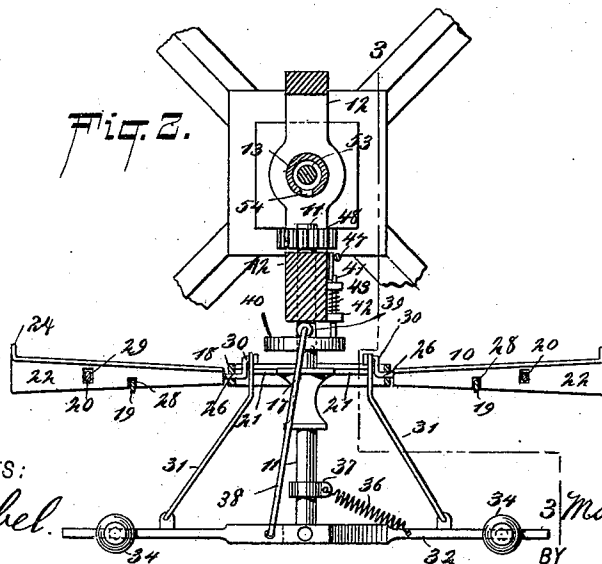
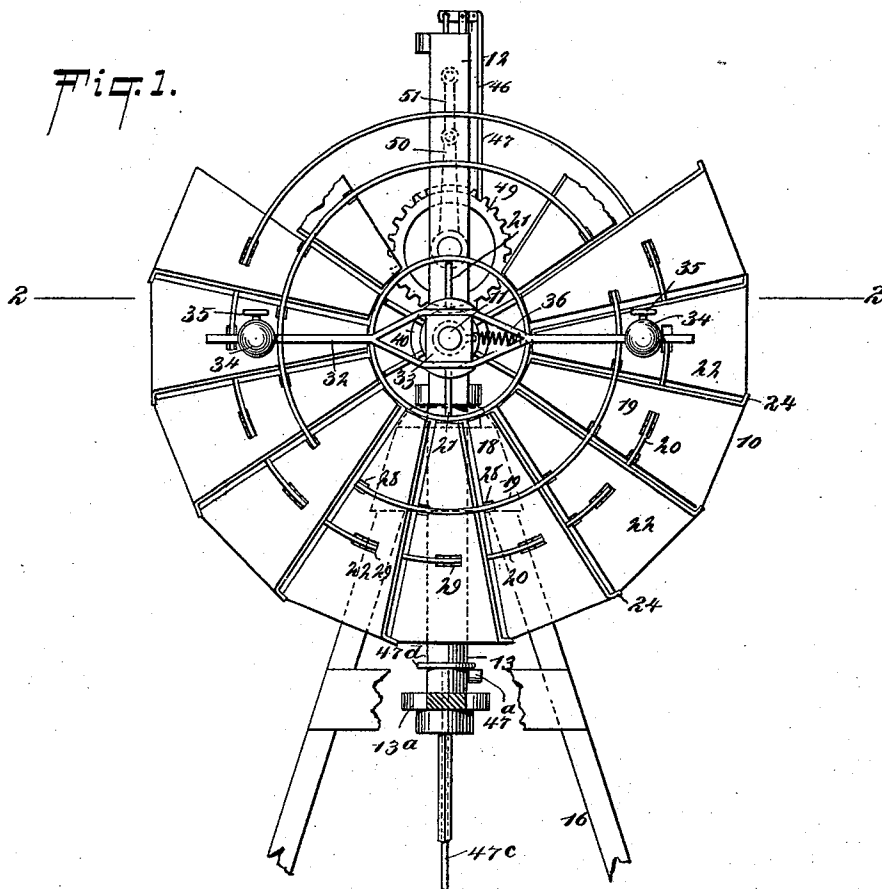


M. H. RICHARDSON.
WINDMILL.

No. 516,900.

Patented Mar. 20, 1894.



WITNESSES:

William Goebel.
Co. Seelgerich

INVENTOR

M. H. Richardson
BY *Munn & Co.*
ATTORNEYS.

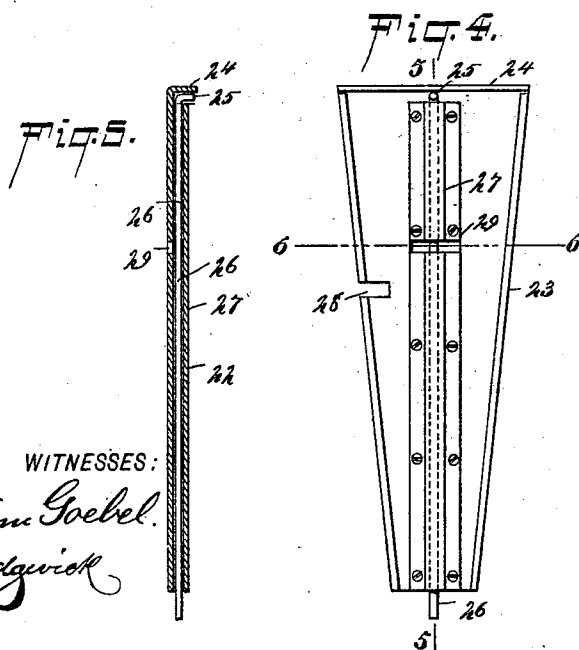
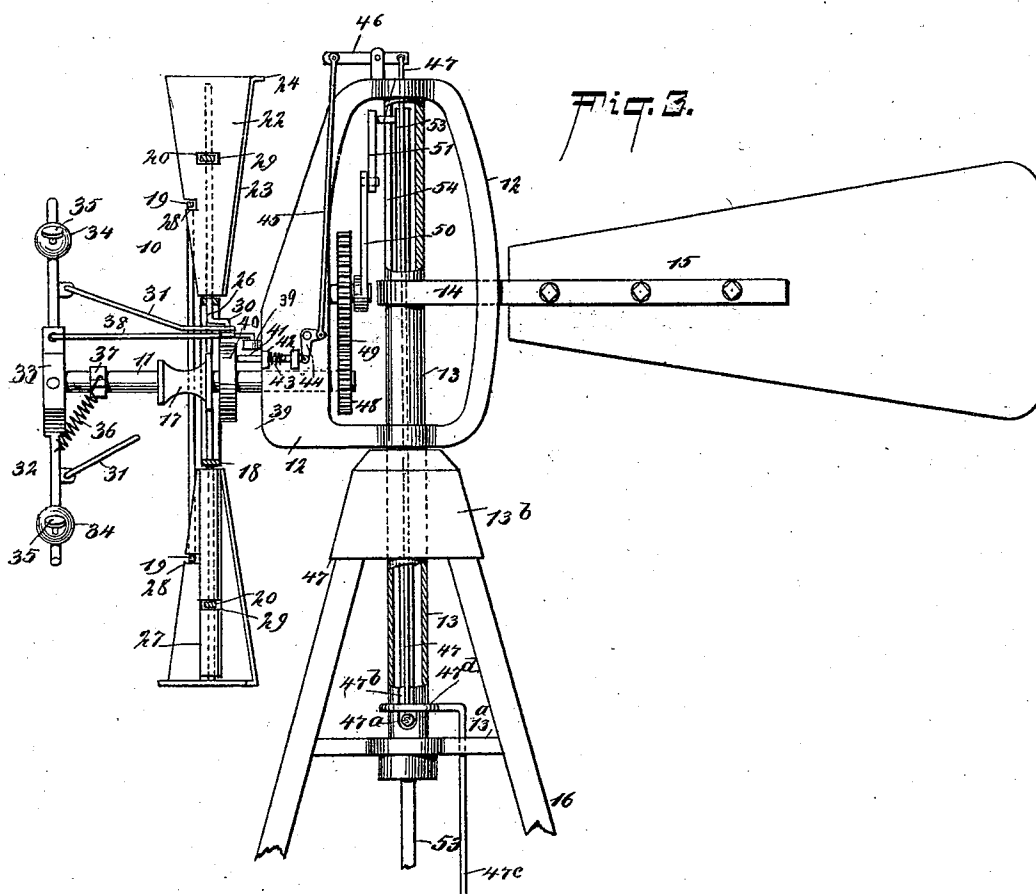
(No Model.)

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UNITED STATES PATENT OFFICE.

MYRON H. RICHARDSON, OF WINDOM, KANSAS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 516,900, dated March 20, 1894.

Application filed May 12, 1893. Serial No. 473,899. (No model.)

To all whom it may concern:

Be it known that I, MYRON HUTCHINSON RICHARDSON, of Windom, in the county of McPherson and State of Kansas, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

My invention relates to improvements in windmills, and the object of my invention is to produce a very simple, strong, light and durable machine, which is adapted to furnish a great deal of power in proportion to its size, which may be thrown easily into and out of gear, which when out of gear affords very little resistance to the wind; and also to provide in connection with the mill, a governor which is actuated by the centrifugal force of the main shaft and wheel, and which operates to make the wheel turn at a uniform rate of speed without regard to the force of the wind.

To these ends my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken front elevation of the mill, showing it supported upon a tower. Fig. 2 is a sectional plan of a mill, on the line 2—2 in Fig. 1. Fig. 3 is a sectional elevation on the line 3—3 in Fig. 2. Fig. 4 is a detail rear elevation of one of the fans of the wheel. Fig. 5 is a longitudinal section of the same, on the line 5—5 in Fig. 4; and Fig. 6 is a cross section on the line 6—6 in Fig. 4.

The mill is provided with a revoluble wind-wheel 10, the construction of which will be hereinafter described, and this wheel carries a shaft 11, which is supported horizontally in a suitable frame 12, and the latter is mounted on a vertical hollow shaft 13, which has secured to it the shank 14 of the wind-vane 15, and the shank is also secured to the frame 12, so that the vane will always swing the wheel into the wind. The shaft 13 is supported in the bracket 13^a and cap 13^b, on the top of a tower 16, which may be of any usual construction.

The wind-wheel 10 has a hub 17, which is fixed to the shaft 11, and it is provided with a plurality of concentric rims or rings 18, 19 and 20, the former being secured to the hub by means of spokes 21, and the rims 19 and 20 being in slightly different vertical planes so that the fans 22 of the wheel may be operatively pivoted to them. The fans 22 radiate from the rim 18, and each fan is wider at its outer than at its inner end, is provided with double edges 23 to give it the necessary strength, and with a flange 24 at its outer end, this abutting with the bent end 25 of the rods 26, which extend longitudinally along the back side of the fans in the casing 27, and which when turned, turn the fan. The flange 24 prevents the rods 26 from being pushed out too far. The fans 22 are slotted at 28 and 29, to permit them to be pivoted to the rims 19 and 20, the fans being pivoted at these points so that when moved by the rods 26, they will operate like the slats of a blind shutter, and thus be swung to the desired angle. The inner ends of two of the rods 26 terminate in cranks 30, and the cranks connect by rods 31 with the governor bar 32, which is pivoted by pin or bolt 32^a to a block 33 carried rigidly on the shaft 11, and the bar has at its outer ends weights 34, which are held to the bar by set screws 35. The bar is held by a spring 36, which connects the bar with a collar 37 on the shaft 11, in such a manner as to extend diagonally from the shaft, and when in this position the cranks 30 and fans 22 are turned so as to bring the fans at the correct angle to receive the full force of the wind, but as the wheel revolves, the tendency is for the bar 32 to swing into a position at right angles to the shaft 11, and as it straightens out in this manner it pulls upon the cranks and turns the fans slightly out of the wind. It will be seen that the tendency of the bar to straighten will be governed entirely by the force of the wind and by the speed of the shaft 11, so that the governor will operate quickly and will, by means of the connection described, actuate the fans and hold them in position to maintain a constant speed. The speed may be made slower or faster by regulating the position of the weights 34 on the bar 32. The governor bar 32 carries a rod 38, which

extends parallel with the shaft 11, or substantially so, and this rod has at one end a friction wheel or roller 39, which is adapted to contact with one side of a friction wheel 40 on the shaft 11, and by pulling the wheel 40 against the roller 39, the rod 38 is made to tilt the governor against the tension of the spring 36, thus throwing it into a position at right angles to the shaft 11. When this occurs, the rods 31 turn the cranks 30 and rods 26 in a manner to throw the fans 22 edgewise to the wind, and the wheel is thus thrown out of gear. The wheel 40 is actuated by a bolt or rod 41, which slides in supports 42 on the frame 12, and which is arranged behind the wheel 40, and on this bolt is a spring 43, the tension of which is such as to throw the wheel forward so that the governor may tilt and put the wind-wheel in gear. The bolt or rod 42 is pivotally connected with a bell crank 44, which is fulcrumed on the frame 12, and one arm of the bell crank is pivoted to an upwardly-extending connecting rod 45, which is also pivoted to a lever 46 on the top of the frame 12, and this lever also connects with a rod 47, which extends downward into the hollow shaft 13, and has a stud 47^a which slides in a slot 47^b in the shaft. A rod 47^c extends downward through the tower and has at its upper end a loop 47^d which encircles the shaft 13 above the stud 47^a. The wind-wheel is normally in gear, and to throw it out of gear it is only necessary to pull down on the rod 47^c, as this pulls down the rod 47, tilts the levers 46 and 44, pulls the wheel 40 against the roller 39, and actuates the governor and fans in the manner already described. The main shaft 11 of the wind-wheel carries a pinion 48, which meshes with a second pinion 49 above it, this pinion being journaled on the frame 12, and the pinion 49 carries a crank 50, which connects by means of a pitman 51 and pin 52, with the pump rod 53, and consequently the rotation of the gear wheel 49 causes the pump rod to reciprocate vertically, and power may be taken from it in the usual way, either to drive a pump or to drive other mechanism. The shaft 13 is slotted near its upper end, as shown at 54, to permit the pin 52 to slide.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A windmill, comprising a suitable driving shaft, a wind-wheel mounted on the shaft and comprising a plurality of concentric rims, and a series of radial fans pivoted to the rims and provided with longitudinal crank rods, a governor carried by the driving shaft and adapted to swing laterally thereon, and a connection between the governor and the crank rods of the fans, whereby the movement of the governor will regulate the position of the fans, substantially as specified.

2. In a windmill, the combination of the main driving shaft, the wind-wheel thereon having radial fans with longitudinal crank rods, the fans being adapted to turn on their longitudinal axes, the swinging governor bar pivoted on the shaft and extending laterally therefrom, the connections between the governor bar and the crank rod, whereby the rods and bar may move in unison, means for holding the bar normally in position to throw the fans into the wind, and adjustable weights carried by the bar, substantially as specified.

3. In a windmill, the combination of the main driving shaft, the tilting governor thereon, the wind-wheel having the positions of its fans regulated by the governor, the friction wheel or roller carried by the governor, the sliding friction wheel on the driving shaft adapted to contact with the friction roller, and a lever mechanism for moving the sliding friction wheel, substantially as specified.

4. In a windmill the combination with the driving shaft, and a wind wheel mounted thereon and provided with pivoted radial fans having crank shafts, of a weighted governor bar pivoted on the outer end of the driving shaft, a spring secured to the governor bar and to the driving shaft, rods connecting the crank shafts of the fans with the governor bar, a slide on the drive shaft, a rod secured to the governor bar and engaging the said slide, and means for operating the slide, substantially as described.

MYRON H. RICHARDSON.

Witnesses:

J. L. MOSS,
S. HAMMOCK.