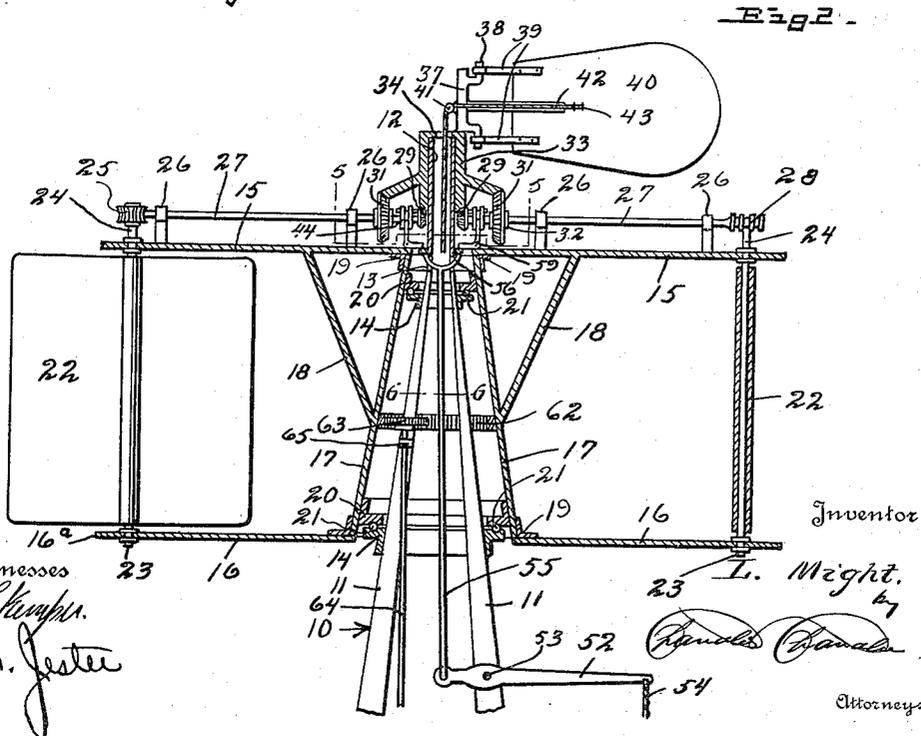
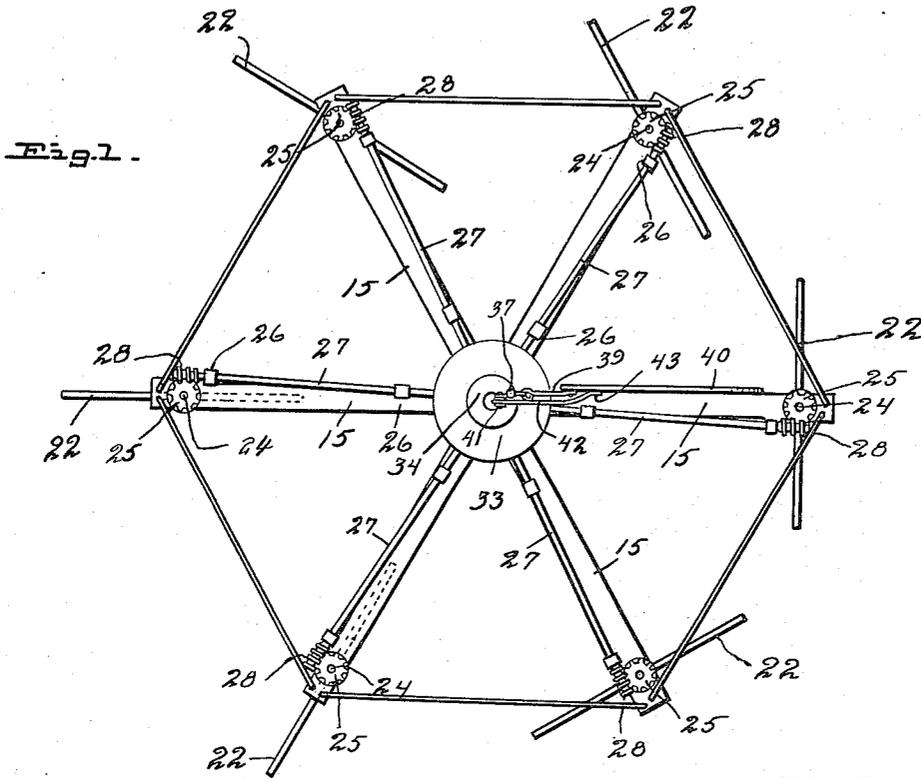


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 AUTOMATIC WINDMILL.  
 APPLICATION FILED OCT. 13, 1914.

1,154,930.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.



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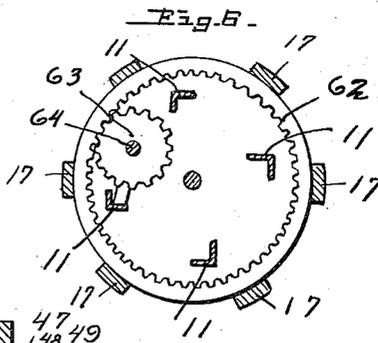
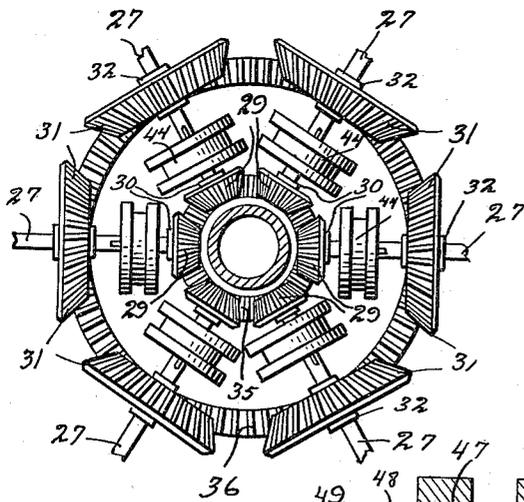
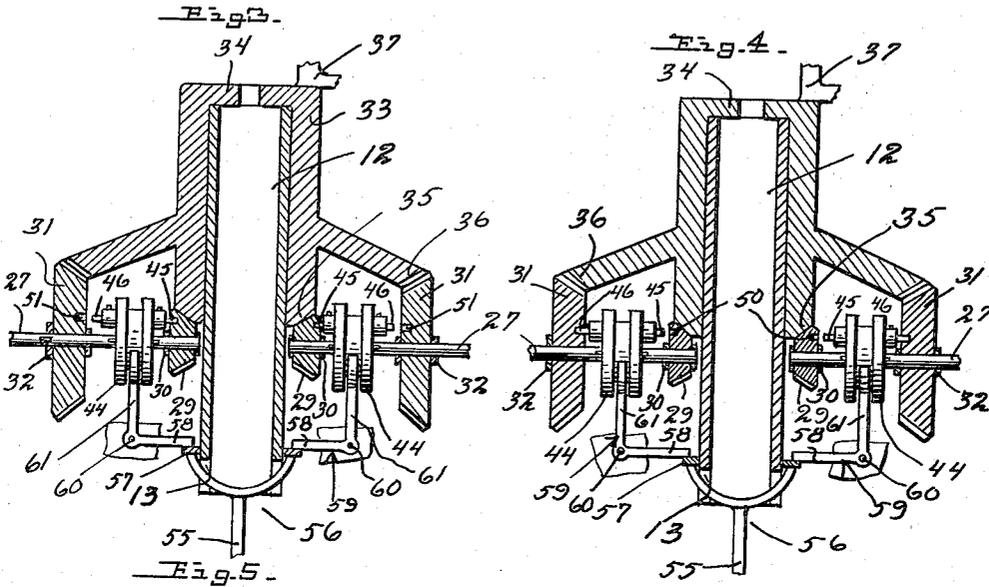
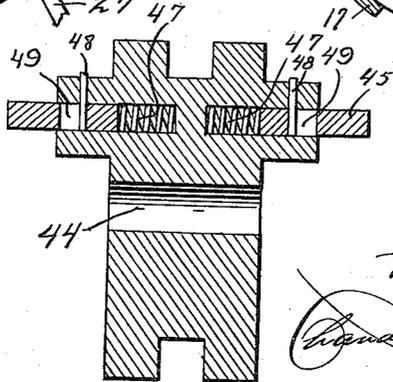


Fig. 7.



Witnesses  
 C. E. Kumpfer.  
 J. M. Jester

Inventor  
 L. Might.  
 Charles Chasels

Attorney

# UNITED STATES PATENT OFFICE.

LINCOLN MIGHT, OF BATTLEFORD, SASKATCHEWAN, CANADA.

AUTOMATIC WINDMILL.

Specification of Letters Patent. Patented Sept. 28, 1915.

1,154,930.

Application filed October 13, 1914. Serial No. 866,460.

*To all whom it may concern:*

Be it known that I, LINCOLN MIGHT, a subject of the King of England, residing at Battleford, in the Province of Saskatchewan, Dominion of Canada, have invented certain new and useful Improvements in Automatic Windmills; 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 wind mills, particularly to those of the horizontal type, and has for its object the provision of a wind mill provided with a plurality of revoluble vanes, the position of the vanes being automatically varied during the rotation of the wheel whereby the maximum degree of rotative power of the wind impinging against the vanes will be obtained.

An important object is the provision of a device of this character in which the positions of the vanes will be varied properly to obtain the maximum power regardless of the direction in which the wind is blowing, the vane shifting means being automatically regulating in accordance with the direction of the wind.

Another object is the provision of a device of this character provided with manually operated means whereby the adjustment may be varied so that the vanes will be automatically moved into a position parallel with the wind and therefore eventually bringing the device to a stop, this shifting of the vanes being operated by the movement of the wheel.

Still another object is the provision of a device of this character provided with means whereby the entire device may be thrown into its inoperative position.

An additional object is the provision of a device of this character which will be comparatively inexpensive in manufacture, efficient and durable in service, and a general improvement of the art.

With these and other objects and advantages in view, the invention consists in the novel construction and arrangement of parts as will be hereinafter more fully described and claimed and illustrated in the accompanying drawing, in which—

Figure 1 is a top plan view of my device, Fig. 2 is a vertical sectional view there-through, Fig. 3 is an enlarged vertical sectional view through the head, showing the

device in its operative position, Fig. 4 is a similar view showing the parts moved to throw the device into its inoperative position, Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 2 looking upwardly, Fig. 6 is a cross sectional view, looking downwardly, on the line 6—6 of Fig. 2, and Fig. 7 is a detail sectional view through one of the shiftable collars.

Referring more particularly to the drawing, the numeral 10 designates the supporting tower upon which my device is mounted and which may be of any desired height. The tower 10 is formed preferably of a plurality of angle bars 11 of any desired cross section which converge toward their upper ends in the usual manner and are connected with a tubular head 12 which may be slotted at its lower end as shown at 13. Adjacent the upper portion of the tower 10 are rings 14 grooved upon their upper edges as shown for a purpose to be described.

My novel wind mill comprises a wheel formed of upper and lower horizontal bars 15 and 16 which have their ends connected and braced by suitable wires as shown. The bars 15 and 16 are connected by substantially vertical bars 17 and braced by diagonal bars 18 connecting the bars 15 and 17. The bars 15, 16, 17 and 18 form a frame and there are preferably six of these frames comprising the wheel, the frames being connected at their lower and upper ends by rings 19 and 20, the lower faces of the rings 20 being grooved as shown and cooperating with the grooved rings 14 on the tower to form races for the reception of balls 21, or rollers if preferred. By this structure it will be seen that the wheel is freely and easily revoluble relatively to the tower.

In order that the wheel may be rotated by the action of the wind, I provide a plurality of vanes 22, said vanes being rotatably mounted upon suitable shafts, the upper ends 24 and the lower ends 23 of which are respectively journaled in the upper and lower bars 15 and 16 of the wheel frame, fixedly engaged on the shafts above the bars 15 with worm wheels 25. Journaled through bearings 26 secured upon the upper bars 15 are shafts 27, corresponding in number to the number of vanes and carrying upon their outer ends worms 28 which mesh with the worm wheels 25. The extreme inner ends of the shafts 27 have loosely mounted thereon beveled pinions 29 which are

prevented from longitudinal movement by collars 30. Adjacent their ends, the shafts 27 have loosely mounted thereon larger beveled pinions 31, which are prevented from longitudinal movement upon the shafts 27 by stop collars 32.

The automatic controlling portion of my device comprises a head 33 disposed upon the standard head 12 and provided with overhanging flanges 34 for holding it in position. The head 33 is in the form of a sleeve having inner and outer gears 35 and 36 formed thereon and meshing respectively with the pinions 29 and 31. Formed upon the upper portion of the head 33 is a bracket 37 upon which are formed hooks 38 journally receiving arms 39 secured upon a tail 40.

In order that the tail 40 may be moved, I provide a pulley 41 journaled upon the bracket 37 and having trained thereover a cord or cable 42 connected with the tail as shown at 43 and extending downwardly through the head 12 to the bottom of the tower.

Splined upon each of the shafts 27 between the pinions 29 and 31 is a flanged collar 44 which carries upon its sides bolts 45 and 46 slidable within recesses and normally pressed outwardly by coil springs 47, the bolts being prevented from moving entirely out of the recesses by pins 48 passing through slots 49. The pins 45 and 46 are adapted to engage within holes 50 and 51 in the opposed faces of the pinions 29 and 31 respectively. Under normal conditions, when the device is in operation, the pins 45 are in engagement within the holes 50 in the pinions 29, thus locking the pinions 29 upon the shaft 27.

The holes 50 in the pinions 29 are so arranged that when they are engaged by the bolts 45 the shafts 27 will be so held relatively to each other that the vanes 22 will be disposed relatively to each other, as shown in Fig. 1. As the wind impinges against the vanes, the wheel carrying the vanes will rotate and by virtue of the meshing of the pinions 29 with the gear 35 the vanes will be turned continuously as the wheel rotates, by virtue of the worms 28 and worm wheels 25, so that the vanes will always be disposed at the proper angle for obtaining the maximum power from the wind. The gear 35, pinions 29, worms 28 and worm wheels 25 are so proportioned that as the wheel makes one complete revolution each vane will be turned through half a revolution.

Assuming that the wind has been blowing in a certain direction, and then suddenly changes, the tail 40 will move so as to be parallel with the wind. As the tail moves, the head 33 upon which it is mounted will also move, resulting in movement of the gears 35 and 36. This movement of the

gear 35 will advance or retard the pinions 29 and will consequently, through the gearing and shaft, move the vanes 22 so that they will present the same area and angle of inclination to the wind blowing from the new direction as they presented to the wind blowing in the original direction. Regardless of any change in the wind, the device will operate continuously as the tail 40 will always control the angles of the vanes.

If for any reason it should be desired to change the positions of the vanes, as in the event of a hurricane, so that the vanes will always be disposed parallel with the wind, I provide a lever 52 pivoted at 53 upon one of the uprights forming the tower and having a rope 54 connected with one end thereof and leading down to the ground. To the other end of the lever 52 is connected a rod 55 which extends upwardly and terminates in a fork 56 disposed within the slot 13 in the tower head 12. The fork 56 supports a ring 57 which contacts with the inner ends of the horizontal arms 58 of angle levers 59 pivoted at 60 upon the bars 15 and having their vertical arms 61 forked and engaging the flanged collars 44. When it is desired to swing the vanes parallel with the wind, it is merely necessary to rock the outer end of the lever 52 downwardly, as by means of the rope 54, whereupon the rod 55 will be moved upwardly carrying the plate or ring 57. Upward movement of the ring 57 will rock the vertical arms 58 of the angle levers 59 upwardly, thus disengaging the bolts 45 from the holes 50, by reason of the fact that the flanged collars 44 are moved outwardly upon the shafts 27. This will cause the bolts 45 to bear against the inner faces of the pinions 31, and as the pinions 31 rotate, the pins or bolts 46 will slip into the holes 51 when they register therewith. As the bolts 46 engage within the holes 51, the pinions 31 will be locked upon and rotate with the shafts 27 and consequently as the wheel rotates, owing to the proportionate sizes of the gear 36, pinions 31, worms 28 and worm wheels 25, the vanes 22 will be rotated, only they will make one complete revolution of the wheel. The holes 51 are so positioned in the pinions 31 that when the bolts 46 engage within the holes 51 the vanes 22 are disposed parallel with the wind. No matter in what direction the wind then blows the vanes 22 will always remain parallel with it as their relation is controlled by the position of the tail 40. It will thus be seen that in the event of a sufficiently strong wind to break the device, the device may be quickly and easily rendered inoperative so that the force of the wind can have no purchase upon the vanes.

In case it is desired to stop the wheel gradually or altogether, when the wind is

not blowing too severely, it is merely necessary to pull upon the cable 42 whereupon the tail 40 will move into such a position that its relation to the vanes will be such that the vanes will gradually be disposed in similar positions to the wind on each side of the tail, owing to the engagement of the gear 35 with the pinions 29. This is done only when the device is in its operative position and not when the mill has been adjusted in the event of a hurricane.

In order that the power derived from the rotation of the wheel may be utilized, I provide an internal gear 62, secured upon the bars 17 of the wheel frame between the rings 20 and meshing with a pinion 63 secured upon the end of a shaft 64 extending downwardly along the tower 10 and journaled through suitable bearings 65.

It will be readily understood that I reserve the right to make various changes in the form, construction and arrangement of parts without departing from the spirit of the invention or limiting the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A wind mill comprising a tower, a head thereon, a wheel journaled on said tower, a plurality of vertically disposed vanes secured on shafts journaled through said wheel, horizontally disposed shafts journaled on said wheel, gear connections between said first and last named shafts, a pair of beveled pinions upon the inner ends of said second named shafts and revoluble thereon, a head revoluble on said first named head and provided with two gears meshing with the sets of said pairs of gears, and means for locking either set of said pairs of gears upon said second named shafts whereby said vanes will be rotated selectively one-half or one entire rotation during the rotation of said wheel.

2. A wind mill comprising a tower, a wheel journaled on said tower, a plurality of vertically disposed vanes revoluble on said wheel, a head revoluble on said tower and provided with two gears, shafts having gear connection with said vanes, inner and

outer beveled pinions on said shafts meshing with the gears on said head, said pinions being revoluble on said shafts, and means for locking either set of pinions upon their shafts, said means comprising a manually shiftable clutch member.

3. A wind mill comprising a tower, a wheel journaled on said tower, a plurality of vertically disposed vanes revoluble on said wheel, a head revoluble on said tower and provided with two gears, shafts having gear connection with said vanes, inner and outer beveled pinions on said shafts meshing with the gears on said head, said pinions being revoluble on said shafts, and means for locking either set of pinions upon their shafts, said means comprising a collar shiftable and splined upon each of said shafts, outwardly spring pressed pins carried upon said collar and engageable with holes in the opposed sides of said pinions, and a lever for shifting each of said collars.

4. A wind mill comprising a tower, a wheel journaled on said tower, a plurality of vertically disposed vanes revoluble on said wheel, a head revoluble on said tower and provided with two gears, shafts having gear connection with said vanes, inner and outer beveled pinions on said shafts meshing with the gears on said head, said pinions being revoluble on said shafts, and means for locking either set of pinions upon their shafts, said means comprising a collar shiftable and splined upon each of said shafts, outwardly spring pressed pins carried upon said collar and engageable with holes in the opposed sides of said pinions, a lever for shifting each of said collars, a ring engaging said levers, a rod connected with said ring and extending downwardly along said tower, and a manually movable control lever connected with said rod.

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

LINCOLN MIGHT.

Witnesses:

W. H. KENNEDY,  
E. W. LANDIN.