J. M. KAUFFMAN.

Wind-Wheel.

No. 160,599. Patented March 9, 1875.

Fig. 1.

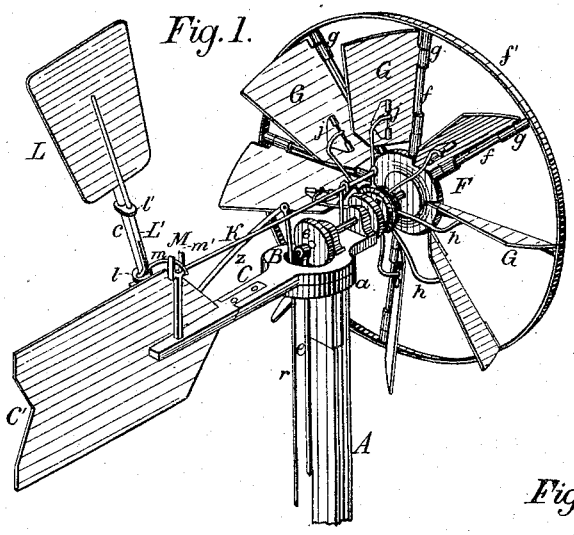


Fig. 4,a.

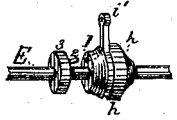


Fig. 2.

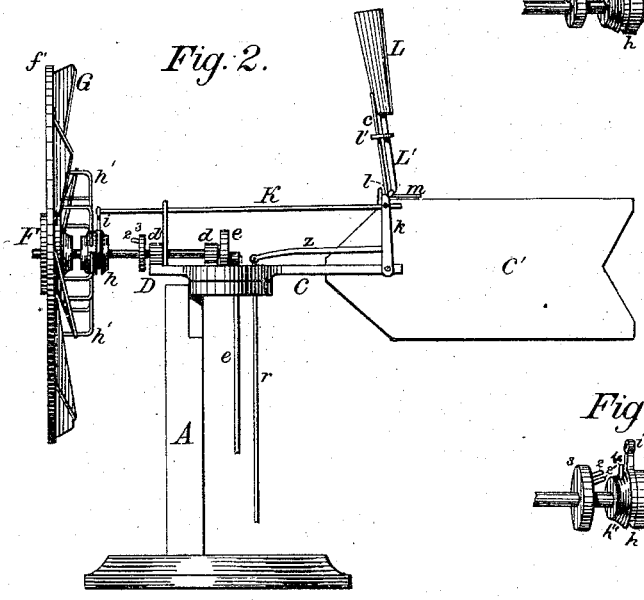


Fig. 4,b.

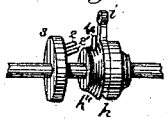
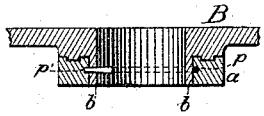


Fig. 3.



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UNITED STATES PATENT OFFICE.

JACOB M. KAUFFMAN, OF GOSHEN, INDIANA.

IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. **160,599**, dated March 9, 1875; application filed February 5, 1875.

To all whom it may concern:

Be it known that I, JACOB M. KAUFFMAN, of Goshen, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Wind-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of my invention, showing the position of the parts in a high wind. Fig. 2 shows the position of the parts in a calm. Fig. 3 is a diametric sectional view of the turn-table. Fig. 4^{b} shows a modification of the adjusting-clutch, of which Fig. 4^{a} is a detached view.

My invention relates to that class of wind-wheels in which the vanes are connected to automatic adjusting devices, which compensate the varying velocities of the wind; and consists in a novel method of mounting the vanes in a wind-wheel, by hinging them at one edge to radial arms projecting from a central hub, and in the devices for adjusting the position of the vanes, so as to produce uniformity of speed in the wheel, whatever may be the velocity of the wind.

In order that others may understand the construction of my invention and its mode of operation, I will proceed to give a particular description thereof, with reference to the drawings, in the several figures of which like parts are indicated by similar letters.

A is the supporting-post. At the top of this post is firmly attached the annular bearing *a* of the turn-table B. The turn-table B is also annular, and has a sleeve or flange, *b*, projecting from its inner periphery, and fitting inside the bearing *a*. From one side of the turn-table, which I will call the rear, projects an arm, C, which supports the weather-vane C′. From the opposite side of the turn-table, which I will call the front, projects an arm, D, upon which are bearings *d d′* for the wind-wheel shaft. Upon the inner end of the wind-wheel shaft E is mounted a crank-wheel, *e*, over one side of the central opening in the turn-table, and to this crank-wheel is connected a pitman, which plays through the opening in the turn-table, and communicates motion to the machine which it is desired to operate. Upon the other end of shaft E is mounted a hub, F, from which project radial arms or spokes *f f*, the outer ends of which are secured to a hoop, *f′*. To the radial arms *f* the vanes G are hinged at their edges by means of hinges *g*, and swing like doors. Upon the shaft E, to the rear of hub F, is a shifting-hub, *h*, from which project radial arms *h′*, the outer ends of which are bent at right angles, and connected loosely, by slip-joints *j*, to the inner sides of vanes G. Around the rear part of this hub *h* is a groove, *i*, into which project the legs of a rider, *i′*. From the top of this rider a rod, K, extends rearward, and is pivoted to a lever, *k*, the lower end of which is pivoted to the arm C of the turn-table. In the end of the shifting-hub *h* is drilled a hole, 1, diagonally in the direction of the dotted lines on the periphery of the hub *h*. This hole 1 is directly opposite an inclined pin, 2, fixed in a disk, 3, firmly secured upon the shaft E at the limit of play of the shifting-hub *h*.

When the hub *h* is shifted rearward by means of lever *k* and rod K, the pin 2 enters the hole 1, and guides or twists the shifting-hub *h* around shaft E, causing the arms *h′* to open the vanes G, at which time the ends of the arms *h′* slip upward upon the slip-joints *j*. The reverse action is obvious. The combination of parts for producing this twisting motion I call the adjusting-clutch.

From the upper end of lever *k* extends upward a round rod, *c*, passing through bearings in the ends of short arms *l l′*, the other ends of which are rigidly attached to the shaft L′ of wing-vane L. From the lower short arm *l* projects a curved lug, *m′*, which passes through an open slot, *m′*, in the top of a post, M, standing on arm C. From the lever *k* an arm, *z*, extends forward to a point over the opening in the center of the turn-table, and to the end of this arm is jointed a rod, *r*, which hangs down within reach of an attendant.

In Fig. 4^{b} is shown a modification of the adjusting-clutch, which I prefer to use in connection with wheels of large size. In this modification the rear portion *h″* of the shift-

ing-hub *h* is of somewhat less diameter than the disk 3, and from this rear portion of the hub projects a pin, 4, located directly opposite the space between two horizontal inclined pins, 2 2′, projecting from the face of disk 3. When the hub *h* is shifted rearward the pin 4 passes between the pins 2 2′, and the twisting effect is the same as explained above.

The operation of my invention is as follows: In a calm the parts will stand as shown in Fig. 2, the weight of rod *r* being just sufficient to hold them in this position. When a wind begins to blow it strikes the weather-vane C′ and turns the turn-table, bringing the wheel-face to the wind, when it (the wheel) begins to turn, and through shaft E communicates motion to the crank-wheel *e* and the pitman, which may be connected by ordinary means to the machinery which it is desired to operate. In a very high wind or a hurricane the wing-vane L is blown backward until its edge is toward the wind, being turned to this position, as the wind forces it backward, by means of the curved lug *m* slipping through the slot in post M. When the wing-vane is in this position the lever *k* and rod K have drawn the shifting-hub *h* rearward to its limit of play, causing vanes G to be turned edge to the wind, or nearly so, as desired, the parts of the adjusting-clutch operating as before explained, and securing the vanes G in position, as shown in Fig. 1. These are the extreme positions of the parts of my invention, as shown in Figs. 1 and 2. In winds of any degree of velocity between a calm and a hurricane the wing-vane L is blown backward, and turned to a position corresponding to the force of the wind, moving the lever *k*, rod K, and shifting-hub *h*, so as to adjust the vanes G so that said vanes will at all times present a proper surface to the wind, and maintain a uniform speed of revolution in the wheel. The weight of rod *r* is such that it will, through intermediate parts, return the vanes toward the wind as it decreases in force. By means of this rod *r* the vanes may be turned edge to the wind, and the wheel stopped at any time by hand.

I am well aware that automatically-adjustable wind-wheels have heretofore been used; but I believe that in simplicity of construction, efficiency, durability, and cheapness, my herein-described improvement supplies a want long felt in those regions where wind-power is utilized; and now,

Having fully described the construction and explained the operation of my said improvement in wind-wheels, so that others may be able to make and use the same, I claim and desire to secure by Letters Patent—

1. In a wind-wheel, the vanes G, hinged at their edges to radial arms *f*, in combination tion with slip-joints *j*, shifting-hub *h*, having radial arms *h′*, and the regulator, substantially as described.

2. The combination of hinged vanes G, arms *h′*, shifting-hub *h*, having diagonal hole 1 in the end thereof, and disk 3, provided with inclined pin 2, substantially as and for the purpose set forth.

3. The combination of lever *k*, rod *c*, regulating wind-vane L, revolving about rod *c* as an axis when said rod vibrates, rod K, and the adjustable vanes of a wind-wheel, arranged and operating substantially as described.

In testimony that I claim the foregoing as my own invention I affix hereto my signature in presence of two witnesses.

JACOB M. KAUFFMAN.

Witnesses:
J. M. EMORY,
E. W. B. PHILLIPS.