(No Model.) 2 Sheets—Sheet 1.

J. P. SCHUCKMAN.

WINDMILL.

No. 359,818. Patented Mar. 22, 1887.

Fig. 1.

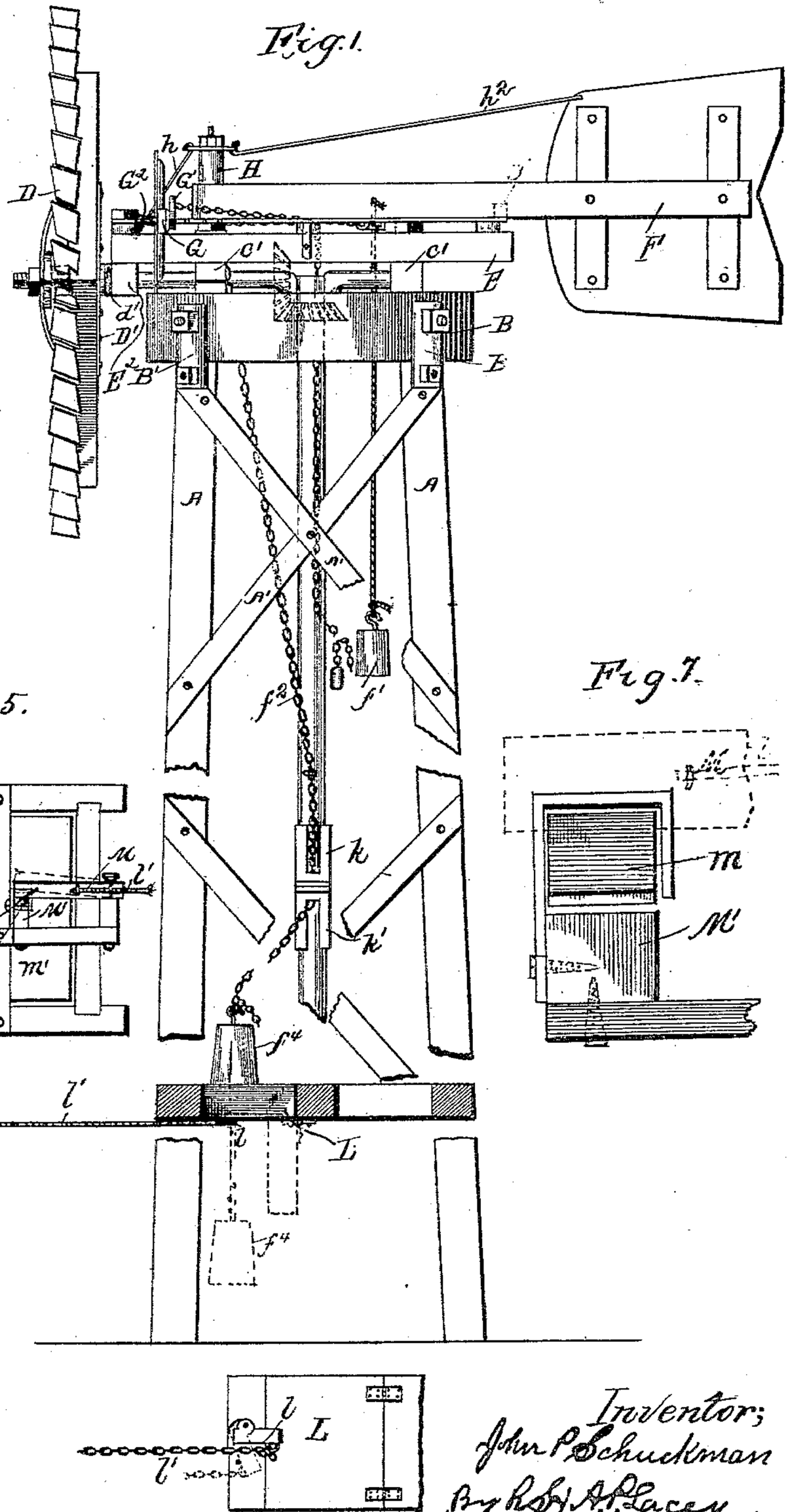


Fig. 4.

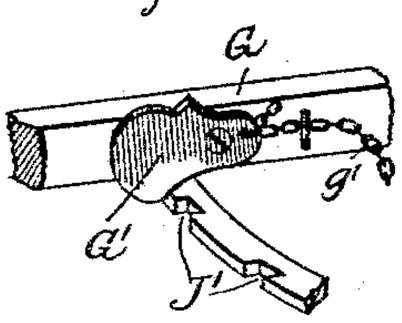


Fig. 5.

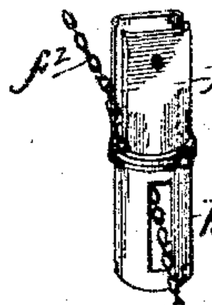
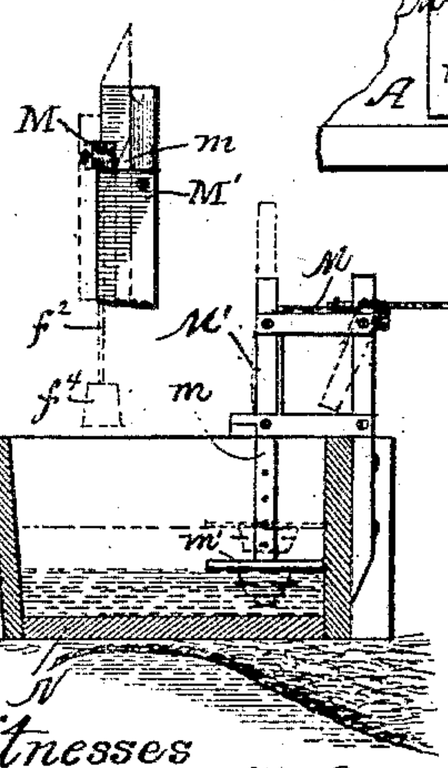


Fig. 6.

Fig. 7.



Witnesses
R. C. Lawie.
H. C. Hunter.

Inventor;
John P. Schuckman
By R. S. & A. P. Lacey
Attys

(No Model.) 2 Sheets—Sheet 2.

J. P. SCHUCKMAN.

WINDMILL.

No. 359,818. Patented Mar. 22, 1887.

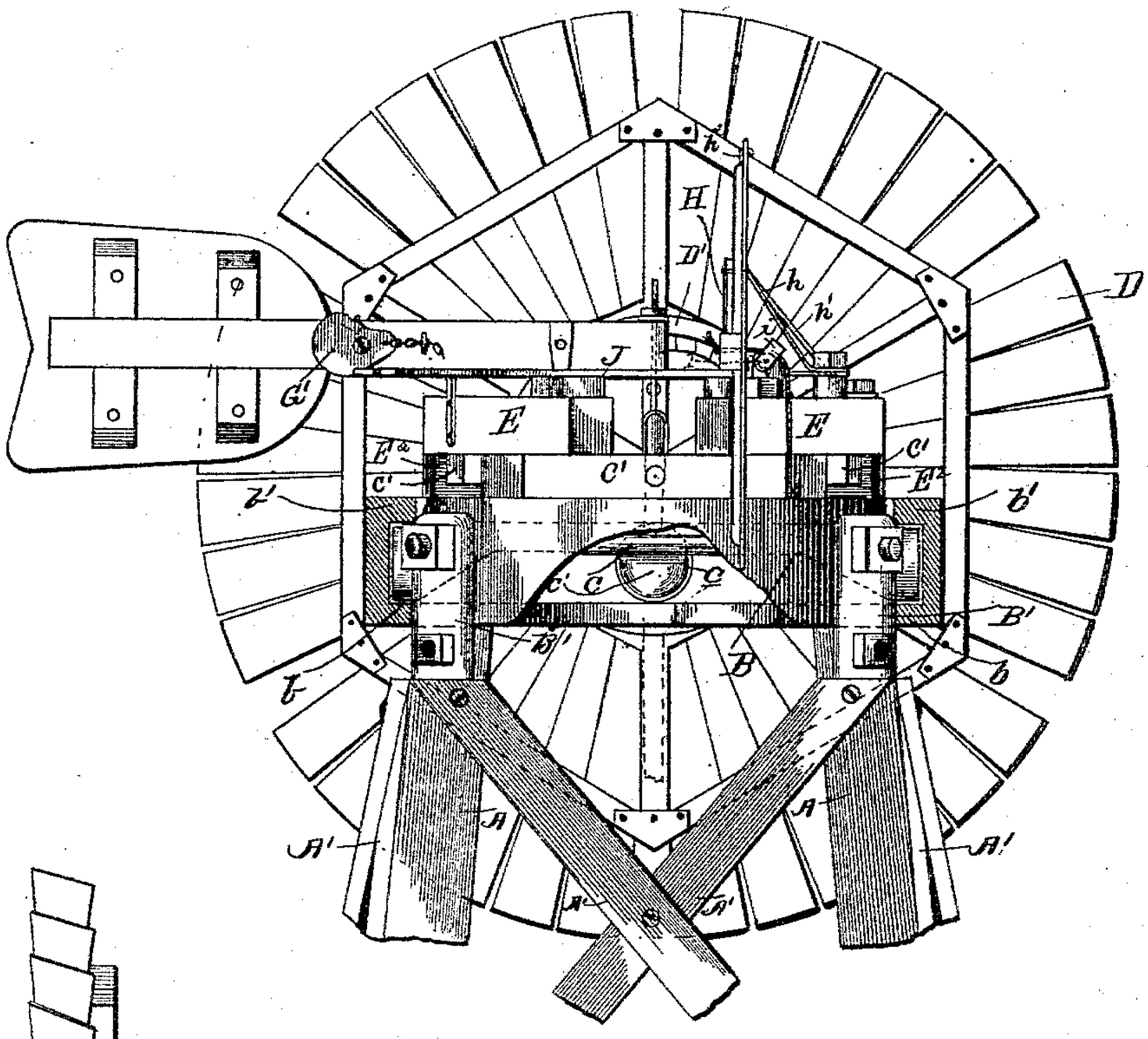


Fig. 2.

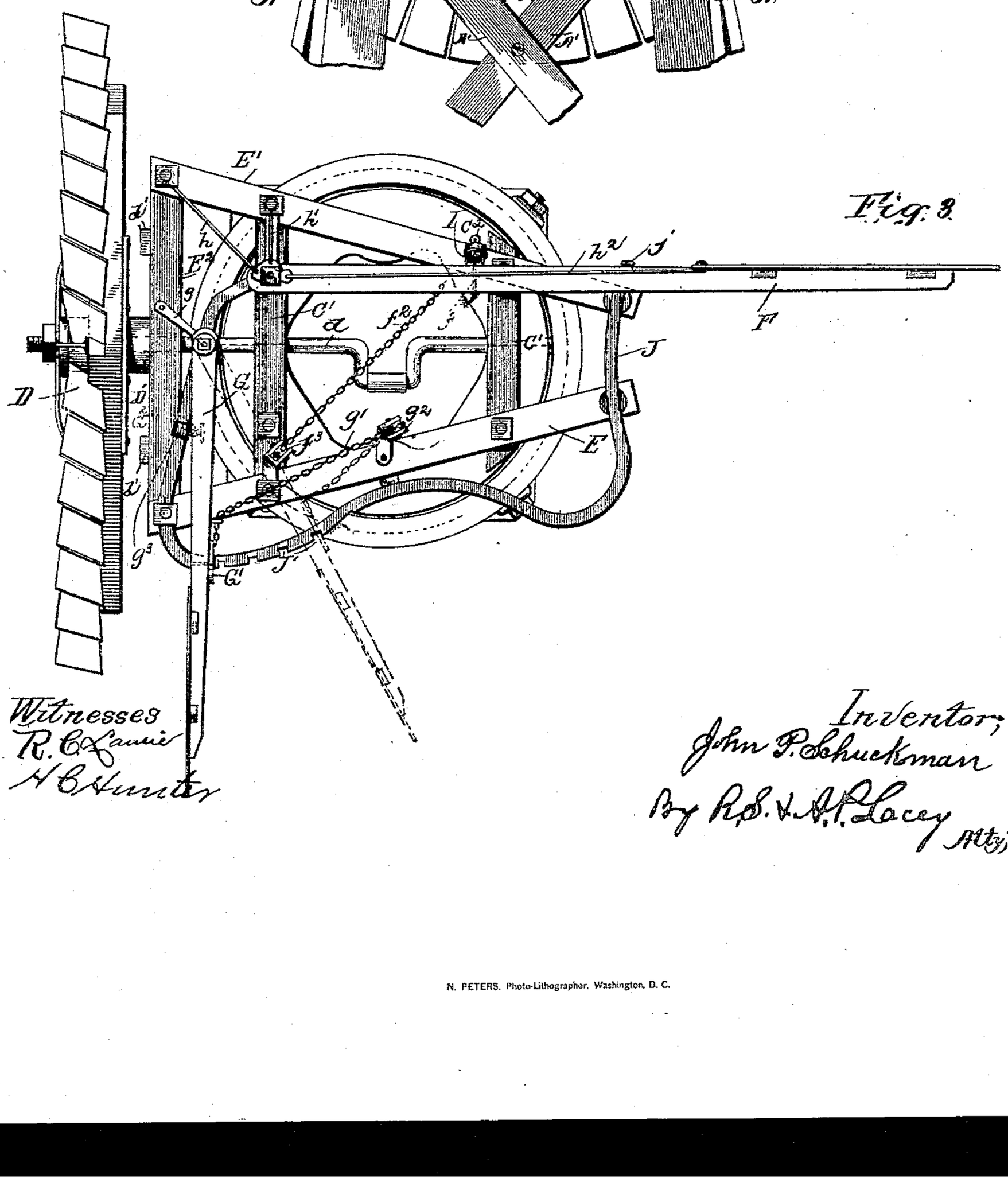


Fig. 3.

Witnesses
R. C. Lamie
H. B. Hunter

Inventor;
John P. Schuckman
By R. S. & A. P. Lacey Attys

UNITED STATES PATENT OFFICE.

JOHN P. SCHUCKMAN, OF OREARVILLE, MISSOURI.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 359,818, dated March 22, 1887.

Application filed August 9, 1886. Serial No. 210,433. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. SCHUCKMAN, a citizen of the United States, residing at Orearville, in the county of Saline and State of Missouri, have invented certain new and useful Improvements in Windmills; 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.

My invention relates to windmills of that class in which the wheel revolves in a vertical plane; and it has for its object to devise a construction by which the wheel may be low down on the frame or tower, and be protected from the force of the wind both in front and from the rear; to combine therewith a side vane or regulator for varying the speed of the mill independent of the force of the wind and the load; to combine with the tail-vane a gage for automatically throwing the wheel out of the wind, and to improve the turn-table, whereby the use of a large wheel is practicable without the use of a cumbersome and heavy tower.

A further object is to improve the general structure, whereby the efficiency and durability of the engine is increased and the latter less liable to get out of repair.

The invention consists in the novel features more fully hereinafter set forth, claimed, and shown in the annexed drawings, in which—

Figure 1 is a side view, parts broken away. Fig. 2 is a rear view. Fig. 3 is a plan view. Figs. 4 and 5 are detail views. Fig. 6 is a plan view, parts broken away, of the tank and the tripping attachment. Fig. 7 is a detail view of the tripping attachment on an enlarged scale.

The tower comprises corner-posts A, suitably braced by cross-slats A′. The upper ends of the posts support a ring, B, which is secured thereto by short plates B′, bolted to the posts at the lower ends and to the ring at the upper ends. An annular flange projects inward from the upper and lower edges of the ring, and may be integral therewith or separate and bolted thereto. The lower flange, *b*, forms the track or support for the turn-table C, and the upper flange, *b′*, serves the double purpose of holding the turn-table from vertical displacement or canting, and also as a shield to protect its travelers or rollers *c* from sleet, rain, or snow.

The turn-table consists of a flat annular casting having its central portion removed to lessen the weight and give room for the pump-rod and various operating-cords, and is provided at intervals with arms *c′*, upon which the rollers *c* are mounted. The arms are thicker than the casting, and the excess of thickness is made to project on the under side, thereby giving a flat unbroken upper surface.

The casting may be a single piece or two or more pieces, as desired, in which latter case they will be united by the bolsters *c′*, which form bearings for the shaft *d* of the wheels D, and which are mounted upon and secured to the turn-table. A frame comprising side bars, E E′, and end bar, E², is supported upon the bolsters, and have the vane F and regulator G carried thereby. The side bars converge from the wheel toward the vane, and the end bar is secured to the under side of the divergent ends, and forms an additional bearing for the wind-wheel shaft *d*.

The wheel D is of ordinary construction, save that the middle portion is strengthened by a metal ring, D′, located on the rear and uniting the inner supports of the slats, which prevents the wheel giving when subjected to the force of the wind from the rear. It revolves close to the end bar, E², and buffer-blocks *d′*, located near each end of said bar directly opposite the ring D′, form the stays for the wheel when the pressure of the wind is from the front and forces it back upon said buffers. This operation will be readily understood when it is remembered that the wind oftentimes, especially when blowing a gale, bends the outer portion of the wheel to one side of the plane of its central portion. The middle of the wheel is stayed by its rigid connection with the wheel-shaft. Consequently it is not liable to give; but the outer portion of the wheel is more flexible, owing to its greater distance from the central support, and gives under abnormal pressure, and in order to prevent it giving so far

as to do injury the buffer-blocks are located as now to be described.

It will be noticed that the buffers are arranged at points diametrically opposite the center of the wheel, and in such close proximity to the ring D′ that a slight give or yielding of the wheel, when subjected to a high wind, will cause the ring to bear upon them, and thus prevent a further giving and any serious damage being done.

The vane F is of the usual construction, and is located to one side of a plane passing vertically through the shaft *d*. It is pivoted at its inner end to the upper end of an arm, H, secured to the bolster, and braced by rods *h h′ h²*. The latter extends to and steadies the tail-piece. A cord or chain, *f*, attached at one end to the arm of the vane and passing over a swiveled pulley, I, secured to the side bars, E′, has a weight, *f′*, fastened to the lower end for normally holding the wheel in the wind, as will be readily understood. The chain extends through an opening, *c²*, in the turn-table. The pulley I has a hood, *i*, which protects it from sleet, snow, &c. The rear portion of the vane-arm rests upon a guide-rail, J, which has its end bent upward at right angles, forming the stop *j*, which limits the movements of the vane, so as to hold the wheel full in the wind. A second cord or chain, *f²*, secured to the vane-arm and passed over a pulley, *f³*, near the front end of the bar E, extends downward within convenient reach to throw the wheel out of the wind, in a manner readily understood. This chain is preferably held close to the pump-rod, which is made in two parts, K K′, united by a swivel coupling or joint, *k k′*. It passes through a slot in one side of the part *k* of the coupling, and out through a similar slot in the side of the other part, *k′*, of the coupling. By this means the chain is prevented wrapping around the rod during the movements of the turn-table.

The regulator consists of a vane, which is adapted to extend from the side of the mill and extend at substantially right angles to the shaft *d* of the wheel. The inner end is pivoted to an arm, *g*, extending from the end bar, E². The outer end is adapted to be swung to and from the plane of the wheel in the arc of a circle, so as to present more or less surface to the wind, and is held at any desired point by suitable means, preferably by gravity-latch G′ engaging one of a series of notches in the segment J′, which may be a continuation of the rail J, bent into an arc of a circle at this point, of which the pivotal point of the vane is the center.

The gravity-latch can be operated from the ground by means of the rope or chain *g′*, which is secured thereto at one end, passed through a keeper on the vane-arm, thence over a pulley, *g²*, on the bar E, and down within convenient reach. A spring, G², fastened at one end to the vane-arm and at the other end to an adjustable clip, *g³*, on an arm or rear extension of the guide-rail J, exerts a force to normally hold the regulator or vane parallel with the wheel.

In operation, when it is desired to adjust the regulator, a pull on the rope or chain *g′* will accomplish the desired result. Suppose the regulator is parallel with the wheel, and it is desired to adjust it at an inclination thereto. The end of the chain *g′* is grasped and pulled upon. The first pull disengages the latch from the notch. A continued pull moves the regulator around its pivot till the desired position is reached. If the chain is suddenly released, the latch will operate and fall in the notch, thereby holding the regulator in place, as shown by dotted lines. When the regulator is adjusted from the wheel and it is desired to bring it closer thereto, the same may be accomplished by pulling upon the chain, which will disengage the latch from the segment, when, by letting out on the chain, the spring G′ will draw the regulator toward the wheel. When the desired point of adjustment is reached, the chain is suddenly released, the latch engaging with the segment, as previously described. The regulator acts in opposition to the vane F to throw the wheel more or less out of the wind, thereby regulating its speed. When it is parallel with the wheel, the wind has the greatest play thereupon, and consequently forces the wheel at the greatest inclination to the wind, which, acting at an incline, exerts less power upon the wheel and drives it at a less speed. The greater the angle between the regulator and wheel, the more the latter is brought full in the wind, and the speed is proportionately increased, everything else considered being equal.

The wheel may be automatically thrown out of the wind by attaching a weight, *f⁴*, to the lower end of the rope or chain *f²*, and supporting it upon a board, L, which is tripped, and allows the weight *f⁴*, which is heavier than the weight *f′*, to overbalance the latter and throw the engine out of gear. The board is hinged at one side to the frame of the tower, and is supported at its other in a horizontal position by a latch, *l*, to which one end of a rope, chain, or wire, *l′*, is secured, the other end being connected to a weighted lever, M, which is normally held in a horizontal position upon the top of a tube or guide, M′, through which the stem *m* of a float, *m′*, works.

The end of the stem is beveled on the side adjacent the lever, so that the latter may have a purchase upon the end of the tube or guide; but when it (the stem) rises the free end of the lever will be moved laterally and pushed off from the guide, and, gravitating, will turn the lever on its pivot and draw the latch, which will permit the board L to drop, for the purpose already described. The pivotal support of the lever M is sufficiently loose to permit the free end thereof to be moved laterally and become disengaged from the guide, as most clearly shown by dotted lines in Fig. 6, where-

by the lever is free to have a vertical movement, as shown by dotted lines in Fig. 1.

The stem *m* rests upon the bottom of a reservoir or tank, N, and the float *m'* is adjustably secured thereto at any desired level, so that when the water which is supplied thereto from the pump reaches the float the latter, rising, will lift the stem and effect the throwing of the engine out of gear in the manner just set forth.

The arms of the regulator and vane may be of any suitable material, although ordinary tubing, such as gas-pipe, is preferred, owing to its strength and lightness.

The shaft *d* of the wind-wheel may impart a reciprocating motion to the pump-rod in the usual manner, in which case it will be provided with the crank in the ordinary way, as shown by full lines, Figs. 1, 2, and 3; or it may impart a rotary motion, in which case the wheel-shaft will be provided with a bevel-pinion on the pump-rod, as shown by dotted lines in Fig. 1, and the chain f^2 will have to be disconnected from the pump-rod. This change will not alter or affect the vital principles of my invention, but is simply mentioned to show that the pump-rod may receive a rotary or reciprocatory motion, as desired.

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

1. The combination, with the wind-wheel and the vane for holding the wheel in the wind, of an adjustable regulator for varying the speed of the wind-engine, consisting of a vane extending to one side of the wheel and adjustable to and from the plane of the wheel, substantially as described.

2. In a wind-engine, the combination, with an adjustable regulator, for the purposes set forth, and a spring normally holding it in place, of a notched segment, a latch, and a rope or chain connected with the latch and extending within convenient reach, substantially as and for the purpose described.

3. The combination, with the wheel, the shaft, and the vane set to one side, of a regulator set to the opposite side of said vertical plane of the shaft and projecting at substantially right angles to the vane and acting in opposition thereto, and adjustable to and from the plane of the wheel in the arc of a circle, as and for the purpose set forth.

4. The combination of the frame, the wheel, the pivoted vane and regulator, the guide-rail bent at its end, forming a stop for the vane, and having a portion formed in the arc of a circle concentric with the pivot of the regulator and notched, and a latch secured to the regulator and adapted to engage one of the notches, substantially as described, and for the purpose set forth.

5. The combination, with the wheel and weighted vane, of a rope or chain connected with the vane, passed over a pulley and weighted to overcome the force of the weight holding the vane in the wind, a movable support for the overbalancing weight, a catch, a weighted lever connected with the catch, and a float for tripping the lever, whereby the catch is drawn and the support moved to precipitate the weight and throw the engine out of gear, substantially as described.

6. The combination of the tower, the ring having flanges projecting inwardly from its top and bottom edges, secured to the top of the tower, the turn-table composed of two parts, each part having rollers traveling in the space between the flanges and supporting said turn-table, the bolsters uniting the parts of the turn-table, the wheel-shaft mounted in the bolsters, the frame comprising the end and side bars, and the vane and regulator supported upon the frame, substantially as set forth.

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

JOHN P. SCHUCKMAN.

Witnesses:
HENRY C. MEAD,
PETER SHEER.