L. KING.
Wind-Engine.

No. 212,709. **Patented Feb. 25, 1879.**

Fig. 1

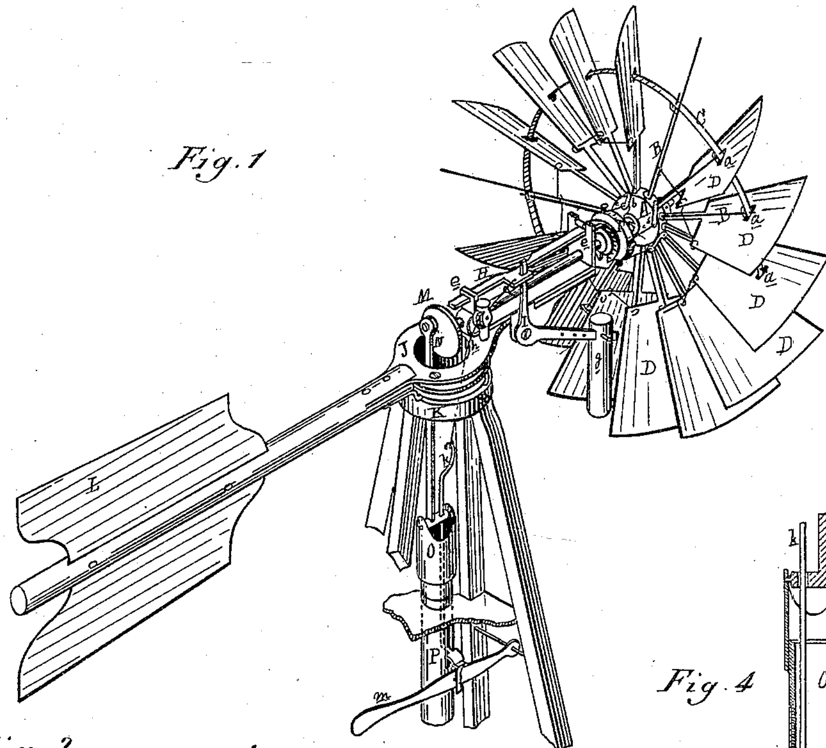


Fig. 4

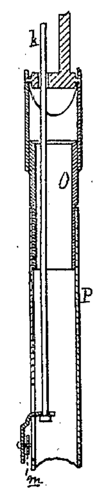


Fig. 2

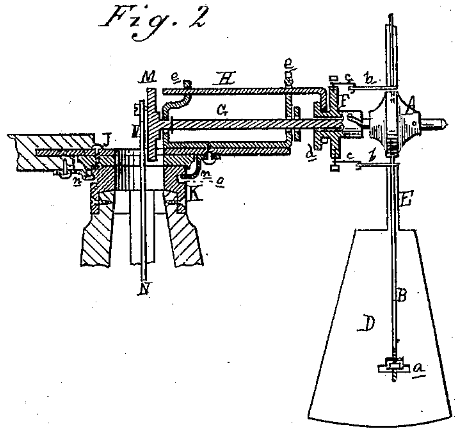
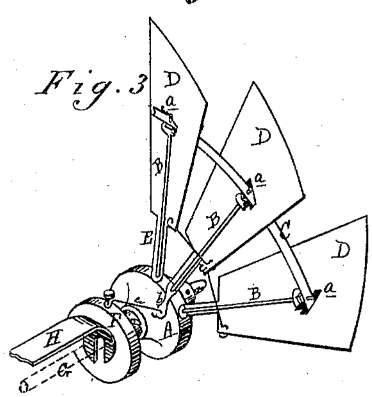


Fig. 3



Attest:

A. B. Barthel
H. Sprague

Inventor:

Lewis King
by his Atty
Tho. S. Sprague

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEWIS KING, OF LAPEER, MICHIGAN.

IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **212,709**, dated February 25, 1879; application filed July 17, 1878.

To all whom it may concern:

Be it known that I, LEWIS KING, of the town and county of Lapeer, and State of Michigan, have invented an Improvement in Wind-Engines, of which the following is a specification:

The nature of my invention relates to certain new and useful improvements in wind-engines, whereby cost of construction, ease of control, and durability are designed to be favorably effected; and the invention consists, first, in the manner of constructing and arranging the wind-wheel, and, second, in the devices for throwing the sails into the wind.

Figure 1 is a perspective of my improved wind-engine. Fig. 2 is a vertical longitudinal section. Fig. 3 is a perspective view enlarged, showing the manner of attaching the sails. Fig. 4 is a vertical section through the pump-rod, showing the swivel-joint.

In the accompanying drawings, which form a part of this specification, A represents the hub of a wheel; B, the spokes thereof, the inner ends of which are rigidly secured to said hub, while their outer ends are secured in any convenient manner to the rim C. The sails D are constructed in the form shown in Fig. 2, provided with arms E, and are pivoted or hinged to the spokes B—that is to say, each sail is pivoted to a different spoke—the number of spokes and sails being alike.

In order to lessen the periphery of the wheel and shorten the spokes, thereby decreasing the cost and weight thereof, the rim of the wheel passes through a slot, *a*, in each sail at a considerable distance from the outer end thereof, as shown in Figs. 2 and 3 very clearly, said slots being of sufficient width to allow of the free movement of the sails, and at the same time to act as stops, when the wheel is in operation, and stiffen the wheel at that point. Preferably, there should be two points at which the sails are pivoted to the spokes, the first one being at the inner end of the arm, next the hub, and the other at the outer extremity of the spoke, just inside the rim. The lower end of each arm is provided with a crank-arm, *b*, by means of which and a connecting-rod, *c*, each of the sails is secured to the clutch-block F, which is sleeved upon the shaft G. The protraction or withdrawal of this clutch-block throws the sails into or out of the wind. To the clutch-block is secured the flange *d* in such manner as to leave between said flange and the rear face of the clutch-block the downwardly-bent end of the arm H, which has a reciprocating motion in the bearings *e*.

A bell-crank, I, is pivoted below the main shaft G in such manner that its upwardly-projecting arm will engage with the arm H, while the other arm is provided near its outer end with an adjustable weight, *g*. A chain or rope, *h*, is attached to the arm H, which leads downward through the turn-table and cap, and is secured to the rod *k*, which passes down through the hollow cylinder and through a slot in the side thereof near the lower end, where it is provided with a pivoted lever, *m*.

The turn-table J has a rotary movement upon the cap K, and to the turn-table there are secured hooked flanges *n*, which engage with a channeled recess, *o*, in the periphery of the cap, and securely hold the turn-table in place without interfering with its rotary movement in said cap. L is the tail-vane, secured to the cap in the usual manner.

To the inner end of the shaft G is secured the crank-wheel M, to which, by the usual wrist-pin, is pivoted the pitman N, the lower end of which is pivoted to the upper end of the hollow cylinder O, and the lower end of this upper portion is sleeved with a shoulder into the upper end of the lower half, P, of said hollow cylinder in such manner that the upper portion of the hollow cylinder will freely revolve with the turn-table without revolving the lower portion thereof.

In practice, the sails being eccentrically hung or pivoted to the spokes and being set for operation, and the weight loaded to a point that will not interfere with their operation with the wind at a certain velocity, should the wind increase, the sails will with such increase be gradually thrown edgewise to or thrown out of the wind. As the velocity diminishes after such increase, the weight forces the clutch forward, thereby throwing the sails into the wind.

When it is desired to stop the wheel, it may

be done by depressing the lever *m*, which, by means of its connections, withdraws the clutch and throws the sails out of the wind.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a wind-engine, the combination, with the hub A, of the short spokes B and the sails D, pivoted eccentrically at two points to such spokes, and having a slot, *a*, through which the rim C passes, substantially as described and shown.

2. The combination, with the wind-wheel, of the clutch-block F on the main shaft G, having flange *d*, said clutch being connected to the wind-wheel by crank-arm *b* and connecting-rod *c*, the arm H, reciprocating in bearings *e*, and the bell-crank I and adjustable weight *g*, whereby the sails are thrown into the wind, all substantially as described and shown.

LEWIS KING.

Witnesses:
H. S. SPRAGUE,
A. BARTHEL.