No. 793,733. PATENTED JULY 4, 1905.

J. P. MÜLLER.

WINDMILL.

APPLICATION FILED AUG. 31, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

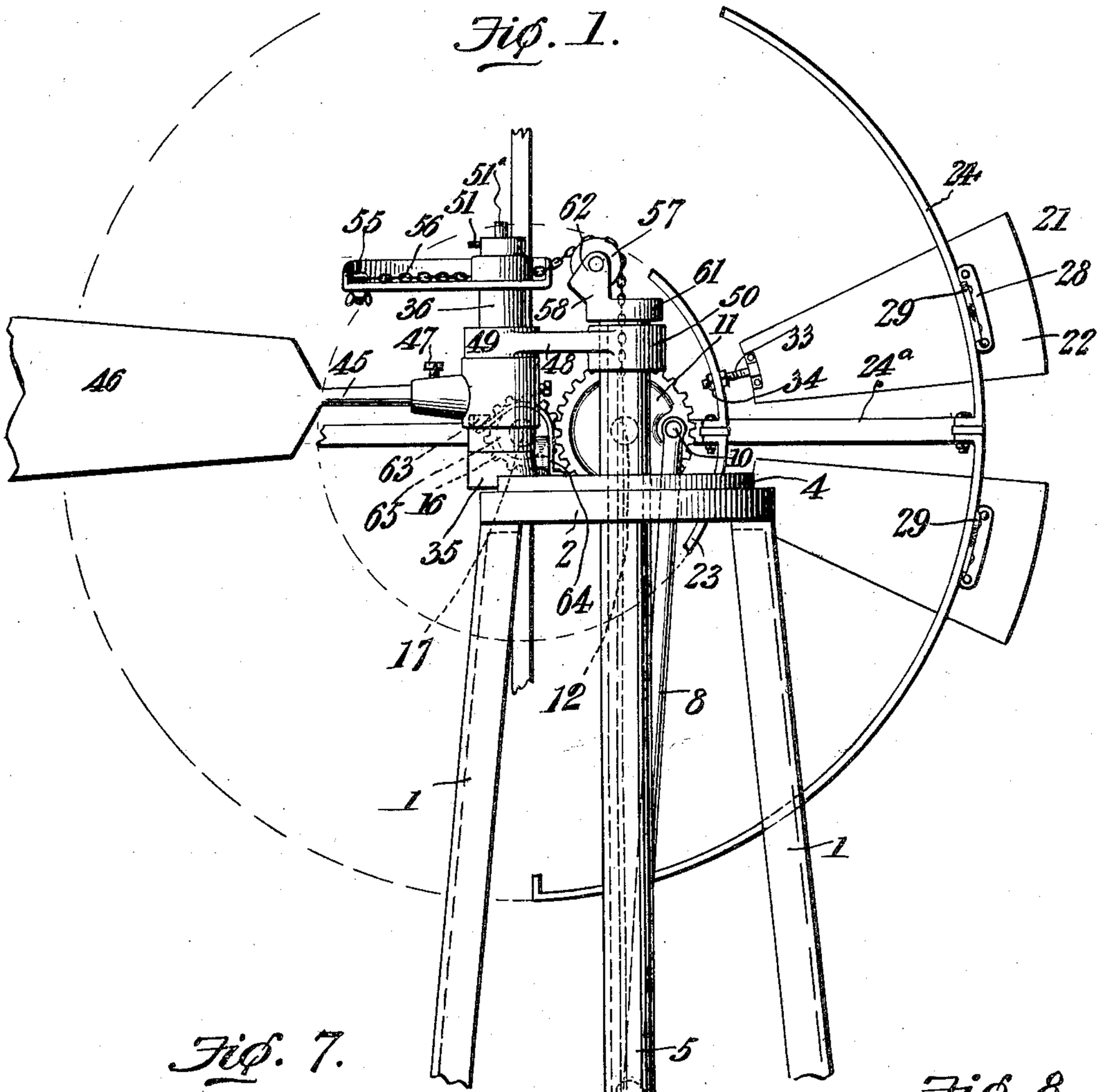


Fig. 7.

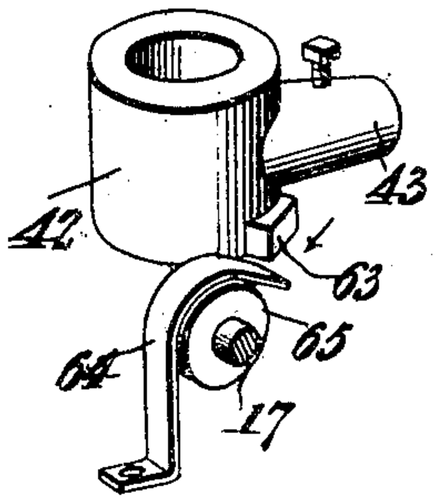
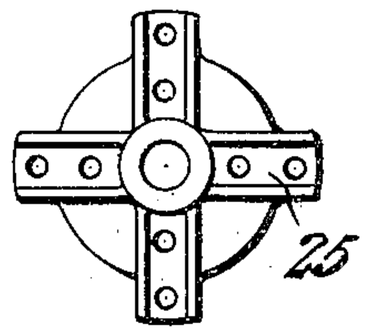


Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 2.

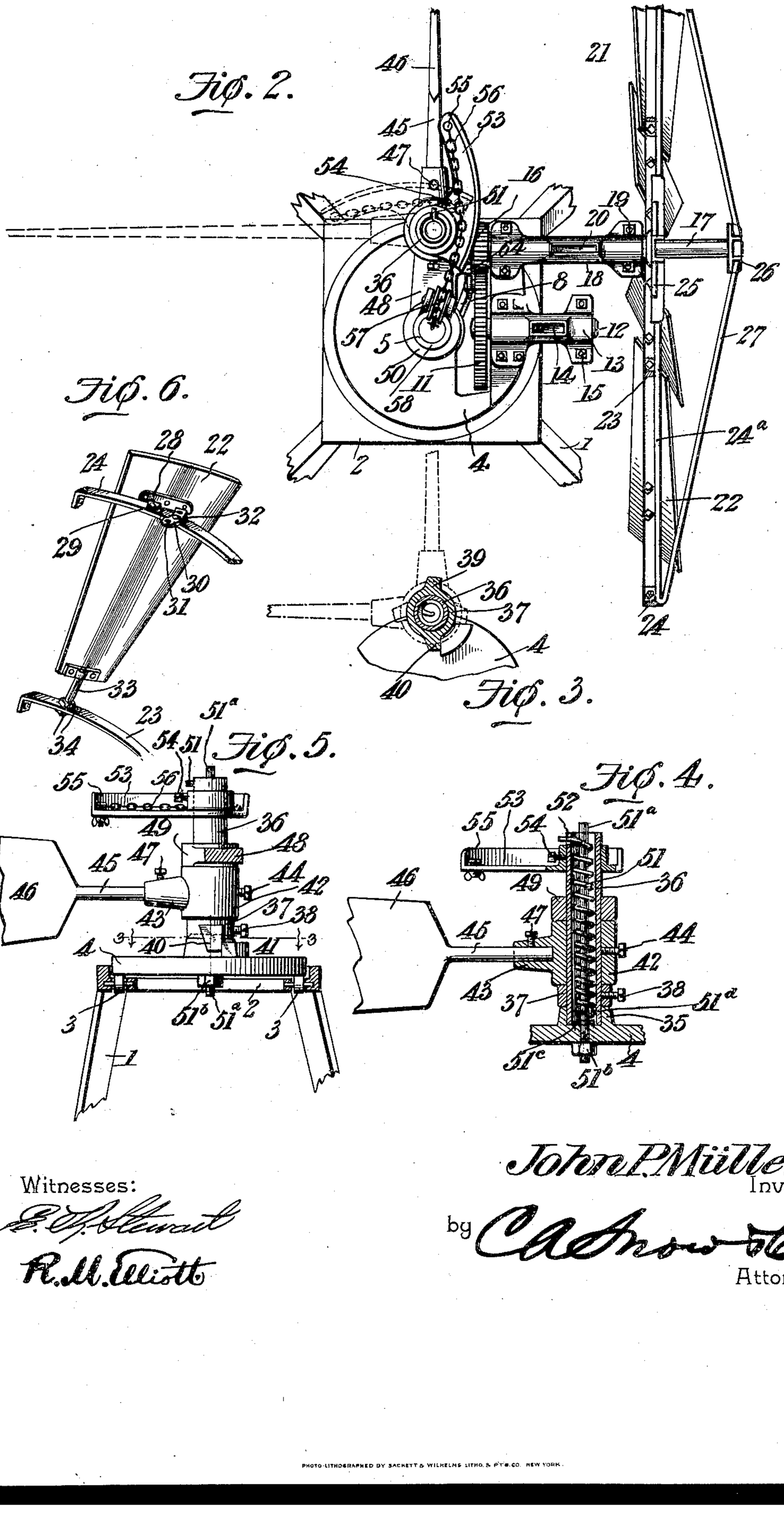

Fig. 6.

Fig. 3.

Fig. 5.

Fig. 4.

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No. 793,733. Patented July 4, 1905.

UNITED STATES PATENT OFFICE.

JOHN P. MÜLLER, OF FREEPORT, ILLINOIS, ASSIGNOR OF ONE-HALF TO WILMER S. LAMB, OF FREEPORT, ILLINOIS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 793,733, dated July 4, 1905.

Application filed August 31, 1904. Serial No. 222,863.

To all whom it may concern:

Be it known that I, JOHN P. MÜLLER, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented a new and useful Windmill, of which the following is a specification.

This invention relates to windmills.

The object of the invention is to present a windmill having a novel arrangement of pitman-rod-actuating and vane-controlling mechanism, all of the parts being constructed and combined in such manner as to reduce the number of elements employed to a minimum, with the least weight to secure the greatest strength, to render repairs easy of accomplishment, to minimize liability of breakage, and generally to improve the operative mechanism of a windmill of the character hereinafter described.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a windmill, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in elevation exhibiting the parts of the windmill when the same is out of the wind. Fig. 2 is a view in plan exhibiting in full lines the position of the vane when the wheel is out of the wind and in dotted lines its position when the wheel is in the wind. Fig. 3 is a sectional detail view of a portion of the vane, showing more particularly the mechanism for limiting its movement in both directions. Fig. 4 is a sectional detail view of a portion of the vane and certain mechanism coacting therewith. Fig. 5 is a view in elevation, partly in section, showing the roller-ring, turn-table, and the means for actuating the vane to move into and out of the wind and also for stopping the vane when moved to its limit in one direction. Fig. 6 is a detached detail view of one of the blades, showing the manner in which it is adjustably connected with its rings. Fig. 7 is a fragmentary detail view showing the brake mechanism combined with the vane-casting for stopping the rotation of the wheel. Fig. 8 is an enlarged detail view of the wheel-spider.

Referring to the drawings, 1 designates the frame-bars for supporting the operative mechanism of the windmill, the same being herein shown as constructed of angle-iron and as four in number, it being understood, of course, that this number may be increased if found necessary or desirable. Upon the upper ends of these bars is secured the roller-ring 2, which, as clearly shown in Fig. 5, is an annulus, the rollers 3 of which are disposed near its periphery. The rollers are disposed below the upper edge of the ring in order to keep the turn-table 4 in coöperative relation with the rollers. The turn-table is provided with a central orifice through which projects the main tube 5, in which works the pump-rod 6, the lower end of which connects with the pump in the usual or any preferred manner. The tube is provided at one side with a longitudinal slot 7, through which projects the lower end of the pitman-rod 8, and is connected with the pump-rod by a pivot 9. (Indicated by dotted lines in Fig. 1.) The upper end of the pitman-rod is connected with a wrist-pin 10, carried by a gear-wheel 11, mounted upon a stub-shaft 12, working in a journal-box 13, carried by the turn-table, the upper member of the journal-box being provided with an oil-cup 14, as usual, and being secured to its lower member through the medium of bolts 15, the lower member being preferably integral with the turn-table. The gear-wheel 11 meshes with a pinion 16, carried by the wheel-shaft 17, the said shaft being mounted in a journal-bearing 18, the lower member of which is by preference integral with the turn-table and the up-

per member being combined therewith through the medium of bolts 19, the said upper member having an oil-cup 20, as usual.

Upon the shaft 17 is mounted a wind-wheel, (designated generally 21,) which consists of a plurality of blades 22 of any preferred contour and combined with wheel-rings 23 and 24, which by preference are made in sections and bolted or otherwise connected with the wheel-spokes 24^a, of which there may be any preferred number, in this instance four, the inner ends of the spokes being secured in a spider 25, keyed or otherwise secured to the wheel-shaft. The shaft 17 projects beyond the spider 25 and carries at its outer end a second spider 26, which connects the inner ends of the wheel-braces 27, the outer ends of which are connected in any preferred manner with the spokes 24^a. In order to vary the pitch of the blades with relation to the rings, there is provided a novel form of adjusting mechanism therefor, comprising a plate 28, which is riveted or otherwise secured to the rear side of each blade and is provided with a lug 29, which is pivotally connected with the ring 24, as clearly shown in Fig. 6. The plate further carries near one end a curved arm 30, provided with a plurality of orifices 31, and these orifices are designed to be engaged by a bolt or rivet 32, secured in any suitable manner to the ring 24. It will be seen that by removing the bolt 32 the blade may be pitched at any desired angle with relation to the ring and be held at this adjustment. As herein shown, there are but three orifices provided in the arm 30; but, as will be obvious, this number may be increased to extend the range of adjustment of the blades, and as this will be understood detailed illustration is omitted. The inner ends of the blades are connected with the ring 23 through the medium of a stem 33, the end of which passes through the ring and is held combined therewith by nuts 34, disposed on the opposite sides of the ring.

The turn-table is provided eccentrically of the tube-orifice with a hollow boss 35, Fig. 4, in which is loosely mounted one end of a section of tubing 36, constituting the vane-standard, and upon this standard and adjacent to the boss is a vane-stop 37, the same consisting of a collar held combined with the standard by a bolt 38 and provided with two lugs 39 and 40, Fig. 3, which are adapted alternately to engage with a stop 41, integral with or secured to the turn-table 4. Disposed above the vane-stop is a vane-casting comprising a collar 42 and a tubular extension 43, projected at right angles to the collar, the collar being held against rotation upon the standard by a jam-bolt 44. The extension 43 receives the shank 45 of the vane 46, which may be of any desired construction, the shank being held combined with the extension by a jam-bolt 47. To hold the standard against any lateral movement under the strains to which it is subjected in use, there is provided a vane-brace 48, consisting of a casting provided at each of its terminals with a collar, the collar 49 being loosely mounted upon the vane-standard and the collar 50 being mounted upon the upper end of the main tube 5. In order to hold the vane in position to keep the wheel in the wind, there is provided a spiral or coil spring 51, through which extends a rod 51^a, the lower terminal of which projects through the turn-table 4 and carries a nut 51^b for clamping it in position, a pin or stop 51^c, projecting through the rod and bearing upon the upper side of the turn-table, serving to prevent the rod from being drawn therethrough. The lower terminal of the spring is secured to the rod by a bolt 51^d, and its upper terminal projects through a slot 52 in the vane-standard 36. Should it be desired any time to increase the tension of the spring 51, the nut 51^b will be loosened and the rod turned by any suitable implement until the spring is placed under the requisite tension, and the nut is again tightened, thereby positively holding the rod against rotation. It will be seen from this construction that when the vane is turned to the position shown in full lines in Fig. 2 the spring will be placed under tension and that when the vane is released the spring will cause it automatically to resume a position at right angles to the face of the wheel, as shown by dotted lines in Fig. 2. To effect turning of the vane-standard, and with it the vane, there is provided a chain-casting 53, clearly shown in Fig. 2, the same comprising a flanged curved arm mounted upon the upper end of the vane-standard and held combined for rotation therewith by a jam-bolt 54. To the upper side of the outer end of the casting is secured in any suitable manner, as by a bolt 55, one end of a chain 56, the free portion of which is passed over a sheave 57, carried by a casting 58, mounted upon the upper end of the tube 5, and thence down into the tube, the depending portion of the chain having connected with it a rope or cable 59, which reaches to the ground. It will be seen that upon draft being applied to the rope 59 the casting 53 will be moved at right angles to its normal position, thereby bringing the vane to the proper position to hold the wheel out of the wind. When the parts are in this position, the rope will be held against loosening by being wrapped around a cleat or combined with any other holding device; but immediately upon being released the spring 51 will then perform its function and cause the vane to return to the position shown by dotted lines in Fig. 2. The sheave-casting, to which reference has been made, comprises a collar 61, suitably secured to the upper end of the tube and provided with a pair of ears 62, between which the sheave is journaled. In order to cause

the wheel to be checked automatically when thrown out of wind, the vane-casting 42 has combined with it a lug 63, as shown in Fig. 7, and this is designed to engage a spring-brake 64, which latter partially encircles a roller 65, carried by the wheel-shaft 17, the lower end of the spring 64 being secured in any suitable manner to the turn-table. While this form of brake mechanism is exceedingly simple in construction, it will be found thoroughly effective in use and in case of damage or breakage may readily be replaced.

From the foregoing description it will be seen that although the machine of this invention is exceedingly simple in construction it combines in a practical and feasible manner all the elements necessary to produce a thoroughly-effective machine and, further, that provision is made for ready repairs should the necessity therefor arise.

Having thus fully described the invention, what is claimed is—

1. In a windmill, a turn-table, a main tube projecting therefrom, a vane-standard projecting from the turn-table, a vane-carrying casting movable with the standard and, means disposed interiorly of the standard to hold the vane normally in operative position.

2. In a windmill, a turn-table, a main tube projecting therefrom, a vane-standard projecting from the turn-table, a vane-carrying casting movable with the standard, means disposed interiorly of the standard to hold the vane normally in operative position, and means for holding the vane in inoperative position.

3. In a windmill, a turn-table, a main tube projecting therefrom, a vane-standard projecting from the turn-table, a vane-carrying casting movable with the standard, means disposed interiorly of the standard to hold the vane normally in operative position, an arm carried by the standard, and a flexible connection secured at one end to the arm and having its other end extending to the ground.

4. In a windmill, a turn-table, a main tube projecting therefrom and carrying at its upper end a sheave, a vane-standard carried by the turn-table, a vane-carrying casting movable with the standard, a brace connecting the tube and the standard, an arm carried by the standard, and a chain connected with the arm and passed over the sheave and to the ground, a portion of the chain being disposed within the tube.

5. In a windmill, the combination with a roller-ring, of a turn-table mounted thereon and provided with bearings, a wheel-shaft mounted in one of the bearings and carrying a pinion, a stub-shaft mounted in the other arm and carrying a gear-wheel meshing with the pinion, a wrist-pin carried by the gear-wheel, a pitman-rod connected with the wrist-pin, a main tube within which a portion of the pitman-rod is housed, said rod being connected with the pitman-rod, a vane-standard carried by the turn-table, a vane-carrying casting rigid with the standard, means for limiting the movement of the vane in both directions, a brace connecting the upper end of the main tube and the standard, a sheave operatively supported by the upper end of the tube, an arm carried by the standard, and a flexible element having one end connected with the arm and the remaining portion passed around the sheave, through a portion of the length of the tube and thence to the ground.

6. In a windmill, a turn-table comprising a socket, a hollow vane-standard mounted within the socket, a vane operatively connected with the standard, a spring housed within the standard for actuating the same, and means for adjusting the tension of the spring.

7. In a windmill, a turn-table provided with a socket, a vane-standard mounted within the socket, a vane operatively connected with the standard, a bar projecting through the standard and secured to the turn-table, and a spring having one end secured to the bar, and its other end connected with the standard.

8. In a windmill, a turn-table provided with a socket, a vane-standard mounted within the socket, a vane operatively connected with the standard, a bar projecting through the standard and secured to the turn-table, a spring having one end secured to the bar and its other end connected with the standard, and mechanism to hold the vane out of operative position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN P. MÜLLER.

Witnesses:
W. N. CRONKRITE,
C. B. COURTNEY.