

McPherson & Harbison,

Wind Wheel.

N^o 3,817.

Patented Mar 26, 1861.

Fig: 2.

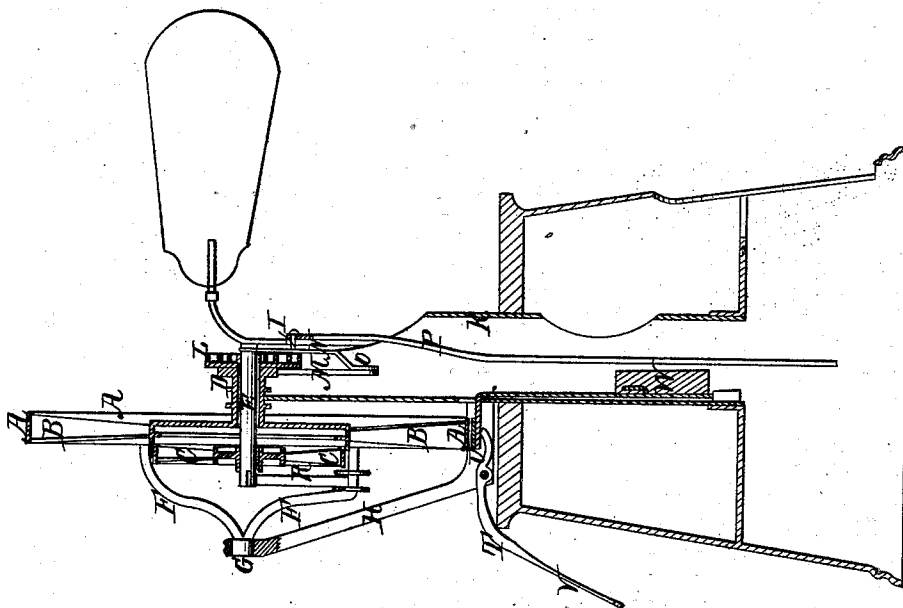
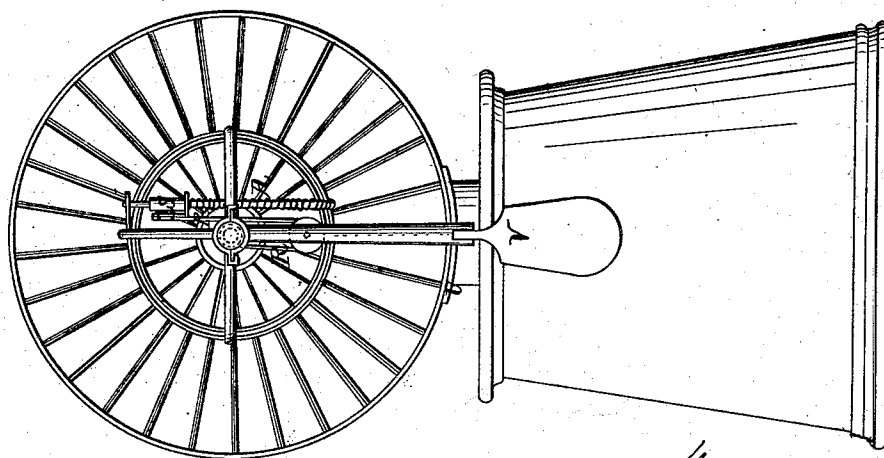


Fig: 1.



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UNITED STATES PATENT OFFICE.

J. L. MCPHERSON AND J. S. HARBISON, OF SACRAMENTO, CALIFORNIA.

IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. 31,817, dated March 26, 1861.

To all whom it may concern:

Be it known that we, J. L. MCPHERSON and JOHN S. HARBISON, of the city and county of Sacramento, and State of California, have invented a new and useful Improvement in Wind-Wheels; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front view, and Fig. 2 a vertical central section, of this improved windmill.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of our invention consists in the arrangement of two concentric wind-wheels, one within the other, the shaft of the smaller wheel revolving within the hollow shaft of the larger wheel, in combination with a spiral cam, strap, and spiral spring for the purpose of automatically regulating the stroke of the connecting-rod according to the force of the wind, all constructed and operating substantially as hereinafter described.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

There are two wheels A C, one placed within the other, but working in combination as one wheel. The main wheel A is made in the usual manner, except that the buckets or fans B do not extend quite to the center, in order to give room for the center wheel C, which fills the space so left. The shaft D of the main wheel is made hollow for the purpose of allowing the shaft E of the small wheel C to be inserted and have its bearings within the same. In place of a continuous shaft extending through to the outer bearings there are braces F extending at a suitable angle from the arms of the main wheel A outside of the small wheel C, leaving room for the latter to turn. These braces are joined together, having a journal G at the junction, the bearing of which is made by a lateral arm or post H, attached to the upright revolving box or hollow cylinder K, on which the wheel has its main bearing. The fans or wings may either be made stationary, as shown in the drawings, or adjustable. The shaft E of the small wheel is made longer than the main shaft or to project at both ends of that portion of the main shaft which is hollow, and on the end of the small shaft is affixed a

spiral cam L, which may be made of any desired size or to admit of any number of revolutions, according to the length of stroke required. On the end of the main shaft, and in juxtaposition with the spiral cam, is a crank having an arm N, pivoted to its end at O. This arm reaches upward to the end of shaft E, or nearly so, but outside of the spiral cam, which has room to vibrate freely between the crank and the arm. In the end of the arm reaching inward is a pin I, to which is attached the rod P, connecting the wind-wheels with the mill or other machinery. The inner end of pin I is provided with a friction-roller working in the groove of the spiral cam. The small wheel, as above described, occupies the center of the larger one on the windward side of the latter. The fans of the small wheel are set flatter to the wind than those of the larger one. This, together with the well-known law of motion—to wit, that a small wheel can be turned with greater velocity at its axis than a large one—will when the wind or other propelling-power is strong cause the small wheel to revolve faster than the large one, but only for a limited number of revolutions, it being governed by the spiral cam, in combination with crank M, arm N, and pin I, which latter is moved back or forth in the groove of the spiral cam according to the force of the motive power. The oscillation of the pin in the spiral groove is regulated by a spiral spring Q in front of wheel C. A strap or cord R is made fast to the spring or its follower S and the other end to the projecting end of the shaft E of the small wheel, so that the strap winds or unwinds around it, according as the small wheel is driven with sufficient force in relation to the large one to overcome the tendency of the spring. This spring is made of a strength to retain the spiral cam in the position giving the smallest leverage to pin I, and consequently the shortest stroke of the rod P, when the combined wheels are driven at a low speed; but as the propelling force increases the small wheel is driven faster than the large one. The strap being wound around the shaft as the tendency of the spring is overcome moves the arm with pin I outward, thereby increasing the length of stroke as the propelling-power increases. The arm is forced toward the center by the lever, thus shortening the stroke according to the decreasing force

of the propelling-power. Sometimes the wind blows with such force as to endanger the safety of the wheel and machinery connected with it. To guard against this danger, we have invented a brake well suited to the purpose of checking the speed of the wind-wheel. This brake is attached so as to act on the outer rim A of the main wheel. A friction block or rubber U is elevated or brought in contact with the wheel by means of a lever T when the broad wing V of the latter is acted on by the wind. The lever is balanced by a weight W, suspended within the revolving box, and will as soon as the wind falls below a certain degree, remove the friction by removing the brake from contact with rim A.

The description herein given of the princi-

pal parts of this mill will apply to stationary wheels—one that does not adjust to the wind—as well as to those that turn to the wind.

What we claim as our invention, and desire to secure by Letters Patent, is—

The arrangement of two concentric wind-wheels A C one within the other, the shaft E of the smaller wheel revolving within the hollow shaft D of the larger wheel, in combination with a spiral cam L, strap R, and spiral spring Q, substantially as and for the purposes set forth.

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Witnesses:

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