

No. 757,044.

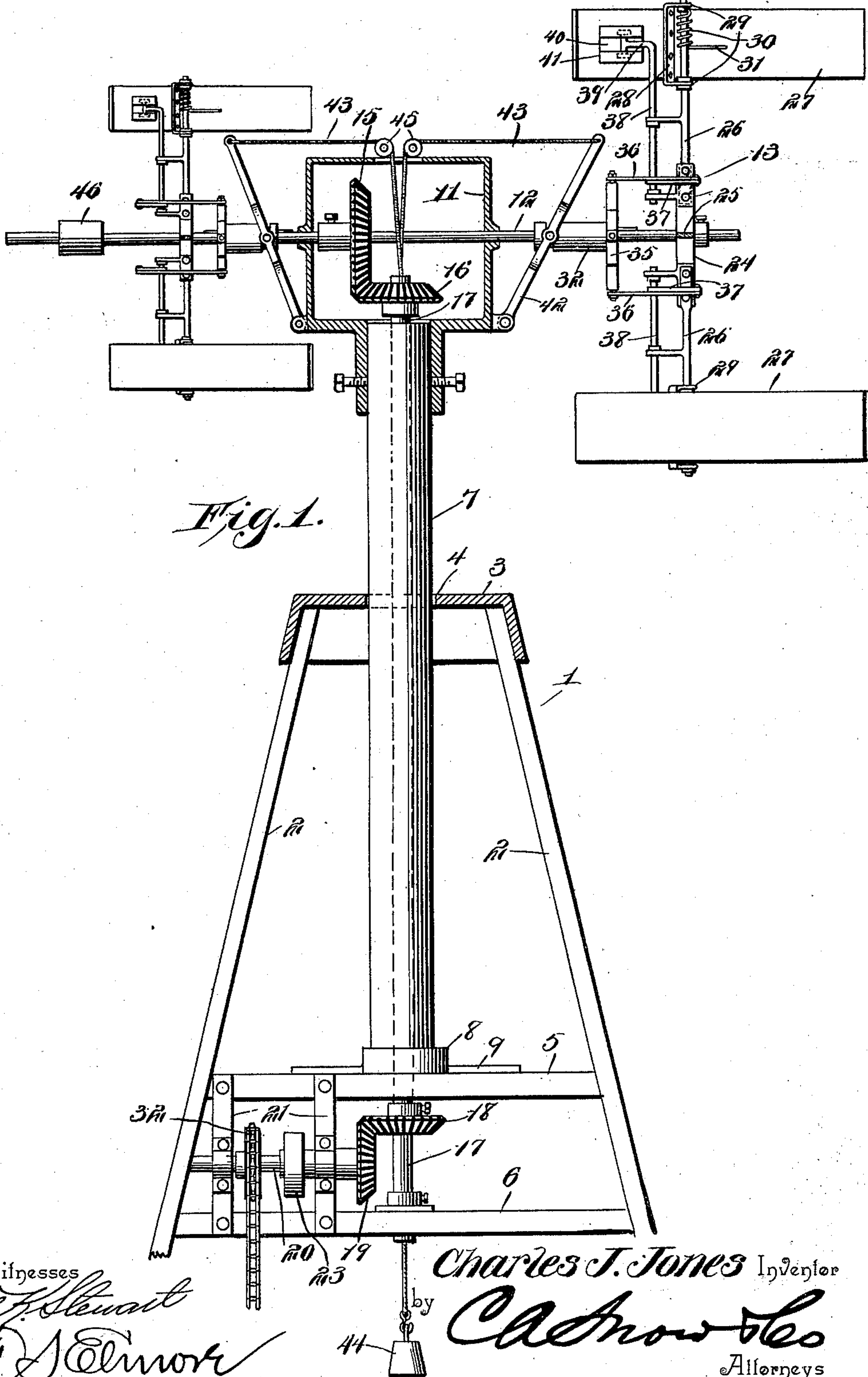
PATENTED APR. 12, 1904.

C. J. JONES.
WINDMILL.

APPLICATION FILED SEPT. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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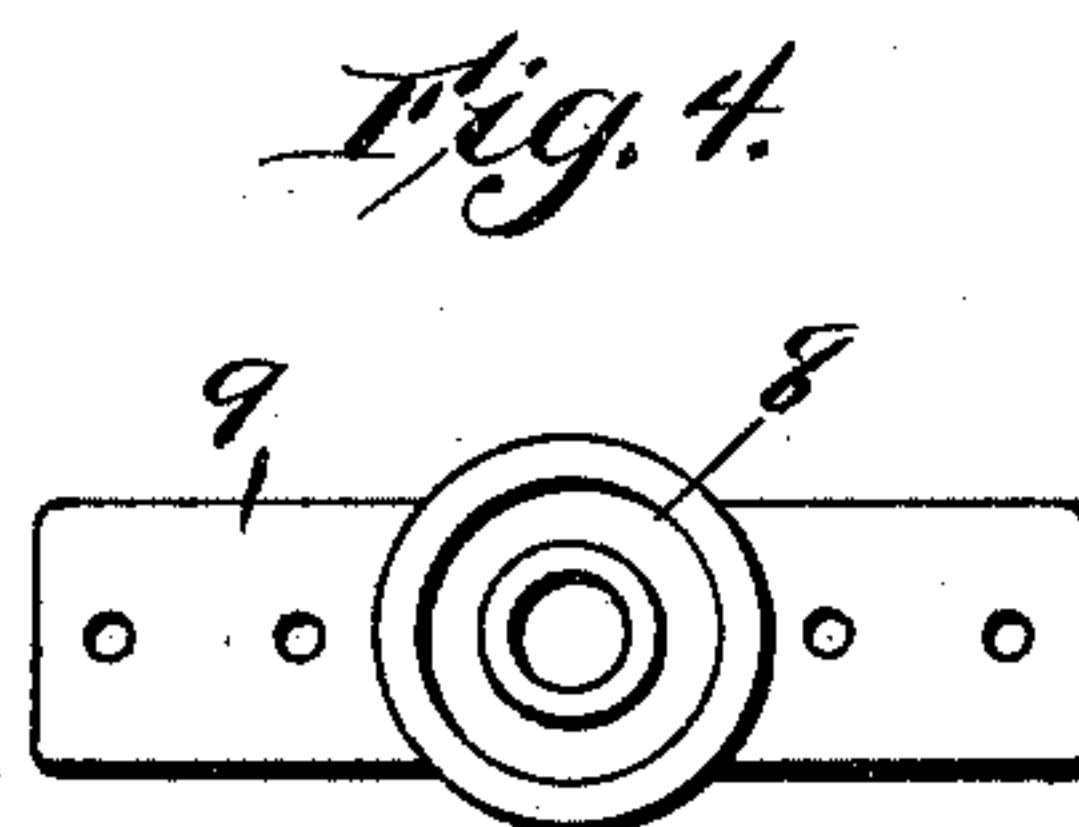
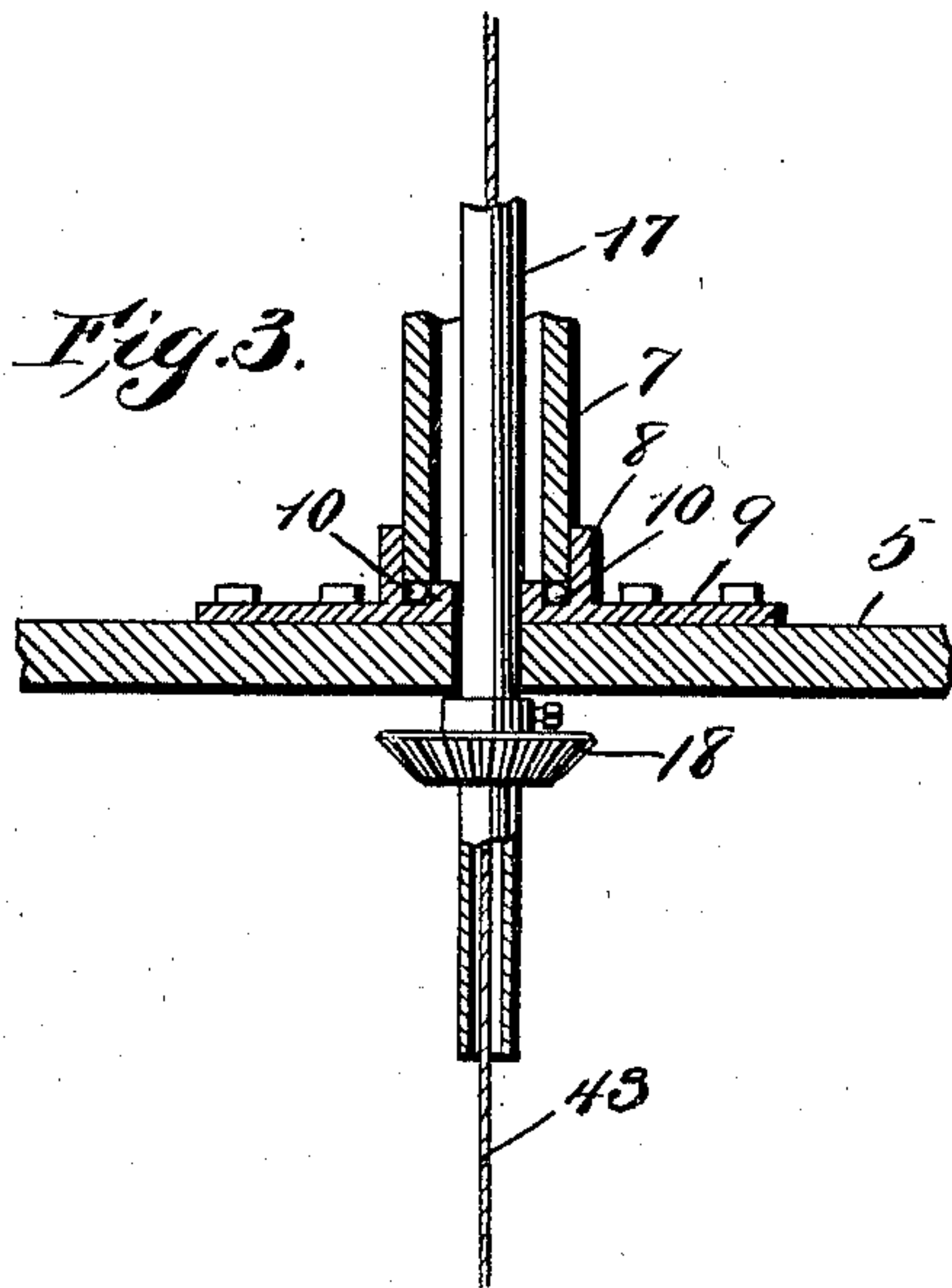
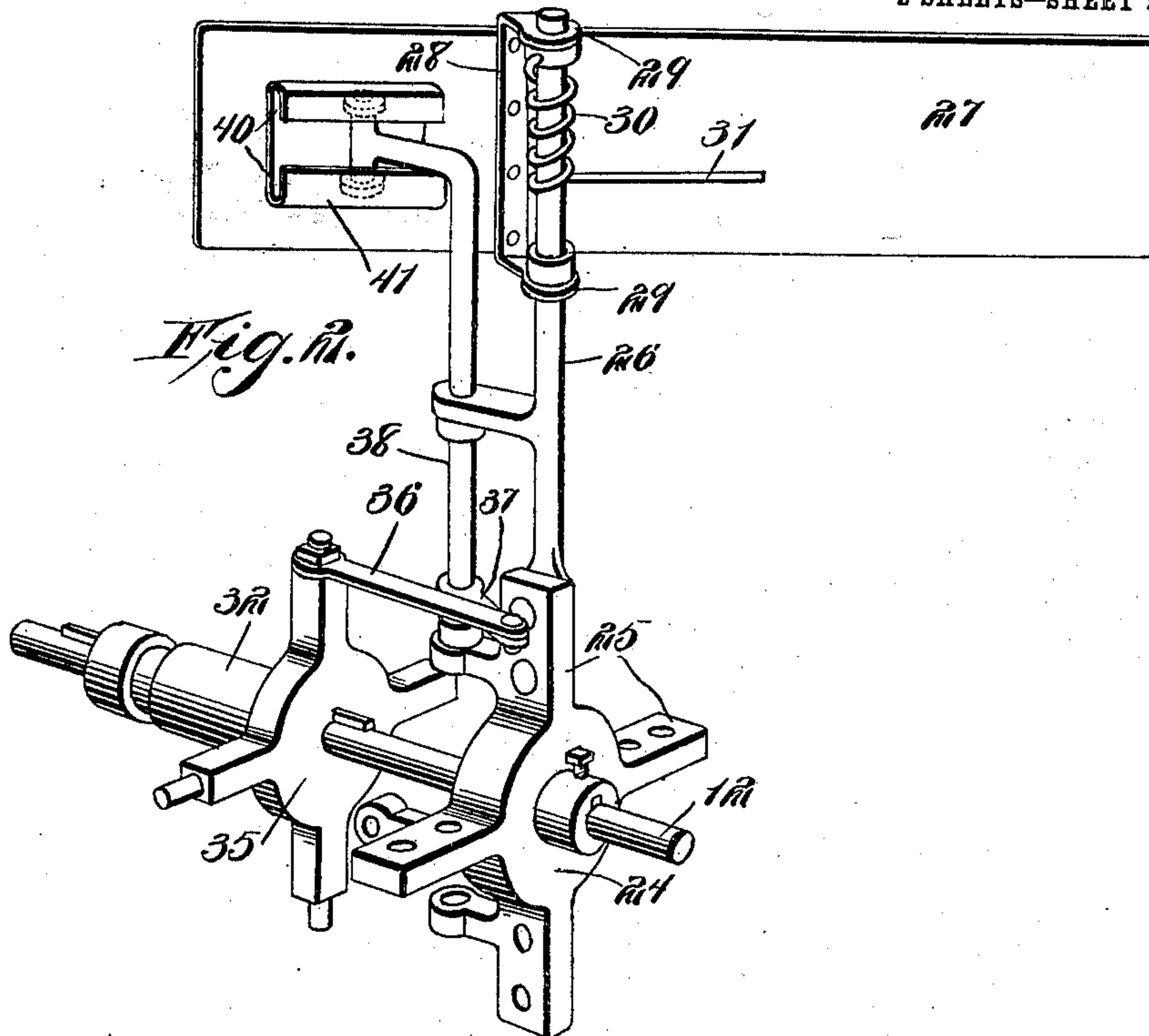
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES J. JONES, OF YELLOWSTONE PARK, WYOMING.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 757,044, dated April 12, 1904.

Application filed September 8, 1903. Serial No. 172,396. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. JONES, a citizen of the United States, residing at Yellowstone Park, in the National Park Reservation, State of Wyoming, have invented a new and useful Windmill, of which the following is a specification.

My invention relates to windmills, and has for its objects to produce a device of this character of comparatively simple construction in which the blades of a pair of wind-wheels disposed in tandem upon the drive-shaft will be simultaneously and automatically thrown into and out of the wind, according to variations in the latter, thus automatically regulating the speed of the drive-shaft and imparting a uniform motion to the driven shaft, one in which the blades may yield under a sudden increase in the wind force and one in which the wheels will remain in proper relation to the wind without the employment of the usual vane.

To these ends the invention comprises the novel details of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a sectional elevation of the upper portion of a windmill embodying my invention. Fig. 2 is a detail perspective view. Fig. 3 is a detail sectional elevation. Fig. 4 is a plan view of the bearing-plate for the lower end of the shaft.

Referring to the drawings, 1 indicates the windmill framework or tower, which preferably comprises a plurality of vertically-disposed standards 2, attached at their upper ends to a head or platform 3, having a central circular opening 4, a pair of the standards 2 being connected at a point beneath the head 3 and suitably remote therefrom by a pair of horizontal girders 5 and 6, which are spaced one above the other, as herein shown.

7 is a primary tubular shaft disposed vertically in the tower, with its upper end projecting somewhat above the platform 3. This shaft has bearing between its ends in the opening 4 and at its lower end in a step or seat 8, formed upon a bearing-plate 9, bolted to the

bar 5, there being disposed beneath the lower end of the shaft within the step 8 a series of antifriction balls or devices 10.

Secured to the upper end of shaft 7 and rotatable therewith is a frame 11, through which extends a horizontal drive-shaft 12, which sustains and is driven by the wind-wheels 13 14, the construction and operation of which will be later described. The shaft 12 is journaled for rotation in the sides of the frame 11 and is provided within the frame with a bevel-gear 15 in mesh with a similar gear 16, fixed to the upper end of a secondary driven shaft 17. This shaft extends vertically through the shaft 7 and has bearing at its lower end in the horizontal girder 6 and is provided adjacent to its lower end with a bevel-gear 18 in mesh with a similar gear 19, fixed upon the end of a horizontal counter-shaft 20, journaled for rotation in bearings carried by a pair of vertical bars 21, attached at their ends to the girders 5 and 6, the shaft 20 being provided with a sprocket-pulley 22 and band-pulley 23, through which suitable belts communicate power to the driven mechanism. In practice power will be transmitted from shaft 12 through the medium of gears 15 16, tubular shaft 17, and gears 18 19 to the counter-shaft 20, and thence to the driven mechanism, as will be readily understood, the shaft 7 being freely rotatable to permit the wind-wheels 13 14 to swing freely into proper relation with the wind throughout the operation of the device.

Mounted upon the rear end of shaft 12, which extends beyond the frame 11 for the purpose, is a primary wind-wheel 13, in the construction of which 24 is a spider fixed upon the shaft and having webs 25, preferably four in number, to each of which is bolted an arm 26, carrying at its outer end one of the wind sails or blades 27. The blades 27 are disposed in a substantially horizontal plane and each pivoted adjacent to its forward end to one of the arms 26 by means of a bearing-plate 28, riveted to the blade and provided with eyes or collars 29, which receive the arm. Each blade is normally held at the proper inclina-

tion to the wind by means of a spring 30, coiled around the arm 26 and having an extended end or finger 31, which bears upon the inner face of the rearward and longest end of the blade, the tendency of the spring being to force the end of the blade outward, while at the same time the blade is permitted to yield under the influence of a particularly strong wind force. For throwing the blades automatically into and out of the wind to regulate the speed of operation of the shaft I mount upon the latter a sliding collar or member 32, which is keyed for rotation with, but free for longitudinal movement of, the shaft, said member carrying a head 35. Pivoted to the head 35 is a series of links 36, connected at their outer ends each with a crank-arm 37 of one of a series of rock-shafts 38, journaled in bearings carried by the arms 26 and spider 25, one rock-shaft being provided for and arranged parallel with each arm. Each shaft is provided at its outer end with a crank-arm 39, carrying a roller or other antifriction device traveling in the guideway 40 of a bearing-plate 41, attached to the inner face of the forward end of one of the blades 27, from which construction it will be seen that when the device 32 is moved inward upon the shaft 12 the rock-shafts 38 will be actuated for forcing outward or spreading the forward shorter ends of the sails 27, thus swinging the rear ends of the latter inward against the action of springs 30 and out of the wind influence.

The wind-wheel 14 is substantially identical in construction and operation with the wheel 13, except that wheel 14 is of smaller size to obviate obstructing the free passage of the wind to the main wheel. Hence further detailed description thereof is deemed unnecessary, as the foregoing description applies equally to and is readable on both wheels.

For simultaneously operating the sliding members to throw the main and secondary wheels simultaneously and automatically into and out of the wind force I pivot at their lower ends to the frame 11 a pair of vertically-disposed levers 42, attached one to each of the sliding collars 32 for reciprocating the same, the levers being operated by cables or the like 43, attached to the upper ends of the levers 42 and thence downward through the tubular shaft 17 and provided at its lower end with a weight 44, the cables being extended at a point above the shaft 17 over guide-rollers 45 and journaled upon the frame 11. From this construction it will be seen that as the wind force varies the blades of both wheels will be simultaneously and automatically thrown into the wind by the springs 30 or out of the wind through the weighted cable 43, and the mechanism actuated thereby thus automatically governing the speed of shaft 12 and driving shaft 17 at a uniform speed. It is also apparent that owing to the wind-wheel sails being disposed horizon-

tally and having their pivots arranged adjacent to their forward ends they will swing properly to the wind without the assistance of a vane and that because of the secondary wheel 14 being of smaller size the wind will not be obstructed in its passage to the main wheel, and the latter will exert the greatest amount of force for maintaining the blades in proper relation to the wind.

Applied to the forward end of shaft 12 is a weight 46 for properly balancing the wheels 14 and 13, and hence the shaft.

From the foregoing it will be seen that I produce a device of comparatively simple construction which will be efficient in operation and one which is admirably adapted for the attainment of the ends in view; but I do not limit myself to the precise details herein set forth, inasmuch as minor changes may be made therein without departing from the spirit of the invention.

Having thus described my invention, what I claim is—

1. In a device of the class described, the combination with a shaft, of a wind-wheel mounted thereon and provided with pivoted sails, said sails being movable on their pivots to active or inactive position, springs acting upon the blades for maintaining them in one of said positions, rock-shafts acting upon the sails to move them to the other position, and means for automatically operating the rock-shafts.

2. In a device of the class described, the combination with a shaft, of a wind-wheel mounted thereon and provided with pivoted sails, said sails being movable on their pivots to active or inactive position, springs acting upon the sails to maintain them in one of said positions, rock-shafts acting upon the sails to move them to the other position, a collar slidable on the shaft, operative connections between the collar and rock-shafts for actuating the latter, and means for automatically operating the collar.

3. In a device of the class described, the combination with a shaft, of a wind-wheel mounted thereon and provided with pivoted sails, said sails being movable on their pivots to active or inactive position, springs acting upon the sails to maintain them in one of said positions, rock-shafts acting upon the sails to move them to the other position, a collar slidable on the shaft, operative connections between the collar and rock-shafts for actuating the latter, a pivoted lever connected with the collar, and a weighted connection engaged with and automatically actuating said lever.

4. In a device of the class described, the combination with a shaft, of a wind-wheel mounted thereon and provided with pivoted sails, said sails being movable on their pivots to active or inactive position, springs bearing upon the blades at one side of their pivots for

maintaining them yieldably in one of said positions, rock-shafts acting upon the blades at the opposite sides of their pivots to move them against the action of the spring to the
5 other position, and means for automatically operating the rock-shaft.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES J. JONES.

Witnesses:

CHESTER A. LINDSLEY,
ROBERT W. LESHER.