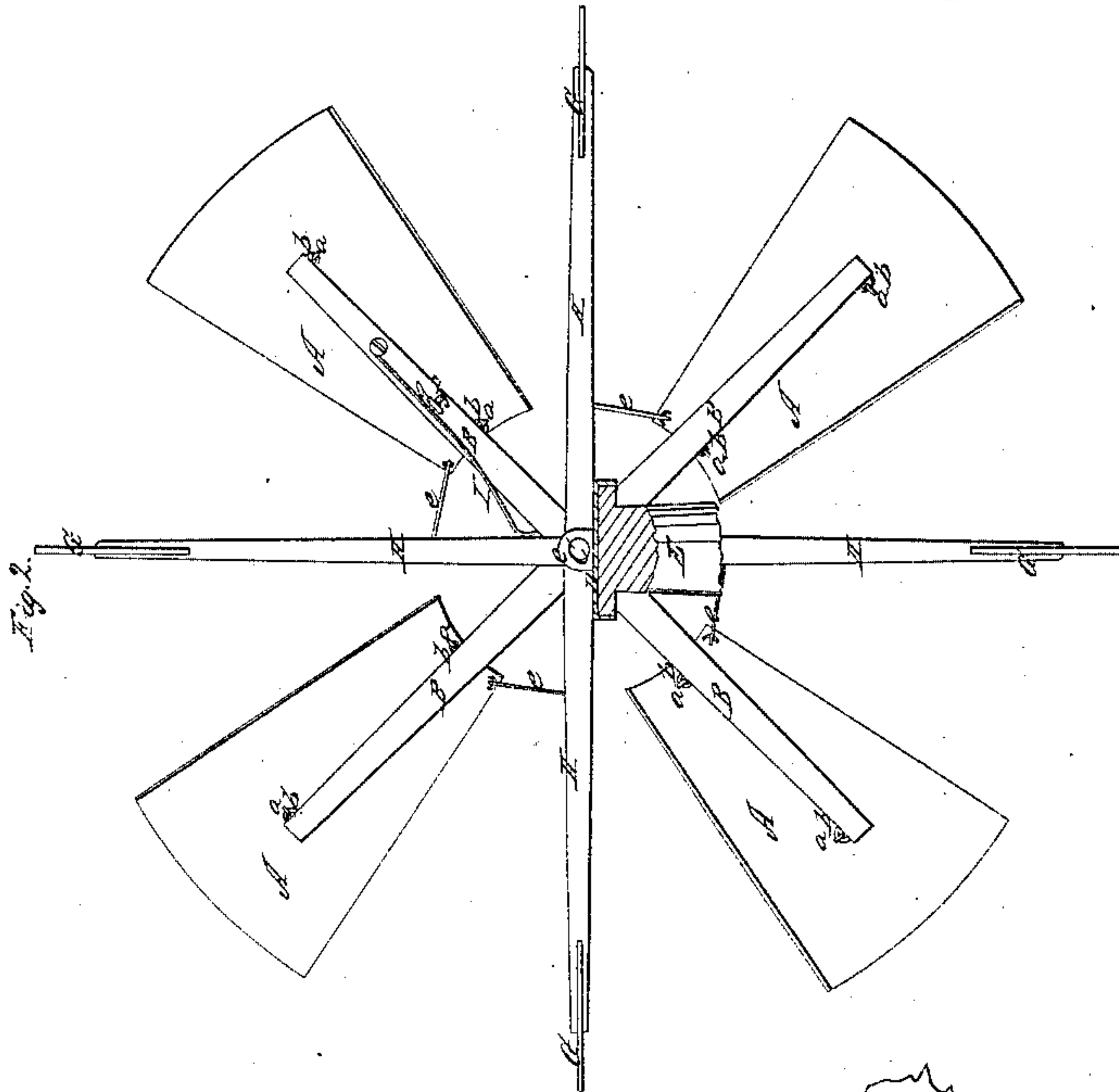


W. I. Tustin,
Wind Wheel,

Nº 28,423.

Patented May 22, 1860.



Witnesses:
R. A. Johnson
J. W. Combs

Inventor:
W. I. Tustin
per Manning & Co.
Attorneys

UNITED STATES PATENT OFFICE

WILLIAM I. TUSTIN, OF BENICIA, CALIFORNIA.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 28,423, dated May 22, 1860.

To all whom it may concern:

Be it known that I, WILLIAM I. TUSTIN, of Benicia, in the county of Solano and State of California, 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, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of my invention. Fig. 2 is a back view of the same on a larger scale than Fig. 1.

Similar letters in both figures refer to corresponding parts.

This invention consists in arranging on the shaft of the driving-sails and on arms, which turn loosely on said shaft, a series of regulating-fans, which or the arms of which connect with the windward edge of the driving-sails in such a manner that whenever the velocity of the wind-wheel exceeds a certain point the resistance of the regulating-fans causes the driving-sails to turn to the wind and to decrease their effective surface; and my invention consists, further, in combining with the arms of the driving-sails and with those of the regulating-fans an adjustable spring in such a manner that the velocity at which the regulating-fans begin to act can be varied at pleasure.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The driving-sails A are hinged to arms B by means of hooks or loops *a* and eyes *b* in such a manner that they can be set at any desired angle to the wind. The arms B are rigidly attached to a shaft C, which has its bearings in boxes *c*, fastened to a plate D, that rotates on the top of a hollow standard E. The vane F is secured to an arm *d*, that extends from the plate D in a direction opposite to the direction of the shaft C, and it serves to turn the plate D according to the direction of the wind, in order to keep the driving-sails in the proper position.

The angle which the driving-sails make with the direction of the wind is generally governed by the regulating-fans G, which are secured to arms H, that turn freely on the

shaft C. These arms are connected by means of links *e* with the windward edges of the driving-sails, and if the motion of said fans by reason of the resistance of the air is retarded the arms H approach the driving-sails to which they are attached and the sails are turned to the wind. Without a check to this backward motion of the regulating-fans, the driving-sails would be turned to the wind at a very slow speed of the wheel. In order, therefore, to allow the wind-wheel to attain the required velocity, it is necessary to retain the arms of the regulating-fans at a certain distance from the driving-sails and with sufficient power to prevent a retrograde motion of the fans until the wind-wheel has attained the required velocity. For this purpose I have applied a spring I, which is secured to one of the arms B of the driving-sails, and which bears against one of the arms H of the regulating-fans, as clearly shown in the drawings. By these means the arms H are kept off from the windward edges of the driving-sails at a distance which depends upon the length of the links *e*, and the power with which the arms H are retained at this distance is regulated by a set-screw *f*, that screws into a lug *g* on the inner side of the arm to which the spring I is attached, and which bears against the spring, as clearly shown in Fig. 2 of the drawings.

If the wind-wheel begins to revolve now, the driving-sails will retain their original position until the velocity of the wheel becomes so great that the resistance of the air against the motion of the fans is sufficient to overcome the power of the spring I and to allow the arms H to close up to the driving-sails. As soon as this takes place the driving-sails will be turned to the wind and their effective area will be diminished, and consequently the speed of the wheel will decrease until it reaches a certain fixed point, which can be determined by the amount of pressure exerted by the spring I on the arm H. From this it will be easily understood how by these means any desired velocity can be given to the wind-wheel, provided the wind be strong enough to turn it at the required speed, and no matter how much the wind may change

beyond this limit the velocity of the wheel will be perfectly uniform and its motion will not in the least be affected by any sudden change in the force of the wind.

What I claim as new, and desire to secure by Letters Patent, is—

The arrangement of the regulating-fans G on the shaft C when the same are connected

to the driving-sails A by means of links e, together with a spring I, substantially as and for the purpose described.

WM. I. TUSTIN.

Witnesses:

MIRON THOMPSON,
A. L. STILES.