

(No Model.)

2 Sheets—Sheet 1.

J. MOSSMAN.

WINDMILL.

No. 373,089.

Patented Nov. 15, 1887.

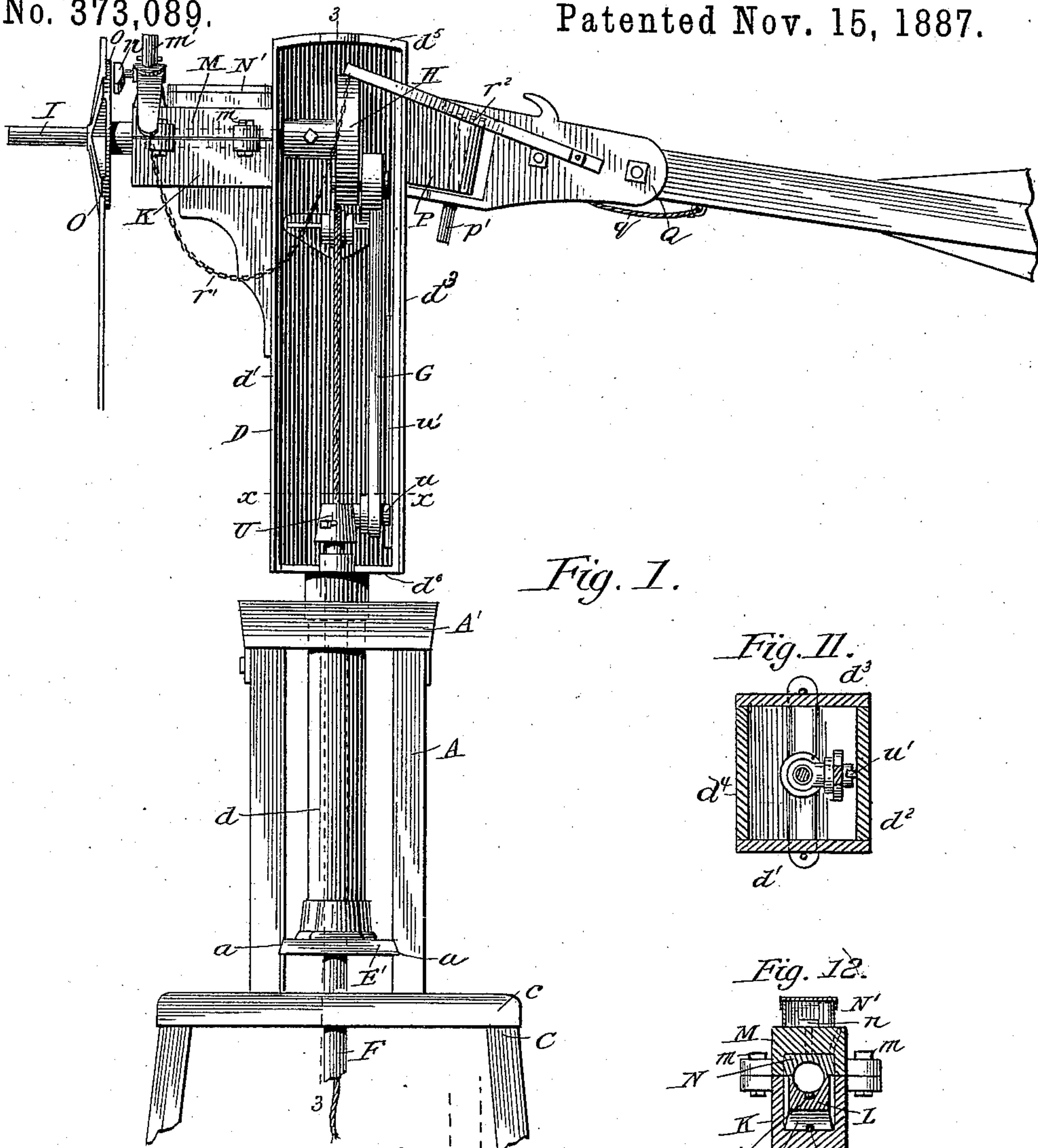


Fig. 1.

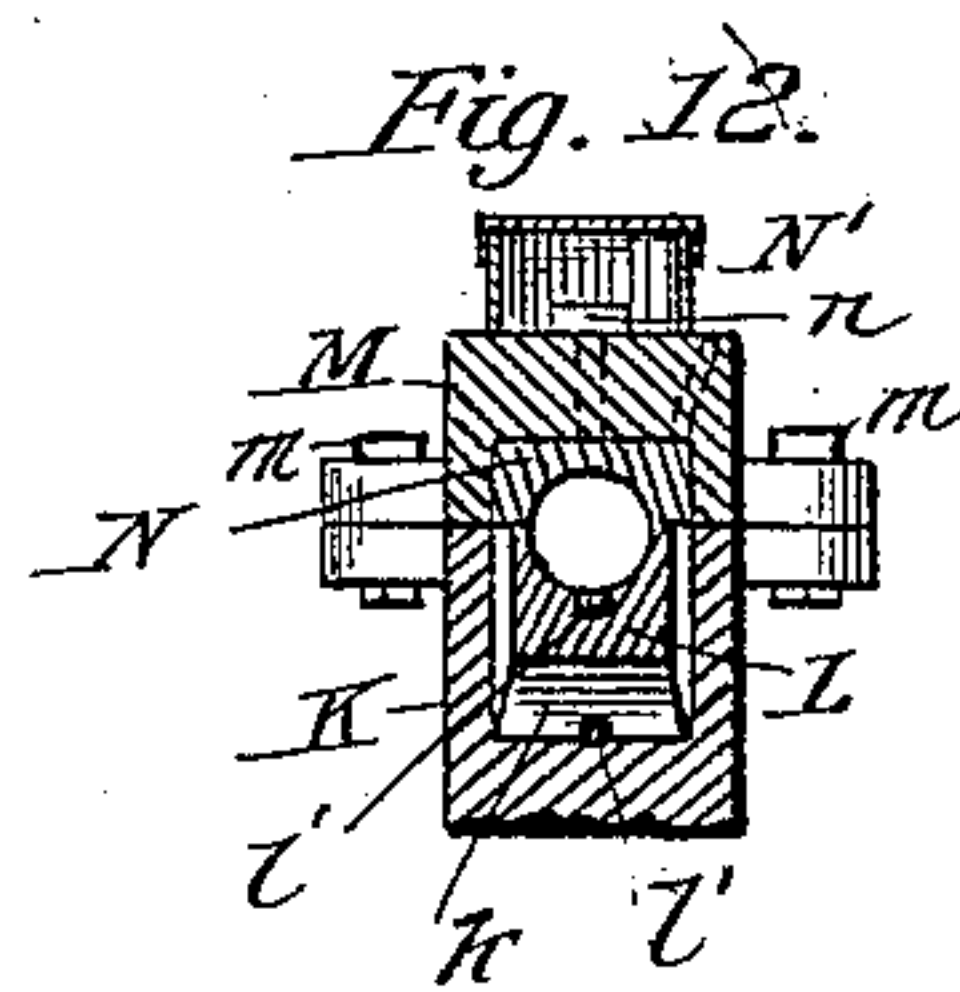
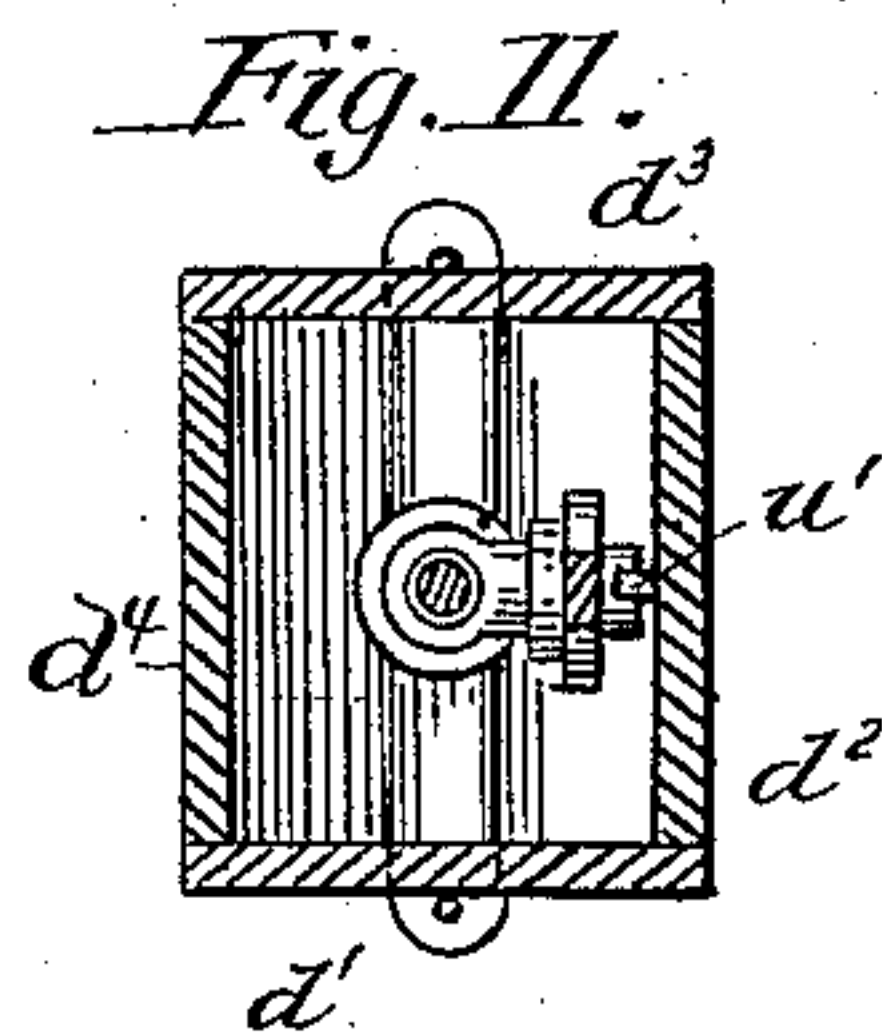
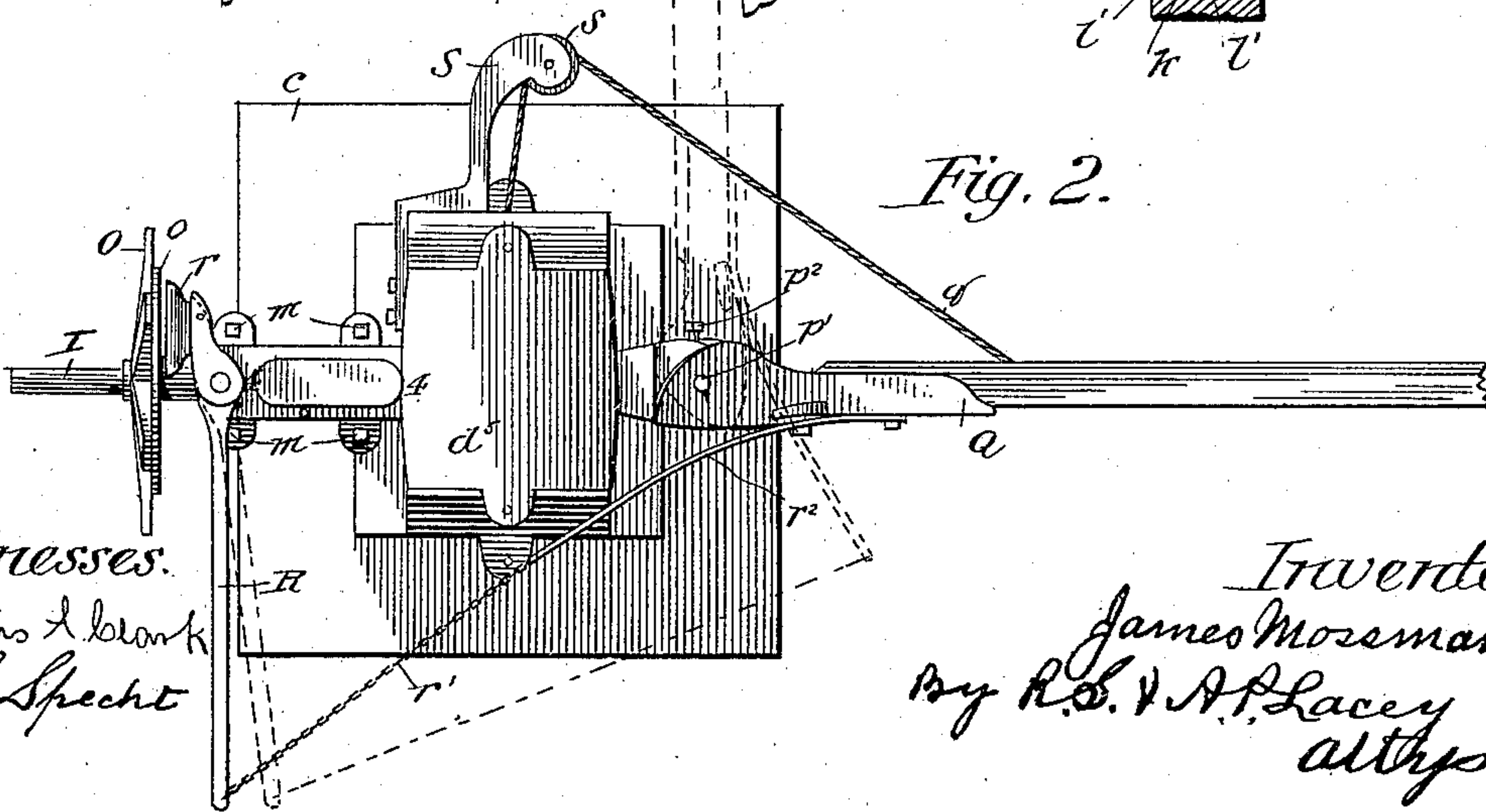


Fig. 2.



Witnesses.  
Morris L. Blank  
S. Specht

Inventor  
James Mossman  
By R. B. & A. P. Lacey  
attys

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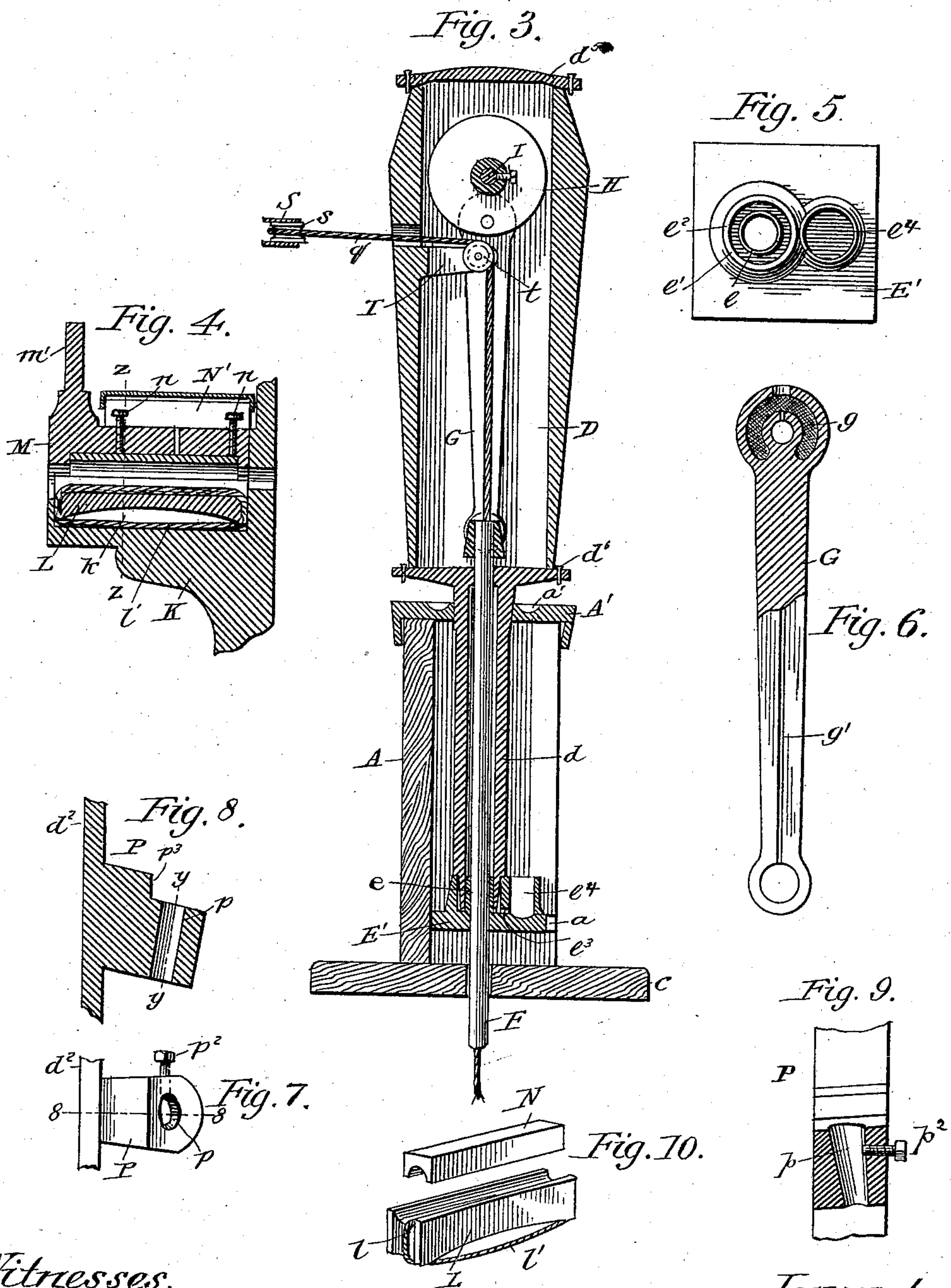
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Witnesses.  
 Morris A. Clark,  
 S. Specht

Inventor  
James Mossman  
By R. E. V. A. P. Lacey  
Atty



# UNITED STATES PATENT OFFICE.

JAMES MOSSMAN, OF WESTERVILLE, OHIO.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 373,089, dated November 15, 1887.

Application filed February 16, 1887. Serial No. 227,778. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MOSSMAN, a citizen of the United States, residing at Westerville, in the county of Franklin and State of Ohio, 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.

This invention relates to windmills of that class commonly designated as "vertical wheel," and has for its object the production of a mill which will be simple and compact in construction, and which can be readily thrown out of the wind by folding the tail-vane, which is hinged to the wheel-supporting casting in such manner that its axis is inclined to a vertical line, and is adjustable to and from a perpendicular position to regulate the force necessary to hold the wheel in the wind. The folding of the tail-vane applies a brake to the wheel and prevents any movement of the latter when thrown out of the wind.

Another object is the construction of a self-lubricating step for the tubular shank of the wheel-supporting casting, and a case for inclosing the crank on the end of the wheel-shaft, the pitman, and the upper end of the pump-rod, and which will at the same time support the wheel, the brake, and the tail-vane.

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

Figure 1 is a side view, parts broken away, of a windmill embodying my invention. Fig. 2 is a plan view showing the tail-vane folded and the brake applied in dotted lines. Fig. 3 is a longitudinal section on the line 3 3 of Fig. 1. Fig. 4 is a longitudinal section through the wheel-shaft bearing on the line 4 4 of Fig. 2, on an enlarged scale. Fig. 5 is a plan view of the step for supporting the tubular shank of the wheel-supporting casting. Fig. 6 is a detail view of the pitman which connects the crank on the end of the wheel-shaft and the pump-rod. Fig. 7 is a detail plan view, on an enlarged scale, of the bracket

to which the tail-vane is connected. Fig. 8 is a sectional view on the line 8 8 of Fig. 7. Fig. 9 is a sectional view on the line Y Y of Fig. 8. Fig. 10 is a detail perspective view of the bearing-blocks for supporting the wheel-shaft. Fig. 11 is a cross-section of the wheel-supporting casting and pitman on the line X X of Fig. 1, and Fig. 12 is a sectional view on the line Z Z of Fig. 4.

The tower C is surmounted by the platform *c*, which supports the frame or casing A united at the upper end by the cap-plate A', which is centrally apertured for the passage of the tubular shank *d* of the wheel-supporting casting D. The lower end of the tubular shank is reduced and fitted to the step E, composed of the plate E', the annular flanges or rims *e* and *e'*, and the reservoir *e''*, placed alongside the outer rim, *e'*, and communicating with the space *e''* between the two rims *e* and *e'*, near the bottom of the same by the passage *e'''*. The step is held in place by being slipped into grooves *a* in the sides of the frame A. Lubricant is filled into the reservoir *e''* and passes from the same into the space *e''* through the passage or duct *e'''* and lubricates the lower end of the tubular shank *d*. The rim or flange *e* forms a guide for the pump-rod F, which passes through it and an aperture in the step.

The wheel-supporting casting is hollow and forms a case for the pitman G, the crank H on the inner end of the wheel-shaft I, and the upper end of the pump-rod. It is composed of the sides *d'* *d''* *d'''* *d''''* and the top and bottom *d''''''* *d''''''*. The sides *d'''* and *d''''* are removable and are held in place by suitable keys or pins passing through lugs projecting from the top and bottom *d''''''* and *d''''''*, as shown. The bracket K, extending from the wheel-supporting casting, preferably from the side *d'*, is recessed at its upper end to receive the lower bearing-block, L, which has concave sides and bottom to leave a space, *k*, for holding a suitable amount of lubricant for keeping the wheel-shaft supplied. The groove *l*, extending lengthwise and down the ends of the lower bearing-block, forms a seat for the wick or fibrous strand *l'*, which rests on the bottom of the oil-chamber or space *k* and feeds the oil to the shaft and prevents the latter running dry so long as any oil is in the chamber *k*. The cap M is suitably recessed to receive the upper bearing-block, N,



and is secured to the bracket by the bolts *m*. Set-screws *n*, passing through the cap and bearing upon the bearing-block *N*, serve to adjust the latter and take up wear. Oil is filled into the chamber *k* through the oil-cup *N'*, secured to or forming a part of the cap *M*, as will be readily understood. The wheel-shaft *I*, journaled between the bearing-blocks *L* and *N*, has a wheel, *O*, of ordinary construction keyed to the outer end and the crank *H* secured to its inner end. The bracket *P*, extended in an opposite direction from the side *d*<sup>3</sup> of the wheel-supporting casting, has an opening, *p*, inclined to a vertical line formed therethrough, which flares from the bottom to the top in a direction at right angles to the wheel-shaft. The tail-vane *Q* is pivotally connected with the bracket by the bolt or pin *p'*, passing through the opening *p*, and the inclination of the bolt is adjusted by the set-screw *p*<sup>2</sup>. By reason of the inclined axis or pivotal connection *p'* the tail-vane will normally stand in the wind and the adjustment of said axis to and from a perpendicular line regulates the amount of force necessary to throw the mill out of the wind and hold it in such position. This operation will be readily understood when it is remembered that the inclination of the axis effects a lifting or elevating of the tail-vane when moved around said axis. The greater the degree of deviation of the axis from a perpendicular line the greater will be the lifting tendency of the vane when turned out of the wind; consequently more power will be required to effect such turning. Hence, the degree of force necessary to keep the wheel in the wind is proportionate to the degree of inclination of the axis of the tail-vane.

The rear side of the wheel or wheel-hub is provided with an iron ring, *o*, against which the brake-shoe *r*, pivotally connected with the brake-lever *R*, is adapted to press and hold the wheel against motion when thrown out of the wind. The brake-lever is mounted upon the stud *m'*, projecting from the cap *M*, and the rear end thereof is connected with the tail-vane by the chain or cord *r'* and the spring-arm *r*<sup>2</sup> in such manner that when the tail-vane is folded, as shown by dotted lines in Fig. 2, the brake will be applied. The tail-vane is folded by the cord *q*, connected at its upper end therewith, passed over a pulley, *s*, journaled in the outer end of the bracket *S*, which is secured to the wheel-supporting casting, thence over the pulley *t*, mounted in the bracket *T*, secured to the interior of the wheel-supporting casting, and thence down through the pump-rod, which is tubular for the purpose, and has its lower end within convenient reach.

The pitman *G* is self-lubricating, and has the oil-chamber *g* formed in its upper end for holding the lubricant, and from which it is supplied to the wrist-pin of the crank *H* by suitable fibrous material. The excess of oil from the wrist-pin follows down the side of the pitman in the groove *g'*, and is directed

to the arm *u* of the collar *U*, secured to the end of the pump-rod. The end of the arm *u* is notched and embraces or fits over a vertical guideway or rib, *u'*; for steadying the movement of the pump-rod.

The tubular shank of the wheel-supporting casting passes through the centrally-aper-tured cap-plate *A'*, which forms an upper bearing therefor, and has the annular groove or recess *a'* for receiving a lubricant which is fed to said bearing by fibrous material, as will be readily comprehended.

The inner curved or cam-shaped end of the tail-vane or the tail-vane casting is bifur-cated and embraces the bracket *P*, which is formed with the shoulder *p*<sup>3</sup> for abutting against the end of the tail-vane and limiting its movement in each direction by striking against each end of the said curved or cam-shaped end.

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

1. In a windmill, the combination, with the wheel-supporting casting, of the wheel-vane pivotally connected therewith, and having its axis adjustable to and from a perpendicular line, substantially as and for the purpose described.

2. The combination, with the wheel-supporting casting and the bracket projecting therefrom, having an opening formed there-through at an incline to a vertical line, and flaring from one end to the other at right angles to the wheel-shaft, of the tail-vane, the bolt or pin passed through said inclined and flared opening for connecting the tail-vane and the wheel-supporting casting, and the set-screw for adjusting the inclination of said pin or bolt, substantially as described, and for the purpose specified.

3. The combination, with the wheel having a bearing-ring on its rear side, the wheel-supporting casting, the brake-lever mounted between its ends on the wheel-casting in substantially a horizontal plane, and the brake-shoe adapted to bear on said ring and pivotally connected with the inner end of the brake-lever, of the tail-vane, the spring-arm secured at one end directly to the tail-vane, and having its free ends extended forward, and the chain connecting said free end of the spring-arm with the outer end of the brake-lever, substantially as and for the purpose described.

4. In a windmill, the combination of the wheel-supporting casting, the bracket projected therefrom and recessed at its upper end, the bearing block having concaved sides and bottom and longitudinal and end grooves fitted in said recess, the cap provided with an oil-cup and recessed and bolted to the bracket, the bearing-block fitted in the recess of the cap, the set-screws for adjusting the upper bearing block, and the wheel-shaft journaled between the bearing-blocks, substantially as set forth.



5. The combination, with the wheel-supporting casting forming a case for the crank and pitman and upper end of the pump-rod, and having a vertical rib on its interior, the  
5 crank and the pump-rod, of the collar secured to the pump-rod and provided with a lateral arm notched on its outer end and fitted over said rib, the pitman connecting the crank, and said arm projecting laterally from the pump-  
10 rod, substantially as set forth.

6. The combination of the wheel-shaft, the crank, the pump-rod, and the self-lubricating

pitman having an oil-chamber at its upper end for feeding oil to the wrist-pin of the crank, and a groove on one side for conveying 15 the excess of oil to the connection between its lower end and the pump rod, substantially as described.

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

JAMES MOSSMAN.

Witnesses:

VAN BUREN HILLYARD,  
NORRIS F. CLARK.