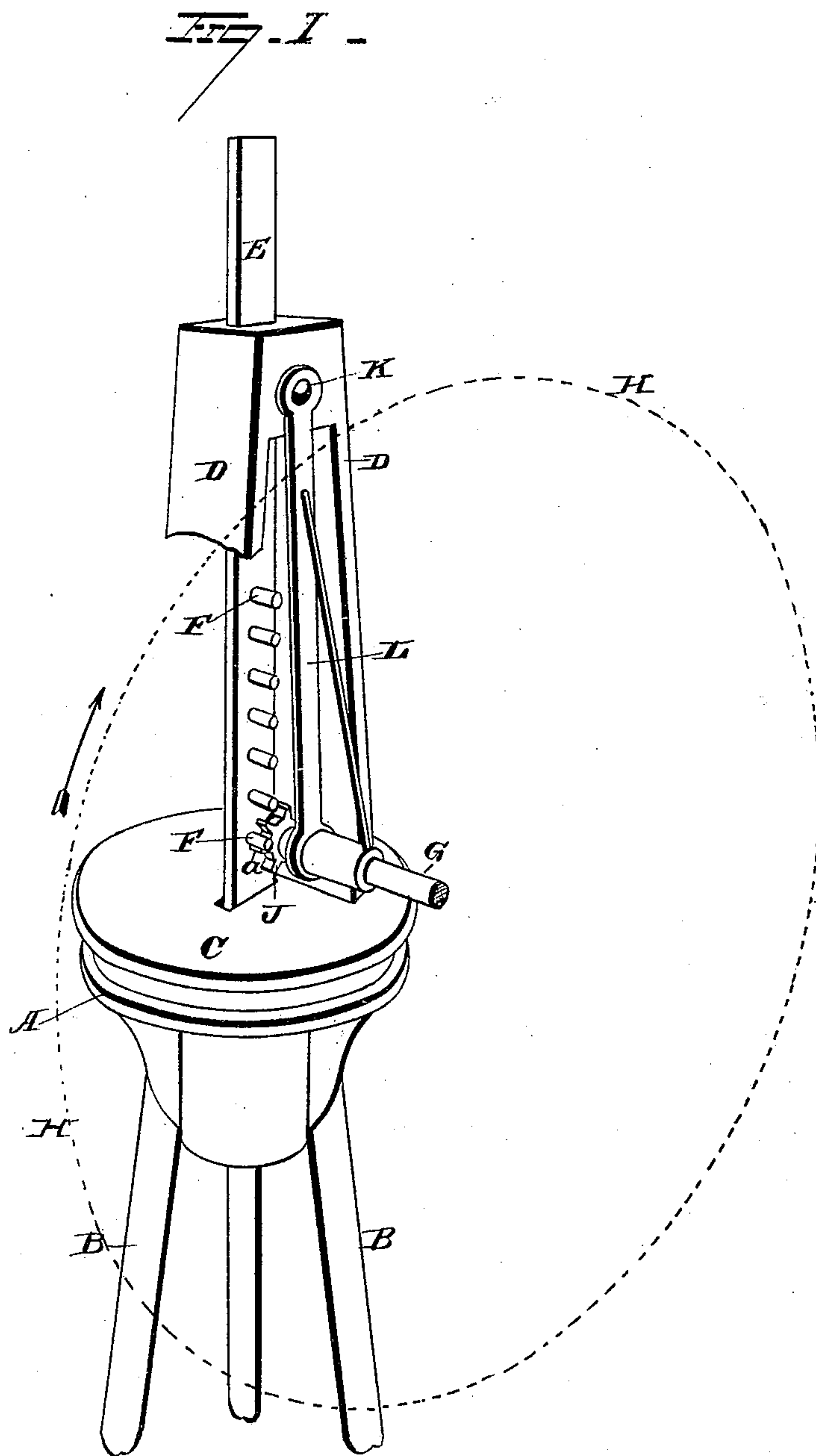


(No Model.)

L. B. DENTON.
WINDMILL FOR PUMPING.

No. 253,016.

Patented Jan. 31, 1882.



WITNESSES
Herman Moran
Albert L. Lawrence.

INVENTOR
Lemi B. Denton.
By H. A. Symour,
ATTORNEY

UNITED STATES PATENT OFFICE

LEMI B. DENTON, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF
TO ARTHUR J. HOLT, OF SAME PLACE.

WINDMILL FOR PUMPING.

SPECIFICATION forming part of Letters Patent No. 253,016, dated January 31, 1882.

Application filed May 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, LEMI B. DENTON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Improvement in Windmills for Pumping, of which the following is a specification.

My invention relates to an improvement in windmills.

Heretofore in windmills the rotary motion has been changed to a reciprocating motion by means of a crank or eccentric; but these methods are attended with great disadvantages, in that the leverage upon the pump-rod is not equal throughout the stroke or revolution. Thus it is evident that when the crank is in position known as "full power"—that is, at right angles to the pump-rod—it takes more power or a stronger wind to raise the pump-rod than when the crank forms a greater or less angle with the pump-rod. On account of the above objection it has been found necessary to limit the stroke of the pump-rod to a few inches, from the fact that if a long stroke is attempted a light wind cannot overcome the leverage of the crank when in an unfavorable position.

The object of my invention is to provide simple means whereby the circular motion of the wind-wheel is converted into a vertical reciprocating motion for pumping or other purposes, thereby dispensing with the usual crank and permitting the stroke to be of indefinite length without altering the leverage of the mill.

The accompanying drawing fully illustrates my idea, and is the arrangement of parts which I prefer to use.

In the figure, which is a perspective view of the upper front or windward portion of a windmill with the wind-wheel removed, A and C represent the usual circular castings or turntables, A being bolted fast to the derrick B, and C being free to turn upon A. Upon C are cast the uprights D D, connected at the top and forming guideways for the flat rod E, which latter slides vertically in the space between them and passes down through the center of the turn-table, the lower end of the said rod E being secured in any suitable manner to the pump-rod. Upon the face of the rod E, and projecting at right angles thereto, is a series of

pins, F, of suitable size and of such distance apart to be engaged by the spur-wheel or pinion J, and form therewith a rack and pinion. The spur-wheel J is fixed rigidly upon the inner end of the shaft G, which latter at its outer end also carries the wind-wheel, whose circumference is indicated by the circle H, it not having been deemed necessary to delineate the wheel more exactly. The shaft G is journaled in a bearing in the lower end of the vibrating link L, which latter is adapted to vibrate in a plane parallel to the motion of the rod E. The rod L is suspended from the bolt K in the upper part of the supports D.

If, now, with the parts in the position shown in the drawing, the wind-wheel H, and consequently the shaft G and pinion J, be rotated in the direction of the arrow, it is obvious that the pinion engaging with the pins F will raise them and the rod E until the lowest pin is raised by the pinion, when the rod L being free to vibrate will do so to the left by the engagement of tooth *a* of the pinion with the pin F, thereby bringing the pinion onto the other or left side of the pins, and the rotary motion of the shaft G being always in the same direction will cause the pins and the rod E to descend until the upper pin reaches the pinion, when the rod L is caused in the same manner to vibrate to the right, and the pinion being then on the right side of the pins will elevate them again, and so on continuously.

It is obvious that the leverage upon the pins is the same throughout the stroke, and that the length of stroke may be increased indefinitely by inserting more pins without changing the leverage.

I would have it understood that I do not limit myself at all to such specific arrangement of the mechanism, as various other methods could be arranged embodying the same principle.

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

1. In a windmill, the combination, with the wind-wheel shaft having a pinion attached thereto, of a rod having a series of pins secured thereto, the parts being arranged so that the pinion will engage with the opposite sides of

the pins, and thereby convert the rotary motion of the wheel-shaft into a reciprocating motion of the rod, substantially as set forth.

2. In a windmill, the combination, with the
5 wind-wheel shaft having a pinion secured thereto, of a rod provided with a series of removable pins arranged in a vertical line, the parts being arranged so that when the pinion engages
10 with one side of the series of pins the rod will be raised, and when it engages with the opposite side the rod will be depressed, substantially as set forth.

3. In a windmill, the combination, with the windmill-shaft provided with a pinion and supported at one end by a vibrating link, of a pump-rod provided with a series of pins, with which
15 said pinion engages and operates to impart a reciprocatory movement to the rod, substantially as set forth.

LEMI B. DENTON.

Witnesses:

DENNIS L. ROGERS,
JOHN J. SOURS.