

(Model.)

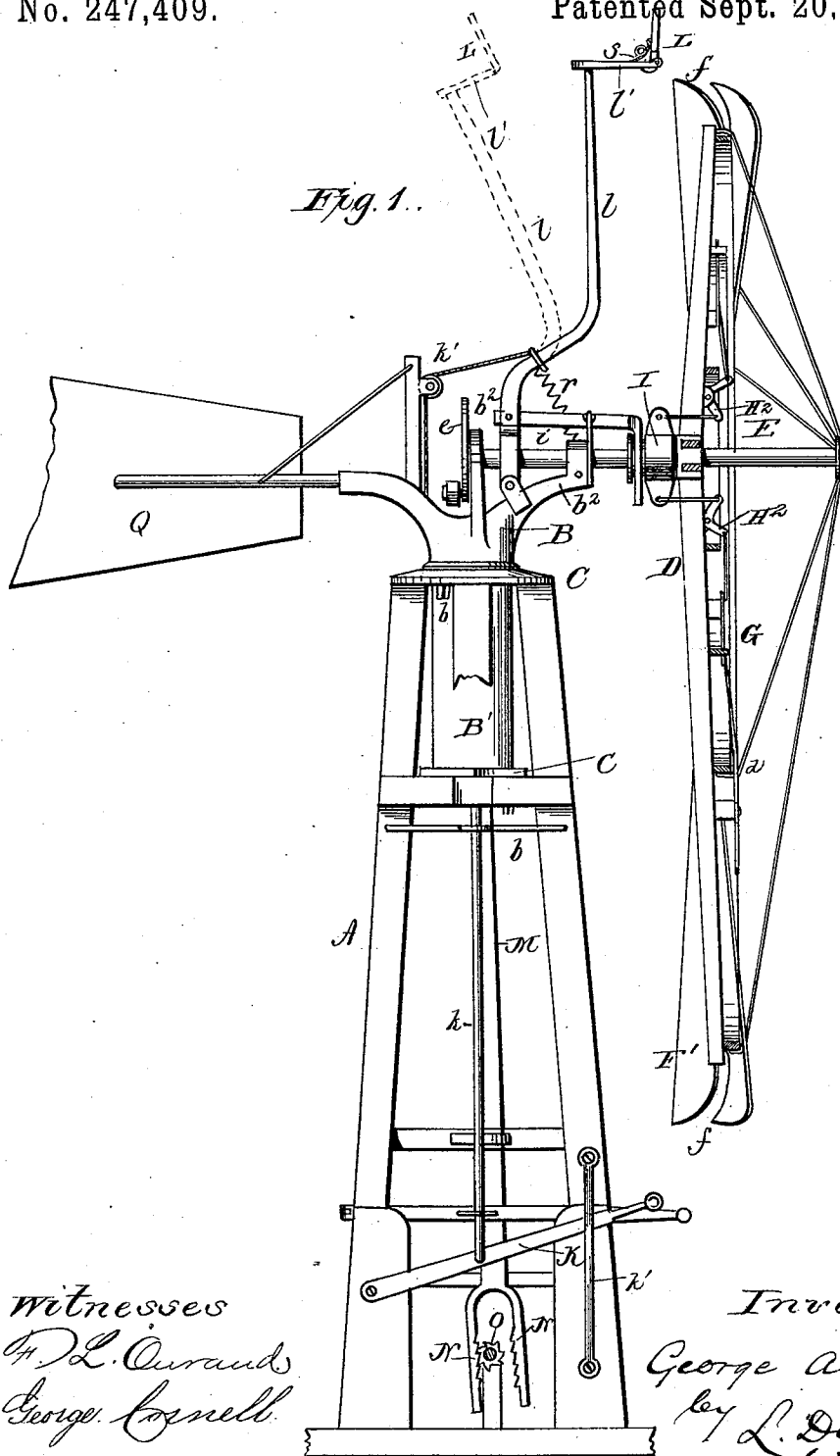
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G. A. ROLAND.

WINDMILL.

No. 247,409.

Patented Sept. 20, 1881.



Witnesses
H. L. Curran
George. Cornell.

Inventor,
George A. Roland
by L. Deane.
his atty

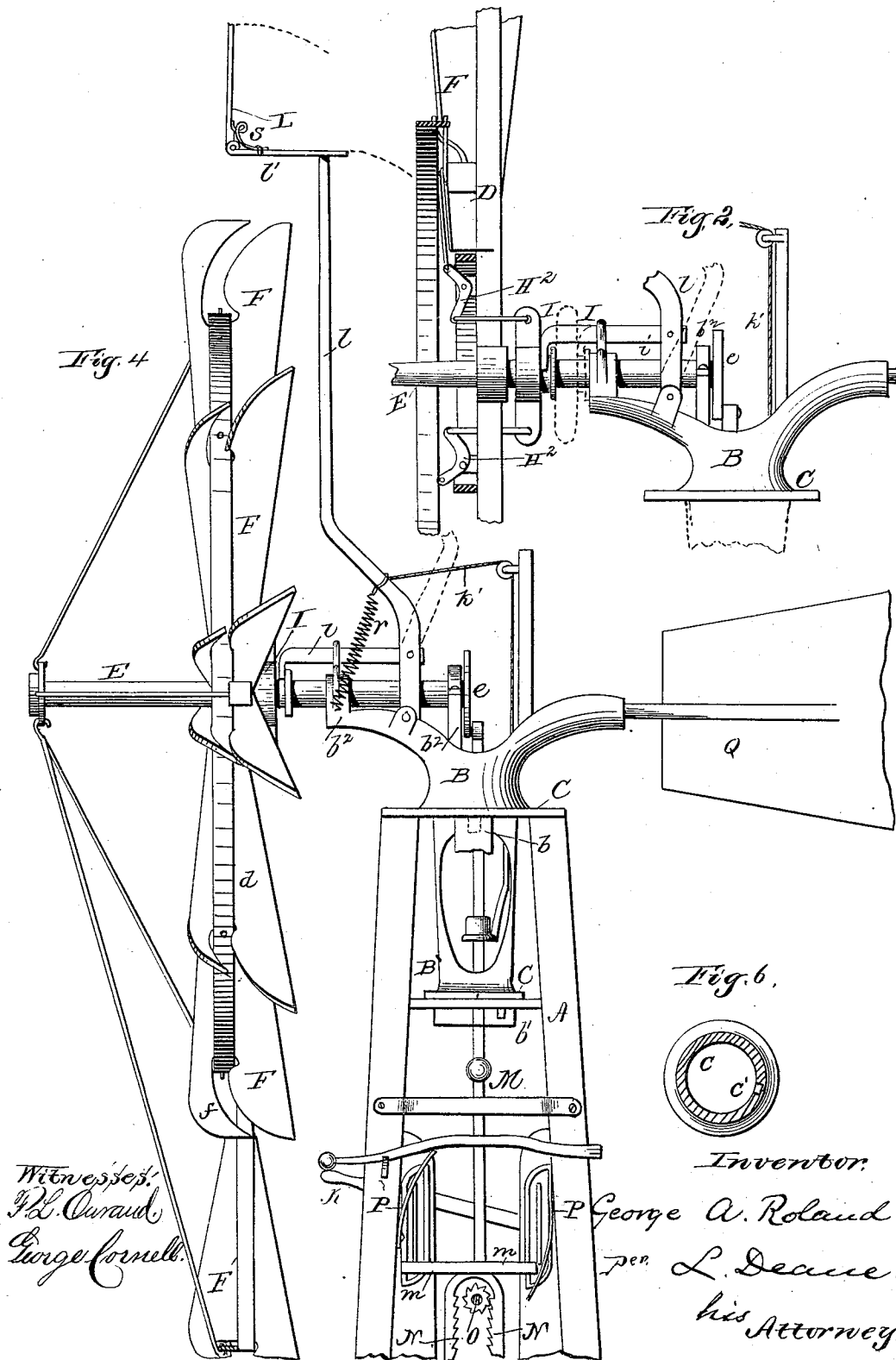
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Witnesses:
J. L. Caraud.
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Inventor:
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his Attorney.

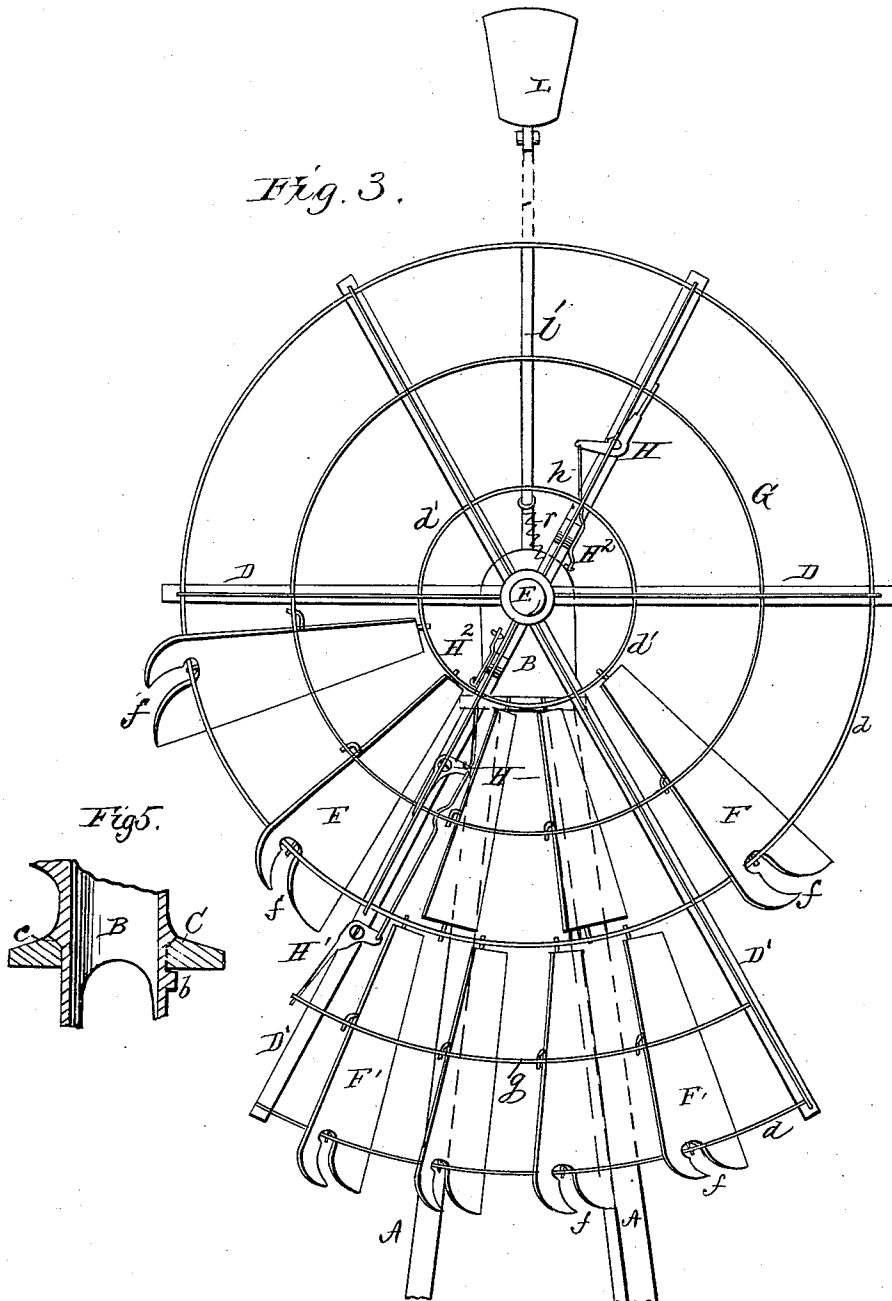
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UNITED STATES PATENT OFFICE.

GEORGE A. ROLAND, OF WASECA, MINNESOTA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 247,409, dated September 20, 1881.

Application filed January 22, 1881. (Model.)

To all whom it may concern:

Be it known that I, GEORGE A. ROLAND, a citizen of the United States, residing at Waseca, in the county of Waseca and State of Minnesota, have invented certain new and useful Improvements in Wind-Powers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of a wind-wheel embodying the present invention. Fig. 2 is a detail showing, in side elevation, the turn-table and the operative mechanism connecting with it. Fig. 3 is a front elevation of the wind-wheel. Fig. 4 is an elevation (enlarged) viewed from the side opposite to that shown in Fig. 1; Figs. 5 and 6, details, showing the foot of the turn-table and one of the bearing-plates.

This invention relates to that class of devices which utilize the force of the wind for motive or operative purposes; and the novelty consists in the details of the construction and combination of the several parts of this wind-wheel and its connecting mechanism, whereby a very efficient and durable device is produced, all as will now be more in detail set out and explained.

In the accompanying drawings, A denotes any suitable upright frame, in the upper part of which is mounted the turn-table B in the bearing-plates C, one of which is in the top of the frame and the other at a suitable distance below, to accommodate the lower part, B', of the turn-table, which rests on it. These bearing-plates are beveled on the inner circumference at *c*, and this bevel is especially adapted to those on the turn-table, where it rests in the bearings. This beveled inner edge of C is notched at *c'* to allow the lugs *b* and *b'* on the turn-table to pass through. These lugs are not in the same vertical line, and serve to hold the turn-table in said bearings, but do not interfere with the revolution of the turn-table.

The sail-frame D, made in any suitable way, is properly mounted on shaft E, on which it is revolved. This has suitable bearings, *b*², on the turn-table B. The main sails F are hinged or

pivoted in the slot *f* at their outer ends to the large circle *d* of frame D and at their inner ends on the smaller circle *d'*, and these, as well as the supplemental side-wings, F', which are pivoted in like manner, but to a lateral extension, D', of the frame, are moved in and out of the wind by means of the ring G or ring *g*, which connect with all of the wings F and F', and are simultaneously operated by means of crank-arms H and H'. These are pivoted to the frame of the wheel. One end of each connects with the ring G or ring *g*, and to the other a rod, *h*, is attached, which connects with crank-arms H², attached to the frame and operating in like manner as crank-arms H. These last secure motion from the loose head or sleeve I on the shaft E inside of the wheel, to which sleeve said crank-arms H² are properly connected. This head or sleeve I has motion from the lever K at the lower part of the frame A, with which it is connected by rod *k* and rope or chain *k'* and suitable intermediate pulleys and other means, or by the small vane L, which is hinged on the bent end *l'* of the upwardly-extending arm *l*. This arm is pivoted to the turn-table at its lower end, and by the bar *i* is connected to the said sleeve or head I. Thus, when the wind acting on this vane throws it backward, the sails will be automatically turned out of the wind, like as may be done by hand, by means of the lever K, and which lever may be secured at any desired point or height. The spring *r*, connecting the arm *l* with turn-table, will serve to return it into proper position when the wind goes down, and thus the sails will set to the wind. The sliding spring *s*, connecting with the vane L and the bent end *l'* of arm *l*, will cause the vane to resume an upright position when the force of the wind allows.

The usual pitman, M, is attached to a crank-arm or eccentric, *e*, on the end of the shaft E, and passing downward to the lower end of the frame. To this lower end of the pitman are attached the ratchet-dogs N, corresponding in length to the stroke of the pitman, and placed one on each side of the ratchet-wheel O, which is suitably hung in such a manner that at the downward stroke one of the springs P, acting on one of the arms *m* of the pitman M, will press the dog on the opposite side against the

wheel, and in the upward stroke the others spring will act on the other dog and cause it to act on the wheel, which in this way will have continuous rotary motion.

5 The usual tail-vane, Q, is attached to the wind-wheel.

On a large wheel there may be two or more sections of sails on the main wheel, and so adapted to operate as by lengthening the con-
10 nection-arms and like mechanical means that one section shall present a more obtuse angle to the wind than the other, but at the same time will, when turned out of the wind, stand in the same line with the rest.

15 The manner now adopted to pivot the outer end of the sails in the frame—to wit, by means of the slot *f*—affords greater security not only to the position of the sail, but also of the ring which passes through it.

20 The action of the small vane L is so sure, as well as automatic, that it serves a most useful purpose in insuring a regular and safe action of the vanes in any force of wind.

25 The ease and certainty of the operation of the means for changing the vertical to a rotary motion is of large value in devices of this character.

30 Having thus described my invention, what I consider new, and desire to secure by Letters Patent, is—

1. In a wind-wheel, the combination of the turn-table B, having depending part B' and lugs *b b'*, with bearing-plates C, beveled on their inner edge at *c* and slotted at *c'*, substantially as shown and described.

2. The arm *l*, having on its outer end the hinged vane L, provided with spring *s*, and pivoted to the turn-table B, and connected also thereto by spring *r*, combined with the movable head I and the wind-wheel, substantially
35 as shown and described.

3. In combination with a wind-wheel, the pitman M, having on its lower end the arms *m* and ratchet-dogs N, with springs P and wheel O, substantially as shown, and for the purposes
40 set forth.

4. The combination of frame D D', rings *d*, movable rings G and *g* with vanes F F', slotted at *f*, crank-arms H, H', and H², sleeve I, and bar *i*, all operated substantially as de-
45 scribed, and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. ROLAND.

Witnesses:

J. L. CLAGHORN.

CHAS. C. CLAGHORN.