L. Patric,

Wind Mill.

No. 121,125. **Fig 1** Patented Nov. 21, 1871.

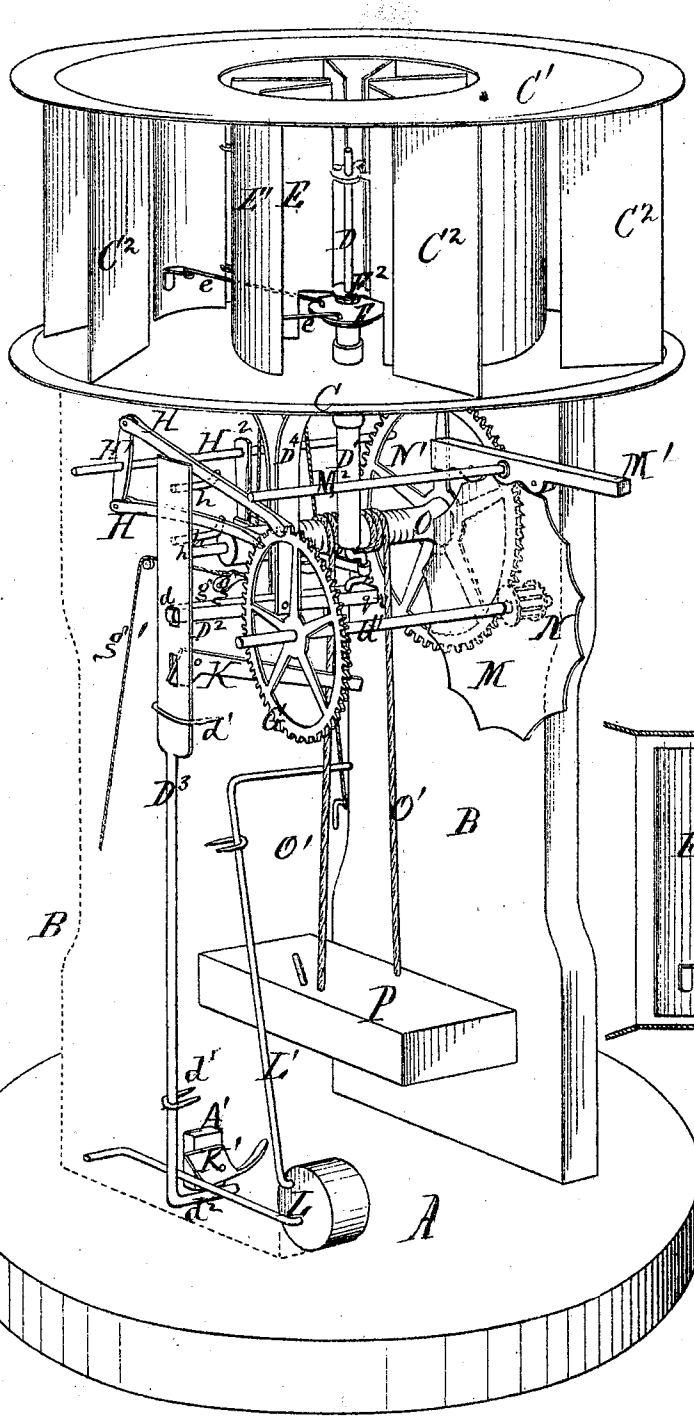


Fig. 2

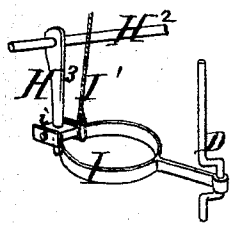
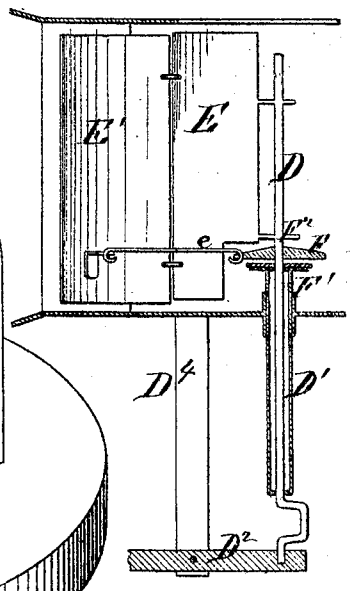


Fig. 3



Witnesses.

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LEWIS PATRIC, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 121,125, dated November 21, 1871; antedated November 4, 1871.

To all whom it may concern:

Be it known that I, LEWIS PATRIC, of Springfield, county of Clark, State of Ohio, have invented certain new and useful Improvements in Windmills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view, with one of the supporting standards removed for the purpose of showing the operating mechanism. Fig. 2 is a detached sectional view of the wind-wheel, shaft, and the friction-stop for closing the wings of the wheel; and Fig. 3 represents the adjustable elastic pitman-rod.

The first part of my invention relates to that class of wind-mills in which a horizontal wheel having jointed wings is used; and consists in the employment of a friction-stop, operated automatically, to close or fold the wings when required for the purpose of stopping the wheel. The second part of my invention consists in combining with a mill, constructed substantially as described to store up or accumulate power, a series of tripping devices operated automatically in such manner that when a certain amount of power has been stored it shall stop the further accumulation, and shall also, when the power thus accumulated has been suspended, put the mill in operation again.

Having thus described the nature of my invention, I will proceed to describe one method of carrying it into effect; but I do not wish to be limited to the precise construction shown.

In the drawing, A represents the base or a suitable foundation, from which rise two supporting standards, B, one being represented only in dotted lines. Upon the upper end of standard B the deck C of the wheel is mounted. C^1 is a disk-shaped cap, connected with the deck C by means of partitions or division-plates C^2, which are so arranged as to form chutes, which conduct the wind to the wheel in the direction of its revolution, and need not be particularly described except with reference to the construction of the deck C and cap C^1. These are made dishing, and are placed with their convex surfaces toward each other, making the space inclosed between them somewhat funnel-shaped, as shown in Fig. 2, by means of which the wind is concentrated upon the wheel. D is the main crank-shaft. It is mounted vertically in a sleeve, D^1, attached to the deck C, the lower end of the shaft being supported in a suitable step in one end of a lever, D^2, which is pivoted in a hanger, D^4, pendent from the lower side of the deck, as plainly shown in Fig. 2. As will be readily understood, both ends of lever D^2 are free to vibrate; but the times and extent of their vibration, and the consequent rising and falling movements of shaft D, are controlled by a sliding bar, D^3, one end of said lever being confined in a slot in this bar, as at *d*, Fig. 1. Bar D^3 is secured to one of the upright standards by means of staples d^1 or their equivalents, and has its lower end bent inward and projecting a short distance through a slot in the standard, as at d^2. The wind-wheel consists of a series of radial vanes, E, connected to shaft D by means of suitable arms, and of a series of wings, E′, hinged to the vanes E, and maintained in suitable relation thereto by links *e*, one end of each of these links being secured to the wings, while the other end is attached to a disk, F, mounted loosely upon shaft D. As this disk is made to serve as a friction-stop, its operation will be fully explained hereafter. F^1 is a disk placed below disk F, and rigidly secured to sleeve D^1. F^2 is another disk, rigidly attached to shaft D a short distance above disk F, and in this instance is made to support the lower ends of vanes E. G is a ratchet-wheel keyed to shaft G′, and actuated by two pawls, H H, which are connected with the opposite ends of arm H^1 on rock-shaft H^2. This rock-shaft is provided with a pendent arm, H^3. I is an adjustable pitman-rod, connecting the crank-shaft D with the pendent arm H^3 of the rock-shaft. Pitman I is forked at the end, which is attached to the arm H^3, and the two legs of the fork are bent into a semicircular or elliptical shape in order to make the pitman elastic. Pitman I is connected with an arm, H^3, by means of a perforated block, *i*, which is clasped between the forked ends, and is moved up and down upon the arm when required by means of a cord, I′, passing over a pulley and secured to standard B. The construction and adjustment of the pitman is fully shown in Fig. 3. *h h* are two tripping-studs, projecting from bar D^3 in such position that a certain upward movement of the bar, to be described, will lift pawls H H. K is a trigger pivoted in one of the standards,

and engaging with bar D^3. K′ is another trigger pivoted to a stud, A′, rising from the base A. L is a weighted lever, pivoted to one of the standards B in such position that it (the lever) shall rest upon the inwardly-projecting end d^1 of bar D^3. L′ is a link connected with the free end of lever L, and provided with an arm bent inwardly, and extending half way or so across the space which intervenes between the standard B. M is a serpentine or pattern wheel keyed to shaft G′. M^1 is a vibrating lever mounted upon a shaft, M^2, and made to engage with the peripherical face of wheel M. Thus a rotation of that wheel in either direction imparts an oscillatory motion to lever M^1. N is a spur-pinion (shown only in dotted lines, Fig. 1) keyed to shaft G′, and engaging with a spur-wheel, N′, on shaft O, provided with spiral grooves for the reception of a rope, O′. P represents a heavy weight, to which the lower ends of ropes O′ are attached. The points at which the ropes are attached to the weight are much further apart than are the points at which the upper ends of the ropes are attached to shaft O, thus causing the ropes to diverge, the extent of this divergence being such that as the rope is wound upon the shaft each successive coil is caused to lie closely against the preceding one and all tendency of the ropes to climb upon the adjacent coils is obviated. *g* is a pawl engaging the ratchet-wheel G, and lifted at will by means of a rope, *g′*.

When I desire to use my mill only at intervals—as, for instance, for churning and other like work during the day—and wish to avail myself of such wind as may happen to blow during the night, but is liable to go down before morning, I leave the parts in the position shown in the drawing.

It will readily be seen from an inspection of the drawing that the revolution of crank-shaft D actuates the rock-shaft H^2, and through it the pawls H H. These pawls rotate ratchet-wheels G and pattern-wheel M, thus vibrating the lever M^1, from which motion may be conveyed to any desired point. This rotation of wheels G and M also drives shaft O through pinion N and spur-wheel N′, thus winding up the weight P. As this weight rises it comes in contact with the horizontal arm of link L′ and lifts it (the link) and the weighted lever L up until said lever has passed by trigger K′, which yields for the passage of the lever, but immediately returns to the position shown in the drawing. As the weight P continues its ascent it strikes the inner end of trigger K and carries it up until the outer end is withdrawn far enough to release the bar D^3.

It must be borne in mind that the weighted lever L has already been lifted from the inwardly-projecting end d^1 of the bar, so that when trigger K is withdrawn, as above described, the bar is left free to rise, and it is at once lifted by the lever D^2, the inner end of which is forced down by the weight of the crank-shaft D and the wind-wheel, both of which are supported upon the lever. As the crank-shaft descends the disk F is caught between disk F^2 on the shaft and the stationary disk F^1, the effect of which is to hold disk F still by the friction between the parts, and as the wheel continues its revolution the wings F^1 are closed by links *e* in a manner which will need no further explanation.

Thus it will be seen that as the wind is excluded from the buckets the wheel stops. But the ascent of bars D^3, in addition to letting down shaft D, and thereby stopping the wheel, also lifts the pawls H H from ratchet-wheel G, through the tripping studs *h h*.

The ratchet-wheel would now be drawn backward by the weight P were it not for pawl *g;* but this pawl prevents all motion of the parts until released by the attendant, who withdraws the pawl by rope *g′*. When this pawl has been withdrawn the weight descends and trips trigger K′, which has been holding the weighted lever L up in the position to which it has been lifted by weight P. As lever L descends it engages with the inwardly-projecting arm of bar D^3, and, pulling said bar down, raises the crank-shaft D, thereby releasing the disk F, and of course allowing the wings E′ to be again opened and operated by the wind. The downward movement of bar D^3 also allows the pawls H H to engage with and rotate the ratchet-wheel G. As bar D^3 drops trigger K again assumes the position shown, thus locking it (the bar) down and holding it, even after the lever L has been removed.

By securing the pawl *g* from contact with the ratchet-wheel the weight will begin to descend as soon as the wind-wheel is closed and has stopped, so that there will be but little intermission in the movement of the vibrating lever, and in this case the machine will continue to run substantially like an ordinary windmill as long as the wind continues to blow, without any attention from the operator.

By means of the cord I′ the pitman I may be moved up and down on the arm H^3, and the leverage upon rock-shaft H^2 varied as circumstances may require.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the weight, wind-wheel, and friction-stop, the trigger K and connecting devices, operating substantially as set forth to stop the wind-wheel, as described.

2. In combination with the pawls H H, the sliding bar D^3, operated substantially as set forth to raise the pawls and permit a reverse motion of the ratchet-wheel G, as described.

3. The combination of pawls H H *g* and operating devices, substantially as set forth, with ratchet-wheel G, whereby, after the power has been communicated by the action of the wind

it (the power) may either be stored or immediately expended by the automatic action of the mechanism.

4. In combination with the weight, wind-wheel, and friction-stop, the trigger K′ and connecting devices, substantially as described, whereby the wind-wheel is set in motion when the accumulated power has been expended, as described.

5. The combination of wings E′, links *e*, disks F F^1 F^2, and the movable shaft D, substantially as set forth.

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Witnesses:
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