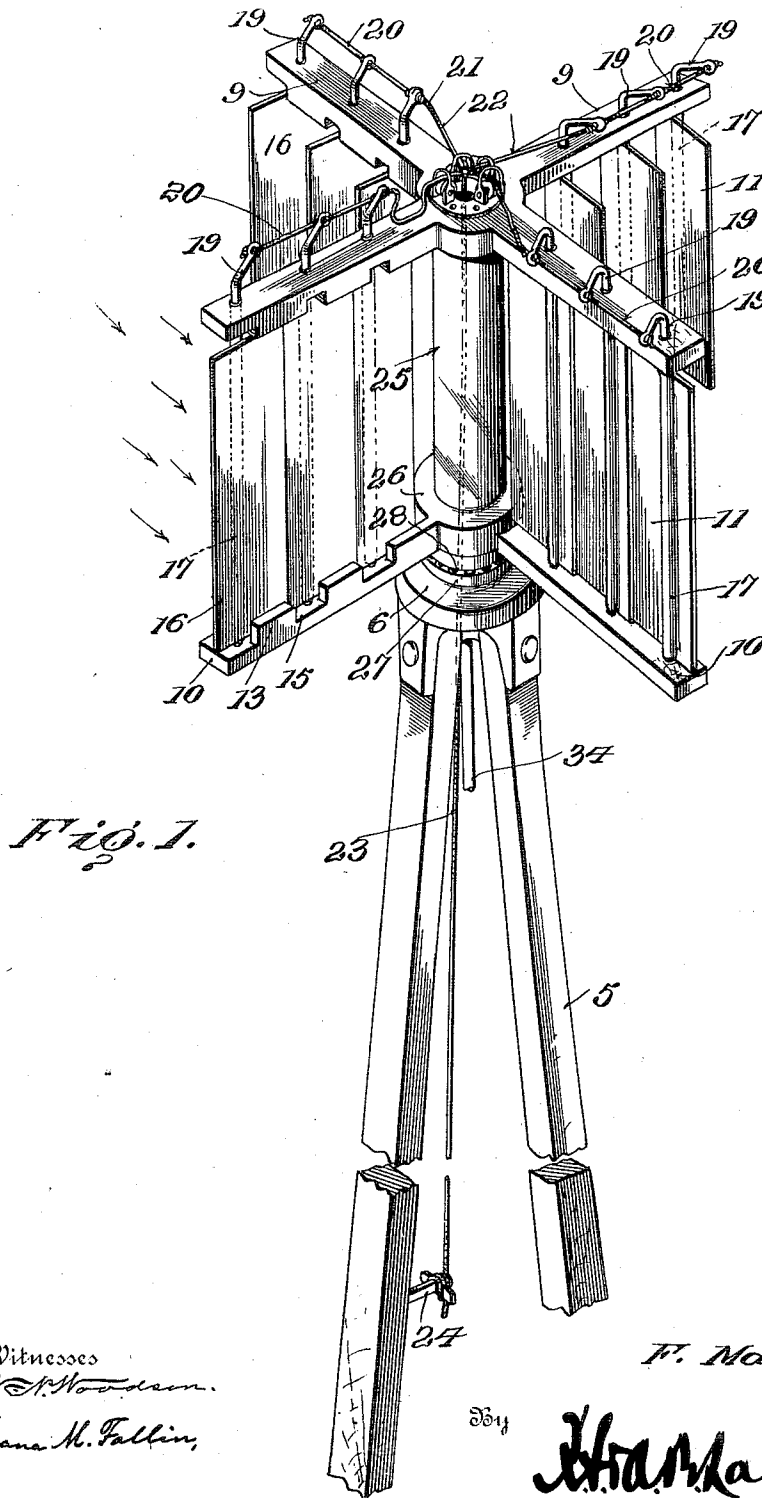


F. MANNING.
WINDMILL.
APPLICATION FILED APR. 7, 1910.

994,765.

Patented June 13, 1911.

2 SHEETS—SHEET 1.



Witnesses
W. P. Woodson.
Juana M. Fallon,

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By

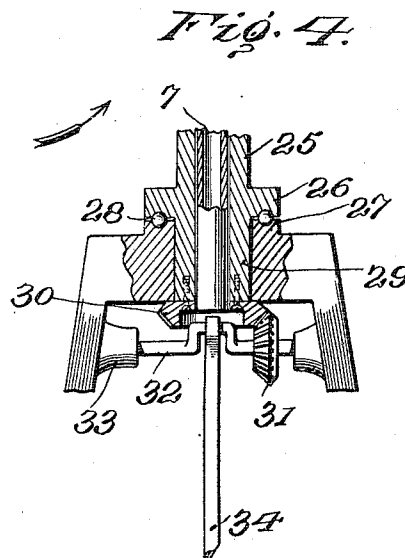
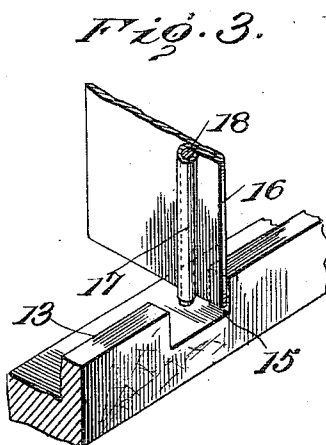
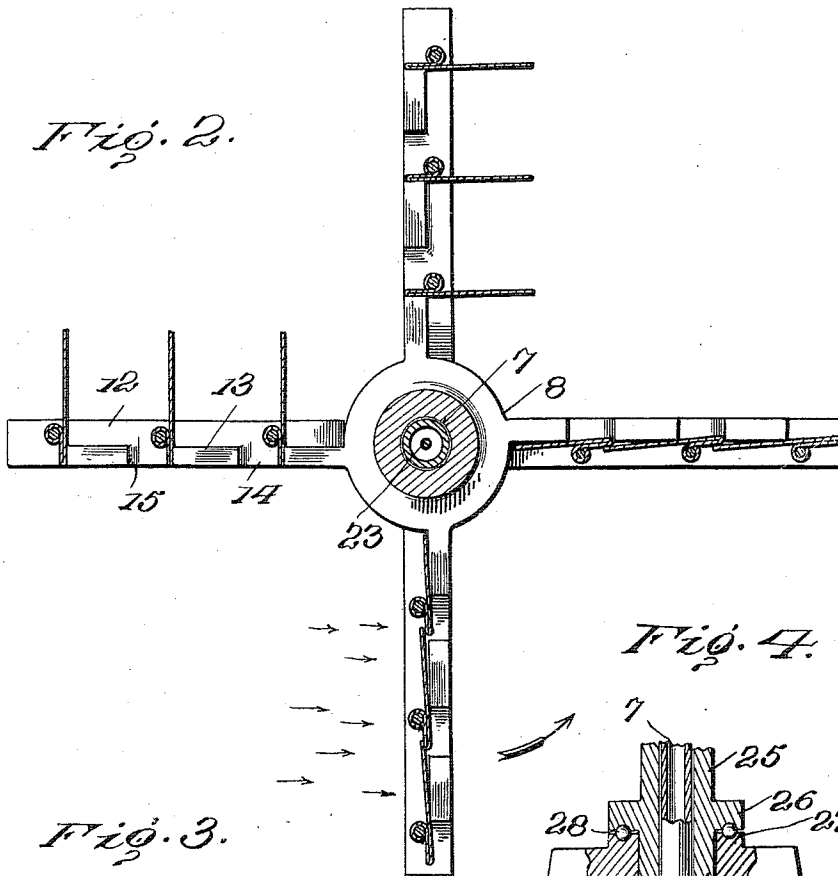
H. H. Macy, Attorney

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UNITED STATES PATENT OFFICE.

FRED MANNING, OF DIETZ, WYOMING.

WINDMILL.

994,765.

Specification of Letters Patent. Patented June 13, 1911.

Application filed April 7, 1910. Serial No. 554,050.

To all whom it may concern:

Be it known that I, FRED MANNING, citizen of the United States, residing at Dietz, in the county of Sheridan and State of Wyoming, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

This invention relates to wind mills of the horizontal wheel type.

10 The object of the invention is to provide a wind mill including a wheel having a plurality of sets of blades pivotally mounted thereon and movable alternately to open and closed positions.

15 A further object is to form the blade supporting arms with stop shoulders which serve to limit the opening and closing movement of the blades.

20 A further object is to provide means for holding the blades in open position.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

25 Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claim.

30 For a full understanding of the invention and the merits thereof, reference is to be had to the following description and accompanying drawings, in which:

35 Figure 1 is a perspective view of a wind mill constructed in accordance with my invention; Fig. 2 is a transverse sectional view of the wheel; Fig. 3 is a detail perspective view of a portion of one of the blade supporting arms, showing a blade pivotally mounted thereon; Fig. 4 is a detail vertical sectional view showing the manner of transmitting motion from the wheel to the driving shaft of a pump or other machine.

40 Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

45 The device comprises a supporting frame preferably formed of converging bars 5 having their upper ends united by a cap piece 6. Rigidly secured to the cap piece 6 is a vertically disposed shaft 7 on which is mounted for rotation a horizontally disposed wheel, indicated at 8. The wheel 8 comprises spaced upper and lower intersecting arms 9

and 10 between which are pivotally mounted a plurality of sets of blades 11. The inner faces of the arms 9 and 10 are rabbeted at 12 to produce longitudinally disposed stop shoulders 13 which serve to limit the inward swinging movement of the blades 11, there being spaced recesses 14 intersecting the shoulders 13 and defining transverse shoulders 15 adapted to bear against the adjacent blades 11 and limit the opening movement thereof. The blades 11 are each preferably formed of a single piece of metal having one longitudinal edge thereof bent upon itself at 16 and thence pressed outwardly to produce a cylindrical socket 17 on one side of the blade for the reception of a pivot pin or rod 18. The upper end of each pivot pin or rod 18 is projected above the adjacent arms 9 of the wheel and bent to produce a crank arm 19, the crank arms 19 on each arm 9 of the wheel being connected by a rod or cord 20 terminating in an eye 21. Secured to the eyes 21 are connecting cords 22, which latter are in turn connected with an operating cord or cable 23 which extends through the hollow shaft 7 for attachment to a hook or similar device 24 secured to one of the converging arms of the supporting frame.

50 The hub 25 of the wheel is provided with a laterally extending flange 26, which latter bears against a boss or enlargement 27 formed on the cap piece 6, there being anti-friction balls 28 interposed between the flange 26 and boss 27 in order to reduce friction between the parts. The hub 25 is provided with a depending cylindrical extension 29 having a bevel gear 30 rigidly secured thereto and which meshes with a bevel pinion 31 carried by a crank shaft 32. The crank shaft 32 is journaled in suitable bearings 33 and is connected in any suitable manner with a pump rod 34 so that as the wheel 8 revolves, motion will be transmitted from the wheel through the medium of the shaft 32 and rod 34 to the pump. Thus it will be seen that when the wind is blowing in the direction of the arrows indicated in Fig. 1 of the drawings, certain of the blades will be forced into engagement with the stop shoulders 13, while other blades will be retained in open position by engagement with the stop shoulders 15, the blades being successively presented to the wind as said wheel is rotated. It will of course be understood that the wheels may be made in different sizes and

provided with any number of pivotally mounted blades, without departing from the spirit of the invention.

It is to be noted that the blades are mounted on pivotal axes placed to one side of the middle line of each blade, thereby causing the blades to open and close automatically by the pressure of the wind. In the present embodiment of the invention, there are four series of blades, as clearly illustrated in the drawing. When the wheel is turning and one series of blades reaches the point from which the wind is blowing in a direct line with the wind, the pressure of the wind will close the blades and hold them closed until they reach an exact opposite point. Then the pressure of the wind opens the blades and holds them open until they reach the point where the pressure of the wind will close them. This is due to the fact that there is a greater surface on one side of the pivotal rod or axis to which the blades are secured, than there is on the other side. In the operation of the wheel two series of blades are always open, and the other two always closed. The cord, or rather the cords, (as there must be two), are not for the purpose of opening the blades, but for holding them open after they have been opened by the pressure of the wind. To force open the blades, each of which is provided with two surfaces, say

10 feet by 10 inches, would require a pull of not less than four hundred pounds and manifestly if there was the pressure of a twenty mile breeze against them, this action would be practically impossible. By securing the cord as described, the blades will be held open on the side of the wheel which is moving against the wind, and when the blades on the other side move around and are opened by the pressure of the wind, by securing a cord which is attached to them in a proper manner, to something stationary, such fans or blades will remain open.

Having thus described the invention, what is claimed as new is:

A wind mill including a support, a wheel mounted for rotation in a horizontal plane on said support, a plurality of blades pivotally mounted on the wheel and each formed of a single piece of metal having one longitudinal edge thereof bent upon itself and thence extended outwardly to produce a socket, and a pin extending through the socket of each blade and forming the pivotal axis thereof.

In testimony whereof I affix my signature in presence of two witnesses.

FRED MANNING. [L. S.]

Witnesses:

SAMUEL C. GARRETT,
FRED H. STURM.