

(No Model.)

2 Sheets—Sheet 1.

E. J. MARSH.
WINDMILL REGULATOR.

No. 574,813.

Patented Jan. 5, 1897.

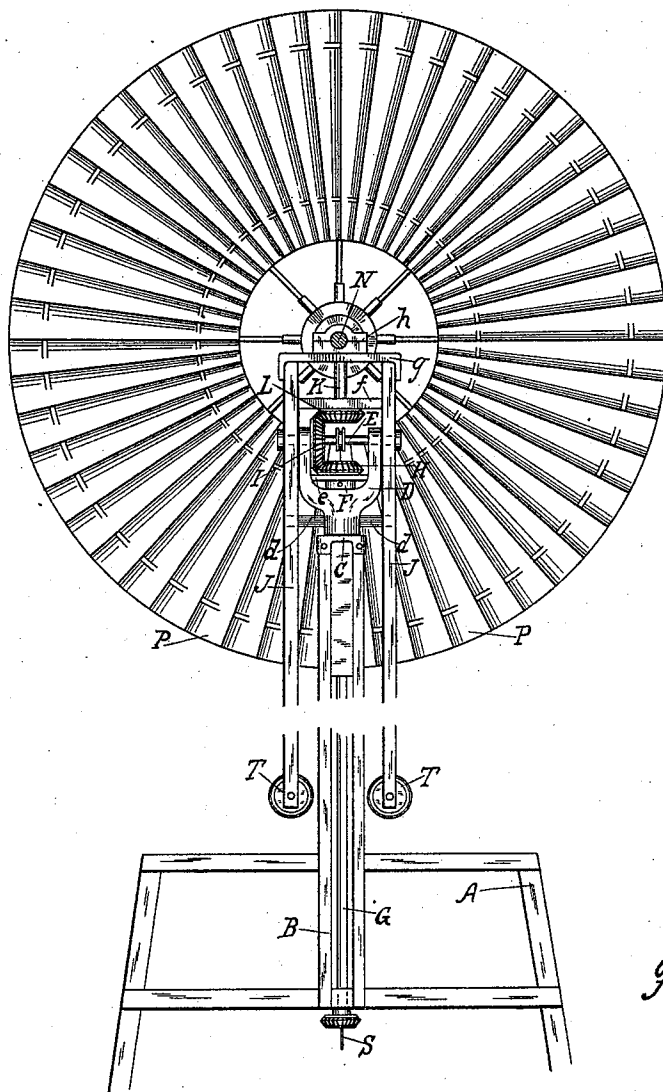


Fig. 1.

Witnesses

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S. Mc Bain

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Edgar J. Marsh
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Attorney.

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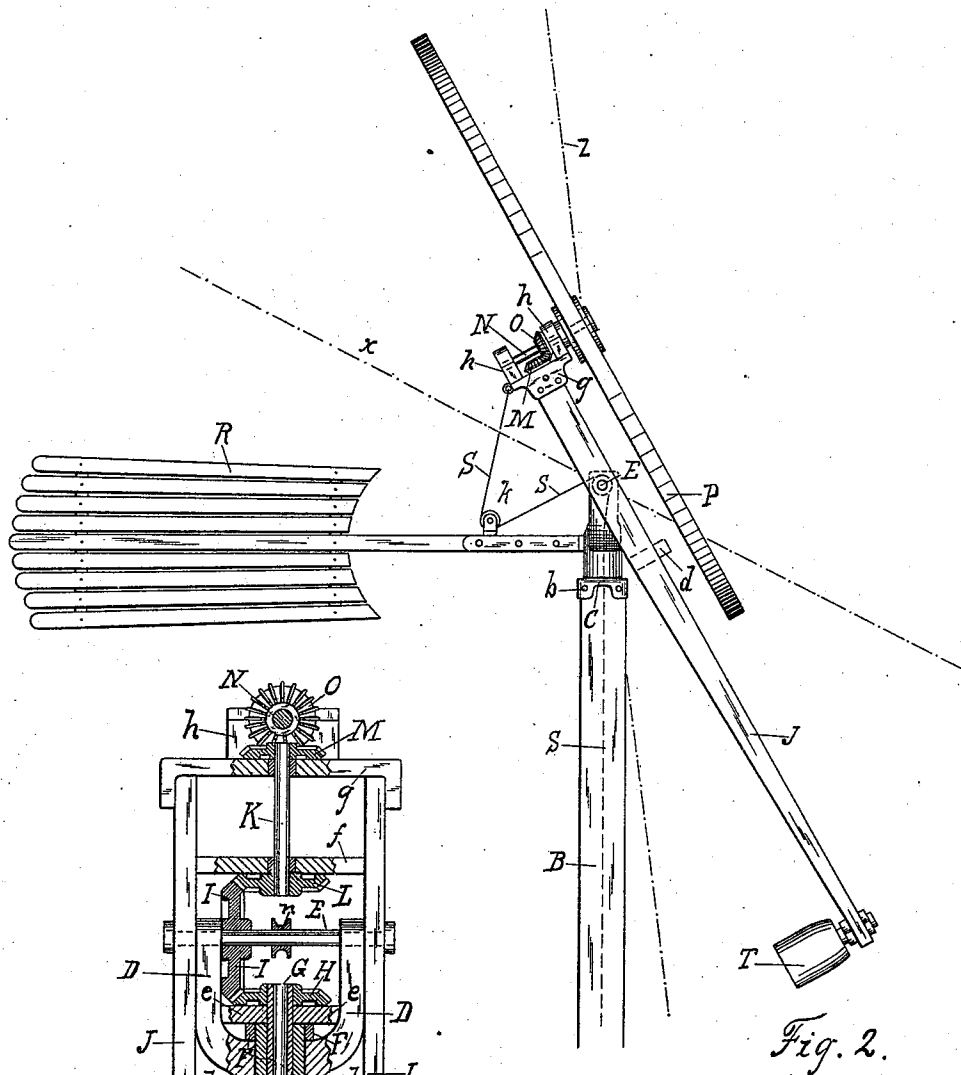


Fig. 2.

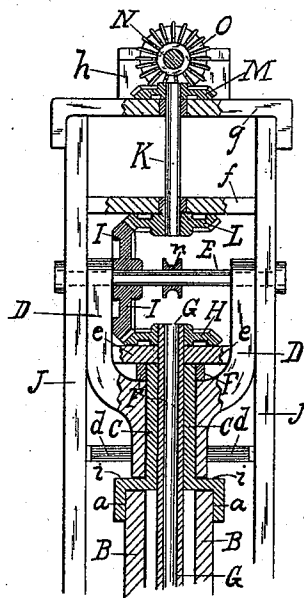


Fig. 3.

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UNITED STATES PATENT OFFICE.

EDGAR J. MARSH, OF COLDSTREAM, CANADA.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 574,813, dated January 5, 1897.

Application filed June 24, 1895. Serial No. 553,927. (No model.)

To all whom it may concern:

Be it known that I, EDGAR J. MARSH, a subject of the Queen of Great Britain, and a resident of Coldstream, in the county of Middlesex, in the Province of Ontario, Canada, have invented a new and useful Windmill-Regulator, of which the following is a specification.

This invention relates to improvements on a mill in which motion is imparted to mechanism for operating a pump, root-cutter, or for any other purpose desired by the action of the wind on a wheel or revolving sail; and these improvements relate to mechanism which governs the wind-wheel or sail and causes the latter to revolve at a uniform rate of speed when winds of different force are acting thereon.

To this end my invention consists in the specific details of construction, as hereinafter more fully described and claimed, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a rear view of the upper portion of a windmill embodying my invention. In this view the vane is removed in order to illustrate the working parts more clearly. Fig. 2 is a side view of same, showing the vane attached. Fig. 3 is an enlarged detail view, partly in section, of the working parts of Fig. 1.

A designates the windmill-tower, the upper end only of which is shown; B, a hollow standard, the lower end of which is fixed to said tower.

C designates a hollow or tubular metallic head in the lower end of which a socket *a* is formed, in which socket the upper end of the standard B is inserted and fixed therein by the bolts *b*; or this socket *a* may be formed by flanges integral with said head C, which project downward from said head and clasp the standard B, and be fixed thereto by means of said bolts *b*.

D designates a U-shaped rotatable yoke in the forked ends of which the pivot-bar E is fixed, the forked ends of said table being strengthened by the cross-brace *e*, secured to or formed integral with said forked ends, and the body of said turn-table is formed tubular and fitted to and encircles a portion of the

head C and rests on the outwardly-projecting shoulder *i* thereof.

F designates a collar, which is fixed to the head C by a set-screw or other suitable securing means for the purpose of preventing the yoke D from raising.

G designates a tubular shaft, which is fitted to and extends upward through the head C and standard B, and H designates a beveled gear-wheel fixed to the upper end of said shaft G, which beveled gear-wheel H rests on the cross-brace *e* and forms a convenient means for preventing the shaft G from falling out of the head C or standard B, and the lower end of this shaft G is provided with suitable gearing and mechanism by which it may be connected with a pump, root-cutter, &c.

I designates a beveled gear-wheel which revolves perfectly free on the pivot-bar E, and this gear-wheel I engages with the gear-wheel H, so that as the gear-wheel I is operated the gear-wheel H will also be operated, as well as the shaft G and the pump or other device connected therewith.

J designates a tilting frame which is pivotally supported on the rotary frame by the bar E, the sides or arms of which frame are rigidly braced and held together by the cross and stop braces *d* and *f* and the cap *g*. The brace *f* strengthens and stiffens the frame J above the pivot-bar E, and the stop-brace *d* serves the same end below said pivot-bar, and the brace *f*, engaging with the vane R or a post secured thereto, prevents the wheel P or frame J from turning downward below a horizontal position, and the stop-brace *d* engages with the standard B to prevent the wheel P or frame J from turning forward beyond a vertical position. The movement of the frame J or wheel P is thereby limited to or prevented from moving farther than an angle of ninety degrees.

T designates the governor or balancing means, which I have illustrated as being a weight or weights and which are adjustably secured to the lower ends of the arms of the tilting frame J.

K designates a shaft supported by and revolving perfectly free in bearings in the brace *f* and cap *g*, to which shaft the beveled gear-wheels L and M are fixed and on opposite

sides of the brace *f* and cap *g* for the purpose of preventing said shaft K from falling out of said brace or said cap, and said beveled gear-wheel L engages with the gear-wheel I.

5 N designates the wheel-shaft, which is held in place by and revolves perfectly free in bearings *h* on the cap *g*.

O designates a beveled gear-wheel, and P the revolving wind-wheel, which are fixed to the wheel-shaft N, and said beveled gear-wheel O engages with the beveled gear-wheel M, so that as the wind, acting on the slats or sails of the wheel P, causes said wheel to operate the mechanism just enumerated communi-

15 cates motion to the pump or other device connected with the shaft G.

R designates a vane which is secured to the yoke D, against which the wind acts to hold the wheel P to the wind.

20 S designates a rope, one end of which is attached to the tilting frame J, and *k* and *n* designate grooved antifriction-rollers secured to the vane R and the pivot-bar E, respectively, over which this cord S passes. Said cord then passes down through the tubular shaft G to the ground, by means of which

30 The operation of my improved construction is as follows: The weights T are regulated or are in proportion to the amount of power required and are for the purpose of holding the wheel P to the wind, when the wind is of a certain or normal force, to present the required fan or sail surface of the wheel to the wind in proportion to the power required and thus automatically regulate the speed of said wheel P. The result of wind

40 of greater force will be to overcome the resistance of the weights T and automatically tilt the wheel to the rear, as shown by dotted line *x*, Fig. 2, and thereby automatically present less surface of the wheel to the wind.

45 Again, if the force of the wind is less than normal the weights T will be sufficient to overcome the resistance thereof and automatically adjust the wheel to the position shown by dotted line *z* in Fig. 2 and present

50 greater area of fan or sail surface of said wheel to the wind. The area of the wheel in proportion to the force of the wind will be

thereby automatically maintained, and as a result this balancing means will automatically maintain an even uniform speed when operated by winds of different force. 55

I do not limit myself to the exact construction hereinbefore set forth, as a great many changes may be made without departing from the spirit of my invention. 60

Having thus described my invention, I claim—

1. In a windmill, the combination with a tower, a rotating yoke mounted thereon, and a vane carried by the tower and having a roller; of a tilting frame composed of two long arms standing astride the yoke and pivoted between their ends thereto, a second roller on the pivot-bar within the yoke, braces connecting the arms above and below said pivot, a cap connecting their upper ends and having bearings for the axle of the wind-wheel, weights at their lower ends, and a rope leading from the cap, over the roller on the vane, thence over the roller on the pivot-bar, and to the ground, as and for the purpose set forth. 65 70 75

2. In a windmill, the combination with a tower, a tubular head mounted thereon and having an annular shoulder, an upright yoke having a tubular stem journaled around said head and resting on the shoulder, and a collar secured to the head above the stem; of a brace across the yoke above said collar, an upright shaft journaled through the head and end, an open frame spanning the yoke and pivotally connected with the outside thereof by a transverse pivot-bar passing through the yoke above said bevel-gear, a wind-wheel on one end of the frame, a weight at its other end, a longitudinal shaft in the frame driven by said wind-wheel and having a bevel-gear just above said pivot-bar, and an idle-gear journaled on the pivot-bar and connecting said two bevel-gears, substantially as and for the purpose set forth. 80 85 90 95

In testimony whereof I have signed in the presence of the two undersigned witnesses.

EDGAR J. MARSH.

Witnesses:

P. J. EDMUNDS,
S. MCBAIN.