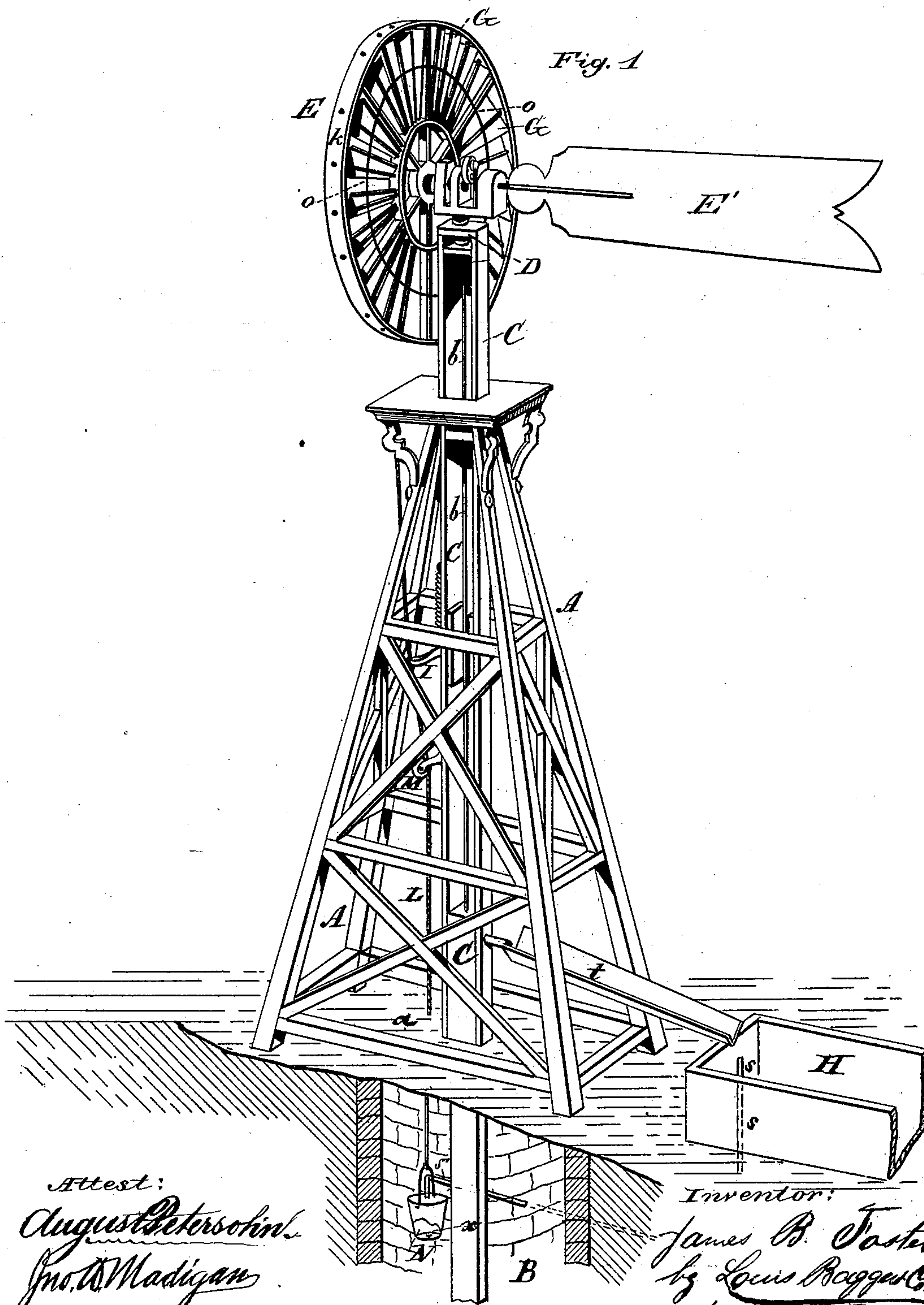


J. B. FOSTER.  
Wind-Engine.

No. 201,233.

Patented March 12, 1878.



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Fig. 2.

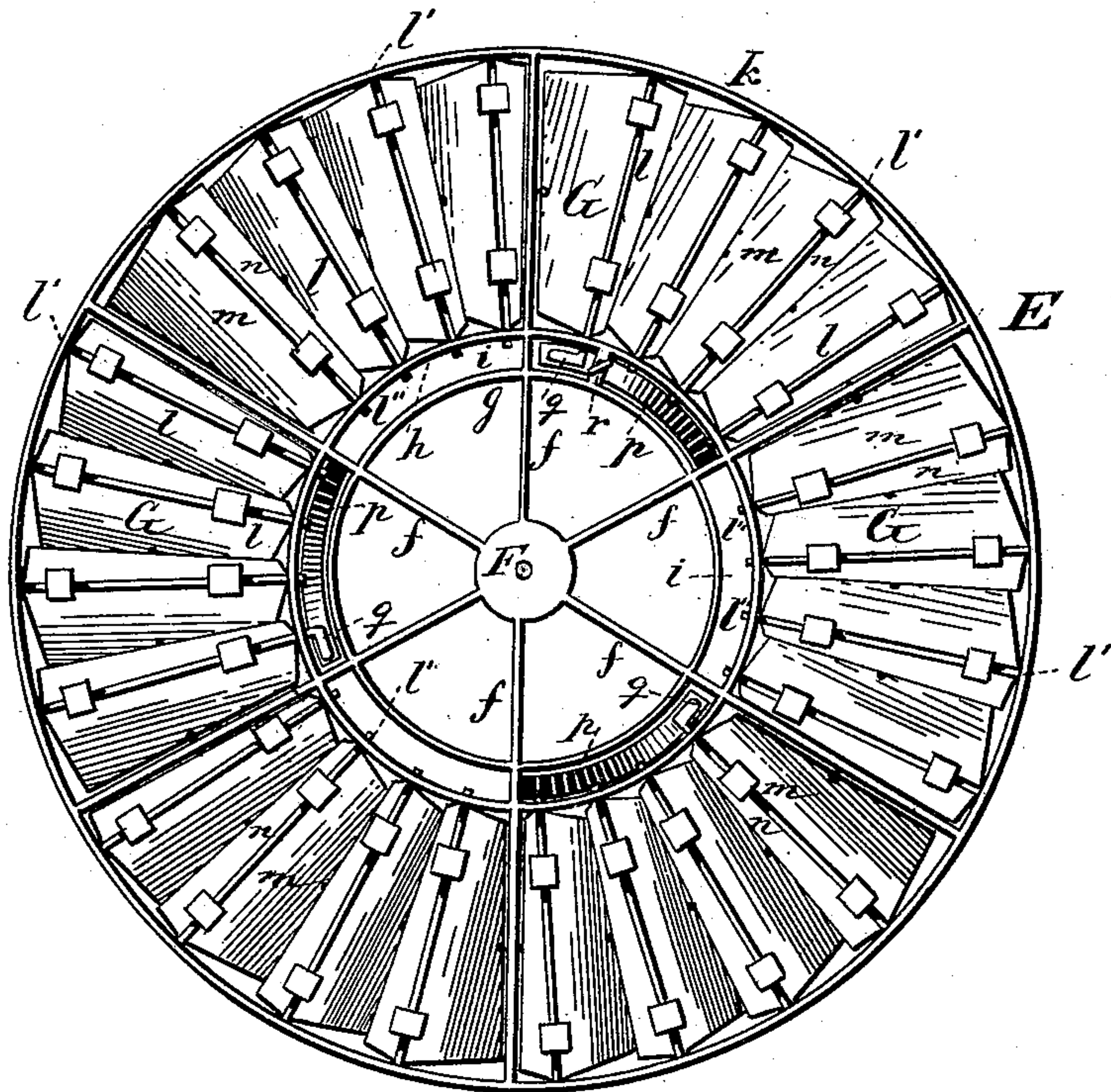
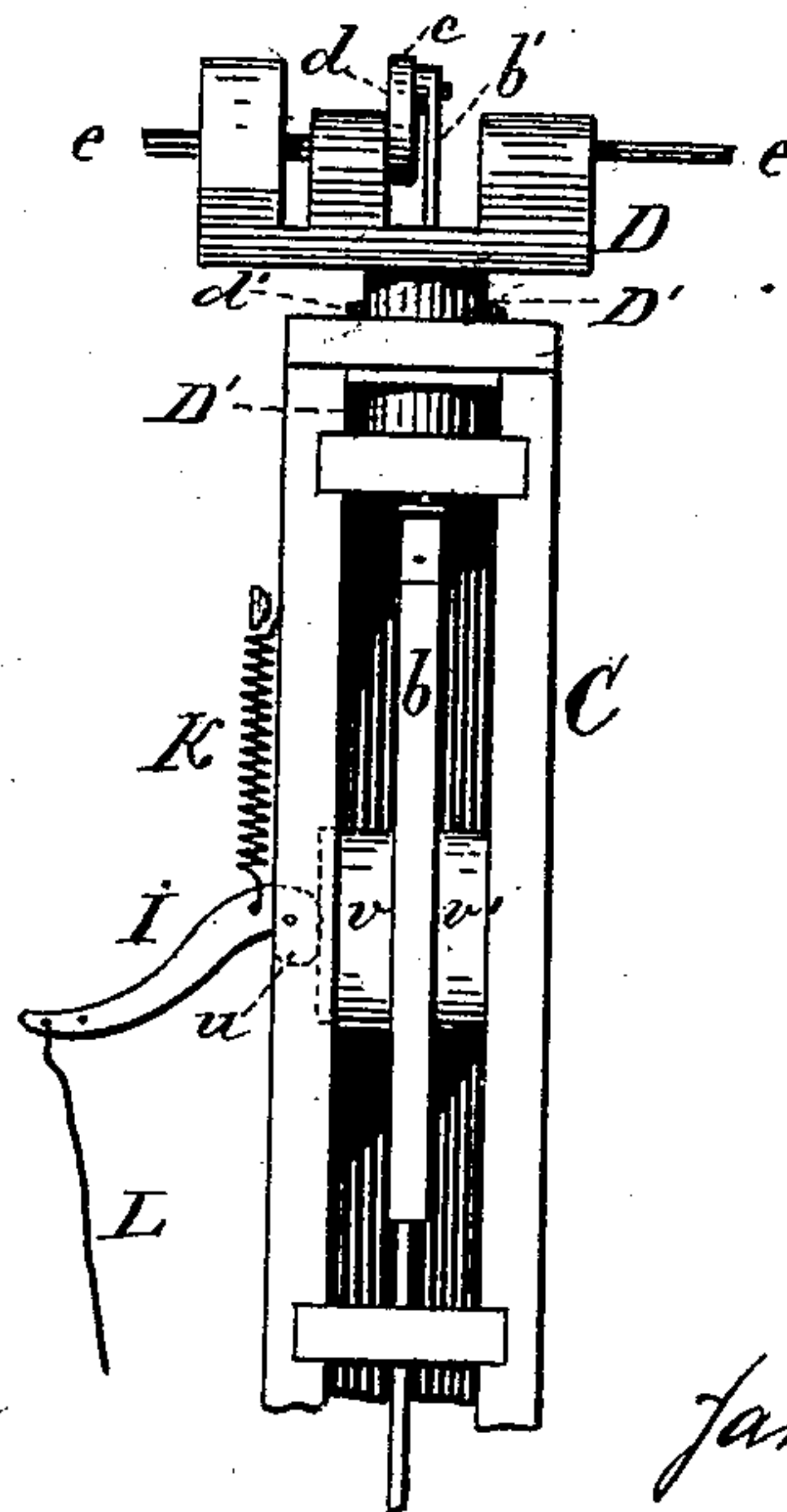


Fig. 3.



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Jno. W. Madigan

Inventor:  
James B. Foster  
by Louis Baggett  
his attorney.



# UNITED STATES PATENT OFFICE.

JAMES B. FOSTER, OF DELAWARE, OHIO.

## IMPROVEMENT IN WIND-ENGINES.

Specification forming part of Letters Patent No. **201,233**, dated March 12, 1878; application filed December 19, 1877.

*To all whom it may concern:*

Be it known that I, JAMES B. FOSTER, of Delaware, in the county of Delaware and State of Ohio, have invented certain new and useful Improvements in Wind-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to pumps operated by wind-wheels.

It consists, first, in an improved construction of the wheel; and, second, in the construction and arrangement of an automatic device for regulating the flow of water from the well, substantially as hereinafter more fully described.

In the two sheets of drawings hereto annexed, Figure 1 is a perspective view of my improved wind-engine complete. Fig. 2 is a front elevation of the wheel; and Fig. 3 is a side view of the upper part of the pitman-box, showing the pitman-rod and brake.

Similar letters of reference indicate corresponding parts in all the figures.

A is the frame or derrick, which is built up over the mouth of the well B, and has a floor or covering, *a*, to prevent dirt from falling into this. In the center of the derrick is the pitman-box C, consisting either of a hollow tube of suitable dimensions or of lengths of plank bolted together to form a square box, inside of which plays the pitman *b*, the end of which is connected to the sucker-rods, which reach down into the well and operate the piston. The top of the pitman projects up through a bore or hole in the turn-table D, (the construction of which will be hereinafter described,) and is connected by an oscillating arm, *b'*, to the crank *c* on disk *d*, which latter is keyed centrally upon the shaft *e* of the wind-wheel E; hence, when this rotates, a reciprocating motion is given to the pitman and its connecting sucker-rods.

The wind-wheel E consists of a central hub, F, made preferably of cast-iron, from which radiate the arms or spokes *fffff*. These are connected and strengthened by a circular ring or flange, *g*, which is concentric with an-

other ring or flange, *h*, leaving a narrow open annular space, *i*, between the two rings *g* and *h*. *k* is the periphery or exterior rim or flange of the wheel, between which and the inner ring *h* the fans G are pivoted. Each of these fans consists of a blade mounted either upon a shaft, *l*, in such manner that the shaft shall be nearer to one side or edge of the blade than to the other; in other words, that portion of the blade which lies on one side of the shaft (indicated by the letter *m*) is wider than the other part, *n*; or, if preferred, short staples or pivots may be riveted onto either end of the blade, which will answer the same purpose. The edges *m m* of the several blades are connected to each other either by a continuous wire or short rods or links *o*.

The projecting upper and lower ends of the shafts *l* form pivots, (denoted by *l'* and *l''*), which are inserted into holes or bearings in the rims *k* and *h*, respectively; and in the narrow annular space or box *i*, formed between the concentric flanges *g* and *h*, are inserted two or more segmental springs, *p p*, fastened at one end to the spokes *f*, back of flanges *g h*, and projecting forward and slantingly into the box *i*. The lower pivot *l''* of the fan G, which is nearest to the end of the spring in each of the parts of box *i* in which springs are placed, projects downward into the box, and is bent at a right angle, as shown at *q q*, forming a short lever arm or key, which bears against the free end of spring *p*, at an angle of about forty-five degrees, that being the position or incline of the blades under ordinary circumstances; but the tension or incline of these springs may be adjusted by means of set-screws *r*, working in suitably arranged bearings, or in any other suitable manner, so that the pressure of these springs upon the lever-arms *q* may be regulated at will.

By this construction of the wheel, the fans will give or yield to the pressure of any sudden gust of wind against the face of the wheel, the springs acting in the same manner as the governor of a steam-engine to regulate and equalize the motion of the wheel and its connecting mechanism, so that the pump will always work evenly and smoothly without regard to fluctuations in the wind-currents.

The second part of my invention relates to



the construction and arrangement of the brake mechanism for regulating the flow of water raised by the engine, and its combination with the pitman and wheel, and will be understood by reference to Figs. 1 and 3.

H is the water-tank, which has an overflow-pipe, *s*, leading down into the well below the derrick-floor, where it terminates in a spout, *s'*; and *t* is the gutter or inlet-pipe from the pump to the tank. I is a lever, terminating in an eccentric disk or head, *u*, and having its fulcrum in a slot made in the pitman-box C. Head *u* bears against a block or brake-shoe, *v*, placed opposite to another friction-block, *v'*, bolted onto the inner wall of the pitman-box; and between the movable brake-shoe *v* and the stationary friction-block *v'* works the pitman *b*. It follows that by depressing the lever I eccentric *u* will press against the shoe *v* and clamp the pitman between this and the stationary friction-block *v'*, thereby stopping motion of the pitman and of the wheel. Lever I is raised by a spring, K, and a rope, chain, or wire (denoted by L) passes from the end of lever I over a pulley, M, down into the well to a short distance below spout *s'* of the overflow-pipe, where it has a bucket, N, having a perforation, *x*, in the bottom, secured to its end.

The operation of this part of my invention is as follows: When the tank is full, water will flow through pipe *s* and spout *s'* down into the bucket, and, the hole *x* being of less diameter than that of pipe *s*, this (the bucket) will gradually fill up until heavy enough to pull the lever I, which stops the wheel or engine. As the water gradually runs out of the bucket down into the well, spring K will overcome the weight of the bucket and raise lever I, thereby allowing the machine to resume working and replenish the supply in the tank. When this again becomes filled, the operation of filling the bucket and thereby automatically stopping the machine is repeated, and so on, the stoppage of or resuming the operation of pumping being so gradual as to prevent any sudden jar by the contact of the brake with the pitman-rod.

The turn-table D consists of a casting having

a tubular part, D', the shoulder *d'* of which rests upon a metallic bearing, which is inserted into and suitably secured upon the top of the pitman-box. Friction-rollers may be inserted under the bearing-shoulder *d'*, if desired, for the purpose of making the table D, which carries the shaft *e*, wheel E, and vane E', rotate easier. The inner sides of the tubular part D' have vertical flanges, which fit into grooves in a cross-head on the pitman *b*, so as to guide this straight up and down without lateral motion. The several parts of the turn-table are preferably cast in metal in one piece.

This engine is simple in construction, and therefore strong and durable. It is automatic in its operation, requiring no attention nor attendance, will work smoothly and evenly in all conditions of the weather, and prevents the waste of water. It can be taken apart and again set up with little trouble, and without the aid of skilled labor, and can be manufactured at less cost than most of the mills of a similar class now in the market.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the pitman *b*, pitman-box C, having stationary friction-block *v'*, brake-shoe *v*, and operating-lever I, having cam or eccentric *u*, substantially as and for the purpose herein shown and described.

2. The combination of spring K, lever I, cord L, and bucket N, having perforation *x*, substantially as and for the purpose herein shown and described.

3. In combination with the tank H, having induct-pipe *t* and overflow-pipe *s s'*, the perforated bucket N, cord L, brake mechanism I *u v v'*, spring K, and pitman *b*, with its operating mechanism, substantially as and for the purpose herein shown and described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES B. FOSTER.

Witnesses:

F. B. SPRAGUE,  
F. M. MARRIOTT.