H. CROFT, Sr., & H. CROFT, Jr.
Wind-Engine.

No. 201,334. Patented March 19, 1878.

Fig. 1.

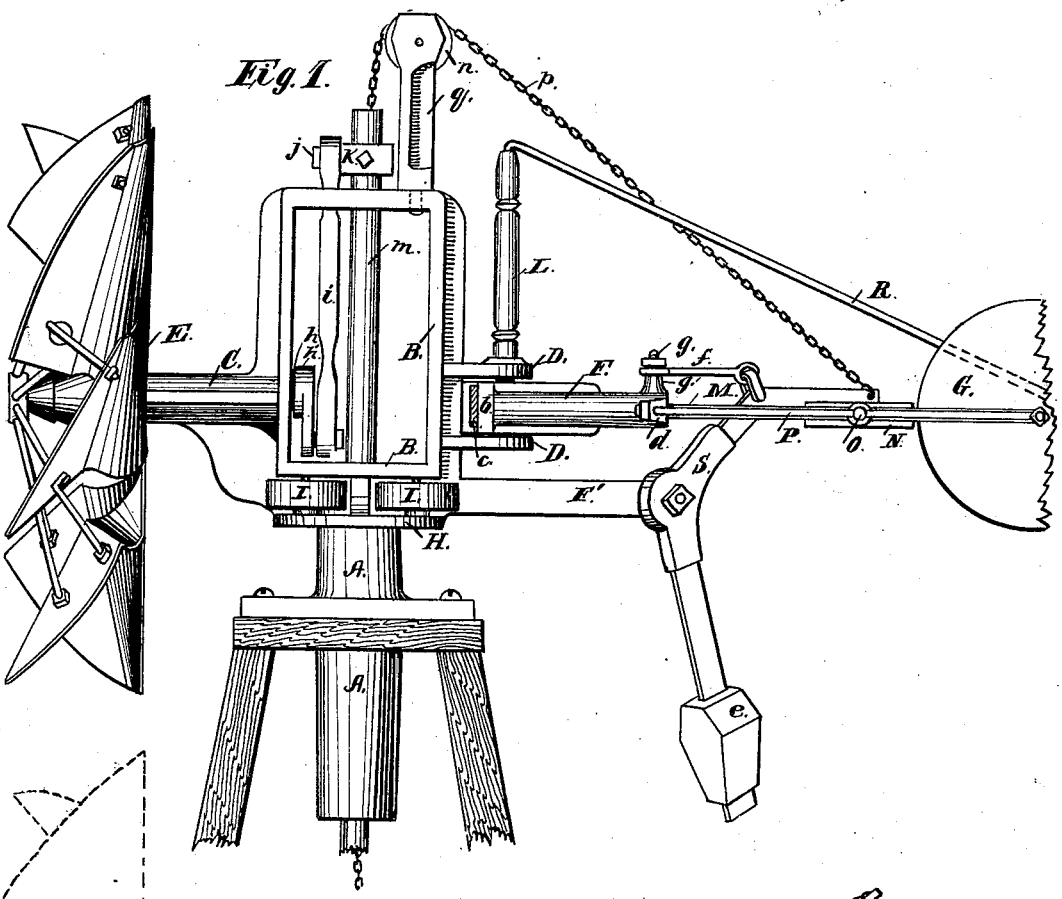


Fig. 2.

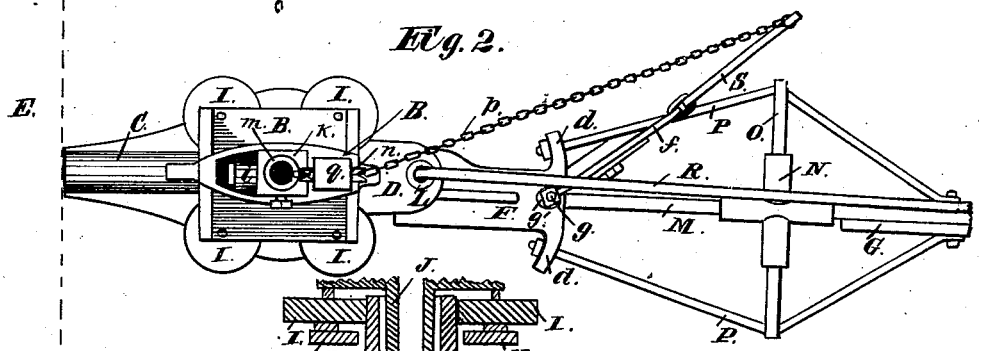
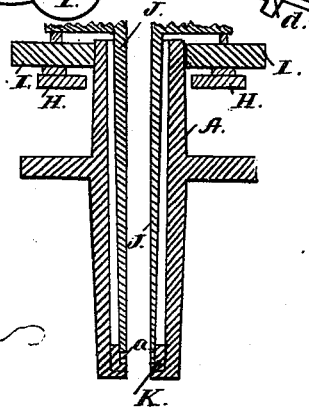


Fig. 3.



Witnesses;
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UNITED STATES PATENT OFFICE.

HENRY CROFT, SR., AND HENRY CROFT, JR., OF SPRINGFIELD, OHIO.

IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **201,334**, dated March 19, 1878; application filed February 8, 1878.

To all whom it may concern:

Be it known that we, HENRY CROFT, Sr., and HENRY CROFT, Jr., of Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Wind-Engines; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to certain improvements in windmills, or, as they are sometimes called, "wind-engines," whereby we obtain an increased strength, compactness, and general efficiency.

The novelty of our device consists in its general structure, together with the combination and arrangement of the several parts.

In the accompanying drawing, Figure 1 is a side elevation of the whole engine. Fig. 2 is a plan view of the same. Fig. 3 is a central sectional view, in elevation, of the lower part of the turn-table and its bearings.

Upon the top of the derrick or frame-work (of any suitable construction) we secure a slightly-tapering metal socket, A, as shown more particularly in Fig. 3. This socket forms the bearing for the turn-table B, which last is constructed as follows: The upper portion is a quadrilateral frame, from which extends on opposite sides brackets C and D, in the former of which is journaled the shaft that carries the wind-wheel E, of any suitable construction, while in the latter is pivoted the support F of the tail-vane G. Just under the platform of the turn-table, and forming an integral part thereof, is an annular disk, H, supported by brackets, and between which and the base of the turn-table are journaled four equidistant wheels, I, as shown. These latter bear against the upper or sleeve portion of the socket A, and their function will be explained farther on. Extending from the under side of the platform, at or about its middle, is a tapering sleeve or spindle, J, Fig. 3, which enters and fits loosely in the socket A. The bottom of this sleeve enters a chilled box or bearing, K, which is fitted into the bottom of the socket A. In this box are one or more washers, *a*, on which rests the lower end of the sleeve J.

This construction and arrangement form a very strong and very smooth bearing for the turn-table, the only points of contact being in the chilled box and upon the upper outer part of the socket A, where the wheels I bear and travel as the table revolves.

We are aware that it is not new to rest the turn-table upon friction-rollers or balls; but these were only to support the weight of the superimposed devices, while by our application and arrangement they are used to diminish the lateral strain caused by the pressure of the wind against the wheel, and they do not aid in bearing the weight of the turn-table. Between the ears of the bracket D we pivot the tail-vane support F, and the pivot of this support and of the vane extends upward to form a standard, L, whose top is recessed. The pivoted end of the support F has right-angular shoulders *b*, which limit its rotation to an arc of ninety degrees, (90°,) or less. When the tail-vane is in line with the wheel shaft or spindle one of these shoulders bears against a rib on the frame of the turn-table and between the ears of the bracket D; and when the vane swings around, the other shoulder comes in contact with the other side of the rib, and limits the vibration of the vane.

To prevent injury to the parts by the sudden swinging of the vane, we attach rubber guards or buffers *c*, in any convenient manner, either to the shoulders or to the opposite sides of the rib, or to both.

The tail-vane, which may be of wood or metal, is attached in a vertical position to a frame of the following construction:

From a recess in the rear end of the support F extends a rod or piece of gas-pipe, M. To the outer end of this rod the vane is directly bolted. Slipped upon this rod, and just in front of the vane, is a four-way sleeve, N, Fig. 1. This sleeve forms the bearings for the short laterally-projecting arms O, which may also be of gas-pipe.

On the end of the support F are lateral ears *d*, (seen in Fig. 1,) and from these ears extend brace-rods P, which pass through eyes or slots in the extremities of the arms O, and are bolted to each side, respectively, of the vane, as indicated. This forms a light but very strong frame for the vane, and renders it safe from sudden side jars in a violent wind.

To balance the vane, we extend a rod, R,

Fig. 2, from near its outer extremity to the top of the standard L, where its end is bent, and enters the recess or socket in the top of the said standard. This rod aids the above-described frame-work in bearing the weight of the vane; and by pivoting it in the top of the standard, we make its axis of rotation coincident with that of the vane.

S is the bell-crank governor-arm, of the shape shown, pivoted near its middle to the bent end of an arm, F′, which extends rearwardly from the turn-table, just under the support F. Upon the lower end of the arm S is an adjustable sliding weight, *e*, of any convenient construction; and from a point near the middle of the upper portion of the governor-arm extends a link-rod, *f*, which is pivoted upon a stud, *g*, which projects upward from a lug, *g′*, on the end of the support F. This link and the governor-arm should lie nearly in the same plane, so that as the governor-arm is raised by the swinging of the tail-vane the raising force is at right angles to the pivotal axis of the governor-arm. By this arrangement we can employ a simple bolt for the governor-arm pivot, and can dispense with swivel-joints, which some use for this purpose.

Upon the end of the wheel-spindle *h* is a crank, *h′*, from which extends upward and through an opening in the top of the turn-table frame a pitman, *i*, whose top is pivoted upon a pin, *j*, extending from a box, *k*. This last is adjustably attached by a set-screw upon a vertical hollow rod, *m*, which passes down through the turn-table, the sleeve J, and the derrick, and forms the piston-rod of the pump, in the usual way.

The drain *p*, which extends from the upper outer end of the governor-arm and descends through the rod *m*, passes over a sheave, *n*, pivoted in the top of a standard, *q*, whose lower end is pivoted, so as to turn freely, in the top cross-piece of the turn-table frame.

The arrangement of this standard and pulley is such that the chain descends from the pulley in a vertical line directly through the rod *m*, thus avoiding the danger as the rod descends.

Having described our invention, we claim as follows:

1. In a wind-engine, the tapering socket A, having in its bottom a chilled box, in which the spindle-sleeve of the turn-table rests and rotates, substantially as set forth.

2. The turn-table B, consisting of a rectangular frame-work, carrying on opposite sides the brackets C and D and the arm F′, and having the integral annular disk H and wheels I, and provided with a spindle-sleeve, J, which has its bearing in the socket A, as and for the purpose set forth.

3. In combination with the turn-table, the pivoted standard *q*, carrying a sheave, *n*, arranged to convey the chain *p* in a vertical line through the center of the hollow rod, *m*, substantially as set forth.

4. The vane-support F, pivoted between the ears of the bracket D, and having the right-angular shoulders *b*, provided with rubber buffers *c*, and having on its recessed rear end the ears *d* and lug *g′*, substantially as set forth.

5. The standard L, carrying the pivoted end of the vane-supporting rod R, and coincident with the tail-vane pivot, substantially as set forth.

6. In combination with the tail-vane, the lateral brace-rods P, sleeve N, and arms O, arranged substantially as and for the purpose set forth.

7. The combination, with the turn-table, constructed as described, of the spindle *h*, crank *h′*, pitman *i*, adjustable box K, and hollow rod *m*, the whole arranged substantially as and for the purpose specified.

Witness our hands this 15th day of January, A. D. 1878.

HENRY CROFT, Sr.
HENRY CROFT, Jr.

Witnesses:
J. S. Christie,
Nimrod Myers.