

No. 804,684.

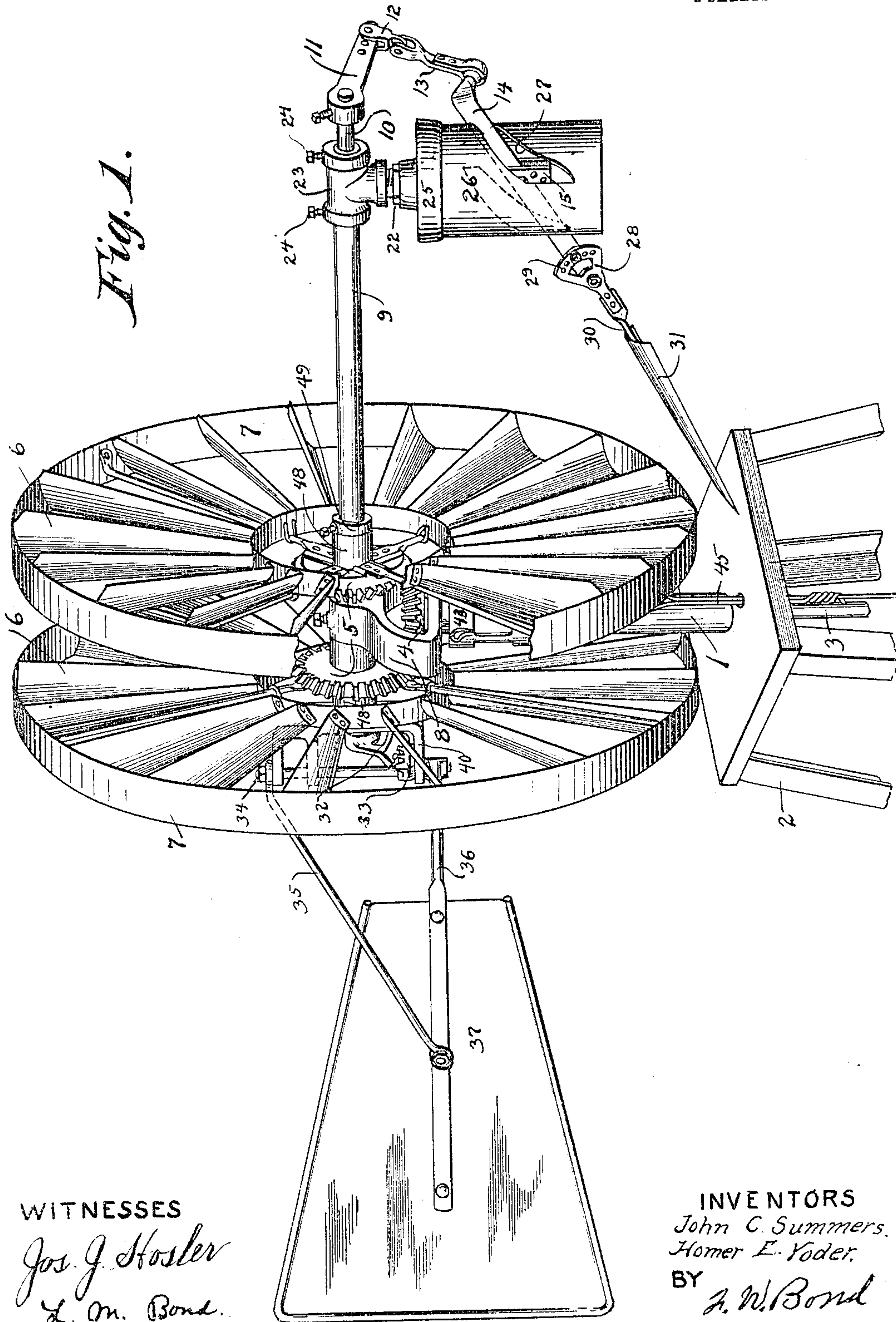
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J. C. SUMMERS & H. E. YODER.

WINDMILL.

APPLICATION FILED MAY 25, 1905.

2 SHEETS—SHEET 1.



WITNESSES

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INVENTORS

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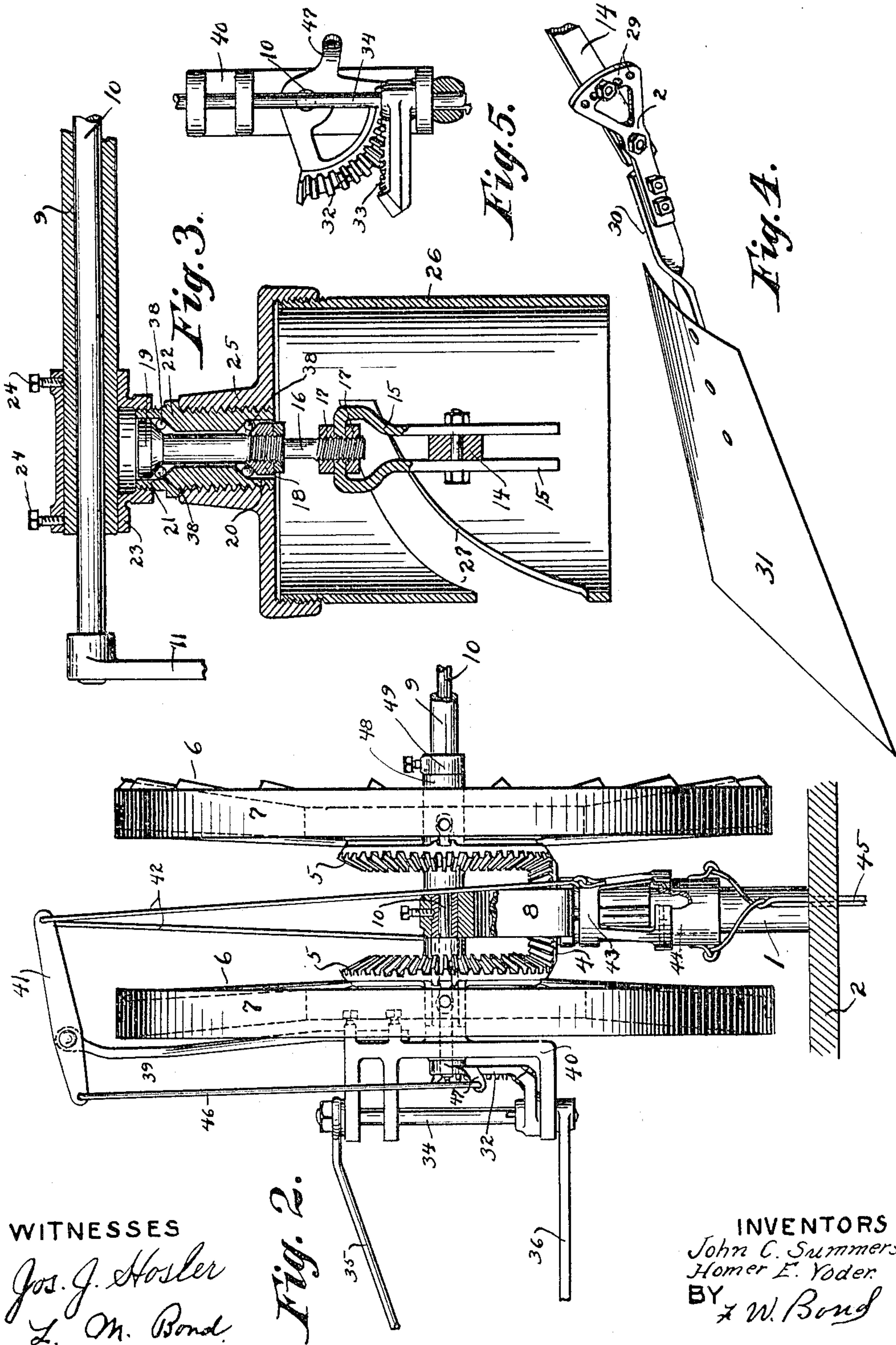
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Fig. 2.

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# UNITED STATES PATENT OFFICE.

JOHN C. SUMMERS AND HOMER E. YODER, OF MOUNTHOPE, OHIO.

## WINDMILL.

No. 804,684.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed May 25, 1905. Serial No. 262,138.

*To all whom it may concern:*

Be it known that we, JOHN C. SUMMERS and HOMER E. YODER, citizens of the United States, residing at Mounthope, in the county of Holmes and State of Ohio, have invented certain new and useful Improvements in Windmills; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the figures of reference marked thereon, in which—

Figure 1 is a perspective view of wind-wheels, showing the same properly mounted and connected together with the different parts pertaining to the governing of the wheel. Fig. 2 is an edge view of the wind-wheels proper, showing the shaft-supporting head in section and illustrating the hand regulating devices. Fig. 3 is an enlarged view of the regulating-blade mechanism, showing a transverse section of the regulating-arm and illustrating the parts properly connected to the fixed hollow shaft. Fig. 4 is a detached view of the regulating-blade and the manner of connecting the same to its arm. Fig. 5 is a view showing the vane-regulating gear and shaft.

The present invention has relation to wind-mills and to that part of a windmill designed to regulate the speed; and it consists in the novel construction hereinafter described, and particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, 1 represents the post or support, which is securely connected in any convenient and well-known manner to the top of the frame 2. The post 1 is formed hollow and is so formed for the purpose of receiving the vertical shaft 3, to the top or upper end of which vertical shaft is attached the gear-wheel 4, which gear-wheel meshes with the gear-wheels 5, which gear-wheels are fixed to and rotate with the wind-wheels 6, which wind-wheels may be of the form shown in the drawings or they may be differently formed without departing from the nature of our invention. Owing to the fact that the wind-wheels within themselves form no particular part of the present invention except for the purpose of preventing the wind from striking the blades of the wheels when the wheels are edge to the wind, said wheels are provided with the bands 7,

which bands act as wind-brakes to the blades of the wheels.

To the post or support 1 is attached or formed integral therewith the head 8, which head is for the purpose of forming a support to the various parts of the windmill proper and to which head is securely fixed the hollow bar or shaft 9, which hollow shaft is extended in one direction to considerable length and is so extended for the purpose hereinafter described. Within the hollow shaft is located the shaft 10, to the outer forward end of which is securely attached the arm 11, and to which arm is connected the yoke 12, and to said yoke is attached the link 13, said link being pivotally attached to the regulating-blade arm 14, which regulating-blade arm is pivotally attached to the bars 15, which bars are joined together at their top or upper ends, and to the top or upper joined ends of the bars 15 is attached the shaft 16 by means of the nuts 17 or their equivalents. Upon the shaft 16 is located the bearing-nut 18, and the top or upper end of the shaft is provided with the bearing-head 19, which bearing nut and head are located in the bearing-sockets 20 and 21, which bearing-sockets are formed in the head-connecting thimble 22.

To the thimble 22 is attached the connecting-head 23, which connecting-head is securely fixed to the shaft or rod 9 by means of suitable set-screws 24 or their equivalents. To the bottom or lower portion of the thimble 22 is connected the cap 25 and to which cap is connected the housing 26. The housing 26 is preferably cylindrical in cross-section and is for the purpose of inclosing the bars 15 and the lower portion of the shaft 16 and is also for the purpose hereinafter described. For the purpose of preventing any accumulation from the freezing of water the housing 26 is closed at its top or upper end by the cap 25 and open at its bottom or lower end. The housing 26 is provided with the curved slots 27, which curved slots are located diametrically opposite each other and through which slots the blade-arm 14 is extended, as illustrated in Fig. 1.

To the inner or wheel end of the blade-arm 14 is attached the head 28, which head is provided with a series of apertures 29, which apertures are for the purpose of changing the angularity of the blade-holding stem 30, to which blade-holding stem is attached the regulating-blade 31. The shaft 10, to which



the arm 11 is attached, is extended through the hollow shaft 9 and continued beyond the rear wheel 7, and to the rear end of said shaft is attached the toothed segment 32, which  
 5 toothed segment meshes with the toothed segment 33, which segment is securely attached to the vane-shaft 34, to which shaft is securely attached the vane-holding rods 35 and 36, which rods support and hold the vane  
 10 37. The regulating-blade 31 is weighted, so that its normal position will be that illustrated in Fig. 1, and when in the position illustrated in Fig. 1 the vane 37 will be parallel with the current of wind, or substantially so,  
 15 and the wheels practically at right angles to the current of wind and to the vane; but when the velocity of the wind is excessive it will have a tendency to elevate the regulating-blade 31, thereby turning the blade-arm  
 20 14 upon its pivotal point, which in turn depresses the rear end of said arm and rocks the shaft 10 through the intermediate connections between said shaft and the arm 14, which rocking movement rotates the toothed  
 25 segments 32 and imparts rotary movement to the toothed segment 33 and rocks the vane-shaft 34, thereby throwing the vane into wind and the wheels out of wind, thereby regulating the speed of the wheels. It  
 30 will of course be understood that the regulating-blade 31 will act as a governor to hold the wheels at the proper angle with reference to the wind-current. It will be understood that when the vane 37 is brought into wind  
 35 the different parts of the windmill carried by the support 1 will be rotated around a vertical center or axis, and when so rotated the housing 26, together with the different parts carried thereby, will have a planetary  
 40 movement around or partially around the vertical axis of the windmill-head of the windmill proper. For the purpose of allowing the regulating-blade 31 to remain parallel with the current of wind, or substantially so, the  
 45 curved slots 27 are provided, which curved slots allow the arm 14 to partially revolve in a horizontal plane during the time it is rocked in a vertical plane by the current of wind. It  
 50 will be understood that the regulating-blade 31 will fall automatically when not acted upon by an excessive current of wind or when the velocity of the wind is normal or below, and for the purpose of allowing the arm 14 to  
 55 move in a horizontal plane the bars to which the arm is pivoted are suspended by the shaft 16, and for the purpose of reducing the friction of said shaft the ball-bearings 38 are provided.

In use it is frequently desirable to set the  
 60 wheels 7 out of wind independent of the regulating-blade 31, and in order to accomplish this we provide mechanism by which the vane 37 can be brought at an angle to the current of air, which mechanism consists in  
 65 an upright support 39, held in fixed position

with reference to the bracket 40, to which upright support is pivotally attached the rock-bar 41, to one end of which rock-bar are connected the rods 42, which rods extend  
 70 downward and are connected to the sliding head 43, which sliding head is swiveled to the head 44, which heads 43 and 44 are adapted to move vertically upon the support 1. To the head 44 is attached the pull-rod 45, which  
 75 pull-rod extends downward a sufficient distance to be easily reached by a person standing upon the ground or platform. To the opposite end of the rock-bar 41 is attached the rod 46, the bottom or lower end of which is attached  
 80 to the arm 47, so that when the pull-rod 45 is drawn downward it will elevate the rod 46, and by means of the toothed segments the vane 37 will be brought at an angle to the current of air, and thereby turn the wheels 7  
 85 out of wind and out of action by bringing the wheels into position so as to bring their axes at right angles to the current of air.

It will be understood that the wheels 6 are to be provided with the hubs 48, which hubs are mounted upon the hollow shaft 9 and  
 90 held in proper position by means of the head 8 and the collars 49.

It will be understood that the blades of the wind-wheels should be set at opposite angles, so that the wheels will rotate in opposite di-  
 95 rections, thereby causing the wheels 5 to rotate in opposite directions and transmit their power to the gear-wheel 4 and the power-shaft 3.

Having fully described our invention, what  
 100 we claim as new, and desire to secure by Letters Patent, is—

1. In a windmill, the combination of a horizontal hollow shaft having mounted thereon  
 105 wind-wheels, said wheels provided with blades located at opposite angles, gear-wheels rotatable in opposite directions with the opposite rotations of the wind-wheels, a power-shaft provided with a gear-wheel meshing with the  
 110 oppositely-rotating gear-wheels upon the hollow shaft, a shaft located in the hollow shaft and provided with an arm, a regulating-blade arm pivotally attached to vertical rotatable  
 115 bars suspended by a rotatable shaft, and the shaft located within the hollow shaft upon which the wind-wheels are mounted, a regulating-blade secured to the pivoted arm, a vane, and means for operating the vane by the movement of the regulating-blade, substantially as and for the purpose specified.  
 120

2. In a windmill, the combination of a hollow shaft having suspended therefrom a  
 125 head, a thimble suspended by the head, a housing and a cap for said housing connected to the thimble, a rotatable shaft mounted in the thimble, bars suspended by the rotatable  
 130 shaft, a blade-arm pivotally attached to the suspended arms, and the arms extended through curved slots in the housing, wind-wheels mounted upon the hollow shaft, and



rotatable in a vertical plane, a vane, and means for operating the vane by the movement of the regulating-blade, substantially as and for the purpose specified.

5 3. In a windmill, a post supporting a head, a hollow shaft carried by the head, wind-wheels mounted upon the shaft and rotatable in opposite directions, a gear-wheel secured to a power-shaft and meshing with the  
10 gear-wheels carried by the wind-wheels, and a regulating-blade fixed to a pivoted arm and the pivoted arm rotatable in a vertical plane, a housing provided with curved slots, and the blade located through the slots, a vane,  
15 and means for operating the vane, by the movements of the regulating-blade, substantially as and for the purpose specified.

4. In a windmill, the combination of a head, said head having connected thereto a  
20 hollow shaft, wind-wheels mounted upon the

hollow shaft, a power-shaft and means for imparting rotary motion to the power-shaft from the wind-wheels, a regulating-blade suspended from the hollow shaft and pivotally attached, a shaft located in the hollow shaft, 25 means for rocking the shaft by the movements of the regulating-blade, a vane, and means for imparting movement to the regulating-vane by the movement of the regulating-blade, substantially as and for the purpose specified. 30

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

JOHN C. SUMMERS.  
HOMER E. YODER.

Witnesses:

CELSUS POMEREUE,  
ORA POMEREUE.