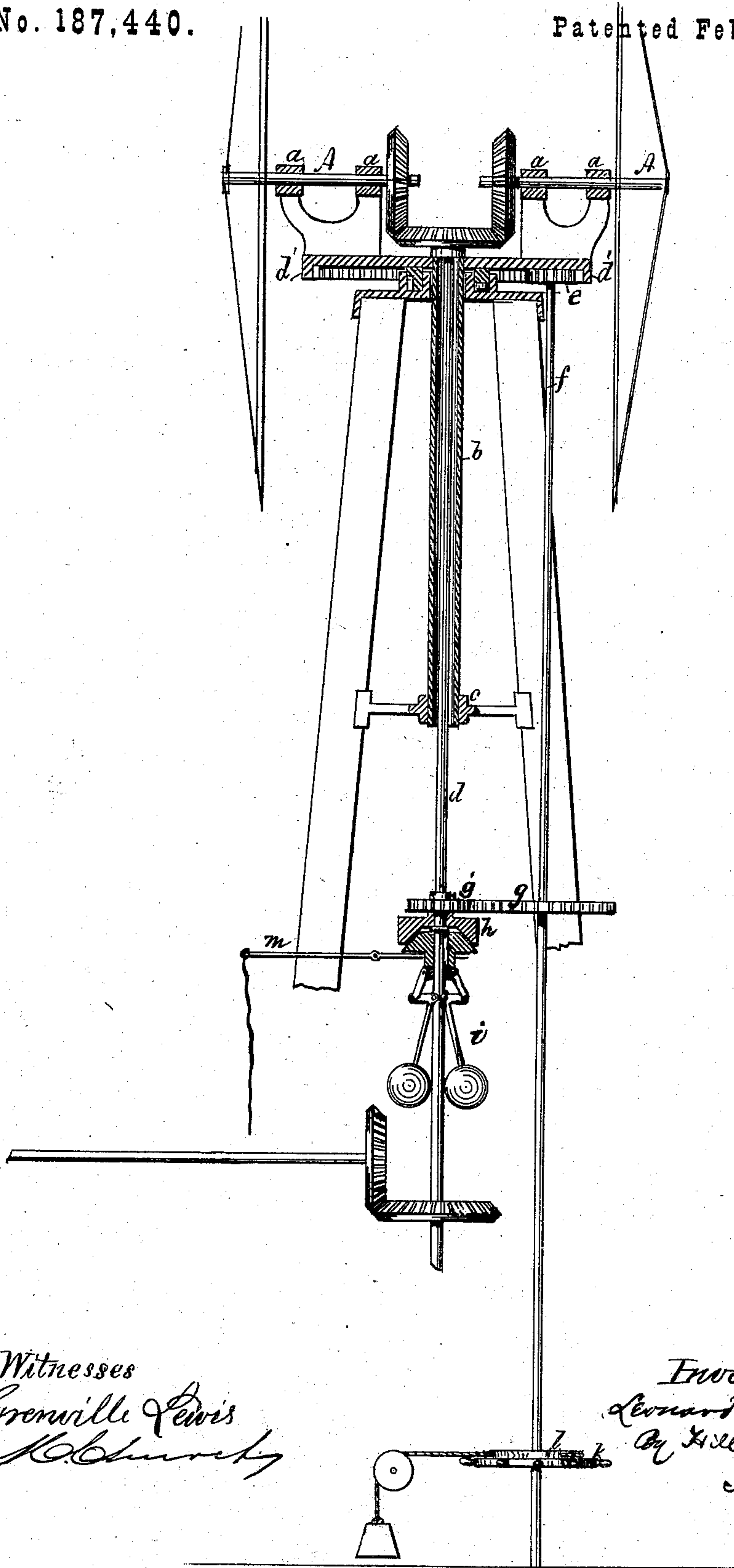


L. H. WHEELER, Jr.
WIND-MILL.

No. 187,440.

Patented Feb. 13, 1877.



Witnesses
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UNITED STATES PATENT OFFICE

LEONARD H. WHEELER, JR., OF BELOIT, WISCONSIN.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 187,440, dated February 13, 1877; application filed June 22, 1876.

To all whom it may concern:

Be it known that I, LEONARD H. WHEELER, Jr., of Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Windmills; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which is shown an elevation of a windmill, with my improvements attached, parts in the figure being represented in section for the better illustration of the devices.

My invention relates to windmills of that form in which the wheels are turned out of the wind to reduce the speed or to stop the mill, and further, in which the motion is transmitted to the machinery below by means of a vertical rotating shaft.

It consists essentially in interposing between the main vertical shaft, or its connections, and the turn-table, a governor, with suitable mechanical connections, so that any excess of speed in the main shaft shall operate to rotate, or partially rotate, the turn-table, tending to turn the wheel or wheels carried thereon out of the wind.

It consists, further, in certain details of construction, which will be more fully and specifically set forth in this specification.

I have represented in the drawing a form of windmill in which there are two wind-wheels mounted on independent shafts. These shafts A A revolve in suitable bearings, *a a*, in the turn-table, and, by means of beveled gears on their inner ends and a horizontal bevel-gear on the top of the main shaft, are connected to the said main shaft, and through it to the machinery below. This turn-table is mounted on a casting which rests or moves on friction-rollers of any suitable size and kind, and suitably guided and supported on the top of the tower. This turn-table is also provided with a tubular extension and support, marked in the drawing *b*. This tube is fixed centrally to the turn-table, or to the casting, or to both, and extends downward to a collar, *c*, supported in a plate, or on rods which extend to, and are supported by, the main posts of the tower. Through this tubular support extends the main shaft *d*, as clearly shown. The lower

surface of the turn-table is provided near the edge with a flange, *d'*, the inner edge of which is provided with teeth. These teeth mesh into those of a pinion, *e*, fixed on the upper end of a shaft, *f*, which rotates in suitable bearings in the tower-frame. The construction and arrangement of the parts are such that the rotation of the shaft *f* shall tend to revolve the turn-table, and with it the wind wheel or wheels. This shaft receives its motion from the main shaft by means of the pinion *g*, on the secondary shaft, which meshes into a pinion, *g'*, connected to the main shaft. This pinion *g'* is not directly fixed on the main shaft, but forms part of the cylinder of a cone-clutch on the main shaft. The upper part *h* of this cone-clutch is formed with a central cylindrical perforation, suitably bushed, through which the shaft passes and in which it revolves freely. The pinion *g'* may be cast as a part of this half of the clutch, or fixed thereto in any suitable manner. The plug of the clutch, arranged in this case below, slides vertically on a spline on the main shaft. This plug is connected by small pitmen to the bell-crank levers of an ordinary governor, *i*, the spread of whose arms by any undue increase of speed will obviously raise the plug and cause it to engage with its upper section. This tends to rotate the pinion *g'* and, through it, the pinion *g* and the shaft and upper pinion which meshes into the internal gear of the turn-table heretofore described. By this the wheels are turned out of the wind, more or less, depending upon the excess of speed in the rotation of the main shaft.

Obviously, the secondary shaft may serve to rotate the turn-table in either direction; that is to say, either into or out of the wind. In order to counteract the tendency of the wheels reacting from their force upon the central shaft, to turn themselves out of the wind, I prolong the secondary shaft downward, and fix thereon a hand-wheel, *k*, by which the shaft may be rotated in either direction, but which is especially designed for bringing the wheels up into the wind.

For the purpose of keeping them automatically to the wind, and to counteract the tendency of these wheels to turn themselves out of the wind, I place on the upper surface of the

hand-wheel a pulley-flange, *l*, and pass around it a rope or chain, one end of which is fixed to the pulley-flange, and the other carried to a second pulley arranged vertically at convenient distance. It may be carried over this second pulley, and have a weight attached to the pendent end, or it may be carried partially around the pulley and be fixed thereto. In the latter case the pulley should have a weighted arm fixed upon it, so that the turning of the platform out of the wind would tend to raise the weighted arm, the weighted arm, on the other hand, acting always against the tendency of the wheels to rotate the turn-table, and thereby carry the wheel or wheels out of the wind.

It will thus be seen that the hand-wheel and weight are calculated to operate to turn the wheel to the wind or retain it in that position, while, on the other hand, the action of the governor is to turn automatically the wheel in the opposite direction or out of the wind.

Whenever it is desirable to stop the mill, the weight may be, in any convenient manner, disconnected from the secondary shaft, and the mechanism by which the wheel is turned out of the wind left free to operate.

In order that this may be done by hand and at will, I have provided a lever, *m*, forked to embrace the lower part of the clutch, and pivoted, so that when the outer end is depressed, as it may be by pulling the cord, the plug will be forced into connection with its seat, and the gears set in motion to turn the wheels entirely, if need be, out of the wind.

I have shown the wind-wheels as duplicated. This makes a more compact arrangement, and by it all the wind-receiving surfaces are caused to exert their power upon the main shaft, and are thus directly utilized. Yet this form of mill tends the more to turn out of the wind, for the reason that the rear wheel, which acts in the place of the ordinary vane, exerts this tendency to horizontal movement of the table, as the ordinary vane does not. This tendency, whether caused by one or two wheels, is readily counteracted by my arrangement of the weight, which acts directly on the turn table.

It will be apparent that the devices may be greatly varied without departing from the spirit of my invention.

Having thus described my invention, what I claim as new is—

1. A windmill having its wheel or wheels mounted on a turn-table, and having also a vertical rotating shaft, by which motion is communicated from the wheels to the machinery to be driven, and a governor driven by the main shaft, or any of its connections, and suitably connected to the turn-table, whereby any excess of motion in the main shaft shall tend to rotate the turn-table, substantially as described.

2. The vertical shaft, carrying a pinion, which meshes into the turn-table, the said shaft being connected to the main shaft through the intervention of a governor, whereby excess of speed in the main shaft shall serve to rotate the secondary shaft, as set forth.

3. The main shaft, friction-clutch, governor-pinions *g* and *g'*, connecting the main to the secondary shaft, and thereby to the turn-table, all combined as set forth.

4. The prolongation of the secondary shaft, which operates the turn-table, in combination with the pulleys and weight, as set forth.

5. The lever and cord, in combination with the clutch on the main shaft, as and for the purposes set forth.

6. A pinion operating to revolve the turn-table, in combination with a weight and suitable intermediate connections, whereby the said weight is made to counteract the tendency of the wheel to turn itself out of the wind, as set forth.

7. In a windmill, the wheel or wheels of which are mounted on a turn-table, and which operate to rotate a vertical shaft, a weight acting directly on the turn-table, and counteracting its tendency to turn the wheels out of the wind, and a governor, intermediate between the main shaft and the turn-table, and acting with the tendency of the wheel to turn out of the wind and against the weight, as set forth.

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Witnesses:

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