

No. 840,458.

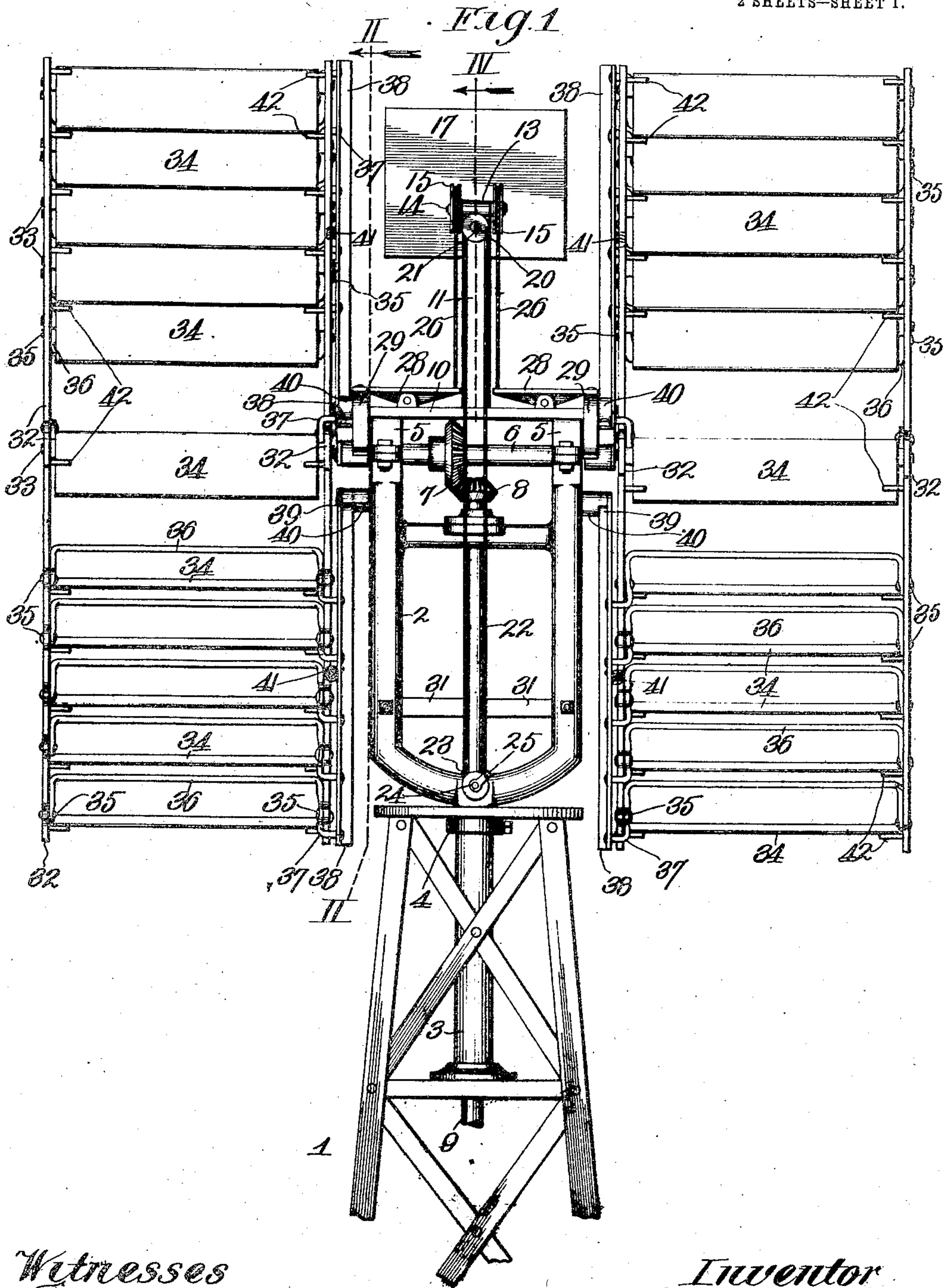
PATENTED JAN. 1, 1907.

R. L. LONGLEY.

WINDMILL.

APPLICATION FILED MAY 31, 1906.

2 SHEETS—SHEET 1.



Witnesses
Frank R. Gore
H. C. Rodgers.

Inventor
R. L. Longley.

By *George F. Thompson* Atty.

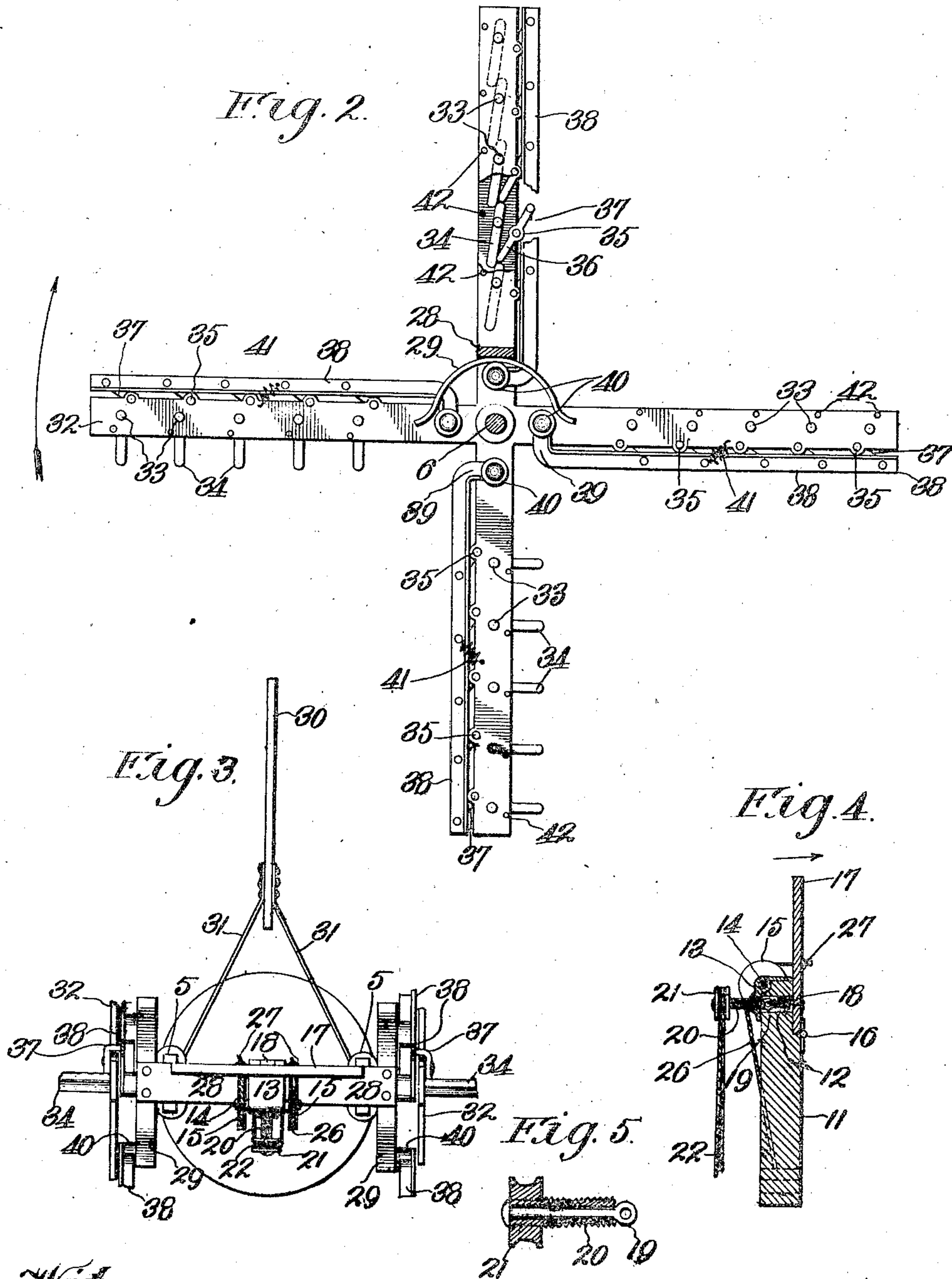
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Frank R. Glone.
H. C. Rodgers

Inventor
R. L. Longley.
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UNITED STATES PATENT OFFICE.

RICHARD L. LONGLEY, OF KANSAS CITY, MISSOURI.

WINDMILL.

No. 840,458.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed May 31, 1906. Serial No. 319,420.

To all whom it may concern:

Be it known that I, RICHARD L. LONGLEY, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

This invention relates to windmills; and my object is to produce a machine of this character which operates efficiently and reliably.

A further object is to produce mechanism for automatically adjusting the slats of the wind-wheel to prevent less surface to the wind when the latter is high.

To these ends and others, as hereinafter appear, the invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a front view of a windmill embodying my invention. Fig. 2 is a section on the line II II of Fig. 1 and partly broken away. Fig. 3 is a top plan view of a portion of the windmill. Fig. 4 is a vertical section on the dotted line IV of Fig. 1. Fig. 5 is an enlarged central longitudinal section of the threaded shaft and grooved sheave shown in Fig. 4.

In the said drawings, 1 indicates a tower of any suitable or preferred type; 2, a rotatable frame surmounting and provided with a stem 3, depending into the upper portion of the tower and suitably journaled therein and provided with a collar 4 below the top of the tower to prevent upward movement of said rotatable frame. 5 represents bearing-caps secured to the upper end of said frame and forming in conjunction with the latter bearings for the horizontal shaft 6, provided with bevel-gear 7, meshing with bevel-gear 8, secured on the upper end of a vertical shaft 9, which extends down through the rotatable frame and its stem 3 and is adapted to be connected with a device or the machinery (not shown) to be operated.

10 indicates a cross-bar cast with or secured to caps 5, and 11 a post rising from the center of said bar and provided near its upper end with a hole 12 and with a perforated bracket 13, the perforation of the bracket being threaded and registering with said hole,

and journaled in bracket 13 is a short shaft 14, equipped with sheave-wheels 15. Hinged at 16 to post 11 and projecting upwardly therefrom is a wind-plate 17, limited in its forward movement by the post and connected by a retractile spring 18 in hole 12 to an eyebolt 19, swiveled in the threaded shaft 20, mounted in the threaded perforation of bracket 13, and secured rigidly on said threaded shaft is a grooved sheave 21, connected by an endless cable 22 to a similar sheave 23, journaled on the stub-shaft 24, projecting from the rotatable frame, the sheave 23 having a crank-handle 25, whereby it may be turned to revolve bolt 20, and thus increase or diminish the tension of spring 12 on the wind-plate 17.

26 indicates a pair of cables engaging sheaves 15 and secured at their upper ends, as at 27, to the wind-plate and at their lower ends to rock-levers 28, pivoted upon cross-bar 10 and equipped at their outer ends with arched trackways 29, said trackways being disposed at the opposite sides of and contiguous to bearings 5.

For the purpose of presenting the face of the wind-plate to the wind at all times I provide a vane 30, supported rigidly by the rotatable frame through the instrumentality of the rearwardly-converging braces 31, bolted at their front ends to said frame or otherwise suitably secured.

Secured upon the opposite ends of shaft 6 outward of the arched trackways 29 are the wind-wheels; constructed as follows: 32 indicates cross-shaped frames secured upon said shaft, and pivotally connected to each pair of frames at 33 are a series of slats 34 of the type common in window-shutters—that is to say, of that type in which the slats when closed overlap and occupy parallel positions at a slight angle to their supports, as shown most clearly in the upper part of Fig. 2. Pivoted at 35 to the arms of the frames are crank-shafts 36, and said shafts are provided at their inner ends with angle-arms 37, pivotally connected to links 38, said links being preferably of angle-iron to insure rigidity and strength and having their inner ends bent, as at 39, and equipped with antifriction-rollers 40, retractile springs 41 connecting said links 38 with the arms of the inner frames 32 to hold the antifriction-rollers 40 at their outer limit of movement from the shaft, and con-

sequently hold said links as close to said arms of the inner frames as possible, as shown most clearly in Fig. 2.

In the practical operation of the machine, 5 assuming that the wind on the vane holds the face of the wind-plate 17 toward the wind without regard to the direction in which the latter is blowing, and consequently holds the wheels with their edges toward the wind, the 10 wind on the wheels causes the latter to revolve in the direction indicated by the arrow in Fig. 2, in which figure it will be noticed that the slats of the depending arms of the wheel are open, and therefore offer practically 15 no resistance to the wind, while the slats of the upwardly-projecting arms are closed and present an unbroken front to the wind in order that the pressure of the latter shall revolve the wheel at a high rate of speed, it be- 20 ing also noticed in this connection that the arms of the wheels are provided with stop-pins 42, which limit the opening movement of the slats and prevent them from describing a full quarter-revolution. The arms of 25 the wheel projecting toward the wind show their slats pendent, though in actual practice if the wind be strong enough it may swing them back to folded position by the time they have arrived at the position indi- 30 cated. The slats carried by the arms projecting away from the wind occupy their folded position by gravity, as at that time there is practically no wind-pressure upon them. Should the wind increase materially 35 in velocity, it will blow the wind-plate 17 more or less in the direction indicated by the arrow, Fig. 4, and thus through the cables operate levers 28 and force the arched track- 40 ways 29 downward and into the path of movement of the rollers 40, which occupy the same vertical plane as said trackways, said rollers under normal conditions revolving without contact with said trackway. When 45 said trackways are lowered, however, as explained, each roller successively engages the trackway and is therefore drawn inward toward the shaft, the springs 41 yielding to accommodate this movement, which results in pivotal movement of the crank-shafts and 50 causes the same to press outwardly on the pivoted slats and prevent the same from completely closing, the result being the wind is permitted to pass through the wheel between the slats at such times when above the plane 55 of shaft 6. As the wheel is thus deprived of the full power of the wind, its speed decreases. This regulation or governing of the wheel is entirely automatic. Under some conditions it may be desirable to increase or diminish 60 the tension of the wind-plate, and to do this the operator stretches or relaxes the spring 18 by screwing shaft 20 outward or inward through bracket 13. To accomplish this re- 65 sult, the pulley 23 is rotated for the purpose

of the endless connection 22. As shown, it is necessary for the operator to climb to the top of the tower to accomplish the result described; but I do not wish to limit myself to this particular construction. 70

From the above description it will be apparent that I have produced a windmill embodying the features of construction enumerated and which may obviously be modified 75 without departing from the principle of construction involved, and while the vane is shown and described as rigid for convenience it will be of course understood that the vane may be of that type in common use whereby 80 it can be turned parallel with the axis of the wheel, and thus hold the latter with its side to the wind, and therefore completely out of gear.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is— 85

1. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal shaft journaled in said frame, a substantially 90 vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, a wind-plate, and means whereby movement imparted to the wind-plate shall prevent the pivoted slats on the uppermost 95 arm from completely closing.

2. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal shaft journaled in said frame, a substantially 100 vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, a wind-plate, means whereby movement imparted to the wind-plate shall prevent the pivoted slats on the uppermost 105 arm from completely closing, and means to yieldingly resist such movement of the wind-plate.

3. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal shaft journaled in said frame, a substantially 110 vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, a wind-plate, means whereby the movement imparted to the wind-plate shall prevent the pivoted slats on the uppermost 115 arm from completely closing, means for resisting the movement of the wind-plate, and means for varying the resistance of the wind-plate to the wind.

4. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal 120 shaft journaled in said frame, a substantially vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, bars capable of moving toward and from the shaft, and means actuated by 125 inward movement of said bars to prevent the pivoted slats on the uppermost arm from completely closing.

5. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal 130

shaft journaled in said frame, a substantially vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, bars capable of moving toward and from the shaft, means actuated by inward movement of said bars to prevent the pivoted slats on the uppermost arm from completely closing, a wind-plate and means actuated thereby to successively move said bars inward when the slats are offering resistance to the wind to effect the rotation of the wheel.

6. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal shaft journaled in said frame, a substantially vertical wind-wheel comprising radial arms, mounted on the shaft and provided with pivoted slats, bars capable of moving toward and from said shaft and provided with rollers at their inner ends, a trackway over the shaft, means to move said trackway toward or from the shaft and into or out of the path of said rollers, and means whereby inward movement imparted to said bars and the trackway shall prevent the pivoted slats on the uppermost arm from completely closing.

7. A windmill, comprising a tower, a frame journaled thereon, a substantially horizontal shaft journaled in said frame, a substantially vertical wind-wheel comprising radial arms,

mounted on the shaft and provided with pivoted slats, a wind-plate, means whereby the movement imparted to the wind-plate shall prevent the pivoted slats of the uppermost arm from completely closing, and a vane to hold the face of the wind-plate and edge of the wheel to the wind.

8. In a windmill, a rotatable frame, a substantially vertical wind-wheel comprising radial arms, journaled thereon and provided with pivoted slats, a movable wind-plate to open said slats, an adjustable shaft, and a retractile spring connecting said shaft and wind-plate and bearing a swivel relation to the former.

9. In a windmill, a rotatable frame, a substantially vertical wind-wheel comprising radial arms, journaled thereon and provided with pivoted slats, a movable wind-plate to open said slats, an adjustable shaft, a retractile spring connecting said shaft and wind-plate and bearing a swivel relation to the former, and means to longitudinally adjust said shaft.

In testimony whereof I affix my signature in the presence of two witnesses.

RICHARD L. LONGLEY.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.