

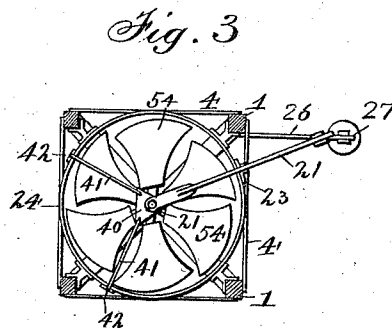
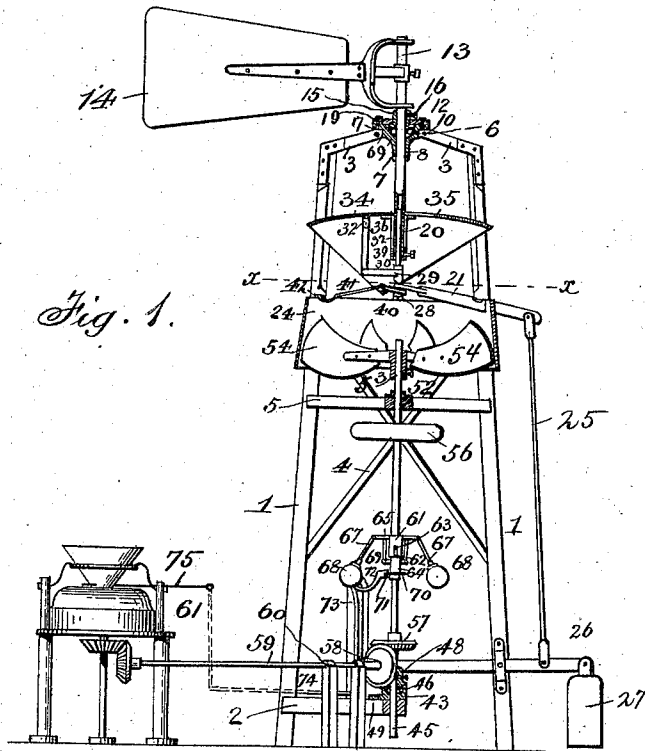
(No Model.)

2 Sheets—Sheet 1.

A. G. OLSON & J. S. LINDQUIST.
WINDMILL.

No. 576,325.

Patented Feb. 2, 1897.



Witnesses.

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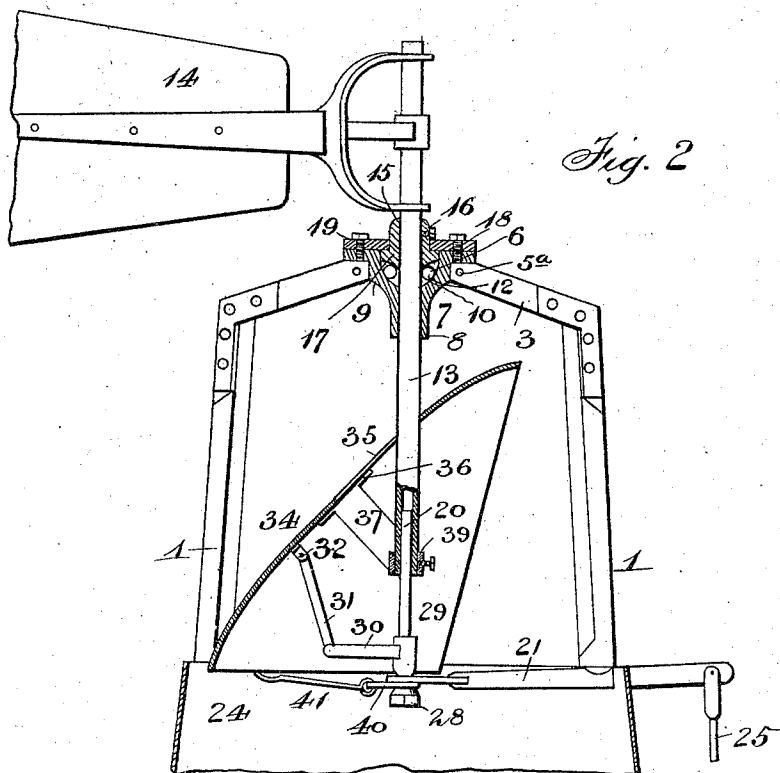


Fig. 2

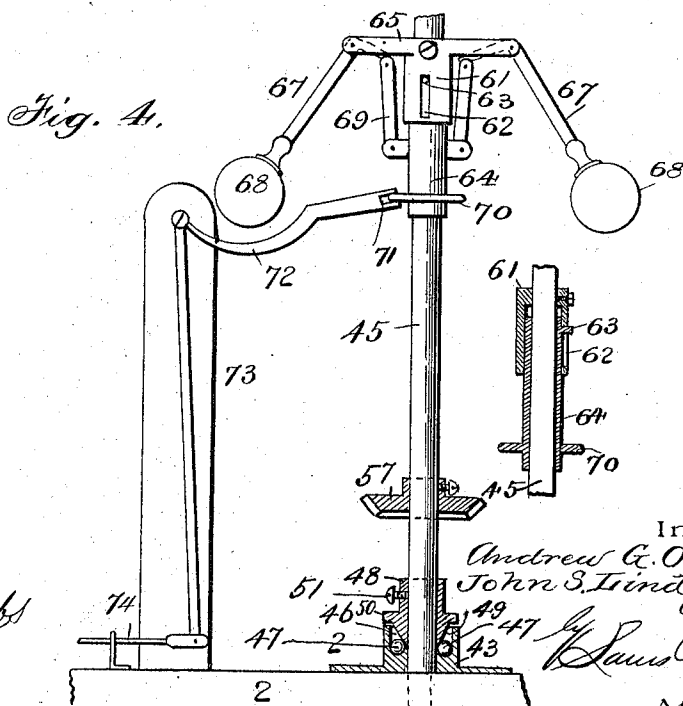


Fig. 4.

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UNITED STATES PATENT OFFICE.

ANDREW G. OLSON AND JOHN S. LINDQUIST, OF SWEDEBURG, NEBRASKA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 576,325, dated February 2, 1897.

Application filed May 1, 1896. Serial No. 589,876. (No model.)

To all whom it may concern:

Be it known that we, ANDREW G. OLSON and JOHN S. LINDQUIST, citizens of the United States, and residents of Swedeburg, in the county of Saunders and State of Nebraska, 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 invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to windmills for pumping water and driving grist-mills and other machinery of that class or character comprising in their structure a horizontal wind-wheel inclosed within or surrounded by a casing or ring and provided with a wind-deflector for directing the wind upon the upper face or side of the wheel to operate it to rotate the main driving-shaft, to which it is secured.

The object of the invention is to improve the general construction of the apparatus, whereby we secure important advantages with respect to efficiency in use.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a central longitudinal section of a windmill constructed in accordance with our invention, the wind-deflector being turned edgewise to the wind to allow the wind to pass without operating or rotating the wind-wheel. Fig. 2 is a similar view, on an enlarged scale, showing the deflector turned down to guide the wind to the wind-wheel. Fig. 3 is a horizontal section on the line *x x*, Fig. 1. Fig. 4 is a detail view of the regulator for operating the valve of the hopper of a grinding or grist mill.

In the said drawings the reference-numeral 1 designates four inclined standards, two of which are connected together near the lower ends by a cross-bar 2. These standards are provided at their upper ends with inwardly-extending bars 3 and are braced intermediate their ends by brace-bars 4 and also by inwardly-extending bars 5. The inner ends of the bars 3 are secured by screws 5^a to lugs 6,

formed integral with a bearing-box 7, comprising the sleeve 8 and a circular portion or plate 9, formed on its upper side with a cylindrical recess 10, in which are seated a number of balls 12. The bore of the sleeve 8 is of smaller diameter than the said recess, and passing therethrough is a tubular vertical shaft 13, to the upper end of which is secured a wind-vane 14. The numeral 15 designates a short sleeve or collar loosely mounted on said shaft and secured in place by a set-screw 16, and is formed at its lower end with an annular flange 17, which rests upon the balls 12. A circular plate or disk 18 fits upon the plate 9 and engages with the said flange to hold it down upon the balls. This plate 18 is secured to plate 9 by screws 19. By this means the shaft is permitted to freely rotate while it is held against vertical movement. Fitting in the lower end of said tubular shaft is a vertically-movable rod or shaft 20, the lower end of which loosely passes through an aperture in the inner end of a horizontal lever 21, pivoted to lugs 23 of a stationary ring or drum 24, secured to the standards 1. The outer end of this lever is connected by a vertical rod 25 to a horizontal lever 26, pivoted to one of the standards 1, provided at its outer end with a weight 27.

The lower end of the rod or shaft 20 is provided with a screw-nut 28 and above the same has secured to it a collar 29, the inner end of the lever 21 being located therebetween. This collar is formed with lugs 30, to which is pivoted a link 31, the other end of which is pivoted to lugs 32, secured to a curved wind guide or deflector 34, provided at the center with an elongated slot 35, through which the tubular shaft 13 passes. This guide or deflector at each side of said slot is provided with lugs 36, to which are pivoted arms 37, the lower ends of which are pivoted to lugs 38 of a block 39, secured to the lower end of the shaft 13.

Pivoted on the shaft 20 is a plate 40, to which are pivoted radial brace-rods 41, the outer ends of which are pivoted to lugs 42, secured to the ring or drum 24. The apertures in plate 40 and lever 21, through which the shaft 20 passes, are sufficiently large to allow the plate and lever to move vertically up and down upon the shaft.

Secured to the lower cross-bar 2 is a cylin-

dricial bearing-box 43, through which passes a vertical driving-shaft 45. This box in its upper side is formed with an enlarged cylindrical recess 46, in which is seated a number
5 of balls 47. Secured to this shaft is a sleeve or collar 48, provided on its lower side with an annular flange 49, which rests upon the balls. A set-screw 51 holds this collar to the shaft.

10 The upper end of shaft 45 passes through a bearing 52, secured to the bars 5, and has secured to it a hub 53, provided with a number of inclined blades or propellers 54, forming a horizontal wind-wheel, which is located
15 within the rim or ring 24 and adapted to be rotated by the wind directed upon the upper side or face by the wind guide or deflector. A fly or balance wheel 56 is secured to the shaft 45.

20 Fixed to the driving-shaft near the lower end is a horizontal bevel-gear 57, which meshes with a vertical gear 58, secured to a shaft 59, journaled in bearings 60 and adapted to drive a grist or grinding mill 61 of any ordinary or suitable construction. The said
25 gear 58 is provided with a wrist or crank pin adapted to be connected with a pump-rod.

For the purpose of regulating the feed of the material to the grinding-mill we provide
30 a regulator constructed as follows: Secured to the driving-shaft is a sleeve 61, provided at one side with a vertical slot 62, through which projects a pin 63 on a vertically-movable sleeve 64, working on said shaft. The
35 sleeve 61 is provided with opposite lugs 65, to which are pivoted levers 67, provided at their outer ends with balls 68. These levers are pivotally connected with the sleeve 64 by means of links 69. Near the lower end sleeve
40 64 is provided with a peripheral flange or collar 70, with which engages a slot or notch 71 of an elbow-lever 72, pivoted to a post 73, secured to the cross-bar 2. The lower end of this lever is pivoted to a rod 74, which in
45 turn is connected with the sliding valve or gate 75 of the hopper of the grinding-mill, so that as the driving-shaft rotates slowly the balls will fall and operate the said elbow-lever and connections to decrease the feed-opening
50 in the hopper. On the other hand, when the driving-shaft rotates swiftly the balls will spread apart by centrifugal force, elevating the sleeve 64, operating the elbow-lever and valve or gate to allow a larger supply of grain
55 to be fed to the grinding-mill.

The operation is as follows: When the apparatus is not to be operated, the weight on the lever 26 will depress the same and the vertical rod 25, which in turn will elevate the
60 inner end of lever 21, which will raise the sleeve or collar 29 and by means of the pivoted link 31 will turn the deflector or guide to a horizontal position, or with its edge to the

wind, so that the wind will pass by the top of the ring or drum. To throw the apparatus
65 into operative condition, the inner end of lever 26 is depressed, which will depress the inner end of lever 21, depressing the collar or sleeve 29 and causing the deflector to be turned down, so that one edge will rest upon the top
70 of the ring or drum and thus deflect the wind down upon the wind-wheel, whereby the latter will be rotated.

The driving-shaft extends below the cross-bar 2 and may be provided with a pulley to
75 transmit movement to any suitable machinery.

From the above it will be seen that the vane will always keep the guide or deflector in the path of the wind by turning the tubular shaft,
80 with which the deflector is pivotally connected, as the wind shifts. The fly-wheel on the driving-shaft serves to balance the wind-wheel, so that it will run smoothly and evenly.

Having thus described our invention, what
85 we claim is—

1. In a windmill, the combination with the standards, the stationary ring or drum secured thereto, the rotatable driving-shaft and the horizontal wind-wheel secured thereto, of
90 the vertical tubular shaft, the wind-vane, the arms pivoted to the lower end of said shaft, the slotted wind guide or deflector with which said arms are connected, the links pivoted to said guide or deflector, the collar pivotally
95 connected therewith, the vertically-movable shaft to which said collar is secured working in the lower end of said tubular shaft, the nut on the end thereof, the horizontal lever pivoted to said drum, the vertical connecting-
100 rod and the horizontal operating-lever connected therewith, substantially as described.

2. In a windmill of the character described, the combination with the rotatable driving-shaft, the bevel-gear secured thereto, the intermeshing bevel-gear and the shaft to which
105 it is secured for driving a grinding-mill, of the sleeve secured to said driving-shaft formed with a slot, the vertically-movable sleeve having a pin projecting through said slot and a
110 peripheral flange at the lower end, the levers pivoted to the fixed sleeve, the balls, the links connected with said levers and pin, the elbow-lever having a notch engaging with the said
115 flange, the rod connected with the other end of said lever and the feed gate or valve of the grinding-mill connected with said rod, substantially as described.

In testimony that we claim the foregoing as our own we have hereunto affixed our signatures in presence of two witnesses.

ANDREW G. OLSON.
JOHN S. LINDQUIST.

Witnesses:

PETER ANDERSON,
CHAS. YOUNGSTEDT.