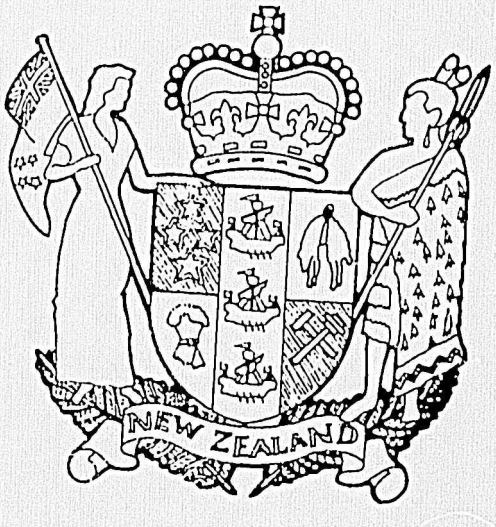


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PATENT SPECIFICATION

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10 MAR 1914
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The Patents, Designs and Trade Marks Act 1911.

COMPLETE SPECIFICATION

"AN IMPROVED WIND MILL"

WE, HENRY ERNEST COLLINS, Dairy Farmer, and HENRY GRAINGE BIGGS, Dairy Farmer, both of "Twan Loa", Elizabeth Street, Nowlands, Via Coburg, in the State of Victoria, previously of Currie Post Office, King Island, in the State of Tasmania, all in the Commonwealth of Australia, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:-

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THIS INVENTION RELATES to wind mills used generally for pumping water. Hitherto a wind mill has usually consisted of a wind wheel disposed in a vertical plane, the axis of the wheel being capable of turning in a horizontal plane by means of a tail or wing. Some of such apparatus at present manufactured are heavy in construction, of a more or less complicated nature, comparatively costly to manufacture, sometimes easily deranged or, as the wind wheel is usually rotated whenever the wind is blowing (though not necessarily pumping during such rotation) the cost of maintenance has often been unnecessarily increased.

THE OBJECT of this invention is to provide a wind mill of simple, reliable construction which will be comparatively cheap to manufacture and maintain, sensitive in operation and may be thrown out of gear and does not rotate except when required. The invention consists essentially in a series of horizontally disposed vanes which may be closed or collapsed when not in use and opened or expanded to form a wind wheel when it is necessary to pump water or the like.

BUT IN ORDER that this invention may be better understood reference will now be made to the accompanying sheet of drawings which are to be taken as part of this specification and read herewith:-

FIGURE 1 is a view of this invention, one half being in section and one half in elevation. The vanes and connections thereof which would normally appear in front of the left hand vane seen in the Figure have been omitted for convenience of illustration.

FIGURE 2 is a side view of a vane.

FIGURE 3 is a cross section on line A—A Figure 2.

FIGURE 4 is a cross section on line B—B Figure 2.

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FIGURE 5 is a plan on an enlarged scale of portion of a disc secured to the upper end of a vertical shaft, parts being omitted for convenience of illustration.

THE INVENTION INCLUDES a frame-work 2, carrying a crank shaft bearing or bearings 3, mounted in which is a crank shaft 4, having secured thereto a bevel wheel 5 from which may protrude a crank pin 6. Pivotally connected to the crank pin 6 may be a pump rod 7, of any ordinary nature. Or instead of the pin protruding from the bevel wheel a separate crank disc may be secured to the crank shaft; or the said shaft may be provided with an ordinary crank. Or any other arrangement may be used for imparting a vertical reciprocatory motion to the pump rod. A sprocket wheel may, for example, be provided upon the shaft 4 and by a suitable chain, rotate a second sprocket wheel carried by a counter shaft, the pump rod being reciprocated by the rotation of the second sprocket wheel. The gear ratios of the sprocket wheels may vary with circumstances. Gearing with the bevel wheel 5 is a bevel pinion 8 secured to the lower end of a vertical shaft 9.

The shaft 9 is mounted in a lower bearing 10 carried by the framework 2. the bearing 10 at its upper end is provided with a flange 11, having therein a ball race accommodating balls 12. Protruding from the flange 11 may be a series of rod guides or lugs 13 each having a hole therethrough.

Keyed or otherwise secured to the shaft 9, above the lower bearing 10, is a down thrust collar 14 having a flange 15 provided with a ball race. The balls 12 are accommodated in the said race as shown.

Loosely encircling the shaft 9 above the collar 14 is an upper bearing 16 having a flange 17 provided with a ball race, accommodating balls 18. Protruding from the flange 17 is a series of lugs 19 each having a hole therethrough.

Loosely encircling the shaft 9 above the upper bearing 16 is the boss 20 of a ring or disc 21. The ring or disc 21 is provided with a ball race accommodating the balls 18, as shown. Up-

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standing from the ring or disc 21 is a series of lugs 22 carrying a series of pivot pins 23.

Keyed or otherwise secured to the upper end of the shaft 9 is the boss 24 of an upper disc 25. Formed in the upper disc 25 is a series of radial slotways indicated at 26. Secured to the disc 25 at each side of each slotway 26 is an upstanding guide 27. Extending across each slotway 26 and mounted in the guides 27 thereof is a cross pin 28.

Pivotted to each cross pin 28 is the inner end 29 of a radial arm 30. Carried by each radial arm 30 is an intermediate pivot pin 31. Pivotted to each pivot pin 31 is the upper end of a link 32. The lower ends of the links 32 are pivotted to the pivot pins 23 carried by the lugs 22 of the ring or disc 21.

Carried by the outer end of each radial arm 30 is a tapered vane 33. The inner end of each vane 33 converges or is contracted as shown at 34. The outer end of each vane 33 is enlarged or expanded as indicated at 35. The vanes are preferably concave convex or rounded as shown in Figures 3 and 4. Formed through each vane 33 is a series of equalizing holes 36.

Passing through the holes in the lugs 19 of the upper bearing 16 and secured thereto by nuts or the like are the upper ends of a series of lifting rods 37. The lower ends of the rods are secured to a ring 38. Pivotally connected to the ring 38 is the upper end of a link 39 the lower end of which is pivotted to the inner end of an intermediately pivotted hand lever 40 pivotted to a pin 41 protruding from any suitable portion of the framework. Formed in the outer end of the lever is a hole indicated at 42. Adjoining the lever 40 is a quadrant 43 having a series of adjusting holes indicated at 44. The quadrant is preferably carried by the framework. Passing through the hole in the lever 40 and a corresponding

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hole in the quadrant 43 is a locking pin 45.

With this invention by means of the hand lever 40 and lifting rods 37 the upper bearing 16 and the ring or disc 21 are lifted or lowered vertically upon the shaft 9. As the ring or disc 21 rises the links 32 cause the radial arms 30 to pivot upon the pins 28 and move outwardly into a horizontal plane. As the arms move outwardly the vanes 33 thereof move correspondingly. The angle of the vanes is adjustable by means of the quadrant 43 and locking pin 45. If necessary a chain or the like may extend around and between the outer ends of the vanes to secure or stay them together when the said vanes are disposed in the horizontal plane. Upon the wind striking the vanes they rotate the upper disc 25 and with it the vertical shaft 9. The holes 36 prevent any back drag or vacuum. The shaft 9 by the bevel wheels 8 and 5 rotates the crank shaft 4 and operates any ordinary pump or the like. As the vanes rotate, the ring or disc 21 which is free upon the shaft also rotates upon the balls 18. The upper bearing 16 is prevented from creeping or rotating by means of the lifting rods 37 which pass through the rod guides 13 of the stationary lower bearing 10. The thrust collar 14 rotates with the shaft 9 upon the balls 12. When it is desired to collapse the wind wheel the hand lever 40 is operated to draw the upper bearing 16 downwardly. The ring or disc 21 resting upon the bearing 16 falls therewith and by means of the links 32 lowers the radial arms 30 and the vanes 33. The wheel is then collapsed in a manner similar to an ordinary umbrella.

HAVING NOW PARTICULARLY described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:-

1st. An improved wind mill, consisting of the combination with a vertical shaft, of a series of pivotted radial arms each carrying a vane, and means for raising and lowering the vanes to and from

the horizontal plane.

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2nd. An improved wind mill, consisting in the combination with a vertical shaft having an upper disc secured thereto, of a series of radial arms pivotted to said disc, a vane carried by each arm, and means for raising and lowering the arms and vanes in relation to the disc.

3rd. In an improved wind mill, a tapered and rounded or concave convex vane having therein a series of equalising holes the inner end of said vane converging or being constructed and the outer end thereof being enlarged or expanded.

4th. An improved wind mill, consisting in the combination with a framework, of a vertical shaft having an upper disc secured to its upper end, said disc having therein a series of radial slotways, a radial arm pivotted in each slotway, a vane secured to each arm, a link pivotted to each arm, a ring or disc loosely encircling the shaft, said links being pivotted to said ring or disc, and means for raising and lowering the ring or disc upon the shaft.

5th. An improved wind mill, consisting in the combination with a framework and a crank shaft mounted therein of a vertical shaft actuating the crank shaft, a ring or disc loosely encircling the vertical shaft, lifting rods adapted to raise and lower said disc upon the shaft, links pivotted to said disc, radial arms pivotted to said links, a concave convex or rounded vane carried by each arm and an upper disc secured to the upper end of the vertical shaft, said upper disc having a series of radial slotways therein, the radial arms being pivotted in said slotways.

6th. An improved wind mill, consisting in the combimtion with a framework and a crank shaft mounted therein, of a vertical shaft actuating the crank shaft, a lower bearing carried by the frame

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work and passing the the vertical shaft, a thrust collar secured to the shaft above said bearing, an upper bearing loosely encircling said shaft, lifting rods secured to said bearing, a ring or disc loosely encircling said shaft and resting upon the upper bearing, a series of links pivotted at their lower ends to said ring or disc, a series of radial arms pivotted to the upper ends of said links, a concave convex or rounded vane having a series of equalizing holes therein carried by each radial arm, an upper disc secured to the upper end of the vertical shaft, said disc having a series of radial slotways therein, the inner ends of the radial arms being pivotted in said slotways and upstanding guides adjoining each slotway.

7th. The improved wind mill substantially as hereinbefore described and illustrated in the annexed drawings.

Dated this 18th day of March A.D. 1914.

Baldwin & Rayward per E.F.B.

Attorneys for the Applicants

True Copy:-

Baldwin & Rayward.

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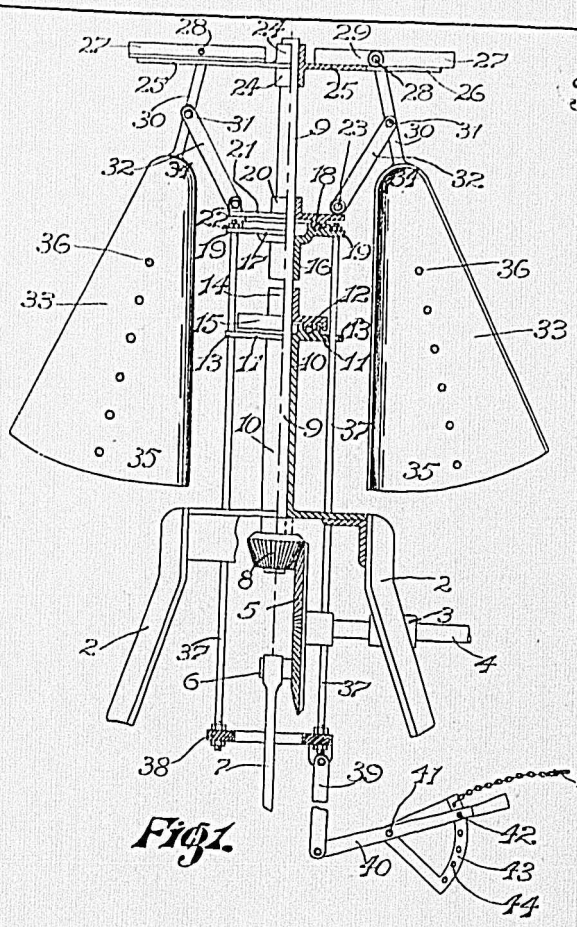


Fig 1.

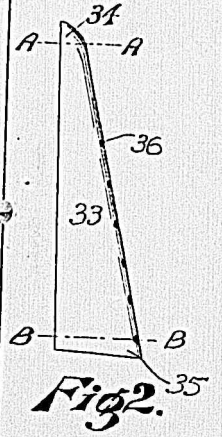


Fig 2.



Fig 3.

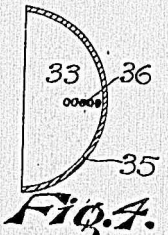


Fig 4.

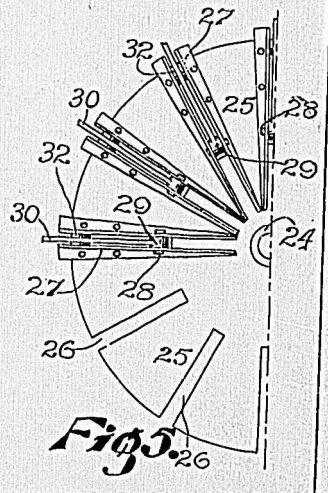


Fig 5.

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