(No Model.) 2 Sheets—Sheet 1.

W. W. LOCKWOOD.

WIND WHEEL.

No. 385,674. Patented July 3, 1888.

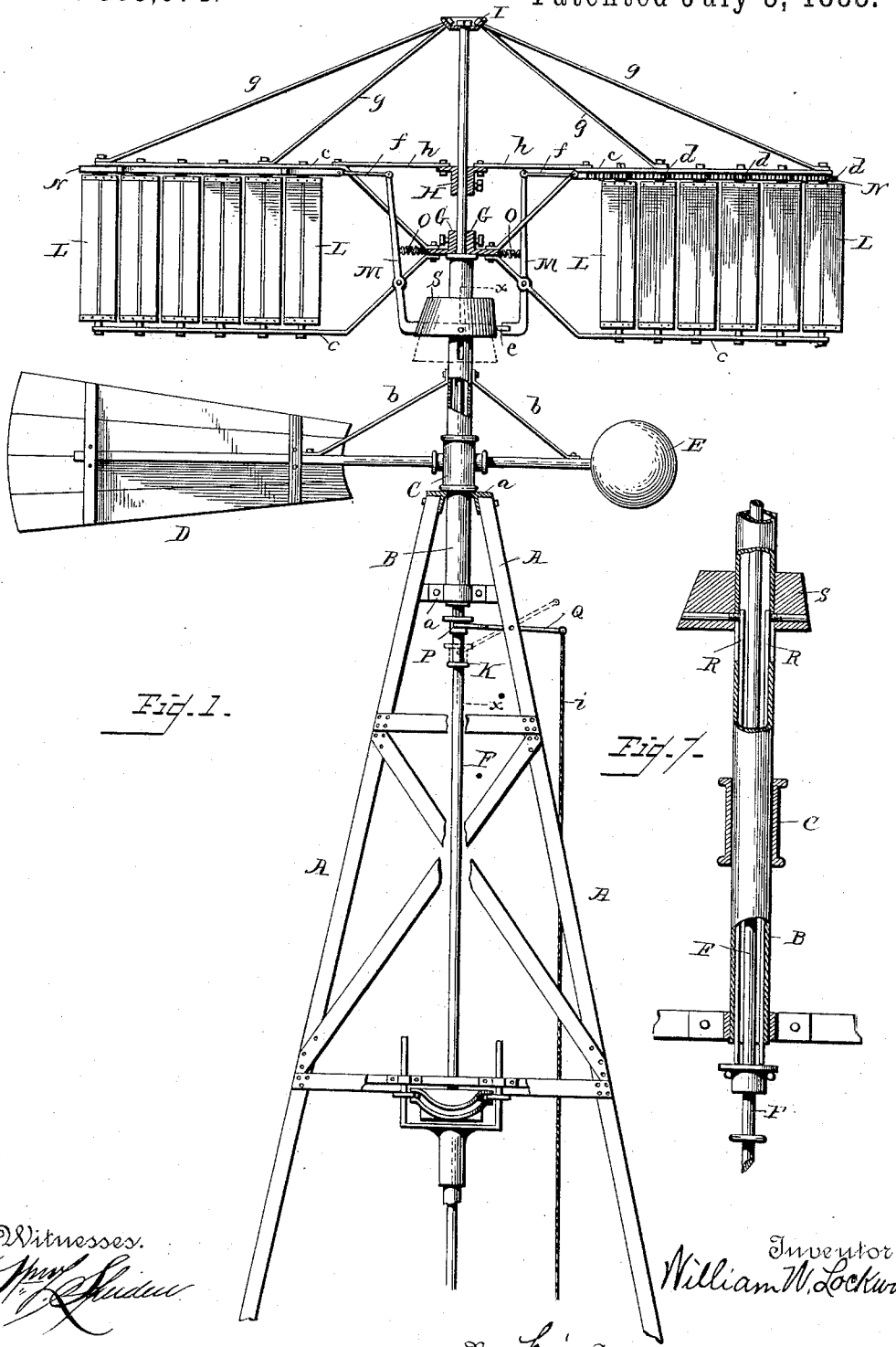

Fig. 1.

Fig. 7.

Witnesses.
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Inventor.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

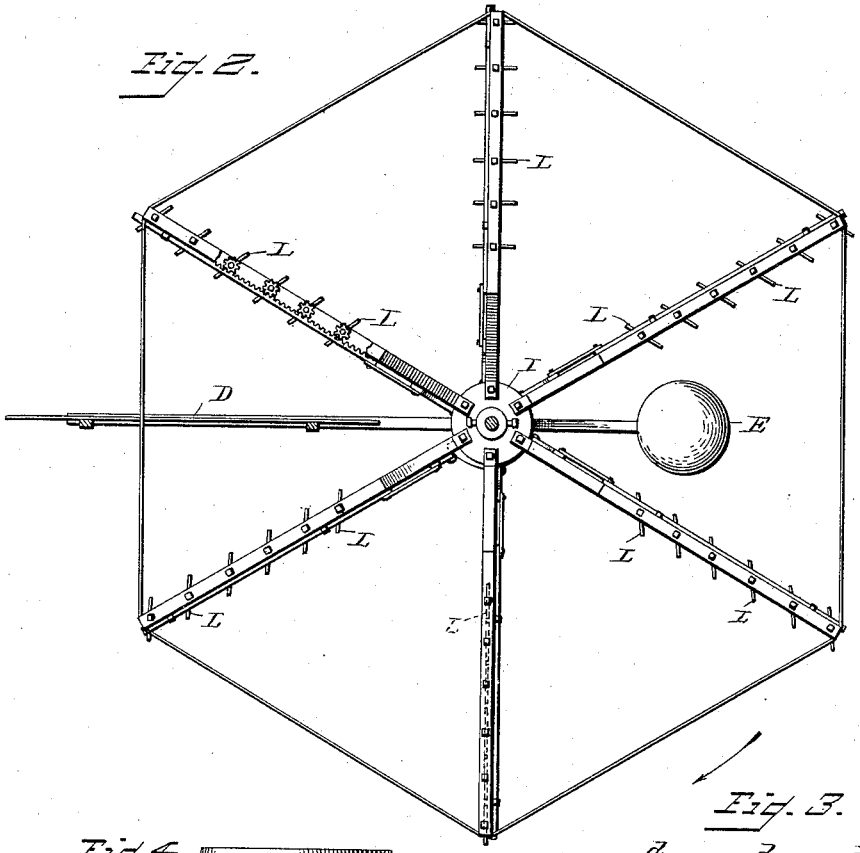


Fig. 3.

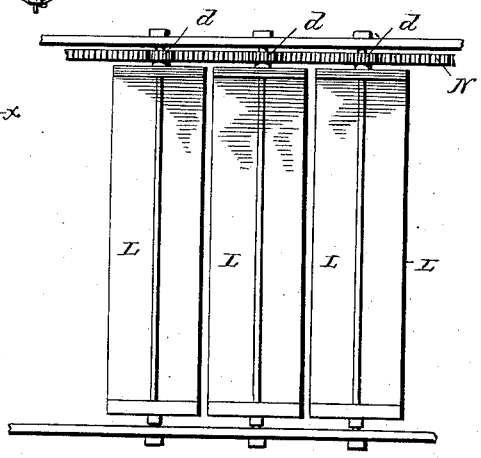


Fig. 4.

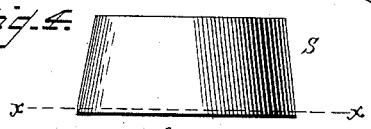


Fig. 5.

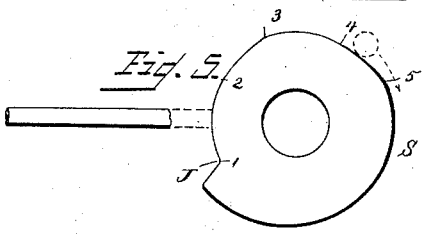
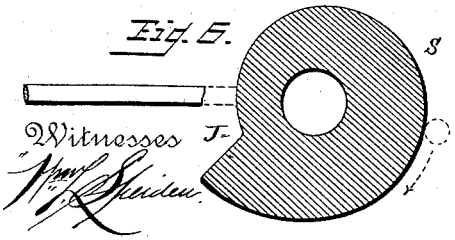


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM W. LOCKWOOD, OF FREEPORT, ASSIGNOR OF ONE-HALF TO FERRIS O. MOTT, OF ANTHONY, KANSAS.

WIND-WHEEL.

SPECIFICATION forming part of Letters Patent No. 385,674, dated July 3, 1888.

Application filed January 10, 1888. Serial No. 260,299. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. LOCKWOOD, a citizen of the United States, residing at Freeport, in the county of Harper and State of Kansas, have invented certain new and useful Improvements in Wind-Wheels; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

In the accompanying drawings, Figure 1 is a side elevation, partly in section. Fig. 2 is a plan, partially in section. Fig. 3 is a detail of the slats on an enlarged scale. Figs. 4, 5, and 6 are detail views of the cam, Fig. 6 being on the line *x x* of Fig. 4. Fig. 7 is an enlarged detail section on line *x x* of Fig. 1.

The invention relates to wind-wheels; and it consists in the peculiar combination, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then specifically defined in the claims.

Referring to the details of the drawings, A designates the supporting-frame, in the crossties *a a* of which is journaled the hollow shaft B, to which is secured the casting C, carrying the vane D and counter-balance E, the shaft of which is suitably braced by the ties *b*.

F is the main shaft, extending through the hollow shaft B and carrying the collars G, H, and I. To the collar G are secured the radiating arms *c*, in which are pivoted on vertical pivots the sails L, the pivot of each sail carrying upon one end a pinion, *d*. Pivoted to the arms *c*, as shown, are the levers M, the lower ends of which are bent inwardly, as shown, and provided with friction-rollers *e*. The upper ends of these levers are connected by means of the cords *f* with the rack-bars N, which work in suitable guides on the arms *c*.

O O are springs attached at one end to the collar G and at the other end to the lever H, as shown.

The arms *c* are braced by means of the rods *g* and *h*, connected with the collars H and I, respectively.

P is a sleeve or collar sliding loosely on the shaft F below the hollow shaft B, and designed to rest upon the collar K, as shown in dotted lines in Fig. 1.

Q is a lever. This lever is pivoted to the frame A and engages the collar or sleeve P, and to its other end is attached the cord or rope *i*, by means of which the collar P may be adjusted vertically on the shaft F, for a purpose hereinafter described.

Within the hollow shaft B are the rods R, to the upper end of which is connected the drum S by means of pins which pass through slots in the hollow shaft. The drum S is of peculiar construction, as will be seen by reference to Figs. 4, 5, and 6 of the drawings. It is slightly conical, and is provided with a notch, *j*, the object of which will hereinafter appear. The springs O, being located so as to act on the long arms of the levers M, serve to at all times keep the rollers *e* in close contact with the inclined face of the drum S.

From the foregoing description of the construction the operation of the device will be readily understood. The machine having been thrown into gear by means of the rope *i* and lever Q, it will be seen that the friction-rollers *e* upon the levers M are brought into contact with the drum S at a point near its upper or smaller end. It is also at once evident that the sails will make a one-half revolution during each revolution of the wheel, and that they will return to the point from which they started.

Reference being had to Fig. 5 of the drawings, we will suppose that the friction-wheel starts at the point 1. From 1 to 2 it travels upon an arc of a perfect circle, and the sails will in consequence retain the same position with reference to the arm. From the point 2 to the point 3 the diameter of the drum increases sufficiently to turn the sails so that they will continue to present a flat or bearing surface to the wind during the revolution of the wheel. From 3 to 4 the path is upon the arc of a circle, and the sails will retain the same position with reference to the arm, and from 4 to 5 there is an increase, &c., so that when the rollers have arrived at the point X the sails will be in the same position with ref-

erence to the wind as when at the starting-point. The rack-bars N, with which the pinions upon the sail-pivots mesh, have to travel in the same direction for each revolution of the wheel, and must return each time to the starting-point. It is necessary that this return must be accomplished with as little delay as possible, and before the arm passes the vane. In order to provide for this I have provided the drum with an inclined or cut-away portion, as shown, and in order to cause the rollers to pass over this portion of the drum with as little noise and jar as possible I prefer to use either solid-rubber friction-rollers or rollers that are faced with rubber. When out of gear, the rollers start at a point upon the drum at which the diameter is slightly less than at the starting-point when in gear, and from this point there is a gradual increase in the diameter of the drum to its lower edge, at which the diameter of the drum is the greatest.

Having thus described my invention and set forth its merits, what I claim to be new, and desire to secure by Letters Patent, is—

1. The combination, with the arms and the sails pivoted therein, of pinions on the pintles of said sails and a rack movable on said arms and engaging said pinions, substantially as and for the purpose described.

2. The combination, with the main shaft, the arms, pivoted sails, pinions, and rack-bars, of the levers pivoted to said arms and connected with the rack-bars, the springs attached at one end to said shaft and at the other to the levers, the drum S, and means for vertically adjusting said drum, substantially as described.

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

WILLIAM W. LOCKWOOD.

Witnesses:
W. M. DUFFY,
F. KENDALL.