



# UNITED STATES PATENT OFFICE.

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## WIND WHEEL.

1,415,645.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, SAMUEL HOLTERUD, a citizen of the United States, residing at Duluth, in the county of St. Louis, State of Minnesota, have invented certain new and useful Improvements in Wind Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in wind mills and particularly to governing devices therefor.

One object of the invention is to provide a windmill which is especially adapted for use in driving an electric generator for the purpose of recharging storage batteries.

Another object is to provide a governing device for a windmill which can be automatically operated or may be manually operated, the latter being arranged to lock the windwheel in operative position or in inoperative position, as desired.

Other objects and advantages will be apparent from the following description when taken in connection with the accompanying drawing.

In the drawing:

Figure 1 is an elevation of a windmill made in accordance with the present invention.

Figure 2 is an enlarged vertical longitudinal sectional view through the governor mechanism.

Figure 3 is a vertical sectional view through the wheel, showing the means for turning the shafts of the vanes.

Referring particularly to the accompanying drawing, 10 represents a supporting frame which supports the vertical central shaft 11. This shaft 11 has on its lower end portion a bevel gear 12 which meshes with a similar gear 13 on a horizontal shaft 14 which is carried by the armature of the dynamo 15. The dynamo is properly connected with the batteries to be charged, as shown at 16. The lower end of the shaft 11 is properly supported in the bearing 17, while the upper end is held in the bearing 18. Carried by the upper portion of the shaft 11 are the vertical and crossed angular frames 19, each having the horizontal rod 20 radiating from the shaft, and secured, at their outer ends, in the outer vertical sides of the said frames. These rods 20 are rota-

table, and carried rigidly on the inner end portion of each rod is an angularly extending vertical arm 21.

Secured on the vertical shaft 11, below the frames 19, for rotation with said shaft, is a collar 22, and pivotally supported on the upper side of the collar are the upwardly and outwardly extending arms 23, said arms being connected with the governor ball weights 24. A similar collar 25 is slidably mounted or splined on the shaft 11, above the collar 22, and this latter collar has the arms 26 pivotally connected thereto, the said arms being also connected to the ball weights 24. A block 27 is rigidly mounted on the shaft 11, between the collars, and connected to the said block, and to the ball weights 24, are the springs 28, which normally draw the balls inwardly, to lift the upper collar 25. The collar 25 also carries the small pulleys 29, over which are engaged the cords 30. One end of each of the cords 30 is secured to the lower collar 22, while the other end extends downwardly through openings 31, in said collar, and are secured to the splined sleeve 32, which is mounted on the shaft 11, below the collar 22. Secured to the upper side of the upper collar 25, are the lower ends of the cords 33, the same extending upwardly where they are secured to the upper ends of the arms 21. When the speed of the shaft 11 attains a high rate the balls 24 will fly outwardly, with the result that the upper collar 25 will be drawn downwardly. This downward movement of the collar 25 pulls the cords 33 and rotates the rods 20, placing the edges of the cups or vanes 34, carried by said rods, with their edges to the wind, thus checking the rotation of the vanes and the frames carrying them.

Below the slidable collar or sleeve 32 is a supporting stop, for limiting the downward movement of said sleeve. Engaged with this sleeve 32 is the forked end of the vertical rod 35, said rod being slidable through the vertical guide 36, on the frame 10, and having notches 37, in one side, for the reception of the spring detent 38, carried by the frame. A coil spring 39 is secured to the frame 10 and to the rod 35, for normally urging the rod upwardly, so that the detent 38 will be retained in one or another of the notches 37. When it is desired to put the wheel out of operating position, the rod 35 is grasped and pulled down, against the

spring 39. This movement of the rod 35 draws the sleeve 32 down, and pulls the cords 30, so that the upper collar 25 is slipped downwardly on the shaft 11, against the 5 springs 28, with the result that the upper cords 33 will rotate the rods 20 and feather the vanes.

If desired the vanes may be elongated, instead of circular, as illustrated, and may 10 be disposed vertically or horizontally, without departing from the spirit of the invention, or the scope of the claims.

There is thus provided a windwheel which is readily capable of automatic or manual 15 operation to throw the vanes of the wheel into inoperative position. By means of the rod 35, the governor and the vanes can be locked in inoperative position.

What is claimed is:

20 1. A windmill device comprising a wheel having feathering blades, a vertical shaft carrying the wheel and rotatable therewith, a governor on the shaft and including sliding collars and centrifugal weights connected 25 with the collars, cords connected with one of the collars and with the vanes, a locking rod operatively engaged with the other collar, and cords connected with the last-named collar and with the locking rod and 30 engage with the first-named collar.

2. A windmill device comprising a wheel

including crossed rods rotatably supported and carrying vanes, each of the rods having a radial arm, a vertical shaft supporting the rods and rotatable with the wheel, a station- 35 ary collar on the shaft, a slidable collar on the shaft, means for moving the slidable collar, connections between the collars, connections between the sliding collar and the 40 moving means, and connections between the sliding collar and the said radial arms.

3. A windmill device comprising a wheel including a pair of crossed frames each hav- 45 ing longitudinal rockably supported rods thereon, a radial arm on each of the rods, a vertical shaft secured to and rotatable with the frames, a stationary collar on the shaft, a slidable collar on the shaft, the stationary collar having pulleys, centrifugal means be- 50 tween the collars, a second slidable collar on the shaft, flexible elements connected to the stationary collar and said arms, flexible elements connected to the slidable collar and to the second slidable collar and passing over 55 the pulleys and through the first slidable collar.

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

SAMUEL HOLTERUD.

Witnesses:

JOHN HOGAN,

ROY HOLTERUD.