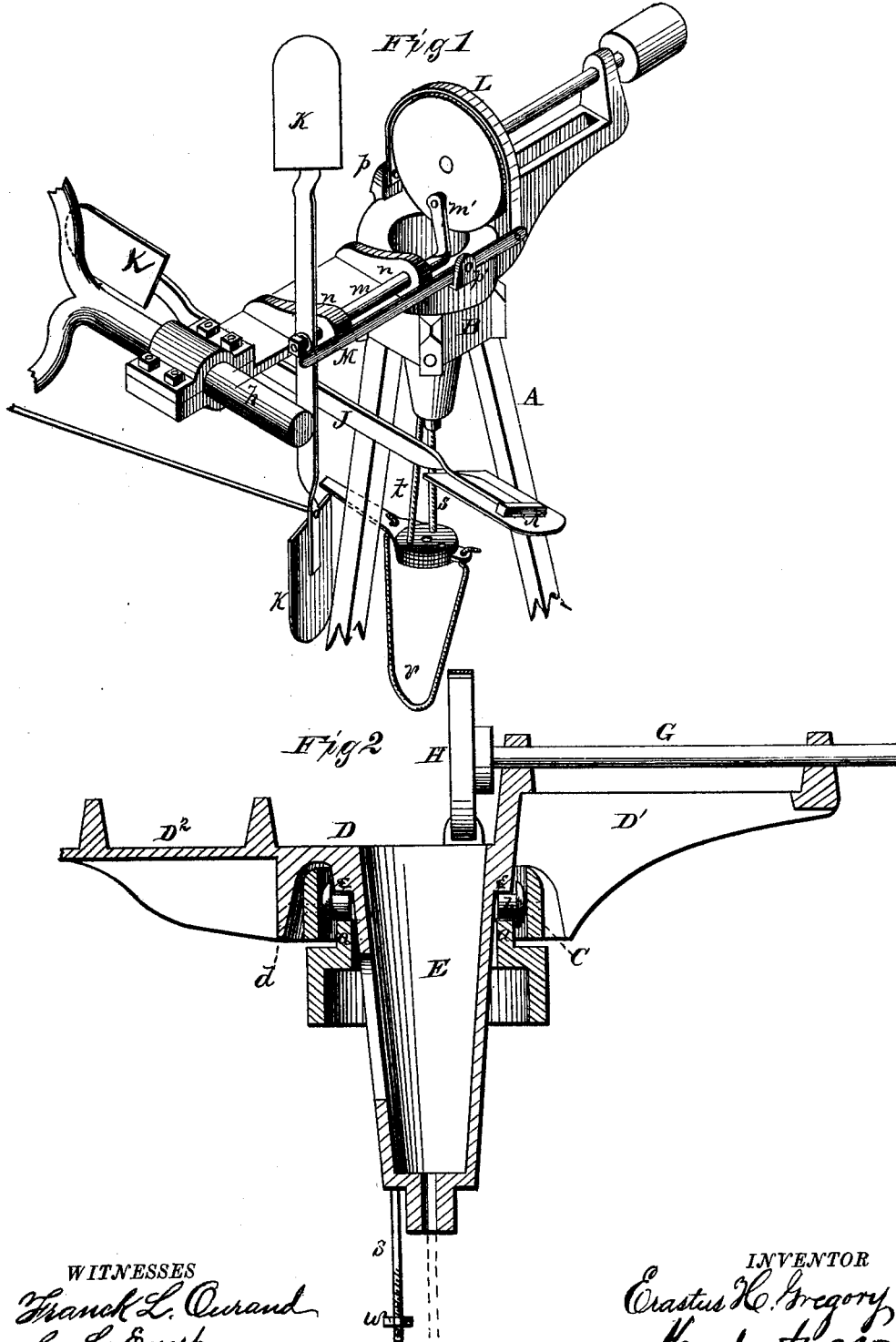


E. H. GREGORY.  
WIND-WHEEL.

No. 185,523.

Patented Dec. 19, 1876.



WITNESSES  
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Fig 3

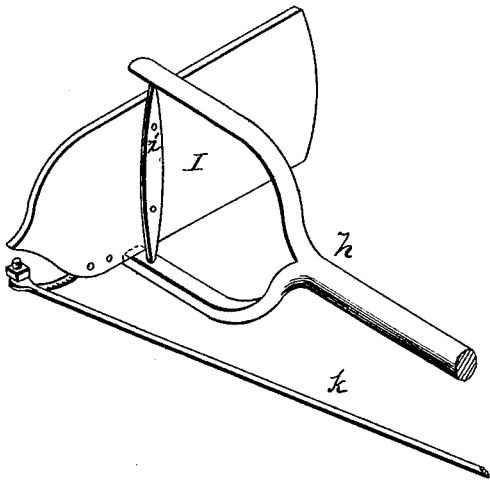


Fig 4

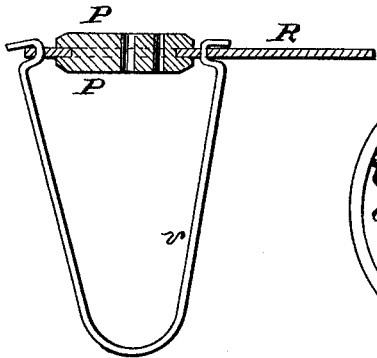
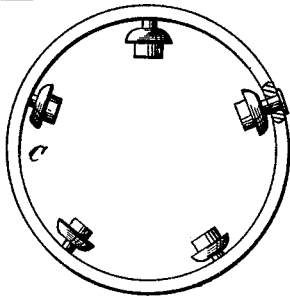


Fig 5



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# UNITED STATES PATENT OFFICE

ERASTUS H. GREGORY, OF BATTLE CREEK, MICHIGAN.

## IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. **185,523**, dated December 19, 1876; application filed June 13, 1876.

*To all whom it may concern:*

Be it known that I, ERASTUS H. GREGORY, of the city of Battle Creek, in the county of Calhoun, and in the State of Michigan, have invented certain new and useful Improvements in Wind-Wheels; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates more particularly to that class of wind-wheels which run behind the mast, pitman, or turn-table, having no vane to keep the wheel in the wind, but maintain their working position by reason of their situation rearward of the turn-table; and the nature of my invention consists in the construction and arrangement of the turn-table, and of devices for automatically governing and regulating the wind-wheel, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a perspective view of my wind-mill. Fig. 2 is a vertical section of the turn-table. Figs. 3, 4, and 5 are detailed views of parts of the mill.

A represents the central stand or tower, on top of which is a casting, B. This casting has a round central aperture, with an annular flange, *a*, projecting upward around the same. On this flange ride a series of flanged friction-rollers, *b b*, which have journals on their outer ends only, and said journals are placed from the inside, in holes made for that purpose, in a ring, C, as shown in Fig. 2. D is the turn-table, which is formed with a central downward-projecting cone, E, which extends through the casting B, and has a circumferential shoulder, *e*, that rests on the rollers *b b*. The turn-table D is formed with an overhanging flange, *d*, which incloses the ring C. It is also formed with arms D<sup>1</sup> and D<sup>2</sup>, projecting in opposite directions. The arm D<sup>1</sup> is formed with boxes to receive the wind-wheel shaft G, said shaft having at its inner end a wheel, H, to which the crank for oper-

ating the rod is to be connected. The other arm, D<sup>2</sup>, supports the governing and regulating mechanism.

By the construction of the turn-table as described, friction is materially lessened, and the entire apparatus is rendered more delicately sensitive to the slightest variations and most instantaneous changes in the direction and velocity of the wind. At the end of the arm D<sup>2</sup> is a suitable box for holding a shaft, *h*, at right angles with the axis of the wind-wheel, and horizontal thereto. The outer end of this shaft is split and spread to form two arms, as shown in Fig. 3, in the ends of which is placed the vertical axis *i* of the governing-sail I. The inner end of this sail is, by a rod, *k*, connected with one arm of a four-armed governor, J, provided with fans or wings at the ends of the arms.

The governor J is suspended by means of a shaft, *m*, passing through one of its arms, which is made fast on the shaft, and said shaft having its bearings in projections *n n* on the arm D<sup>2</sup> of the turn-table. The normal position of the governor J is with two of its arms horizontal, and the other two vertical, the rod connecting it with the sail I being attached near the outer end of the lower vertical arm; the object of said governor being solely for the purpose of operating the governing-sail, and to hold the wind-wheel in position when turning, or when partially or wholly out of the wind. The governor-sail and connections are placed on the opposite side of the turn-table from the great wheel, in order to evenly balance the whole on the turn-table as nearly as possible. Over the disk H, on the inner end of the wheel-shaft G, is placed a flat spring-band, L, one end of which is fastened to a lug, *p*, on the turn-table, and the other end fastened to the end of a lever, M, which is pivoted to a lug, *p'*, on the other side of the turn-table. The other end of this lever rests on the outer horizontal arm of the governor J. As the governing-sail I turns on its axis by any increase of the wind it pulls the governor J around more or less, so that the outer horizontal arm thereof will raise that end of the lever, thereby depressing the other end, and applying the band or brake L to the wheel H. As the wind lulls the governor resumes

its former position, turning the sail back, and relieving the brake. This is accomplished by having the fan K on the outer horizontal arm of the wheel weighted, as shown. By these means the wind-wheel is held steady under all possible conditions of wind, all sudden jerking and consequent breakages of machinery heretofore incurred from sudden violent gusts and changes of wind are obviated, and at the same time, and by the same means, the most perfect automatic and self governing and protecting control of the whole apparatus is secured through the aid and instrumentality of this governor and its attachments.

The inner end of the shaft *m* is formed with a crank, *m'*, from which a rod, *s*, extends downward through a hole in the body of the cone E. P P represent two disks, which are fastened together by a pin, *x*, and the edges of the disks are turned down on the adjacent sides, so as to form, when put together, a circumferential groove, and before the disks are put together they are placed in an aperture in a plate or arm, R, so that when the disks are fastened by the pin, as described, they can turn together in the plate or arm R. The pump-rod passes through the center of the disks P, while the rod *s* also passes through them at one side of the center. *t t* are guide-rods, attached to the cone E, and also passing through the disks P.

To the plate or arm R is attached a bail, *v*, from which a cord or rod is suspended, and hangs down to the ground. The arm R will not rotate, as the frame-work or tower A prevents any such movement.

By these means the wind-wheel may be thrown out of the wind and the brake applied, for the purpose of stopping all motion of the wheel and machinery when desired, by the operator standing on the ground. These devices are also so arranged with reference to the turn-table that the cord or rod cannot by any means be wound around and be entangled with the piston-shaft by the movement of the mill around the turn-table. A nut, *w*, is screwed on the lower end of the rod *s*.

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

1. The governor J, in combination with the sail I, constructed and arranged substantially as and for the purposes herein set forth.
2. The brake L M, in combination with the governor J and sail I, substantially as and for the purposes herein set forth.
3. The combination of the disks P P, plate R, with bail *v*, guide-rods *t*, rod *s*, and cone E, all substantially as and for the purposes herein set forth.
4. The combination of the governor-lever M, brake L, arm *h*, and sail I, when placed opposite the wind-wheel, and all constructed and operating substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of April, A. D. 1876.

ERASTUS H. GREGORY.

Witnesses:

TOLMAN W. HALL,  
MARTIN METCALF.