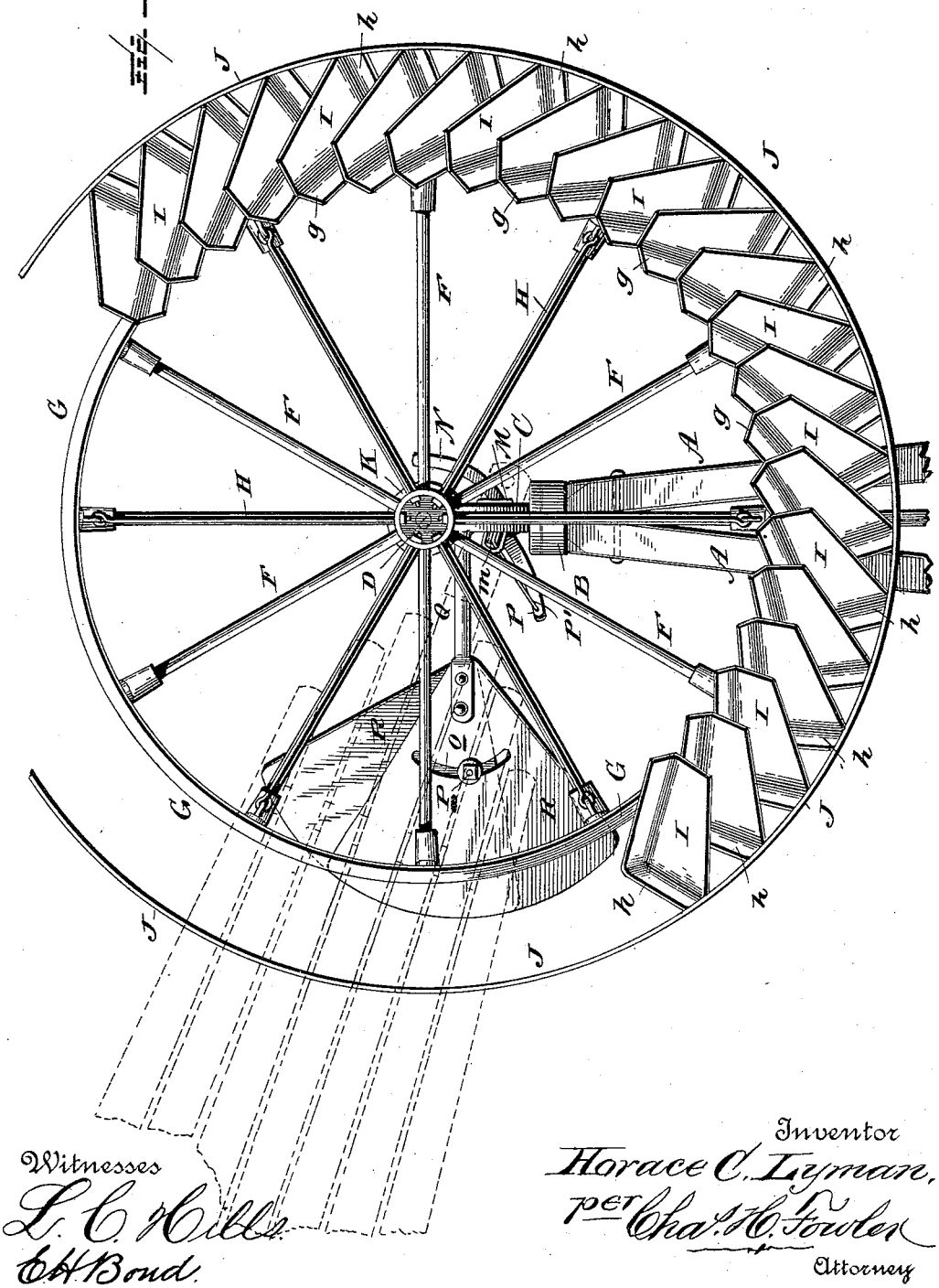
(No Model.) 2 Sheets—Sheet 1.

H. C. LYMAN.

WINDMILL.

No. 457,284. Patented Aug. 4, 1891.

Fig. 1.



Witnesses
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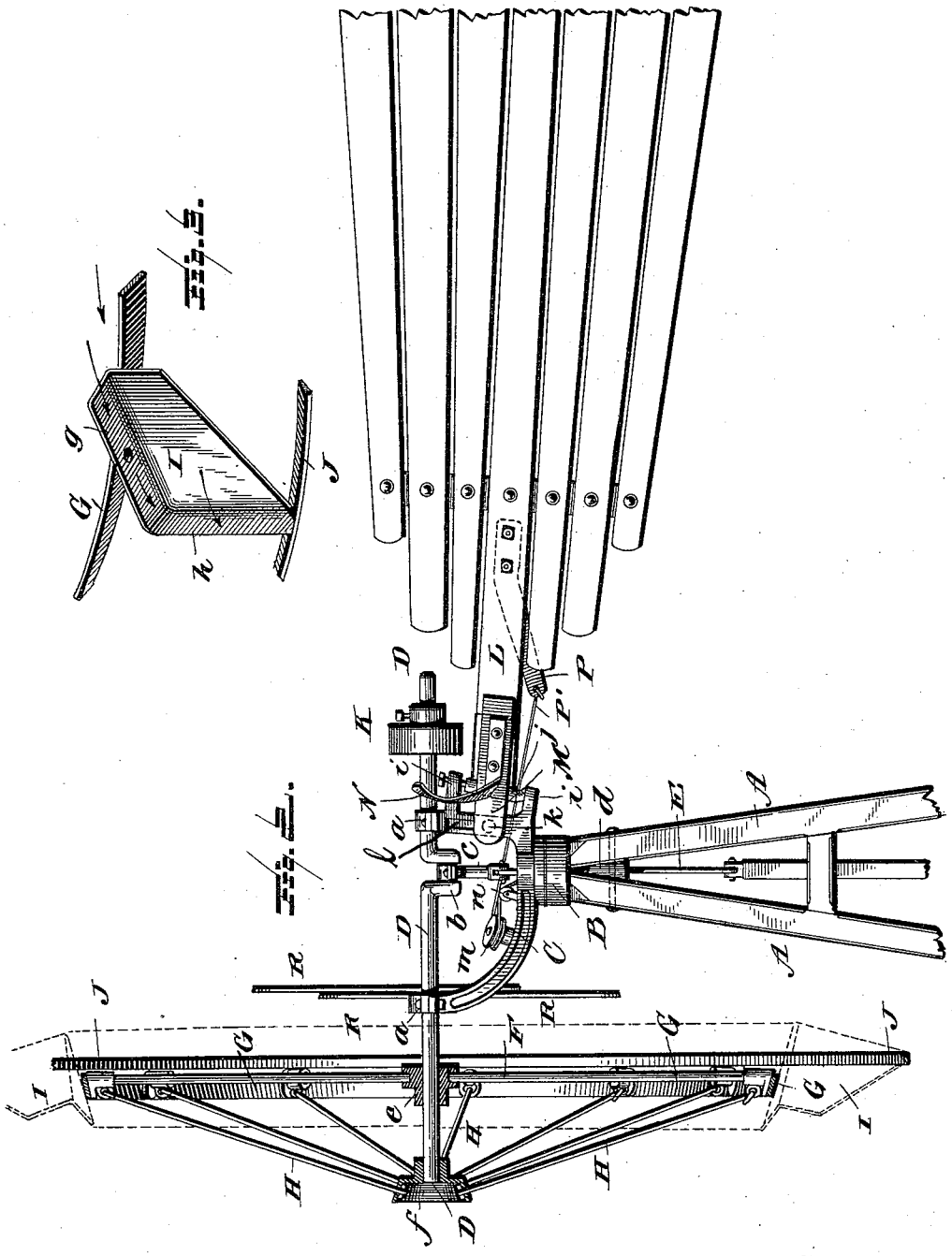

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UNITED STATES PATENT OFFICE.

HORACE C. LYMAN, OF MONON, INDIANA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 457,284, dated August 4, 1891.

Application filed January 22, 1891. Serial No. 378,690. (No model.)

To all whom it may concern:

Be it known that I, HORACE C. LYMAN, a citizen of the United States, residing at Monon, in the county of White and State of Indiana, have invented certain new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

This invention relates to certain new and useful improvements in windmills; and it has for its object, among others, to provide an improved device of this character wherein the maximum power shall be obtained and wherein provision is made for the setting of the wheel for a predetermined amount of wind, with provisions for regulating the same. I provide a wheel open at the center and provided around its periphery with buckets or blades of peculiar form and adapted to conduct the wind along the path in which the wheel turns, acting first on the upper edge and thence downward and on the portion at right angles thereto. These blades are carried by a rim which is braced and supported from the hub.

I provide an improved brake actuated by the movement of the tail-vane.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an end view of a windmill constructed in accordance with my invention, with a portion of the blades or buckets removed in order to better show some of the other parts. Fig. 2 is a side view with the wheel in vertical section. Fig. 3 is a perspective detail showing the construction of one of the blades or buckets.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates a portion of the tower, which may be of known construction. At the upper end of this tower is the casting B, on which is supported the yoke C, from which the shaft is supported. This yoke carries the boxes or bearings *a*, in which the wheel-shaft D is journaled, the said shaft being provided with a crank *b*, to which is suitably connected the link *c*, which is pivotally connected with the pump-rod E, which is guided in its up and down movements by the guide-tube *d*, all of these parts being of the well-known and usual construction and operating in the usual manner.

The wheel consists of a hub *e* on the wheel-shaft, as seen in Fig. 2, from which hub extend the radial spokes or braces F, the outer ends of which are connected with a rim G in any suitable manner. This rim may be inclined from the center, as seen in Figs. 1 and 3, or not, as may be deemed best. It may be further braced by the brace-arms H, as seen in Fig. 2, which are connected with a hub *f* and to the said rim or the spokes near their connection with the rim; but in some cases I propose to dispense with these brace-arms H. The buckets or blades I are of novel form, which will be best understood from reference to Fig. 3. They are each of one piece of material, having open outer end and side, with the inner side *g* turned at substantially right angles to the body portion and its inner end turned at right angles to the body portion and at right angles to the inner side, as seen at *h*. The inner side is bolted or otherwise secured to the rim G, of which the outer point is secured to an outer ring or band J, as seen best in Fig. 3. The blades or buckets are arranged to overlap slightly, and in practice the wind first strikes along the upper inner edge and then against the lower side *h*, as indicated by the arrows in Fig. 3, so that the full power of the wind is utilized, acting as it enters and also as it leaves the blade. The center of the wheel is open, as seen in Fig. 1, so as to offer as little resistance as possible, and thus permit of its more rapid revolution. On the inner end of the wheel-shaft is adjustably held a heavy counterbalance weighted disk K, as seen in Fig. 2.

The yoke C has at one side horizontal ears *i*, as seen in Fig. 2, in which is held in an inclined position the pivot-pin *j*, to which the tail-vane is connected by the arm L. To this arm is secured an arm M, which has a lateral

pin *k*, which works in the vertical guide or slot *l* in the vertical portion of the yoke, as seen in Fig. 2, serving as a stop. The inclination of the pivot on which the tail-vane turns gives to the said vane a slight upward movement as it is thrown out of the wind. On this arm M is secured a curved brake N, the free end of which is designed to be brought into contact with the wheel K as the tail-vane is thrown out of the wind, and thus stop the revolution of the wheel-shaft and wheel.

Attached to the inner end of the tail-vane is an inclined arm P, to the inner end of which is attached a rope or cord P′, which passes over a pulley *m* on the yoke, thence over another pulley *n*, and thence downward through the guide-tube *d*, where it may extend to within convenient reach from the ground, so that the wheel may be thrown out of the wind when desired.

Q is a shaft or arm extending from and at right angles to the wheel-shaft, as seen in Figs. 1 and 2, and on this shaft, at its free end, are the two fan-shaped blades R, which are pivotally connected to the said arm or shaft, and provided with suitable means—as, for instance, the radial slot *o* on or in one and the set-screw *p* on the other extended through and working in said slot, as seen in Fig. 1. This fan is arranged parallel with the wheel and the same may be readily adjusted to increase or decrease its resisting-surface, as may be desired, so that the wind will automatically throw the wheel out of the wind with greater or less force thereon, as occasion may require.

What I claim as new is—

1. The combination, with the wheel-shaft and the counterbalance-weight thereon, of the tail-vane and a brake carried thereby and adapted to act against said wheel, as set forth.

2. The combination, with the wheel and its shaft, of the counterbalance-weight on the said shaft, the tail-vane, and a curved brake-arm secured to the tail-vane and adapted to act against the periphery of the counterbalance-wheel as the tail-vane is turned, substantially as specified.

3. The combination, with the wheel and its shaft, of a resistance-blade arranged substantially parallel with the wheel, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

HORACE C. LYMAN.

Witnesses:
CHAS. H. FOWLER,
E. M. DAWSON.